Ameren Services

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March 29, 2001

FILED[2]
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Missouri Public Service Commission

**VIA FEDERAL EXPRESS**

Mr. Dale Hardy Roberts
Secretary/Chief Regulatory Law Judge
Missouri Public Service Commission
Governor Office Building
200 Madison Street, Suite 100
Jefferson City, MO 65101

Ameren

Re: In the matter of the Application of Union Electric Company (d/b/a AmerenUE) for an order to approve a change to the single phase meter testing standard under which AmerenUE currently performs its single phase meter testing
Case No. EO-2001-521

Dear Mr. Roberts:

Enclosed for filing in the above-referenced matter are an original and eight (8) copies of the Application of AmerenUE.

Please kindly acknowledge receipt of this filing by stamping as filed a copy of this letter and returning it to the undersigned in the enclosed, self-addressed, stamped envelope.

Sincerely,

David Hennen

David B. Hennen
Associate General Counsel

DBH:rd
enclosures

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI



| | | |
|---|---|---|
| In the matter of the Application of Union Electric Company (d/b/a AmerenUE) for an order to approve a change to the single phase meter testing standard under which AmerenUE currently performs its single phase meter testing | ) ) ) ) ) | Case No. EO-2001-521 |

**APPLICATION OF UNION ELECTRIC COMPANY FOR APPROVAL TO CHANGE THE SINGLE PHASE METER TESTING STANDARD UNDER WHICH AMERENUE CURRENTLY PERFORMS ITS SINGLE PHASE METER TESTING**

COMES NOW Union Electric Company, d/b/a AmerenUE ("AmerenUE" or "Company"), and hereby requests, pursuant to 4 CSR 240-2.060, approval of the Missouri Public Service Commission ("Commission") of this Application to change the single phase watt-hour meter statistical sample testing standard under which AmerenUE currently performs its single phase meter testing, and in support thereof, respectfully states the following:

1. AmerenUE is a Missouri corporation, in good standing in all respects, with its principal office and place of business located at 1901 Chouteau Avenue, St. Louis, Missouri 63103. AmerenUE is engaged in providing electric, gas and steam heating utility services in portions of Missouri as a public utility under the jurisdiction of the Missouri Public Service Commission ("Commission"). AmerenUE is also engaged in providing electric and gas service in portions of Illinois. There is already on file with the Commission a certified copy of AmerenUE's Restated Articles of Incorporation (see Commission Case No. EA-87-105), and a copy of AmerenUE's Fictitious Name Registration as filed with the Missouri Secretary of State's Office (see Commission Case No. GO-98-486), and said documents are incorporated herein by reference and made a part hereof for all purposes.

2. Pleadings, notices, orders and other correspondence concerning this Application should be addressed to:

David B. Hennen
Associate General Counsel
Ameren Services Company
1901 Chouteau Avenue
P.O. Box 66149 (MC 1310)
St. Louis, MO 63166-6149
(314) 554-4673
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3. AmerenUE does not have any pending action or unsatisfied judgments or decisions against it from any state or federal agency or court which involve customer service or rates, which action, judgment or decision has occurred within the last three (3) years. Furthermore, AmerenUE does not have any annual report or assessment fees that are overdue.

**Historical Background**

4. By application filed on August 26, 1974 (hereinafter "Prior Application"), the Company sought permission to depart from certain requirements of Rule 32 of the Commission's General Order No. 20 (hereinafter "Rule 32") regarding the testing of electric service watt-hour meters.

5. Rule 32 required that every electric service watt-hour meter in Missouri be periodically tested by the electric corporation furnishing the same. The schedule of testing a meter was based upon the year that it was manufactured and the rated current capacity of that meter. For example, induction type watt-hour meters not exceeding 50 amperes and manufactured after 1927, but before 1937, needed to be tested every 96 months. Watt-hour

meters manufactured during and since 1937 had to be tested every 240 months. These same testing schedules required under Rule 32 are now codified in 4 CSR 240-10.030(28).

6. In its Prior Application, the Company sought approval to be relieved from full compliance with Rule 32, and in furtherance thereof, submitted to the Commission an alternative testing procedure that differed from the testing requirements set forth under Rule 32.

7. The Company's alternative testing procedure would utilize a standardized statistical sampling technique that incorporates the mathematical principles of Statistical Quality Control as set forth in published standards of the United States Military establishments and other government agencies. (i.e. MIL-STD-414 and MIL-STD-105) (Hereinafter, such standards shall be referred to collectively as "MIL Standards".) The alternative testing procedure would insure with a confidence level of 95% that not more than 2.5% of meters in service will deviate from 100% accuracy of registration by more than plus or minus 2.0%.

8. In its order dated March 12, 1975, the Commission stated in its order approving the Company's request to implement the alternative testing procedure using the MIL Standards sampling technique that the new procedure was in the public interest both from an economic and a practical standpoint. In support of its order the Commission further stated: i) the new testing procedure using the MIL Standards sampling technique would result in significant cost savings of about $1.5 million over twenty years, ii) by employing the MIL Standards sample testing technique, the Company can focus its testing on those meters that are known to need adjustment or replacement rather than testing each and every meter in operation, most of which will be found to be accurate, iii) testing every meter is time consuming and expensive and if a more feasible method can be used to achieve the same result, then that method should be implemented, iv) the

alternate testing procedure will not impact the procedure in which the Company tests its meters upon the receipt of a customer complaint.

9. The Company, in accordance with the Commission order, has utilized the alternative testing procedure to date as its means of testing the Company's single phase watt-hour meters.

**Request**

10. Pursuant to 4 CSR -10.030(28), AmerenUE hereby requests the Commission's approval to change from the MIL Standards currently used by AmerenUE as a basis for its testing procedure to the American National Standard Institute Sampling Procedures and Tables for Inspection by Attributes and by Variables. (i.e. ANSI/ASQC Z1.4 and ANSI/ASCQ Z1.9 which are attached hereto as Appendix A and B respectively and incorporated herein for all purposes.) (Hereinafter, such standards shall collectively be referred to as the "ANSI Standards".) In support thereof AmerenUE states the following:

A. The ANSI Standards are essentially a modernization of the MIL Standards. This is evidenced by the statements contained in the forwards of the respective ANSI Standards. The forward of ANSI/ASQC Z1.4 states that ANSI/ASQC Z1.4 "corresponds directly to MIL-STD-105E...All the tables, table numbers, and procedures used in MIL-STD-105E were retained. The tables are unchanged to make the tabular content completely compatible with MIL-STD-105E." The forward of ANSI/ASQC Z1.9 states that ANSI/ASQC Z1.9 "corresponds directly to the military standard MIL-STD-414...The tables and procedures contained

herein are those of the original MIL-STD-414, suitably modified to ... match MIL-STD-105D."

B. All other aspects of the Company's testing procedure will remain the same as approved by the Commission in its March 12, 1975 order.

C. The change from the MIL Standards to the ANSI Standards will not result in any additional cost to the Company's electric customers.

D. The change from the MIL Standards to the ANSI Standards will not result in a reduction of meters tested nor change the accuracy of the meter testing procedures. The sampling procedures under the ANSI Standards will continue to insure with a confidence level of 95% that not more than 2.5 % of meters in service will deviate from 100% accuracy of registration by more than plus or minus 2.0%.

E. In connection with the Illinois restructuring legislation, the Company was required to update its electric meter testing procedures in Illinois to incorporate the ANSI Standards. As a result, the Company purchased new software for managing its ANSI Standard based meter testing procedure in Illinois, which also could be used for testing the Company's watt-hour meters in Missouri. Employing the same testing procedure in both of the Company's jurisdictions will reduce the administrative burdens of having to maintain and track two separate, but statistically identical, meter testing programs.

F. It is the Company's understanding that other electric utilities under the Commission's jurisdiction have been granted permission to use the ANSI

Standards as a basis for their meter testing program.

G. In an order dated November 12, 1997 in Case No. GO-98-25, the Commission approved the Company's request to utilize the ANSI Standards as a basis for its natural gas meter testing program.

H. A change from the MIL Standards to the ANSI Standards will not have any impact on the procedure in which the Company tests its meters upon the receipt of a customer complaint.

WHEREFORE, AmerenUE requests that this Commission enter an order granting permission, consent, approval and authority to AmerenUE to adopt the ANSI Standards as a basis for its single phase, watt-hour meter testing procedure.

Respectfully submitted

UNION ELECTRIC COMPANY d/b/a AmerenUE

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DHennen@ameren.com

Dated: March 29, 2001

VERIFICATION

STATE OF MISSOURI )
) SS
CITY OF ST. LOUIS )

I, David B. Hennen, do state upon oath, that I am an attorney for Union Electric Company, d/b/a AmerenUE, with authority to file this Application, that I am familiar with its contents, and that they are true and correct to the best of my knowledge, information and belief.

David B. Hennen

Sworn to before me this 29th day of March, 2001.

Notary Public

CAROL A. HEAD
Notary Public - Notary Seal
STATE OF MISSOURI
St. Charles County
My Commission Expires: Sept. 23, 2002

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Application was mailed by U. S. mail, first class, postage paid to the following persons on this 29th day of March, 2001:

General Counsel
Missouri Public Service Commission
Governor Office Building
200 Madison Street, Suite 100
Jefferson City, Missouri 65101

Office of Public Counsel
Governor Office Building
200 Madison Street, Suite 650
Jefferson City, Missouri 65101

David B. Hennen

# AMERICAN NATIONAL STANDARD

## SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY VARIABLES FOR PERCENT NONCONFORMING

PREPARED BY
AMERICAN SOCIETY FOR QUALITY CONTROL STANDARDS COMMITTEE
FOR
AMERICAN NATIONAL STANDARDS COMMITTEE
Z-1 ON QUALITY ASSURANCE

SPONSOR AND SECRETARIAT
AMERICAN SOCIETY FOR QUALITY CONTROL

## Abstract

Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming is an acceptable sampling system to be used on a continuing stream of lots for AQL specified. It provides tightened, normal, and reduced plans to be used on measurements which are normally distributed. Variation may be measured by sample standard deviation, sample range, or known standard deviation. It is applicable only when the normality of the measurements is assured.

*AMERICAN NATIONAL STANDARD:* An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review and users are cautioned to obtain the latest edition.

*CAUTION NOTICE:* This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

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# Foreword

(This foreword is not a part of American National Standard - Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, Z1.9-1993)

This standard is a revision of ANSI/ASQC Z1.9-1972, "Sampling Procedures and Tables for Inspection by Variables for Percent Defective", which corresponds directly to the military standard MIL-STD-414. The present revision ANSI/ASQC Z.1-1993 was undertaken to allow complete interchangeability of the tabulated plans with ISO/DIS 3951, which provides a graphical means for implementation of the plans. ANSI/ASQC Z1.9-1993 is also roughly matched to ANSI Z1.4, which corresponds directly to the military standard MIL-STD-105D. The matching is sufficient to allow inspection under either standard for stated AQLs and Inspection Levels with reasonably equivalent protection. Tables are given in Appendix E which shows differences in protection between ANSI Z1.9-1993 and ANSI Z1.4. These are for use in critical applications to determine whether moving from one standard to the other is appropriate.

The tables and procedures contained herein are those of the original MIL-STD-414, suitably modified to achieve correspondence with the aforementioned ISO/DIS 3951 and matching with MIL-STD-105D. These modifications include:

1. Rearranging the code letters assigned to the various plans by eliminating the plans for the original codes J and L and dropping the symbol O. The codes were then relettered alphabetically.
2. Relabeling the original Inspection Levels I,II,III,IV,V as S3,S4,I,II,III.
3. Adjusting lot size ranges corresponding to various inspection levels to match MIL-STD-105D.
4. Deleting original AQLs: 0.04,0.065 and 15.00 percent. (Users who wish to use these AQL values should refer to MIL-STD-414.)
5. Replacing the original rules for switching and discontinuance of inspection by those of MIL-STD-105D (slightly revised).
6. Deletion of Section A2 on "Classification of Defects" and substituting a new section on "Definitions and Terminology" which refers to ANSI/ASQC Standard A2-1987 as a reference source for terminology and definitions. ANSI/ASQC Z1.6-1987 contains modifiers for the degree of seriousness of defects to be used in defect classifications.
7. Deletion of Section A8 on "Estimation of Process Average" and substituting a new section calling attention to the need for verifying the assumption of normality of the underlying distribution of individual measurements.
8. Substitution of the word "nonconformity" for "defect", "nonconformance" for "defective", and "percent nonconforming" for "percent defective" throughout.
9. Addition of an appendix showing the match between Z1.9-1993 and Z1.4.

NOTE: A compatible and interchangeable graphical version of this standard is contained in ISO/DIS 3951.

Suggestions for improvement of this standard will be welcome. They should be sent to the standard's sponsor, ASQC. Committee members serving as writers and editors of this standard were:

Joseph M. Califano, Chairperson
Michael Yargosz
August Mundel
Harrison Wadsworth
Edward G. Schilling

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# INTRODUCTION

This Standard was prepared to meet a growing need for the use of standard sampling plans for inspection by variables in procurement, supply and storage, and maintenance inspection operations. The variables sampling plans apply to a single quality characteristic which can be measured on a continuous scale, and for which quality is expressed in terms of percent nonconforming. The theory underlying the development of the variables sampling plans, including the operating characteristic curves, assumes that measurements of the quality characteristics are independent, identically distributed normal random variables.

*It is important to note that variables sampling plans are not to be used indiscriminately, simply because it is possible to obtain variables measurement data. In considering applications where the normality or independence assumptions may be questioned, the user is advised to consult his technical agency to determine the feasibility of application.*

In comparison with attributes sampling plans, variables sampling plans have the advantage of usually resulting in considerable savings in sample size for comparable assurance as to the correctness of decisions in judging a single quality characteristic, or for the same sample size, greater assurance is obtained using variables plans. Attributes sampling plans have the advantage of greater simplicity, of being applicable to either single or multiple quality characteristics, and of requiring no knowledge about the distribution of the continuous measurements of any of the quality characteristics.

This Standard is divided into four sections. Section A describes general procedures of the sampling plans. Sections B and C describe specific procedures and applications of the sampling plans when variability is unknown. In Section B the estimate of lot standard deviation is used as the basis for an estimate of the unknown variability, and in Section C the average range of the sample is used. Section D describes the plans when variability is known.

Each of Section B, C, and D is divided into two parts: (I) Sampling Plans for the Single Specification Limit Case, and (II) Sampling Plans for the Double Specification Limit Case. For the single specification limit case, the acceptability criterion is given in two forms: Form 1 and Form 2. Either of the forms may be used, since they are identical as to sample size and decision for lot acceptability or rejectability. In deciding whether to use Form 1 or Form 2, the following points should be borne in mind. Form 1 provides the lot acceptability criterion without estimating lot percent nonconforming. The Form 2 lot acceptability criterion requires estimates of lot percent nonconforming.

Operating Characteristic Curves in Table A-3 are for the Normal Sampling Plans and show the relationship between quality and percent of lots expected to be acceptable for the quality characteristic inspected. As stated, these Operating Characteristic Curves are based on the assumption that measurements are selected at random from a normal distribution.

The corresponding sampling plans in Sections B, C, and D were matched as closely as possible under a system of fixed sample size with respect to their Operating Characteristic Curves. Operating Characteristic Curves in Table A-3 have been computed for the sampling plans based on the estimate of lot standard deviation of unknown variability. They are equally applicable for sampling plans based on the average range of the sample of unknown variability and those based on known variability.

Certain characteristics concerning the sampling plans in Section B and C and those in Section D should be noted. Plans based on the estimate of unknown variability require fewer sample units for comparable assurance when the estimate of lot standard deviation is used than when the average range of the sample is used; on the other hand, plans using the average range of the sample require simpler computations. Plans using known variability require considerably fewer sample units for comparable assurance than either of the plans of unknown variability; however, the requirement of known variability is a stringent one. The user is well advised to consult a statistician before applying sampling plans using known variability.

Table B-6 provides values of the factor F to compute the maximum standard deviation: MSD. The MSD serves as a guide for the magnitude of the estimate of lot standard deviation when using plans for the double specification limit case, based on the estimate of lot standard deviation of unknown variability. Similarly Table C-6 provides values of the factor f to compute the maximum average range: MAR. The MAR serves as a guide for the magnitude of the average range of the sample when using plans for the double specification limit case, based on the average range of the sample of unknown variability. The estimate of lot standard deviation or average range of the sample, if it is less than the MSD or MAR, respectively, helps to insure, but does not guarantee, lot acceptability.

All symbols and their definitions are given in the appendix of the applicable section. An illustration of the computations and procedures used in the sampling plans is given in the examples of Parts I and II of the applicable section. The computations involve simple arithmetic operations such as addition, subtraction, multiplication, and division of numbers, or at most, the taking of a square root of a number. The user should become familiar with the general procedures of Section A, and refer to the applicable section for detailed instructions regarding specific procedures, computations, and tables for the sampling plans.

The Appendix—Section E—provides information about the match between this variables standard, ANSI/ASQC Z1.9-1993, and the corresponding attributes standard, ANSI Z1.4.

# SECTION A

# GENERAL DESCRIPTION OF SAMPLING PLANS

## A1. SCOPE

A1.1 Purpose. This Standard establishes sampling plans and procedures for inspection by variables for use in procurement, supply and storage, and maintenance inspection operations. When applicable this Standard shall be referenced in the specification, contract, or inspection instructions, and the provisions set forth herein shall govern.

A1.2 Inspection. Inspection is the process of measuring, examining, testing, gauging, or otherwise comparing the "unit or product" (See A1.4) with the applicable requirements.

A1.3 Inspection by Variables. Inspection by variables is inspection wherein a specified quality characteristic (See A1.5) on a unit of product is measured on a continuous scale, such as pounds, inches, feet per second, etc., and a measurement is recorded.

A1.4 Unit of Product. The unit of product is the entity of product inspected in order to determine its measurable quality characteristic. This may be a single article, a pair, a set, a component of an end product, or the end product itself. The unit of product may or may not be the same as the unit of purchase, supply, production, or shipment.

A1.5 Quality Characteristic. The quality characteristic for variables inspection is that characteristic of a unit of product that is actually measured to determine conformance with a given requirement.

A1.6 Specification Limits. The specification limit(s) is the requirement that a quality characteristic should meet. This requirement may be expressed as an upper specification limit; or a lower specification limit, called herein a single specification limit; or both upper and lower specification limits, called herein a double specification limit.

A1.7 Sampling Plans. A sampling plan is a procedure which specifies the number of units of product from a lot which are to be inspected, and the criterion for acceptability of the lot. Sampling plans designated in this Standard are applicable to the inspection of a single quality characteristic of a unit of product. These plans may be used whether procurement inspection is performed at the plant of a prime contractor, subcontractor or vendor, or at destination, and also may be used when appropriate in supply and storage, and maintenance inspection operations.

## A2. DEFINITIONS AND TERMINOLOGY

The definitions and terminology employed in this standard are in accord with ANSI/ASQC Standard A2-1987 (Terms, Symbols, and Definitions for Acceptance Sampling Involving the Percent or Proportion of Variant Units in a Lot or Batch). The following two definitions are of particular importance in application of this standard:

> DEFECT: A departure of a quality characteristic from its intended level or state that occurs with a severity sufficient to cause an associated product or service not to satisfy intended normal, or foreseeable, usage requirements.
>
> NONCONFORMITY: A departure of a quality characteristic from its intended level or state that occurs with severity sufficient to cause an associated product or service not to meet a specification requirement.

These acceptance sampling plans for variables are given in terms of the percent or proportion of product in a lot or batch that depart from some requirement. The general terminology used within the document will be given in terms of percent of nonconforming units or number of nonconformities, since these terms are likely to constitute the most widely used criteria for acceptance sampling.

## A3. PERCENT NONCONFORMING

A3.1 Expression of Nonconformance. The extent of nonconformance of product shall be expressed in terms of percent nonconforming.

A3.2 Percent Nonconforming. The percent nonconforming for a quality characteristic of a given lot of product is the number of units of product nonconforming for that characteristic divided by the total number of units of product and multiplied by one hundred. Expressed as an equation: Percent nonconforming =

$$\frac{\text{Number of nonconforming units}}{\text{Number of units}} \times 100$$

## A4. ACCEPTABLE QUALITY LEVEL

A4.1 Acceptable Quality Level. The acceptable quality level (AQL) is defined as the maximum percentage or proportion of nonconforming units in a lot or batch that, for purposes of acceptance sampling, can be considered satisfactory as a process average. The acceptable quality level is a nominal value expressed in terms of percent nonconforming specified for a single quality characteristic. Certain numerical values of AQL ranging from .10 to 10.00 percent are shown in Table A-1. When a range of AQL values is specified, it shall be treated as if it were equal to the value of AQL for which sampling plans are furnished and which is included within the AQL range. When the specified AQL is a particular value other than those for which sampling plans are furnished, the AQL, which is to be used in applying the provisions of this Standard, shall be as shown in Table A-1.

A4.2 Specifying AQLs. The particular AQL value to be used for a single quality characteristic of a given product must be specified. In the case of a double specification limit, either an AQL value is specified for the total percent nonconforming outside of both upper and lower specification limits, or two AQL values are specified, one for the upper limit and another for the lower limit.

## A5. SUBMITTAL OF PRODUCT

A5.1 Lot. The term "lot" shall mean "inspection lot," i.e., a collection of units of product from which a sample is drawn and inspected to determine compliance with the acceptability criterion.

A5.1.1 Formation of Lots. Each lot shall, as far as is practicable, consist of units of product of a single type, grade, class, size, or composition manufactured under essentially the same conditions.

A5.2 Lot Size. The lot size is the number of units of product in a lot, and may differ from the quantity designated in the contract or order as a lot for production, shipment, or other purposes.

## A6. LOT ACCEPTABILITY

A6.1 Acceptability Criterion. The acceptability of a lot of material submitted for inspection shall be determined by use of one of the sampling plans associated with a specified value of the AQL(s). This Standard provides sampling plans based on known and unknown variability. In the latter case two alternative methods are provided, one based on the estimate of lot standard deviation and the other on the average range of the sample. These are referred to as the standard deviation method and the range method. For the case of a single specification limit, the acceptability criterion is given in two forms. These are identified as Form 1 and Form 2.

A6.2 Choice of Sampling Plans. Sampling plans and procedures are provided in Section B if variability is unknown and the standard deviation method is used, in Section C if variability is unknown and the range method is used, and in Section D if variability is known. Unless otherwise specified, unknown variability, standard deviation method sampling plans, and the acceptability criterion of Form 2 (for the single specification limit case) shall be used.

## A7. SAMPLE SELECTION

A7.1 Determination of Sample Size. The sample size is the number of units of product drawn from a lot. Relative sample sizes are designated by code letters. The sample size code letter depends on the inspection level and the lot size. There are five inspection levels: Special Levels S3, S4, and General Levels I, II and III. Unless otherwise specified, Inspection Level II shall be used. However, Inspection Level I may be specified when less discrimination is needed, or Level III may be specified for greater discrimination. Levels S3 and S4 may be used when relatively small sample sizes are necessary and large sampling risks can or must be tolerated. The sample size code letter applicable to the specified inspection level and for lots of given size shall be obtained from Table A-2.

A7.2 Drawings of Samples. A sample is one or more units of product drawn from a lot. Units of the sample shall be selected without regard to their quality.

## A8. NORMALITY ASSUMPTION

This standard assumes the underlying distribution of individual measurements to be normal in shape. Failure of this assumption to be valid will affect the OC curves and probabilities based on these curves. In particular it will affect the estimate of percent nonconforming calculated from the mean and standard deviation of the distribution. The assumption should be verified prior to use of the standard.

A variety of statistical tests and graphical techniques are available for this purpose. A person knowledgeable in statistics should be consulted who can advise whether the distribution appears suitable for sampling by variables.

## A9. SPECIAL PROCEDURE FOR APPLICATION OF MIXED VARIABLES-ATTRIBUTES SAMPLING PLANS

A9.1 Applicability. A mixed variables and attributes sampling plan may be used under either of the two following conditions: (Note: No Operating Characteristic Curves are provided for the mixed variables-attributes sampling plans herein and those in Table A-3 are not applicable.)

Condition A. Ample evidence exists that the product submitted for inspection is selected by the supplier to meet the specification limit(s) by a screening process from a larger quantity of product which is not being produced within the specification limit(s).

Condition B. Other conditions exist that warrant the use of a variables-attributes sampling plan.

A9.2 Definitions.

A9.2.1 Inspection by Attributes. Inspection by attributes is inspection wherein the unit of product is classified simply as a nonconforming unit or conforming with respect to a given requirement or set of requirements.

A9.2.2 Mixed Variables-Attributes Inspection. Mixed variables-attributes inspection is inspection of a sample by attributes, in addition to inspection by variables already made of a previous sample, before a decision as to acceptability or rejectability of a lot can be made.

A9.3 Selection of Sampling Plans. The mixed variables-attributes sampling plan shall be selected in accordance with the following:

A9.3.1 Select the variables sampling plan in accordance with Section B, C, or D.

A9.3.2 Select the attributes sampling plan from ANSI Z1.4 (MIL-STD-105D) using a single sampling plan and tightened inspection. The same AQL value(s) shall be used for the attributes sampling plan as used for the variables plan of paragraph A9.3.1.

(Additional sample items may be drawn, as necessary, to satisfy the requirements for sample size of the attributes sampling plan. Count as a nonconforming unit each sample item falling outside of specification limit(s).)

A9.4 Determination of Acceptability. A lot meets the acceptability criterion if one of the following conditions is satisfied:

Condition A. The lot complies with the appropriate variables acceptability criterion of Section B, C. or D.

Condition B. The lot complies with the acceptability criterion of ANSI Z1.4.

A9.4.1 If Condition A is not satisfied, proceed in accordance with the attributes sampling plan to meet Condition B.

A9.4.2 If Condition B is not satisfied, the lot does not meet the acceptability criterion.

## A10. NORMAL, TIGHTENED AND REDUCED INSPECTION

A10.1 Initiation of Inspection. Normal inspection will be used at the start of inspection unless otherwise directed by the responsible authority.

A10.2 Continuation of Inspection. Normal, tightened or reduced inspection shall continue unchanged on successive lots or batches except where the switching procedures given below require change.

A10.3 Switching Procedures.

A10.3.1 Normal to Tightened. When normal inspection is in effect, tightened inspection shall be instituted when 2 out of 5 consecutive lots or batches have been rejected on original inspection (i.e., ignoring resubmitted lots or batches for this procedure).

A10.3.2 Tightened to Normal. When tightened inspection is in effect, normal inspection shall be instituted when 5 consecutive lots or batches have been considered acceptable on original inspection.

A10.3.3 Normal to Reduced. When normal inspection is in effect, reduced inspection shall be instituted providing that all of the following conditions are satisfied:

a. The preceding 10 lots or batches have been on normal inspection and none has been rejected; and
b. Production is at a steady rate; and
c. Reduced inspection is considered desirable by the responsible authority and is permitted by the contract or specification.

A10.3.4 Reduced to Normal. When reduced inspection is in effect, normal inspection shall be instituted if any of the following occur on original inspection:

a. A lot or batch is rejected; or
b. Production becomes irregular or delayed; or
c. Other conditions warrant that normal inspection shall be instituted.

A10.4 Discontinuation of Inspection. In the event that 10 consecutive lots or batches remain on tightened inspection (or such other number as may be designated by the responsible authority), inspection under the provisions of this document should be discontinued pending action to improve the quality of submitted material.

## TABLE A-1
### AQL Conversion Table

| For specified AQL values falling within these ranges. | Use this AQL value |
|---|---|
| – to 0.109 | 0.10 |
| 0.110 to 0.164 | 0.15 |
| 0.165 to 0.279 | 0.25 |
| 0.280 to 0.439 | 0.40 |
| 0.440 to 0.669 | 0.65 |
| 0.700 to 1.09 | 1.0 |
| 1.10 to 1.64 | 1.5 |
| 1.65 to 2.79 | 2.5 |
| 2.80 to 4.39 | 4.0 |
| 4.40 to 6.99 | 6.5 |
| 7.00 to 10.9 | 10.0 |

## TABLE A-2[2]
### Sample Size Code Letters[1]

| Lot Size | Inspection Levels | |
|---|---|---|
| | Special | General |
| | S3 S4 | I II III |
| 2 to 8 | B B | B B C |
| 9 to 15 | B B | B B D |
| 16 to 25 | B B | B C E |
| 26 to 50 | B B | C D F |
| 51 to 90 | B B | D E G |
| 91 to 150 | B C | E F H |
| 151 to 280 | B D | F G I |
| 281 to 400 | C E | G H J |
| 401 to 500 | C E | G I J |
| 501 to 1,200 | D F | H J K |
| 1,201 to 3,200 | E G | I K L |
| 3,201 to 10,000 | F H | J L M |
| 10,001 to 35,000 | G I | K M N |
| 35,001 to 150,000 | H J | L N P |
| 150,001 to 500,000 | H K | M P P |
| 500,001 and over | H K | N P P |

[1] Sample size code letters given in body of table are applicable when the indicated inspection levels are to be used.

[2] The theory governing inspection by variables depends on the properties of the normal distribution and, therefore, this method of inspection is only applicable when there is reason to believe that the frequency distribution is normal.

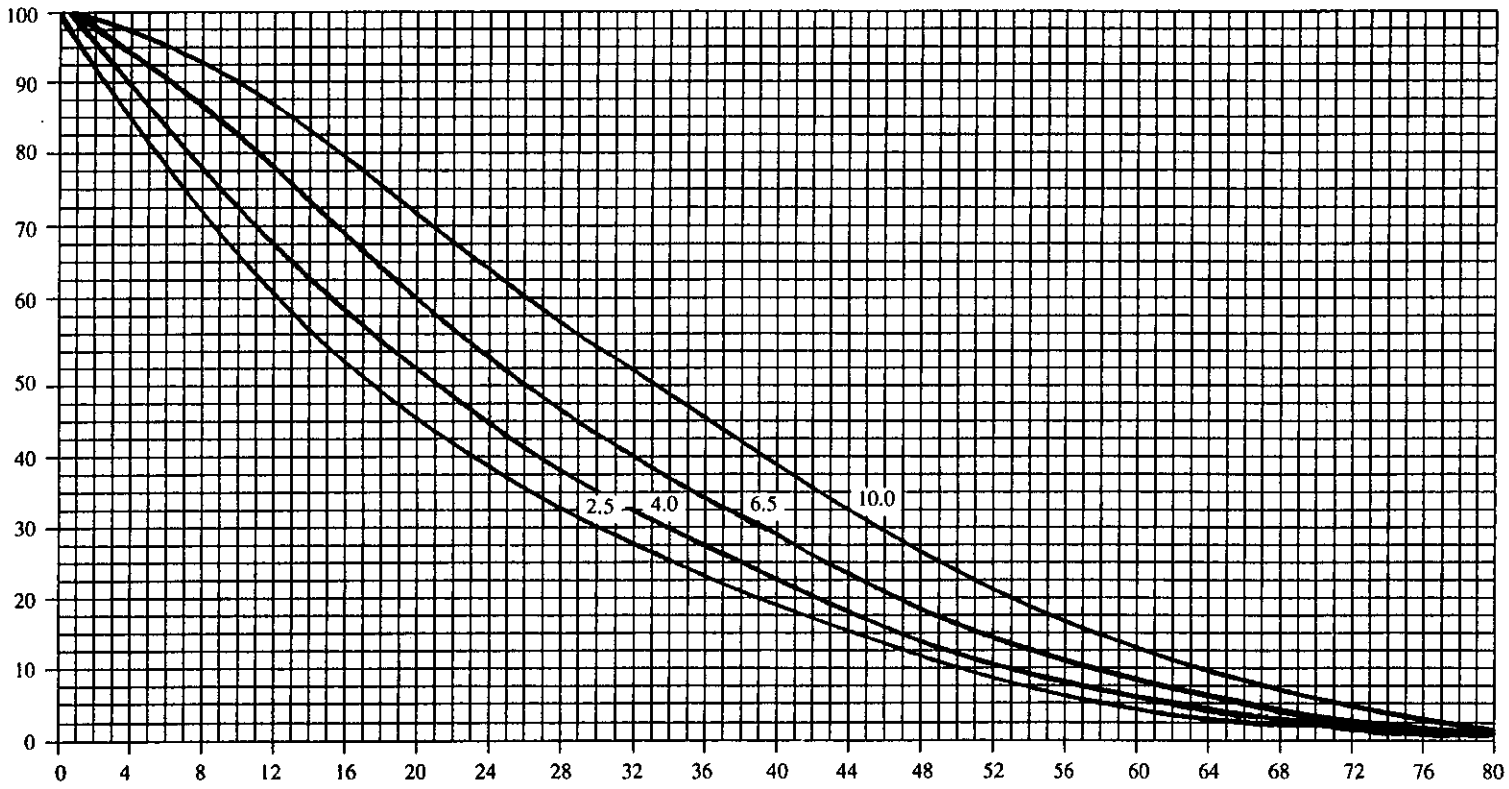
**TABLE A-3**
**Operating Characteristic Curves for Sampling Plans of Sections B, C, and D**

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter B

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

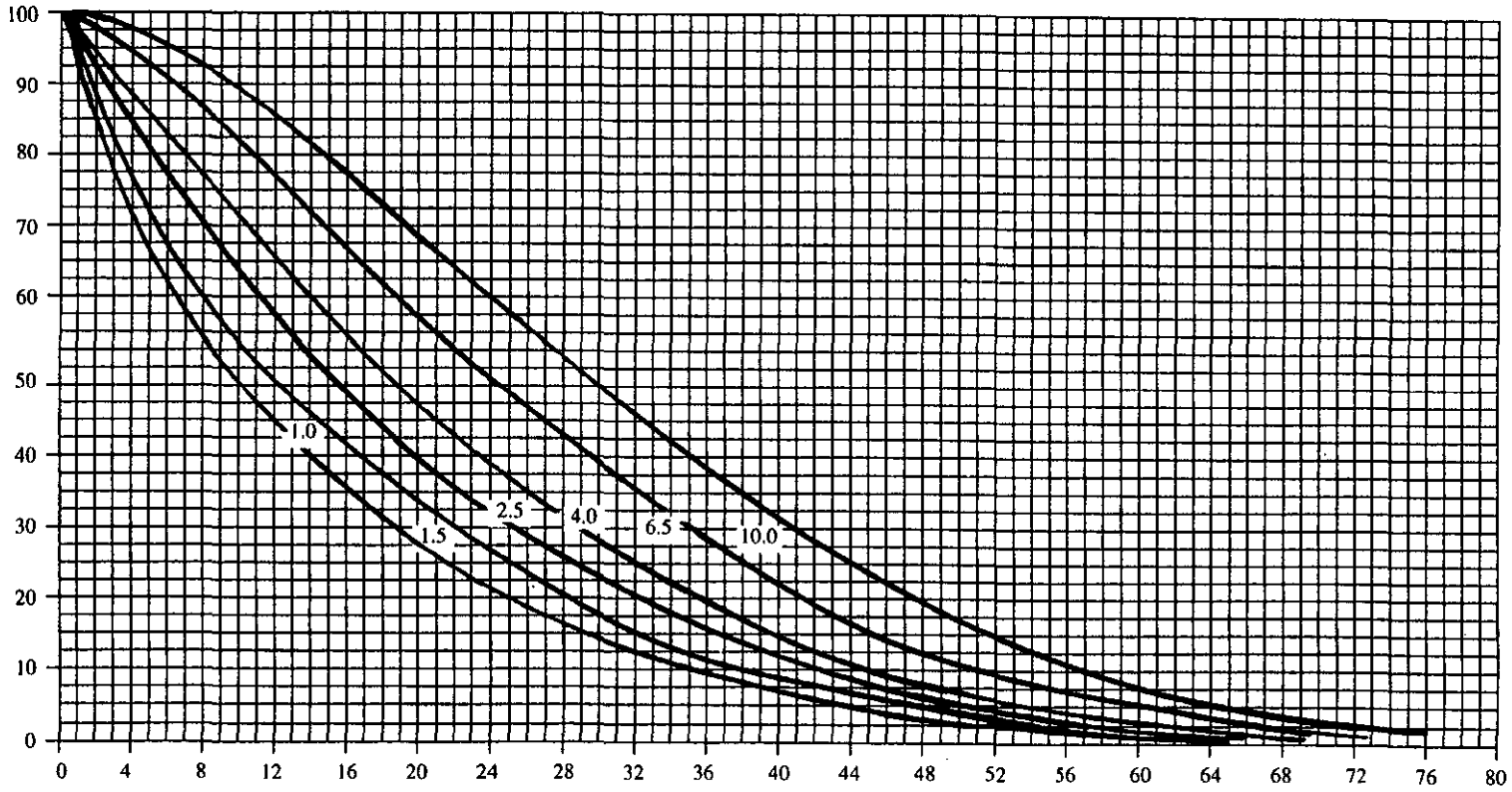
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter C

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

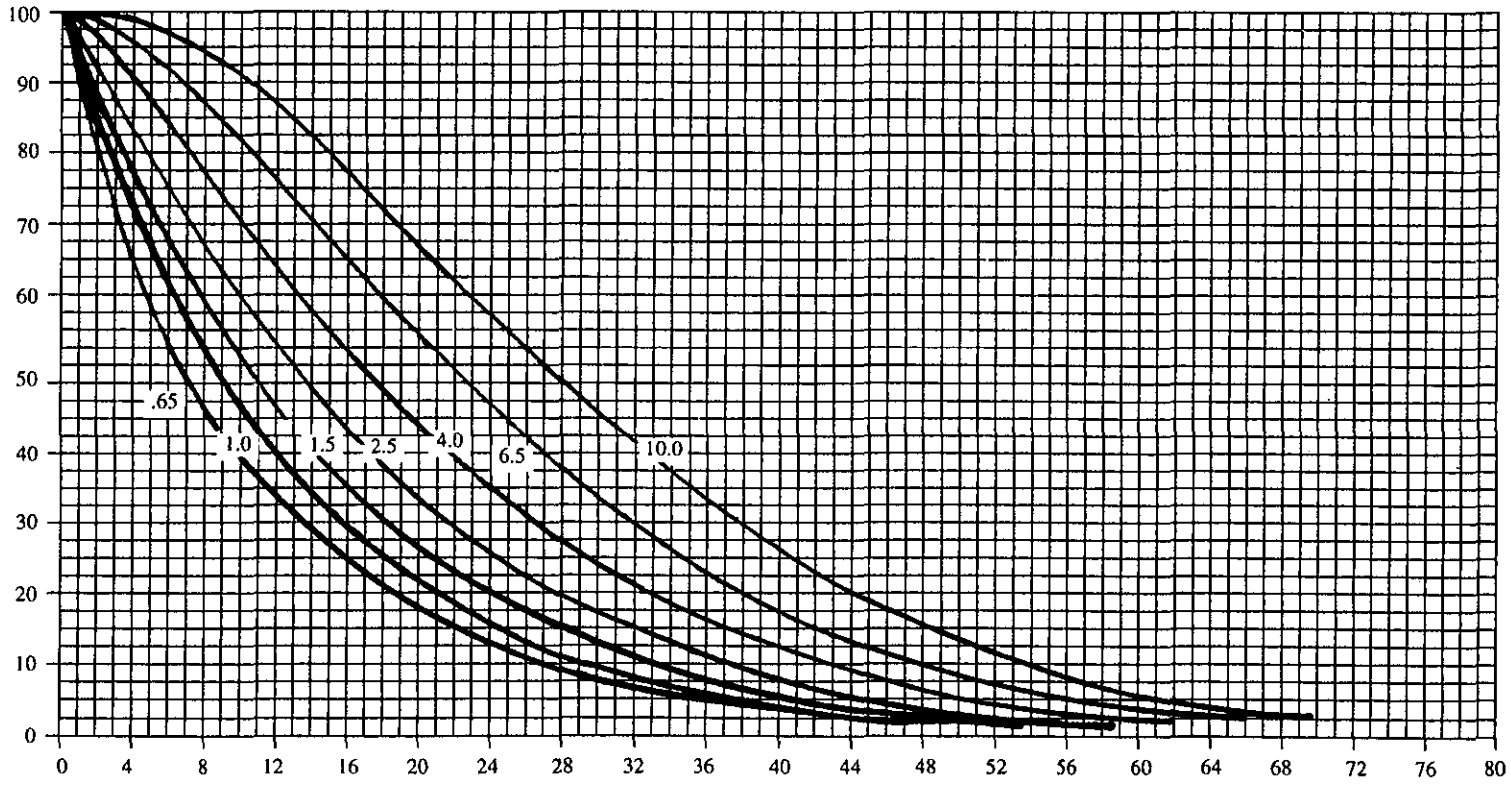
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter D

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

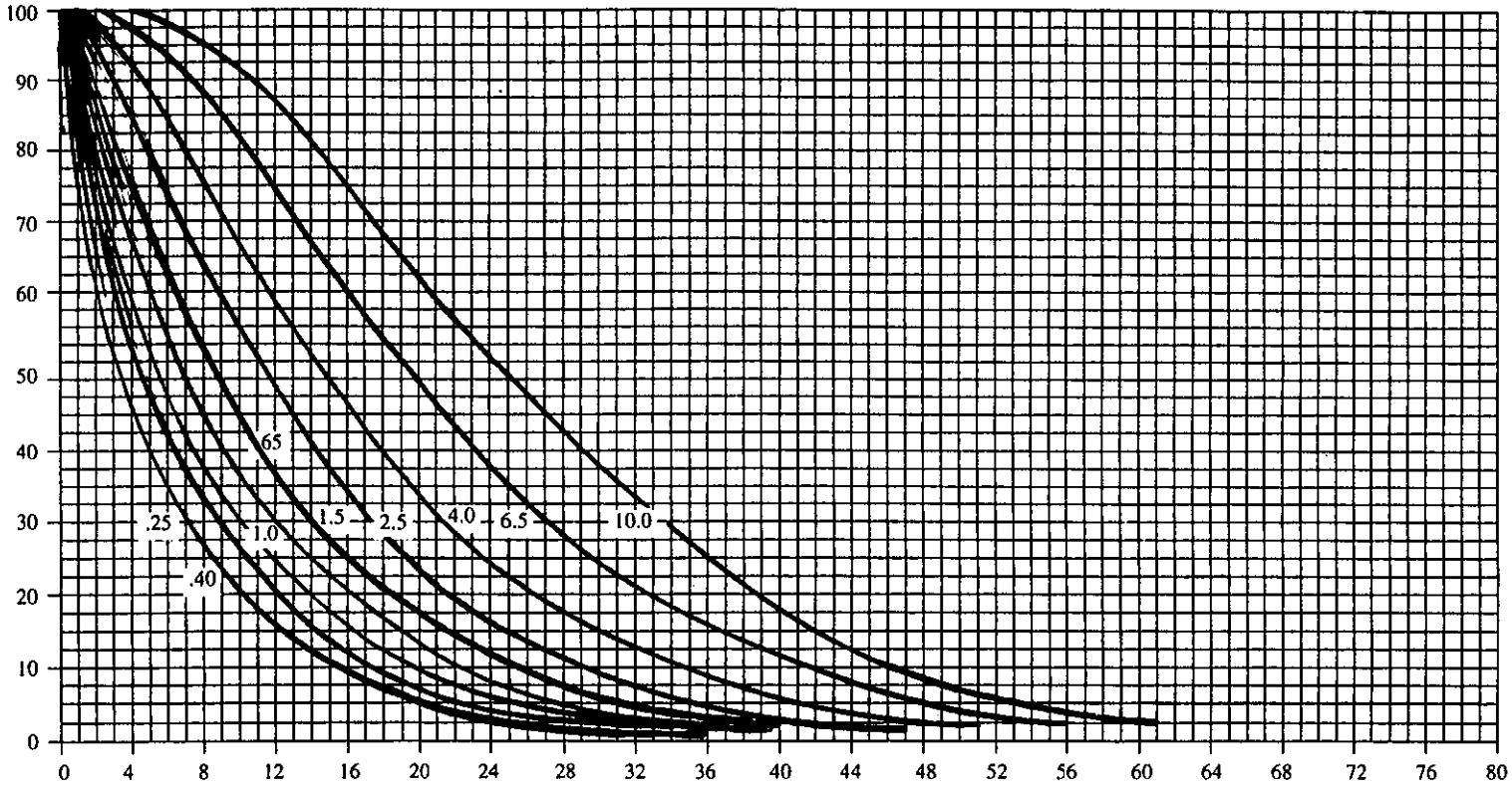
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter E

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

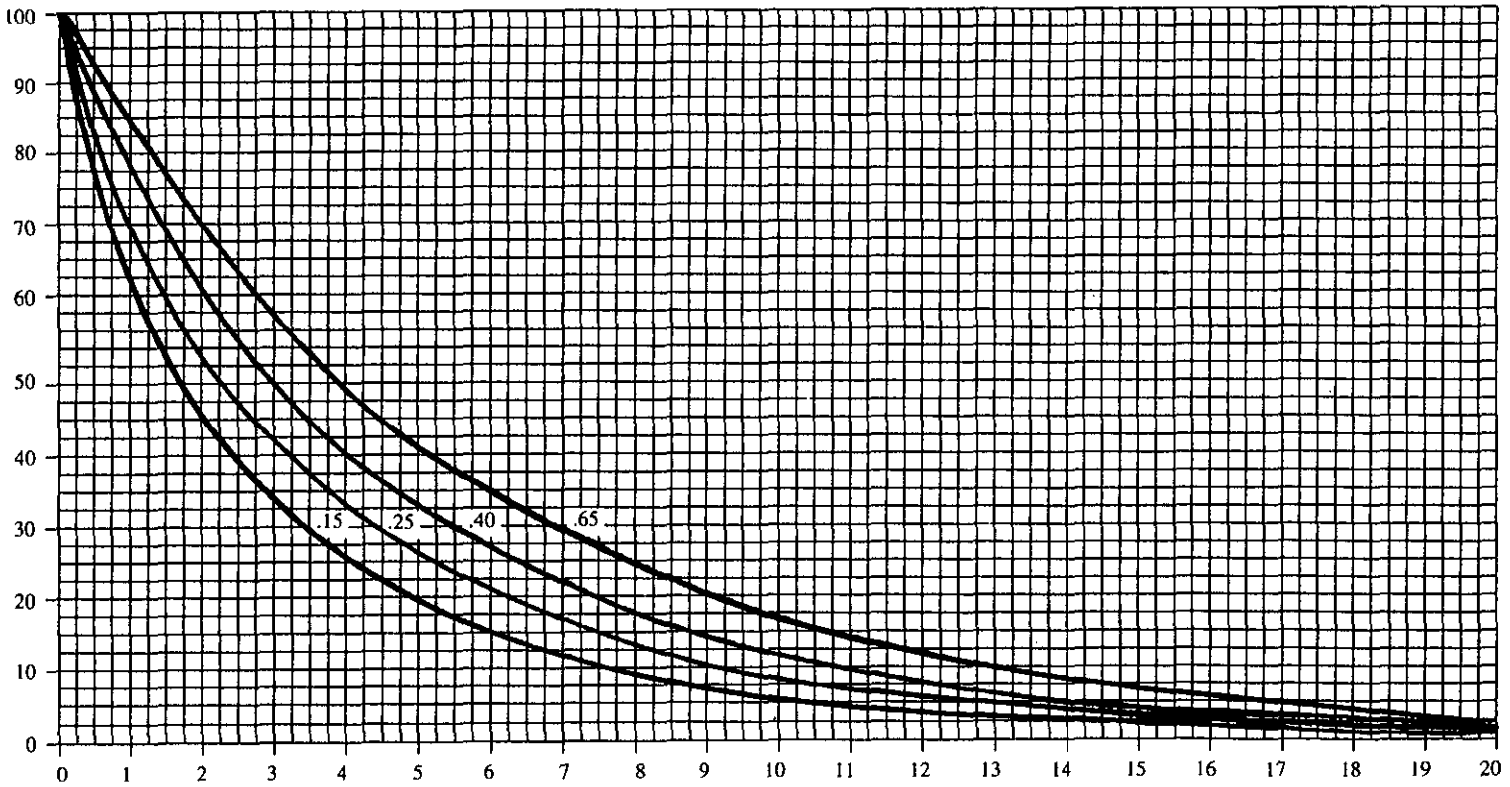
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter F

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

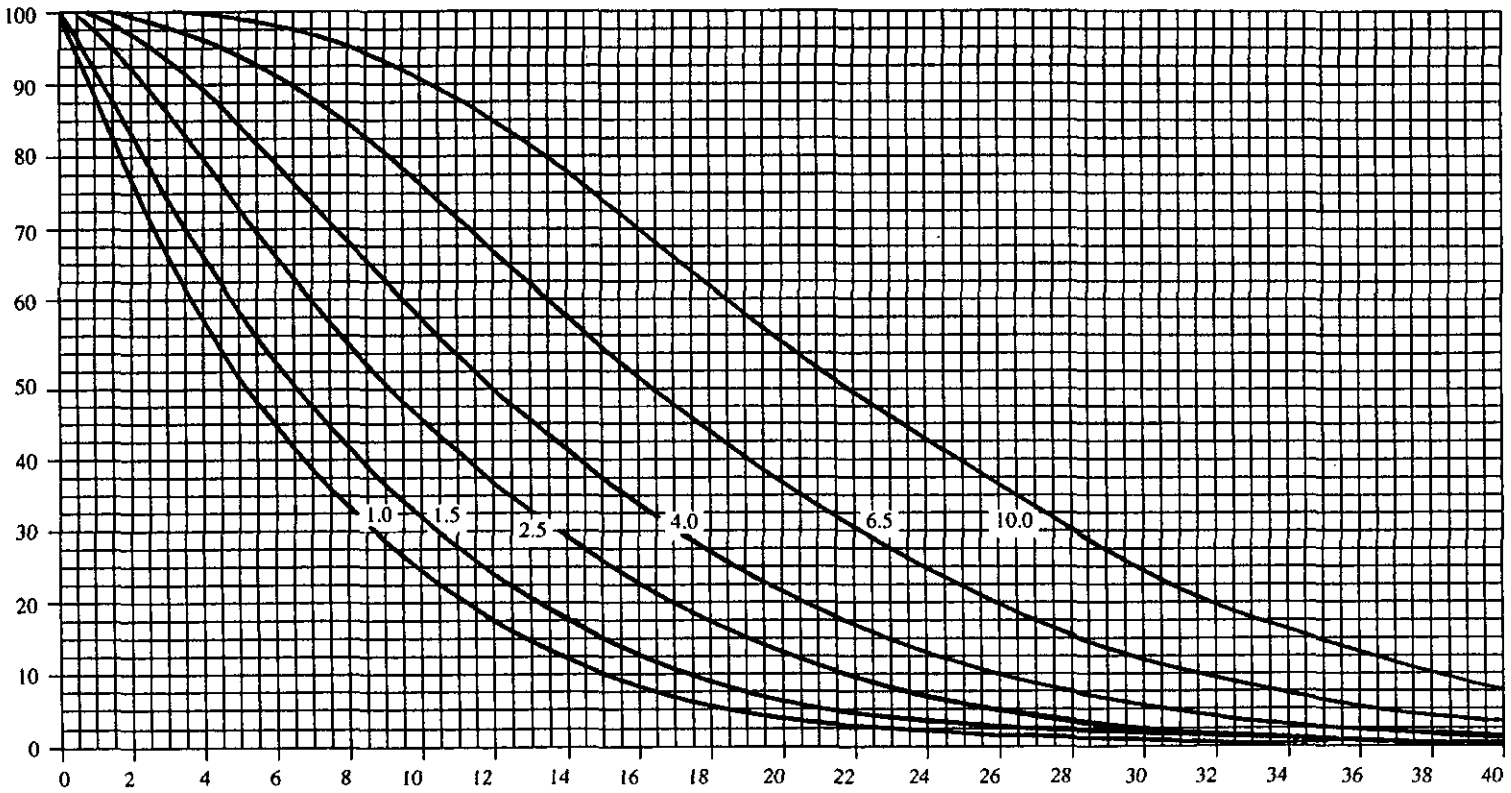
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter F (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

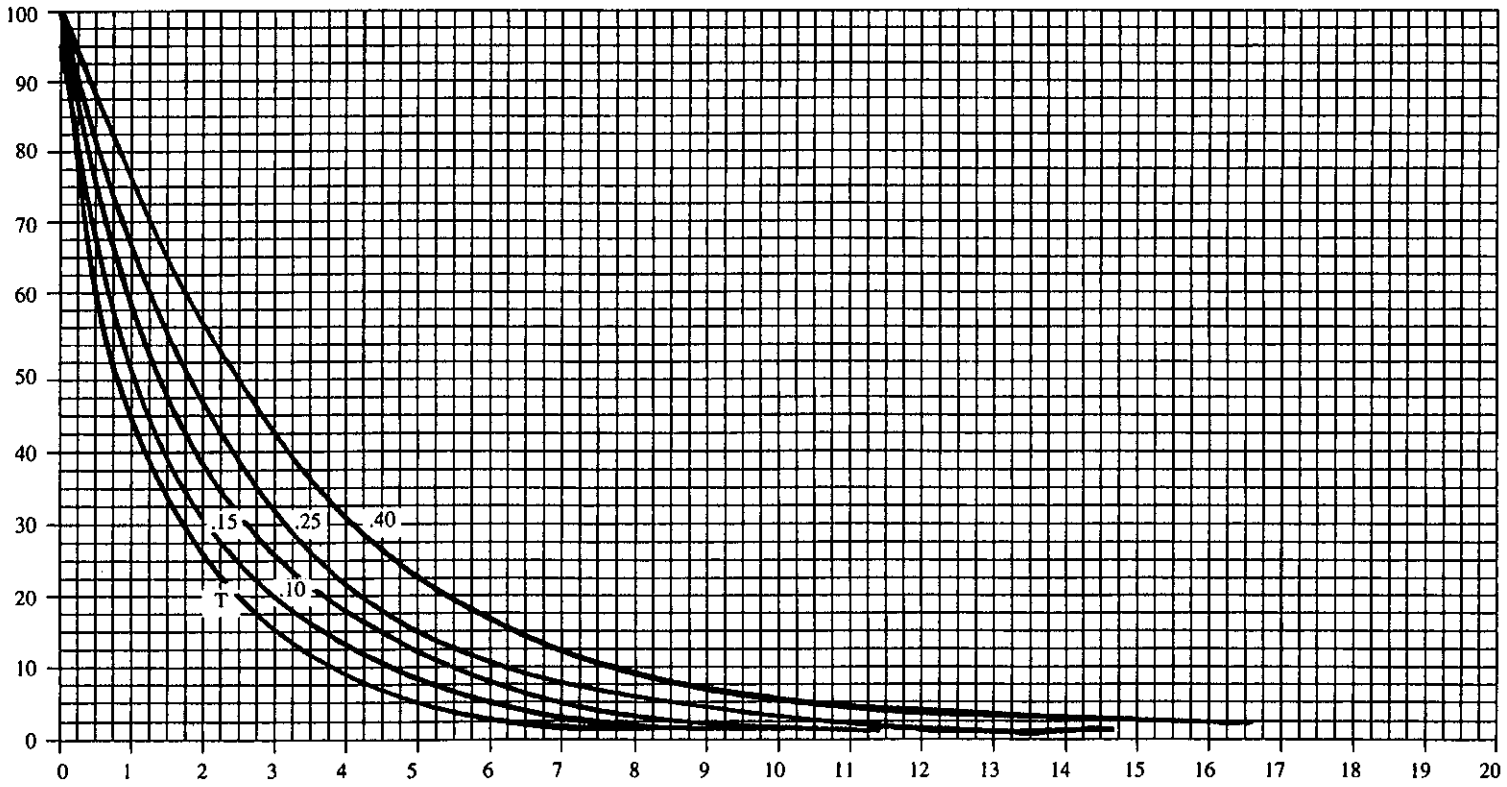
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter G

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

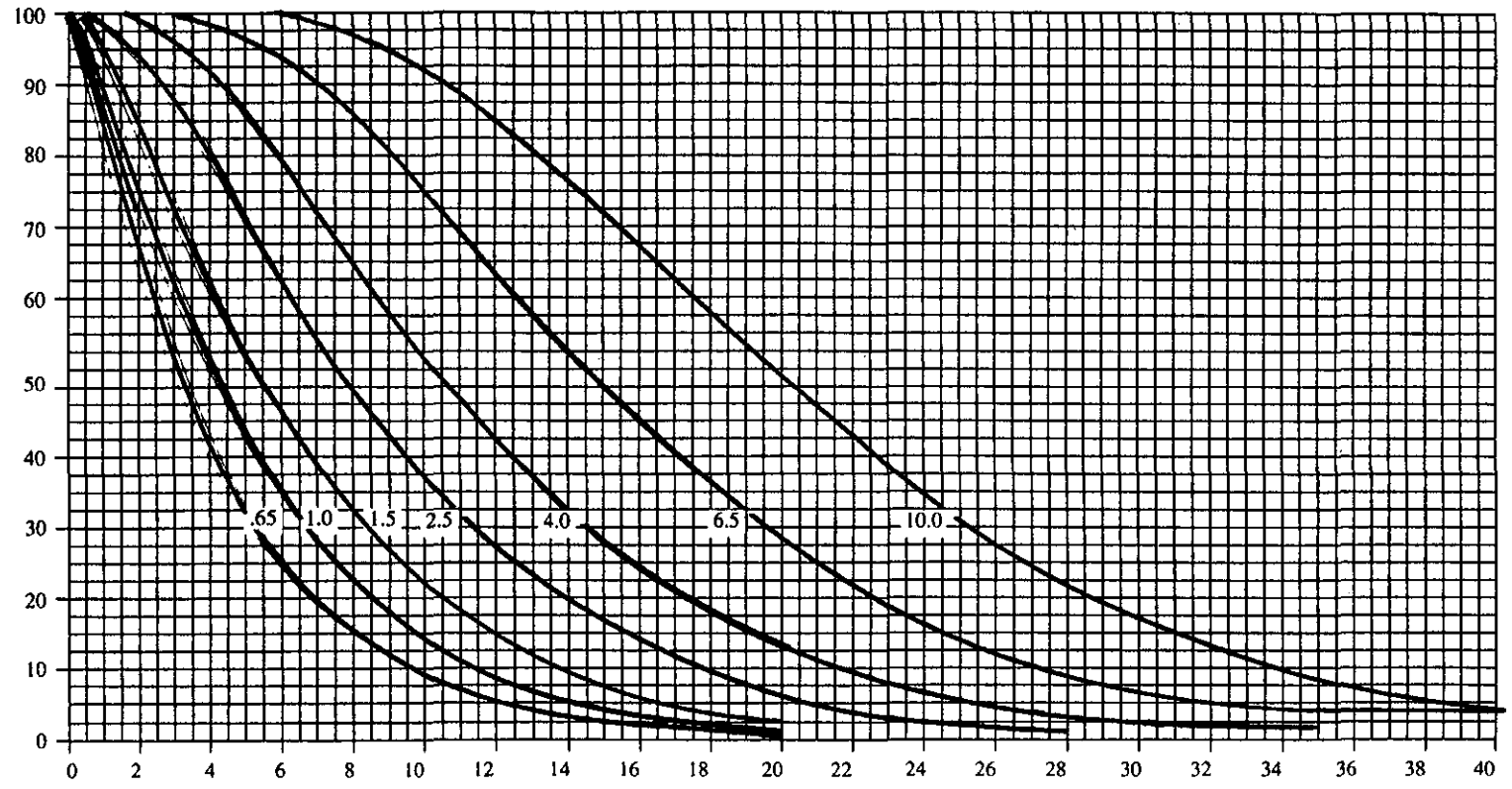
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.
T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter G (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

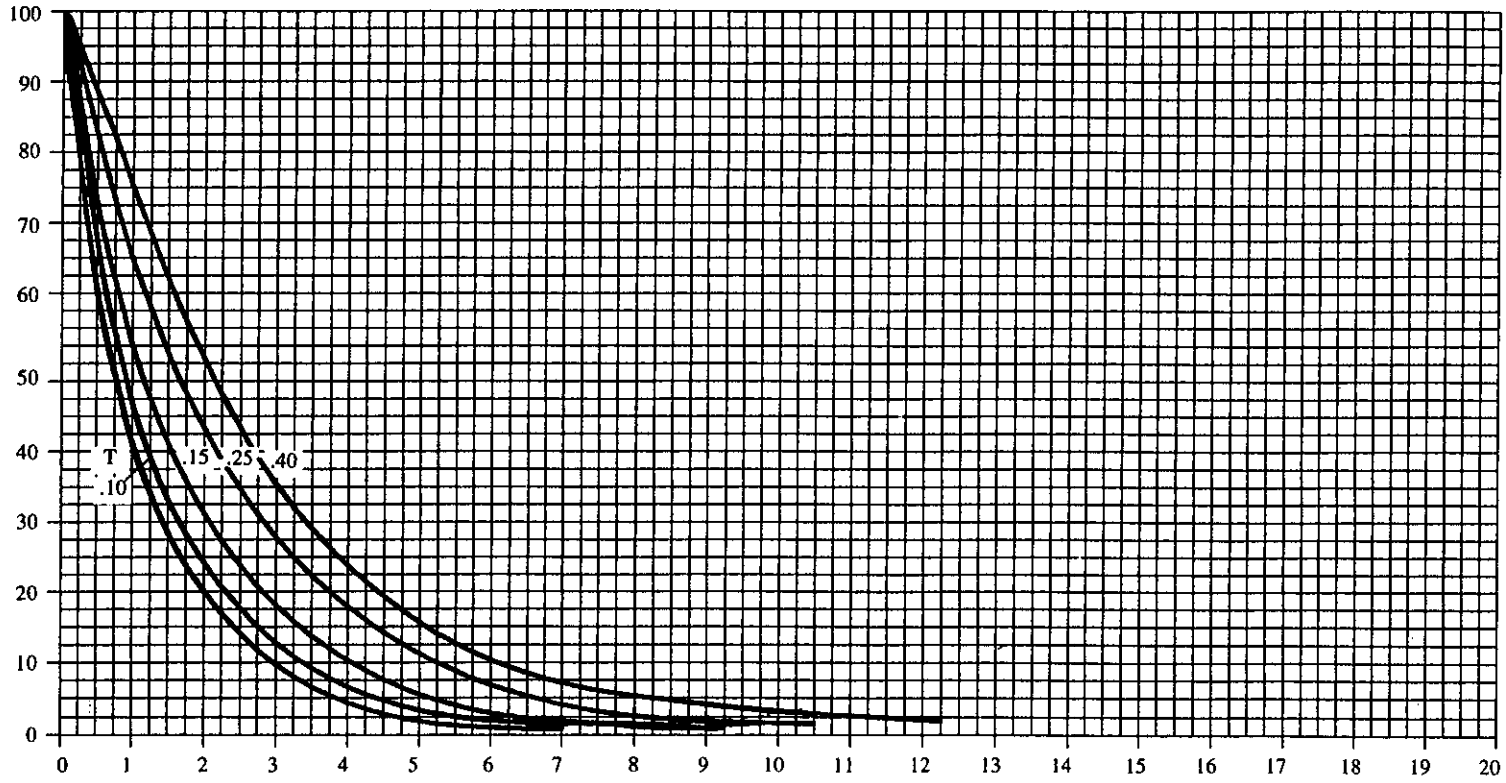
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter H

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

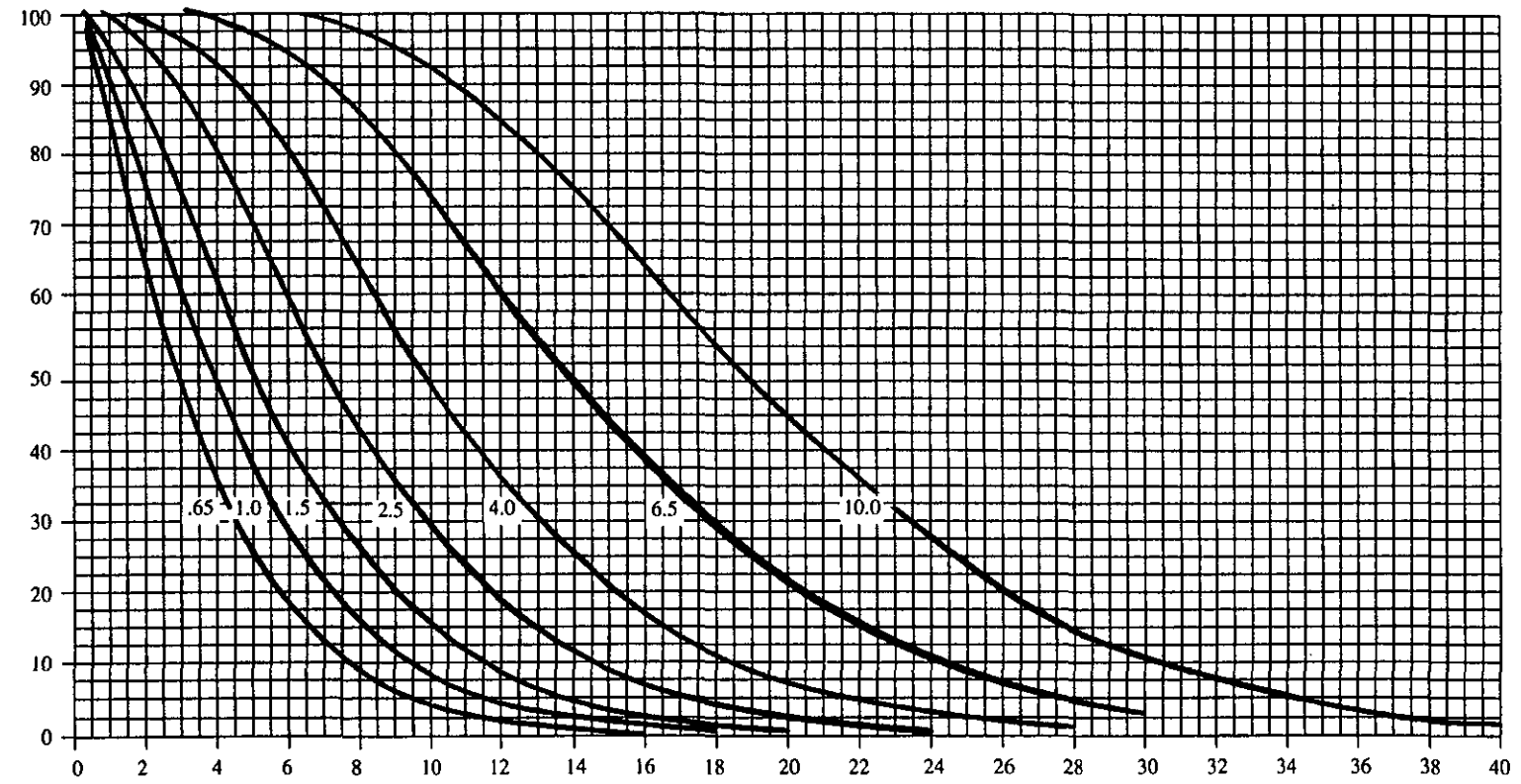
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter H (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

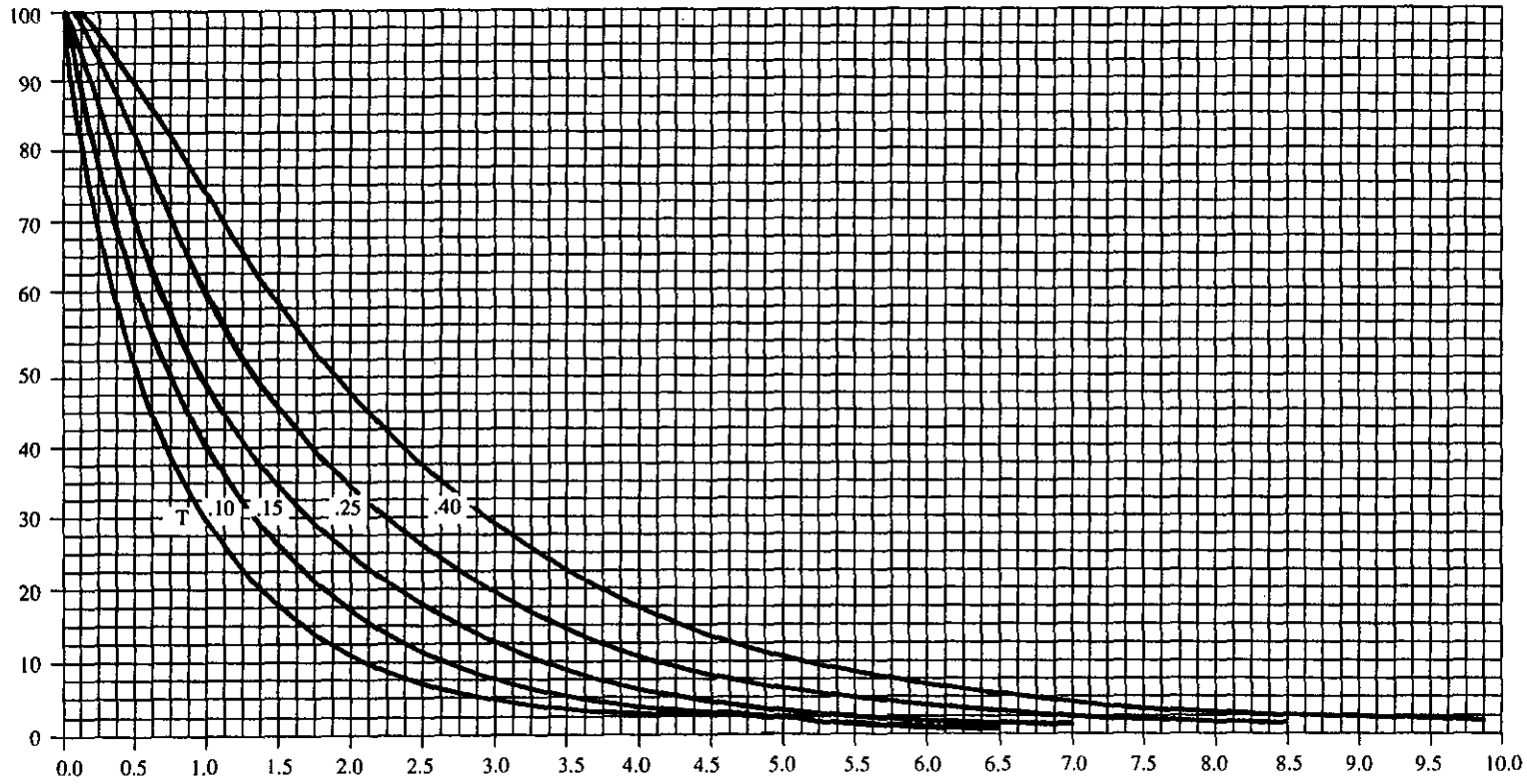
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter I

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

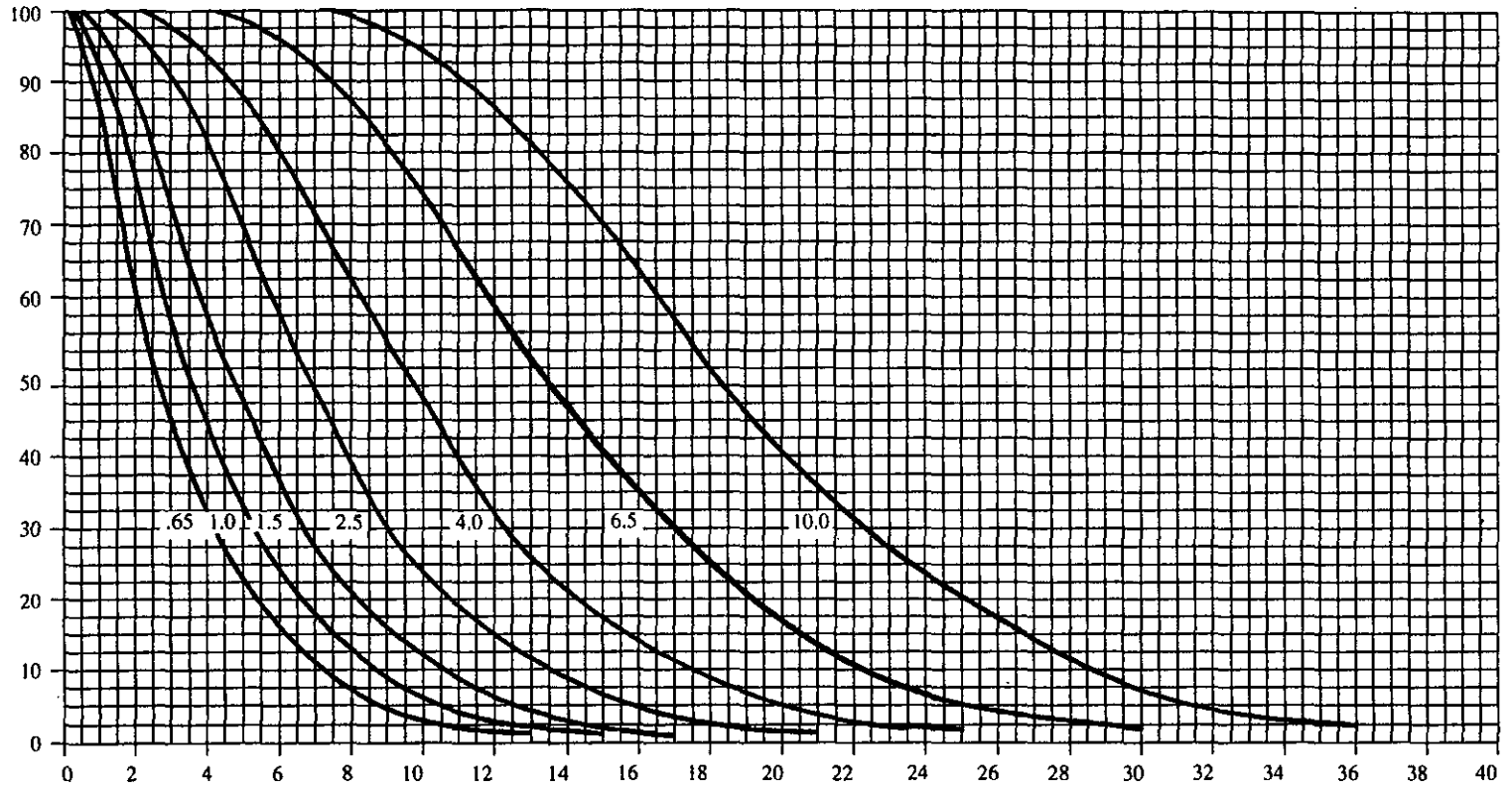
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter I (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




*The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.*

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

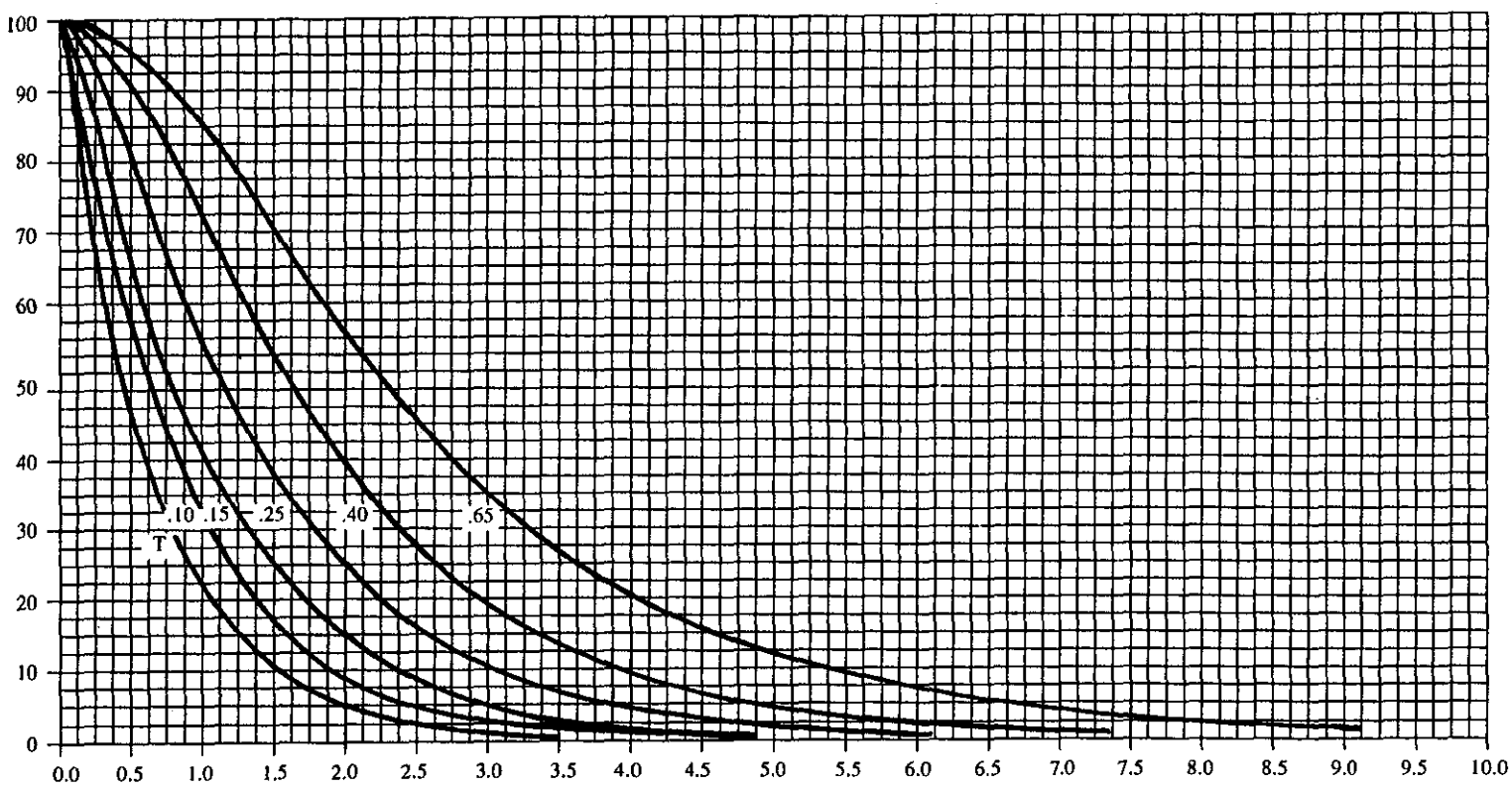
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter J

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

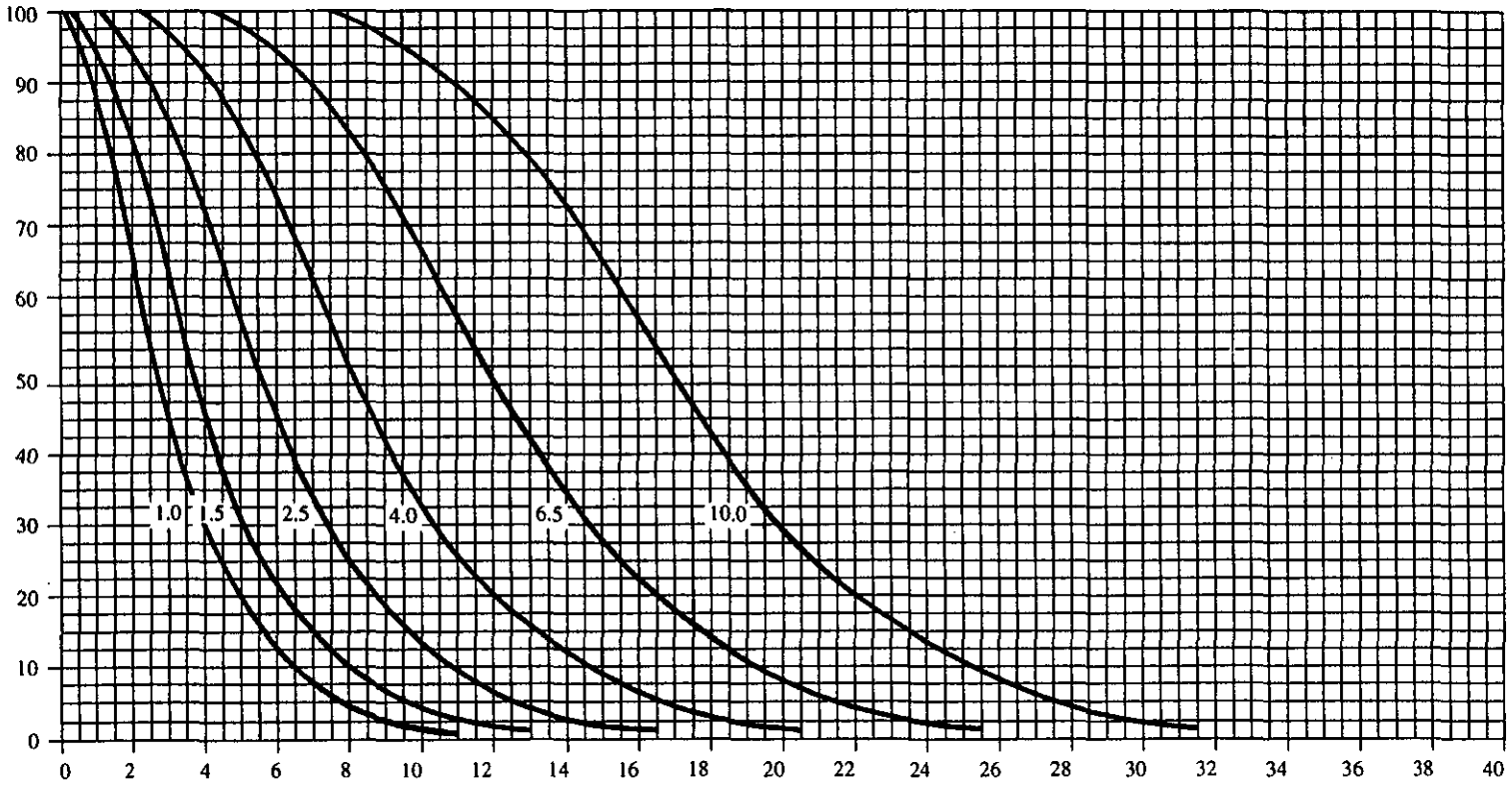
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter J (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

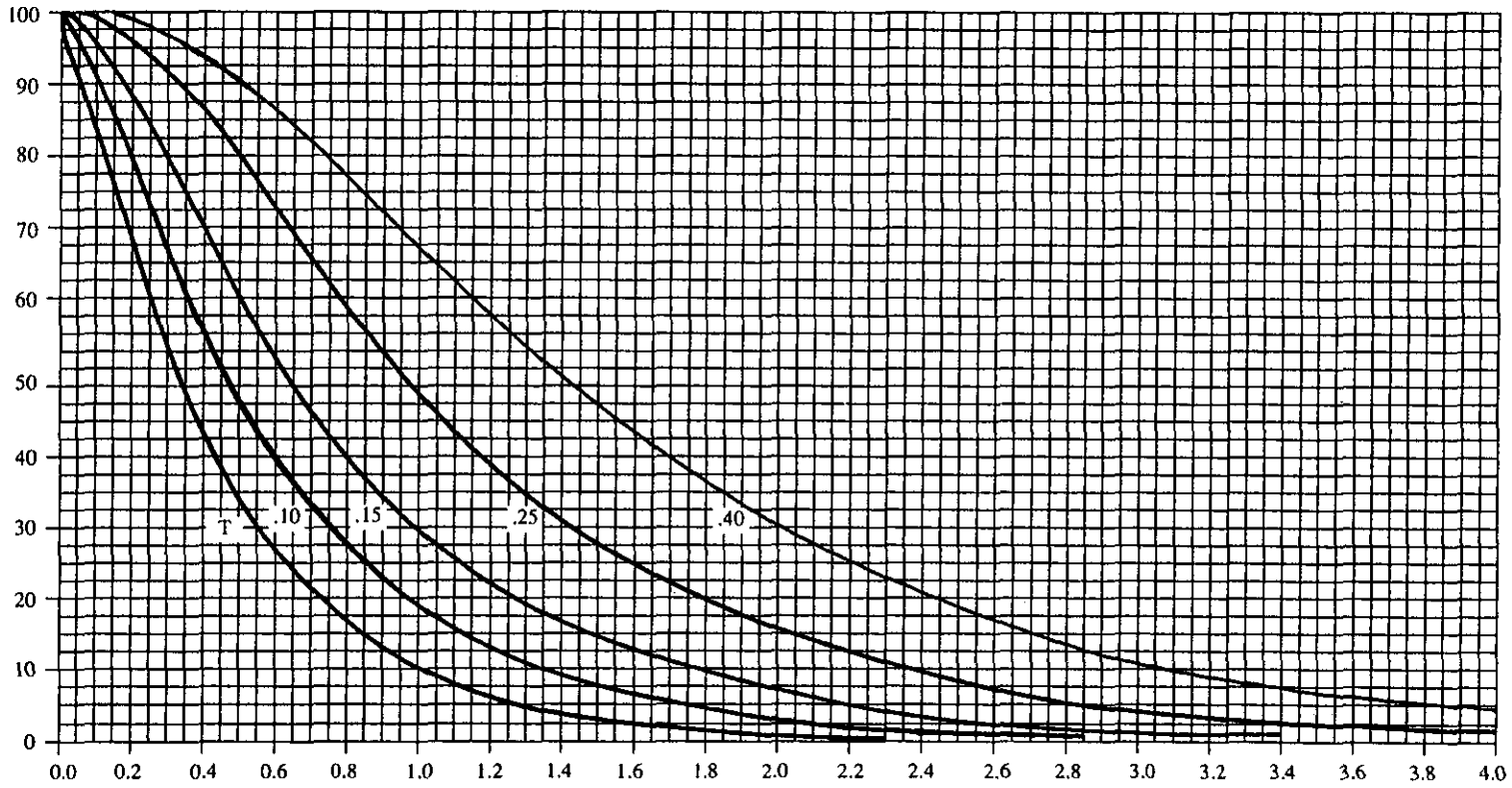
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter K

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

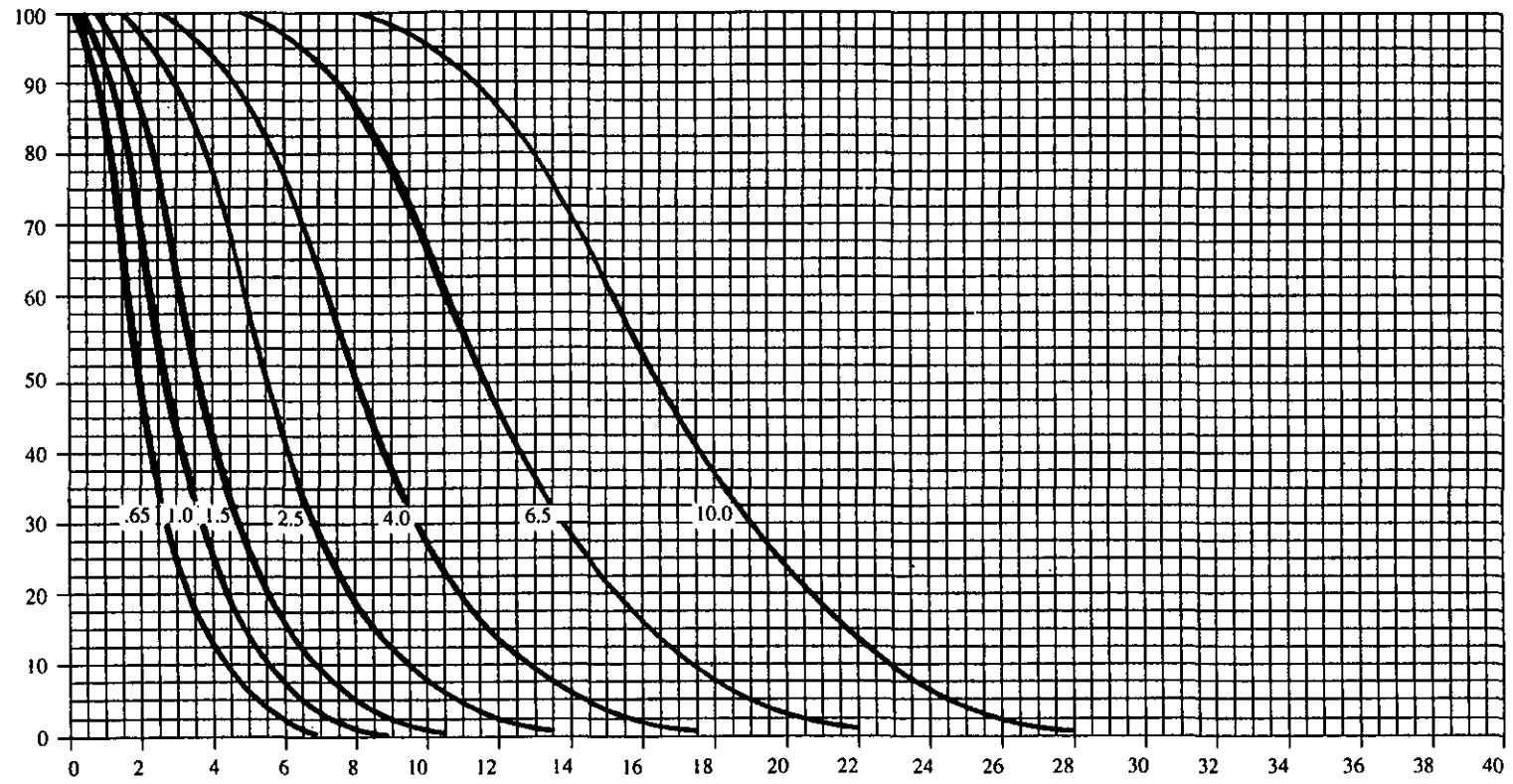
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter K (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

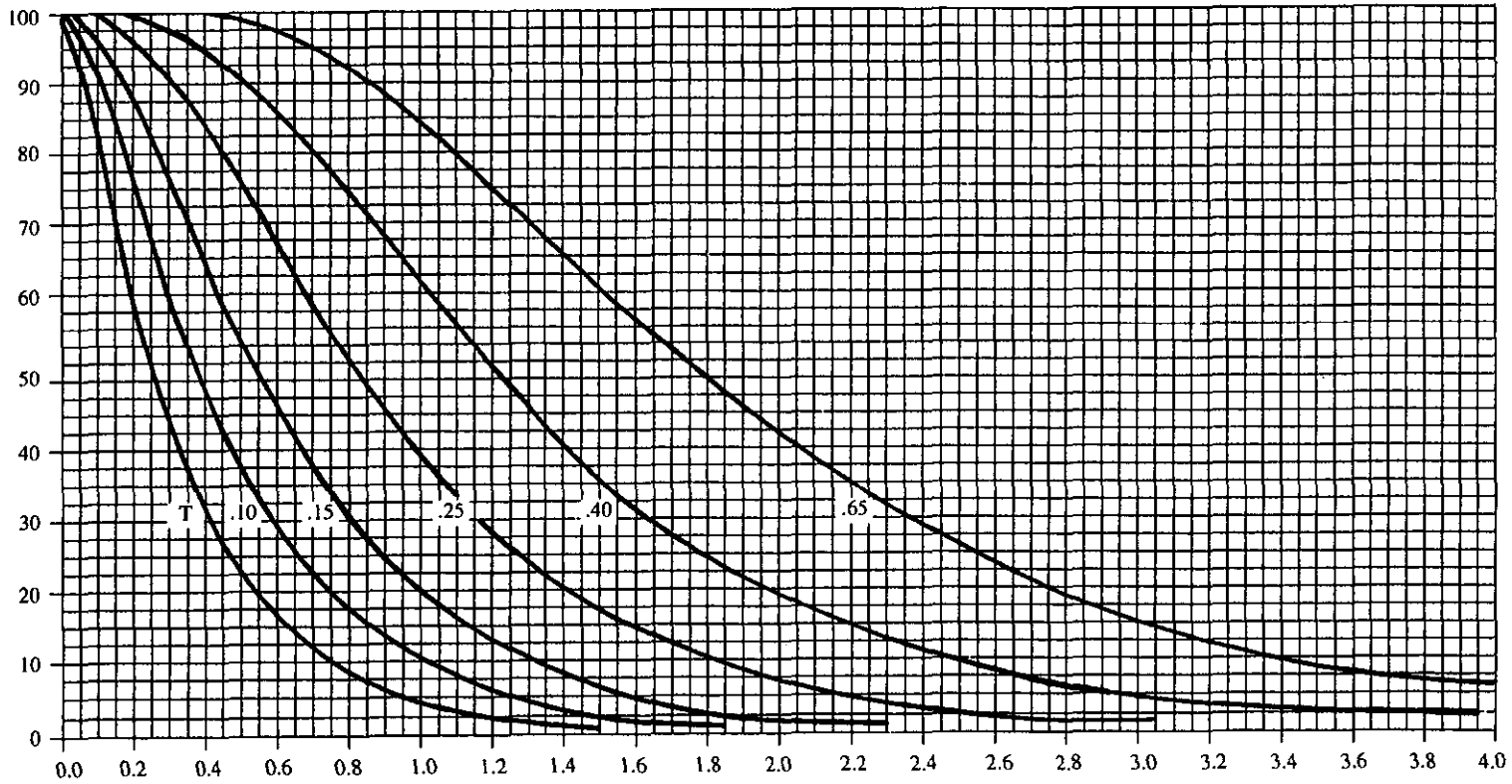
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter L

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

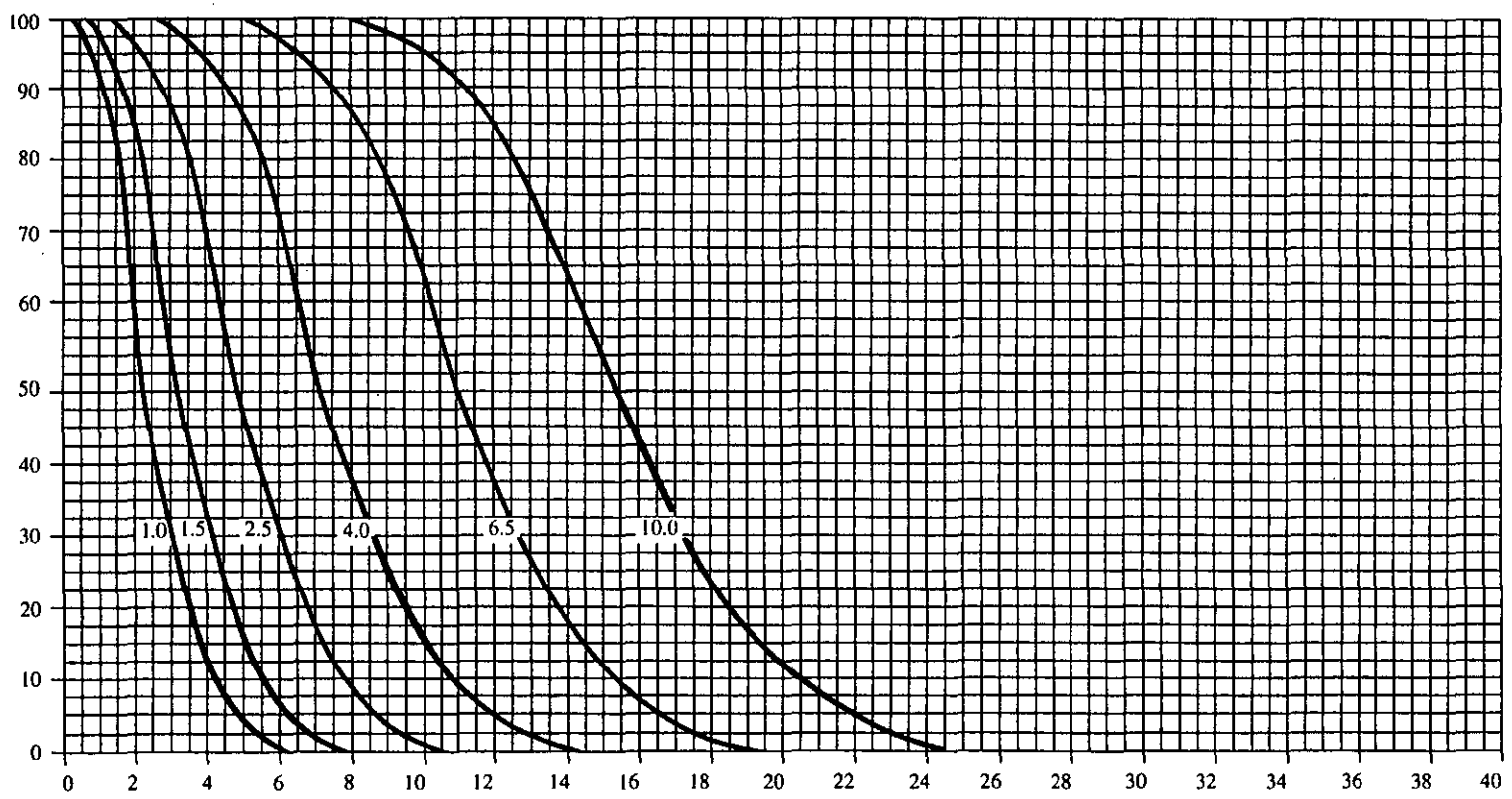
QUALITY OF SUBMITTED LOTS (In percent nonconforming)

NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter L (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

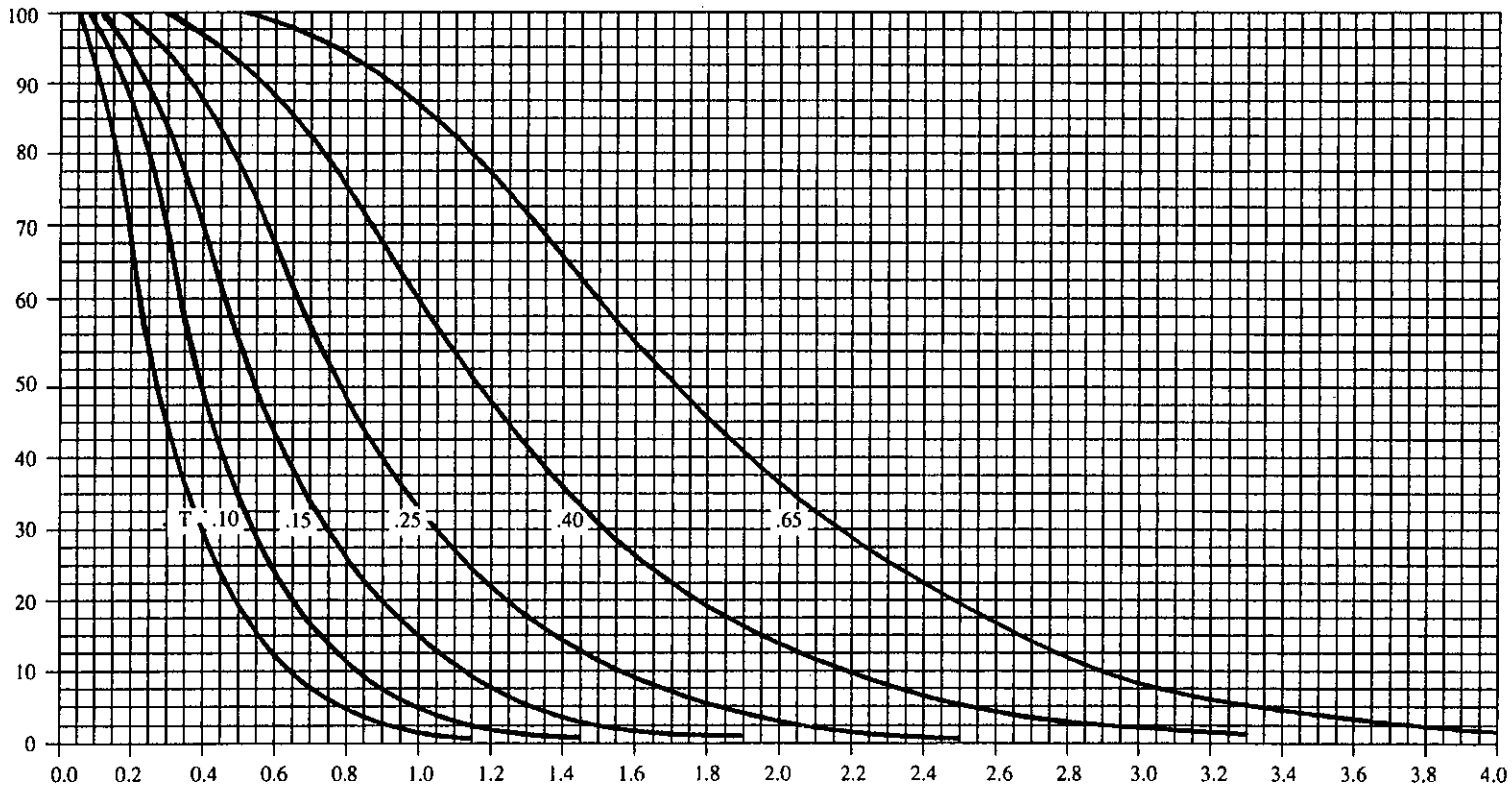
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter M

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

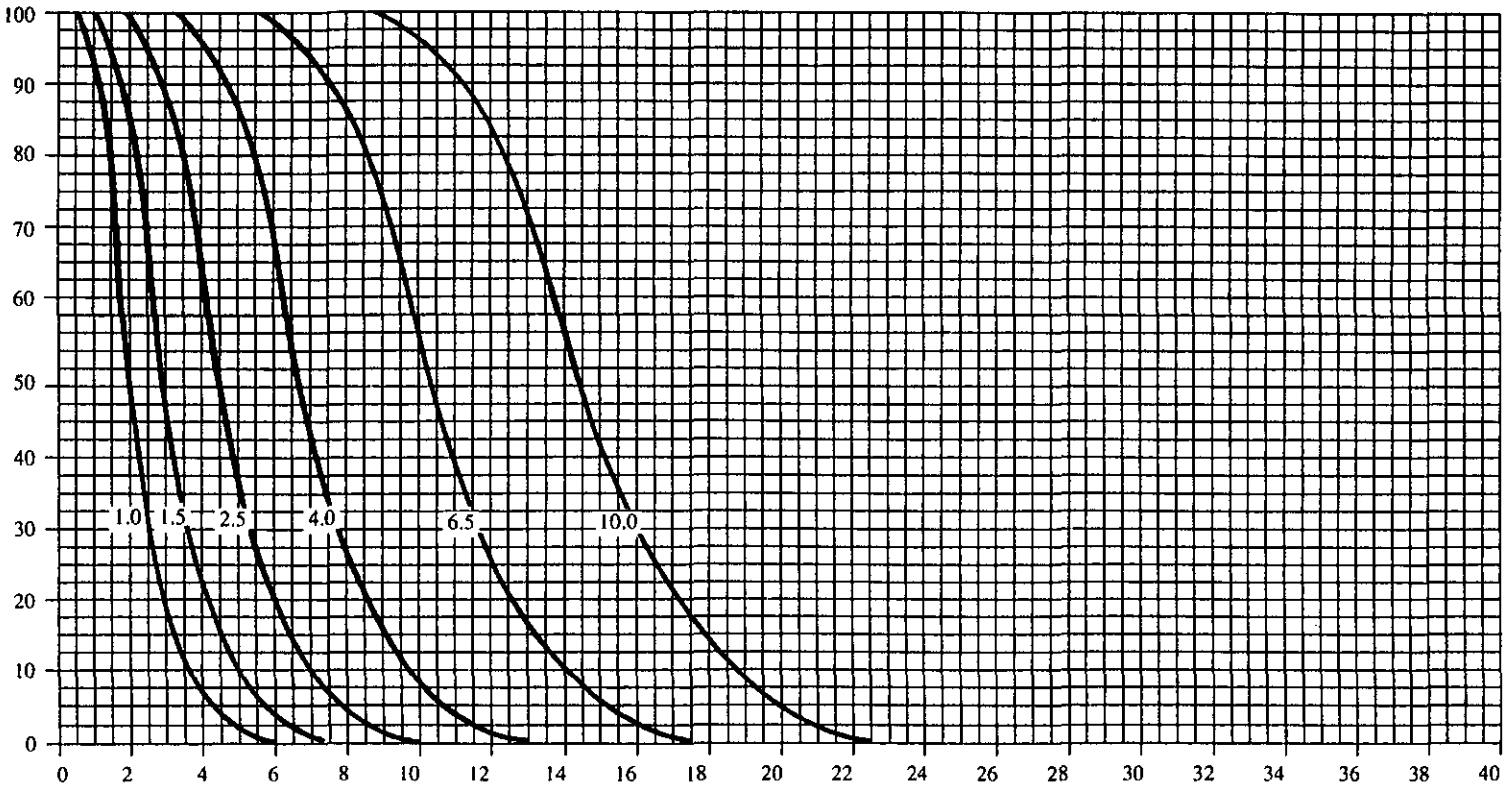
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter M (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

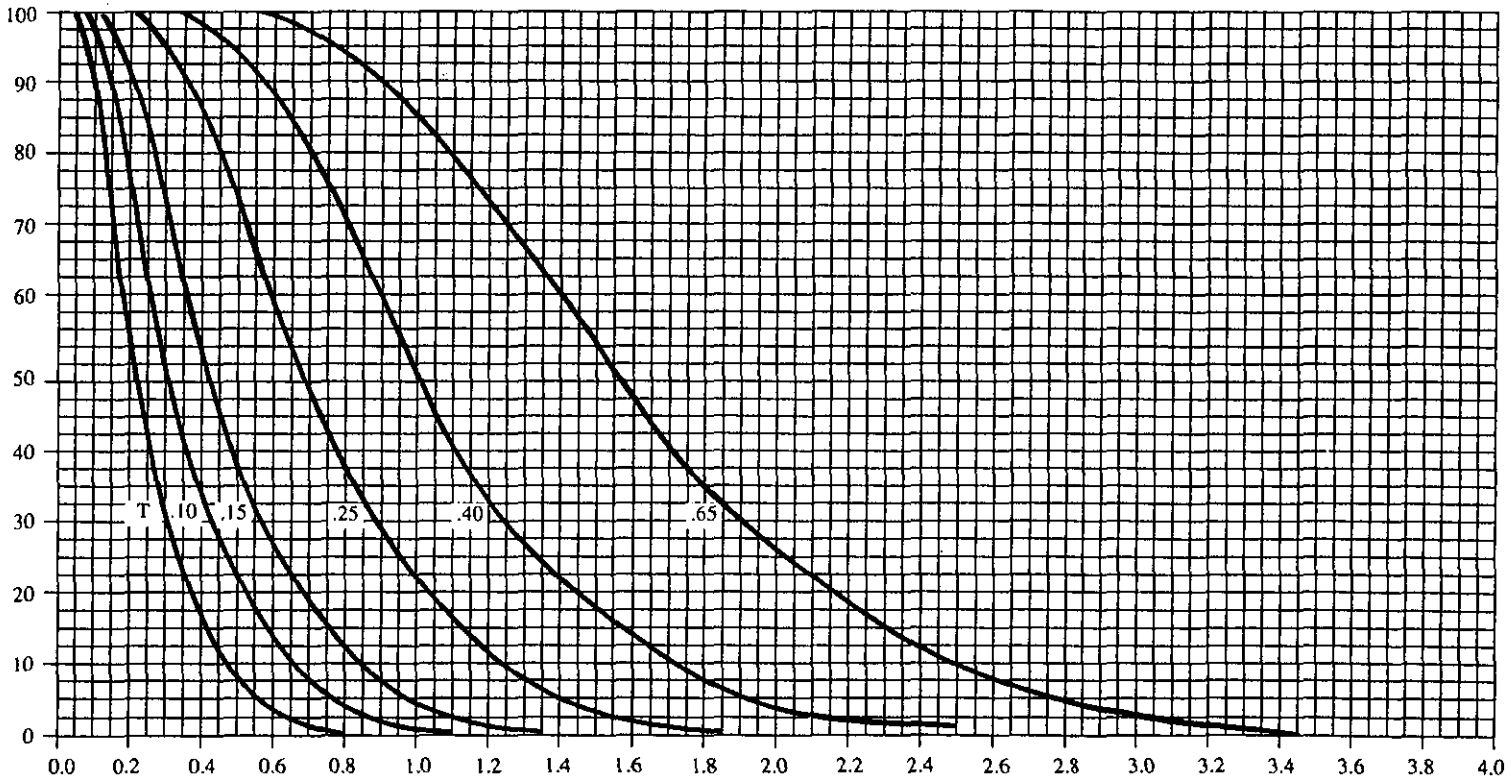
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter N

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

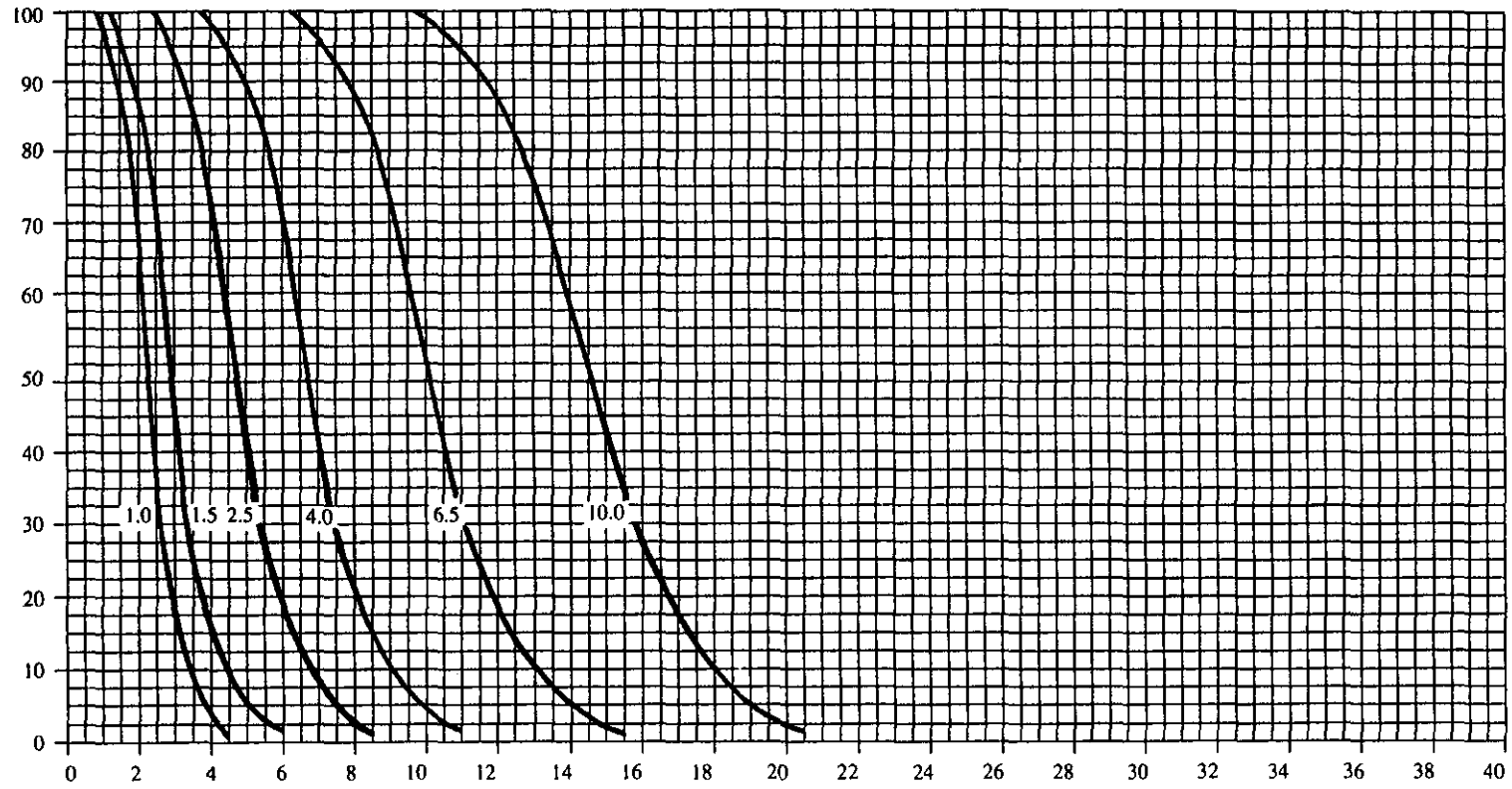
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter N (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

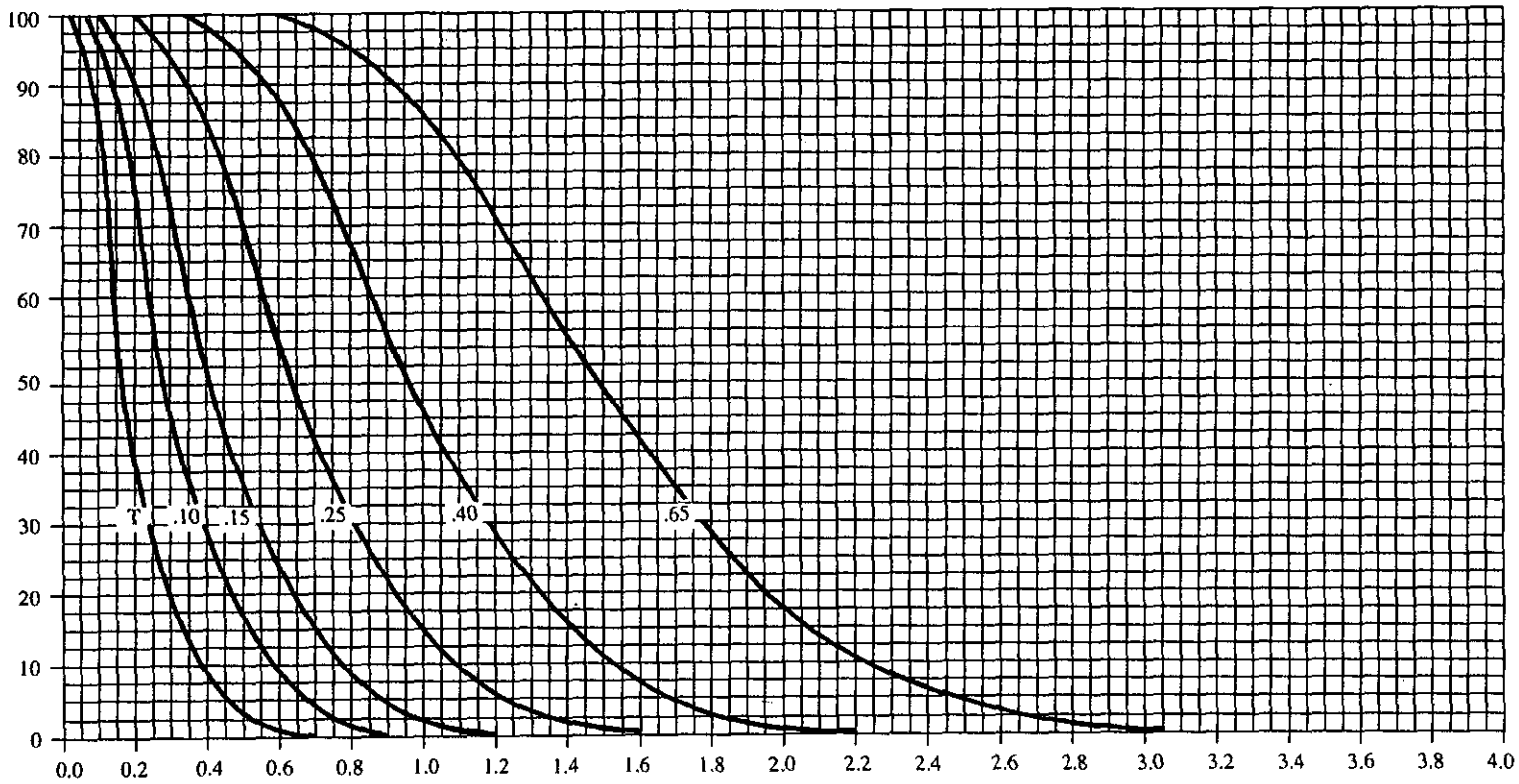
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method
## Sample Size Code Letter P

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

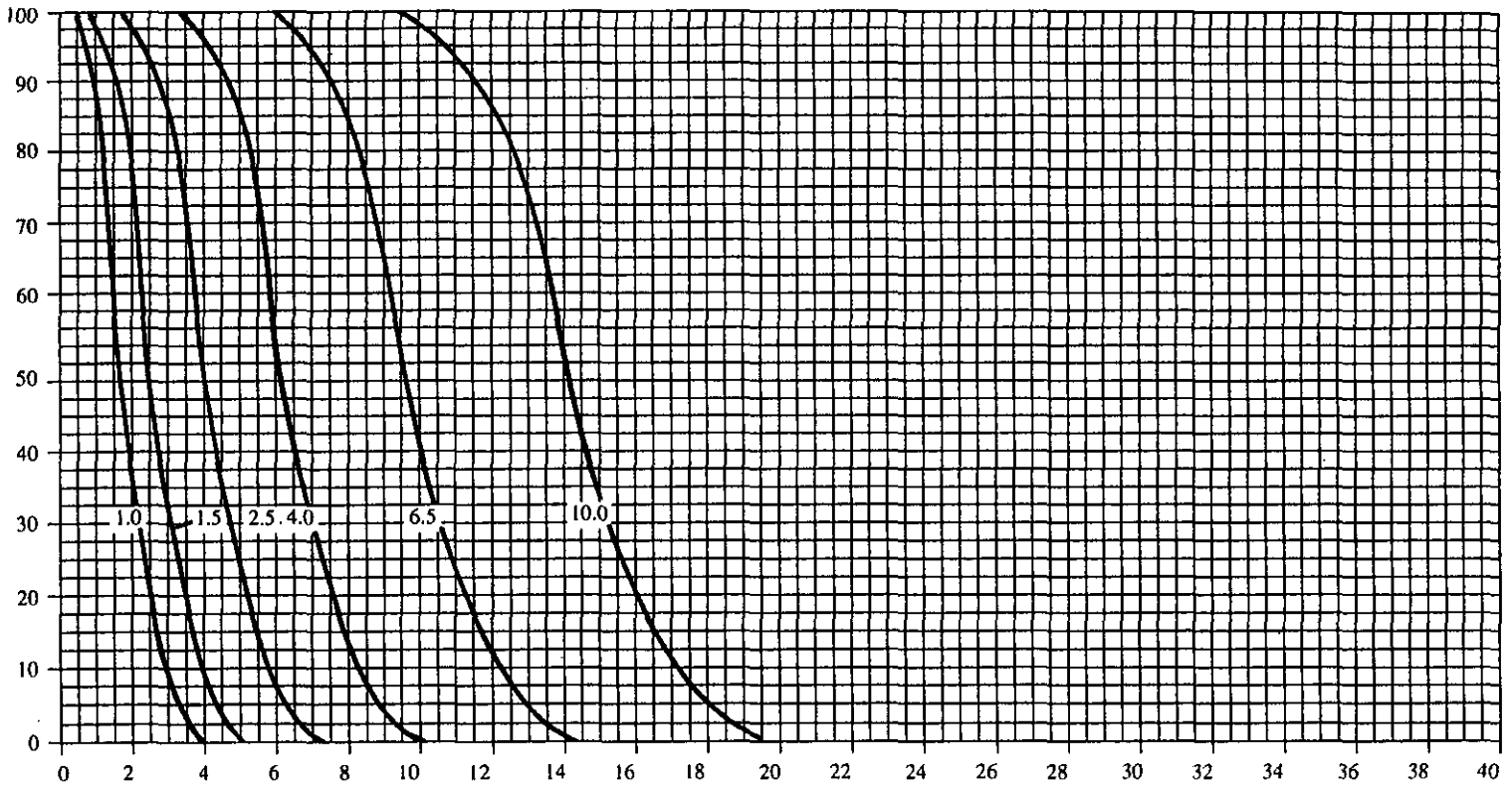
NOTE: Figures on curves are Acceptable Quality Levels for normal inspection. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

*Table A-3*

## Operating Characteristic Curves for Sampling Plans Based on Standard Deviation Method Sample Size Code Letter P (Continued)

(Curves for sampling plans based on range method and known variability are essentially equivalent)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED




The values of the percent of lots expected to be accepted are valid only when measurements are selected at random from a normal distribution.

QUALITY OF SUBMITTED LOTS (In percent nonconforming)

NOTE: Figures on curves are Acceptable Quality Levels for normal inspection.

# SECTION B
# VARIABILITY UNKNOWN—STANDARD DEVIATION METHOD

## Part 1
## SINGLE SPECIFICATION LIMIT

### B1. SAMPLING PLAN FOR SINGLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a single specification limit when variability of the lot with respect to the quality characteristic is unknown and the standard deviation method is used. The acceptability criterion is given in two equivalent forms. These are identified as Form 1 and Form 2.

B1.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value, the applicable sampling plan shall be used in accordance with the provisions of Section A, General Description of Sampling Plans, and those in this part of the Standard.

B1.2 Drawing of Samples. All samples shall be drawn in accordance with paragraph A7.2.

B1.3 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

### B2. SELECTING THE SAMPLING PLAN WHEN FORM 1 IS USED

B2.1 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a single specification limit when using the standard deviation method are Tables B-1 and B-2. Table B-1 is used for normal and tightened inspection and Table B-2 for reduced inspection.

B2.2 Obtaining the Sampling Plan. The sampling plan consists of a sample size and an associated acceptability constant.[1] The sampling plan is obtained from Master Table B-1 or B-2.

B2.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter.

B2.2.2 Acceptability Constant. The acceptability constant k, corresponding to the sample size mentioned in paragraph B2.2.1, is indicated in the column of the master table corresponding to the applicable AQL value. Table B-1 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table B-2.

### B3. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 1 IS USED[2]

B3.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the quantity $(U - \bar{X})/s$ or $(\bar{X} - L)/s$.

B3.2 Computation. The following quantity shall be computed: $(U - \bar{X})/s$ or $(\bar{X} - L)/s$, depending on whether the specification limit is an upper or lower limit, where

U is the upper specification limit,
L is the lower specification limit,
$\bar{X}$ is the sample mean, and
s is the estimate of lot standard deviation.

B3.3 Acceptability Criteria. Compare the quantity $(U - \bar{X})/s$ or $(\bar{X} - L)/s$ with the acceptability constant k. If $(U - \bar{X})/s$ or $(\bar{X} - L)/s$ is equal to or greater than k, the lot meets the acceptability criterion; if $(U - \bar{X})/s$ or $(\bar{X} - L)/s$ is less than k or negative, then the lot does not meet the acceptability criterion.

### B4. SUMMARY FOR OPERATION OF SAMPLING PLAN WHEN FORM 1 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and inspection level.

(2) Obtain plan from Master Table B-1 or B-2 by selecting the sample size n and the acceptability constant k.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic for each unit of the sample.

(4) Compute the sample mean $(\bar{X})$ and estimate of lot standard deviation s, and also compute the quantity $(U-\bar{X})/s$ for an upper specification limit U or the quantity $(\bar{X} - L)/s$ for a lower specification limit L.

[1]See Appendix B for definitions of all symbols used in the sampling plans based on variability unknown—standard deviation method.
[2]See Example B-1 for a complete example of this procedure.

(5) If the quantity $(U-\bar{X})/s$ or $(\bar{X}-L)/s$ is equal to or greater than k, the lot meets the acceptability criterion; if $(U-\bar{X})/s$ or $(\bar{X}-L)/s$ is less than k or negative, then the lot does not meet the acceptability criterion.

## B5. SELECTING THE SAMPLING PLAN WHEN FORM 2 IS USED

B5.1 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a single specification limit when using the standard deviation method are Table B-3 and B-4 of Part II. Table B-3 is used for normal and tightened inspection and Table B-4 for reduced inspection.

B5.2 Obtaining the Sampling Plan. The sampling plan consists of a sample size and an associated maximum allowable percent nonconforming. The sampling plan is obtained from Master Table B-3 or B-4.

B5.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter.

B5.2.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming M for sample estimates corresponding to the sample size mentioned in paragraph B5.2.1 is indicated in the column of the master table corresponding to the applicable AQL value. Table B-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table B-4.

## B6. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 2 IS USED[3]

B6.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the percent of nonconforming product outside the upper or lower specification limit. The percentage of nonconforming product is estimated by entering Table B-5 with the quality index and the sample size.

B6.2 Computation of Quality Index. The quality index $Q_U = (U-\bar{X})/s$ shall be computed if the specification limit is an upper limit U, or $Q_L(\bar{X}-L)/s$ if it is a lower limit L. The quantities, $(\bar{X})$ and s, are the sample mean and estimate of lot standard deviation, respectively.

B6.3 Estimate of Percent Nonconforming in Lot. The quality of a lot shall be expressed by $p_U$, the estimated percent nonconforming in the lot above the upper specification limit, or by $p_L$, the estimated percent nonconforming below the lower specification limit. The estimated percent nonconforming $p_U$ or $p_L$ is obtained by entering Table B-5 with $Q_U$ or $Q_L$ and the appropriate sample size.

B6.4 Acceptability Criterion. Compare the estimated lot percent nonconforming $p_U$ or $p_L$ with the maximum allowable percent nonconforming M. If $p_U$ or $p_L$ is equal to or less than M, the lot meets the acceptability criterion; if $p_U$ or $p_L$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

## B7. SUMMARY FOR OPERATION OF SAMPLING PLAN WHEN FORM 2 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Obtain plan from Master Table B-3 or B-4 by selecting the sample size n and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

(4) Compute the sample mean $\bar{X}$ and the estimate of lot standard deviation s.

(5) Compute the quality index $Q_U = (U-\bar{X})/s$ if an upper specification limit U is specified, or $Q_L = (\bar{X}-L)/s$ if a lower specification limit L is specified.

(6) Determine the estimated lot percent nonconforming $P_U$ or $P_L$ from Table B-5.

(7) If the estimated lot percent nonconforming $P_U$ or $P_L$ is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if $P_U$ or $P_L$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

[3]See Example B-2 for a complete example of this procedure.

## EXAMPLE B-1

Example of Calculations

Single Specification Limit—Form 1

Variability Unknown—Standard Deviation Method

Example The maximum temperature of operation for a certain device is specified as 209°F. A lot of 40 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1% is to be used. From Tables A-2 and B-1 it is seen that a sample of size 5 is required. Suppose the measurements obtained are as follows: 197°, 188°, 184°, 205°, and 201°; and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 5 | |
| 2 | Sum of Measurements: $\Sigma X$ | 975 | |
| 3 | Sum of Squared Measurements: $\Sigma X^2$ | 190,435 | |
| 4 | Correction Factor (CF): $\Sigma X^2/n$ | 190,125 | $(975)^2/5$ |
| 5 | Corrected Sum of Squares (SS): $\Sigma X^2 - CF$ | 310 | 190,435 – 190,125 |
| 6 | Variance (V): $SS/(n-1)$ | 77.5 | 310/4 |
| 7 | Estimate of Lot Standard Deviation s: $\sqrt{V}$ | 8.81 | $\sqrt{77.5}$ |
| 8 | Sample Mean $\bar{X}$ : $\Sigma X/n$ | 195 | 975/5 |
| 9 | Specification Limit (Upper): U | 209 | |
| 10 | The quantity: $(U - \bar{X})/s$ | 1.59 | (209 – 195)/8.81 |
| 11 | Acceptability Constant: k | 1.53 | See Table B-1 |
| 12 | Acceptability Criterion: Compare $(U - \bar{X})/s$ with k | 1.59 > 1.53 | See Para. B3.3 |

The lot meets the acceptability criterion, since $(U - \bar{X})/s$ is greater than k.

NOTE: If a single lower specification limit L is given, then compute the quantity $(\bar{X} - L)/s$ in line 10 and compare it with k; the lot meets the acceptability criterion if $(\bar{X} - L)/s$ is equal to or greater than k.

**EXAMPLE B-2**

Example of Calculations

Single Specification Limit—Form 2

Variability Unknown—Standard Deviation Method

Example The maximum temperature of operation for a certain device is specified as 209° F. A lot of 40 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1% is to be used. From Tables A-2 and B-1 it is seen that a sample of size 5 is required. Suppose the measurements obtained are as follows: 197°, 188°, 184°, 205°, and 201°; and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 5 | |
| 2 | Sum of Measurements: $\Sigma X$ | 975 | |
| 3 | Sum of Squared Measurements: $\Sigma X^2$ | 190,435 | |
| 4 | Correction Factor (CF): $(\Sigma X)^2/n$ | 190,125 | $(975)^2/5$ |
| 5 | Corrected Sum of Squares (SS): $\Sigma X^2 - CF$ | 310 | 190,435 – 190,125 |
| 6 | Variance (V): $SS/(n-1)$ | 77.5 | 310/4 |
| 7 | Estimate of Lot Standard Deviation s: $\sqrt{V}$ | 8.81 | $\sqrt{77.5}$ |
| 8 | Sample Mean $\overline{X}$ : $\Sigma X/n$ | 195 | 975/5 |
| 9 | Specification Limit (Upper): U | 209 | |
| 10 | Quality Index: $Q_U = (U - \overline{X})/s$ | 1.59 | (209 – 195)/8.81 |
| 11 | Est. of Lot Percent Ncf.: $p_U$ | 2.19% | See Table B-5 |
| 12 | Max. Allowable Percent Ncf.: M | 3.32% | See Table B-3 |
| 13 | Acceptability Criterion: Compare $p_U$ with M | 2.19% < 3.32% | See Para. B6.4 |

The lot meets the acceptability criterion, since $p_U$ is less than M.

NOTE: If a single lower specification limit L is given, then compute the quality index $Q_L = (\overline{X} - L)/s$ in line 10 and obtain the estimate of lot percent nonconforming $p_L$. Compare $p_L$ with M; the lot meets the acceptability criterion if $p_L$ is equal to or less than M.

*Table B-1* Standard Deviation Method

Master Table for Normal and Tightened Inspection for Plans Based on Variability Unknown
(Single Specification Limit—Form 1)

| Sample size code letter | Sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | k | k | k | k | k | k | k | k | k | k | k | k |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.12 | .958 | .765 | .566 |
| C | 4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.46 | 1.34 | 1.17 | 1.01 | .815 | .617 |
| D | 5 | ↓ | ↓ | ↓ | ↓ | 1.77 | 1.65 | 1.52 | 1.40 | 1.24 | 1.07 | .874 | .675 |
| E | 7 | ↓ | 2.22 | 2.13 | 2.00 | 1.88 | 1.75 | 1.62 | 1.50 | 1.33 | 1.15 | .955 | .755 |
| F | 10 | 2.44 | 2.34 | 2.24 | 2.11 | 1.98 | 1.84 | 1.72 | 1.59 | 1.41 | 1.23 | 1.03 | .828 |
| G | 15 | 2.53 | 2.42 | 2.32 | 2.19 | 2.06 | 1.92 | 1.79 | 1.65 | 1.48 | 1.30 | 1.09 | .885 |
| H | 20 | 2.58 | 2.47 | 2.37 | 2.23 | 2.10 | 1.96 | 1.83 | 1.69 | 1.51 | 1.33 | 1.12 | .916 |
| I | 25 | 2.61 | 2.50 | 2.40 | 2.26 | 2.13 | 1.98 | 1.85 | 1.72 | 1.53 | 1.35 | 1.14 | .935 |
| J | 35 | 2.66 | 2.55 | 2.45 | 2.31 | 2.18 | 2.03 | 1.89 | 1.76 | 1.57 | 1.39 | 1.18 | .968 |
| K | 50 | 2.71 | 2.61 | 2.50 | 2.36 | 2.22 | 2.08 | 1.94 | 1.80 | 1.61 | 1.42 | 1.21 | 1.00 |
| L | 75 | 2.77 | 2.66 | 2.55 | 2.41 | 2.27 | 2.12 | 1.98 | 1.84 | 1.65 | 1.46 | 1.25 | 1.03 |
| M | 100 | 2.80 | 2.69 | 2.58 | 2.43 | 2.29 | 2.14 | 2.00 | 1.86 | 1.67 | 1.48 | 1.26 | 1.05 |
| N | 150 | 2.84 | 2.73 | 2.62 | 2.47 | 2.33 | 2.18 | 2.03 | 1.89 | 1.70 | 1.51 | 1.29 | 1.07 |
| P | 200 | 2.85 | 2.73 | 2.62 | 2.47 | 2.33 | 2.18 | 2.04 | 1.89 | 1.70 | 1.51 | 1.29 | 1.08 |
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table B-2* Standard Deviation Method

Master Table for Reduced Inspection for Plans Based on Variability Unknown
(Single Specification Limit—Form 1)

| Sample size code letter | Sample size | Acceptable Quality Levels | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | k | k | k | k | k | k | k | k | k | k | k |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.12 | .958 | .765 | .566 | .341 |
| C | 3 | | | | | | | 1.12 | .958 | .765 | .566 | .341 |
| D | 3 | | | | | | | 1.12 | .958 | .765 | .566 | .341 |
| E | 3 | | | | | ↓ | ↓ | 1.12 | .958 | .765 | .566 | .341 |
| F | 4 | | | ↓ | ↓ | 1.46 | 1.34 | 1.17 | 1.01 | .815 | .617 | .396 |
| G | 5 | ↓ | ↓ | 1.77 | 1.65 | 1.52 | 1.40 | 1.24 | 1.07 | .874 | .675 | .456 |
| H | 7 | 2.13 | 2.00 | 1.88 | 1.75 | 1.62 | 1.50 | 1.33 | 1.15 | .955 | .755 | .536 |
| I | 10 | 2.24 | 2.11 | 1.98 | 1.84 | 1.71 | 1.59 | 1.41 | 1.23 | 1.03 | .828 | .609 |
| J | 15 | 2.32 | 2.19 | 2.06 | 1.92 | 1.79 | 1.65 | 1.48 | 1.30 | 1.09 | .885 | .663 |
| K | 20 | 2.37 | 2.23 | 2.10 | 1.96 | 1.83 | 1.69 | 1.51 | 1.33 | 1.12 | .916 | .694 |
| L | 25 | 2.40 | 2.26 | 2.13 | 1.98 | 1.85 | 1.72 | 1.53 | 1.35 | 1.14 | .935 | .712 |
| M | 30 | 2.41 | 2.28 | 2.14 | 2.00 | 1.86 | 1.73 | 1.55 | 1.36 | 1.15 | .946 | .722 |
| N | 50 | 2.50 | 2.36 | 2.22 | 2.08 | 1.94 | 1.80 | 1.61 | 1.42 | 1.21 | 1.00 | .774 |
| P | 75 | 2.55 | 2.41 | 2.27 | 2.12 | 1.98 | 1.84 | 1.65 | 1.46 | 1.25 | 1.03 | .806 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

# Part II
# DOUBLE SPECIFICATION LIMIT

## B8. SAMPLING PLAN FOR DOUBLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a double specification limit when variability of the lot with respect to the quality characteristic is unknown and the standard deviation method is used.

B8.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value(s) the applicable sampling plan shall be used in accordance with the provisions of Section A. General Description of Sampling Plans, and those in this part of the Standard.

## B9. SELECTING THE SAMPLING PLAN

A sampling plan for each AQL value shall be selected from Table B-3 or B-4 as follows:

B9.1 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

B9.2 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a double specification limit when using the standard deviation method are Tables B-3 and B-4. Table B-3 is used for normal and tightened inspection and Table B-4 for reduced inspection.

B9.3 Obtaining Sampling Plan. A sampling plan consists of a sample size and the associated maximum allowable percent nonconforming. The sampling plan to be applied in inspection shall be obtained from Master Table B-3 or B-4.

B9.3.1 Sample Size. The sample size n is shown in the master tables corresponding to each sample size code letter.

B9.3.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming for sample estimates of percent nonconforming for the lower, upper, or both specification limits combined, corresponding to the sample size mentioned in paragraph B9.3.1, is shown in the column of the master table corresponding to the applicable AQL value(s). If different AQLs are assigned to each specification limit, designate the maximum allowable percent nonconforming by $M_L$ for the lower limit, and by $M_U$ for the upper limit. If one AQL is assigned to both limits combined, designate the maximum allowable percent nonconforming by M. Table B-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table B-4.

## B10. DRAWING OF SAMPLES

Samples shall be selected in accordance with paragraph A7.2.

## B11. LOT-BY-LOT ACCEPTABILITY PROCEDURES

B11.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a double specification limit shall be judged by the percent of nonconforming product. The percentage of nonconforming product is estimated by entering Table B-5 with the quality index and the sample size.

B11.2 Computation of Quality Indices. The quality indices $Q_U = (U - \bar{X})/s$ and $Q_L = (\bar{X} - L)/s$ shall be computed, where

U is the upper specification limit,
L is the lower specification limit,
$\bar{X}$ is the sample mean, and
s is the estimate of lot standard deviation.

B11.3 Percent Nonconforming in the Lot. The quality of a lot shall be expressed in terms of the lot percent nonconforming. Its estimate will be designated by $p_L$, $p_U$, or p. The estimate $p_U$ indicates conformance with respect to the upper specification limit, $p_L$ with respect to the lower specification limit, and p for both specification limits combined. The estimates $p_L$ and $p_U$ shall be determined by entering Table B-5, respectively with $Q_L$ and $Q_U$ and the sample size. The estimate p shall be determined by adding the corresponding estimated percents nonconforming $p_L$ and $p_U$ found in the table.

## B12. ACCEPTABILITY CRITERION AND SUMMARY FOR OPERATION OF SAMPLING PLANS

B12.1 One AQL value for both Upper and Lower Specification Limit Combined.

B12.1.1 Acceptability Criterion.[4] Compare the estimated lot percent nonconforming $p = p_L + p_U$ with the maximum allowable percent nonconforming M. If p is equal to or less than M, the lot meets the acceptability criterion; if p is greater than M or if either $Q_U$ or $Q_L$ or both are negative, then the lot does not meet the acceptability criterion.

B12.1.2 Summary for Operation of Sampling Plan. In cases where a single AQL value is established for the upper and lower specification limit combined for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Select plan from Master Table B-3 or B-4. Obtain the sample size n and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

(4) Compute the sample mean $\bar{X}$ and estimate a lot of standard deviation s.

(5) Compute the quality indices $Q_U = (U - \bar{X})/s$ and $Q_L = (\bar{X} - L)/s$.

(6) Determine the estimated lot percent nonconforming $p = p_U + p_L$ from Table B-5.

(7) If the estimated lot percent nonconforming p is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if p is greater than M or if either $Q_U$ or $Q_L$ or both are negative, then the lot does not meet the acceptability criterion.

B12.2 Different AQL Values for Upper and Lower Specification Limit.

B12.2.1 Acceptability Criteria.[5] Compare the estimated lot percents nonconforming $p_L$ and $p_U$ with the corresponding maximum allowable percents nonconforming $M_L$ and $M_U$; also compare $p = p_L + p_U$ with the larger of $M_L$ and $M_U$. If $p_L$ is equal to or less than $M_L$, $p_U$ is equal to or less than $M_U$, and p is equal to or less than the larger of $M_L$ and $M_U$, the lot meets the acceptability criteria; otherwise, the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

B12.2.2 Summary for Operation of Sampling Plan. In cases where a different AQL value is established for the upper and lower specification limit for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot size and inspection level.

(2) Select the sampling plan from Master Table B-3 or B-4. Obtain the sample size n and the maximum allowable percents nonconforming $M_U$ or $M_L$, corresponding to the AQL values for the upper and lower specification limits, respectively.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit in the sample.

(4) Compute the sample mean $\bar{X}$ and estimate a lot standard deviation s.

(5) Compute the quality indices $Q_U = (U - \bar{X})/s$ and $Q_L = (\bar{X} - L)/s$.

(6) Determine the estimated lot percents nonconforming $p_L$ and $p_U$ corresponding to the percents nonconforming above the upper and below the lower specification limits. Also determine the combined percent nonconforming $p = p_L + p_U$.

(7) If all three of the following conditions:

(a) $p_U$ is equal to or less than $M_U$,

(b) $p_L$ is equal to or less than $M_L$,

(c) p is equal to or less than the larger of $M_L$ and $M_U$,

are satisfied, the lot meets the acceptability criteria; otherwise the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

[4]See Example B-3 for a complete example of this procedure.

[5]See Example B-4 for a complete example of this procedure.

## EXAMPLE B-3

**Example of Calculations**

**Double Specification Limit**

**Variability Unknown—Standard Deviation Method**

**One AQL Value for Both Upper and Lower Specification Limit Combined**

Example: The minimum temperature of operation for a certain device is specified as 180°F. The maximum temperature is 209°F. A lot of 40 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1% is to be used. From Tables A-2 and B-3 it is seen that a sample of size 5 is required. Suppose the measurements obtained are as follows: 197°, 188°, 184°, 205°, and 201°; and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 5 | |
| 2 | Sum of Measurements: $\Sigma X$ | 975 | |
| 3 | Sum of Squared Measurements: $\Sigma X^2$ | 190,435 | |
| 4 | Correction Factor (CF): $(\Sigma X)^2/n$ | 190,125 | $(975)^2/5$ |
| 5 | Corrected Sum of Squares (SS): $\Sigma X^2 - CF$ | 310 | 190,435 – 190,125 |
| 6 | Variance (V): $SS/(n-1)$ | 77.5 | 310/4 |
| 7 | Estimate of Lot Standard Deviation s: $\sqrt{V}$ | 8.81 | $\sqrt{77.5}$ |
| 8 | Sample Mean $\overline{X}$ : $\Sigma X/n$ | 195 | 975/5 |
| 9 | Upper Specification Limit: U | 209 | |
| 10 | Lower Specification Limit: L | 180 | |
| 11 | Quality Index: $Q_U = (U - \overline{X})/s$ | 1.59 | (209 – 195)/8.81 |
| 12 | Quality Index: $Q_L = (\overline{X} - L)/s$ | 1.70 | (195 – 180)/8.81 |
| 13 | Est. of Lot Percent Ncf. above U: $p_U$ | 2.19% | See Table B-5 |
| 14 | Est. of Lot Percent Ncf. below L: $p_L$ | .66% | See Table B-5 |
| 15 | Total Est. Percent Ncf. in Lot: $p = p_U + p_L$ | 2.85% | 2.19% + .66% |
| 16 | Max. Allowable Percent Ncf.: M | 3.32% | See Table B-3 |
| 17 | Acceptability Criterion: | | |
| | Compare $p = p_U + p_L$ with M | 2.85% < 3.32% | See Para. B12.1.2(7) |

The lot meets the acceptability criterion, since $p = p_U + p_L$ is less than M.

**EXAMPLE B-4**

***Example of Calculations***

**Double Specification Limit**

**Variability Unknown—Standard Deviation Method**

**Different AQL Values for Upper and Lower Specification Limits**

Example: The minimum temperature of operation for a certain device is specified as 180°F. The maximum temperature is 209°F. A lot of 40 items is submitted for inspection. Inspection Level II, normal inspection, with *AQL = 1% for the upper and AQL = 2.5% for the lower specification limit is to be used.* From Tables A-2 and B-3 it is seen that a sample of size 5 is required. Supposed the measurements obtained are as follows: 197°, 188°, 184°, 205°, and 201°; and compliance with the acceptability criteria is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 5 | |
| 2 | Sum of Measurements: $\Sigma X$ | 975 | |
| 3 | Sum of Squared Measurements: $\Sigma X^2$ | 190,435 | |
| 4 | Correction Factor (CF): $(\Sigma X)^2/n$ | 190,125 | $(975)^2/5$ |
| 5 | Corrected Sum of Squares (SS): $\Sigma X^2 - CF$ | 310 | 190,435 – 190,125 |
| 6 | Variance (V): $SS/(n-1)$ | 77.5 | 310/4 |
| 7 | Estimate of Lot Standard Deviation s: $\sqrt{V}$ | 8.80 | $\sqrt{77.5}$ |
| 8 | Sample Mean $\overline{X}$ : $\Sigma X/n$ | 195 | 975/5 |
| 9 | Upper Specification Limit: U | 209 | |
| 10 | Lower Specification Limit: L | 180 | |
| 11 | Quality Index: $Q_U = (U - \overline{X})/s$ | 1.59 | (209 – 195)/8.80 |
| 12 | Quality Index: $Q_L = (\overline{X} - L)/s$ | 1.70 | (195 – 180)/8.80 |
| 13 | Est. of Lot Percent Ncf. above U: $p_U$ | 2.19% | See Table B-5 |
| 14 | Est. of Lot Percent Ncf. below L: $p_L$ | .66% | See Table B-5 |
| 15 | Total Est. Percent Ncf. in Lot: $p = p_U + p_L$ | 2.85% | 2.19% + .66% |
| 16 | Max. Allowable Percent Ncf. Above U: $M_U$ | 3.32% | See Table B-3 |
| 17 | Max. Allowable Percent Ncf. below L: $M_L$ | 9.80% | See Table B-3 |
| 18 | Acceptability Criteria: (a) Compare $p_U$ with $M_U$ | 2.19% < 3.32% | See Para. B12.2.2(7)(a) |
| | (b) Compare $p_L$ with $M_L$ | .66% < 9.80% | See Para. B12.2.2(7)(b) |
| | (c) Compare p with $M_L$ | 2.85% < 9.80% | See Para. B12.2.2(7)(c) |

The lot meets the acceptability criteria, since 18(a), (b), and (c) are satisfied; i.e., $p_U < M_U$, $p_L < M_L$, and $p < M_L$.

*Table B-3*

Master Table for Normal and Tightened Inspection for Plans Based on Variability Unknown
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | M | M | M | M | M | M | M | M | M | M | M | M |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 |
| C | 4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.49 | 5.46 | 10.88 | 16.41 | 22.84 | 29.43 |
| D | 5 | ↓ | ↓ | ↓ | ↓ | 0.041 | 1.34 | 3.33 | 5.82 | 9.80 | 14.37 | 20.19 | 26.55 |
| E | 7 | ↓ | 0.005 | 0.087 | 0.421 | 1.05 | 2.13 | 3.54 | 5.34 | 8.40 | 12.19 | 17.34 | 23.30 |
| F | 10 | 0.077 | 0.179 | 0.349 | 0.714 | 1.27 | 2.14 | 3.27 | 4.72 | 7.26 | 10.53 | 15.17 | 20.73 |
| G | 15 | 0.186 | 0.311 | 0.491 | 0.839 | 1.33 | 2.09 | 3.06 | 4.32 | 6.55 | 9.48 | 13.74 | 18.97 |
| H | 20 | 0.228 | 0.356 | 0.531 | 0.864 | 1.33 | 2.03 | 2.93 | 4.10 | 6.18 | 8.95 | 13.01 | 18.07 |
| I | 25 | 0.250 | 0.378 | 0.551 | 0.874 | 1.32 | 2.00 | 2.86 | 3.97 | 5.98 | 8.65 | 12.60 | 17.55 |
| J | 35 | 0.253 | 0.373 | 0.534 | 0.833 | 1.24 | 1.87 | 2.66 | 3.70 | 5.58 | 8.11 | 11.89 | 16.67 |
| K | 50 | 0.243 | 0.355 | 0.503 | 0.778 | 1.16 | 1.73 | 2.47 | 3.44 | 5.21 | 7.61 | 11.23 | 15.87 |
| L | 75 | 0.225 | 0.326 | 0.461 | 0.711 | 1.06 | 1.59 | 2.27 | 3.17 | 4.83 | 7.10 | 10.58 | 15.07 |
| M | 100 | 0.218 | 0.315 | 0.444 | 0.684 | 1.02 | 1.52 | 2.18 | 3.06 | 4.67 | 6.88 | 10.29 | 14.71 |
| N | 150 | 0.202 | 0.292 | 0.412 | 0.636 | 0.946 | 1.42 | 2.05 | 2.88 | 4.42 | 6.56 | 9.86 | 14.18 |
| P | 200 | 0.204 | 0.294 | 0.414 | 0.637 | 0.945 | 1.42 | 2.04 | 2.86 | 4.39 | 6.52 | 9.80 | 14.11 |
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table B-4* Standard Deviation Method

Master Table for Reduced Inspection for Plans Based on Variability Unknown
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Sample size | Acceptable Quality Levels | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | M | M | M | M | M | M | M | M | M | M | M |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| C | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| D | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| E | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| F | 4 | ↓ | ↓ | ↓ | ↓ | 1.49 | 5.46 | 10.88 | 16.41 | 22.84 | 29.43 | 36.79 |
| G | 5 | ↓ | ↓ | 0.041 | 1.34 | 3.33 | 5.82 | 9.80 | 14.37 | 20.19 | 26.55 | 33.94 |
| H | 7 | 0.087 | 0.421 | 1.06 | 2.13 | 3.54 | 5.34 | 8.40 | 12.19 | 17.34 | 23.30 | 30.50 |
| I | 10 | 0.349 | 0.714 | 1.27 | 2.14 | 3.27 | 4.72 | 7.26 | 10.53 | 15.17 | 20.73 | 27.65 |
| J | 15 | 0.491 | 0.839 | 1.33 | 2.09 | 3.06 | 4.32 | 6.55 | 9.48 | 13.74 | 18.97 | 25.63 |
| K | 20 | 0.531 | 0.864 | 1.33 | 2.03 | 2.93 | 4.10 | 6.18 | 8.95 | 13.01 | 18.07 | 24.58 |
| L | 25 | 0.551 | 0.874 | 1.32 | 2.00 | 2.86 | 3.97 | 5.98 | 8.65 | 12.60 | 17.55 | 23.97 |
| M | 30 | 0.567 | 0.885 | 1.32 | 1.98 | 2.82 | 3.91 | 5.87 | 8.48 | 12.37 | 17.25 | 23.61 |
| N | 50 | 0.503 | 0.778 | 1.16 | 1.73 | 2.47 | 3.44 | 5.21 | 7.61 | 11.23 | 15.87 | 21.99 |
| P | 75 | 0.461 | 0.711 | 1.06 | 1.59 | 2.27 | 3.17 | 4.83 | 7.10 | 10.58 | 15.07 | 21.05 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table B-5*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 0 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 |
| .1 | 47.24 | 46.67 | 46.44 | 46.26 | 46.16 | 46.10 | 46.08 | 46.06 | 46.05 | 46.05 | 46.04 | 46.03 | 46.03 | 46.02 | 46.02 |
| .2 | 44.46 | 43.33 | 42.90 | 42.54 | 42.35 | 42.24 | 42.19 | 42.16 | 42.15 | 42.13 | 42.11 | 42.10 | 42.09 | 42.09 | 42.08 |
| .3 | 41.63 | 40.00 | 39.37 | 38.87 | 38.60 | 38.44 | 38.37 | 38.33 | 38.31 | 38.29 | 38.27 | 38.25 | 38.24 | 38.23 | 38.22 |
| .31 | 41.35 | 39.67 | 39.02 | 38.50 | 38.23 | 38.06 | 37.99 | 37.95 | 37.93 | 37.91 | 37.89 | 37.87 | 37.86 | 37.85 | 37.84 |
| .32 | 41.06 | 39.33 | 38.67 | 38.14 | 37.86 | 37.69 | 37.62 | 37.58 | 37.55 | 37.54 | 37.51 | 37.49 | 37.48 | 37.47 | 37.46 |
| .33 | 40.77 | 39.00 | 38.32 | 37.78 | 37.49 | 37.31 | 37.24 | 37.20 | 37.18 | 37.16 | 37.13 | 37.11 | 37.10 | 37.09 | 37.08 |
| .34 | 40.49 | 38.67 | 37.97 | 37.42 | 37.12 | 36.94 | 36.87 | 36.83 | 36.80 | 36.78 | 36.75 | 36.73 | 36.72 | 36.71 | 36.71 |
| .35 | 40.20 | 38.33 | 37.62 | 37.06 | 36.75 | 36.57 | 36.49 | 36.45 | 36.43 | 36.41 | 36.38 | 36.36 | 36.35 | 36.34 | 36.33 |
| .36 | 39.91 | 38.00 | 37.28 | 36.69 | 36.38 | 36.20 | 36.12 | 36.08 | 36.05 | 36.04 | 36.01 | 35.98 | 35.97 | 35.96 | 35.96 |
| .37 | 39.62 | 37.67 | 36.93 | 36.33 | 36.02 | 35.83 | 35.75 | 35.71 | 35.68 | 35.66 | 35.63 | 35.61 | 35.60 | 35.59 | 35.58 |
| .38 | 39.33 | 37.33 | 36.58 | 35.98 | 35.65 | 35.46 | 35.38 | 35.34 | 35.31 | 35.29 | 35.26 | 35.24 | 35.23 | 35.22 | 35.21 |
| .39 | 39.03 | 37.00 | 36.23 | 35.62 | 35.29 | 35.10 | 35.02 | 34.97 | 34.94 | 34.93 | 34.89 | 34.87 | 34.86 | 34.85 | 34.84 |
| .40 | 38.74 | 36.67 | 35.88 | 35.26 | 34.93 | 34.73 | 34.65 | 34.60 | 34.58 | 34.56 | 34.53 | 34.50 | 34.49 | 34.48 | 34.47 |
| .41 | 38.45 | 36.33 | 35.54 | 34.90 | 34.57 | 34.37 | 34.28 | 34.24 | 34.21 | 34.19 | 34.16 | 34.13 | 34.12 | 34.11 | 34.11 |
| .42 | 38.15 | 36.00 | 35.19 | 34.55 | 34.21 | 34.00 | 33.92 | 33.87 | 33.85 | 33.83 | 33.79 | 33.77 | 33.76 | 33.75 | 33.74 |
| .43 | 37.85 | 35.67 | 34.85 | 34.19 | 33.85 | 33.64 | 33.56 | 33.51 | 33.48 | 33.46 | 33.43 | 33.40 | 33.39 | 33.38 | 33.38 |
| .44 | 37.56 | 35.33 | 34.50 | 33.84 | 33.49 | 33.28 | 33.20 | 33.15 | 33.12 | 33.10 | 33.07 | 33.04 | 33.03 | 33.02 | 33.01 |
| .45 | 37.26 | 35.00 | 34.16 | 33.49 | 33.13 | 32.92 | 32.84 | 32.79 | 32.76 | 32.74 | 32.71 | 32.68 | 32.67 | 32.66 | 32.65 |
| .46 | 36.96 | 34.67 | 33.81 | 33.13 | 32.78 | 32.57 | 32.48 | 32.43 | 32.40 | 32.38 | 32.35 | 32.32 | 32.31 | 32.30 | 32.29 |
| .47 | 36.66 | 34.33 | 33.47 | 32.78 | 32.42 | 32.21 | 32.12 | 32.07 | 32.04 | 32.02 | 31.99 | 31.96 | 31.95 | 31.94 | 31.93 |
| .48 | 36.35 | 34.00 | 33.12 | 32.43 | 32.07 | 31.85 | 31.77 | 31.72 | 31.69 | 31.67 | 31.63 | 31.61 | 31.60 | 31.58 | 31.58 |
| .49 | 36.05 | 33.67 | 32.78 | 32.08 | 31.72 | 31.50 | 31.41 | 31.36 | 31.33 | 31.31 | 31.28 | 31.25 | 31.24 | 31.23 | 31.22 |
| .50 | 35.75 | 33.33 | 32.44 | 31.74 | 31.37 | 31.15 | 31.06 | 31.01 | 30.98 | 30.96 | 30.93 | 30.90 | 30.89 | 30.88 | 30.87 |
| .51 | 35.44 | 33.00 | 32.10 | 31.39 | 31.02 | 30.80 | 30.71 | 30.66 | 30.63 | 30.61 | 30.57 | 30.55 | 30.54 | 30.53 | 30.52 |
| .52 | 35.13 | 32.67 | 31.76 | 31.04 | 30.67 | 30.45 | 30.36 | 30.31 | 30.28 | 30.26 | 30.23 | 30.20 | 30.19 | 30.18 | 30.17 |
| .53 | 34.82 | 32.33 | 31.42 | 30.70 | 30.32 | 30.10 | 30.01 | 29.96 | 29.93 | 29.91 | 29.88 | 29.85 | 29.84 | 29.83 | 29.82 |
| .54 | 34.51 | 32.00 | 31.08 | 30.36 | 29.98 | 29.76 | 29.67 | 29.62 | 29.59 | 29.57 | 29.53 | 29.51 | 29.49 | 29.48 | 29.48 |
| .55 | 34.20 | 31.67 | 30.74 | 30.01 | 29.64 | 29.41 | 29.32 | 29.27 | 29.24 | 29.22 | 29.19 | 29.16 | 29.15 | 29.14 | 29.13 |
| .56 | 33.88 | 31.33 | 30.40 | 29.67 | 29.29 | 29.07 | 28.98 | 28.93 | 28.90 | 28.88 | 28.85 | 28.82 | 28.81 | 28.80 | 28.79 |
| .57 | 33.57 | 31.00 | 30.06 | 29.33 | 28.95 | 28.73 | 28.64 | 28.59 | 28.56 | 28.54 | 28.51 | 28.48 | 28.47 | 28.46 | 28.45 |
| .58 | 33.25 | 30.67 | 29.73 | 28.99 | 28.61 | 28.39 | 28.30 | 28.25 | 28.22 | 28.20 | 28.17 | 28.14 | 28.13 | 28.12 | 28.11 |
| .59 | 32.93 | 30.33 | 29.39 | 28.66 | 28.28 | 28.05 | 27.96 | 27.92 | 27.89 | 27.87 | 27.83 | 27.81 | 27.79 | 27.78 | 27.78 |
| .60 | 32.61 | 30.00 | 29.05 | 28.32 | 27.94 | 27.72 | 27.63 | 27.58 | 27.55 | 27.53 | 27.50 | 27.47 | 27.46 | 27.45 | 27.44 |
| .61 | 32.28 | 29.67 | 28.72 | 27.98 | 27.60 | 27.39 | 27.30 | 27.25 | 27.22 | 27.20 | 27.16 | 27.14 | 27.13 | 27.11 | 27.11 |
| .62 | 31.96 | 29.33 | 28.39 | 27.65 | 27.27 | 27.05 | 26.96 | 26.92 | 26.89 | 26.87 | 26.83 | 26.81 | 26.80 | 26.78 | 26.78 |
| .63 | 31.63 | 29.00 | 28.05 | 27.32 | 26.94 | 26.72 | 26.63 | 26.59 | 26.56 | 26.54 | 26.50 | 26.48 | 26.47 | 26.46 | 26.45 |
| .64 | 31.30 | 28.67 | 27.72 | 26.99 | 26.61 | 26.39 | 26.31 | 26.26 | 26.23 | 26.21 | 26.18 | 26.15 | 26.14 | 26.13 | 26.12 |
| .65 | 30.97 | 28.33 | 27.39 | 26.66 | 26.28 | 26.07 | 25.98 | 25.93 | 25.90 | 25.88 | 25.85 | 25.83 | 25.82 | 25.81 | 25.80 |
| .66 | 30.63 | 28.00 | 27.06 | 26.33 | 25.96 | 25.74 | 25.66 | 25.61 | 25.58 | 25.56 | 25.53 | 25.51 | 25.49 | 25.48 | 25.48 |
| .67 | 30.30 | 27.67 | 26.73 | 26.00 | 25.63 | 25.42 | 25.33 | 25.29 | 25.26 | 25.24 | 25.21 | 25.19 | 25.17 | 25.16 | 25.16 |
| .68 | 29.96 | 27.33 | 26.40 | 25.68 | 25.31 | 25.10 | 25.01 | 24.97 | 24.94 | 24.92 | 24.89 | 24.87 | 24.86 | 24.85 | 24.84 |
| .69 | 29.61 | 27.00 | 26.07 | 25.35 | 24.99 | 24.78 | 24.70 | 24.65 | 24.62 | 24.60 | 24.57 | 24.55 | 24.54 | 24.53 | 24.52 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| .70 | 29.27 | 26.67 | 25.74 | 25.03 | 24.67 | 24.46 | 24.38 | 24.33 | 24.31 | 24.29 | 24.26 | 24.24 | 24.23 | 24.22 | 24.21 |
| .71 | 28.92 | 26.33 | 25.41 | 24.71 | 24.35 | 24.15 | 24.06 | 24.02 | 23.99 | 23.98 | 23.95 | 23.92 | 23.91 | 23.90 | 23.90 |
| .72 | 28.57 | 26.00 | 25.09 | 24.39 | 24.03 | 23.83 | 23.75 | 23.71 | 23.68 | 23.67 | 23.64 | 23.61 | 23.60 | 23.59 | 23.59 |
| .73 | 28.22 | 25.67 | 24.76 | 24.07 | 23.72 | 23.52 | 23.44 | 23.40 | 23.37 | 23.36 | 23.33 | 23.31 | 23.30 | 23.29 | 23.28 |
| .74 | 27.86 | 25.33 | 24.44 | 23.75 | 23.41 | 23.21 | 23.13 | 23.09 | 23.07 | 23.05 | 23.02 | 23.00 | 22.99 | 22.98 | 22.98 |
| .75 | 27.50 | 25.00 | 24.11 | 23.44 | 23.10 | 22.90 | 22.83 | 22.79 | 22.76 | 22.75 | 22.72 | 22.70 | 22.69 | 22.68 | 22.68 |
| .76 | 27.13 | 24.67 | 23.79 | 23.12 | 22.79 | 22.60 | 22.52 | 22.48 | 22.46 | 22.44 | 22.42 | 22.40 | 22.39 | 22.38 | 22.38 |
| .77 | 26.76 | 24.33 | 23.47 | 22.81 | 22.48 | 22.30 | 22.22 | 22.18 | 22.16 | 22.14 | 22.12 | 22.10 | 22.09 | 22.08 | 22.08 |
| .78 | 26.39 | 24.00 | 23.15 | 22.50 | 22.18 | 21.99 | 21.92 | 21.89 | 21.86 | 21.85 | 21.82 | 21.80 | 21.78 | 21.79 | 21.78 |
| .79 | 26.02 | 23.67 | 22.83 | 22.19 | 21.87 | 21.70 | 21.63 | 21.59 | 21.57 | 21.55 | 21.53 | 21.51 | 21.50 | 21.49 | 21.49 |
| .80 | 25.64 | 23.33 | 22.51 | 21.88 | 21.57 | 21.40 | 21.33 | 21.29 | 21.27 | 21.26 | 21.23 | 21.22 | 21.21 | 21.20 | 21.20 |
| .81 | 25.25 | 23.00 | 22.19 | 21.58 | 21.27 | 21.10 | 21.04 | 21.00 | 20.98 | 20.97 | 20.94 | 20.93 | 20.92 | 20.91 | 20.91 |
| .82 | 24.86 | 22.67 | 21.87 | 21.27 | 20.98 | 20.81 | 20.75 | 20.71 | 20.69 | 20.68 | 20.65 | 20.64 | 20.63 | 20.62 | 20.62 |
| .83 | 24.47 | 22.33 | 21.56 | 20.97 | 20.68 | 20.52 | 20.46 | 20.42 | 20.40 | 20.39 | 20.37 | 20.35 | 20.35 | 20.34 | 20.34 |
| .84 | 24.07 | 22.00 | 21.24 | 20.67 | 20.39 | 20.23 | 20.17 | 20.14 | 20.12 | 20.11 | 20.09 | 20.07 | 20.06 | 20.06 | 20.05 |
| .85 | 23.67 | 21.67 | 20.93 | 20.37 | 20.10 | 19.94 | 19.89 | 19.86 | 19.84 | 19.82 | 19.80 | 19.79 | 19.78 | 19.78 | 19.77 |
| .86 | 23.26 | 21.33 | 20.62 | 20.07 | 19.81 | 19.66 | 19.60 | 19.57 | 19.56 | 19.54 | 19.53 | 19.51 | 19.51 | 19.50 | 19.50 |
| .87 | 22.84 | 21.00 | 20.31 | 19.78 | 19.52 | 19.38 | 19.32 | 19.30 | 19.28 | 19.27 | 19.25 | 19.24 | 19.23 | 19.23 | 19.22 |
| .88 | 22.42 | 20.67 | 20.00 | 19.48 | 19.23 | 19.10 | 19.05 | 19.02 | 19.00 | 18.99 | 18.98 | 18.96 | 18.96 | 18.95 | 18.95 |
| .89 | 21.99 | 20.33 | 19.69 | 19.19 | 18.95 | 18.82 | 18.77 | 18.74 | 18.73 | 18.72 | 18.70 | 18.69 | 18.69 | 18.68 | 18.68 |
| .90 | 21.55 | 20.00 | 19.38 | 18.90 | 18.67 | 18.54 | 18.50 | 18.47 | 18.46 | 18.45 | 18.43 | 18.42 | 18.42 | 18.41 | 18.41 |
| .91 | 21.11 | 19.67 | 19.07 | 18.61 | 18.39 | 18.27 | 18.23 | 18.20 | 18.19 | 18.18 | 18.17 | 18.16 | 18.15 | 18.15 | 18.15 |
| .92 | 20.66 | 19.33 | 18.77 | 18.33 | 18.11 | 18.00 | 17.96 | 17.94 | 17.92 | 17.92 | 17.90 | 17.89 | 17.89 | 17.89 | 17.88 |
| .93 | 20.19 | 19.00 | 18.46 | 18.04 | 17.84 | 17.73 | 17.69 | 17.67 | 17.66 | 17.65 | 17.64 | 17.63 | 17.63 | 17.62 | 17.62 |
| .94 | 19.73 | 18.67 | 18.16 | 17.76 | 17.56 | 17.46 | 17.43 | 17.41 | 17.40 | 17.39 | 17.38 | 17.37 | 17.37 | 17.37 | 17.36 |
| .95 | 19.25 | 18.33 | 17.86 | 17.48 | 17.29 | 17.20 | 17.17 | 17.16 | 17.14 | 17.13 | 17.12 | 17.12 | 17.11 | 17.11 | 17.11 |
| .96 | 18.75 | 18.00 | 17.55 | 17.20 | 17.03 | 16.94 | 16.90 | 16.89 | 16.88 | 16.88 | 16.87 | 16.86 | 16.86 | 16.86 | 16.86 |
| .97 | 18.25 | 17.67 | 17.25 | 16.92 | 16.76 | 16.68 | 16.65 | 16.63 | 16.63 | 16.62 | 16.61 | 16.61 | 16.61 | 16.61 | 16.60 |
| .98 | 17.74 | 17.33 | 16.96 | 16.65 | 16.49 | 16.42 | 16.39 | 16.38 | 16.37 | 16.37 | 16.36 | 16.36 | 16.36 | 16.36 | 16.36 |
| .99 | 17.21 | 17.00 | 16.66 | 16.37 | 16.23 | 16.16 | 16.14 | 16.13 | 16.12 | 16.12 | 16.12 | 16.11 | 16.11 | 16.11 | 16.11 |
| 1.00 | 16.67 | 16.67 | 16.36 | 16.10 | 15.97 | 15.91 | 15.89 | 15.88 | 15.88 | 15.87 | 15.87 | 15.87 | 15.87 | 15.87 | 15.87 |
| 1.01 | 16.11 | 16.33 | 16.07 | 15.83 | 15.72 | 15.66 | 15.64 | 15.63 | 15.63 | 15.63 | 15.63 | 15.62 | 15.62 | 15.62 | 15.62 |
| 1.02 | 15.53 | 16.00 | 15.78 | 15.56 | 15.46 | 15.41 | 15.40 | 15.39 | 15.39 | 15.38 | 15.38 | 15.38 | 15.38 | 15.39 | 15.39 |
| 1.03 | 14.93 | 15.67 | 15.48 | 15.30 | 15.21 | 15.17 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 |
| 1.04 | 14.31 | 15.33 | 15.19 | 15.03 | 14.96 | 14.92 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 |
| 1.05 | 13.66 | 15.00 | 14.91 | 14.77 | 14.71 | 14.68 | 14.67 | 14.67 | 14.67 | 14.67 | 14.68 | 14.68 | 14.68 | 14.68 | 14.68 |
| 1.06 | 12.98 | 14.67 | 14.62 | 14.51 | 14.46 | 14.44 | 14.44 | 14.44 | 14.44 | 14.44 | 14.45 | 14.45 | 14.45 | 14.45 | 14.45 |
| 1.07 | 12.27 | 14.33 | 14.33 | 14.26 | 14.22 | 14.20 | 14.20 | 14.21 | 14.21 | 14.21 | 14.22 | 14.22 | 14.22 | 14.23 | 14.22 |
| 1.08 | 11.51 | 14.00 | 14.05 | 14.00 | 13.97 | 13.97 | 13.97 | 13.98 | 13.98 | 13.98 | 13.99 | 13.99 | 14.00 | 14.00 | 14.00 |
| 1.09 | 10.71 | 13.67 | 13.76 | 13.75 | 13.73 | 13.74 | 13.74 | 13.75 | 13.75 | 13.76 | 13.77 | 13.77 | 13.77 | 13.78 | 13.78 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 1.10 | 9.84 | 13.33 | 13.48 | 13.49 | 13.50 | 13.51 | 13.52 | 13.52 | 13.53 | 13.54 | 13.54 | 13.55 | 13.55 | 13.56 | 13.56 |
| 1.11 | 8.89 | 13.00 | 13.20 | 13.25 | 13.26 | 13.28 | 13.29 | 13.30 | 13.31 | 13.31 | 13.32 | 13.33 | 13.34 | 13.34 | 13.34 |
| 1.12 | 7.82 | 12.67 | 12.93 | 13.00 | 13.03 | 13.05 | 13.07 | 13.08 | 13.09 | 13.10 | 13.11 | 13.12 | 13.12 | 13.13 | 13.13 |
| 1.13 | 6.60 | 12.33 | 12.65 | 12.75 | 12.80 | 12.83 | 12.85 | 12.86 | 12.87 | 12.88 | 12.89 | 12.90 | 12.91 | 12.91 | 12.92 |
| 1.14 | 5.08 | 12.00 | 12.37 | 12.51 | 12.57 | 12.61 | 12.63 | 12.65 | 12.66 | 12.67 | 12.68 | 12.69 | 12.70 | 12.70 | 12.71 |
| 1.15 | 2.87 | 11.67 | 12.10 | 12.27 | 12.34 | 12.39 | 12.42 | 12.44 | 12.45 | 12.46 | 12.47 | 12.48 | 12.49 | 12.49 | 12.50 |
| 1.16 | 0.00 | 11.33 | 11.83 | 12.03 | 12.12 | 12.18 | 12.21 | 12.22 | 12.24 | 12.25 | 12.26 | 12.28 | 12.28 | 12.29 | 12.29 |
| 1.17 | 0.00 | 11.00 | 11.56 | 11.79 | 11.90 | 11.96 | 12.00 | 12.02 | 12.03 | 12.04 | 12.06 | 12.07 | 12.08 | 12.09 | 12.09 |
| 1.18 | 0.00 | 10.67 | 11.29 | 11.56 | 11.68 | 11.75 | 11.79 | 11.81 | 11.82 | 11.84 | 11.85 | 11.87 | 11.88 | 11.88 | 11.89 |
| 1.19 | 0.00 | 10.33 | 11.02 | 11.33 | 11.46 | 11.54 | 11.58 | 11.61 | 11.62 | 11.63 | 11.65 | 11.67 | 11.68 | 11.69 | 11.69 |
| 1.20 | 0.00 | 10.00 | 10.76 | 11.10 | 11.24 | 11.34 | 11.38 | 11.41 | 11.42 | 11.43 | 11.46 | 11.47 | 11.48 | 11.49 | 11.49 |
| 1.21 | 0.00 | 9.67 | 10.50 | 10.87 | 11.03 | 11.13 | 11.18 | 11.21 | 11.22 | 11.24 | 11.26 | 11.28 | 11.29 | 11.30 | 11.30 |
| 1.22 | 0.00 | 9.33 | 10.23 | 10.65 | 10.82 | 10.93 | 10.98 | 11.01 | 11.03 | 11.04 | 11.07 | 11.09 | 11.09 | 11.10 | 11.11 |
| 1.23 | 0.00 | 9.00 | 9.97 | 10.42 | 10.61 | 10.73 | 10.78 | 10.81 | 10.84 | 10.85 | 10.88 | 10.90 | 10.91 | 10.92 | 10.92 |
| 1.24 | 0.00 | 8.67 | 9.72 | 10.20 | 10.41 | 10.53 | 10.59 | 10.62 | 10.64 | 10.66 | 10.69 | 10.71 | 10.72 | 10.73 | 10.73 |
| 1.25 | 0.00 | 8.33 | 9.46 | 9.98 | 10.21 | 10.34 | 10.40 | 10.43 | 10.46 | 10.47 | 10.50 | 10.52 | 10.53 | 10.54 | 10.55 |
| 1.26 | 0.00 | 8.00 | 9.21 | 9.77 | 10.00 | 10.15 | 10.21 | 10.25 | 10.27 | 10.29 | 10.32 | 10.34 | 10.35 | 10.36 | 10.37 |
| 1.27 | 0.00 | 7.67 | 8.96 | 9.55 | 9.81 | 9.96 | 10.02 | 10.06 | 10.09 | 10.10 | 10.13 | 10.16 | 10.17 | 10.18 | 10.19 |
| 1.28 | 0.00 | 7.33 | 8.71 | 9.34 | 9.61 | 9.77 | 9.84 | 9.88 | 9.90 | 9.92 | 9.95 | 9.98 | 9.99 | 10.00 | 10.01 |
| 1.29 | 0.00 | 7.00 | 8.46 | 9.13 | 9.42 | 9.58 | 9.66 | 9.70 | 9.72 | 9.74 | 9.78 | 9.80 | 9.82 | 9.83 | 9.83 |
| 1.30 | 0.00 | 6.67 | 8.21 | 8.93 | 9.22 | 9.40 | 9.48 | 9.52 | 9.55 | 9.57 | 9.60 | 9.63 | 9.64 | 9.65 | 9.66 |
| 1.31 | 0.00 | 6.33 | 7.97 | 8.72 | 9.03 | 9.22 | 9.30 | 9.34 | 9.37 | 9.39 | 9.43 | 9.46 | 9.47 | 9.48 | 9.49 |
| 1.32 | 0.00 | 6.00 | 7.73 | 8.52 | 8.85 | 9.04 | 9.12 | 9.17 | 9.20 | 9.22 | 9.26 | 9.29 | 9.30 | 9.31 | 9.32 |
| 1.33 | 0.00 | 5.67 | 7.49 | 8.32 | 8.66 | 8.86 | 8.95 | 9.00 | 9.03 | 9.05 | 9.09 | 9.12 | 9.13 | 9.15 | 9.15 |
| 1.34 | 0.00 | 5.33 | 7.25 | 8.12 | 8.48 | 8.69 | 8.78 | 8.83 | 8.86 | 8.88 | 8.92 | 8.95 | 8.97 | 8.98 | 8.99 |
| 1.35 | 0.00 | 5.00 | 7.02 | 7.92 | 8.30 | 8.52 | 8.61 | 8.66 | 8.69 | 8.72 | 8.76 | 8.79 | 8.81 | 8.82 | 8.83 |
| 1.36 | 0.00 | 4.67 | 6.79 | 7.73 | 8.12 | 8.35 | 8.44 | 8.50 | 8.53 | 8.55 | 8.60 | 8.63 | 8.65 | 8.66 | 8.67 |
| 1.37 | 0.00 | 4.33 | 6.56 | 7.54 | 7.95 | 8.18 | 8.28 | 8.33 | 8.37 | 8.39 | 8.44 | 8.47 | 8.49 | 8.50 | 8.51 |
| 1.38 | 0.00 | 4.00 | 6.33 | 7.35 | 7.77 | 8.01 | 8.12 | 8.17 | 8.21 | 8.24 | 8.28 | 8.31 | 8.33 | 8.35 | 8.36 |
| 1.39 | 0.00 | 3.67 | 6.10 | 7.17 | 7.60 | 7.85 | 7.96 | 8.01 | 8.05 | 8.08 | 8.12 | 8.16 | 8.18 | 8.19 | 8.20 |
| 1.40 | 0.00 | 3.33 | 5.88 | 6.98 | 7.44 | 7.69 | 7.80 | 7.86 | 7.90 | 7.92 | 7.97 | 8.01 | 8.02 | 8.04 | 8.05 |
| 1.41 | 0.00 | 3.00 | 5.66 | 6.80 | 7.27 | 7.53 | 7.64 | 7.70 | 7.74 | 7.77 | 7.82 | 7.86 | 7.87 | 7.89 | 7.90 |
| 1.42 | 0.00 | 2.67 | 5.44 | 6.62 | 7.10 | 7.37 | 7.49 | 7.55 | 7.59 | 7.62 | 7.67 | 7.71 | 7.73 | 7.74 | 7.75 |
| 1.43 | 0.00 | 2.33 | 5.23 | 6.45 | 6.94 | 7.22 | 7.34 | 7.40 | 7.44 | 7.47 | 7.52 | 7.56 | 7.58 | 7.60 | 7.61 |
| 1.44 | 0.00 | 2.00 | 5.02 | 6.27 | 6.78 | 7.07 | 7.19 | 7.26 | 7.30 | 7.33 | 7.38 | 7.42 | 7.44 | 7.46 | 7.47 |
| 1.45 | 0.00 | 1.67 | 4.81 | 6.10 | 6.63 | 6.92 | 7.04 | 7.11 | 7.15 | 7.18 | 7.24 | 7.28 | 7.30 | 7.32 | 7.32 |
| 1.46 | 0.00 | 1.33 | 4.60 | 5.93 | 6.47 | 6.77 | 6.90 | 6.97 | 7.01 | 7.04 | 7.10 | 7.14 | 7.16 | 7.18 | 7.19 |
| 1.47 | 0.00 | 1.00 | 4.39 | 5.77 | 6.32 | 6.63 | 6.75 | 6.83 | 6.87 | 6.90 | 6.96 | 7.00 | 7.02 | 7.04 | 7.05 |
| 1.48 | 0.00 | .67 | 4.19 | 5.60 | 6.17 | 6.48 | 6.61 | 6.69 | 6.73 | 6.77 | 6.82 | 6.86 | 6.88 | 6.90 | 6.91 |
| 1.49 | 0.00 | .33 | 3.99 | 5.44 | 6.02 | 6.34 | 6.48 | 6.55 | 6.60 | 6.63 | 6.69 | 6.73 | 6.75 | 6.77 | 6.78 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 1.50 | 0.00 | 0.00 | 3.80 | 5.28 | 5.87 | 6.20 | 6.34 | 6.41 | 6.46 | 6.50 | 6.55 | 6.60 | 6.62 | 6.64 | 6.65 |
| 1.51 | 0.00 | 0.00 | 3.61 | 5.13 | 5.73 | 6.06 | 6.20 | 6.28 | 6.33 | 6.36 | 6.42 | 6.47 | 6.49 | 6.51 | 6.52 |
| 1.52 | 0.00 | 0.00 | 3.42 | 4.97 | 5.59 | 5.93 | 6.07 | 6.15 | 6.20 | 6.23 | 6.29 | 6.34 | 6.36 | 6.38 | 6.39 |
| 1.53 | 0.00 | 0.00 | 3.23 | 4.82 | 5.45 | 5.80 | 5.94 | 6.02 | 6.07 | 6.11 | 6.17 | 6.21 | 6.24 | 6.26 | 6.27 |
| 1.54 | 0.00 | 0.00 | 3.05 | 4.67 | 5.31 | 5.67 | 5.81 | 5.89 | 5.95 | 5.98 | 6.04 | 6.09 | 6.11 | 6.13 | 6.15 |
| 1.55 | 0.00 | 0.00 | 2.87 | 4.52 | 5.18 | 5.54 | 5.69 | 5.77 | 5.82 | 5.86 | 5.92 | 5.97 | 5.99 | 6.01 | 6.02 |
| 1.56 | 0.00 | 0.00 | 2.69 | 4.38 | 5.05 | 5.41 | 5.56 | 5.65 | 5.70 | 5.74 | 5.80 | 5.85 | 5.87 | 5.89 | 5.90 |
| 1.57 | 0.00 | 0.00 | 2.52 | 4.24 | 4.92 | 5.29 | 5.44 | 5.53 | 5.58 | 5.62 | 5.68 | 5.73 | 5.75 | 5.78 | 5.79 |
| 1.58 | 0.00 | 0.00 | 2.35 | 4.10 | 4.79 | 5.16 | 5.32 | 5.41 | 5.46 | 5.50 | 5.56 | 5.61 | 5.64 | 5.66 | 5.67 |
| 1.59 | 0.00 | 0.00 | 2.19 | 3.96 | 4.66 | 5.04 | 5.20 | 5.29 | 5.34 | 5.38 | 5.45 | 5.50 | 5.52 | 5.55 | 5.56 |
| 1.60 | 0.00 | 0.00 | 2.03 | 3.83 | 4.54 | 4.92 | 5.08 | 5.17 | 5.23 | 5.27 | 5.33 | 5.38 | 5.41 | 5.43 | 5.44 |
| 1.61 | 0.00 | 0.00 | 1.87 | 3.69 | 4.41 | 4.81 | 4.97 | 5.06 | 5.12 | 5.16 | 5.22 | 5.27 | 5.30 | 5.32 | 5.33 |
| 1.62 | 0.00 | 0.00 | 1.72 | 3.57 | 4.30 | 4.69 | 4.86 | 4.95 | 5.01 | 5.04 | 5.11 | 5.16 | 5.19 | 5.21 | 5.23 |
| 1.63 | 0.00 | 0.00 | 1.57 | 3.44 | 4.18 | 4.58 | 4.75 | 4.84 | 4.90 | 4.94 | 5.01 | 5.06 | 5.08 | 5.11 | 5.12 |
| 1.64 | 0.00 | 0.00 | 1.42 | 3.31 | 4.06 | 4.47 | 4.64 | 4.73 | 4.79 | 4.83 | 4.90 | 4.95 | 4.98 | 5.00 | 5.01 |
| 1.65 | 0.00 | 0.00 | 1.28 | 3.19 | 3.95 | 4.36 | 4.53 | 4.62 | 4.68 | 4.72 | 4.79 | 4.85 | 4.87 | 4.90 | 4.91 |
| 1.66 | 0.00 | 0.00 | 1.15 | 3.07 | 3.84 | 4.25 | 4.43 | 4.52 | 4.58 | 4.62 | 4.69 | 4.74 | 4.77 | 4.80 | 4.81 |
| 1.67 | 0.00 | 0.00 | 1.02 | 2.95 | 3.73 | 4.15 | 4.32 | 4.42 | 4.48 | 4.52 | 4.59 | 4.64 | 4.67 | 4.70 | 4.71 |
| 1.68 | 0.00 | 0.00 | 0.89 | 2.84 | 3.62 | 4.05 | 4.22 | 4.32 | 4.38 | 4.42 | 4.49 | 4.55 | 4.57 | 4.60 | 4.61 |
| 1.69 | 0.00 | 0.00 | 0.77 | 2.73 | 5.52 | 3.94 | 4.12 | 4.22 | 4.28 | 4.32 | 4.39 | 4.45 | 4.47 | 4.50 | 4.51 |
| 1.70 | 0.00 | 0.00 | 0.66 | 2.62 | 3.41 | 3.84 | 4.02 | 4.12 | 4.18 | 4.22 | 4.30 | 4.35 | 4.38 | 4.41 | 4.42 |
| 1.71 | 0.00 | 0.00 | 0.55 | 2.51 | 3.31 | 3.75 | 3.93 | 4.02 | 4.09 | 4.13 | 4.20 | 4.26 | 4.29 | 4.31 | 4.32 |
| 1.72 | 0.00 | 0.00 | 0.45 | 2.41 | 3.21 | 3.65 | 3.83 | 3.93 | 3.99 | 4.04 | 4.11 | 4.17 | 4.19 | 4.22 | 4.23 |
| 1.73 | 0.00 | 0.00 | 0.36 | 2.30 | 3.11 | 3.56 | 3.74 | 3.84 | 3.90 | 3.94 | 4.02 | 4.08 | 4.10 | 4.13 | 4.14 |
| 1.74 | 0.00 | 0.00 | 0.27 | 2.20 | 3.02 | 3.46 | 3.65 | 3.75 | 3.81 | 3.85 | 3.93 | 3.99 | 4.01 | 4.04 | 4.05 |
| 1.75 | 0.00 | 0.00 | 0.19 | 2.11 | 2.93 | 3.37 | 3.56 | 3.66 | 3.72 | 3.77 | 3.84 | 3.90 | 3.93 | 3.95 | 3.97 |
| 1.76 | 0.00 | 0.00 | 0.12 | 2.01 | 2.83 | 3.28 | 3.47 | 3.57 | 3.63 | 3.68 | 3.76 | 3.81 | 3.84 | 3.87 | 3.88 |
| 1.77 | 0.00 | 0.00 | 0.06 | 1.92 | 2.74 | 3.20 | 3.38 | 3.48 | 3.55 | 3.59 | 3.67 | 3.73 | 3.76 | 3.78 | 3.80 |
| 1.78 | 0.00 | 0.00 | 0.02 | 1.83 | 2.66 | 3.11 | 3.30 | 3.40 | 3.47 | 3.51 | 3.59 | 3.64 | 3.67 | 3.70 | 3.71 |
| 1.79 | 0.00 | 0.00 | 0.00 | 1.74 | 2.57 | 3.03 | 3.21 | 3.32 | 3.38 | 3.43 | 3.51 | 3.56 | 3.59 | 3.62 | 3.63 |
| 1.80 | 0.00 | 0.00 | 0.00 | 1.65 | 2.49 | 2.94 | 3.13 | 3.24 | 3.30 | 3.35 | 3.43 | 3.48 | 3.51 | 3.54 | 3.55 |
| 1.81 | 0.00 | 0.00 | 0.00 | 1.57 | 2.40 | 2.86 | 3.05 | 3.16 | 3.22 | 3.27 | 3.35 | 3.40 | 3.43 | 3.46 | 3.47 |
| 1.82 | 0.00 | 0.00 | 0.00 | 1.49 | 2.32 | 2.79 | 2.98 | 3.08 | 3.15 | 3.19 | 3.27 | 3.33 | 3.36 | 3.38 | 3.40 |
| 1.83 | 0.00 | 0.00 | 0.00 | 1.41 | 2.25 | 2.71 | 2.90 | 3.00 | 3.07 | 3.11 | 3.19 | 3.25 | 3.28 | 3.31 | 3.32 |
| 1.84 | 0.00 | 0.00 | 0.00 | 1.34 | 2.17 | 2.63 | 2.82 | 2.93 | 2.99 | 3.04 | 3.12 | 3.18 | 3.21 | 3.23 | 3.25 |
| 1.85 | 0.00 | 0.00 | 0.00 | 1.26 | 2.09 | 2.56 | 2.75 | 2.85 | 2.92 | 2.97 | 3.05 | 3.10 | 3.13 | 3.16 | 3.17 |
| 1.86 | 0.00 | 0.00 | 0.00 | 1.19 | 2.02 | 2.48 | 2.68 | 2.78 | 2.85 | 2.89 | 2.97 | 3.03 | 3.06 | 3.09 | 3.10 |
| 1.87 | 0.00 | 0.00 | 0.00 | 1.12 | 1.95 | 2.41 | 2.61 | 2.71 | 2.78 | 2.82 | 2.90 | 2.96 | 2.99 | 3.02 | 3.03 |
| 1.88 | 0.00 | 0.00 | 0.00 | 1.06 | 1.88 | 2.34 | 2.54 | 2.64 | 2.71 | 2.75 | 2.83 | 2.89 | 2.92 | 2.95 | 2.96 |
| 1.89 | 0.00 | 0.00 | 0.00 | 0.99 | 1.81 | 2.28 | 2.47 | 2.57 | 2.64 | 2.69 | 2.77 | 2.83 | 2.85 | 2.88 | 2.90 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 1.90 | 0.00 | 0.00 | 0.00 | 0.93 | 1.75 | 2.21 | 2.40 | 2.51 | 2.57 | 2.62 | 2.70 | 2.76 | 2.79 | 2.82 | 2.83 |
| 1.91 | 0.00 | 0.00 | 0.00 | 0.87 | 1.68 | 2.14 | 2.34 | 2.44 | 2.51 | 2.56 | 2.63 | 2.69 | 2.72 | 2.75 | 2.77 |
| 1.92 | 0.00 | 0.00 | 0.00 | 0.81 | 1.62 | 2.08 | 2.27 | 2.38 | 2.45 | 2.49 | 2.57 | 2.63 | 2.66 | 2.69 | 2.70 |
| 1.93 | 0.00 | 0.00 | 0.00 | 0.76 | 1.56 | 2.02 | 2.21 | 2.32 | 2.38 | 2.43 | 2.51 | 2.57 | 2.60 | 2.63 | 2.64 |
| 1.94 | 0.00 | 0.00 | 0.00 | 0.70 | 1.50 | 1.96 | 2.15 | 2.25 | 2.32 | 2.37 | 2.45 | 2.51 | 2.54 | 2.56 | 2.58 |
| 1.95 | 0.00 | 0.00 | 0.00 | 0.65 | 1.44 | 1.90 | 2.09 | 2.19 | 2.26 | 2.31 | 2.39 | 2.45 | 2.48 | 2.50 | 2.52 |
| 1.96 | 0.00 | 0.00 | 0.00 | 0.60 | 1.38 | 1.84 | 2.03 | 2.14 | 2.20 | 2.25 | 2.33 | 2.39 | 2.42 | 2.44 | 2.46 |
| 1.97 | 0.00 | 0.00 | 0.00 | 0.56 | 1.33 | 1.78 | 1.97 | 2.08 | 2.14 | 2.19 | 2.27 | 2.33 | 2.36 | 2.39 | 2.40 |
| 1.98 | 0.00 | 0.00 | 0.00 | 0.51 | 1.27 | 1.73 | 1.92 | 2.02 | 2.09 | 2.13 | 2.21 | 2.27 | 2.30 | 2.33 | 2.34 |
| 1.99 | 0.00 | 0.00 | 0.00 | 0.47 | 1.22 | 1.67 | 1.86 | 1.97 | 2.03 | 2.08 | 2.16 | 2.22 | 2.25 | 2.27 | 2.29 |
| 2.00 | 0.00 | 0.00 | 0.00 | 0.43 | 1.17 | 1.62 | 1.81 | 1.91 | 1.98 | 2.03 | 2.10 | 2.16 | 2.19 | 2.22 | 2.23 |
| 2.01 | 0.00 | 0.00 | 0.00 | 0.39 | 1.12 | 1.57 | 1.76 | 1.86 | 1.93 | 1.97 | 2.05 | 2.11 | 2.14 | 2.17 | 2.18 |
| 2.02 | 0.00 | 0.00 | 0.00 | 0.36 | 1.07 | 1.52 | 1.71 | 1.81 | 1.87 | 1.92 | 2.00 | 2.06 | 2.09 | 2.11 | 2.13 |
| 2.03 | 0.00 | 0.00 | 0.00 | 0.32 | 1.03 | 1.47 | 1.66 | 1.76 | 1.82 | 1.87 | 1.95 | 2.01 | 2.04 | 2.06 | 2.08 |
| 2.04 | 0.00 | 0.00 | 0.00 | 0.29 | 0.98 | 1.42 | 1.61 | 1.71 | 1.77 | 1.82 | 1.90 | 1.96 | 1.99 | 2.01 | 2.03 |
| 2.05 | 0.00 | 0.00 | 0.00 | 0.26 | 0.94 | 1.37 | 1.56 | 1.66 | 1.73 | 1.77 | 1.85 | 1.91 | 1.94 | 1.96 | 1.98 |
| 2.06 | 0.00 | 0.00 | 0.00 | 0.23 | 0.90 | 1.33 | 1.51 | 1.61 | 1.68 | 1.72 | 1.80 | 1.86 | 1.89 | 1.92 | 1.93 |
| 2.07 | 0.00 | 0.00 | 0.00 | 0.21 | 0.86 | 1.28 | 1.47 | 1.57 | 1.63 | 1.68 | 1.76 | 1.81 | 1.84 | 1.87 | 1.88 |
| 2.08 | 0.00 | 0.00 | 0.00 | 0.18 | 0.82 | 1.24 | 1.42 | 1.52 | 1.59 | 1.63 | 1.71 | 1.77 | 1.79 | 1.82 | 1.84 |
| 2.09 | 0.00 | 0.00 | 0.00 | 0.16 | 0.78 | 1.20 | 1.38 | 1.48 | 1.54 | 1.59 | 1.66 | 1.72 | 1.75 | 1.78 | 1.79 |
| 2.10 | 0.00 | 0.00 | 0.00 | 0.14 | 0.74 | 1.16 | 1.34 | 1.44 | 1.50 | 1.54 | 1.62 | 1.68 | 1.71 | 1.73 | 1.75 |
| 2.11 | 0.00 | 0.00 | 0.00 | 0.12 | 0.71 | 1.12 | 1.30 | 1.39 | 1.46 | 1.50 | 1.58 | 1.63 | 1.66 | 1.69 | 1.70 |
| 2.12 | 0.00 | 0.00 | 0.00 | 0.10 | 0.67 | 1.08 | 1.26 | 1.35 | 1.42 | 1.46 | 1.54 | 1.59 | 1.62 | 1.65 | 1.66 |
| 2.13 | 0.00 | 0.00 | 0.00 | 0.08 | 0.64 | 1.04 | 1.22 | 1.31 | 1.38 | 1.42 | 1.50 | 1.55 | 1.58 | 1.61 | 1.62 |
| 2.14 | 0.00 | 0.00 | 0.00 | 0.07 | 0.61 | 1.00 | 1.18 | 1.28 | 1.34 | 1.38 | 1.46 | 1.51 | 1.54 | 1.57 | 1.58 |
| 2.15 | 0.00 | 0.00 | 0.00 | 0.06 | 0.58 | 0.97 | 1.14 | 1.24 | 1.30 | 1.34 | 1.42 | 1.47 | 1.50 | 1.53 | 1.54 |
| 2.16 | 0.00 | 0.00 | 0.00 | 0.05 | 0.55 | 0.93 | 1.10 | 1.20 | 1.26 | 1.30 | 1.38 | 1.43 | 1.46 | 1.49 | 1.50 |
| 2.17 | 0.00 | 0.00 | 0.00 | 0.04 | 0.52 | 0.90 | 1.07 | 1.16 | 1.22 | 1.27 | 1.34 | 1.40 | 1.42 | 1.45 | 1.46 |
| 2.18 | 0.00 | 0.00 | 0.00 | 0.03 | 0.49 | 0.87 | 1.03 | 1.13 | 1.19 | 1.23 | 1.30 | 1.36 | 1.39 | 1.41 | 1.42 |
| 2.19 | 0.00 | 0.00 | 0.00 | 0.02 | 0.46 | 0.83 | 1.00 | 1.09 | 1.15 | 1.20 | 1.27 | 1.32 | 1.35 | 1.38 | 1.39 |
| 2.20 | 0.000 | 0.000 | 0.000 | 0.015 | 0.437 | 0.803 | 0.968 | 1.061 | 1.120 | 1.061 | 1.233 | 1.287 | 1.314 | 1.340 | 1.352 |
| 2.21 | 0.000 | 0.000 | 0.000 | 0.010 | 0.413 | 0.772 | 0.936 | 1.028 | 1.087 | 1.128 | 1.199 | 1.253 | 1.279 | 1.305 | 1.318 |
| 2.22 | 0.000 | 0.000 | 0.000 | 0.006 | 0.389 | 0.734 | 0.905 | 0.996 | 1.054 | 1.095 | 1.166 | 1.219 | 1.245 | 1.271 | 1.284 |
| 2.23 | 0.000 | 0.000 | 0.000 | 0.003 | 0.366 | 0.715 | 0.874 | 0.965 | 1.023 | 1.063 | 1.134 | 1.186 | 1.212 | 1.238 | 1.250 |
| 2.24 | 0.000 | 0.000 | 0.000 | 0.002 | 0.345 | 0.687 | 0.845 | 0.935 | 0.992 | 1.032 | 1.102 | 1.154 | 1.180 | 1.205 | 1.218 |
| 2.25 | 0.000 | 0.000 | 0.000 | 0.001 | 0.324 | 0.660 | 0.816 | 0.905 | 0.962 | 1.002 | 1.071 | 1.123 | 1.148 | 1.173 | 1.186 |
| 2.26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.304 | 0.634 | 0.789 | 0.876 | 0.933 | 0.972 | 1.041 | 1.092 | 1.117 | 1.142 | 1.155 |
| 2.27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.285 | 0.609 | 0.762 | 0.848 | 0.904 | 0.943 | 1.011 | 1.062 | 1.087 | 1.112 | 1.124 |
| 2.28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.267 | 0.585 | 0.735 | 0.821 | 0.876 | 0.915 | 0.982 | 1.033 | 1.058 | 1.082 | 1.095 |
| 2.29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.250 | 0.561 | 0.710 | 0.794 | 0.849 | 0.887 | 0.954 | 1.004 | 1.029 | 1.053 | 1.065 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 2.30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.233 | 0.538 | 0.685 | 0.769 | 0.823 | 0.861 | 0.927 | 0.977 | 1.001 | 1.025 | 1.037 |
| 2.31 | 0.000 | 0.000 | 0.000 | 0.000 | 0.218 | 0.516 | 0.661 | 0.743 | 0.797 | 0.834 | 0.900 | 0.949 | 0.974 | 0.998 | 1.009 |
| 2.32 | 0.000 | 0.000 | 0.000 | 0.000 | 0.203 | 0.495 | 0.637 | 0.719 | 0.772 | 0.809 | 0.874 | 0.923 | 0.947 | 0.971 | 0.982 |
| 2.33 | 0.000 | 0.000 | 0.000 | 0.000 | 0.189 | 0.474 | 0.614 | 0.695 | 0.748 | 0.784 | 0.848 | 0.897 | 0.921 | 0.944 | 0.956 |
| 2.34 | 0.000 | 0.000 | 0.000 | 0.000 | 0.175 | 0.454 | 0.592 | 0.672 | 0.724 | 0.760 | 0.824 | 0.872 | 0.895 | 0.919 | 0.930 |
| 2.35 | 0.000 | 0.000 | 0.000 | 0.000 | 0.163 | 0.435 | 0.571 | 0.650 | 0.701 | 0.736 | 0.799 | 0.847 | 0.870 | 0.893 | 0.905 |
| 2.36 | 0.000 | 0.000 | 0.000 | 0.000 | 0.151 | 0.416 | 0.550 | 0.628 | 0.678 | 0.714 | 0.776 | 0.823 | 0.846 | 0.869 | 0.880 |
| 2.37 | 0.000 | 0.000 | 0.000 | 0.000 | 0.139 | 0.398 | 0.530 | 0.606 | 0.656 | 0.691 | 0.753 | 0.799 | 0.822 | 0.845 | 0.856 |
| 2.38 | 0.000 | 0.000 | 0.000 | 0.000 | 0.128 | 0.381 | 0.510 | 0.586 | 0.635 | 0.670 | 0.730 | 0.777 | 0.799 | 0.822 | 0.833 |
| 2.39 | 0.000 | 0.000 | 0.000 | 0.000 | 0.118 | 0.364 | 0.491 | 0.566 | 0.614 | 0.648 | 0.709 | 0.754 | 0.777 | 0.799 | 0.810 |
| 2.40 | 0.000 | 0.000 | 0.000 | 0.000 | 0.109 | 0.348 | 0.473 | 0.546 | 0.594 | 0.628 | 0.687 | 0.732 | 0.755 | 0.777 | 0.787 |
| 2.41 | 0.000 | 0.000 | 0.000 | 0.000 | 0.100 | 0.332 | 0.455 | 0.527 | 0.575 | 0.608 | 0.667 | 0.711 | 0.733 | 0.755 | 0.766 |
| 2.42 | 0.000 | 0.000 | 0.000 | 0.000 | 0.091 | 0.317 | 0.437 | 0.509 | 0.555 | 0.588 | 0.646 | 0.691 | 0.712 | 0.734 | 0.744 |
| 2.43 | 0.000 | 0.000 | 0.000 | 0.000 | 0.083 | 0.302 | 0.421 | 0.491 | 0.537 | 0.569 | 0.627 | 0.670 | 0.692 | 0.713 | 0.724 |
| 2.44 | 0.000 | 0.000 | 0.000 | 0.000 | 0.076 | 0.288 | 0.404 | 0.474 | 0.519 | 0.551 | 0.608 | 0.651 | 0.672 | 0.693 | 0.703 |
| 2.45 | 0.000 | 0.000 | 0.000 | 0.000 | 0.069 | 0.275 | 0.389 | 0.457 | 0.501 | 0.533 | 0.589 | 0.632 | 0.653 | 0.673 | 0.684 |
| 2.46 | 0.000 | 0.000 | 0.000 | 0.000 | 0.063 | 0.262 | 0.373 | 0.440 | 0.484 | 0.516 | 0.571 | 0.613 | 0.634 | 0.654 | 0.664 |
| 2.47 | 0.000 | 0.000 | 0.000 | 0.000 | 0.057 | 0.249 | 0.359 | 0.425 | 0.468 | 0.499 | 0.553 | 0.595 | 0.615 | 0.636 | 0.646 |
| 2.48 | 0.000 | 0.000 | 0.000 | 0.000 | 0.051 | 0.237 | 0.345 | 0.409 | 0.452 | 0.482 | 0.536 | 0.577 | 0.597 | 0.617 | 0.627 |
| 2.49 | 0.000 | 0.000 | 0.000 | 0.000 | 0.046 | 0.226 | 0.331 | 0.394 | 0.436 | 0.466 | 0.519 | 0.560 | 0.580 | 0.600 | 0.609 |
| 2.50 | 0.000 | 0.000 | 0.000 | 0.000 | 0.041 | 0.214 | 0.317 | 0.380 | 0.421 | 0.451 | 0.503 | 0.543 | 0.563 | 0.582 | 0.592 |
| 2.51 | 0.000 | 0.000 | 0.000 | 0.000 | 0.037 | 0.204 | 0.305 | 0.366 | 0.407 | 0.436 | 0.487 | 0.527 | 0.546 | 0.565 | 0.575 |
| 2.52 | 0.000 | 0.000 | 0.000 | 0.000 | 0.033 | 0.193 | 0.292 | 0.352 | 0.392 | 0.421 | 0.472 | 0.511 | 0.530 | 0.549 | 0.559 |
| 2.53 | 0.000 | 0.000 | 0.000 | 0.000 | 0.029 | 0.184 | 0.280 | 0.339 | 0.379 | 0.407 | 0.457 | 0.495 | 0.514 | 0.533 | 0.542 |
| 2.54 | 0.000 | 0.000 | 0.000 | 0.000 | 0.026 | 0.174 | 0.268 | 0.326 | 0.365 | 0.393 | 0.442 | 0.480 | 0.499 | 0.517 | 0.527 |
| 2.55 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 | 0.165 | 0.257 | 0.314 | 0.352 | 0.379 | 0.428 | 0.465 | 0.484 | 0.502 | 0.511 |
| 2.56 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.156 | 0.246 | 0.302 | 0.340 | 0.366 | 0.414 | 0.451 | 0.469 | 0.487 | 0.496 |
| 2.57 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.148 | 0.236 | 0.291 | 0.327 | 0.354 | 0.401 | 0.437 | 0.455 | 0.473 | 0.482 |
| 2.58 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.140 | 0.226 | 0.279 | 0.316 | 0.341 | 0.388 | 0.424 | 0.441 | 0.459 | 0.468 |
| 2.59 | 0.000 | 0.000 | 0.000 | 0.000 | 0.013 | 0.133 | 0.216 | 0.269 | 0.304 | 0.330 | 0.375 | 0.410 | 0.428 | 0.445 | 0.454 |
| 2.60 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.125 | 0.207 | 0.258 | 0.293 | 0.318 | 0.363 | 0.398 | 0.415 | 0.432 | 0.441 |
| 2.61 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.118 | 0.198 | 0.248 | 0.282 | 0.307 | 0.351 | 0.385 | 0.402 | 0.419 | 0.428 |
| 2.62 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.112 | 0.189 | 0.238 | 0.272 | 0.296 | 0.339 | 0.373 | 0.390 | 0.406 | 0.451 |
| 2.63 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.105 | 0.181 | 0.229 | 0.262 | 0.285 | 0.328 | 0.361 | 0.378 | 0.394 | 0.402 |
| 2.64 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.099 | 0.172 | 0.220 | 0.252 | 0.275 | 0.317 | 0.350 | 0.366 | 0.382 | 0.390 |
| 2.65 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.094 | 0.165 | 0.211 | 0.242 | 0.265 | 0.307 | 0.339 | 0.355 | 0.371 | 0.379 |
| 2.66 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.088 | 0.157 | 0.202 | 0.233 | 0.256 | 0.296 | 0.328 | 0.344 | 0.359 | 0.367 |
| 2.67 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.083 | 0.150 | 0.194 | 0.224 | 0.246 | 0.286 | 0.317 | 0.333 | 0.348 | 0.356 |
| 2.68 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.078 | 0.143 | 0.186 | 0.216 | 0.237 | 0.277 | 0.307 | 0.322 | 0.338 | 0.345 |
| 2.69 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.073 | 0.136 | 0.179 | 0.208 | 0.229 | 0.267 | 0.297 | 0.312 | 0.327 | 0.335 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 2.70 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.069 | 0.130 | 0.171 | 0.200 | 0.220 | 0.258 | 0.288 | 0.302 | 0.317 | 0.325 |
| 2.71 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.064 | 0.124 | 0.164 | 0.192 | 0.212 | 0.249 | 0.278 | 0.293 | 0.307 | 0.315 |
| 2.72 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.060 | 0.118 | 0.157 | 0.184 | 0.204 | 0.241 | 0.269 | 0.283 | 0.298 | 0.305 |
| 2.73 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.057 | 0.112 | 0.151 | 0.177 | 0.197 | 0.232 | 0.260 | 0.274 | 0.288 | 0.296 |
| 2.74 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.053 | 0.107 | 0.144 | 0.170 | 0.189 | 0.224 | 0.252 | 0.266 | 0.279 | 0.286 |
| 2.75 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.049 | 0.102 | 0.138 | 0.163 | 0.182 | 0.216 | 0.243 | 0.257 | 0.271 | 0.277 |
| 2.76 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.046 | 0.097 | 0.132 | 0.157 | 0.175 | 0.209 | 0.235 | 0.249 | 0.262 | 0.269 |
| 2.77 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 | 0.092 | 0.126 | 0.151 | 0.168 | 0.201 | 0.227 | 0.241 | 0.254 | 0.260 |
| 2.78 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.040 | 0.087 | 0.121 | 0.145 | 0.162 | 0.194 | 0.220 | 0.223 | 0.246 | 0.252 |
| 2.79 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.037 | 0.083 | 0.115 | 0.139 | 0.156 | 0.187 | 0.212 | 0.225 | 0.238 | 0.244 |
| 2.80 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.035 | 0.079 | 0.110 | 0.133 | 0.150 | 0.181 | 0.205 | 0.218 | 0.230 | 0.237 |
| 2.81 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.032 | 0.075 | 0.105 | 0.128 | 0.144 | 0.174 | 0.198 | 0.211 | 0.223 | 0.229 |
| 2.82 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.030 | 0.071 | 0.101 | 0.122 | 0.138 | 0.168 | 0.192 | 0.204 | 0.216 | 0.222 |
| 2.83 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.028 | 0.067 | 0.096 | 0.117 | 0.133 | 0.162 | 0.185 | 0.197 | 0.209 | 0.215 |
| 2.84 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.026 | 0.064 | 0.092 | 0.112 | 0.128 | 0.156 | 0.179 | 0.190 | 0.202 | 0.208 |
| 2.85 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.024 | 0.060 | 0.088 | 0.108 | 0.122 | 0.150 | 0.173 | 0.184 | 0.195 | 0.201 |
| 2.86 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 | 0.057 | 0.084 | 0.103 | 0.118 | 0.145 | 0.167 | 0.178 | 0.189 | 0.195 |
| 2.87 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.054 | 0.080 | 0.099 | 0.113 | 0.139 | 0.161 | 0.172 | 0.183 | 0.188 |
| 2.88 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 | 0.051 | 0.076 | 0.094 | 0.108 | 0.134 | 0.155 | 0.166 | 0.177 | 0.182 |
| 2.89 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.048 | 0.073 | 0.090 | 0.104 | 0.129 | 0.150 | 0.160 | 0.171 | 0.176 |
| 2.90 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.016 | 0.046 | 0.069 | 0.087 | 0.100 | 0.125 | 0.145 | 0.155 | 0.165 | 0.171 |
| 2.91 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.043 | 0.066 | 0.083 | 0.096 | 0.120 | 0.140 | 0.150 | 0.160 | 0.165 |
| 2.92 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.013 | 0.041 | 0.063 | 0.079 | 0.092 | 0.115 | 0.135 | 0.145 | 0.155 | 0.160 |
| 2.93 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.038 | 0.060 | 0.076 | 0.088 | 0.111 | 0.130 | 0.140 | 0.149 | 0.154 |
| 2.94 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.036 | 0.057 | 0.072 | 0.084 | 0.107 | 0.125 | 0.135 | 0.144 | 0.149 |
| 2.95 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.034 | 0.054 | 0.069 | 0.081 | 0.103 | 0.121 | 0.130 | 0.140 | 0.144 |
| 2.96 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.032 | 0.051 | 0.066 | 0.077 | 0.099 | 0.117 | 0.126 | 0.135 | 0.140 |
| 2.97 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.030 | 0.049 | 0.063 | 0.074 | 0.095 | 0.112 | 0.121 | 0.130 | 0.135 |
| 2.98 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.028 | 0.046 | 0.060 | 0.071 | 0.091 | 0.108 | 0.117 | 0.126 | 0.130 |
| 2.99 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.027 | 0.044 | 0.057 | 0.068 | 0.088 | 0.104 | 0.113 | 0.122 | 0.126 |
| 3.00 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.025 | 0.042 | 0.055 | 0.065 | 0.084 | 0.101 | 0.109 | 0.118 | 0.122 |
| 3.01 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.024 | 0.040 | 0.052 | 0.062 | 0.081 | 0.097 | 0.105 | 0.113 | 0.118 |
| 3.02 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.022 | 0.038 | 0.050 | 0.059 | 0.078 | 0.093 | 0.101 | 0.110 | 0.114 |
| 3.03 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.021 | 0.036 | 0.048 | 0.057 | 0.075 | 0.090 | 0.098 | 0.106 | 0.110 |
| 3.04 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.019 | 0.034 | 0.045 | 0.054 | 0.072 | 0.087 | 0.094 | 0.102 | 0.106 |
| 3.05 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.018 | 0.032 | 0.043 | 0.052 | 0.069 | 0.083 | 0.091 | 0.099 | 0.103 |
| 3.06 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.017 | 0.030 | 0.041 | 0.050 | 0.066 | 0.080 | 0.088 | 0.095 | 0.099 |
| 3.07 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.016 | 0.029 | 0.039 | 0.047 | 0.064 | 0.077 | 0.085 | 0.092 | 0.096 |
| 3.08 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.015 | 0.027 | 0.037 | 0.045 | 0.061 | 0.074 | 0.081 | 0.089 | 0.092 |
| 3.09 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.014 | 0.026 | 0.036 | 0.043 | 0.059 | 0.072 | 0.079 | 0.086 | 0.089 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 3.10 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.013 | 0.024 | 0.034 | 0.041 | 0.056 | 0.069 | 0.076 | 0.083 | 0.086 |
| 3.11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.012 | 0.023 | 0.032 | 0.039 | 0.054 | 0.066 | 0.073 | 0.080 | 0.083 |
| 3.12 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.011 | 0.022 | 0.031 | 0.038 | 0.052 | 0.064 | 0.070 | 0.077 | 0.080 |
| 3.13 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.011 | 0.021 | 0.029 | 0.036 | 0.050 | 0.061 | 0.068 | 0.074 | 0.077 |
| 3.14 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.010 | 0.019 | 0.028 | 0.034 | 0.048 | 0.059 | 0.065 | 0.071 | 0.075 |
| 3.15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.009 | 0.018 | 0.026 | 0.033 | 0.046 | 0.057 | 0.063 | 0.069 | 0.072 |
| 3.16 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.009 | 0.017 | 0.025 | 0.031 | 0.044 | 0.055 | 0.060 | 0.066 | 0.069 |
| 3.17 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.008 | 0.016 | 0.024 | 0.030 | 0.042 | 0.053 | 0.058 | 0.064 | 0.067 |
| 3.18 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.007 | 0.015 | 0.022 | 0.028 | 0.040 | 0.050 | 0.056 | 0.062 | 0.065 |
| 3.19 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.007 | 0.015 | 0.021 | 0.027 | 0.038 | 0.049 | 0.054 | 0.059 | 0.062 |
| 3.20 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.006 | 0.014 | 0.020 | 0.026 | 0.037 | 0.047 | 0.052 | 0.057 | 0.060 |
| 3.21 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.013 | 0.019 | 0.024 | 0.035 | 0.045 | 0.050 | 0.055 | 0.058 |
| 3.22 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.012 | 0.018 | 0.023 | 0.034 | 0.043 | 0.048 | 0.053 | 0.056 |
| 3.23 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.011 | 0.017 | 0.022 | 0.032 | 0.041 | 0.046 | 0.051 | 0.054 |
| 3.24 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.011 | 0.016 | 0.021 | 0.031 | 0.040 | 0.044 | 0.049 | 0.052 |
| 3.25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.010 | 0.015 | 0.020 | 0.030 | 0.038 | 0.043 | 0.048 | 0.050 |
| 3.26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.009 | 0.015 | 0.019 | 0.028 | 0.037 | 0.041 | 0.046 | 0.048 |
| 3.27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.009 | 0.014 | 0.018 | 0.027 | 0.035 | 0.040 | 0.044 | 0.046 |
| 3.28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.008 | 0.013 | 0.017 | 0.026 | 0.034 | 0.038 | 0.042 | 0.045 |
| 3.29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.008 | 0.012 | 0.016 | 0.025 | 0.032 | 0.037 | 0.041 | 0.043 |
| 3.30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.007 | 0.012 | 0.015 | 0.024 | 0.031 | 0.035 | 0.039 | 0.042 |
| 3.31 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.007 | 0.011 | 0.015 | 0.023 | 0.030 | 0.034 | 0.038 | 0.040 |
| 3.32 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.006 | 0.010 | 0.014 | 0.022 | 0.029 | 0.032 | 0.036 | 0.038 |
| 3.33 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.006 | 0.010 | 0.013 | 0.021 | 0.027 | 0.031 | 0.035 | 0.037 |
| 3.34 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.006 | 0.009 | 0.013 | 0.020 | 0.026 | 0.030 | 0.034 | 0.036 |
| 3.35 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.005 | 0.009 | 0.012 | 0.019 | 0.025 | 0.029 | 0.032 | 0.034 |
| 3.36 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.005 | 0.008 | 0.011 | 0.018 | 0.024 | 0.028 | 0.031 | 0.033 |
| 3.37 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.005 | 0.008 | 0.011 | 0.017 | 0.023 | 0.026 | 0.030 | 0.032 |
| 3.38 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.004 | 0.007 | 0.010 | 0.016 | 0.022 | 0.025 | 0.029 | 0.031 |
| 3.39 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.004 | 0.007 | 0.010 | 0.016 | 0.021 | 0.024 | 0.028 | 0.029 |
| 3.40 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.004 | 0.007 | 0.009 | 0.015 | 0.020 | 0.023 | 0.027 | 0.028 |
| 3.41 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.006 | 0.009 | 0.014 | 0.020 | 0.022 | 0.026 | 0.027 |
| 3.42 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.006 | 0.008 | 0.014 | 0.019 | 0.022 | 0.025 | 0.026 |
| 3.43 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.008 | 0.013 | 0.018 | 0.021 | 0.024 | 0.025 |
| 3.44 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.012 | 0.017 | 0.020 | 0.023 | 0.024 |
| 3.45 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.012 | 0.016 | 0.019 | 0.022 | 0.023 |
| 3.46 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.005 | 0.007 | 0.011 | 0.016 | 0.018 | 0.021 | 0.022 |
| 3.47 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.011 | 0.015 | 0.018 | 0.020 | 0.022 |
| 3.48 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.010 | 0.014 | 0.017 | 0.019 | 0.021 |
| 3.49 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.005 | 0.010 | 0.014 | 0.016 | 0.019 | 0.020 |

[1]Values tabulated are read in percent.

*Table B-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Standard Deviation Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 20 | 25 | 30 | 35 | 50 | 75 | 100 | 150 | 200 |
| 3.50 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.005 | 0.009 | 0.013 | 0.015 | 0.018 | 0.019 |
| 3.51 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.005 | 0.009 | 0.013 | 0.015 | 0.017 | 0.018 |
| 3.52 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.005 | 0.008 | 0.012 | 0.014 | 0.016 | 0.018 |
| 3.53 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.004 | 0.008 | 0.011 | 0.014 | 0.016 | 0.017 |
| 3.54 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.004 | 0.008 | 0.011 | 0.013 | 0.015 | 0.016 |
| 3.55 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.004 | 0.007 | 0.011 | 0.012 | 0.015 | 0.016 |
| 3.56 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.007 | 0.010 | 0.012 | 0.014 | 0.015 |
| 3.57 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.006 | 0.010 | 0.011 | 0.013 | 0.014 |
| 3.58 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.006 | 0.009 | 0.011 | 0.013 | 0.014 |
| 3.59 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.006 | 0.009 | 0.010 | 0.012 | 0.013 |
| 3.60 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.006 | 0.008 | 0.010 | 0.012 | 0.013 |
| 3.61 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.008 | 0.010 | 0.011 | 0.012 |
| 3.62 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.008 | 0.009 | 0.011 | 0.012 |
| 3.63 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.005 | 0.007 | 0.009 | 0.010 | 0.011 |
| 3.64 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.007 | 0.008 | 0.010 | 0.011 |
| 3.65 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.007 | 0.008 | 0.010 | 0.010 |
| 3.66 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.008 | 0.009 | 0.010 |
| 3.67 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.009 | 0.010 |
| 3.68 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.008 | 0.009 |
| 3.69 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.007 | 0.008 | 0.009 |
| 3.70 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.006 | 0.008 | 0.008 |
| 3.71 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.003 | 0.005 | 0.006 | 0.007 | 0.008 |
| 3.72 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.003 | 0.005 | 0.006 | 0.007 | 0.008 |
| 3.73 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.003 | 0.005 | 0.006 | 0.007 | 0.007 |
| 3.74 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 |
| 3.75 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.005 | 0.006 | 0.007 |
| 3.76 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.005 | 0.006 | 0.007 |
| 3.77 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.005 | 0.006 | 0.006 |
| 3.78 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.004 | 0.005 | 0.006 |
| 3.79 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 |
| 3.80 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 |
| 3.81 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.005 |
| 3.82 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.005 |
| 3.83 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 |
| 3.84 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.003 | 0.003 | 0.004 | 0.005 |
| 3.85 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 |
| 3.86 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 |
| 3.87 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 |
| 3.88 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.003 | 0.004 |
| 3.89 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.003 | 0.004 |
| 3.90 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.003 | 0.004 |

[1]Values tabulated are read in percent.

*Table B-6*
Values of F for Maximum Standard Deviation (MSD)

| Sample size | Acceptable Quality Levels (in percent nonconforming) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| 3 | | | | | | | | | .436 | .453 | .475 | .502 |
| 4 | | | | | | | .338 | .353 | .374 | .399 | .432 | .472 |
| 5 | | | | | .281 | .294 | .308 | .323 | .346 | .372 | .408 | .452 |
| 7 | | .224 | .231 | .242 | .253 | .266 | .280 | .295 | .318 | .345 | .381 | .425 |
| 10 | .200 | .206 | .214 | .224 | .235 | .247 | .261 | .275 | .298 | .324 | .359 | .403 |
| 15 | .188 | .195 | .202 | .212 | .222 | .235 | .248 | .262 | .284 | .309 | .344 | .386 |
| 20 | .183 | .190 | .197 | .206 | .217 | .229 | .242 | .256 | .277 | .302 | .336 | .377 |
| 25 | .180 | .187 | .194 | .203 | .213 | .225 | .238 | .252 | .273 | .298 | .331 | .372 |
| 30 | .179 | .185 | .192 | .201 | .211 | .223 | .236 | .249 | .271 | .295 | .329 | .369 |
| 35 | .176 | .182 | .189 | .198 | .208 | .220 | .232 | .246 | .267 | .291 | .324 | .364 |
| 50 | .172 | .178 | .185 | .194 | .204 | .215 | .227 | .241 | .261 | .285 | .317 | .357 |
| 75 | .168 | .174 | .181 | .190 | .199 | .211 | .223 | .236 | .256 | .279 | .311 | .349 |
| 100 | .167 | .173 | .179 | .188 | .198 | .209 | .220 | .233 | .253 | .276 | .308 | .346 |
| 150 | .164 | .170 | .176 | .185 | .195 | .206 | .217 | .230 | .250 | .273 | .304 | .341 |
| 200 | .164 | .168 | .176 | .185 | .194 | .205 | .217 | .230 | .249 | .272 | .303 | .340 |

The MSD may be obtained by multiplying the factor F by the difference between the upper specification limit U and lower specification limit L. The formula is MSD = F (U – L). The MSD serves as a guide for the magnitude of the estimate of lot standard deviation when using plans for the double specification limit case, based on the estimate of lot standard deviation of unknown variability. The estimate of lot standard deviation, if it is less than the MSD, helps to insure, but does not guarantee, lot acceptability.

NOTE: There is a corresponding acceptability constant in Table B-1 for each value of F. For reduced inspection, find the acceptability constant of Table B-2 in Table B-1 and use the corresponding value of F.

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

## APPENDIX B
## Definitions

| Symbol | Read | Definition |
|---|---|---|
| n | | Sample size for a single lot. |
| $\bar{X}$ | X bar | Sample mean. Arithmetic mean of sample measurements from a single lot. $\bar{X} = \frac{\Sigma X}{n}$ |
| s | | Estimate of lot standard deviation. Standard deviation of sample measurements from a single lot. (See Examples in Section B.) $s = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{n}}{n-1}}$ |
| U | | Upper specification limit. |
| L | | Lower specification limit. |
| k | | The acceptability constant given in Tables B-1 and B-2. |
| $Q_U$ | Q sub U | Quality index for use with Table B-5. |
| $Q_L$ | Q sub L | Quality index for use with Table B-5. |
| $p_U$ | p sub U | Sample estimate of the lot percent nonconforming above U from Table B-5. |
| $p_L$ | p sub L | Sample estimate of the lot percent nonconforming below L from Table B-5. |
| p | | Total sample estimate of the lot percent nonconforming $p = p_U + p_L$. |
| M | | Maximum allowable percent nonconforming for sample estimates given in Tables B-3 and B-4. |
| $M_U$ | M sub U | Maximum allowable percent nonconforming above U given in Tables B-3 and B-4. (For use when different AQL values for U and L are specified.) |
| $M_L$ | M sub L | Maximum allowable percent nonconforming below L given in Tables B-3 and B-4. (For use when different AQL values for U and L are specified.) |
| $\bar{p}$ | p bar | Sample estimate of the process percent nonconforming, i.e., the estimated process average. |
| $\bar{p}_U$ | p bar sub U | The estimated process average for an upper specification limit. |
| $\bar{p}_L$ | p bar sub L | The estimated process average for a lower specification limit. |
| F | | A factor used in determining the Maximum Standard Deviation (MSD). The F values are given in Table B-6. |
| > | Greater than | Greater than. |
| < | Less than | Less than. |
| $\Sigma$ | Sum of | Sum of. |
| T | | AQL symbol denoting plan used exclusively on tightened inspection (provides identification of appropriate OC curve). |

# SECTION C
# VARIABILITY UNKNOWN—RANGE METHOD

## Part I
## SINGLE SPECIFICATION LIMIT

### C1. SAMPLING PLAN FOR SINGLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a single specification limit when variability of the lot with respect to the quality characteristic is unknown and the range method is used. The acceptability criterion is given in two equivalent forms. These are identified as Form 1 and Form 2.

C1.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value, the applicable sampling plan shall be used in accordance with the provisions of Section A, General Description of the Sampling Plans, and those in this part of the Standard.

C1.2 Drawing of Samples. All samples shall be drawn in accordance with paragraph A7.2.

C1.3 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

### C2. SELECTING THE SAMPLE PLAN WHEN FORM 1 IS USED

C2.1 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a single specification limit when using the range method are Tables C-1 and C-2. Table C-1 is used for normal and tightened inspection and Table C-2 for reduced inspection.

C2.2 Obtaining the Sample Plan. The sampling plan consists of a sample size and an associated acceptability constant.[1] The sampling plan is obtained from Master Table C-1 or C-2.

C2.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter.

C2.2.2 Acceptability Constant. The acceptability constant k, corresponding to the sample size mentioned in paragraph C2.2.1, is indicated in the column of the master table corresponding to the applicable AQL value. Table C-1 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table C-2.

### C3. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 1 IS USED[2]

C3.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the quantity $(U - \bar{X})/\bar{R}$ or $(\bar{X} - L)/\bar{R}$.

C3.2 Computation. The following quantity shall be computed: $(U - \bar{X})/\bar{R}$ or $(\bar{X} - L)/\bar{R}$, depending on whether the specification limit is an upper or a lower limit, where

U is the upper specification limit,
L is the lower specification limit,
$\bar{X}$ is the sample mean, and
$\bar{R}$ is the average range of the sample.

In this Standard, $\bar{R}$ is the average range of subgroup ranges. Each of the subgroups consists of 5 measurements, except for those plans with sample size 3, 4, or 7 in which case the subgroup size is the same as the sample size and the sample range is used as $\bar{R}$. In computing $\bar{R}$, the order of the sample measurements as made must be retained. Subgroups of consecutive measurements must be formed and the range of each subgroup obtained. $\bar{R}$ is the average of the individual subgroup ranges.

C3.3 Acceptability Criteria. Compare the quantity $(U - \bar{X})/\bar{R}$ or $(\bar{X} - L)/\bar{R}$ with the acceptability constant k. If $(U - \bar{X})/\bar{R}$ or $(\bar{X} - L)/\bar{R}$ is equal to or greater than k, the lot meets the acceptability criterion; if $(U - \bar{X})/\bar{R}$ or $(\bar{X} - L)/\bar{R}$ is less than k or negative, then the lot does not meet the acceptability criterion.

### C4. SUMMARY FOR OPERATION OF SAMPLING PLAN WHEN FORM 1 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Obtain plan from Master Table C-1 or C-2 by selecting the sample size n and the acceptability constant k.

[1]See Appendix C for definitions of all symbols used in the sampling plans based on variability unknown—range method.

[2]See Example C-1 for a complete example of this procedure.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic for each unit of the sample.

(4) Compute the sample mean $\bar{X}$ and the average range of the sample $\bar{R}$, and also compute the quantity $(U-\bar{X})/\bar{R}$ for an upper specification limit U or the quantity $(\bar{X}-L)/\bar{R}$ for a lower specification limit L.

(5) If the quantity $(U-\bar{X})/\bar{R}$ or $(\bar{X}-L)/\bar{R}$ is equal to or greater than k, the lot meets the acceptability criterion; if $(U-\bar{X})/\bar{R}$ or $(\bar{X}-L)/\bar{R}$ is less than k or negative, then the lot does not meet the acceptability criterion.

## C5. SELECTING THE SAMPLING PLAN WHEN FORM 2 IS USED

C5.1 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a single specification limit when using the range method are Tables C-3 and C-4 of Part II. Table C-3 is used for normal and tightened inspection and Table C-4 for reduced inspection.

C5.2 Obtaining the Sampling Plan. The sampling plan consists of a sample size and an associated maximum allowable percent nonconforming. The sampling plan is obtained from Master Table C-3 or C-4.

C5.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter.

C5.2.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming M for sample estimates corresponding to the sample size mentioned in paragraphs C5.2.1 is indicated in the column of the master table corresponding to the applicable AQL value. Table C-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table C-4.

## C6. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 2 IS USED[3]

C6.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the percent of nonconforming product outside the upper or lower specification limit. The percentage of nonconforming product is estimated by entering Table C-5 with the quality index and the sample size.

C6.2 Computation of Quality Index. The quality index $Q_U = (U-\bar{X})c/\bar{R}$ shall be computed if the specification limit is an upper limit U, or $Q_L = (\bar{X}-L)c/\bar{R}$ if it is a lower limit L. The quantities, $\bar{X}$ and $\bar{R}$, are the sample mean and average range of the sample, respectively. The computation of $\bar{R}$ is explained in paragraph C3.2. The factor c is provided in Master Tables C-3 and C-4 corresponding to the sample size code letter.

C6.3 Estimate of Percent Nonconforming in Lot. The quality of a lot shall be expressed by $p_U$, the estimated percent nonconforming in the lot above the upper specification limit, or by $p_L$, the estimated percent nonconforming below the lower specification limit. The estimated percent nonconforming $p_U$ or $p_L$ is obtained by entering Table C-5 with $Q_U$ or $Q_L$ and the appropriate sample size.

C6.4 Acceptability Criterion. Compare the estimated lot percent nonconforming $p_U$ or $p_L$ with the maximum allowable percent nonconforming M. If $p_U$ or $p_L$ is equal to or less than M, the lot meets the acceptability criterion; if $p_U$ or $p_L$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

## C7. SUMMARY OF OPERATION OF SAMPLING PLAN WHEN FORM 2 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Obtain plan from Master Table C-3 or C-4 by selecting the sample size n, the factor c, and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

[3]See Example C-2 for a complete example of this procedure.

(4) Compute the sample mean $\bar{X}$ and the average range of the sample $\bar{R}$.

(5) Compute the quality index $Q_U = (U - \bar{X})c/\bar{R}$ if the upper specification limit U is specified, or $Q_L = (\bar{X} - L)c/\bar{R}$ if the lower specification limit L is specified.

(6) Determine the estimated lot percent nonconforming $p_L$ or $p_U$ from Table C-5.

(7) If the estimated lot percent nonconforming $p_L$ or $p_U$ is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if $p_L$ or $p_U$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

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**EXAMPLE C-1**

**Example of Calculations**

**Single Specification Limit—Form 1**

**Variability Unknown—Range Method**

Example: The lower specification limit for electrical resistance of a certain electrical component is 620 ohms. A lot of 100 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = .4% is to be used. From Tables A-2 and C-1 it is seen that a sample of size 10 is required. Suppose that values of the sample resistances in the order reading from left to right are as follows:

643, 651, 619, 627, 658, ($R_1 = 658 - 619 = 39$)
670, 673, 641, 638, 650, ($R_2 = 673 - 638 = 35$)

and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size n | 10 | |
| 2 | Sum of Measurements: $\Sigma X$ | 6470 | |
| 3 | Sample Mean ($\bar{X}$): $\Sigma X/n$ | 647 | 6470/10 |
| 4 | Average Range ($\bar{R}$): $\Sigma R$/no. of subgroups | 37 | (39 + 35)/2 |
| 5 | Specification Limit (Lower): L | 620 | |
| 6 | The quantity: $(\bar{X} - L)/\bar{R}$ | .730 | (647 – 620)/37 |
| 7 | Acceptability Constant: k | .811 | See Table C-1 |
| 8 | Acceptability Criterion: Compare $(\bar{X} - L)/\bar{R}$ with k | .730 < .811 | See Para. C3.3 |

The lot does not meet the acceptability criterion, since $(\bar{X} - L)/\bar{R}$ is less than k.

NOTE: If a single upper specification limit U is given, then compute the quantity $(U - \bar{X})/\bar{R}$ in line 6 and compare it with k; the lot meets the acceptability criterion if $(U - \bar{X})/\bar{R}$ is equal to or greater than k.

## EXAMPLE C-2

### Example of Calculations

### Single Specification Limit—Form 2

### Variability Unknown—Range Method

Example: A lower specification limit for electrical resistance of a certain electrical component is 620 ohms. A lot of 100 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = .4% is to be used. From Tables A-2 and C-1 it is seen that a sample of size 10 is required. Suppose the values of the sample resistances in the order reading from left to right are as follows:

643, 651, 619, 627, 658, ($R_1 = 658 - 619 = 39$)
670, 673, 641, 638, 650, ($R_2 = 673 - 638 = 35$)

and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample size n | 10 | |
| 2 | Sum of Measurements: $\Sigma X$ | 6470 | |
| 3 | Sample Mean $\bar{X}$: $\Sigma X/n$ | 647 | 6470/10 |
| 4 | Average Range $\bar{R}$: $\Sigma R$/no. of subgroups | 37 | (39 + 35)/2 |
| 5 | Factor c | 2.405 | See Table C-3 |
| 6 | Specification Limit (Lower): L | 620 | |
| 7 | Quality Index: $Q_L = (\bar{X} - L)c/\bar{R}$ | 1.76 | (647 – 620)2.405/37 |
| 8 | Est. of Lot Percent Ncf.: $p_L$ | 2.54% | See Table C-5 |
| 9 | Max. Allowable Percent Ncf.: M | 1.14% | See Table C-3 |
| 10 | Acceptability Criterion: Compare $p_L$ with M | 2.54% > 1.14% | See Para. C6.4 |

The lot does not meet the acceptability criterion, since $p_L$ is greater than M.

NOTE: If a single upper specification limit U is given, then compute the quality index $Q_U = (U - \bar{X})c/\bar{R}$ in line 7 and obtain the estimate of lot percent nonconforming $p_U$. Compare $p_U$ with M; the lot meets the acceptability criterion, if $p_U$ is equal to or less than M.

*Table C-1* Range Method

Master Table for Normal and Tightened Inspection for Plans Based on Variability Unknown
(Single Specification Limit—Form 1)

| Sample size code letter | Sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | k | k | k | k | k | k | k | k | k | k | k | k |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | .587 | .502 | .401 | .296 |
| C | 4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | .651 | .598 | .525 | .450 | .364 | .276 |
| D | 5 | ↓ | ↓ | ↓ | ↓ | ↓ | .663 | .614 | .565 | .498 | .431 | .352 | .272 |
| E | 7 | ↓ | ↓ | ↓ | .702 | .659 | .613 | .569 | .525 | .465 | .405 | .336 | .266 |
| F | 10 | ↓ | ↓ | .916 | .863 | .811 | .755 | .703 | .650 | .579 | .507 | .424 | .341 |
| G | 15 | 1.04 | .999 | .958 | .903 | .850 | .792 | .738 | .684 | .610 | .536 | .452 | .368 |
| H | 25 | 1.10 | 1.05 | 1.01 | .951 | .896 | .835 | .779 | .723 | .647 | .571 | .484 | .398 |
| I | 30 | 1.10 | 1.06 | 1.02 | .959 | .904 | .843 | .787 | .730 | .654 | .577 | .490 | .403 |
| J | 40 | 1.13 | 1.08 | 1.04 | .978 | .921 | .860 | .803 | .746 | .668 | .591 | .503 | .415 |
| K | 60 | 1.16 | 1.11 | 1.06 | 1.00 | .948 | .885 | .826 | .768 | .689 | .610 | .521 | .432 |
| L | 85 | 1.17 | 1.13 | 1.08 | 1.02 | .962 | .899 | .839 | .780 | .701 | .621 | .530 | .441 |
| M | 115 | 1.19 | 1.14 | 1.09 | 1.03 | .975 | .911 | .851 | .791 | .711 | .631 | .539 | .449 |
| N | 175 | 1.21 | 1.16 | 1.11 | 1.05 | .994 | .929 | .868 | .807 | .726 | .644 | .552 | .460 |
| P | 230 | 1.21 | 1.16 | 1.12 | 1.06 | .996 | .931 | .870 | .809 | .728 | .646 | .553 | .462 |
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table C-2*

Master Table for Reduced Inspection for Plans Based on Variability Unknown
(Single Specification Limit—Form 1)

| Sample size code letter | Sample size | Acceptable Quality Levels | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | k | k | k | k | k | k | k | k | k | k | k |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | .587 | .502 | .401 | .296 | .178 |
| C | 3 | | | | | | | .587 | .502 | .401 | .296 | .178 |
| D | 3 | | | | | | | .587 | .502 | .401 | .296 | .178 |
| E | 3 | | | | | | | .587 | .502 | .401 | .296 | .178 |
| F | 4 | | | | | .651 | .598 | .525 | .450 | .364 | .276 | .176 |
| G | 5 | | ↓ | ↓ | .663 | .614 | .565 | .498 | .431 | .352 | .272 | .184 |
| H | 7 | ↓ | .702 | .659 | .613 | .569 | .525 | .465 | .405 | .336 | .266 | .189 |
| I | 10 | .916 | .863 | .811 | .755 | .703 | .650 | .579 | .507 | .424 | .341 | .252 |
| J | 15 | .958 | .903 | .850 | .792 | .738 | .684 | .610 | .536 | .452 | .368 | .276 |
| K | 25 | 1.01 | .951 | .896 | .835 | .779 | .723 | .647 | .571 | .484 | .398 | .305 |
| L | 30 | 1.02 | .959 | .904 | .843 | .787 | .730 | .654 | .577 | .490 | .403 | .310 |
| M | 35 | 1.02 | .964 | .908 | .848 | .791 | .734 | .658 | .581 | .494 | .406 | .313 |
| N | 60 | 1.06 | 1.00 | .948 | .885 | .826 | .768 | .689 | .610 | .521 | .432 | .336 |
| P | 85 | 1.08 | 1.02 | .962 | .899 | .839 | .780 | .701 | .621 | .530 | .441 | .345 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

## Part II
## DOUBLE SPECIFICATION LIMIT

### C8. SAMPLING PLAN FOR DOUBLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a double specification limit when variability of the lot with respect to the quality characteristic is unknown and the range method is used.

C8.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value(s), the applicable sampling plan shall be used in accordance with the provisions of Section A, General Description of Sampling Plans, and those in this part of the Standard.

### C9. SELECTING THE SAMPLING PLAN

A sampling plan for each AQL value shall be selected from Table C-3 or C-4 as follows:

C9.1 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

C9.2 Master Sampling Tables. The master sampling tables for plans based on variability unknown for a double specification limit when using the range method are Tables C-3 and C-4. Table C-3 is used for normal and tightened inspection and Table C-4 for reduced inspection.

C9.3 Obtaining Sampling Plan. A sampling plan consists of a sample size and the associated maximum allowable percent nonconforming. The sampling plan to be applied in inspection shall be obtained from Master Table C-3 or C-4.

C9.3.1 Sample Size. The sample size n is shown in the master tables corresponding to each sample size code letter.

C9.3.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming for sample estimates of percent nonconforming for the lower, upper, or both specification limits combined, corresponding to the sample size mentioned in paragraph C9.3.1, is shown in the column of the master table corresponding to the applicable AQL value(s). If different AQLs are assigned to each specification limit, designate the maximum allowable percent nonconforming by $M_L$ for the lower limit, and by $M_U$ for the upper limit. If one AQL is assigned to both limits combined, designate the maximum allowable percent nonconforming by M. Table C-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table C-4.

### C10. DRAWING OF SAMPLES

Samples shall be selected in accordance with paragraph A7.2.

### C11. LOT-BY-LOT ACCEPTABILITY PROCEDURES

C11.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a double specification limit shall be judged by the percent of nonconforming product. The percentage of nonconforming product is estimated by entering Table C-5 with the quality index and the sample size.

C11.2 Computation of Quality Indices. The quality indices $Q_U = (U - \bar{X})c/\bar{R}$ and $Q_L = (\bar{X} - L)c/\bar{R}$ shall be computed, where

U is the upper specification limit,
L is the lower specification limit,
c is a factor provided in Tables C-3 and C-4,
$\bar{X}$ is the sample mean, and
$\bar{R}$ is the average range of the sample.

In this Standard, $\bar{R}$ is the average range of the subgroup ranges. Each of the subgroups consists of 5 measurements, except for those plans with sample size 3, 4, or 7 in which case the subgroup size is the same as the sample size and the sample range is used as $\bar{R}$. In computing $\bar{R}$, the order of the sample measurements as made must be retained. Subgroups of consecutive measurements must be formed and the range of each subgroup obtained. $\bar{R}$ is the average of the individual subgroup ranges.

C11.3 Percent Nonconforming in the Lot. The quality of a lot shall be expressed in terms of the lot percent nonconforming. Its estimate will be designated by $p_L$, $p_U$, or p. The estimate $p_U$ indicates conformance with respect to the upper specification limit, $p_L$ with respect to the lower specification limit, and p for both specification limits combined. The estimate $p_L$ and $p_U$ shall be determined by entering Table

C-5, respectively with $Q_L$ and $Q_U$ and the sample size. The estimate p shall be determined by adding the corresponding estimated percents nonconforming $p_L$ and $p_U$ found in the table.

## C12. ACCEPTABILITY CRITERION AND SUMMARY FOR OPERATION OF SAMPLING PLANS

C12.1 One AQL Value for Both Upper and Lower Specification Limit Combined.

C12.1.1 Acceptability Criterion.[4] Compare the estimated lot percent nonconforming $p = p_U + p_L$ with the maximum allowable percent nonconforming M. If p is equal to or less than M, the lot meets the acceptability criterion; if p is greater than M or if either $Q_U$ or $Q_L$ or both are negative, then the lot does not meet the acceptability criterion.

C12.1.2 Summary for Operation of Sampling Plan. In cases where a single AQL value is established for the upper and lower specification limit combined for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Select plan from Master Table C-3 or C-4. Obtain the sample size n, the factor c, and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

(4) Compute the sample mean $\bar{X}$ and average range of the sample $\bar{R}$.

(5) Compute the quality indices $Q_U = (U - \bar{X})c/\bar{R}$ and $Q_L = (\bar{X} - L)c/\bar{R}$.

(6) Determine the estimated lot percent nonconforming $p = p_U + p_L$ from Table C-5.

(7) If the estimated lot percent nonconforming p is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if p is greater than M or if either $Q_U$ or $Q_L$ or both are negative, then the lot does not meet the acceptability criterion.

C12.2 Different AQL Values for Upper and Lower Specification Limit.

C12.2.1 Acceptability Criteria.[5] Compare the estimated lot percents nonconforming $p_L$ and $p_U$ with the corresponding maximum allowable percents nonconforming $M_L$ and $M_U$; also compare $p = p_L + p_U$ with the larger of $M_L$ and $M_U$. If $p_L$ is equal to or less than $M_L$, $p_U$ is equal to or less than $M_U$, and p is equal to or less than the larger of $M_L$ and $M_U$, the lot meets the acceptability criteria; otherwise, the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

C12.2.2 Summary for Operation of Sampling Plan. In cases where a different AQL value is established for the upper and lower specification limit for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot size and inspection level.

(2) Select the sampling plan from Master Table C-3 or C-4. Obtain the sample size n, the factor c, and the maximum allowable percent nonconforming $M_U$ and $M_L$, corresponding to AQL values for the upper and lower specification limits, respectively.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit in the sample.

(4) Compute the sample mean $\bar{X}$ and average range of the sample $\bar{R}$.

(5) Compute the quality indices $Q_U = (U - \bar{X})c/\bar{R}$ and $Q_L = (\bar{X} - L)c/\bar{R}$.

(6) Determine the estimated lot percents nonconforming $p_U$ and $p_L$, corresponding to the percents nonconforming above the upper and below the lower specification limits. Also determine the combined percent nonconforming $p = p_U + p_L$.

[4]See Example C-3 for a complete example of this procedure.

[5]See Example C-4 for a complete example of this procedure.

(7) If all three of the following conditions:
  (a) $p_U$ is equal to or less than $M_U$,
  (b) $p_L$ is equal to or less than $M_L$,
  (c) p is equal to or less than the larger of $M_L$ and $M_U$,

are satisfied, the lot meets the acceptability criteria; otherwise the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

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**EXAMPLE C-3**

**Example of Calculations**

**Double Specification Limit**

**Variability Unknown—Average Range Method**

**One AQL Value for Both Upper and Lower Specification Limit Combined**

Example: The specifications for electrical resistance of a certain electrical component is 650.0 ± 340 ohms. A lot of 100 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = .4% is to be used. From Tables A-2 and C-3 it is seen that a sample of size 10 is required. Suppose the values of the sample resistance in the order reading from left to right are as follows:

643, 651, 619, 627, 658, ($R_1 = 658 - 619 = 39$)
670, 673, 641, 638, 650, ($R_2 = 673 - 638 = 35$)

and compliance with the acceptability criterion is to be determined.

| Lot | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 10 | |
| 2 | Sum of Measurements: $\Sigma X$ | 6470 | |
| 3 | Sample Mean $\bar{X}$ : $\Sigma X/n$ | 647 | 6470/10 |
| 4 | Average Range $\bar{R}$ : $\Sigma R$/no. of subgroups | 37 | (39 + 35)/2 |
| 5 | Factor c | 2.405 | See Table C-3 |
| 6 | Upper Specification Limit: U | 680 | |
| 7 | Lower Specification Limit: L | 620 | |
| 8 | Quality Index: $Q_U = (U - \bar{X})c/\bar{R}$ | 2.15 | (680 – 647)2.405/37 |
| 9 | Quality Index: $Q_L = (\bar{X} - L)c/\bar{R}$ | 1.76 | (647 – 620)2.405/37 |
| 10 | Est. of Lot Percent Ncf. above U: $p_U$ | .35% | See Table C-5 |
| 11 | Est. of Lot Percent Ncf. below L: $p_L$ | 2.54% | See Table C-5 |
| 12 | Total Est. Percent Ncf. in Lot: $p = p_U + p_L$ | 2.89% | .35% + 2.54% |
| 13 | Max. Allowable Percent Ncf.: M | 1.14% | See Table C-3 |
| 14 | Acceptability Criterion: Compare $p = p_U + p_L$ with M | 2.89% > 1.14% | See Para. C12.1.2(7) |

The lot does not meet the acceptability criterion, since $p = p_U + p_L$ is greater than M.

## EXAMPLE C-4

### Example of Calculations

### Double Specification Limit

### Variability Unknown—Average Range Method

### Different AQL Values for Upper and Lower Specification Limits

Example: The specifications for electrical resistance of a certain electrical component is 650.0 ± 30 ohms. A lot of 100 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 2.5% for the upper and AQL = 1% for the lower specification limit is to be used. From Tables A-2 and C-3 it is seen that a sample of size 10 is required. Suppose the values of the sample resistances in the order reading from left to right are as follows:

643, 651, 619, 627, 658, ($R_1 = 658 - 619 = 39$)
670, 673, 641, 638, 650, ($R_2 = 673 - 638 = 35$)

and compliance with the acceptability criteria is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 10 | |
| 2 | Sum of Measurements: $\Sigma X$ | 6470 | |
| 3 | Sample Mean $\bar{X}$: $\Sigma X/n$ | 647 | 6470/10 |
| 4 | Average Range $\bar{R}$: $\Sigma R$/no. of subgroups | 37 | (39 + 35)/2 |
| 5 | Factor c | 2.405 | See Table C-3 |
| 6 | Upper Specification Limit: U | 680 | |
| 7 | Lower Specification Limit: L | 620 | |
| 8 | Quality Index: $Q_U = (U - \bar{X})c/\bar{R}$ | 2.15 | (680 – 647)2.405/37 |
| 9 | Quality Index: $Q_L = (\bar{X} - L)c/\bar{R}$ | 1.76 | (647 – 620)2.405/37 |
| 10 | Est. of Lot Percent Ncf. above U: $p_U$ | .35% | See Table C-5 |
| 11 | Est. of Lot Percent Ncf. below L: $p_L$ | 2.54% | See Table C-5 |
| 12 | Total Est. Percent Ncf. in Lot: $p = p_U + p_L$ | 2.89% | .35% + 2.54% |
| 13 | Max. Allowable Percent Ncf. above U: $M_U$ | 7.42% | See Table C-3 |
| 14 | Max. Allowable Percent Ncf. below L: $M_L$ | 3.23% | See Table C-3 |
| 15 | Acceptability Criteria: (a) Compare $p_U$ with $M_U$ | .35% < 7.42% | See Para. C12.2.2(7)(a) |
| | (b) Compare $p_L$ with $M_L$ | 2.54% < 3.23% | See Para. C12.2.2(7)(b) |
| | (c) Compare p with $M_U$ | 2.89% < 7.42% | See Para. C12.2.2(7)(c) |

The lot meets the acceptability criteria, since 15(a), (b), and (c) are satisfied; i.e., $p_U < M_U$, $p_L < M_L$, and $p < M_U$.

*Table C-3*

Range Method

Master Table for Normal and Tightened Inspection for Plans Based on Variability Unknown
(Double Specification Limit and for Form 2—Single Specification Limit)

| Sample size code letter | Sample size | c factor | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | | M | M | M | M | M | M | M | M | M | M | M | M |
| B | 3 | 0.910 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 |
| C | 4 | 2.234 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.53 | 5.50 | 10.92 | 16.45 | 22.86 | 29.45 |
| D | 5 | 2.474 | ↓ | ↓ | ↓ | ↓ | ↓ | 1.42 | 3.44 | 5.93 | 9.90 | 14.47 | 20.27 | 26.59 |
| E | 7 | 2.830 | ↓ | ↓ | ↓ | .28 | .89 | 1.99 | 3.46 | 5.32 | 8.47 | 12.35 | 17.54 | 23.50 |
| F | 10 | 2.405 | ↓ | ↓ | .23 | .58 | 1.14 | 2.05 | 3.23 | 4.77 | 7.42 | 10.79 | 15.49 | 21.06 |
| G | 15 | 2.379 | .136 | .253 | .430 | .786 | 1.30 | 2.10 | 3.11 | 4.44 | 6.76 | 9.76 | 14.09 | 19.30 |
| H | 25 | 2.358 | .214 | .336 | .506 | .827 | 1.27 | 1.95 | 2.82 | 3.96 | 5.98 | 8.65 | 12.59 | 17.48 |
| I | 30 | 2.353 | .240 | .366 | .537 | .856 | 1.29 | 1.96 | 2.81 | 3.92 | 5.88 | 8.50 | 12.36 | 17.19 |
| J | 40 | 2.346 | .252 | .375 | .539 | .842 | 1.25 | 1.88 | 2.69 | 3.73 | 5.61 | 8.11 | 11.84 | 16.55 |
| K | 60 | 2.339 | .244 | .356 | .504 | .781 | 1.16 | 1.74 | 2.47 | 3.44 | 5.17 | 7.54 | 11.10 | 15.64 |
| L | 85 | 2.335 | .242 | .350 | .493 | .755 | 1.12 | 1.67 | 2.37 | 3.30 | 4.97 | 7.27 | 10.73 | 15.17 |
| M | 115 | 2.333 | .230 | .333 | .468 | .718 | 1.06 | 1.58 | 2.25 | 3.14 | 4.76 | 6.99 | 10.37 | 14.74 |
| N | 175 | 2.331 | .210 | .303 | .427 | .655 | .972 | 1.46 | 2.08 | 2.93 | 4.47 | 6.60 | 9.89 | 14.15 |
| P | 230 | 2.330 | .215 | .308 | .432 | .661 | .976 | 1.47 | 2.08 | 2.92 | 4.46 | 6.57 | 9.84 | 14.10 |
| | | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 | |
| | | | Acceptable Quality Levels (*tightened inspection*) | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table C-4*

Master Table for Reduced Inspection for Plans Based on Variability Unknown
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Sample size | c factor | Acceptable Quality Levels (normal inspection) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | | M | M | M | M | M | M | M | M | M | M | M |
| B | 3 | 1.910 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| C | 3 | 1.910 | | | | | | | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| D | 3 | 1.910 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| E | 3 | 1.910 | | | | | | | 7.59 | 18.86 | 26.94 | 33.69 | 40.47 |
| F | 4 | 2.234 | | | | | 1.53 | 5.50 | 10.92 | 16.45 | 22.86 | 29.45 | 36.90 |
| G | 5 | 2.474 | ↓ | ↓ | ↓ | 1.42 | 3.44 | 5.93 | 9.90 | 14.47 | 20.27 | 26.59 | 33.95 |
| H | 7 | 2.830 | | .28 | .89 | 1.99 | 3.46 | 5.32 | 8.47 | 12.35 | 17.54 | 23.50 | 30.66 |
| I | 10 | 2.405 | .23 | .58 | 1.14 | 2.05 | 3.23 | 4.77 | 7.42 | 10.79 | 15.49 | 21.06 | 27.90 |
| J | 15 | 2.379 | .430 | .786 | 1.30 | 2.10 | 3.11 | 4.44 | 6.76 | 9.76 | 14.09 | 19.30 | 25.92 |
| K | 25 | 2.358 | .506 | .827 | 1.27 | 1.95 | 2.82 | 3.96 | 5.98 | 8.65 | 12.59 | 17.48 | 23.79 |
| L | 30 | 2.353 | .537 | .856 | 1.29 | 1.96 | 2.81 | 3.92 | 5.88 | 8.50 | 12.36 | 17.19 | 23.42 |
| M | 35 | 2.349 | .564 | .883 | 1.33 | 1.98 | 2.82 | 3.90 | 5.85 | 8.42 | 12.24 | 17.03 | 23.21 |
| N | 60 | 2.339 | .504 | .781 | 1.16 | 1.74 | 2.47 | 3.44 | 5.17 | 7.54 | 11.10 | 15.64 | 21.63 |
| P | 85 | 2.335 | .493 | .755 | 1.12 | 1.67 | 2.37 | 3.30 | 4.97 | 7.27 | 10.73 | 15.17 | 21.05 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table C-5*

## Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 0 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 |
| .1 | 47.24 | 46.67 | 46.44 | 46.29 | 46.20 | 46.13 | 46.08 | 46.07 | 46.06 | 46.05 | 46.04 | 46.03 | 46.03 | 46.02 | 46.02 |
| .2 | 44.46 | 43.33 | 42.90 | 42.60 | 42.42 | 42.29 | 42.19 | 42.17 | 42.16 | 42.15 | 42.12 | 42.10 | 42.10 | 42.08 | 42.08 |
| .3 | 41.63 | 40.00 | 39.37 | 38.95 | 38.70 | 38.51 | 38.38 | 38.34 | 38.32 | 38.31 | 38.27 | 38.26 | 38.24 | 38.23 | 38.22 |
| .31 | 41.35 | 39.67 | 39.02 | 38.59 | 38.33 | 38.14 | 38.00 | 37.96 | 37.94 | 37.93 | 37.89 | 37.88 | 37.86 | 37.85 | 37.84 |
| .32 | 41.06 | 39.33 | 38.67 | 38.23 | 37.96 | 37.77 | 37.63 | 37.59 | 37.57 | 37.55 | 37.51 | 37.50 | 37.48 | 37.47 | 37.46 |
| .33 | 40.77 | 39.00 | 38.32 | 37.87 | 37.60 | 37.39 | 37.25 | 37.21 | 37.19 | 37.18 | 37.14 | 37.12 | 37.11 | 37.09 | 37.09 |
| .34 | 40.49 | 38.67 | 37.97 | 37.51 | 37.23 | 37.02 | 36.88 | 36.84 | 36.82 | 36.80 | 36.76 | 36.74 | 36.73 | 36.71 | 36.71 |
| .35 | 40.20 | 38.33 | 37.62 | 37.15 | 36.87 | 36.65 | 36.50 | 36.46 | 36.44 | 36.43 | 36.39 | 36.37 | 36.36 | 36.34 | 36.33 |
| .36 | 39.91 | 38.00 | 37.28 | 36.79 | 36.50 | 36.29 | 36.13 | 36.09 | 36.07 | 36.05 | 36.01 | 35.99 | 35.97 | 35.96 | 35.96 |
| .37 | 39.62 | 37.67 | 36.93 | 36.43 | 36.14 | 35.92 | 35.76 | 35.72 | 35.70 | 35.68 | 35.64 | 35.62 | 35.61 | 35.59 | 35.59 |
| .38 | 39.33 | 37.33 | 36.58 | 36.07 | 35.78 | 35.55 | 35.39 | 35.35 | 35.33 | 35.31 | 35.27 | 35.25 | 35.24 | 35.22 | 35.22 |
| .39 | 39.03 | 37.00 | 36.23 | 35.72 | 35.41 | 35.19 | 35.02 | 34.98 | 34.96 | 34.94 | 34.90 | 34.88 | 34.87 | 34.85 | 34.85 |
| .40 | 38.74 | 36.67 | 35.88 | 35.36 | 35.05 | 34.82 | 34.66 | 34.62 | 34.59 | 34.58 | 34.53 | 34.51 | 34.49 | 34.48 | 34.48 |
| .41 | 38.45 | 36.33 | 35.54 | 35.01 | 34.69 | 34.46 | 34.29 | 34.25 | 34.23 | 34.21 | 34.17 | 34.14 | 34.12 | 34.11 | 34.11 |
| .42 | 38.15 | 36.00 | 35.19 | 34.65 | 34.33 | 34.10 | 33.93 | 33.89 | 33.86 | 33.85 | 33.80 | 33.78 | 33.77 | 33.75 | 33.74 |
| .43 | 37.85 | 35.67 | 34.85 | 34.30 | 33.98 | 33.74 | 33.57 | 33.53 | 33.50 | 33.48 | 33.44 | 33.41 | 33.39 | 33.38 | 33.38 |
| .44 | 37.56 | 35.33 | 34.50 | 33.95 | 33.62 | 33.38 | 33.21 | 33.17 | 33.14 | 33.12 | 33.08 | 33.05 | 33.03 | 33.02 | 33.02 |
| .45 | 37.26 | 35.00 | 34.16 | 33.60 | 33.27 | 33.02 | 32.85 | 32.81 | 32.78 | 32.76 | 32.72 | 32.69 | 32.67 | 32.66 | 32.66 |
| .46 | 36.96 | 34.67 | 33.81 | 33.24 | 32.91 | 32.66 | 32.49 | 32.45 | 32.42 | 32.40 | 32.36 | 32.33 | 32.31 | 32.30 | 32.30 |
| .47 | 36.66 | 34.33 | 33.47 | 32.89 | 32.56 | 32.31 | 32.13 | 32.09 | 32.06 | 32.04 | 32.00 | 31.97 | 31.95 | 31.94 | 31.94 |
| .48 | 36.35 | 34.00 | 33.12 | 32.55 | 32.21 | 31.96 | 31.78 | 31.74 | 31.71 | 31.69 | 31.64 | 31.62 | 31.61 | 31.59 | 31.58 |
| .49 | 36.05 | 33.67 | 32.78 | 32.20 | 31.86 | 31.60 | 31.42 | 31.38 | 31.35 | 31.33 | 31.29 | 31.26 | 31.24 | 31.23 | 31.23 |
| .50 | 35.75 | 33.33 | 32.44 | 31.85 | 31.51 | 31.25 | 31.07 | 31.03 | 31.00 | 30.98 | 30.94 | 30.91 | 30.89 | 30.88 | 30.87 |
| .51 | 35.44 | 33.00 | 32.10 | 31.51 | 31.16 | 30.90 | 30.72 | 30.68 | 30.65 | 30.63 | 30.59 | 30.55 | 30.55 | 30.53 | 30.52 |
| .52 | 35.13 | 32.67 | 31.76 | 31.16 | 30.81 | 30.55 | 30.37 | 30.33 | 30.30 | 30.28 | 30.24 | 30.21 | 30.19 | 30.18 | 30.17 |
| .53 | 34.82 | 32.33 | 31.42 | 30.82 | 30.46 | 30.21 | 30.02 | 29.98 | 29.95 | 29.93 | 29.89 | 29.86 | 29.84 | 29.83 | 29.83 |
| .54 | 34.51 | 32.00 | 31.08 | 30.47 | 30.12 | 29.86 | 29.68 | 29.64 | 29.61 | 29.59 | 29.54 | 29.52 | 29.50 | 29.48 | 29.48 |
| .55 | 34.20 | 31.67 | 30.74 | 30.13 | 29.78 | 29.52 | 29.33 | 29.29 | 29.26 | 29.24 | 29.20 | 29.17 | 29.15 | 29.14 | 29.14 |
| .56 | 33.88 | 31.33 | 30.40 | 29.79 | 29.44 | 29.18 | 28.99 | 28.95 | 28.92 | 28.90 | 28.86 | 28.83 | 28.81 | 28.80 | 28.79 |
| .57 | 33.57 | 31.00 | 30.06 | 29.45 | 29.09 | 28.83 | 28.65 | 28.61 | 28.58 | 28.56 | 28.52 | 28.49 | 28.47 | 28.46 | 28.45 |
| .58 | 33.25 | 30.67 | 29.73 | 29.11 | 28.76 | 28.50 | 28.31 | 28.27 | 28.24 | 28.22 | 28.18 | 28.15 | 28.13 | 28.12 | 28.12 |
| .59 | 32.93 | 30.33 | 29.39 | 28.77 | 28.42 | 28.16 | 27.97 | 27.93 | 27.91 | 27.89 | 27.84 | 27.82 | 27.80 | 27.78 | 27.78 |
| .60 | 32.61 | 30.00 | 29.05 | 28.44 | 28.08 | 27.82 | 27.64 | 27.60 | 27.57 | 27.55 | 27.51 | 27.48 | 27.46 | 27.45 | 27.45 |
| .61 | 32.28 | 29.67 | 28.72 | 28.10 | 27.75 | 27.49 | 27.31 | 27.27 | 27.24 | 27.22 | 27.17 | 27.15 | 27.14 | 27.12 | 27.11 |
| .62 | 31.96 | 29.33 | 28.39 | 27.77 | 27.41 | 27.16 | 26.97 | 26.93 | 26.91 | 26.89 | 26.84 | 26.82 | 26.81 | 26.79 | 26.78 |
| .63 | 31.63 | 29.00 | 28.05 | 27.44 | 27.08 | 26.82 | 26.64 | 26.60 | 26.58 | 26.56 | 26.51 | 26.49 | 26.48 | 26.46 | 26.45 |
| .64 | 31.30 | 28.67 | 27.72 | 27.11 | 26.75 | 26.50 | 26.32 | 26.28 | 26.25 | 26.23 | 26.19 | 26.16 | 26.14 | 26.13 | 26.13 |
| .65 | 30.97 | 28.33 | 27.39 | 26.78 | 26.42 | 26.17 | 25.99 | 25.95 | 25.92 | 25.90 | 25.86 | 25.84 | 25.83 | 25.81 | 25.80 |
| .66 | 30.63 | 28.00 | 27.06 | 26.45 | 26.10 | 25.84 | 25.67 | 25.63 | 25.60 | 25.58 | 25.54 | 25.52 | 25.50 | 25.48 | 25.48 |
| .67 | 30.30 | 27.67 | 26.73 | 26.12 | 25.77 | 25.52 | 25.34 | 25.30 | 25.28 | 25.26 | 25.22 | 25.20 | 25.18 | 25.16 | 25.16 |
| .68 | 29.96 | 27.33 | 26.40 | 25.79 | 25.45 | 25.20 | 25.02 | 24.98 | 24.96 | 24.94 | 24.90 | 24.88 | 24.87 | 24.85 | 24.84 |
| .69 | 29.61 | 27.00 | 26.07 | 25.47 | 25.12 | 24.88 | 24.71 | 24.67 | 24.64 | 24.62 | 24.58 | 24.56 | 24.55 | 24.53 | 24.53 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| .70 | 29.27 | 26.67 | 25.74 | 25.14 | 24.80 | 24.56 | 24.39 | 24.35 | 24.32 | 24.31 | 24.27 | 24.25 | 24.24 | 24.22 | 24.21 |
| .71 | 28.92 | 26.33 | 25.41 | 24.82 | 24.48 | 24.24 | 24.07 | 24.03 | 24.01 | 23.99 | 23.95 | 23.93 | 23.91 | 23.90 | 23.90 |
| .72 | 28.57 | 26.00 | 25.09 | 24.50 | 24.17 | 23.93 | 23.76 | 23.72 | 23.70 | 23.68 | 23.64 | 23.62 | 23.60 | 23.59 | 23.59 |
| .73 | 28.22 | 25.67 | 24.76 | 24.18 | 23.85 | 23.61 | 23.45 | 23.41 | 23.39 | 23.37 | 23.33 | 23.32 | 23.30 | 23.29 | 23.29 |
| .74 | 27.86 | 25.33 | 24.44 | 23.86 | 23.54 | 23.30 | 23.14 | 23.10 | 23.08 | 23.07 | 23.03 | 23.01 | 23.00 | 22.98 | 22.98 |
| .75 | 27.50 | 25.00 | 24.11 | 23.55 | 23.22 | 22.99 | 22.84 | 22.80 | 22.78 | 22.76 | 22.72 | 22.71 | 22.69 | 22.68 | 22.68 |
| .76 | 27.13 | 24.67 | 23.79 | 23.23 | 22.91 | 22.69 | 22.53 | 22.49 | 22.47 | 22.46 | 22.42 | 22.41 | 22.39 | 22.38 | 22.38 |
| .77 | 26.77 | 24.33 | 23.47 | 22.92 | 22.60 | 22.38 | 22.23 | 22.19 | 22.17 | 22.16 | 22.12 | 22.11 | 22.09 | 22.08 | 22.08 |
| .78 | 26.39 | 24.00 | 23.15 | 22.60 | 22.30 | 22.08 | 21.93 | 21.90 | 21.88 | 21.86 | 21.83 | 21.81 | 21.80 | 21.78 | 21.78 |
| .79 | 26.02 | 23.67 | 22.83 | 22.29 | 21.99 | 21.78 | 21.64 | 21.60 | 21.58 | 21.57 | 21.53 | 21.52 | 21.50 | 21.49 | 21.49 |
| .80 | 25.64 | 23.33 | 22.51 | 21.98 | 21.69 | 21.48 | 21.34 | 21.30 | 21.28 | 21.27 | 21.24 | 21.22 | 21.22 | 21.20 | 21.20 |
| .81 | 25.25 | 23.00 | 22.19 | 21.68 | 21.39 | 21.18 | 21.04 | 21.01 | 20.99 | 20.98 | 20.95 | 20.93 | 20.93 | 20.91 | 20.91 |
| .82 | 24.86 | 22.67 | 21.87 | 21.37 | 21.09 | 20.89 | 20.75 | 20.72 | 20.70 | 20.69 | 20.66 | 20.64 | 20.64 | 20.62 | 20.62 |
| .83 | 24.47 | 22.33 | 21.56 | 21.06 | 20.79 | 20.59 | 20.46 | 20.43 | 20.41 | 20.40 | 20.37 | 20.36 | 20.35 | 20.34 | 20.34 |
| .84 | 24.07 | 22.00 | 21.24 | 20.76 | 20.49 | 20.30 | 20.17 | 20.15 | 20.13 | 20.12 | 20.09 | 20.08 | 20.06 | 20.06 | 20.06 |
| .85 | 23.67 | 21.67 | 20.93 | 20.46 | 20.20 | 20.01 | 19.89 | 19.87 | 19.85 | 19.84 | 19.81 | 19.79 | 19.79 | 19.78 | 19.78 |
| .86 | 23.26 | 21.33 | 20.62 | 20.16 | 19.90 | 19.73 | 19.60 | 19.58 | 19.57 | 19.56 | 19.54 | 19.52 | 19.51 | 19.50 | 19.50 |
| .87 | 22.84 | 21.00 | 20.31 | 19.86 | 19.61 | 19.44 | 19.32 | 19.31 | 19.29 | 19.28 | 19.25 | 19.24 | 19.24 | 19.22 | 19.22 |
| .88 | 22.42 | 20.67 | 20.00 | 19.57 | 19.33 | 19.16 | 19.04 | 19.03 | 19.01 | 19.00 | 18.98 | 18.97 | 18.96 | 18.95 | 18.95 |
| .89 | 21.99 | 20.33 | 19.69 | 19.27 | 19.04 | 18.88 | 18.77 | 18.75 | 18.74 | 18.73 | 18.70 | 18.69 | 18.69 | 18.68 | 18.68 |
| .90 | 21.55 | 20.00 | 19.38 | 18.98 | 18.75 | 18.60 | 18.50 | 18.48 | 18.47 | 18.46 | 18.43 | 18.42 | 18.42 | 18.41 | 18.41 |
| .91 | 21.11 | 19.67 | 19.07 | 18.69 | 18.47 | 18.32 | 18.22 | 18.21 | 18.20 | 18.19 | 18.17 | 18.17 | 18.16 | 18.15 | 18.15 |
| .92 | 20.66 | 19.33 | 18.77 | 18.40 | 18.19 | 18.05 | 17.96 | 17.95 | 17.93 | 17.92 | 17.90 | 17.89 | 17.89 | 17.88 | 17.88 |
| .93 | 20.20 | 19.00 | 18.46 | 18.11 | 17.91 | 17.78 | 17.69 | 17.68 | 17.67 | 17.66 | 17.65 | 17.63 | 17.63 | 17.62 | 17.62 |
| .94 | 19.74 | 18.67 | 18.16 | 17.82 | 17.64 | 17.51 | 17.43 | 17.42 | 17.41 | 17.40 | 17.39 | 17.37 | 17.37 | 17.36 | 17.36 |
| .95 | 19.25 | 18.33 | 17.86 | 17.54 | 17.36 | 17.24 | 17.17 | 17.16 | 17.15 | 17.14 | 17.13 | 17.12 | 17.12 | 17.11 | 17.11 |
| .96 | 18.76 | 18.00 | 17.56 | 17.26 | 17.09 | 16.98 | 16.91 | 16.90 | 16.89 | 16.88 | 16.87 | 16.86 | 16.86 | 16.86 | 16.86 |
| .97 | 18.25 | 17.67 | 17.25 | 16.97 | 16.82 | 16.71 | 16.65 | 16.64 | 16.63 | 16.63 | 16.62 | 16.61 | 16.61 | 16.60 | 16.60 |
| .98 | 17.74 | 17.33 | 16.96 | 16.70 | 16.55 | 16.45 | 16.39 | 16.38 | 16.38 | 16.37 | 16.37 | 16.36 | 16.36 | 16.36 | 16.36 |
| .99 | 17.21 | 17.00 | 16.66 | 16.42 | 16.28 | 16.19 | 16.14 | 16.13 | 16.13 | 16.12 | 16.12 | 16.11 | 16.11 | 16.11 | 16.11 |
| 1.00 | 16.67 | 16.67 | 16.36 | 16.14 | 16.02 | 15.94 | 15.89 | 15.88 | 15.88 | 15.88 | 15.87 | 15.87 | 15.87 | 15.87 | 15.87 |
| 1.01 | 16.11 | 16.33 | 16.07 | 15.87 | 15.76 | 15.68 | 15.64 | 15.63 | 15.63 | 15.63 | 15.63 | 15.62 | 15.62 | 15.62 | 15.62 |
| 1.02 | 15.53 | 16.00 | 15.78 | 15.60 | 15.50 | 15.43 | 15.40 | 15.39 | 15.39 | 15.39 | 15.39 | 15.38 | 15.38 | 15.38 | 15.38 |
| 1.03 | 14.93 | 15.67 | 15.48 | 15.33 | 15.24 | 15.18 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 | 15.15 |
| 1.04 | 14.31 | 15.33 | 15.19 | 15.06 | 14.98 | 14.94 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 | 14.91 |
| 1.05 | 13.66 | 15.00 | 14.91 | 14.79 | 14.73 | 14.69 | 14.67 | 14.67 | 14.67 | 14.67 | 14.68 | 14.68 | 14.68 | 14.68 | 14.68 |
| 1.06 | 12.98 | 14.67 | 14.62 | 14.53 | 14.48 | 14.45 | 14.44 | 14.44 | 14.44 | 14.44 | 14.44 | 14.45 | 14.45 | 14.45 | 14.45 |
| 1.07 | 12.27 | 14.33 | 14.33 | 14.27 | 14.23 | 14.21 | 14.20 | 14.21 | 14.21 | 14.21 | 14.21 | 14.22 | 14.22 | 14.22 | 14.22 |
| 1.08 | 11.51 | 14.00 | 14.05 | 14.01 | 13.98 | 13.97 | 13.97 | 13.98 | 13.98 | 13.98 | 13.99 | 13.99 | 13.99 | 14.00 | 14.00 |
| 1.09 | 10.71 | 13.67 | 13.76 | 13.75 | 13.74 | 13.73 | 13.74 | 13.75 | 13.75 | 13.75 | 13.76 | 13.77 | 13.77 | 13.78 | 13.78 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 1.10 | 9.84 | 13.33 | 13.48 | 13.50 | 13.49 | 13.50 | 13.52 | 13.52 | 13.52 | 13.53 | 13.54 | 13.55 | 13.55 | 13.56 | 13.56 |
| 1.11 | 8.89 | 13.00 | 13.20 | 13.24 | 13.25 | 13.27 | 13.29 | 13.30 | 13.30 | 13.31 | 13.32 | 13.32 | 13.33 | 13.34 | 13.34 |
| 1.12 | 7.82 | 12.67 | 12.93 | 12.99 | 13.02 | 13.04 | 13.07 | 13.08 | 13.08 | 13.09 | 13.10 | 13.12 | 13.12 | 13.12 | 13.12 |
| 1.13 | 6.60 | 12.33 | 12.65 | 12.74 | 12.78 | 12.81 | 12.85 | 12.86 | 12.86 | 12.87 | 12.89 | 12.89 | 12.90 | 12.91 | 12.91 |
| 1.14 | 5.08 | 12.00 | 12.37 | 12.49 | 12.55 | 12.59 | 12.63 | 12.64 | 12.65 | 12.66 | 12.67 | 12.69 | 12.69 | 12.70 | 12.70 |
| 1.15 | 0.29 | 11.67 | 12.10 | 12.25 | 12.31 | 12.37 | 12.42 | 12.43 | 12.44 | 12.45 | 12.46 | 12.48 | 12.48 | 12.49 | 12.49 |
| 1.16 | 0.00 | 11.33 | 11.83 | 12.00 | 12.08 | 12.15 | 12.21 | 12.22 | 12.23 | 12.24 | 12.25 | 12.27 | 12.28 | 12.29 | 12.29 |
| 1.17 | 0.00 | 11.00 | 11.56 | 11.76 | 11.86 | 11.93 | 12.00 | 12.01 | 12.02 | 12.03 | 12.06 | 12.07 | 12.07 | 12.08 | 12.08 |
| 1.18 | 0.00 | 10.67 | 11.29 | 11.52 | 11.63 | 11.71 | 11.79 | 11.80 | 11.81 | 11.82 | 11.84 | 11.86 | 11.88 | 11.88 | 11.88 |
| 1.19 | 0.00 | 10.33 | 11.02 | 11.29 | 11.41 | 11.50 | 11.58 | 11.60 | 11.61 | 11.62 | 11.65 | 11.66 | 11.68 | 11.69 | 11.69 |
| 1.20 | 0.00 | 10.00 | 10.76 | 11.05 | 11.19 | 11.29 | 11.38 | 11.40 | 11.41 | 11.42 | 11.45 | 11.47 | 11.47 | 11.49 | 11.49 |
| 1.21 | 0.00 | 9.67 | 10.50 | 10.82 | 10.97 | 11.08 | 11.18 | 11.20 | 11.21 | 11.22 | 11.26 | 11.27 | 11.29 | 11.30 | 11.30 |
| 1.22 | 0.00 | 9.33 | 10.23 | 10.59 | 10.76 | 10.88 | 10.98 | 11.00 | 11.02 | 11.03 | 11.06 | 11.08 | 11.09 | 11.10 | 11.10 |
| 1.23 | 0.00 | 9.00 | 9.97 | 10.36 | 10.54 | 10.67 | 10.78 | 10.80 | 10.82 | 10.84 | 10.87 | 10.89 | 10.90 | 10.91 | 10.91 |
| 1.24 | 0.00 | 8.67 | 9.72 | 10.13 | 10.33 | 10.47 | 10.58 | 10.61 | 10.63 | 10.64 | 10.68 | 10.70 | 10.71 | 10.73 | 10.73 |
| 1.25 | 0.00 | 8.33 | 9.46 | 9.91 | 10.12 | 10.27 | 10.39 | 10.42 | 10.44 | 10.46 | 10.49 | 10.51 | 10.52 | 10.54 | 10.54 |
| 1.26 | 0.00 | 8.00 | 9.21 | 9.69 | 9.92 | 10.08 | 10.20 | 10.24 | 10.26 | 10.27 | 10.31 | 10.33 | 10.34 | 10.36 | 10.36 |
| 1.27 | 0.00 | 7.67 | 8.96 | 9.47 | 9.71 | 9.88 | 10.01 | 10.05 | 10.07 | 10.09 | 10.13 | 10.15 | 10.17 | 10.18 | 10.18 |
| 1.28 | 0.00 | 7.33 | 8.71 | 9.25 | 9.51 | 9.69 | 9.83 | 9.87 | 9.89 | 9.90 | 9.95 | 9.97 | 9.99 | 10.00 | 10.00 |
| 1.29 | 0.00 | 7.00 | 8.46 | 9.04 | 9.31 | 9.50 | 9.64 | 9.68 | 9.71 | 9.72 | 9.77 | 9.79 | 9.81 | 9.83 | 9.83 |
| 1.30 | 0.00 | 6.67 | 8.21 | 8.83 | 9.11 | 9.32 | 9.47 | 9.51 | 9.53 | 9.55 | 9.59 | 9.62 | 9.64 | 9.65 | 9.65 |
| 1.31 | 0.00 | 6.33 | 7.97 | 8.62 | 8.92 | 9.13 | 9.29 | 9.33 | 9.35 | 9.37 | 9.42 | 9.45 | 9.47 | 9.48 | 9.48 |
| 1.32 | 0.00 | 6.00 | 7.73 | 8.41 | 8.73 | 8.95 | 9.11 | 9.15 | 9.18 | 9.20 | 9.25 | 9.28 | 9.30 | 9.31 | 9.31 |
| 1.33 | 0.00 | 5.67 | 7.49 | 8.20 | 8.54 | 8.77 | 8.94 | 8.98 | 9.01 | 9.03 | 9.08 | 9.11 | 9.13 | 9.14 | 9.15 |
| 1.34 | 0.00 | 5.33 | 7.25 | 8.00 | 8.35 | 8.59 | 8.77 | 8.81 | 8.84 | 8.86 | 8.91 | 8.94 | 8.96 | 8.98 | 8.98 |
| 1.35 | 0.00 | 5.00 | 7.02 | 7.80 | 8.16 | 8.41 | 8.60 | 8.64 | 8.67 | 8.69 | 8.75 | 8.78 | 8.80 | 8.82 | 8.82 |
| 1.36 | 0.00 | 4.67 | 6.79 | 7.60 | 7.98 | 8.24 | 8.43 | 8.48 | 8.51 | 8.53 | 8.59 | 8.62 | 8.64 | 8.66 | 8.66 |
| 1.37 | 0.00 | 4.33 | 6.56 | 7.40 | 7.80 | 8.07 | 8.27 | 8.31 | 8.34 | 8.37 | 8.43 | 8.46 | 8.48 | 8.50 | 8.50 |
| 1.38 | 0.00 | 4.00 | 6.33 | 7.21 | 7.62 | 7.90 | 8.11 | 8.15 | 8.18 | 8.21 | 8.26 | 8.30 | 8.32 | 8.34 | 8.35 |
| 1.39 | 0.00 | 3.67 | 6.10 | 7.02 | 7.45 | 7.73 | 7.95 | 7.99 | 8.02 | 8.05 | 8.11 | 8.14 | 8.17 | 8.19 | 8.19 |
| 1.40 | 0.00 | 3.33 | 5.88 | 6.83 | 7.27 | 7.57 | 7.79 | 7.84 | 7.88 | 7.90 | 7.96 | 8.00 | 8.02 | 8.03 | 8.04 |
| 1.41 | 0.00 | 3.00 | 5.66 | 6.65 | 7.10 | 7.41 | 7.63 | 7.68 | 7.71 | 7.74 | 7.81 | 7.85 | 7.87 | 7.88 | 7.89 |
| 1.42 | 0.00 | 2.67 | 5.44 | 6.46 | 6.93 | 7.25 | 7.48 | 7.53 | 7.56 | 7.59 | 7.66 | 7.70 | 7.72 | 7.74 | 7.74 |
| 1.43 | 0.00 | 2.33 | 5.23 | 6.28 | 6.76 | 7.09 | 7.33 | 7.38 | 7.41 | 7.44 | 7.51 | 7.54 | 7.57 | 7.59 | 7.60 |
| 1.44 | 0.00 | 2.00 | 5.01 | 6.10 | 6.60 | 6.93 | 7.18 | 7.24 | 7.28 | 7.30 | 7.37 | 7.41 | 7.43 | 7.45 | 7.46 |
| 1.45 | 0.00 | 1.67 | 4.81 | 5.93 | 6.44 | 6.78 | 7.03 | 7.09 | 7.13 | 7.15 | 7.23 | 7.27 | 7.29 | 7.30 | 7.32 |
| 1.46 | 0.00 | 1.33 | 4.60 | 5.75 | 6.28 | 6.63 | 6.89 | 6.95 | 6.99 | 7.01 | 7.09 | 7.13 | 7.15 | 7.17 | 7.18 |
| 1.47 | 0.00 | 1.00 | 4.39 | 5.58 | 6.12 | 6.48 | 6.74 | 6.80 | 6.85 | 6.87 | 6.95 | 6.99 | 7.01 | 7.03 | 7.04 |
| 1.48 | 0.00 | 0.67 | 4.19 | 5.41 | 5.96 | 6.34 | 6.60 | 6.66 | 6.71 | 6.73 | 6.81 | 6.85 | 6.87 | 6.89 | 6.90 |
| 1.49 | 0.00 | 0.33 | 3.99 | 5.24 | 5.81 | 6.19 | 6.47 | 6.53 | 6.57 | 6.60 | 6.67 | 6.72 | 6.74 | 6.76 | 6.77 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 1.50 | 0.00 | 0.00 | 3.80 | 5.08 | 5.66 | 6.05 | 6.33 | 6.39 | 6.43 | 6.46 | 6.54 | 6.58 | 6.61 | 6.63 | 6.64 |
| 1.51 | 0.00 | 0.00 | 3.61 | 4.92 | 5.51 | 5.91 | 6.19 | 6.25 | 6.30 | 6.33 | 6.41 | 6.45 | 6.48 | 6.50 | 6.51 |
| 1.52 | 0.00 | 0.00 | 3.42 | 4.76 | 5.37 | 5.77 | 6.06 | 6.12 | 6.17 | 6.20 | 6.28 | 6.32 | 6.35 | 6.37 | 6.38 |
| 1.53 | 0.00 | 0.00 | 3.23 | 4.60 | 5.22 | 5.64 | 5.93 | 5.99 | 6.04 | 6.07 | 6.15 | 6.20 | 6.22 | 6.25 | 6.26 |
| 1.54 | 0.00 | 0.00 | 3.05 | 4.45 | 5.08 | 5.50 | 5.80 | 5.86 | 5.91 | 5.95 | 6.03 | 6.07 | 6.10 | 6.12 | 6.14 |
| 1.55 | 0.00 | 0.00 | 2.87 | 4.30 | 4.94 | 5.37 | 5.68 | 5.74 | 5.79 | 5.82 | 5.90 | 5.95 | 5.98 | 6.00 | 6.01 |
| 1.56 | 0.00 | 0.00 | 2.69 | 4.15 | 4.81 | 5.24 | 5.55 | 5.62 | 5.67 | 5.70 | 5.78 | 5.83 | 5.86 | 5.88 | 5.89 |
| 1.57 | 0.00 | 0.00 | 2.52 | 4.01 | 4.67 | 5.11 | 5.43 | 5.50 | 5.55 | 5.58 | 5.66 | 5.71 | 5.74 | 5.77 | 5.79 |
| 1.58 | 0.00 | 0.00 | 2.35 | 3.86 | 4.54 | 4.99 | 5.31 | 5.38 | 5.43 | 5.46 | 5.55 | 5.59 | 5.62 | 5.65 | 5.66 |
| 1.59 | 0.00 | 0.00 | 2.19 | 3.72 | 4.41 | 4.86 | 5.19 | 5.26 | 5.31 | 5.34 | 5.43 | 5.48 | 5.51 | 5.53 | 5.55 |
| 1.60 | 0.00 | 0.00 | 2.03 | 3.58 | 4.28 | 4.74 | 5.08 | 5.14 | 5.19 | 5.23 | 5.32 | 5.36 | 5.39 | 5.42 | 5.43 |
| 1.61 | 0.00 | 0.00 | 1.87 | 3.45 | 4.16 | 4.62 | 4.96 | 5.03 | 5.08 | 5.12 | 5.20 | 5.25 | 5.28 | 5.31 | 5.32 |
| 1.62 | 0.00 | 0.00 | 1.72 | 3.31 | 4.03 | 4.51 | 4.85 | 4.92 | 4.97 | 5.01 | 5.09 | 5.14 | 5.17 | 5.20 | 5.22 |
| 1.63 | 0.00 | 0.00 | 1.57 | 3.18 | 3.91 | 4.39 | 4.74 | 4.81 | 4.86 | 4.90 | 4.99 | 5.04 | 5.07 | 5.10 | 5.12 |
| 1.64 | 0.00 | 0.00 | 1.42 | 3.06 | 3.79 | 4.28 | 4.63 | 4.70 | 4.75 | 4.79 | 4.88 | 4.93 | 4.96 | 4.99 | 5.00 |
| 1.65 | 0.00 | 0.00 | 1.28 | 2.93 | 3.68 | 4.17 | 4.52 | 4.59 | 4.64 | 4.68 | 4.77 | 4.83 | 4.86 | 4.89 | 4.91 |
| 1.66 | 0.00 | 0.00 | 1.15 | 2.81 | 3.56 | 4.06 | 4.41 | 4.49 | 4.54 | 4.58 | 4.67 | 4.72 | 4.75 | 4.79 | 4.81 |
| 1.67 | 0.00 | 0.00 | 1.02 | 2.69 | 3.45 | 3.95 | 4.31 | 4.39 | 4.44 | 4.48 | 4.57 | 4.62 | 4.65 | 4.69 | 4.71 |
| 1.68 | 0.00 | 0.00 | 0.89 | 2.57 | 3.34 | 3.85 | 4.21 | 4.29 | 4.34 | 4.38 | 4.47 | 4.53 | 4.56 | 4.59 | 4.61 |
| 1.69 | 0.00 | 0.00 | 0.77 | 2.46 | 3.23 | 3.74 | 4.10 | 4.19 | 4.24 | 4.28 | 4.37 | 4.43 | 4.46 | 4.49 | 4.51 |
| 1.70 | 0.00 | 0.00 | 0.66 | 2.35 | 3.13 | 3.64 | 4.00 | 4.09 | 4.14 | 4.18 | 4.28 | 4.33 | 4.36 | 4.40 | 4.42 |
| 1.71 | 0.00 | 0.00 | 0.55 | 2.24 | 3.02 | 3.54 | 3.92 | 3.99 | 4.05 | 4.09 | 4.18 | 4.24 | 4.27 | 4.30 | 4.31 |
| 1.72 | 0.00 | 0.00 | 0.45 | 2.13 | 2.92 | 3.45 | 3.82 | 3.90 | 3.95 | 3.99 | 4.09 | 4.15 | 4.18 | 4.21 | 4.23 |
| 1.73 | 0.00 | 0.00 | 0.36 | 2.03 | 2.82 | 3.35 | 3.73 | 3.81 | 3.86 | 3.90 | 4.00 | 4.06 | 4.09 | 4.12 | 4.14 |
| 1.74 | 0.00 | 0.00 | 0.27 | 1.93 | 2.73 | 3.26 | 3.63 | 3.72 | 3.77 | 3.81 | 3.91 | 3.97 | 4.00 | 4.03 | 4.05 |
| 1.75 | 0.00 | 0.00 | 0.19 | 1.83 | 2.63 | 3.16 | 3.54 | 3.63 | 3.68 | 3.72 | 3.82 | 3.88 | 3.91 | 3.94 | 3.96 |
| 1.76 | 0.00 | 0.00 | 0.12 | 1.73 | 2.54 | 3.07 | 3.45 | 3.54 | 3.59 | 3.63 | 3.74 | 3.79 | 3.82 | 3.86 | 3.88 |
| 1.77 | 0.00 | 0.00 | 0.06 | 1.64 | 2.45 | 2.99 | 3.37 | 3.45 | 3.51 | 3.55 | 3.65 | 3.71 | 3.74 | 3.77 | 3.79 |
| 1.78 | 0.00 | 0.00 | 0.02 | 1.55 | 2.36 | 2.90 | 3.28 | 3.37 | 3.43 | 3.47 | 3.57 | 3.62 | 3.65 | 3.69 | 3.71 |
| 1.79 | 0.00 | 0.00 | 0.00 | 1.46 | 2.27 | 2.81 | 3.20 | 3.28 | 3.34 | 3.38 | 3.49 | 3.54 | 3.57 | 3.61 | 3.63 |
| 1.80 | 0.00 | 0.00 | 0.00 | 1.38 | 2.19 | 2.73 | 3.11 | 3.20 | 3.26 | 3.30 | 3.41 | 3.46 | 3.49 | 3.53 | 3.55 |
| 1.81 | 0.00 | 0.00 | 0.00 | 1.29 | 2.10 | 2.65 | 3.03 | 3.12 | 3.18 | 3.22 | 3.33 | 3.38 | 3.41 | 3.45 | 3.47 |
| 1.82 | 0.00 | 0.00 | 0.00 | 1.21 | 2.02 | 2.57 | 2.96 | 3.05 | 3.11 | 3.15 | 3.25 | 3.31 | 3.34 | 3.37 | 3.39 |
| 1.83 | 0.00 | 0.00 | 0.00 | 1.14 | 1.94 | 2.49 | 2.88 | 2.97 | 3.03 | 3.07 | 3.17 | 3.23 | 3.26 | 3.30 | 3.32 |
| 1.84 | 0.00 | 0.00 | 0.00 | 1.06 | 1.87 | 2.42 | 2.80 | 2.89 | 2.95 | 2.99 | 3.10 | 3.16 | 3.19 | 3.22 | 3.24 |
| 1.85 | 0.00 | 0.00 | 0.00 | 0.99 | 1.79 | 2.34 | 2.73 | 2.82 | 2.88 | 2.92 | 3.03 | 3.08 | 3.11 | 3.15 | 3.17 |
| 1.86 | 0.00 | 0.00 | 0.00 | 0.92 | 1.72 | 2.27 | 2.66 | 2.75 | 2.81 | 2.85 | 2.95 | 3.01 | 3.04 | 3.08 | 3.10 |
| 1.87 | 0.00 | 0.00 | 0.00 | 0.86 | 1.65 | 2.20 | 2.59 | 2.68 | 2.74 | 2.78 | 2.88 | 2.94 | 2.97 | 3.01 | 3.03 |
| 1.88 | 0.00 | 0.00 | 0.00 | 0.79 | 1.58 | 2.13 | 2.52 | 2.61 | 2.67 | 2.71 | 2.81 | 2.87 | 2.90 | 2.94 | 2.96 |
| 1.89 | 0.00 | 0.00 | 0.00 | 0.73 | 1.51 | 2.06 | 2.45 | 2.54 | 2.60 | 2.64 | 2.75 | 2.81 | 2.84 | 2.87 | 2.89 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

## Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 1.90 | 0.00 | 0.00 | 0.00 | 0.67 | 1.45 | 1.99 | 2.38 | 2.47 | 2.53 | 2.57 | 2.68 | 2.74 | 2.77 | 2.81 | 2.83 |
| 1.91 | 0.00 | 0.00 | 0.00 | 0.62 | 1.38 | 1.93 | 2.32 | 2.41 | 2.47 | 2.51 | 2.61 | 2.67 | 2.70 | 2.74 | 2.76 |
| 1.92 | 0.00 | 0.00 | 0.00 | 0.56 | 1.32 | 1.86 | 2.25 | 2.34 | 2.41 | 2.45 | 2.55 | 2.61 | 2.64 | 2.68 | 2.70 |
| 1.93 | 0.00 | 0.00 | 0.00 | 0.51 | 1.26 | 1.80 | 2.19 | 2.28 | 2.34 | 2.38 | 2.49 | 2.55 | 2.58 | 2.61 | 2.63 |
| 1.94 | 0.00 | 0.00 | 0.00 | 0.46 | 1.20 | 1.74 | 2.13 | 2.22 | 2.28 | 2.32 | 2.43 | 2.49 | 2.52 | 2.55 | 2.57 |
| 1.95 | 0.00 | 0.00 | 0.00 | 0.42 | 1.15 | 1.68 | 2.07 | 2.16 | 2.22 | 2.26 | 2.37 | 2.43 | 2.46 | 2.49 | 2.51 |
| 1.96 | 0.00 | 0.00 | 0.00 | 0.37 | 1.09 | 1.62 | 2.01 | 2.10 | 2.16 | 2.20 | 2.31 | 2.37 | 2.40 | 2.43 | 2.45 |
| 1.97 | 0.00 | 0.00 | 0.00 | 0.33 | 1.04 | 1.57 | 1.95 | 2.04 | 2.10 | 2.14 | 2.25 | 2.31 | 2.34 | 2.38 | 2.40 |
| 1.98 | 0.00 | 0.00 | 0.00 | 0.30 | 0.99 | 1.51 | 1.90 | 1.99 | 2.05 | 2.09 | 2.19 | 2.25 | 2.28 | 2.32 | 2.34 |
| 1.99 | 0.00 | 0.00 | 0.00 | 0.26 | 0.94 | 1.46 | 1.84 | 1.93 | 1.99 | 2.03 | 2.14 | 2.20 | 2.23 | 2.26 | 2.28 |
| 2.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.89 | 1.41 | 1.79 | 1.88 | 1.94 | 1.98 | 2.08 | 2.14 | 2.17 | 2.21 | 2.23 |
| 2.01 | 0.00 | 0.00 | 0.00 | 0.20 | 0.84 | 1.36 | 1.74 | 1.83 | 1.89 | 1.93 | 2.03 | 2.09 | 2.12 | 2.16 | 2.18 |
| 2.02 | 0.00 | 0.00 | 0.00 | 0.17 | 0.80 | 1.31 | 1.69 | 1.78 | 1.83 | 1.87 | 1.98 | 2.04 | 2.07 | 2.10 | 2.12 |
| 2.03 | 0.00 | 0.00 | 0.00 | 0.14 | 0.75 | 1.26 | 1.64 | 1.73 | 1.78 | 1.82 | 1.93 | 1.99 | 2.02 | 2.05 | 2.07 |
| 2.04 | 0.00 | 0.00 | 0.00 | 0.12 | 0.71 | 1.21 | 1.59 | 1.68 | 1.73 | 1.77 | 1.88 | 1.94 | 1.97 | 2.00 | 2.02 |
| 2.05 | 0.00 | 0.00 | 0.00 | 0.10 | 0.67 | 1.17 | 1.54 | 1.63 | 1.69 | 1.73 | 1.83 | 1.89 | 1.92 | 1.95 | 1.97 |
| 2.06 | 0.00 | 0.00 | 0.00 | 0.08 | 0.63 | 1.12 | 1.49 | 1.58 | 1.64 | 1.68 | 1.78 | 1.84 | 1.87 | 1.91 | 1.93 |
| 2.07 | 0.00 | 0.00 | 0.00 | 0.06 | 0.60 | 1.08 | 1.45 | 1.54 | 1.59 | 1.63 | 1.74 | 1.79 | 1.82 | 1.86 | 1.88 |
| 2.08 | 0.00 | 0.00 | 0.00 | 0.05 | 0.56 | 1.04 | 1.40 | 1.49 | 1.55 | 1.59 | 1.69 | 1.75 | 1.78 | 1.81 | 1.83 |
| 2.09 | 0.00 | 0.00 | 0.00 | 0.03 | 0.53 | 1.00 | 1.36 | 1.45 | 1.50 | 1.54 | 1.64 | 1.70 | 1.73 | 1.77 | 1.79 |
| 2.10 | 0.00 | 0.00 | 0.00 | 0.02 | 0.49 | 0.96 | 1.32 | 1.41 | 1.46 | 1.50 | 1.60 | 1.66 | 1.69 | 1.72 | 1.74 |
| 2.11 | 0.00 | 0.00 | 0.00 | 0.01 | 0.46 | 0.92 | 1.28 | 1.36 | 1.42 | 1.46 | 1.56 | 1.61 | 1.64 | 1.68 | 1.70 |
| 2.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 0.88 | 1.24 | 1.32 | 1.38 | 1.42 | 1.52 | 1.57 | 1.60 | 1.64 | 1.66 |
| 2.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.85 | 1.20 | 1.28 | 1.34 | 1.38 | 1.48 | 1.53 | 1.56 | 1.60 | 1.62 |
| 2.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.81 | 1.16 | 1.25 | 1.30 | 1.34 | 1.44 | 1.49 | 1.52 | 1.56 | 1.58 |
| 2.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.78 | 1.13 | 1.21 | 1.26 | 1.30 | 1.40 | 1.45 | 1.48 | 1.52 | 1.54 |
| 2.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.75 | 1.09 | 1.17 | 1.22 | 1.26 | 1.36 | 1.41 | 1.44 | 1.48 | 1.50 |
| 2.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.71 | 1.06 | 1.13 | 1.18 | 1.22 | 1.32 | 1.38 | 1.41 | 1.44 | 1.46 |
| 2.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.68 | 1.02 | 1.10 | 1.15 | 1.19 | 1.28 | 1.34 | 1.37 | 1.40 | 1.41 |
| 2.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.65 | 0.99 | 1.06 | 1.11 | 1.15 | 1.25 | 1.30 | 1.33 | 1.37 | 1.39 |
| 2.20 | 0.000 | 0.000 | 0.000 | 0.000 | 0.236 | 0.625 | 0.954 | 1.030 | 1.083 | 1.122 | 1.214 | 1.267 | 1.299 | 1.330 | 1.346 |
| 2.21 | 0.000 | 0.000 | 0.000 | 0.000 | 0.217 | 0.597 | 0.922 | 0.997 | 1.058 | 1.089 | 1.180 | 1.233 | 1.265 | 1.295 | 1.311 |
| 2.22 | 0.000 | 0.000 | 0.000 | 0.000 | 0.199 | 0.570 | 0.891 | 0.966 | 1.018 | 1.056 | 1.147 | 1.199 | 1.231 | 1.261 | 1.277 |
| 2.23 | 0.000 | 0.000 | 0.000 | 0.000 | 0.182 | 0.544 | 0.861 | 0.935 | 0.986 | 1.025 | 1.115 | 1.167 | 1.197 | 1.228 | 1.244 |
| 2.24 | 0.000 | 0.000 | 0.000 | 0.000 | 0.166 | 0.519 | 0.831 | 0.905 | 0.956 | 0.994 | 1.083 | 1.135 | 1.165 | 1.195 | 1.211 |
| 2.25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.150 | 0.495 | 0.802 | 0.875 | 0.926 | 0.964 | 1.052 | 1.104 | 1.134 | 1.163 | 1.179 |
| 2.26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.136 | 0.471 | 0.775 | 0.847 | 0.897 | 0.935 | 1.022 | 1.073 | 1.103 | 1.132 | 1.148 |
| 2.27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.123 | 0.449 | 0.748 | 0.819 | 0.869 | 0.906 | 0.993 | 1.043 | 1.073 | 1.103 | 1.118 |
| 2.28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.111 | 0.427 | 0.722 | 0.792 | 0.841 | 0.878 | 0.964 | 1.014 | 1.044 | 1.073 | 1.088 |
| 2.29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 | 0.406 | 0.697 | 0.766 | 0.814 | 0.851 | 0.936 | 0.986 | 1.015 | 1.044 | 1.059 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 2.30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.089 | 0.386 | 0.672 | 0.741 | 0.789 | 0.825 | 0.909 | 0.959 | 0.988 | 1.016 | 1.031 |
| 2.31 | 0.000 | 0.000 | 0.000 | 0.000 | 0.079 | 0.367 | 0.648 | 0.716 | 0.763 | 0.799 | 0.882 | 0.931 | 0.960 | 0.988 | 1.003 |
| 2.32 | 0.000 | 0.000 | 0.000 | 0.000 | 0.070 | 0.348 | 0.624 | 0.691 | 0.739 | 0.774 | 0.856 | 0.905 | 0.934 | 0.962 | 0.976 |
| 2.33 | 0.000 | 0.000 | 0.000 | 0.000 | 0.061 | 0.330 | 0.601 | 0.668 | 0.715 | 0.750 | 0.831 | 0.879 | 0.908 | 0.935 | 0.950 |
| 2.34 | 0.000 | 0.000 | 0.000 | 0.000 | 0.054 | 0.313 | 0.579 | 0.645 | 0.691 | 0.720 | 0.807 | 0.854 | 0.882 | 0.909 | 0.924 |
| 2.35 | 0.000 | 0.000 | 0.000 | 0.000 | 0.047 | 0.296 | 0.558 | 0.623 | 0.669 | 0.703 | 0.782 | 0.829 | 0.857 | 0.884 | 0.889 |
| 2.36 | 0.000 | 0.000 | 0.000 | 0.000 | 0.040 | 0.280 | 0.538 | 0.602 | 0.646 | 0.680 | 0.759 | 0.806 | 0.833 | 0.860 | 0.874 |
| 2.37 | 0.000 | 0.000 | 0.000 | 0.000 | 0.035 | 0.265 | 0.518 | 0.580 | 0.624 | 0.658 | 0.736 | 0.782 | 0.809 | 0.836 | 0.850 |
| 2.38 | 0.000 | 0.000 | 0.000 | 0.000 | 0.029 | 0.250 | 0.498 | 0.560 | 0.604 | 0.637 | 0.714 | 0.759 | 0.787 | 0.813 | 0.827 |
| 2.39 | 0.000 | 0.000 | 0.000 | 0.000 | 0.025 | 0.236 | 0.479 | 0.541 | 0.584 | 0.616 | 0.693 | 0.737 | 0.764 | 0.791 | 0.804 |
| 2.40 | 0.000 | 0.000 | 0.000 | 0.000 | 0.021 | 0.223 | 0.461 | 0.521 | 0.564 | 0.596 | 0.671 | 0.715 | 0.742 | 0.769 | 0.782 |
| 2.41 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.210 | 0.443 | 0.503 | 0.545 | 0.577 | 0.651 | 0.695 | 0.721 | 0.747 | 0.760 |
| 2.42 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.198 | 0.426 | 0.485 | 0.526 | 0.557 | 0.631 | 0.674 | 0.701 | 0.726 | 0.739 |
| 2.43 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.186 | 0.410 | 0.467 | 0.508 | 0.539 | 0.611 | 0.654 | 0.679 | 0.705 | 0.718 |
| 2.44 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.175 | 0.393 | 0.450 | 0.491 | 0.521 | 0.593 | 0.635 | 0.660 | 0.685 | 0.698 |
| 2.45 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.165 | 0.378 | 0.434 | 0.473 | 0.503 | 0.573 | 0.616 | 0.641 | 0.665 | 0.678 |
| 2.46 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.154 | 0.362 | 0.417 | 0.456 | 0.486 | 0.556 | 0.597 | 0.622 | 0.646 | 0.659 |
| 2.47 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.145 | 0.348 | 0.403 | 0.441 | 0.470 | 0.538 | 0.579 | 0.604 | 0.627 | 0.640 |
| 2.48 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.136 | 0.333 | 0.387 | 0.425 | 0.454 | 0.522 | 0.562 | 0.586 | 0.609 | 0.622 |
| 2.49 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.127 | 0.321 | 0.372 | 0.409 | 0.438 | 0.504 | 0.545 | 0.569 | 0.593 | 0.605 |
| 2.50 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.118 | 0.307 | 0.358 | 0.395 | 0.423 | 0.489 | 0.528 | 0.552 | 0.575 | 0.587 |
| 2.51 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.111 | 0.294 | 0.345 | 0.381 | 0.409 | 0.473 | 0.512 | 0.536 | 0.558 | 0.570 |
| 2.52 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.103 | 0.282 | 0.331 | 0.367 | 0.394 | 0.458 | 0.497 | 0.519 | 0.542 | 0.553 |
| 2.53 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.096 | 0.270 | 0.319 | 0.354 | 0.381 | 0.444 | 0.481 | 0.503 | 0.526 | 0.537 |
| 2.54 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.089 | 0.258 | 0.306 | 0.340 | 0.367 | 0.428 | 0.466 | 0.488 | 0.510 | 0.522 |
| 2.55 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.083 | 0.247 | 0.294 | 0.328 | 0.354 | 0.415 | 0.451 | 0.473 | 0.495 | 0.506 |
| 2.56 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.237 | 0.283 | 0.316 | 0.341 | 0.401 | 0.437 | 0.459 | 0.480 | 0.491 |
| 2.57 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.071 | 0.227 | 0.272 | 0.304 | 0.328 | 0.388 | 0.424 | 0.445 | 0.466 | 0.477 |
| 2.58 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.066 | 0.217 | 0.261 | 0.292 | 0.317 | 0.376 | 0.411 | 0.432 | 0.452 | 0.463 |
| 2.59 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.061 | 0.207 | 0.251 | 0.282 | 0.305 | 0.363 | 0.397 | 0.418 | 0.439 | 0.449 |
| 2.60 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.056 | 0.198 | 0.240 | 0.271 | 0.294 | 0.351 | 0.385 | 0.406 | 0.426 | 0.436 |
| 2.61 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.052 | 0.189 | 0.231 | 0.260 | 0.283 | 0.339 | 0.372 | 0.393 | 0.413 | 0.423 |
| 2.62 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.048 | 0.181 | 0.221 | 0.250 | 0.273 | 0.327 | 0.360 | 0.381 | 0.400 | 0.410 |
| 2.63 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.044 | 0.173 | 0.212 | 0.241 | 0.263 | 0.316 | 0.349 | 0.368 | 0.388 | 0.398 |
| 2.64 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.040 | 0.164 | 0.203 | 0.232 | 0.253 | 0.306 | 0.338 | 0.357 | 0.376 | 0.386 |
| 2.65 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.037 | 0.157 | 0.195 | 0.223 | 0.244 | 0.295 | 0.327 | 0.346 | 0.365 | 0.375 |
| 2.66 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.034 | 0.149 | 0.186 | 0.213 | 0.234 | 0.285 | 0.316 | 0.335 | 0.353 | 0.363 |
| 2.67 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.031 | 0.143 | 0.179 | 0.205 | 0.225 | 0.275 | 0.305 | 0.324 | 0.342 | 0.352 |
| 2.68 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.028 | 0.136 | 0.171 | 0.197 | 0.217 | 0.266 | 0.296 | 0.314 | 0.332 | 0.342 |
| 2.69 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.025 | 0.129 | 0.164 | 0.190 | 0.209 | 0.257 | 0.286 | 0.304 | 0.321 | 0.331 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 2.70 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 | 0.123 | 0.156 | 0.182 | 0.201 | 0.248 | 0.277 | 0.295 | 0.311 | 0.321 |
| 2.71 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.021 | 0.117 | 0.150 | 0.174 | 0.193 | 0.239 | 0.267 | 0.285 | 0.302 | 0.311 |
| 2.72 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 | 0.111 | 0.143 | 0.167 | 0.185 | 0.231 | 0.259 | 0.275 | 0.292 | 0.301 |
| 2.73 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.106 | 0.137 | 0.160 | 0.178 | 0.222 | 0.250 | 0.266 | 0.283 | 0.292 |
| 2.74 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.101 | 0.131 | 0.153 | 0.171 | 0.215 | 0.241 | 0.258 | 0.274 | 0.282 |
| 2.75 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.096 | 0.125 | 0.147 | 0.164 | 0.207 | 0.233 | 0.248 | 0.266 | 0.274 |
| 2.76 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.091 | 0.120 | 0.141 | 0.158 | 0.200 | 0.225 | 0.241 | 0.257 | 0.265 |
| 2.77 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.086 | 0.114 | 0.135 | 0.152 | 0.192 | 0.217 | 0.232 | 0.249 | 0.257 |
| 2.78 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.081 | 0.109 | 0.130 | 0.146 | 0.185 | 0.210 | 0.226 | 0.241 | 0.249 |
| 2.79 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.077 | 0.103 | 0.124 | 0.140 | 0.179 | 0.202 | 0.218 | 0.233 | 0.241 |
| 2.80 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.074 | 0.099 | 0.118 | 0.134 | 0.172 | 0.196 | 0.210 | 0.225 | 0.233 |
| 2.81 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.070 | 0.094 | 0.113 | 0.129 | 0.165 | 0.189 | 0.204 | 0.218 | 0.226 |
| 2.82 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.066 | 0.090 | 0.109 | 0.123 | 0.159 | 0.183 | 0.194 | 0.211 | 0.219 |
| 2.83 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.062 | 0.085 | 0.103 | 0.118 | 0.154 | 0.176 | 0.190 | 0.204 | 0.212 |
| 2.84 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.059 | 0.082 | 0.099 | 0.113 | 0.148 | 0.170 | 0.184 | 0.197 | 0.205 |
| 2.85 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.055 | 0.078 | 0.095 | 0.109 | 0.143 | 0.164 | 0.178 | 0.191 | 0.198 |
| 2.86 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.053 | 0.074 | 0.091 | 0.104 | 0.137 | 0.159 | 0.172 | 0.185 | 0.192 |
| 2.87 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.050 | 0.070 | 0.087 | 0.100 | 0.132 | 0.152 | 0.166 | 0.179 | 0.185 |
| 2.88 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.047 | 0.067 | 0.082 | 0.095 | 0.127 | 0.147 | 0.160 | 0.173 | 0.179 |
| 2.89 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.044 | 0.064 | 0.079 | 0.091 | 0.122 | 0.142 | 0.155 | 0.167 | 0.173 |
| 2.90 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.042 | 0.061 | 0.075 | 0.088 | 0.117 | 0.138 | 0.149 | 0.161 | 0.168 |
| 2.91 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.039 | 0.057 | 0.072 | 0.084 | 0.112 | 0.132 | 0.145 | 0.156 | 0.162 |
| 2.92 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.037 | 0.055 | 0.069 | 0.080 | 0.107 | 0.127 | 0.140 | 0.151 | 0.157 |
| 2.93 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.035 | 0.052 | 0.066 | 0.077 | 0.104 | 0.123 | 0.134 | 0.146 | 0.151 |
| 2.94 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.033 | 0.049 | 0.062 | 0.073 | 0.100 | 0.118 | 0.129 | 0.141 | 0.146 |
| 2.95 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.031 | 0.047 | 0.059 | 0.070 | 0.096 | 0.114 | 0.125 | 0.136 | 0.142 |
| 2.96 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.029 | 0.044 | 0.056 | 0.067 | 0.092 | 0.110 | 0.121 | 0.132 | 0.137 |
| 2.97 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.027 | 0.042 | 0.054 | 0.064 | 0.088 | 0.105 | 0.116 | 0.127 | 0.132 |
| 2.98 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.025 | 0.039 | 0.051 | 0.061 | 0.085 | 0.101 | 0.112 | 0.123 | 0.128 |
| 2.99 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.024 | 0.038 | 0.049 | 0.058 | 0.082 | 0.098 | 0.108 | 0.119 | 0.124 |
| 3.00 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 | 0.036 | 0.047 | 0.056 | 0.078 | 0.094 | 0.105 | 0.115 | 0.120 |
| 3.01 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 | 0.034 | 0.044 | 0.053 | 0.075 | 0.091 | 0.101 | 0.111 | 0.116 |
| 3.02 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.032 | 0.042 | 0.050 | 0.072 | 0.087 | 0.097 | 0.107 | 0.112 |
| 3.03 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 | 0.030 | 0.040 | 0.048 | 0.069 | 0.084 | 0.094 | 0.103 | 0.108 |
| 3.04 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.028 | 0.038 | 0.045 | 0.066 | 0.081 | 0.090 | 0.099 | 0.104 |
| 3.05 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.016 | 0.027 | 0.036 | 0.043 | 0.064 | 0.078 | 0.086 | 0.096 | 0.101 |
| 3.06 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.025 | 0.034 | 0.041 | 0.061 | 0.075 | 0.083 | 0.092 | 0.097 |
| 3.07 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.024 | 0.032 | 0.039 | 0.059 | 0.072 | 0.080 | 0.089 | 0.094 |
| 3.08 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.013 | 0.022 | 0.030 | 0.037 | 0.056 | 0.069 | 0.077 | 0.086 | 0.091 |
| 3.09 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.021 | 0.029 | 0.036 | 0.054 | 0.067 | 0.075 | 0.083 | 0.088 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 3.10 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.020 | 0.027 | 0.034 | 0.051 | 0.064 | 0.072 | 0.080 | 0.085 |
| 3.11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.019 | 0.026 | 0.032 | 0.050 | 0.061 | 0.069 | 0.077 | 0.082 |
| 3.12 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.018 | 0.025 | 0.031 | 0.048 | 0.060 | 0.067 | 0.074 | 0.079 |
| 3.13 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.017 | 0.024 | 0.029 | 0.046 | 0.057 | 0.064 | 0.072 | 0.075 |
| 3.14 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 | 0.015 | 0.022 | 0.028 | 0.044 | 0.055 | 0.062 | 0.069 | 0.073 |
| 3.15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.014 | 0.021 | 0.026 | 0.042 | 0.053 | 0.060 | 0.067 | 0.070 |
| 3.16 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.014 | 0.020 | 0.025 | 0.040 | 0.051 | 0.057 | 0.064 | 0.067 |
| 3.17 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.013 | 0.019 | 0.024 | 0.038 | 0.049 | 0.056 | 0.062 | 0.065 |
| 3.18 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.012 | 0.017 | 0.022 | 0.036 | 0.046 | 0.053 | 0.060 | 0.063 |
| 3.19 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.012 | 0.017 | 0.021 | 0.034 | 0.044 | 0.052 | 0.057 | 0.060 |
| 3.20 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.011 | 0.016 | 0.020 | 0.033 | 0.043 | 0.049 | 0.055 | 0.058 |
| 3.21 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.010 | 0.015 | 0.019 | 0.032 | 0.041 | 0.047 | 0.053 | 0.056 |
| 3.22 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.009 | 0.014 | 0.018 | 0.031 | 0.040 | 0.045 | 0.051 | 0.054 |
| 3.23 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.009 | 0.013 | 0.017 | 0.029 | 0.037 | 0.043 | 0.049 | 0.052 |
| 3.24 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.009 | 0.013 | 0.016 | 0.028 | 0.037 | 0.042 | 0.047 | 0.050 |
| 3.25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.008 | 0.012 | 0.015 | 0.027 | 0.035 | 0.040 | 0.046 | 0.049 |
| 3.26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.007 | 0.011 | 0.015 | 0.025 | 0.033 | 0.039 | 0.044 | 0.047 |
| 3.27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.007 | 0.011 | 0.014 | 0.024 | 0.032 | 0.037 | 0.042 | 0.045 |
| 3.28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.006 | 0.010 | 0.013 | 0.023 | 0.031 | 0.036 | 0.040 | 0.043 |
| 3.29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.006 | 0.009 | 0.012 | 0.023 | 0.029 | 0.034 | 0.039 | 0.042 |
| 3.30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.005 | 0.009 | 0.012 | 0.021 | 0.028 | 0.033 | 0.037 | 0.040 |
| 3.31 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.005 | 0.008 | 0.011 | 0.021 | 0.027 | 0.032 | 0.036 | 0.039 |
| 3.32 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.007 | 0.010 | 0.020 | 0.026 | 0.030 | 0.034 | 0.037 |
| 3.33 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.007 | 0.010 | 0.019 | 0.025 | 0.029 | 0.033 | 0.036 |
| 3.34 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.007 | 0.009 | 0.018 | 0.024 | 0.028 | 0.032 | 0.035 |
| 3.35 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.006 | 0.009 | 0.017 | 0.023 | 0.027 | 0.031 | 0.033 |
| 3.36 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.006 | 0.008 | 0.016 | 0.022 | 0.026 | 0.030 | 0.032 |
| 3.37 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.006 | 0.008 | 0.015 | 0.021 | 0.024 | 0.028 | 0.031 |
| 3.38 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.014 | 0.019 | 0.024 | 0.027 | 0.030 |
| 3.39 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.014 | 0.019 | 0.022 | 0.027 | 0.029 |
| 3.40 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.013 | 0.018 | 0.021 | 0.026 | 0.028 |
| 3.41 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.012 | 0.018 | 0.021 | 0.025 | 0.027 |
| 3.42 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.012 | 0.017 | 0.020 | 0.024 | 0.026 |
| 3.43 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.005 | 0.011 | 0.016 | 0.019 | 0.023 | 0.025 |
| 3.44 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.005 | 0.011 | 0.015 | 0.018 | 0.022 | 0.024 |
| 3.45 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.005 | 0.011 | 0.014 | 0.017 | 0.021 | 0.023 |
| 3.46 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.010 | 0.014 | 0.017 | 0.020 | 0.022 |
| 3.47 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.010 | 0.014 | 0.016 | 0.019 | 0.021 |
| 3.48 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.009 | 0.013 | 0.015 | 0.018 | 0.020 |
| 3.49 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.004 | 0.009 | 0.012 | 0.015 | 0.018 | 0.020 |

[1]Values tabulated are read in percent.

*Table C-5—Continued*

Table for Estimating the Lot Percent Nonconforming Using Range Method[1]

| $Q_U$ or $Q_L$ | Sample Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 7 | 10 | 15 | 25 | 30 | 35 | 40 | 60 | 85 | 115 | 175 | 230 |
| 3.50 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.008 | 0.012 | 0.014 | 0.017 | 0.019 |
| 3.51 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.008 | 0.011 | 0.014 | 0.016 | 0.018 |
| 3.52 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.007 | 0.010 | 0.013 | 0.016 | 0.017 |
| 3.53 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.007 | 0.010 | 0.013 | 0.015 | 0.016 |
| 3.54 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.007 | 0.010 | 0.012 | 0.014 | 0.015 |
| 3.55 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.006 | 0.009 | 0.012 | 0.014 | 0.015 |
| 3.56 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.006 | 0.009 | 0.011 | 0.013 | 0.014 |
| 3.57 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.005 | 0.008 | 0.011 | 0.012 | 0.013 |
| 3.58 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.005 | 0.008 | 0.010 | 0.012 | 0.013 |
| 3.59 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.005 | 0.008 | 0.010 | 0.011 | 0.012 |
| 3.60 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.005 | 0.007 | 0.009 | 0.011 | 0.012 |
| 3.61 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.007 | 0.009 | 0.011 | 0.011 |
| 3.62 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.007 | 0.009 | 0.010 | 0.011 |
| 3.63 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.004 | 0.006 | 0.008 | 0.010 | 0.010 |
| 3.64 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.003 | 0.006 | 0.008 | 0.009 | 0.010 |
| 3.65 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.003 | 0.006 | 0.008 | 0.009 | 0.010 |
| 3.66 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.009 | 0.009 |
| 3.67 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.007 | 0.008 | 0.009 |
| 3.68 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.005 | 0.006 | 0.008 | 0.008 |
| 3.69 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.008 | 0.008 |
| 3.70 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.008 |
| 3.71 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.007 |
| 3.72 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.007 |
| 3.73 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.006 | 0.007 | 0.007 |
| 3.74 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.004 | 0.005 | 0.006 | 0.007 |
| 3.75 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.006 | 0.006 |
| 3.76 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.006 | 0.006 |
| 3.77 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.005 | 0.006 | 0.006 |
| 3.78 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.004 | 0.005 | 0.005 |
| 3.79 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.003 | 0.005 | 0.005 |
| 3.80 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.003 | 0.005 | 0.005 |
| 3.81 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.003 | 0.005 | 0.005 |
| 3.82 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.003 | 0.005 | 0.005 |
| 3.83 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.003 | 0.003 | 0.004 | 0.004 |
| 3.84 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 |
| 3.85 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.004 |
| 3.86 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.004 |
| 3.87 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.004 |
| 3.88 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.004 | 0.004 |
| 3.89 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.003 | 0.003 |
| 3.90 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.003 | 0.003 |

[1]Values tabulated are read in percent.

*Table C-6*
Values of f for Maximum Average Range (MAR)

| Sample size | Acceptable Quality Levels (in percent nonconforming) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| 3 | | | | | | | | | .833 | .865 | .907 | .958 |
| 4 | | | | | | | .756 | .788 | .836 | .891 | .965 | 1.056 |
| 5 | | | | | | .730 | .764 | .801 | .857 | .923 | 1.011 | 1.118 |
| 7 | | | | .695 | .727 | .765 | .804 | .846 | .910 | .985 | 1.086 | 1.209 |
| 10 | | | .529 | .553 | .579 | .610 | .642 | .677 | .730 | .793 | .876 | .977 |
| 15 | .460 | .477 | .493 | .517 | .542 | .572 | .602 | .637 | .688 | .748 | .830 | .928 |
| 25 | .432 | .447 | .463 | .486 | .509 | .537 | .567 | .600 | .649 | .707 | .785 | .879 |
| 30 | .426 | .442 | .457 | .480 | .503 | .531 | .560 | .593 | .642 | .699 | .776 | .870 |
| 35 | .423 | .438 | .454 | .476 | .499 | .527 | .556 | .588 | .637 | .694 | .771 | .864 |
| 40 | .417 | .432 | .447 | .469 | .492 | .519 | .548 | .580 | .628 | .684 | .761 | .852 |
| 50 | .411 | .426 | .441 | .463 | .486 | .503 | .542 | .573 | .621 | .676 | .752 | .843 |
| 60 | .405 | .419 | .434 | .455 | .478 | .505 | .533 | .564 | .608 | .666 | .740 | .830 |
| 85 | .398 | .412 | .427 | .448 | .470 | .497 | .525 | .555 | .602 | .656 | .729 | .818 |
| 115 | .392 | .406 | .421 | .442 | .464 | .490 | .517 | .548 | .594 | .648 | .720 | .808 |
| 175 | .384 | .399 | .413 | .434 | .455 | .481 | .508 | .538 | .584 | .637 | .708 | .794 |
| 230 | .384 | .397 | .412 | .432 | .454 | .480 | .507 | .536 | .582 | .633 | .706 | .792 |

The MAR may be obtained by multiplying the factor f by the difference between the upper specification limit U and lower specification limit L. The formula is MAR = f(U – L). The MAR serves as a guide for the magnitude of the average range of the sample when using plans for the double specification limit case, based on the average range of the sample of unknown variability. The average range of the sample, if it is less than the MAR, helps to insure, but does not guarantee, lot acceptability.

NOTE: There is a corresponding acceptability constant in Table C-1 for each value of f. For reduced inspection, find the acceptability constant of Table C-2 in Table C-1 and use the corresponding value of f.

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

## APPENDIX C
### Definitions

| Symbol | Read | Definitions |
|---|---|---|
| n | | Sample size for a single lot. |
| $\bar{X}$ | X bar | Sample mean. Arithmetic mean of sample measurements from a single lot. |
| R | | Range. The difference between the largest and smallest measurements in a subgroup. In this Standard, the subgroup size is 5 except for those plans in which n = 3, 4, or 7, in which case the subgroup is the same as the sample size. |
| $R_1$ | | Range of the first subgroup. |
| $R_2$ | | Range of the second subgroup. |
| $\bar{R}$ | R bar | Average range. The arithmetic mean of the range values of the subgroups of the sample measurements from a single lot. |
| U | | Upper specification limit. |
| L | | Lower specification limit. |
| k | | The acceptability constant given in Tables C-1 and C-2. |
| c | | A factor used in determining the quality index when using the range method. The c values are given in Tables C-3 and C-4. |
| $Q_U$ | Q sub U | Quality Index for use with Table C-5. |
| $Q_L$ | Q sub L | Quality index for use with Table C-5. |
| $p_U$ | p sub U | Sample estimate of the lot percent nonconforming above U from Table C-5. |
| $p_L$ | p sub L | Sample estimate of the lot percent nonconforming below L from Table C-5. |
| p | | Total sample estimate of the lot percent nonconforming $p = p_U + p_L$. |
| M | | Maximum allowable percent nonconforming for sample estimates given in Tables C-3 and C-4. |
| $M_U$ | M sub U | Maximum allowable percent nonconforming above U given in Tables C-3 and C-4. (For use when different AQL values for U and L are specified.) |
| $M_L$ | M sub L | Maximum allowable percent nonconforming below L given in Tables C-3 and C-4. (For use when different AQL values for U and L are specified.) |
| $\bar{p}$ | p bar | Sample estimate of the process percent nonconforming, i.e., the estimated process average. |
| $\bar{p}_U$ | p bar sub U | The estimated process average for an upper specification limit. |
| $\bar{p}_L$ | p bar sub L | The estimated process average for a lower specification limit. |
| f | | A factor used in determining the Maximum Average Range (MAR). The f values are given in Table C-6. |
| > | Greater than | Greater than. |
| < | Less than | Less than. |
| $\Sigma$ | Sum of | Sum of. |
| T | | AQL symbol denoting plan used exclusively on tightened inspection (provides identification of appropriate OC curve). |

# SECTION D
# VARIABILITY KNOWN
## Part I
## SINGLE SPECIFICATION LIMIT

### D1. SAMPLING PLAN FOR SINGLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a single specification limit when variability of the lot with respect to the quality characteristic is known. The acceptability criterion is given in two equivalent forms. These are identified as Form 1 and Form 2.

D1.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value, the applicable sampling plan shall be used in accordance with the provisions of Section A, General Description of Sampling Plans, and those in this part of the Standard.

D1.2 Drawing of Samples. All samples shall be drawn in accordance with paragraph A7.2.

D1.3 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

### D2. SELECTING THE SAMPLING PLAN WHEN FORM 1 IS USED

D2.1 Master Sampling Tables. The master sampling tables for plans based on variability known for a single specification limit are TAbles D-1 and D-2. Table D-1 is used for normal and tightened inspection and Table D-2 for reduced inspection.

D2.2 Obtaining Sampling Plan. The sampling plan consists of a sample size and an associated acceptability constant.[1] The sampling plan is obtained from Master Table D-1 and D-2.

D2.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter and AQL.

D2.2.2 Acceptability Constant. The acceptability constant k, corresponding to the sample size mentioned in paragraph D2.2.1, is indicated in the column of the master table corresponding to the applicable AQL value. Table D-1 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table D-2.

### D3. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 1 IS USED[2]

D3.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the quantity $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$.

D3.2 Computation. The following quantity shall be computed: $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$, depending on whether the specification limit is an upper or a lower limit, where

U is the upper specification limit,
L is the lower specification limit,
$\bar{X}$ is the sample mean, and
$\sigma$ is the known variability.

D3.3 Acceptability Criteria. Compare the quantity $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$ with the acceptability constant k. If $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$ is equal to or greater than k, the lot meets the acceptability criterion; if $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$ is less than k or negative, then the lot does not meet the acceptability criterion.

### D4. SUMMARY FOR OPERATION OF SAMPLING PLAN WHEN FORM 1 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Obtain plan from Master Table D-1 or D-2 by selecting the sample size n and the acceptability constant k.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic for each unit of the sample.

(4) Compute the sample mean $\bar{X}$, and also compute the quantity $(U-\bar{X})/\sigma$ for an upper specification limit U or the quantity $(\bar{X}-L)/\sigma$ for a lower specification limit L.

(5) If the quantity $(U-\bar{X})/\sigma$ or $(\bar{X}-L)/\sigma$ is equal to or greater than k, the lot meets the acceptability criterion; if

[1]See Appendix D for definitions of all symbols used in the sampling plans based on variability known.

[2]See Example D-1 for a complete example of this procedure.

$(U - \bar{X})/\sigma$ or $(\bar{X} - L)/\sigma$ is less than k or negative, then the lot does not meet the acceptability criterion.

## D5. SELECTING THE SAMPLING PLAN WHEN FORM 2 IS USED

D5.1 Master Sampling Tables. The master sampling tables for plans based on variability known for a single specification limit are Tables D-3 and D-4 of Part II. Table D-3 is used for normal and tightened inspection and Table D-4 for reduced inspection.

D5.2 Obtaining the Sampling Plan. The sampling plan consists of a sample size and an associated maximum allowable percent nonconforming. The sampling plan is obtained from Master Table D-3 or D-4.

D5.2.1 Sample Size. The sample size n is shown in the master table corresponding to each sample size code letter.

D5.2.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming M for sample estimates corresponding to the sample size mentioned in paragraph D5.2.1 is indicated in the column of the master table corresponding to the applicable AQL value. Table D-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table D-4.

## D6. LOT-BY-LOT ACCEPTABILITY PROCEDURES WHEN FORM 2 IS USED[3]

D6.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a single specification limit shall be judged by the percent of nonconforming product outside the upper or lower specification limit. The percentage of nonconforming product is estimated by entering Table D-5 with the quality index.

D6.2 Computation of Quality Index. The quality index $Q_U = (U - \bar{X})v/\sigma$ shall be computed if the specification limit is an upper limit U, or $Q_U = (\bar{X} - L)v/\sigma$ if it is a lower limit L. The quantities, $\bar{X}$ and $\sigma$, are the sample mean and known variability, respectively. The factor v is provided in Tables D-3 and D-4 corresponding to the sample size.

D6.3 Estimate of Percent Nonconforming in Lot. The quality of a lot shall be expressed by $p_U$, the estimated percent nonconforming in the lot above the upper specification limit, or by $p_L$, the estimated percent nonconforming below the lower specification limit. The estimated percent nonconforming $p_U$ or $p_L$ is obtained by entering Table D-5 with $Q_U$ or $Q_L$.

D6.4 Acceptability Criterion. Compare the estimated lot percent nonconforming $p_U$ or $p_L$ with the maximum allowable percent nonconforming M. If $p_U$ or $p_L$ is equal to or less than M, the lot meets the acceptability criterion; if $p_U$ or $p_L$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

## D7. SUMMARY FOR OPERATION OF SAMPLING PLAN WHEN FORM 2 IS USED

The following steps summarize the procedures to be followed:

(1) Determine the sample size code letter from Table A-2 by using the lot size and inspection level.

(2) Obtain plan from Master Table D-3 or D-4 by selecting the sample size n, the factor v, and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

(4) Compute the sample mean $\bar{X}$.

(5) Compute the quality index $Q_U = (U - \bar{X})v/\sigma$ if an upper specification limit U is specified, or $Q_L = (\bar{X} - L)v/\sigma$ if a lower specification limit L is specified.

(6) Determine the estimated lot percent nonconforming $p_U$ or $p_L$ from Table D-5.

(7) If the estimated lot percent nonconforming $p_U$ or $p_L$ is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if $p_U$ or $p_L$ is greater than M or if $Q_U$ or $Q_L$ is negative, then the lot does not meet the acceptability criterion.

[3]See Example D-2 for a complete example of this procedure.

## EXAMPLE D-1
## Example of Calculations
## Single Specification Limit—Form 1
## Variability Known

Example: The specified minimum yield point for certain steel castings is 58,000 psi. A lot of 500 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1.5% is to be used. The variability $\sigma$ is known to be 3000 psi. From Tables A-2 and D-1 it is seen that a sample of size 10 is required. Suppose the yield points of the sample specimens are:

62,500; 60,500; 68,000; 59,000; 65,500
62,000; 61,000; 69,000; 58,000; 64,500;

and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 10 | |
| 2 | Known Variability: $\sigma$ | 3,000 | |
| 3 | Sum of Measurements: $\Sigma X$ | 630,000 | |
| 4 | Sample Mean $\bar{X}$: $\Sigma X/n$ | 63,000 | 630,000/10 |
| 5 | Specification Limit (Lower): L | 58,000 | |
| 6 | The Quantity: $(\bar{X} - L)/\sigma$ | 1.67 | (63,000 – 58,000)/3000 |
| 7 | Acceptability Constant: k | 1.70 | See Table D-1 |
| 8 | Acceptability Criterion: Compare $(\bar{X} - L)/\sigma$ with k | 1.67 < 1.70 | See Para. D3.3 |

The lot does not meet the acceptability criterion, since $(\bar{X} - L)/\sigma$ is less than k.

NOTE: If a single upper specification limit U is given, then compute the quantity $(U - \bar{X})/\sigma$ in line 6 and compare it with k; the lot meets the acceptability criterion if $(U - \bar{X})/\sigma$ is equal to or greater than k.

## EXAMPLE D-2

### Example of Calculations

### Single Specification Limit—Form 2

### *Variability Known*

Example: The specified minimum yield point for certain steel castings is 58,000 psi. A lot of 500 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1.5% is to be used. The variability $\sigma$ is known to be 3000 psi. From Tables A-2 and D-1 it is seen that a sample of size 10 is required. Suppose the yield points of the sample specimens are:

62,500; 60,500; 68,000; 59,000; 65,500;
62,000; 61,000; 69,000; 58,000; 64,500;

and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 10 | |
| 2 | Known Variability: $\sigma$ | 3,000 | |
| 3 | Sum of Measurements: $\Sigma X$ | 630,000 | |
| 4 | Sample Mean $\bar{X}$ : $\Sigma X/n$ | 63,000 | 630,000/10 |
| 5 | Factor: v | 1.054 | |
| 6 | Specification Limit (Lower): L | 58,000 | |
| 7 | Quality Index: $Q_L = (\bar{X} - L)v/\sigma$ | 1.76 | $\frac{(63{,}000 - 58{,}000)1.054}{3{,}000}$ |
| 8 | Est. of Lot Percent: Ncf.: $p_L$ | 3.92% | See Table D-5 |
| 9 | Max. Allowable Percent Ncf.: M | 3.63% | See Table D-3 |
| 10 | Acceptability Criterion: Compare $p_L$ with M | 3.92% > 3.63% | See Para. D6.4 |

The lot does not meet the acceptability criterion, since $p_L$ is greater than M.

NOTE: If a single upper specification limit U is given, then compute the quality index $Q_U = (U - \bar{X})v/\sigma$ in line 7 and obtain the estimate of the percent nonconforming $p_U$. Compare $p_U$ with M; the lot meets the acceptability criterion if $p_U$ is equal to or less than M.

*Table D-1*

Master Table for Normal and Tightened Inspection for Plans Based on Variability Known
(Single Specification Limit—Form 1)

| Sample size code letter | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | | .10 | | .15 | | .25 | | .40 | | .65 | |
| | n | k | n | k | n | k | n | k | n | k | n | k |
| B | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | |
| C | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | |
| D | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 2 | 1.58 |
| E | ↓ | | ↓ | | ↓ | | 2 | 1.94 | 2 | 1.81 | 3 | 1.69 |
| F | ↓ | | ↓ | | 3 | 2.19 | 3 | 2.07 | 3 | 1.91 | 4 | 1.80 |
| G | 3 | 2.49 | 4 | 2.39 | 4 | 2.30 | 4 | 2.14 | 5 | 2.05 | 5 | 1.88 |
| H | 4 | 2.55 | 5 | 2.46 | 5 | 2.34 | 6 | 2.23 | 6 | 2.08 | 7 | 1.95 |
| I | 6 | 2.59 | 6 | 2.49 | 6 | 2.37 | 7 | 2.25 | 8 | 2.13 | 8 | 1.96 |
| J | 7 | 2.63 | 8 | 2.54 | 9 | 2.45 | 9 | 2.29 | 10 | 2.16 | 11 | 2.01 |
| K | 11 | 2.72 | 11 | 2.59 | 12 | 2.49 | 13 | 2.35 | 14 | 2.21 | 16 | 2.07 |
| L | 15 | 2.77 | 16 | 2.65 | 17 | 2.54 | 19 | 2.41 | 21 | 2.27 | 23 | 2.12 |
| M | 20 | 2.80 | 22 | 2.69 | 23 | 2.57 | 25 | 2.43 | 27 | 2.29 | 30 | 2.14 |
| N | 30 | 2.84 | 31 | 2.72 | 34 | 2.62 | 37 | 2.47 | 40 | 2.33 | 44 | 2.17 |
| P | 40 | 2.85 | 42 | 2.73 | 45 | 2.62 | 49 | 2.48 | 54 | 2.34 | 59 | 2.18 |
| | .10 | | .15 | | .25 | | .40 | | .65 | | 1.00 | |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-1—Continued*

Master Table for Normal and Tightened Inspection for Plans Based on Variability Known
(Single Specification Limit—Form 1)

| Sample size code letter | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | | 1.50 | | 2.50 | | 4.00 | | 6.50 | | 10.00 | |
| | n | k | n | k | n | k | n | k | n | k | n | k |
| B | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | |
| C | 2 | 1.36 | 2 | 1.25 | 2 | 1.09 | 2 | .936 | 3 | .755 | 3 | .573 |
| D | 2 | 1.42 | 2 | 1.33 | 3 | 1.17 | 3 | 1.01 | 3 | .825 | 4 | .641 |
| E | 3 | 1.56 | 3 | 1.44 | 4 | 1.28 | 4 | 1.11 | 5 | .919 | 5 | .728 |
| F | 4 | 1.69 | 4 | 1.53 | 5 | 1.39 | 5 | 1.20 | 6 | .991 | 7 | .797 |
| G | 6 | 1.78 | 6 | 1.62 | 7 | 1.45 | 8 | 1.28 | 9 | 1.07 | 11 | .877 |
| H | 7 | 1.80 | 8 | 1.68 | 9 | 1.49 | 10 | 1.31 | 12 | 1.11 | 14 | .906 |
| I | 9 | 1.83 | 10 | 1.70 | 11 | 1.51 | 13 | 1.34 | 15 | 1.13 | 17 | .924 |
| J | 12 | 1.88 | 14 | 1.75 | 15 | 1.56 | 18 | 1.38 | 20 | 1.17 | 24 | .964 |
| K | 17 | 1.93 | 19 | 1.79 | 22 | 1.61 | 25 | 1.42 | 29 | 1.21 | 33 | .995 |
| L | 25 | 1.97 | 28 | 1.84 | 32 | 1.65 | 36 | 1.46 | 42 | 1.24 | 49 | 1.03 |
| M | 33 | 2.00 | 36 | 1.86 | 42 | 1.67 | 48 | 1.48 | 55 | 1.26 | 64 | 1.05 |
| N | 49 | 2.03 | 54 | 1.89 | 61 | 1.69 | 70 | 1.51 | 82 | 1.29 | 95 | 1.07 |
| P | 65 | 2.04 | 71 | 1.89 | 81 | 1.70 | 93 | 1.51 | 109 | 1.29 | 127 | 1.07 |
| | 1.50 | | 2.50 | | 4.00 | | 6.50 | | 10.00 | | | |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-2*

Master Table for Reduced Inspection for Plans Based on Variability Known
(Single Specification Limit—Form 1)

| Sample size code letter | Acceptable Quality Levels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | .10 | | .15 | | .25 | | .40 | | .65 | |
| | n | k | n | k | n | k | n | k | n | k |
| B | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | |
| C | | | | | | | | | | |
| D | | | | | | | | | ↓ | |
| E | | | | | | | | | | |
| F | | | | | | | ↓ | | 2 | 1.36 |
| G | | | ↓ | | ↓ | | 2 | 1.58 | 2 | 1.42 |
| H | ↓ | | 2 | 1.94 | 2 | 1.81 | 3 | 1.69 | 3 | 1.56 |
| I | 3 | 2.19 | 3 | 2.07 | 3 | 1.91 | 4 | 1.80 | 4 | 1.69 |
| J | 4 | 2.30 | 4 | 2.14 | 5 | 2.05 | 5 | 1.88 | 6 | 1.78 |
| K | 5 | 2.34 | 6 | 2.23 | 6 | 2.08 | 7 | 1.95 | 7 | 1.80 |
| L | 6 | 2.37 | 7 | 2.25 | 8 | 2.13 | 8 | 1.96 | 9 | 1.83 |
| M | 7 | 2.38 | 8 | 2.26 | 9 | 2.13 | 10 | 1.99 | 11 | 1.86 |
| N | 12 | 2.49 | 13 | 2.35 | 14 | 2.21 | 16 | 2.07 | 17 | 1.93 |
| P | 17 | 2.54 | 19 | 2.41 | 21 | 2.27 | 23 | 2.12 | 25 | 1.97 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-2—Continued*

Master Table for Reduced Inspection for Plans Based on Variability Known
(Single Specification Limit—Form 1)

| Sample size code letter | Acceptable Quality Levels | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | | 1.50 | | 2.50 | | 4.0 | | 6.5 | | 10.00 | |
| | *n* | k | *n* | k | *n* | k | *n* | k | *n* | k | *n* | k |
| B | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| C | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| D | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| E | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| F | 2 | 1.25 | 2 | 1.09 | 2 | .936 | 3 | .755 | 3 | .573 | 4 | .344 |
| G | 2 | 1.33 | 3 | 1.17 | 3 | 1.01 | 3 | .825 | 4 | .641 | 4 | .429 |
| H | 3 | 1.44 | 4 | 1.28 | 4 | 1.11 | 5 | .919 | 5 | .728 | 6 | .515 |
| I | 4 | 1.53 | 5 | 1.39 | 5 | 1.20 | 6 | .991 | 7 | .797 | 8 | .584 |
| J | 6 | 1.62 | 7 | 1.45 | 8 | 1.28 | 9 | 1.07 | 11 | .877 | 12 | .649 |
| K | 8 | 1.68 | 9 | 1.49 | 10 | 1.31 | 12 | 1.11 | 14 | .906 | 16 | .685 |
| L | 10 | 1.70 | 11 | 1.51 | 13 | 1.34 | 15 | 1.13 | 17 | .924 | 20 | .706 |
| M | 12 | 1.72 | 13 | 1.53 | 15 | 1.35 | 18 | 1.15 | 21 | .942 | 21 | .719 |
| N | 19 | 1.79 | 22 | 1.61 | 25 | 1.42 | 29 | 1.21 | 33 | .995 | 38 | .770 |
| P | 28 | 1.84 | 32 | 1.65 | 36 | 1.46 | 42 | 1.24 | 49 | 1.03 | 56 | .803 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

## Part II
## DOUBLE SPECIFICATION LIMIT

### D8. SAMPLING PLAN FOR DOUBLE SPECIFICATION LIMIT

This part of the Standard describes the procedures for use with plans for a double specification limit when variability of the lot with respect to the quality characteristic is known.

D8.1 Use of Sampling Plans. To determine whether the lot meets the acceptability criterion with respect to a particular quality characteristic and AQL value(s), the applicable sampling plan shall be used in accordance with the provisions of Section A, General Description of Sampling Plans, and those in this part of the Standard.

D8.2 Initial Review for Combined Double Specification Limits. Before implementing a sampling plan for combined double specification limits when the process variability is known, it is mandatory to carry out a check that the process standard deviation, $\sigma$, does not exceed the Maximum Process Standard Deviation (MPSD) derived from Table D-6 that corresponds to the specified AQL. If $\sigma$ is greater than the MPSD, the process average is known to be excessive, and lots shall be judged not acceptable without samples being drawn. If $\sigma$ does not exceed the MPSD, it is an indication that the process average may be acceptable, and sampling inspection should be carried out in order to determine lot acceptability. To make the comparison, the following procedure is recommended:

(1) Determine the standardized MPSD from Table D-6 for the given AQL.

(2) Multiply the standardized MPSD by the specification interval $U - L$ to obtain the MPSD.

(3) Compare the process standard deviation, $\sigma$, with this calculated MPSD.

### D9. SELECTING THE SAMPLING PLAN

A sampling plan for each AQL value shall be selected from Table D-3 or D-4 as follows:

D9.1 Determination of Sample Size Code Letter. The sample size code letter shall be selected from Table A-2 in accordance with paragraph A7.1.

D9.2 Master Sampling Tables. The master sampling tables for plans based on variability known for a double specification limit are Tables D-3 and D-4. Table D-3 is used for normal and tightened inspection and Table D-4 for reduced inspection.

D9.3 Obtaining Sampling Plan. A sampling plan consists of a sample size and an associated maximum allowable percent nonconforming. The sampling plan to be applied in inspection shall be obtained from Master Table D-3 or D-4.

D9.3.1 Sample Size. The sample size n is shown in the master tables corresponding to each sample size code letter and AQL.

D9.3.2 Maximum Allowable Percent Nonconforming. The maximum allowable percent nonconforming for sample estimates of percent nonconforming for the lower, upper, or both specification limits combined, corresponding to the sample size mentioned in paragraph D9.3.1, is shown in the column of the master table corresponding to the applicable AQL value(s). If different AQLs are assigned to each specification limit, designate the maximum allowable percent nonconforming by $M_L$ for the lower limit, and by $M_U$ for the upper limit. If one AQL is assigned to both limits combined, designate the maximum allowable percent nonconforming by M. Table D-3 is entered from the top for normal inspection and from the bottom for tightened inspection. Sampling plans for reduced inspection are provided in Table D-4.

### D10. DRAWING OF SAMPLES

Samples shall be selected in accordance with paragraph A7.2.

### D11. LOT-BY-LOT ACCEPTABILITY PROCEDURES

D11.1 Acceptability Criterion. The degree of conformance of a quality characteristic with respect to a double specification limit shall be judged by the percent of nonconforming product. The percentage of nonconforming product is estimated by entering Table D-5 with the quality index.

D11.2 Computation of Quality Indices. The quality indices $Q_U = (U - \bar{X})v/\sigma$ and $Q_U = (\bar{X} - L)v/\sigma$ shall be computed, where

U is the upper specification limit,
L is the lower specification limit,
v is the factor provided in Tables D-3 and D-4,

$\bar{X}$ is the sample mean, and $\sigma$ is the known variability.

D11.3 Percent Nonconforming in the Lot. The quality of a lot shall be expressed in terms of the lot percent nonconforming. Its estimate will be designated by $p_L$, $p_U$, or p. The estimate $p_U$ indicates conformance with respect to the upper specification limit, $p_L$ with respect to the lower specification limit, and p for both specification limits combined. The estimates $p_L$ and $p_U$ shall be determined by entering Table D-5, respectively with $Q_L$ and $Q_U$. The estimate p shall be determined by adding the corresponding estimated percents nonconforming $p_L$ and $p_U$ found in the table.

## D12. ACCEPTABILITY CRITERION AND SUMMARY FOR OPERATION OF SAMPLING PLANS

D12.1 One AQL value for both Upper and Lower Specification Limit Combined.

D12.1.1 Acceptability Criterion.[4] Compare the estimated lot percent nonconforming $p = p_U + p_L$ with the maximum allowable percent nonconforming M. If p is equal to or less than M, the lot meets the acceptability criterion; if p is greater than M or if $Q_U$ or $Q_L$, or both are negative, then the lot does not meet the acceptability criterion.

D12.1.2 Summary of Operation of Sampling Plan. In cases where a single AQL value is established for the upper and lower specification limit combined for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot size and the inspection level.

(2) Select plan from Master Table D-3 or D-4. Obtain the sample size n, the factor v, and the maximum allowable percent nonconforming M.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit of the sample.

(4) Compute the sample mean $\bar{X}$.

(5) Compute the quality indices $Q_U = (U - \bar{X})v/\sigma$ and $Q_L = (\bar{X} - L)v/\sigma$.

(6) Determine the estimated lot percent nonconforming $p = p_U + p_U$ from Table D-5.

(7) If the estimated lot percent nonconforming p is equal to or less than the maximum allowable percent nonconforming M, the lot meets the acceptability criterion; if p is greater than M or if $Q_U$ or $Q_L$ or both are negative, then the lot does not meet the acceptability criterion.

D12.2 Different AQL Values for Upper and Lower Specification Limit.

D12.2.1 Acceptability Criteria.[5] Compare the estimated lot percents nonconforming $p_L$ and $p_U$ with the corresponding maximum allowable percents nonconforming $M_L$ and $M_U$; also compare $p = p_L + p_U$ with the larger of $M_L$ and $M_U$. If $p_L$ is equal to or less than $M_L$, $p_U$ is equal to or less than $M_U$, and p is equal to or less than the larger of $M_L$ and $M_U$, the lot meets the acceptability criteria; otherwise, the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

D12.2.2 Summary of Operation of Sampling Plan. In cases where a different AQL value is established for the upper and lower specification limit for a single quality characteristic, the following steps summarize the procedures to be used:

(1) Determine the sample size code letter from Table A-2 by using the lot sizes and inspection level.

(2) Select the sampling plan from Master Table D-3 or D-4. Obtain the sample size n and the factor v, corresponding to the larger of the two AQL values, and also the maximum allowable percent nonconforming $M_U$ and $M_L$, corresponding to the AQL values for the upper and lower specification limits, respectively.

(3) Select at random the sample of n units from the lot; inspect and record the measurement of the quality characteristic on each unit in the sample.

(4) Compute the sample mean $\bar{X}$.

(5) Compute the quality indices $Q_U = (U - \bar{X})v/\sigma$ and $Q_U = (\bar{X} - L)v/\sigma$.

[4]See Example D-3a for a complete example of this procedure.

[5]See Example D-4a for a complete example of this procedure.

(6) Determine the estimated lot percents nonconforming $p_U$ and $p_L$ corresponding to the percents nonconforming above the upper and below the lower specification limits. Also determine the combined percent nonconforming $p = p_U + p_L$.

(7) If all three of the following conditions:

(a) $p_U$ is equal to or less than $M_U$,

(b) $p_L$ is equal to or less than $M_L$,

(c) p is equal to or less than the larger of $M_L$ and $M_U$,

are satisfied, the lot meets the acceptability criteria; otherwise, the lot does not meet the acceptability criteria. If either $Q_L$ or $Q_U$ or both are negative, then the lot does not meet the acceptability criteria.

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**EXAMPLE D-3a**

**Example of Calculations**

**Double Specification Limit**

**Variability Known**

**One AQL Value for Both Upper and Lower Specification Limit Combined**

Example: The specified maximum and minimum yield points for certain steel castings are 67,000 and 58,000 psi, respectively. A lot of 500 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1.5% is to be used. The variability $\sigma$ is known to be 3,000 psi.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Upper Specification Limit: U | 67,000 | |
| 2 | Lower Specification Limit: L | 58,000 | |
| 3 | Known Variability: $\sigma$ | 3,000 | |
| 4 | Factor for Maximum Process Standard Deviation for an AQL of 1.5%: $F\,\sigma$ | 0.194 | See Table D-6 |
| 5 | Maximum Process Standard Deviation: MPSD = $F\,\sigma\,(U - L)$ | 1,746 | 0.194 (67,000 – 58,000) |
| 6 | Mandatory check: Compare $\sigma$ with MPSD | 3,000 > 1,746 | |

The process fails the mandatory check that $\sigma$ does not exceed the MPSD, so sampling inspection is pointless and submitted lots should not be accepted.

## EXAMPLE D-3b
## Example of Calculations
## Double Specification Limit
## Variability Known
## One AQL Value for Both Upper and Lower Specification Limit Combined

Example: The specified maximum and minimum yield points for certain steel castings are 70,000 and 54,000 psi, respectively. A lot of 500 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1.5% is to be used. The variability $\sigma$ is known to be 3,000 psi.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Upper Specification Limit: U | 70,000 | |
| 2 | Lower Specification Limit: L | 54,000 | |
| 3 | Known Variability: $\sigma$ | 3,000 | |
| 4 | Factor for Maximum Process Standard Deviation for an AQL of 1.5%: $F\,\sigma$ | 0.194 | See Table D-6 |
| 5 | Maximum Process Standard Deviation: MPSD = $F\,\sigma\,(U - L)$ | 3,104 | 0.194 (70,000 – 54,000) |
| 6 | Mandatory check: Compare $\sigma$ with MPSD | 3,000 > 3,104 | |

The process satisfies the mandatory check that $\sigma$ does not exceed the MPSD. It follows that there is a possibility, though not a certainty, that the lot is acceptable. Lot acceptability is determined by sampling. From Tables A-2 and D-3, it is seen that a sample of size 10 is required. Suppose the yield points of the sample specimens are:

62,500; 60,500; 68,000; 59,000; 65,500;
62,000; 61,000; 69,000; 58,000; 64,500;

and compliance with the acceptability criterion is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 7 | Sample size: n | 10 | See Tables A-2 and D-3 |
| 8 | Sum of Measurements: $\Sigma X$ | 630,000 | |
| 9 | Sample Mean: $\bar{X} = \Sigma X/n$ | 63,000 | 630,000/10 |
| 10 | Factor: v | 1.054 | See Table D-3 |
| 11 | Quality Index: $Q_U = (U - \bar{X})v/\sigma$ | 2.459 | (70,000 – 63,000) 1.054/3,000 |
| 12 | Quality Index: $Q_L = (\bar{X} - L)v/\sigma$ | 3,162 | (63,000 – 54,000) 1.054/3,000 |
| 13 | Est. of Lot % Ncf. Above U: $p_U$ | 0.697% | See Table D-5 |
| 14 | Est. of Lot % Ncf. Below L: $p_L$ | 0.078% | See Table D-5 |
| 15 | Total Est. % Ncf. in Lot: $p = p_U + p_L$ | 0.775% | 0.697% + 0.078% |
| 16 | Max. Allowable Est. % Ncf.: M | 3.63% | See Table D-3 |
| 17 | Acceptability Criterion: Compare p with M | 0.775% < 3.63% | |

The lot meets the acceptability criterion, since $p = p_U + p_L$ is less than M.

**EXAMPLE D-4**

**Example of Calculations**

**Double Specification Limit**

**Variability Known**

**Different AQL Values for Upper and Lower Specification Limits**

Example: The specified maximum and minimum yield points for certain steel castings are 67,000 psi and 58,000 psi, respectively. A lot of 500 items is submitted for inspection. Inspection Level II, normal inspection with AQL = 1% for the upper and AQL = 2.5% for the lower specification limit is to be used. The variability $\sigma$ is known to be 3,000 psi. From Tables A-2 and D-3 it is seen that a sample of size 11 corresponding to the sample size code letter, I, and the AQL value of 2.5% is required. Suppose the yield points of the sample specimens are:

62,500; 60,500; 64,000; 59,000; 65,500;
62,000; 61,000; 60,631; 68,000; 62,000; 63,000

and compliance with the acceptability criteria is to be determined.

| Line | Information Needed | Value Obtained | Explanation |
|---|---|---|---|
| 1 | Sample Size: n | 11 | |
| 2 | Known Variability: $\sigma$ | 3,000 | |
| 3 | Sum of Measurements: $\Sigma X$ | 678,131 | |
| 4 | Sample Mean $\bar{X}$ :$\Sigma X/n$ | 61,648 | 678,131/11 |
| 5 | Factor: v | 1.049 | See Table D-3 |
| 6 | Upper Specification Limit: U | 67,000 | |
| 7 | Lower Specification Limit: L | 58,000 | |
| 8 | Quality Index: $Q_U = (U - \bar{X})v/\sigma$ | 1.87 | (67,000 – 61,648)1.049/3,000 |
| 9 | Quality Index: $Q_L = (\bar{X} - L)v/\sigma$ | 1.28 | (61,648 – 58,000)1.049/3,000 |
| 10 | Est. of Lot Percent Ncf. Above U: $p_U$ | 3.07% | See Table D-5 |
| 11 | Est. of Lot Percent Ncf. Below L: $p_L$ | 10.03% | See Table D-5 |
| 12 | Total Est. Percent Ncf. in Lot $p = p_U + p_L$ | 13.10% | 3.07% + 10.03% |
| 13 | Max. Allowable Percent Ncf. Above U: $M_U$ | 2.59% | See Table D-3 |
| 14 | Max. Allowable Percent Ncf. Below L: $M_L$ | 5.60% | See Table D-3 |
| 15 | Acceptability Criteria: | | |
| | (a) Compare $p_U$ with $M_U$ | 3.07% > 2.59% | See Para. D12.2.2(7)(a) |
| | (b) Compare $p_L$ with $M_L$ | 10.03% > 5.60% | See Para. D12.2.2(7)(b) |
| | (c) Compare p with $M_L$ | 13.10% > 5.60% | See Para. D12.2.2(7)(c) |

The lot does not meet the acceptability criteria, since 15(a), (b) and (c) are not satisfied; i.e., $p_U > M_U$, $p_L > M_L$, and $p > M_L$.

*Table D-3*

## Master Table for Normal and Tightened Inspection for Plans Based on Known Variability (Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | | | .10 | | | .15 | | | .25 | | | .40 | | | .65 | | |
| | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v |
| B | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| C | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| D | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | 2 | 1.28 | 1.414 |
| E | | ↓ | | | ↓ | | | ↓ | | 2 | .310 | 1.414 | 2 | .510 | 1.414 | 4 | 1.94 | 1.225 |
| F | | ↓ | | | ↓ | | 3 | .369 | 1.225 | 3 | .568 | 1.225 | 3 | .959 | 1.225 | 4 | 1.88 | 1.155 |
| G | 3 | .114 | 1.225 | 4 | .290 | 1.155 | 4 | .399 | 1.155 | 4 | .681 | 1.155 | 5 | 1.09 | 1.118 | 5 | 1.76 | 1.118 |
| H | 4 | .161 | 1.155 | 5 | .296 | 1.118 | 5 | .445 | 1.118 | 6 | .721 | 1.095 | 6 | 1.14 | 1.095 | 7 | 1.75 | 1.080 |
| I | 6 | .230 | 1.095 | 6 | .321 | 1.095 | 6 | .478 | 1.095 | 7 | .756 | 1.080 | 8 | 1.14 | 1.069 | 8 | 1.80 | 1.069 |
| J | 7 | .226 | 1.080 | 8 | .330 | 1.069 | 9 | .469 | 1.061 | 9 | .760 | 1.061 | 10 | 1.14 | 1.054 | 11 | 1.73 | 1.049 |
| K | 11 | .217 | 1.049 | 11 | .326 | 1.049 | 12 | .461 | 1.045 | 13 | .721 | 1.041 | 14 | 1.08 | 1.038 | 16 | 1.62 | 1.033 |
| L | 15 | .211 | 1.035 | 16 | .308 | 1.033 | 17 | .438 | 1.031 | 19 | .673 | 1.027 | 21 | 1.00 | 1.025 | 23 | 1.51 | 1.023 |
| M | 20 | .207 | 1.026 | 22 | .296 | 1.024 | 23 | .423 | 1.023 | 25 | .655 | 1.021 | 27 | .980 | 1.019 | 30 | 1.47 | 1.017 |
| N | 30 | .193 | 1.017 | 31 | .283 | 1.017 | 34 | .397 | 1.015 | 37 | .615 | 1.014 | 40 | .921 | 1.013 | 44 | 1.39 | 1.012 |
| P | 40 | .196 | 1.013 | 42 | .285 | 1.012 | 45 | .402 | 1.011 | 49 | .620 | 1.010 | 54 | .920 | 1.009 | 59 | 1.39 | 1.009 |
| | .10 | | | .15 | | | .25 | | | .40 | | | .65 | | | 1.00 | | |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-3—Continued*

Master Table for Normal and Tightened Inspection for Plans Based on Known Variability
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | | | 1.50 | | | 2.50 | | | 4.00 | | | 6.50 | | | 10.00 | | |
| | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v |
| B | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| C | 2 | 2.73 | 1.414 | 2 | 3.90 | 1.414 | 2 | 6.11 | 1.414 | 2 | 9.27 | 1.414 | 3 | 17.74 | 1.225 | 3 | 24.22 | 1.225 |
| D | 2 | 2.23 | 1.414 | 2 | 3.00 | 1.414 | 3 | 7.56 | 1.225 | 3 | 10.79 | 1.225 | 3 | 15.60 | 1.225 | 4 | 22.97 | 1.155 |
| E | 3 | 2.76 | 1.225 | 3 | 3.85 | 1.225 | 4 | 6.99 | 1.155 | 4 | 9.97 | 1.155 | 5 | 15.21 | 1.118 | 5 | 20.80 | 1.118 |
| F | 4 | 2.58 | 1.155 | 4 | 3.87 | 1.155 | 5 | 6.05 | 1.118 | 5 | 8.92 | 1.118 | 6 | 13.89 | 1.095 | 7 | 19.46 | 1.080 |
| G | 6 | 2.57 | 1.095 | 6 | 3.77 | 1.095 | 7 | 5.83 | 1.080 | 8 | 8.62 | 1.069 | 9 | 12.88 | 1.061 | 11 | 17.88 | 1.049 |
| H | 7 | 2.62 | 1.080 | 8 | 3.68 | 1.069 | 9 | 5.68 | 1.061 | 10 | 8.43 | 1.054 | 12 | 12.35 | 1.045 | 14 | 17.36 | 1.038 |
| I | 9 | 2.59 | 1.061 | 10 | 3.63 | 1.054 | 11 | 5.60 | 1.049 | 13 | 8.13 | 1.041 | 15 | 12.04 | 1.035 | 17 | 17.05 | 1.031 |
| J | 12 | 2.49 | 1.045 | 14 | 3.43 | 1.038 | 15 | 5.34 | 1.035 | 18 | 7.72 | 1.029 | 20 | 11.57 | 1.026 | 24 | 16.23 | 1.022 |
| K | 17 | 2.35 | 1.031 | 19 | 3.28 | 1.027 | 22 | 4.98 | 1.024 | 25 | 7.34 | 1.021 | 29 | 10.93 | 1.018 | 33 | 15.61 | 1.016 |
| L | 25 | 2.19 | 1.021 | 28 | 3.05 | 1.018 | 32 | 4.68 | 1.016 | 36 | 6.95 | 1.014 | 42 | 10.40 | 1.012 | 49 | 14.87 | 1.010 |
| M | 33 | 2.12 | 1.016 | 36 | 2.99 | 1.014 | 42 | 4.55 | 1.012 | 48 | 6.75 | 1.011 | 55 | 10.17 | 1.009 | 64 | 14.58 | 1.008 |
| N | 49 | 2.00 | 1.010 | 54 | 2.82 | 1.009 | 61 | 4.35 | 1.008 | 70 | 6.48 | 1.007 | 82 | 9.76 | 1.006 | 95 | 14.09 | 1.005 |
| P | 65 | 2.00 | 1.008 | 71 | 2.82 | 1.007 | 81 | 4.34 | 1.006 | 93 | 6.46 | 1.005 | 1.09 | 9.73 | 1.005 | 127 | 14.02 | 1.004 |
| | 1.50 | | | 2.50 | | | 4.00 | | | 6.50 | | | 10.00 | | | | | |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-4*

Master Table for Reduced Inspection for Plans Based on Known Variability
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Acceptable Quality Levels | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .10 | | | .15 | | | .25 | | | .40 | | | .65 | | |
| | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v |
| B | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| C | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| D | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| E | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | |
| F | | ↓ | | | ↓ | | | ↓ | | | ↓ | | 2 | 2.73 | 1.414 |
| G | | ↓ | | | ↓ | | | ↓ | | 2 | 1.28 | 1.414 | 2 | 2.23 | 1.414 |
| H | | ↓ | | 2 | .310 | 1.414 | 2 | .510 | 1.414 | 3 | 1.94 | 1.225 | 3 | 2.76 | 1.225 |
| I | 3 | .369 | 1.225 | 3 | .568 | 1.225 | 3 | .959 | 1.225 | 4 | 1.88 | 1.155 | 4 | 2.58 | 1.155 |
| J | 4 | .399 | 1.155 | 4 | .681 | 1.155 | 5 | 1.09 | 1.118 | 5 | 1.76 | 1.118 | 6 | 2.57 | 1.095 |
| K | 5 | .445 | 1.118 | 6 | .721 | 1.095 | 6 | 1.14 | 1.095 | 7 | 1.75 | 1.080 | 7 | 2.62 | 1.080 |
| L | 6 | .478 | 1.095 | 7 | .756 | 1.080 | 8 | 1.14 | 1.069 | 8 | 1.80 | 1.069 | 9 | 2.59 | 1.061 |
| M | 7 | .507 | 1.080 | 8 | .791 | 1.069 | 9 | 1.18 | 1.061 | 10 | 1.79 | 1.054 | 11 | 2.57 | 1.049 |
| N | 12 | .461 | 1.045 | 13 | .721 | 1.041 | 14 | 1.08 | 1.038 | 16 | 1.62 | 1.033 | 17 | 2.35 | 1.031 |
| P | 17 | .438 | 1.031 | 19 | .673 | 1.027 | 21 | 1.00 | 1.025 | 23 | 1.51 | 1.023 | 25 | 2.19 | 1.021 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-4— Continued*

Master Table for Reduced Inspection for Plans Based on Known Variability
(Double Specification Limit and Form 2—Single Specification Limit)

| Sample size code letter | Acceptable Quality Levels | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | | | 1.50 | | | 2.50 | | | 4.0 | | | 6.5 | | | 10.00 | | |
| | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v | n | M | v |
| B | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| C | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| D | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| E | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| F | 2 | 3.90 | 1.414 | 2 | 6.11 | 1.414 | 2 | 9.27 | 1.414 | 3 | 17.74 | 1.225 | 3 | 24.22 | 1.225 | 4 | 33.67 | 1.225 |
| G | 2 | 3.00 | 1.414 | 3 | 7.56 | 1.225 | 3 | 10.79 | 1.225 | 3 | 15.60 | 1.225 | 4 | 22.97 | 1.155 | 4 | 31.01 | 1.155 |
| H | 3 | 3.85 | 1.225 | 4 | 6.99 | 1.155 | 4 | 9.97 | 1.155 | 5 | 15.21 | 1.118 | 5 | 20.80 | 1.118 | 6 | 28.64 | 1.095 |
| I | 4 | 3.87 | 1.155 | 5 | 6.05 | 1.118 | 5 | 8.92 | 1.118 | 6 | 13.89 | 1.095 | 7 | 19.46 | 1.080 | 8 | 26.64 | 1.069 |
| J | 6 | 3.77 | 1.095 | 7 | 5.83 | 1.080 | 8 | 8.62 | 1.069 | 9 | 12.88 | 1.061 | 11 | 17.88 | 1.049 | 12 | 24.88 | 1.045 |
| K | 8 | 3.68 | 1.069 | 9 | 5.68 | 1.061 | 10 | 8.43 | 1.054 | 12 | 12.35 | 1.045 | 14 | 17.36 | 1.038 | 16 | 23.96 | 1.033 |
| L | 10 | 3.63 | 1.054 | 11 | 5.60 | 1.049 | 13 | 8.13 | 1.041 | 15 | 12.04 | 1.035 | 17 | 17.05 | 1.031 | 20 | 23.43 | 1.026 |
| M | 12 | 3.61 | 1.045 | 13 | 5.58 | 1.041 | 15 | 8.13 | 1.035 | 18 | 11.88 | 1.029 | 21 | 16.71 | 1.025 | 24 | 23.13 | 1.022 |
| N | 19 | 3.28 | 1.027 | 22 | 4.98 | 1.024 | 25 | 7.34 | 1.021 | 29 | 10.93 | 1.018 | 33 | 15.61 | 1.016 | 38 | 21.77 | 1.013 |
| P | 28 | 3.05 | 1.018 | 32 | 4.68 | 1.016 | 36 | 6.95 | 1.014 | 42 | 10.40 | 1.012 | 49 | 14.87 | 1.010 | 56 | 20.90 | 1.009 |

All AQL values are in percent nonconforming.

↓ Use first sampling plan below arrow; that is, both sample size as well as M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

*Table D-5*

## Table for Estimating the Lot Percentage Nonconforming for Plans Based on Known Variability[1]

| $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | | $Q_U$ or $Q_L$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .00 | 50.000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .01 | 49.601 | .26 | 39.743 | .51 | 30.503 | .76 | 22.363 | 1.01 | 15.625 | 1.26 | 10.383 | 1.51 | 06.552 | 1.76 | 03.920 | 2.01 | 02.222 | 2.26 | 01.191 | 2.51 | 00.604 | 2.76 | 00.289 | 3.01 | 00.131 | 3.26 | 00.056 | 3.51 | 00.022 | 3.76 | 00.008 |
| .02 | 49.202 | .27 | 39.358 | .52 | 30.153 | .77 | 22.065 | 1.02 | 15.386 | 1.27 | 10.204 | 1.52 | 06.426 | 1.77 | 03.836 | 2.02 | 02.169 | 2.27 | 01.160 | 2.52 | 00.587 | 2.77 | 00.280 | 3.02 | 00.126 | 3.27 | 00.054 | 3.52 | 00.022 | 3.77 | 00.008 |
| .03 | 48.803 | .28 | 38.974 | .53 | 29.806 | .78 | 21.770 | 1.03 | 15.150 | 1.28 | 10.027 | 1.53 | 06.301 | 1.78 | 03.754 | 2.03 | 02.118 | 2.28 | 01.130 | 2.53 | 00.570 | 2.78 | 00.272 | 3.03 | 00.122 | 3.28 | 00.052 | 3.53 | 00.021 | 3.78 | 00.008 |
| .04 | 48.405 | .29 | 38.591 | .54 | 29.460 | .79 | 21.476 | 1.04 | 14.917 | 1.29 | 09.853 | 1.54 | 06.178 | 1.79 | 03.673 | 2.04 | 02.068 | 2.29 | 01.101 | 2.54 | 00.554 | 2.79 | 00.264 | 3.04 | 00.118 | 3.29 | 00.050 | 3.54 | 00.020 | 3.79 | 00.008 |
| .05 | 48.006 | .30 | 38.209 | .55 | 29.116 | .80 | 21.186 | 1.05 | 14.686 | 1.30 | 09.860 | 1.55 | 06.057 | 1.80 | 03.593 | 2.05 | 02.018 | 2.30 | 01.072 | 2.55 | 00.539 | 2.80 | 00.256 | 3.05 | 00.114 | 3.30 | 00.048 | 3.55 | 00.019 | 3.80 | 00.007 |
| .06 | 47.608 | .31 | 37.828 | .56 | 28.774 | .81 | 20.897 | 1.06 | 14.457 | 1.31 | 09.510 | 1.56 | 05.938 | 1.81 | 03.515 | 2.06 | 01.970 | 2.31 | 01.044 | 2.56 | 00.523 | 2.81 | 00.248 | 3.06 | 00.111 | 3.31 | 00.047 | 3.56 | 00.019 | 3.81 | 00.007 |
| .07 | 47.210 | .32 | 37.448 | .57 | 28.434 | .82 | 20.611 | 1.07 | 14.231 | 1.32 | 09.342 | 1.57 | 05.821 | 1.82 | 03.438 | 2.07 | 01.923 | 2.32 | 01.017 | 2.57 | 00.508 | 2.82 | 00.240 | 3.07 | 00.107 | 3.32 | 00.045 | 3.57 | 00.018 | 3.82 | 00.007 |
| .08 | 46.812 | .33 | 37.070 | .58 | 28.096 | .83 | 20.327 | 1.08 | 14.007 | 1.33 | 09.176 | 1.58 | 05.705 | 1.83 | 03.362 | 2.08 | 01.876 | 2.33 | 00.990 | 2.58 | 00.494 | 2.83 | 00.233 | 3.08 | 00.103 | 3.33 | 00.043 | 3.58 | 00.017 | 3.83 | 00.006 |
| .09 | 46.414 | .34 | 36.693 | .59 | 27.760 | .84 | 20.045 | 1.09 | 13.786 | 1.34 | 09.012 | 1.59 | 05.592 | 1.84 | 03.288 | 2.09 | 01.831 | 2.34 | 00.964 | 2.59 | 00.480 | 2.84 | 00.226 | 3.09 | 00.100 | 3.34 | 00.042 | 3.59 | 00.017 | 3.84 | 00.006 |
| .10 | 46.017 | .35 | 36.317 | .60 | 27.425 | .85 | 19.766 | 1.10 | 13.567 | 1.35 | 08.851 | 1.60 | 05.480 | 1.85 | 03.216 | 2.10 | 01.786 | 2.35 | 00.939 | 2.60 | 00.466 | 2.85 | 00.219 | 3.10 | 00.097 | 3.35 | 00.040 | 3.60 | 00.016 | 3.85 | 00.006 |
| .11 | 45.620 | .36 | 35.942 | .61 | 27.093 | .86 | 19.489 | 1.11 | 13.350 | 1.36 | 08.691 | 1.61 | 05.370 | 1.86 | 03.144 | 2.11 | 01.743 | 2.36 | 00.914 | 2.61 | 00.453 | 2.86 | 00.212 | 3.11 | 00.094 | 3.36 | 00.039 | 3.61 | 00.015 | 3.86 | 00.006 |
| .12 | 45.224 | .37 | 35.569 | .62 | 26.763 | .87 | 19.215 | 1.12 | 13.136 | 1.37 | 08.534 | 1.62 | 25.262 | 1.87 | 03.074 | 2.12 | 01.700 | 2.37 | 00.889 | 2.62 | 00.440 | 2.87 | 00.205 | 3.12 | 00.090 | 3.37 | 00.038 | 3.62 | 00.015 | 3.87 | 00.005 |
| .13 | 44.828 | .38 | 35.197 | .63 | 26.435 | .88 | 18.943 | 1.13 | 12.924 | 1.38 | 08.379 | 1.63 | 05.155 | 1.88 | 03.005 | 2.13 | 01.659 | 2.38 | 00.866 | 2.63 | 00.427 | 2.88 | 00.199 | 3.13 | 00.087 | 3.38 | 00.036 | 3.63 | 00.014 | 3.88 | 00.005 |
| .14 | 44.433 | .39 | 34.827 | .64 | 26.109 | .89 | 18.673 | 1.14 | 12.714 | 1.39 | 08.226 | 1.64 | 05.050 | 1.89 | 02.938 | 2.14 | 01.618 | 2.39 | 00.842 | 2.64 | 00.415 | 2.89 | 00.193 | 3.14 | 00.084 | 3.39 | 00.035 | 3.64 | 00.014 | 3.89 | 00.005 |
| .15 | 44.038 | .40 | 34.458 | .65 | 25.785 | .90 | 18.406 | 1.15 | 12.507 | 1.40 | 08.076 | 1.65 | 04.947 | 1.90 | 02.872 | 2.15 | 01.578 | 2.40 | 00.820 | 2.65 | 00.402 | 2.90 | 00.187 | 3.15 | 00.082 | 3.40 | 00.034 | 3.65 | 00.013 | 3.90 | 00.005 |
| .16 | 43.644 | .41 | 34.090 | .66 | 25.463 | .91 | 18.141 | 1.16 | 12.302 | 1.41 | 07.927 | 1.66 | 04.846 | 1.91 | 02.807 | 2.16 | 01.539 | 2.41 | 00.798 | 2.66 | 00.391 | 2.91 | 00.181 | 3.16 | 00.079 | 3.41 | 00.032 | 3.66 | 00.013 | 3.91 | 00.005 |
| .17 | 43.251 | .42 | 33.724 | .67 | 25.143 | .92 | 17.879 | 1.17 | 12.100 | 1.42 | 07.780 | 1.67 | 04.746 | 1.92 | 02.743 | 2.17 | 01.500 | 2.42 | 00.776 | 2.67 | 00.379 | 2.92 | 00.175 | 3.17 | 00.076 | 3.42 | 00.031 | 3.67 | 00.012 | 3.92 | 00.004 |
| .18 | 42.858 | .43 | 33.360 | .68 | 24.825 | .93 | 17.619 | 1.18 | 11.900 | 1.43 | 07.636 | 1.68 | 04.648 | 1.93 | 02.680 | 2.18 | 01.463 | 2.43 | 00.755 | 2.68 | 00.368 | 2.93 | 00.169 | 3.18 | 00.074 | 3.43 | 00.030 | 3.68 | 00.012 | 3.93 | 00.004 |
| .19 | 42.465 | .44 | 32.997 | .69 | 24.510 | .94 | 17.361 | 1.19 | 11.702 | 1.44 | 07.493 | 1.69 | 04.551 | 1.94 | 02.619 | 2.19 | 01.426 | 2.44 | 00.734 | 2.69 | 00.357 | 2.94 | 00.164 | 3.19 | 00.071 | 3.44 | 00.029 | 3.69 | 00.011 | 3.94 | 00.004 |
| .20 | 42.074 | .45 | 32.636 | .70 | 24.196 | .95 | 17.106 | 1.20 | 11.507 | 1.45 | 07.353 | 1.70 | 04.457 | 1.95 | 02.559 | 2.20 | 01.390 | 2.45 | 00.714 | 2.70 | 00.347 | 2.95 | 00.159 | 3.20 | 00.069 | 3.45 | 00.028 | 3.70 | 00.011 | 3.95 | 00.004 |
| .21 | 41.683 | .46 | 32.276 | .71 | 23.885 | .96 | 16.853 | 1.21 | 11.314 | 1.46 | 07.214 | 1.71 | 04.363 | 1.96 | 02.500 | 2.21 | 01.355 | 2.46 | 00.695 | 2.71 | 00.336 | 2.96 | 00.154 | 3.21 | 00.066 | 3.46 | 00.027 | 3.71 | 00.010 | 3.96 | 00.004 |
| .22 | 41.294 | .47 | 31.918 | .72 | 23.576 | .97 | 16.602 | 1.22 | 11.123 | 1.47 | 07.078 | 1.72 | 04.272 | 1.97 | 02.442 | 2.22 | 01.321 | 2.47 | 00.676 | 2.72 | 00.326 | 2.97 | 00.149 | 3.22 | 00.064 | 3.47 | 00.026 | 3.72 | 00.010 | 3.97 | 00.004 |
| .23 | 40.905 | .48 | 31.561 | .73 | 23.270 | .98 | 16.354 | 1.23 | 10.935 | 1.48 | 06.944 | 1.73 | 04.182 | 1.98 | 02.385 | 2.23 | 01.287 | 2.48 | 00.657 | 2.73 | 00.317 | 2.98 | 00.144 | 3.23 | 00.062 | 3.48 | 00.025 | 3.73 | 00.010 | 3.98 | 00.003 |
| .24 | 40.517 | .49 | 31.207 | .74 | 22.965 | .99 | 16.109 | 1.24 | 10.749 | 1.49 | 06.811 | 1.74 | 04.093 | 1.99 | 02.330 | 2.24 | 01.255 | 2.49 | 00.639 | 2.74 | 00.307 | 2.99 | 00.139 | 3.24 | 00.060 | 3.49 | 00.024 | 3.74 | 00.009 | 3.99 | 00.003 |
| .25 | 40.129 | .50 | 30.854 | .75 | 22.663 | 1.00 | 15.866 | 1.25 | 10.565 | 1.50 | 06.681 | 1.75 | 04.006 | 2.00 | 02.275 | 2.25 | 01.222 | 2.50 | 00.621 | 2.75 | 00.298 | 3.00 | 00.135 | 3.25 | 00.058 | 3.50 | 00.023 | 3.75 | 00.009 | 4.00 | 00.003 |

[1]Values tabulated are read in percent.

*Table D-6*
Value of $F\sigma$ for Maximum Process Standard Deviation

| AQL (% Ncf) | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $F\sigma$ | 0.147 | 0.152 | 0.157 | 0.165 | 0.174 | 0.184 | 0.194 | 0.206 | 0.223 | 0.243 | 0.271 |

The MPSD may be obtained by multiplying the factor $F\sigma$ by the difference between the upper specification limit U and the lower specification limit L. The formula is MPSD = $F\sigma$ (U – L).

The MPSD indicates the greatest allowable magnitude of the process standard deviation when using plans for the double specification limit case with known variability. If the process standard deviation is less than the MPSD, there is a possibility but not a certainty that the lot will be accepted.

## APPENDIX D
### Definitions

| Symbol | Read | Definitions |
|---|---|---|
| n | | Sample size for a single lot. |
| $\bar{X}$ | X bar | Sample mean. Arithmetic mean of sample measurements from a single lot. |
| $\sigma$ | Sigma | Known variability. The predetermined variability of the quality characteristic which will be used with the variability known acceptability plans. |
| U | | Upper specification limit. |
| L | | Lower specification limit. |
| k | | The acceptability constant given in Tables D-1 and D-2. |
| v | | A factor used in determining the quality indices when using the known variability acceptability plan. The v values are given in TAbles D-3 and D-4. |
| $Q_U$ | Q sub U | Quality Index for use with Table D-5. |
| $Q_L$ | Q sub L | Quality Index for use with Table D-5. |
| $p_U$ | p sub U | Sample estimate of the lot percent nonconforming above U from Table D-5. |
| $p_L$ | p sub L | Sample estimate of the lot percent nonconforming below L from Table D-5. |
| p | | Total sample estimate of the lot percent nonconforming $p = p_U + p_L$. |
| M | | Maximum allowable percent nonconforming for sample estimates given in Tables D-3 and D-4. |
| $M_U$ | M sub U | Maximum allowable percent nonconforming above U given in Tables D-3 and D-4. (For use when different AQL values for U and L are specified.) |
| $M_L$ | M sub L | Maximum allowable percent nonconforming below L given in Tables D-3 and D-4. (For use when different AQL values for U and L are specified.) |
| $\bar{p}$ | p bar | Sample estimates of the process percent nonconforming, i.e., the estimated process average. |
| $\bar{p}_U$ | p bar sub U | The estimated process average for an upper specification limit. |
| $\bar{p}_L$ | p bar sub L | The estimated process average for a lower specification limit. |
| < | Less than | Less than. |
| > | Greater than | Greater than. |
| $\Sigma$ | Sum of | Sum of. |
| T | | AQL symbol denoting plan used exclusively on tightened inspection (provides identification of appropriate OC curve). |

# SECTION E
# APPENDIX
# Match with ANSI Z1.4

## E1. INTRODUCTION

The original version of this variables inspection standard (Z1.9-1972) corresponded directly to the military standard MIL-STD-414 dated 11 June 1957, just as the attributes inspection standard ANSI Z1.4 corresponded to MIL-STD-105D, dated 29 April 1963. The plans contained in these variables and attributes standards were, however, not matched. Subsequent to the promulgation of these standards, the International Organization for Standardization Working Group C, in June 1974, presented a procedure for roughly matching the MIL-STD-414 and MIL-STD-105D Normal plans by a realignment of the MIL-STD-414 code letters.* It is this realignment which is used as a basis of the present ANSI/ASQC Z1.9-1993.

The extent to which the plans of ANSI/ASQC Z1.9-1993 match those of Z1.4 is shown in the following tables which give:

Table 1—Matching Code Letters Table
Table 2—ANSI/ASQC Z1.9-1993 percentage points for the 95, 50, 10th percentiles.
Table 3—ANSI Z1.4 percentage points for the 95, 50, 10th percentiles.
Table 4—Difference between ANSI/ASQC Z1.9-1993 and Z1.4 percentiles.

The percentage points are the percents nonconforming having probability of acceptance equal to the percentiles shown. Table 4 can be employed by the user to determine the practical significance of the difference in the operating characteristics of the corresponding plans in ANSI Z1.4 and ANSI/ASQC Z1.9-1993.

Procedures for switching to and from tightened or reduced inspection were taken directly from MIL-STD-105D, eliminating the use of limit numbers for reduced inspection and also the procedure allowing termination of reduced inspection without either acceptance or rejection criteria being met.

## E2. TABLES

Tables showing the extent to which ANSI/ASQC Z1.9-1993 matches Z1.4 follow.

*Working Group C, ISO/TC69, "Sampling by Variables," April 1974, Draft.

*E2—Tables*

*Table 1*
Matching Code Letters and
ANSI/ASQC Z1.9 Sample Size

| Z1.9-1993 Sample Size, Normal Inspection, Level II | Z1.9-1993 New Code Letter | Z1.9-1993 (414) Old Code Letter | Z1.4 (105D) Matched Code Letter |
|---|---|---|---|
| 3 | B | B | B |
| 4 | C | C | C |
| 5 | D | D | D |
| 7 | E | E | E |
| 10 | F | F | F |
| 15 | G | G | G |
| 20 | H | H | H |
| 25 | I | I | H |
| 35 | J | K | J |
| 50 | K | M | K |
| 75 | L | N | L |
| 100 | M | O | M |
| 150 | N | P | N |
| 200 | P | Q | P |

*Table 2*

## ANSI/ASQC Z1.9-1993 Percentage Points in Terms of Percent Nonconforming

| Probability of Acceptance | Z1.9-1993 Code Letter | Acceptable Quality Level | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| 95.0 | | | | | | | | | 1.04 | 1.89 | 3.52 | 6.02 |
| 50.0 | B | | | | | | | | 16.68 | 20.30 | 25.22 | 30.97 |
| 10.0 | | | | | | | | | 49.34 | 52.83 | 57.24 | 62.08 |
| 95.0 | | | | | | | .44 | .69 | 1.32 | 2.29 | 4.13 | 6.85 |
| 50.0 | C | | | | | | 9.52 | 11.28 | 14.44 | 17.93 | 22.89 | 28.61 |
| 10.0 | | | | | | | 34.88 | 37.26 | 41.15 | 45.05 | 50.13 | 55.55 |
| 95.0 | | | | | | .28 | .46 | .77 | 1.38 | 2.43 | 4.30 | 7.11 |
| 50.0 | D | | | | | 6.34 | 7.82 | 9.71 | 12.47 | 15.97 | 20.75 | 26.40 |
| 10.0 | | | | | | 25.94 | 28.40 | 31.24 | 34.98 | 39.25 | 44.55 | 50.32 |
| 95.0 | | | | .11 | .18 | .32 | .53 | .83 | 1.50 | 2.65 | 4.57 | 7.46 |
| 50.0 | E | | | 2.89 | 3.72 | 4.83 | 6.18 | 7.69 | 10.28 | 13.66 | 18.11 | 23.53 |
| 10.0 | | | | 14.42 | 16.33 | 18.60 | 21.09 | 23.58 | 27.43 | 31.93 | 37.28 | 43.25 |
| 95.0 | | | .07 | .12 | .21 | .36 | .57 | .94 | 1.65 | 2.83 | 4.84 | 7.81 |
| 50.0 | F | | 1.53 | 2.08 | 2.79 | 3.77 | 4.82 | 6.33 | 8.62 | 11.69 | 15.91 | 21.09 |
| 10.0 | | | 7.95 | 9.44 | 11.15 | 13.23 | 15.23 | 17.84 | 21.40 | 25.66 | 30.99 | 36.98 |
| 95.0 | | .06 | .09 | .15 | .25 | .45 | .68 | 1.09 | 1.91 | 3.09 | 5.30 | 8.41 |
| 50.0 | G | .90 | 1.17 | 1.57 | 2.20 | 3.09 | 3.99 | 5.32 | 7.51 | 10.15 | 14.27 | 19.25 |
| 10.0 | | 4.31 | 5.07 | 6.13 | 7.58 | 9.41 | 11.12 | 13.38 | 16.77 | 20.48 | 25.76 | 31.63 |
| 95.0 | | .07 | .11 | .17 | .29 | .49 | .79 | 1.21 | 2.07 | 3.39 | 5.69 | 8.88 |
| 50.0 | H | .76 | 1.01 | 1.38 | 1.90 | 2.69 | 3.66 | 4.81 | 6.86 | 9.51 | 13.49 | 18.31 |
| 10.0 | | 3.16 | 3.85 | 4.73 | 5.88 | 7.46 | 9.23 | 11.14 | 14.25 | 17.94 | 23.01 | 28.70 |
| 95.0 | | .08 | .12 | .20 | .32 | .56 | .85 | 1.28 | 2.23 | 3.61 | 5.98 | 9.27 |
| 50.0 | I | .68 | .89 | 1.28 | 1.73 | 2.53 | 3.39 | 4.47 | 6.54 | 9.12 | 13.00 | 17.74 |
| 10.0 | | 2.55 | 3.08 | 3.99 | 4.93 | 6.46 | 7.97 | 9.73 | 12.81 | 16.34 | 21.24 | 26.82 |
| 95.0 | | .09 | .13 | .23 | .36 | .60 | .94 | 1.40 | 2.38 | 3.80 | 6.21 | 9.65 |
| 50.0 | J | .59 | .76 | 1.10 | 1.54 | 2.21 | 3.05 | 4.05 | 5.98 | 8.41 | 12.10 | 16.82 |
| 10.0 | | 1.90 | 2.29 | 3.02 | 3.87 | 5.10 | 6.50 | 8.07 | 10.85 | 14.11 | 18.71 | 24.23 |
| 95.0 | | .10 | .15 | .26 | .40 | .64 | 1.02 | 1.49 | 2.51 | 4.04 | 6.52 | 10.00 |
| 50.0 | K | .19 | .65 | .98 | 1.37 | 1.94 | 2.76 | 3.68 | 5.48 | 7.90 | 11.45 | 16.00 |
| 10.0 | | 1.36 | 1.70 | 2.35 | 3.07 | 4.03 | 5.33 | 6.72 | 9.23 | 12.39 | 16.72 | 21.98 |
| 95.0 | | .11 | .17 | .27 | .43 | .70 | 1.06 | 1.58 | 2.62 | 4.18 | 6.81 | 10.34 |
| 50.0 | L | .40 | .56 | .82 | 1.19 | 1.74 | 2.43 | 3.34 | 5.02 | 7.29 | 10.84 | 15.24 |
| 10.0 | | .97 | 1.27 | 1.74 | 2.37 | 3.24 | 4.28 | 5.58 | 7.82 | 10.70 | 14.94 | 19.95 |
| 95.0 | | .12 | .18 | .29 | .47 | .74 | 1.12 | 1.66 | 2.73 | 4.31 | 6.97 | 10.51 |
| 50.0 | M | .37 | .51 | .77 | 1.12 | 1.64 | 2.31 | 3.18 | 4.80 | 7.00 | 10.45 | 14.75 |
| 10.0 | | .80 | 1.05 | 1.50 | 2.06 | 2.86 | 3.81 | 5.01 | 7.11 | 9.84 | 13.89 | 18.73 |
| 95.0 | | .13 | .19 | .31 | .48 | .77 | 1.18 | 1.73 | 2.82 | 4.41 | 7.07 | 10.80 |
| 50.0 | N | .32 | .46 | .69 | 1.00 | 1.48 | 2.14 | 2.96 | 4.49 | 6.59 | 9.90 | 14.28 |
| 10.0 | | .62 | .85 | 1.21 | 1.68 | 2.36 | 3.26 | 4.34 | 6.26 | 8.78 | 12.58 | 17.44 |
| 95.0 | | .143 | .210 | .344 | .534 | .84 | 1.25 | 1.86 | 3.00 | 4.66 | 7.40 | 11.22 |
| 50.0 | P | .321 | .445 | .683 | 1.000 | 1.48 | 2.08 | 2.96 | 4.48 | 6.58 | 9.88 | 14.27 |
| 10.0 | | .571 | .763 | 1.116 | 1.567 | 2.22 | 3.02 | 4.12 | 5.98 | 8.45 | 12.19 | 16.98 |

*Table 3*

ANSI/ASQC Z1.4 (MIL-STD-105D) Percentage Points in Terms of Percent Nonconforming

| Probability of Acceptance | Z1.4 Code Letter | Acceptable Quality Level | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| 95.0 | | | | | | | | | | 1.70 | | |
| 50.0 | B | | | | | | | | | 20.6 | | |
| 10.0 | | | | | | | | | | 53.6 | | |
| 95.0 | | | | | | | | | 1.02 | | | 7.63 |
| 50.0 | C | | | | | | | | 12.9 | | | 31.4 |
| 10.0 | | | | | | | | | 36.9 | | | 58.4 |
| 95.0 | | | | | | | | .64 | | | 2.64 | 11.1 |
| 50.0 | D | | | | | | | 8.30 | | | 20.1 | 32.1 |
| 10.0 | | | | | | | | 25.0 | | | 40.6 | 53.9 |
| 95.0 | | | | | | | .394 | | | 2.81 | 6.63 | 11.3 |
| 50.0 | E | | | | | | 5.19 | | | 12.6 | 20.0 | 27.5 |
| 10.0 | | | | | | | 16.2 | | | 26.8 | 36.0 | 44.4 |
| 95.0 | | | | | | .256 | | | 1.80 | 4.22 | 7.13 | 14.0 |
| 50.0 | F | | | | | 3.41 | | | 8.25 | 13.1 | 18.1 | 27.9 |
| 10.0 | | | | | | 10.9 | | | 18.1 | 24.5 | 30.4 | 41.9 |
| 95.0 | | | | | .161 | | | 1.13 | 2.59 | 4.39 | 8.50 | 13.1 |
| 50.0 | G | | | | 2.14 | | | 5.19 | 8.29 | 11.4 | 17.5 | 23.7 |
| 10.0 | | | | | 6.94 | | | 13.38 | 15.8 | 19.7 | 27.1 | 34.1 |
| 95.0 | | | | .103 | | | .712 | 1.66 | 2.77 | 5.34 | 8.20 | 12.9 |
| 50.0 | H | | | 1.38 | | | 3.33 | 5.31 | 7.30 | 11.3 | 15.2 | 21.2 |
| 10.0 | | | | 4.50 | | | 7.56 | 10.3 | 12.9 | 17.8 | 22.4 | 29.1 |
| 95.0 | | | .064 | | | .444 | 1.03 | 1.73 | 3.32 | 5.06 | 7.91 | 11.9 |
| 50.0 | J | | .863 | | | 2.09 | 3.33 | 4.57 | 7.06 | 9.55 | 13.3 | 18.3 |
| 10.0 | | | 2.84 | | | 4.78 | 6.52 | 8.16 | 11.3 | 14.2 | 18.6 | 24.2 |
| 95.0 | | .0410 | | | .284 | .654 | 1.09 | 2.09 | 3.19 | 4.94 | 7.40 | 11.9 |
| 50.0 | K | .554 | | | 1.34 | 2.14 | 2.94 | 4.54 | 6.14 | 8.53 | 11.7 | 17.3 |
| 10.0 | | 1.84 | | | 3.11 | 4.26 | 5.35 | 7.42 | 9.42 | 12.3 | 16.1 | 22.5 |
| 95.0 | | | | .178 | .409 | .683 | 1.31 | 1.99 | 3.09 | 4.62 | 7.45 | |
| 50.0 | L | | | .839 | 1.34 | 1.84 | 2.84 | 3.84 | 5.33 | 7.33 | 10.8 | |
| 10.0 | | | | 1.95 | 2.66 | 3.34 | 4.64 | 5.89 | 7.70 | 10.1 | 14.1 | |
| 95.0 | | | .112 | .259 | .433 | .829 | 1.26 | 1.96 | 2.94 | 4.73 | | |
| 50.0 | M | | .532 | .848 | 1.17 | 1.80 | 2.43 | 3.39 | 4.66 | 6.88 | | |
| 10.0 | | | 1.23 | 1.69 | 2.12 | 2.94 | 3.74 | 4.89 | 6.39 | 8.95 | | |
| 95.0 | | .071 | .164 | .273 | .523 | .796 | 1.23 | 1.85 | 2.98 | | | |
| 50.0 | N | .336 | .535 | .734 | 1.13 | 1.53 | 2.13 | 2.93 | 4.33 | | | |
| 10.0 | | .778 | 1.06 | 1.34 | 1.86 | 2.35 | 3.08 | 4.03 | 5.64 | | | |
| 95.0 | | .102 | .171 | .327 | .498 | .771 | 1.16 | 1.86 | | | | |
| 50.0 | P | .334 | .459 | .709 | .959 | 1.33 | 1.83 | 2.71 | | | | |
| 10.0 | | .665 | .835 | 1.16 | 1.47 | 1.93 | 2.52 | 3.52 | | | | |
| 95.0 | | .109 | .209 | .318 | .494 | .740 | 1.19 | | | | | |
| 50.0 | Q | .294 | .454 | .614 | .853 | 1.17 | 1.73 | | | | | |
| 10.0 | | .534 | .742 | .942 | 1.23 | 1.61 | 2.25 | | | | | |
| 95.0 | | .131 | .199 | .309 | .462 | .745 | | | | | | |
| 50.0 | Q | .284 | .384 | .533 | .733 | 1.08 | | | | | | |
| 10.0 | | .464 | .589 | .770 | 1.01 | 1.41 | | | | | | |

*Table 4*

Difference in Percentage Points—ANSI/ASQC Z1.9-1993 Minus Z1.4 (105D)

| Probability of Acceptance | Z1.4 Code Letter | Z1.9-1993 Code Letter | Acceptable Quality Level | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| 95.0 | | | | | | | | | | | .19 | | |
| 50.0 | B | B | | | | | | | | | −.30 | | |
| 10.0 | | | | | | | | | | | −.77 | | |
| 95.0 | | | | | | | | | | .30 | | | −.78 |
| 50.0 | C | C | | | | | | | | 1.54 | | | −2.79 |
| 10.0 | | | | | | | | | | 4.25 | | | −2.85 |
| 95.0 | | | | | | | | | .13 | | | 1.66 | −3.99 |
| 50.0 | D | D | | | | | | | 1.41 | | | .65 | −5.70 |
| 10.0 | | | | | | | | | 6.24 | | | 3.95 | −3.58 |
| 95.0 | | | | | | | | .136 | | | −.16 | −2.06 | −3.84 |
| 50.0 | E | E | | | | | | .99 | | | 1.06 | −1.89 | −5.70 |
| 10.0 | | | | | | | | 4.89 | | | 5.13 | 1.28 | −1.15 |
| 95.0 | | | | | | | .104 | | | −.15 | −1.39 | −2.29 | −6.19 |
| 50.0 | F | F | | | | | .36 | | | .37 | −1.41 | −2.19 | −6.81 |
| 10.0 | | | | | | | 2.33 | | | 3.30 | 1.16 | .59 | −4.52 |
| 95.0 | | | | | | .089 | | | −.04 | −.68 | −1.30 | −3.20 | −4.69 |
| 50.0 | G | G | | | | .06 | | | .13 | −.76 | −1.25 | −3.23 | −4.45 |
| 10.0 | | | | | | .64 | | | 1.78 | .97 | .78 | −1.34 | −2.47 |
| 95.0 | | | | | .067 | | | .078 | −.45 | −.70 | −1.95 | −2.51 | −4.02 |
| 50.0 | H | H | | | .000 | | | .33 | −.50 | −.44 | −1.79 | −1.71 | −2.89 |
| 10.0 | | | | | .23 | | | 1.67 | .84 | 1.35 | .14 | .61 | −.40 |
| 95.0 | | | | | | | | .138 | −.38 | −.54 | −1.73 | −2.22 | −3.63 |
| 50.0 | I | I | | | | | | .06 | −.84 | −.76 | −2.18 | −2.20 | −3.46 |
| 10.0 | | | | | | | | .41 | −.57 | −.09 | −1.46 | −1.16 | −2.28 |
| 95.0 | | | | .066 | | | .156 | −.09 | −.33 | −.94 | −1.26 | −1.70 | −2.25 |
| 50.0 | J | J | | −.103 | | | .12 | −.28 | −.52 | −1.08 | −1.14 | −1.20 | −1.48 |
| 10.0 | | | | −.55 | | | .32 | −.02 | −.09 | −.45 | −.09 | .11 | .03 |
| 95.0 | | | .059 | | | .116 | −.014 | −.07 | −.60 | −.68 | −.90 | −.88 | −1.90 |
| 50.0 | K | K | −.364 | | | .03 | −.20 | −.18 | −.86 | −.66 | −.63 | −.25 | −1.30 |
| 10.0 | | | −.48 | | | −.04 | −.23 | −.02 | −.70 | −.19 | .09 | .62 | −.52 |
| 95.0 | | | | | .092 | .021 | .017 | −.25 | −.41 | −.47 | −.44 | −.64 | |
| 50.0 | L | L | | | −.019 | −.15 | −.10 | −.41 | −.50 | −.31 | −.04 | .04 | |
| 10.0 | | | | | −.21 | −.29 | −.10 | −.36 | −.31 | .12 | .60 | .84 | |
| 95.0 | | | | .068 | .031 | .037 | −.089 | −.14 | −.30 | −.21 | −.42 | | |
| 50.0 | M | M | | −.022 | −.078 | −.05 | −.16 | −.12 | −.21 | .14 | .12 | | |
| 10.0 | | | | −.18 | −.19 | −.06 | −.08 | .07 | .12 | .72 | .89 | | |
| 95.0 | | | .059 | .026 | .037 | −.043 | −.026 | −.05 | −.12 | −.16 | | | |
| 50.0 | N | N | −.016 | −.075 | −.044 | −.13 | −.05 | .01 | .03 | .16 | | | |
| 10.0 | | | −.158 | −.21 | −.13 | −.18 | −.01 | .18 | .31 | .62 | | | |
| 95.0 | | | .041 | .039 | .017 | .036 | .069 | .09 | .00 | | | | |
| 50.0 | P | P | −.013 | −.014 | −.026 | .041 | .15 | .25 | .25 | | | | |
| 10.0 | | | −.094 | −.072 | −.044 | .097 | .29 | .50 | .60 | | | | |

# AMERICAN NATIONAL STANDARD

## SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES

**AMERICAN SOCIETY FOR QUALITY CONTROL**
611 East Wisconsin Avenue Milwaukee, WI 53202

# AMERICAN NATIONAL STANDARD

## *Sampling Procedures and Tables for Inspection by Attributes*

Prepared by
American Society for Quality Control Standards Committee
For
AMERICAN NATIONAL STANDARDS COMMITTEE
Z-1 ON QUALITY ASSURANCE

Sponsor and Secretariat
AMERICAN SOCIETY FOR QUALITY CONTROL

*Abstract*
Sampling Procedures and Tables for Inspection by Attributes is an acceptance sampling system to be used with switching rules on a continuing stream of lots for AQL specified. It provides tightened, normal, and reduced plans to be applied for attributes inspection for percent nonconforming or nonconformities per 100 units.

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# Foreword

(This foreword is not a part of American National Standard —*Sampling Procedures and Tables for Inspection by Attributes*, Z1.4-1993)

This standard is a revision of ANSI Z1.4-1971, "Sampling Procedures and Tables for Inspection by Attributes," which corresponds directly to MIL-STD-105E. The present revision ANSI/ASQC Z1.4-1993 was undertaken to modernize terminology and to emphasize the system aspect of the procedure through incorporation of the operating characteristic curves and other measures computed for scheme performance reflecting the basic strategy including the switching rules.

All tables, table numbers, and procedures used in MIL-STD-105E were retained. The tables are unchanged to make the tabular content completely compatible with MIL-STD-105E. Modifications from the MIL-STD-105E format beyond editorial refinements include:

1) Substitution of the word "nonconformity" for "defect" throughout, in conformance with ANSI/ASQC A2-1978. Substitution of the word "nonacceptance" for "rejection" when it refers to a result of following the procedure. Forms of the word "reject" are retained when they refer to actions the customer may take. The term "rejection number" is retained when it refers to the nomenclature on Tables II, III, IV and X to be consistent with tables of the same numbers in MIL-STD-105E.

2) Presentation of the switching rules to put them in conformance with ANSI Z1.9-1980, the ANSI version of MIL-STD-414. This includes an option for reduced inspection without use of limit numbers (as in ANSI Z1.9-1980). Use without the limit numbers improves the performance of a scheme by accepting more lots at the AQL, with no change in discrimination below the indifference quality level.

3) Introduction of the following tables:
   - Table XI Average Outgoing Quality Limit Factors for ANSI Z1.4 Scheme Performance (Single Sampling)
   - Table XII Limiting Quality for ANSI Z1.4 Scheme Performance for which $P_a$ = 10 Percent (Single Sampling)
   - Table XIII Limiting Quality for ANSI Z1.4 Scheme Performance for which $P_a$ = 5 Percent (Single Sampling)
   - Table XIV Average Sample Size Tables for ANSI Z1.4 Scheme Performance (Single Sampling)
   - Table XV Scheme Performance with Switching Rules—for each Code Letter showing
     1) Operating Characteristic Curves for ANSI Z1.4 Scheme Performance
     2) Tabulated Values for Operating Characteristic Curves for ANSI Z1.4 Scheme Performance

4) The titles of Tables V-A and V-B have been changed to read, "Approximate values for average outgoing quality limits." These are different from the titles in MIL-STD-105E.

5) The tables contained in this Standard cover situations where the quality level is specified in percentages as low as 0.01%. It should be noted that 0.01% is equal to 100 parts per million (PPM). Sampling procedures for quality levels of fewer PPM are not included in this Standard.

6) Substitution of

Section 2 Definitions and Terminology

for

Section 2 Classification of Defects and Defectives

Reference is made to classification of nonconformities in Section 6.3.

7) Reference to the use of operating properties of the scheme and the meaning of scheme performance is made in Section 11.

8) Addition of Section 11.6 spelling out proper use of individual plans when extracted from the ANSI Z1.4 system as a whole.

9) Addition of Figure 1 showing the switching procedure to enhance understanding of the switching aspect of the system.

10) Addition of replotted OC curves.

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Note: A compatible and interchangeable standard for variables inspection is ANSI Z1.9-1993.

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Suggestions for improvement of this standard will be welcome. They should be sent to the sponsor, ASQC, 611 East Wisconsin Avenue, Milwaukee, WI 53202.

Committee members serving as writers and editors of this standard were:

Joseph M. Califano, Chairperson
Michael Yargosz
August Mundel
Harrison Wadsworth
Edward G. Schilling

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# Tables

# SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES

## 1. SCOPE

**1.1 PURPOSE.** This publication establishes sampling plans and procedures for inspection by attributes. When specified by the responsible authority, this publication shall be referenced in the specification, contract, inspection instructions, or other documents and the provisions set forth herein shall govern. The "responsible authority" shall be designated in one of the above documents, as agreed to by the purchaser and seller or producer and user.

**1.2 APPLICATION.** Sampling plans designated in this publication are applicable, but not limited, to inspection of the following:

a. End items.

b. Components and raw materials.

c. Operations

d. Materials in process.

e. Supplies in storage.

f. Maintenance operations.

g. Data or records.

h. Administrative procedures.

These plans are intended primarily to be used for a continuing series of lots or batches. The plans may also be used for the inspection of isolated lots or batches, but, in this latter case, the user is cautioned to consult the operating characteristic curves to find a plan which will yield the desired protection (see 11.6).

**1.3 INSPECTION.** Inspection is the process of measuring, examining, testing, or otherwise comparing the unit of product (see 1.5) with the requirements.

**1.4 INSPECTION BY ATTRIBUTES.** Inspection by attributes is inspection whereby either the unit of product is classified simply as conforming or nonconforming, or the number of nonconformities in the unit of products is counted, with respect to a given requirement or set of requirements.

**1.5 UNIT OF PRODUCT.** The unit of product is the unit inspected in order to determine its classification as conforming or nonconforming or to count the number of nonconformities. It may be a single article, a pair, a set, a length, an area, an operation, a volume, a component of an end product, or the end product itself. The unit of product may or may not be the same as the unit of purchase, supply, production, or shipment.

## 2. DEFINITIONS AND TERMINOLOGY

The definitions and terminology employed in this standard are in accord with ANSI/ASQC Standard A2-1987 (Terms, Symbols, and Definitions for Acceptance Sampling). The following two definitions are particularly important in applying the standard.

DEFECT: A departure of a quality characteristic from its intended level or state that occurs with a severity sufficient to cause an associated product or service not to satisfy intended normal, or fore seeable, usage requirements.

NONCONFORMITY: A departure of a quality characteristic from its intended level or state that occurs with severity sufficient to cause an associated product or service not to meet a specification requirement.

These acceptance sampling plans for attributes are given in terms of the percent or proportion of product in a lot or batch that depart from some requirement. The general terminology used within the document will be given in terms of percent of nonconforming units or number of nonconformities, since these terms are likely to constitute the most widely used criteria for acceptance sampling.

In the use of this standard it is helpful to distinguish between:

a. an individual sampling plan—a specific plan that states the sample size or sizes to be used, and the associated acceptance criteria.

b. a sampling scheme—a combination of sampling plans with switching rules and possi bly a provision for discontinuance of inspection. In this standard the terms "sampling scheme" and "scheme performance" will be used in the restricted sense described in Sec. 11.1.

c. a sampling system—a collection of sampling schemes. This standard is a sampling system indexed by lot-size ranges, inspection levels, and AQLs.

## 3. PERCENT NONCONFORMING AND NONCONFORMITIES PER HUNDRED UNITS

**3.1 EXPRESSION OF NONCONFORMANCE.** The extent of nonconformance of product shall be expressed either in terms of percent nonconforming or in terms of nonconformities per hundred units.

**3.2 PERCENT NONCONFORMING.** The percent nonconforming of any given quantity of units of product is one hundred times the number of nonconforming units divided by the total number of units of product, i.e.:

$$\text{Percent nonconforming} = \frac{\text{Number nonconforming}}{\text{Number of units inspected}} \times 100$$

**3.3 NONCONFORMITIES PER HUNDRED UNITS.** The number of nonconformities per hundred units of any given quantity of units of product is one hundred times the number of nonconformities contained therein (one or more nonconformities being possible in any unit of product) divided by the total number of units of product, i.e.:

$$\text{Nonconformities per hundred units} = \frac{\text{Number of nonconformities}}{\text{Number of units inspected}} \times 100$$

It is assumed that nonconformities occur randomly and with statistical independence within and between units.

## 4. ACCEPTABLE QUALITY LEVEL (AQL)

**4.1 USE.** The AQL together with the Sample Size Code Letter, is used for indexing the sampling plans provided herein.

**4.2 DEFINITION.** The AQL is the maximum percent nonconforming (or the maximum number of nonconformities per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average (see 11.2).

**4.3 NOTE ON THE MEANING OF AQL.** When a consumer designates some specific value of AQL for a certain nonconformity or group of nonconformities, it indicates to the supplier that the consumer's acceptance sampling plan will accept the great majority of the lots or batches that the supplier submits, provided the process average level of percent nonconforming (or nonconformities per hundred units) in these lots or batches be no greater than the designated value of AQL. Thus, the AQL is a designated value of percent nonconforming (or nonconformities per hundred units) that the consumer indicates will be accepted most of the time by the acceptance sampling procedure to be used. The sampling plans provided herein are so arranged that the probability of acceptance at the designated AQL value depends upon the sample size, being generally higher for large samples than for small ones, for a given AQL.

Note that AQL is a parameter of the sampling scheme and should not be confused with process average which describes the operating level of the manufacturing process. It is expected that the process average will be less than or equal to the AQL to avoid excessive rejections under this system.

It is necessary to refer to the operating characteristic curves of the scheme and its constituent plans, to determine what protection the consumer will have.

The AQL alone does not describe the protection to the consumer for individual lots or batches, but more directly relates to what might be expected from a series of lots or batches, provided the steps indicated in this publication are taken.

**4.4 LIMITATION.** The designation of an AQL shall not imply that the supplier has the right to knowingly supply any nonconforming unit of product.

**4.5 SPECIFYING AQLs.** The AQL to be used will be designated in the contract or by the responsible authority. Different AQLs may be designated for groups of nonconformities considered collectively, or for individual nonconformities. For example, Group A may include nonconformities of a type felt to be of the highest concern for the product or service and therefore be assigned a small AQL value; Group B may include nonconformities of the next highest degree of concern and therefore be assigned a larger AQL value than for Group A and smaller than that of Group C, etc. The classification into groups should be appropriate to the quality requirements of the specific situation. An AQL for a group of nonconformities may be designated in addition to AQLs for individual nonconformities,

or subgroups, within that group. AQL values of 10.0 or less may be expressed either in percent nonconforming or in nonconformities per hundred units; those over 10.0 shall be expressed in nonconformities per hundred units only.

**4.6 PREFERRED AQLs.** The values of AQLs given in these tables are known as preferred AQLs. If, for any product, an AQL be designated other than a preferred AQL, these tables are not applicable.

## 5. SUBMISSION OF PRODUCT

**5.1 LOT OR BATCH.** The term lot or batch shall mean "inspection lot" or "inspection batch," i.e., a collection of units of product from which a sample is to be drawn and inspected to determine conformance with the acceptability criteria, and may differ from a collection of units designated as a lot or batch for other purposes (e.g., production, shipment, etc).

**5.2 FORMATION OF LOTS OR BATCHES.** The product shall be assembled into identifiable lots, sublots, batches, or in such other manner as may be prescribed (see 5.4). Each lot or batch shall, as far as is practicable, consist of units of product of a single type, grade, class, size, and composition, manufactured under essentially the same conditions, and at essentially the same time.

**5.3 LOT OR BATCH SIZE.** The lot or batch size is the number of units of product in a lot or batch.

**5.4 PRESENTATION OF LOTS OR BATCHES.** The formation of the lots or batches, lot or batch size, and the manner in which each lot or batch is to be presented and identified by the supplier shall be designated or approved by the responsible authority. As necessary, the supplier shall provide adequate and suitable storage space for each lot or batch, equipment needed for proper identification and presentation, and personnel for all handling of product required for drawing of samples.

## 6. ACCEPTANCE AND NON-ACCEPTANCE

**6.1 ACCEPTABILITY OF LOTS OR BATCHES.** Acceptability of a lot or batch will be determined by the use of a sampling plan or plans associated with the designated AQL or AQLs.

In the use of this standard a statement that a lot is acceptable means simply that sample results satisfy the standard's acceptance criteria. The acceptance of a lot is not intended to provide information about lot quality. If a stream of lots from a given process is inspected under an acceptance sampling scheme such as provided in this standard, some lots will be accepted and others will not. If all incoming lots are assumed to be at the same process average and if the nonconforming items that are discovered and replaced by conforming items during sample inspection are ignored, it will be found that both the set of accepted lots and the set of non-accepted lots will have the same long run average quality as the original set of lots submitted for inspection. Inspection of incoming lots whose quality levels vary around a fixed long run average quality level will divide the lots into a set of accepted lots and a set of non-accepted lots, but it will be found that the long run average quality of the accepted lots is only slightly better than the long run average quality of the non-accepted lots. Replacement of the nonconforming items that are discovered during sample inspection does not alter this finding because the samples are a small fraction of the lots.

The purpose of this standard is, through the economic and psychological pressure of lot non-acceptance, to induce a supplier to maintain a process average at least as good as the specified AQL while at the same time providing an upper limit on the consideration of the consumer's risk of accepting occasional poor lots. The standard is not intended as a procedure for estimating lot quality or for segregating lots.

In acceptance sampling, when sample data do not meet the acceptance criteria, it is often stated that the lot is to be "rejected". In this connection, the words "to reject" generally are used. Rejection in an acceptance sampling sense means to decide that a batch, lot or quantity of product, material or service has not been shown to satisfy the acceptance criteria based on the information obtained from the sample(s).

In acceptance sampling, the words "to reject" generally are used to mean "to not accept" without direct implication of product usability. Lots which are "rejected" may be scrapped, sorted (with or without nonconforming units being replaced), reworked, re-evaluated against more specific usability criteria, held for additional information, etc. Since the common language usage of "reject" often results in an inference of unsafe or unusable product, it is recommended that "not accept" be understood rather than "reject" in the use of this standard.

The word "non-acceptance" is used here for "rejection" when it refers to the result of following the procedure. Forms of the word "reject" are retained when they refer to actions the customer may take, as in "rejection number".

**6.2 NONCONFORMING UNITS.** The right is reserved to reject any unit of product found nonconforming during inspection whether that unit of product forms a part of a sample or not, and whether the lot or batch as a whole is accepted or rejected. Rejected units may be repaired or corrected and resubmitted for inspection with the approval of, and in the manner specified by, the responsible authority.

**6.3 SPECIAL RESERVATION FOR DESIGNATED NONCONFORMITIES.** Since most acceptance sampling involves evaluation of more than one quality characteristic, and since these may differ in importance in terms of quality and/or economic effects, it is often desirable to classify the types of nonconformity according to agreed upon groupings. Specific assignment of types of nonconformities to each class is a function of agreement on specific sampling applications. In general, the function of such classification is to permit the use of a set of sampling plans having a common sample size, but different acceptance numbers for each class having a different AQL, such as in Tables II, III, and IV.

The supplier may be required at the discretion of the responsible authority to inspect every unit of the lot or batch for designated classes of nonconformities. The right is reserved to inspect every unit submitted by the supplier for specified nonconformities, and to reject the lot or batch immediately, when a nonconformity of this class is found. The right is reserved also to sample, for specified classes of nonconformities, lots or batches submitted by the supplier and to reject any lot or batch if a sample drawn therefrom is found to contain one or more of these nonconformities.

**6.4 RESUBMITTED LOTS OR BATCHES.** Lots or batches found unacceptable shall be resubmitted for reinspection only after all units are re-examined or re-tested and all nonconforming units are removed or nonconformities corrected. The responsible authority shall determine whether normal or tightened inspection shall be used on reinspection and whether reinspection shall include all types or classes of nonconformities or only the particular types or classes of nonconformities which caused initial rejection.

## 7. DRAWING OF SAMPLES

**7.1 SAMPLE.** A sample consists of one or more units of product drawn from a lot or batch, the units of the sample being selected at random without regard to their quality. The number of units of product in the sample is the sample size.

**7.2 SAMPLING.** When appropriate, the number of units in the sample shall be selected in proportion to the size of sublots or subbatches, or parts of the lot or batch, identified by some rational criterion. In so doing, the units from each part of the lot or batch shall be selected at random, as defined in ANSI/ASQC Standard A2-1987.

**7.3 TIME OF SAMPLING.** Samples may be drawn after all the units comprising the lot or batch have been produced, or samples may be drawn during production of the lot or batch.

**7.4 DOUBLE OR MULTIPLE SAMPLING.** When double or multiple sampling is to be used, each sample shall be selected over the entire lot or batch.

## 8. NORMAL, TIGHTENED AND REDUCED INSPECTION

**8.1 INITIATION OF INSPECTION.** Normal inspection will be used at the start of inspection unless otherwise directed by the responsible authority.

**8.2 CONTINUATION OF INSPECTION.** Normal, tightened or reduced inspection shall continue unchanged on successive lots or batches except where the switching procedures given below require change.

**8.3 SWITCHING PROCEDURES.**

**8.3.1 NORMAL TO TIGHTENED.** When normal inspection is in effect, tightened inspection shall be instituted when 2 out of 5 consecutive lots or batches have been non-acceptable on original inspection (i.e., ignoring resubmitted lots or batches for this procedure).

**8.3.2 TIGHTENED TO NORMAL.** When tightened inspection is in effect, normal inspection shall be instituted when 5 consecutive lots or batches have been considered acceptable on original inspection.

**8.3.3 NORMAL TO REDUCED.** When normal inspection is in effect, reduced inspection shall be instituted providing that all of the following conditions are satisfied:

a. The preceding 10 lots or batches (or more, as indicated by the note to Table VIII) have been on normal inspection and all have been accepted on original inspection; and

b. The total number of nonconforming units (or nonconformities) in the samples from the preceding 10 lots or batches (or such other number as was used for condition "a" above) is equal to or less than the applicable number given in Table VIII. If double or multiple sampling is in use, all samples inspected should be included, not "first" samples only; and

c. Production is at a steady rate; and

d. Reduced inspection is considered desirable by the responsible authority.

**8.3.4 REDUCED TO NORMAL.** When reduced inspection is in effect, normal inspection shall be instituted if any of the following occur on original inspection:

a. A lot or batch is rejected; or

b. A lot or batch is considered acceptable under the procedures for reduced inspection given in 10.1.4; or

c. Production becomes irregular or delayed; or

d. Other conditions warrant that normal inspection shall be instituted.

**8.4 DISCONTINUATION OF INSPECTION.** In the event that 10 consecutive lots or batches remain on tightened inspection (or such other number as may be designated by the responsible authority), inspection under the provisions of this document should be discontinued pending action to improve the quality of submitted material.

**8.5 LIMIT NUMBERS FOR REDUCED INSPECTION.** When agreed upon by responsible authority for both parties to the inspection, that is, the supplier and the end item customer, the requirements of 8.3.3b may be dropped. This action will have little effect on the operating properties of the scheme.

**8.6 SWITCHING SEQUENCE.** A schematic diagram describing the sequence of application of the switching rules is shown in Figure 1.

## 9. SAMPLING PLANS

**9.1 SAMPLING PLAN.** A sampling plan indicates the number of units of product from each lot or batch which are to be inspected (sample size or series of sample sizes) and the criteria for determining the acceptability of the lot or batch (acceptance and rejection numbers).

**9.2 INSPECTION LEVEL.** The inspection level determines the relationship between the lot or batch size and the sample size. The inspection level to be used for any particular requirement will be prescribed by the responsible authority. Three inspection levels: I, II and III are given in Table I for general use. Unless otherwise specified, Inspection Level II will be used. However, Inspection Level I may be specified when less discrimination is needed, or Level III may be specified for greater discrimination. Four additional special levels: S-1, S-2, S-3, and S-4, are given in the same table and may be used where relatively small sample sizes are necessary and large sampling risks can or must be tolerated.

**NOTE:** In the designation of inspection levels S-1 to S-4, care must be exercised to avoid AQLs inconsistent with these inspection levels.

**9.3 CODE LETTERS.** Sample sizes are designated by code letters. Table I shall be used to find the applicable code letter for the particular lot or batch size and the prescribed inspection level.

**9.4 OBTAINING SAMPLING PLAN.** The AQL and the code letter shall be used to obtain the sampling plan from Tables II, III, or IV. When no sampling plan is available for a given combination of AQL and code letter, the tables direct the user to a different letter. The sample size to be used is given by the new code letter not by the original letter. If this procedure leads to different sample sizes for different classes of nonconformities, the code letter corresponding to the largest sample size derived may be used for all classes of nonconformities when designated or approved by the responsible authority. As an alternative to a single sampling plan with an acceptance number of 0, the plan with an acceptance number of 1 with its correspondingly larger sample size for a designated AQL (where available), may be used when designated or approved by the responsible authority.

**9.5 TYPES OF SAMPLING PLANS.** Three types of sampling plans: Single, Double and Multiple, are given in Tables II, III and IV, respectively. When several types of plans are available for a given AQL and code letter, any one may be used. A decision as to type of plan, either single, double, or multiple, when available for a given AQL and code letter, will usually be based upon the comparison between the administrative difficulty and the average sample sizes of the available plans. The average sample size of multiple plans is less than for double (except in the case corresponding to single acceptance number 1) and both of these are always less than a single sample size (see Table IX). Usually the administrative difficulty for single sam-

pling and the cost per unit of the sample are less than for double or multiple.

## 10. DETERMINATION OF ACCEPTABILITY

**10.1 PERCENT NONCONFORMING INSPECTION.** To determine acceptability of a lot or batch under percent nonconforming inspection, the applicable sampling plan shall be used in accordance with 10.1.1, 10.1.2, 10.1.3 and 10.1.4.

**10.1.1 SINGLE SAMPLING PLAN.** The number of sample units inspected shall be equal to the sample size given by the plan. If the number of nonconforming units found in the sample is equal to or less than the acceptance number, the lot or batch shall be considered acceptable. If the number of nonconforming units is equal to or greater than the rejection number, the lot or batch shall be considered not acceptable.

**10.1.2 DOUBLE SAMPLING PLAN.** The number of sample units first inspected shall be equal to the first sample size given by the plan. If the number of nonconforming units found in the first sample is equal to or less than the first acceptance number, the lot or batch shall be considered acceptable. If the number of nonconforming units found in the first sample is equal to or greater than the first rejection number, the lot or batch shall be considered not acceptable. If the number of nonconforming units found in the first sample is between the first acceptance and rejection numbers, a second sample of the size given by the plan shall be inspected. The number of nonconforming units found in the first and second samples shall be accumulated. If the cumulative number of nonconforming units is equal to or less than the second acceptance number, the lot or batch shall be considered acceptable. If the cumulative number of nonconforming units is equal to or greater than the second rejection number, the lot or batch shall be considered not acceptable.

**10.1.3 MULTIPLE SAMPLE PLAN.** Under multiple sampling, the procedure shall be similar to that specified in 10.1.2, except that the number of successive samples required to reach a decision might be more than two.

**10.1.4 SPECIAL PROCEDURE FOR REDUCED INSPECTION.** Under reduced inspection, the sampling procedure may terminate without making a decision. In these circumstances, the lot or batch will be considered acceptable, but normal inspection will be reinstated starting with the next lot or batch (see 8.3.4(b)).

**10.2 NONCONFORMITIES PER HUNDRED UNITS INSPECTION.** To determine the acceptability of a lot or batch under Nonconformities per Hundred Units inspection, the procedure specified for Percent Nonconforming inspection above shall be used, except that the word "nonconformities" shall be substituted for "nonconforming units".

## 11. SUPPLEMENTARY INFORMATION

**11.1 OPERATING CHARACTERISTIC CURVES.** Operating characteristic curves and other measures of performance presented in this standard are of two types. Those for the individual plans that represent the elements of the schemes are presented in Tables V, VI, VII, IX, and X. Analogous curves and other measures of overall scheme performance when the switching rules are used are given in Tables XI, XII, XIII, XIV, and XV. Scheme performance is defined as the composite proportion of lots accepted at a stated percent nonconforming when the switching rules are applied. The term scheme performance is used here in a very restrictive sense. It refers to how the ANSI Z1.4 scheme of switching rules would operate at a given process level under the assumption that the process stays at that level even after switching to tightened inspection or discontinuation of inspection. This gives a conservative "worst case" description of the performance of the scheme for use as a base-line in the sense that if the psychological and economic pressures associated with the switching rules are considered, the protection of the scheme may be somewhat better than that shown.

Operating characteristic curves are given in Table X for individual sampling plans for normal and tightened inspection. The operating characteristic curve for unqualified acceptance under reduced inspection can be found by using the AQL index of the normal plan with the sample size(s) and acceptance number(s) of the reduced plan. The curves shown are for single sampling; curves for double and multiple sampling are matched as closely as practicable. The O.C. curves shown for AQLs greater than 10.0 are based on the Poisson distribution and apply for nonconformities per hundred units inspection; those for AQLs of 10.0 or less and sample sizes of 80 or less are based on the binomial distribution and apply for percent nonconforming inspection; those for AQLs of 10.0 or less and sample sizes larger than 80 are based on the Poisson distribution and apply either for nonconformities per hundred units inspection, or for percent nonconforming inspection (the Poisson distribution being an adequate approximation to the binomial distribution under these conditions). Tabulated values corresponding to selected values of probabilities of acceptance

($P_a$ in percent) are given for each of the curves shown, and, in addition, are indexed for tightened inspection, and also show values for nonconformities per hundred units for AQLs of 10.0 or less and sample sizes of 80 or less.

The operating characteristic curves for scheme performance shown in Table XV indicate the percentage of lots or batches which may be expected to be accepted under use of the switching rules with the various sampling plans for a given process quality subject to the restrictions stated above. The operating characteristic curves of scheme performance are based on the use of limit numbers in switching to reduced inspection and are approximately correct when the limit numbers for reduced inspection are not used under Option 8.5. The curves also assume a return to tightened inspection when inspection is resumed after discontinuation has been imposed. This is also true of average outgoing quality limit and average sample size for ANSI Z1.4 scheme performance.

Note that the operating characteristic curve for scheme performance is approximately that of the normal plan for low levels of percent nonconforming and that of the tightened plan for high levels of percent nonconforming. Use of the reduced plan increases scheme probability of acceptance only for extremely low levels of percent nonconforming.

**11.2 PROCESS AVERAGE.** The process average is the average percent nonconforming or average number of nonconformities per hundred units (whichever is applicable) of product submitted by the supplier for original inspection. Original inspection is the first inspection of a particular quantity of product as distinguished from the inspection of product which has been resubmitted after prior rejection. When double or multiple sampling is used, only first sample results shall be included in the process average calculation.

**11.3 AVERAGE OUTGOING QUALITY (AOQ).** The AOQ is the average quality of outgoing product including all accepted lots or batches, plus all lots or batches which are not accepted after such lots or batches have been effectively 100 percent inspected and all nonconforming units replaced by conforming units.

**11.4 AVERAGE OUTGOING QUALITY LIMIT (AOQL).** The AOQL is the maximum of the AOQs for all possible incoming qualities for a given acceptance sampling plan. AOQL values are given in Table V-A for each of the single sampling plans for normal inspection and in Table V-B for each of the single sampling plans for tightened inspection. AOQL values for ANSI Z1.4 scheme performance are given in Table XI subject to the restrictions of 11.1. They show the average outgoing quality limits for scheme performance when using single sampling. AOQL will be slightly higher when the limit numbers for reduced inspection are not used under Option 8.5.

**11.5 AVERAGE SAMPLE SIZE CURVES.** Average sample size curves for double and multiple sampling as compared to the single sampling plan for each acceptance number are in Table IX. These show the average sample sizes which may be expected to occur under the various sampling plans for a given process quality level. The curves assume no curtailment of inspection and are approximate to the extent that they are based upon the Poisson distribution, and that the sample sizes at each stage for double and multiple sampling are assumed to be 0.631n and 0.25n respectively, where n is the equivalent single sample size. Average sample size tables for ANSI Z1.4 scheme performance are given in Table XIV. They show the average sample size for scheme performance when using single sampling.

**11.6 LIMITING QUALITY PROTECTION.**

**11.6.1 USE OF INDIVIDUAL PLANS.** This standard is intended to be used as a system employing tightened, normal, and reduced inspection on a continuing series of lots to achieve consumer protection while assuring the producer that acceptance will occur most of the time if quality is better than the AQL.

**11.6.2 IMPORTANCE OF SWITCHING RULES.** Occasionally specific individual plans are selected from the standard and used without the switching rules. This is not the intended application of the ANSI Z1.4 system and its use in this way should not be referred to as inspection under ANSI Z1.4. When employed in this way, this document simply represents a repository for a collection of individual plans indexed by AQL. The operating characteristics and other measures of a plan so chosen must be assessed individually for that plan from the tables provided.

**11.6.3 LIMITING QUALITY TABLES.** If the lot or batch is of an isolated nature, it is desirable to limit the selection of sampling plans to those, associated with a designated AQL value, that provide not less than a specified limiting quality protection. Sampling plans for this purpose can be selected by choosing a Limiting Quality (LQ) and a consumer's risk to be associated with it. Limiting Quality is the percentage of nonconforming units (or nonconformities) in a batch or lot for which for purposes of acceptance sampling, the consumer wishes the probability of acceptance to be restricted to a specified low value.

Tables VI and VII give process levels for which the probabilities of lot acceptance under various sampling plans are 10 percent and 5 percent respectively. If a different value of consumer's risk is required, the O.C. curves and their tabulated values may be used. For individual lots with percents *nonconforming or nonconformities per 100 units equal to* the specified Limiting Quality (LQ) values, the probabilities of lot acceptance are less than 10 percent in the case of plans listed in Table VI and less than 5 percent in the case of plans listed in Table VII. When there is reason for avoiding more than a limiting percentage of nonconforming units (or nonconformities) in a lot or batch, Tables VI and VII may be useful for fixing minimum sample sizes to be associated with the AQL and Inspection Level specified for the inspection of a series of lots or batches. For example, if an LQ of 5 percent is desired for individual lots with an associated $P_a$ of 10 percent or less, then if an AQL of 1.5 percent is designated for inspection of a series of lots or batches, Table VI indicates that the minimum sample size must be that given by Code Letter M.

Where there is interest in a limiting *process level,* Tables XII and XIII, which give LQ values and ANSI Z1.4 scheme performance, may be used in a similar way to fix minimum sample sizes.

In the case of an isolated lot, it is preferable for the customer to adapt a sampling plan with a small consumer's risk. The ideal method of calculating the sample size and risk is by use of the hypergeometric probability function. ANSI/ASQC Q3 contains sampling plans that have been calculated on this basis and therefore provide a more accurate set of tables for these situations.

## Switching Rules for ANSI Z1.4 System

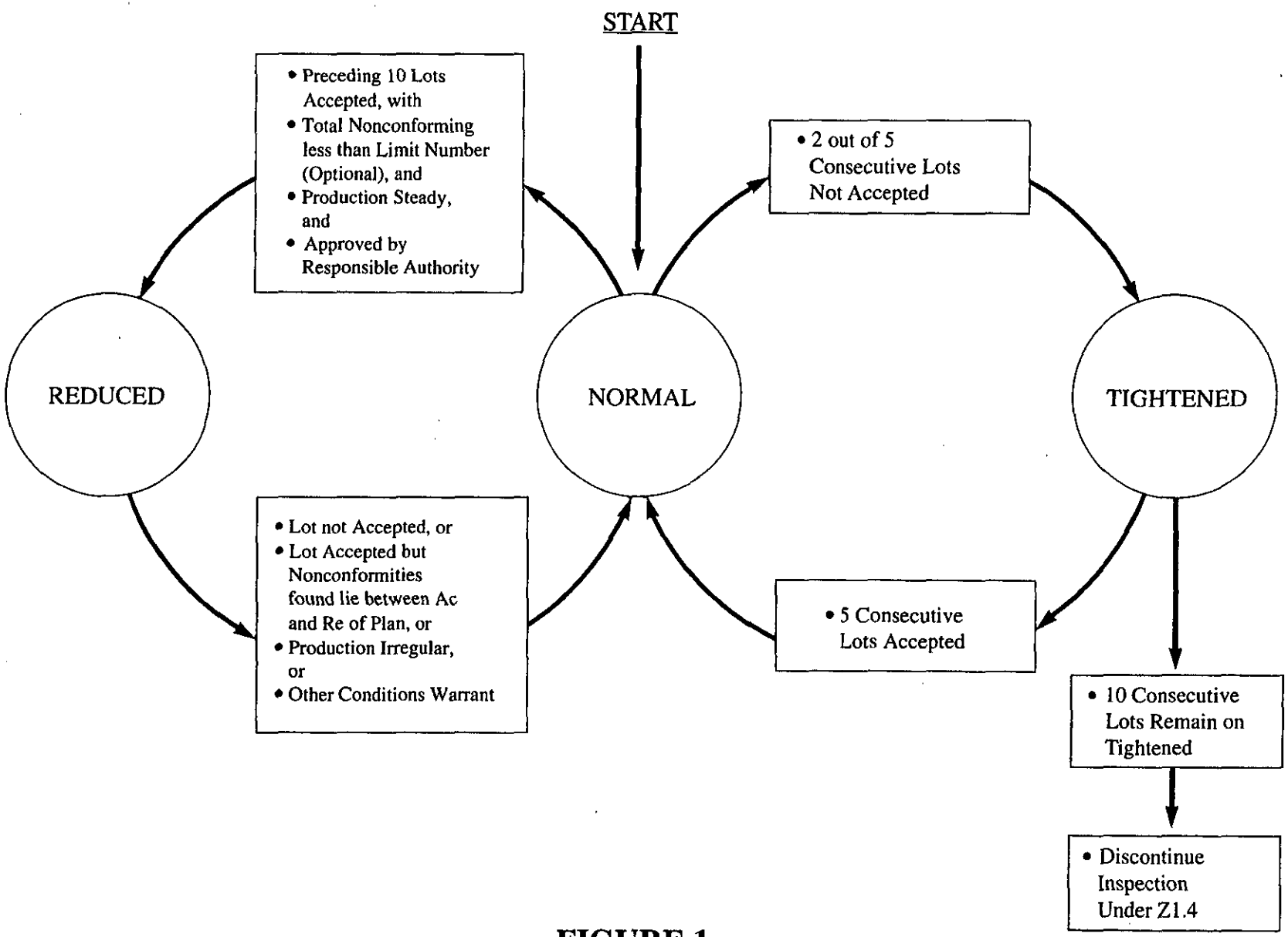



**FIGURE 1**

## *TABLE I—Sample size code letters*

*(See 9.2 and 9.3)*

| Lot or batch size | | | Special inspection levels | | | | General inspection levels | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | S-1 | S-2 | S-3 | S-4 | I | II | III |
| 2 | to | 8 | A | A | A | A | A | A | B |
| 9 | to | 15 | A | A | A | A | A | B | C |
| 16 | to | 25 | A | A | B | B | B | C | D |
| 26 | to | 50 | A | B | B | C | C | D | E |
| 51 | to | 90 | B | B | C | C | C | E | F |
| 91 | to | 150 | B | B | C | D | D | F | G |
| 151 | to | 280 | B | C | D | E | E | G | H |
| 281 | to | 500 | B | C | D | E | F | H | J |
| 501 | to | 1200 | C | C | E | F | G | J | K |
| 1201 | to | 3200 | C | D | E | G | H | K | L |
| 3201 | to | 10000 | C | D | F | G | J | L | M |
| 10001 | to | 35000 | C | D | F | H | K | M | N |
| 35001 | to | 150000 | D | E | G | J | L | N | P |
| 150001 | to | 500000 | D | E | G | J | M | P | Q |
| 500001 | and | over | D | E | H | K | N | Q | R |

## *Table II-A—Single sampling plans for normal inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | A |
| A | 2 | | | | | | | | | | | | | | 0 1 | 0 1 | | | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | |
| B | 3 | | | | | | | | | | | | | 0 1 | | | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | 44 45 | |
| C | 5 | | | | | | | | | | | | | | | | | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | 44 45 | | |
| D | 8 | | | | | | | | | | | | 0 1 | | | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | 44 45 | | | |
| E | 13 | | | | | | | | | | 0 1 | 0 1 | | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | 44 45 | | | | |
| F | 20 | | | | | | | | | | | | | | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | |
| G | 32 | | | | | | | | | 0 1 | | | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | |
| H | 50 | | | | | | | 0 1 | 0 1 | | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | |
| J | 80 | | | | | | 0 1 | | | 1 2 | | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | |
| K | 125 | | | | | 0 1 | | | | | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | |
| L | 200 | | | | 0 1 | | 0 1 | 1 2 | 1 2 | 1 2 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | |
| M | 315 | | | | | 0 1 | | | 2 3 | 2 3 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | | |
| N | 500 | | | 0 1 | | | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | | | |
| P | 800 | | 0 1 | | 0 1 | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | | | | |
| Q | 1250 | 0 1 | | 1 2 | | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | | | | | |
| R | 2000 | | | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | | | | | | | | | | | | | | | | | |

↓ = Use first sampling plan below arrow. If sample size equals, or exceeds, lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

## *Table II-B—Single sampling plans for tightened inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample size | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| A | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | 0 1 | ↓ | ↓ | 1 2 | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ● |
| B | 3 | | | | | | | | | | | | | | ↓ | ↓ | | | ↓ | 2 3 | 3 4 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | 27 28 | |
| C | 5 | | | | | | | | | | | | | | | | | | | 3 4 | 5 6 | 5 6 | 8 9 | 12 13 | 18 19 | 27 28 | 41 42 | |
| D | 8 | | | | | | | | | | | | 0 1 | 0 1 | ↓ | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | 27 28 | 41 42 | | | |
| E | 13 | | | | | | | | | | | 0 1 | ↓ | ↓ | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | | | | | | | |
| F | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | 32 | | | | | | | | | | 0 1 | ↓ | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| H | 50 | | | | | | | | | 0 1 | ↓ | 1 2 | ↓ | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | |
| J | 80 | | | | | | | | 0 1 | ↓ | ↓ | ↓ | 1 2 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | |
| K | 125 | | | | | | | 0 1 | ↓ | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | |
| L | 200 | | | | | | 0 1 | ↓ | 1 2 | 2 3 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | | |
| M | 315 | | | | | 0 1 | ↓ | 1 2 | ↓ | ↓ | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | | | |
| N | 500 | | | | 0 1 | ↓ | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | | | | |
| P | 800 | | | 0 1 | ↓ | 1 2 | ↓ | ↓ | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | | | | | |
| Q | 1250 | | 0 1 | ↓ | ↓ | ↓ | 1 2 | 2 3 | 3 4 | 5 6 | 12 13 | 18 19 | ↑ | | | | | | | | | | | | | | | |
| R | 2000 | 0 1 | ↑ | 1 2 | 1 2 | 2 3 | 3 4 | 5 6 | 8 9 | 12 13 | 18 19 | ↑ | | | | | | | | | | | | | | | | |
| S | 3150 | | | ↑ | | | | | | | | | | | | | | | | | | | | | | | | |

▼ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

▲ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

## *Table II-C—Single sampling plans for reduced inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample size | Acceptable Quality Levels (reduced inspection)† | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | A |
| A | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↓ | ↓ | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | ● |
| B | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↑ | 0 2 | 0 2 | 1 3 | 2 4 | 3 5 | 5 6 | 7 8 | 10 11 | 14 15 | 21 22 | 30 31 | |
| C | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↑ | ↓ | ↓ | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | 14 17 | 21 24 | | |
| D | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↕ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | 14 17 | 21 24 | | | |
| E | 5 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 2 | ↑ | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | 14 17 | 21 24 | | | | |
| F | 8 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↕ | ↓ | ↓ | 0 2 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | 10 13 | 14 17 | 21 24 | | | | |
| G | 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | 0 1 | ↑ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | | | | | | | | |
| H | 20 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↑ | ↓ | 0 2 | ↕ | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | | | | | | | | | |
| J | 32 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↑ | ↓ | ↓ | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | | | | | | | | | | |
| K | 50 | ↓ | ↓ | ↓ | ↓ | ↓ | 0 1 | ↑ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| L | 80 | ↓ | ↓ | ↓ | ↓ | 0 1 | ↕ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| M | 125 | ↓ | ↓ | ↓ | 0 1 | ↓ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| N | 200 | ↓ | ↓ | 0 1 | ↑ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| P | 315 | ↓ | 0 1 | ↕ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| Q | 500 | 0 1 | ↑ | ↓ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| R | 800 | ↑ | ↑ | 0 2 | 1 3 | 1 4 | 2 5 | 3 6 | 5 8 | 7 10 | 10 13 | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | |

↓ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

† = If the acceptance number has been exceeded, but the rejection number has not been reached, accept the lot, but reinstate normal inspection (see 10.1.4).

# *Table III-A—Double sampling plans for normal inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| A | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | * | * | * | * | * | * | * | * | * |
| B | First | 2 | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | 17 22 | 25 31 |
| | Second | 2 | 4 | | | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | 37 38 | 56 57 |
| C | First | 3 | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | 17 22 | 25 31 | |
| | Second | 3 | 6 | | | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | 37 38 | 56 57 | |
| D | First | 5 | 5 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | 17 22 | 25 31 | | | |
| | Second | 5 | 10 | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | 37 38 | 56 57 | | | |
| E | First | 8 | 8 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | 17 22 | 25 31 | | | | |
| | Second | 8 | 16 | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | 37 38 | 56 57 | | | | |
| F | First | 13 | 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | |
| | Second | 13 | 26 | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | |
| G | First | 20 | 20 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | |
| | Second | 20 | 40 | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | |
| H | First | 32 | 32 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | |
| | Second | 32 | 64 | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | |
| J | First | 50 | 50 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | |
| | Second | 50 | 100 | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | |
| K | First | 80 | 80 | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | | |
| | Second | 80 | 160 | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | |
| L | First | 125 | 125 | ↓ | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | | | |
| | Second | 125 | 250 | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | |
| M | First | 200 | 200 | ↓ | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | | | | |
| | Second | 200 | 400 | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | | |
| N | First | 315 | 315 | ↓ | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | | | | | |
| | Second | 315 | 630 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | | | |
| P | First | 500 | 500 | ↓ | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | | | | | | | | | | | | | | | |
| | Second | 500 | 1000 | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | | | | |
| Q | First | 800 | 800 | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 5 9 | 11 16 | | | | | | | | | | | | | | | | |
| | Second | 800 | 1600 | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | | | | | |
| R | First | 1250 | 1250 | ↑ | ↑ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 5 9 | 7 11 | 11 16 | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| | Second | 1250 | 2500 | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 12 13 | 18 19 | 26 27 | | | | | | | | | | | | | | | | |

↓ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

* = Use corresponding single sampling plan (or alternatively, use double sampling plan below, where available).

## *Table III-B—Double sampling plans for tightened inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| A | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | * | * | * | * | * | * | * | * |
| B | First | 2 | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | 15 20 | 23 29 | ● |
| | Second | 2 | 4 | | | | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | 34 35 | 52 53 | |
| C | First | 3 | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | 15 20 | 23 29 | ↓ | |
| | Second | 3 | 6 | | | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | 34 35 | 52 53 | | |
| D | First | 5 | 5 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | 15 20 | 23 29 | ↓ | ↓ | |
| | Second | 5 | 10 | | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | 34 35 | 52 53 | | | |
| T | First | 8 | 8 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | 15 20 | 23 29 | ↓ | ↓ | ↓ | |
| | Second | 8 | 16 | | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | 34 35 | 52 53 | | | | |
| F | First | 13 | 13 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 13 | 26 | | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | |
| G | First | 20 | 20 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 20 | 40 | | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | |
| H | First | 32 | 32 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 32 | 64 | | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | |
| J | First | 50 | 50 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 50 | 100 | | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | |
| K | First | 80 | 80 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 80 | 160 | | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | |
| L | First | 125 | 125 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 125 | 250 | | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | |
| M | First | 200 | 200 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 200 | 400 | | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | | |
| N | First | 315 | 315 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 315 | 630 | | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | | | |
| P | First | 500 | 500 | ↓ | ↓ | ↓ | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 500 | 1000 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | | | | |
| Q | First | 800 | 800 | ↓ | ↓ | ↓ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 800 | 1600 | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | | | | | |
| R | First | 1250 | 1250 | * | ↑ | ↓ | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 6 10 | 9 14 | ↑ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | Second | 1250 | 2500 | | | | 1 2 | 3 4 | 4 5 | 6 7 | 11 12 | 15 16 | 23 24 | | | | | | | | | | | | | | | | | |
| S | First | 2000 | 2000 | | | 0 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 2000 | 4000 | | | 1 2 | | | | | | | | | | | | | | | | | | | | | | | | |

↓ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

* = Use corresponding single sampling plan (or alternatively, use double sampling plan below, where available).

# *Table III-C—Double sampling plans for reduced inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (reduced inspection)† | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | First | 2 | 2 | | | | | | | | | | | | ↓ | | ↑ | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | 7 12 | 11 17 | | |
| | Second | 2 | 4 | | | | | | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | 18 22 | 26 30 | | |
| E | First | 3 | 3 | | | | | | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | 7 12 | 11 17 | | | |
| | Second | 3 | 6 | | | | | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | 18 22 | 26 30 | | | |
| F | First | 5 | 5 | | | | | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | |
| | Second | 5 | 10 | | | | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | |
| G | First | 8 | 8 | | | | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | |
| | Second | 8 | 16 | | | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | |
| H | First | 13 | 13 | | | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | |
| | Second | 13 | 26 | | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | |
| J | First | 20 | 20 | | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | |
| | Second | 20 | 40 | | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | |
| K | First | 32 | 32 | | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | |
| | Second | 32 | 64 | | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | |
| L | First | 50 | 50 | | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | |
| | Second | 50 | 100 | | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | | |
| M | First | 80 | 80 | | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | | |
| | Second | 80 | 160 | | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | | | |
| N | First | 125 | 125 | | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | | | |
| | Second | 125 | 250 | | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | | | | |
| P | First | 200 | 200 | | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | | | | |
| | Second | 200 | 400 | | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | | | | | |
| Q | First | 315 | 315 | ↓ | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | | | | | |
| | Second | 315 | 630 | | | | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | | | | | | | | | | | | | | | |
| R | First | 500 | 500 | | | 0 2 | 0 3 | 0 4 | 0 4 | 1 5 | 2 7 | 3 8 | 5 10 | | | | | | | | | | | | | | | | |
| | Second | 500 | 1000 | ↑ | ↑ | 0 2 | 0 4 | 1 5 | 3 6 | 4 7 | 6 9 | 8 12 | 12 16 | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |

↓ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number.

Re = Rejection number.

* = Use corresponding single sampling plan (or alternatively, use double sampling plan below, where available).

† = If, after the second sample, the acceptance number has been exceeded, but the rejection number has not been reached, accept the lot, but reinstate normal inspection (see 10.1.4).

# *Table IV-A—Multiple sampling plans for normal inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| A<br>B<br>C | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | * | * | ↓ | ↓ | * | * | * | * | * | * | * | * | * | * |
| | | | | | | | | | | | | | | | | * | * | ↕ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ | ++ |
| D | First | 2 | 2 | | | | | | | | | | | ↓ | * | ↓ | ↕ | ↕ | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | 4 12 | 6 16 | ↓ | ● |
| | Second | 2 | 4 | | | | | | | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | 11 19 | 17 27 | | |
| | Third | 2 | 6 | | | | | | | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | 19 27 | 29 39 | | |
| | Fourth | 2 | 8 | | | | | | | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | 27 34 | 40 49 | | |
| | Fifth | 2 | 10 | | | | | | | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | 36 40 | 53 58 | | |
| | Sixth | 2 | 12 | | | | | | | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | 45 47 | 65 68 | | |
| | Seventh | 2 | 14 | | | | | | | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | 53 54 | 77 78 | | |
| E | First | 3 | 3 | | | | | | | | | | | | ↓ | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | 4 12 | 6 16 | | |
| | Second | 3 | 6 | | | | | | | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | 11 19 | 17 27 | | |
| | Third | 3 | 9 | | | | | | | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | 19 27 | 29 39 | | |
| | Fourth | 3 | 12 | | | | | | | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | 27 34 | 40 49 | | |
| | Fifth | 3 | 15 | | | | | | | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | 36 40 | 53 58 | | |
| | Sixth | 3 | 18 | | | | | | | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | 45 47 | 65 68 | | |
| | Seventh | 3 | 21 | | | | | | | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | 53 54 | 77 78 | | |
| F | First | 5 | 5 | | | | | | | | | | ↓ | ↓ | ↓ | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | |
| | Second | 5 | 10 | | | | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | |
| | Third | 5 | 15 | | | | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | |
| | Fourth | 5 | 20 | | | | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | |
| | Fifth | 5 | 25 | | | | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | |
| | Sixth | 5 | 30 | | | | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | |
| | Seventh | 5 | 35 | | | | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | |
| G | First | 8 | 8 | | | | | | | | | ↓ | ↕ | ↓ | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | |
| | Second | 8 | 16 | | | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | |
| | Third | 8 | 24 | | | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | |
| | Fourth | 8 | 32 | | | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | |
| | Fifth | 8 | 40 | | | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | |
| | Sixth | 8 | 48 | | | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | |
| | Seventh | 8 | 56 | | | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | |
| H | First | 13 | 13 | | | | | | | | ↓ | ↓ | ↓ | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | |
| | Second | 13 | 26 | | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | |
| | Third | 13 | 39 | | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | |
| | Fourth | 13 | 52 | | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | |
| | Fifth | 13 | 65 | | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | |
| | Sixth | 13 | 78 | | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | |
| | Seventh | 13 | 91 | | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | |
| J | First | 20 | 20 | | | | | | | ↓ | ↓ | ↓ | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | |
| | Second | 20 | 40 | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | |
| | Third | 20 | 60 | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | |
| | Fourth | 20 | 80 | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | |
| | Fifth | 20 | 100 | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | |
| | Sixth | 20 | 120 | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | |
| | Seventh | 20 | 140 | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | |

51-90
17
91-150
151-280
281-500
501-1200

MULTIPLE NORMAL PLANS

↓ = Use first sampling plan below arrow (refer to continuation of table on following page, when necessary.) If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

* = Use corresponding single sampling plan (or alternatively, use double sampling plan below, where available).

++ = Use corresponding double sampling plan (or alternatively, use multiple sampling plan below, where available).

Ac = Acceptance number.

Re = Rejection number.

\# = Acceptance not permitted at this sample size.

# *Table IV-A—Multiple sampling plans for normal inspection (Master table)*

*(Continued)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| K | First | 32 | 32 | | | | | | * | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | |
| | Second | 32 | 64 | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | |
| | Third | 32 | 96 | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | |
| | Fourth | 32 | 128 | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | |
| | Fifth | 32 | 160 | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | |
| | Sixth | 32 | 192 | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | |
| | Seventh | 32 | 224 | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | |
| L | First | 50 | 50 | | | | | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | |
| | Second | 50 | 100 | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | |
| | Third | 50 | 150 | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | |
| | Fourth | 50 | 200 | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | |
| | Fifth | 50 | 250 | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | |
| | Sixth | 50 | 300 | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | |
| | Seventh | 50 | 350 | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | |
| M | First | 80 | 80 | | | | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | | | |
| | Second | 80 | 160 | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | | | |
| | Third | 80 | 240 | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | | | |
| | Fourth | 80 | 320 | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | | | |
| | Fifth | 80 | 400 | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | | | |
| | Sixth | 80 | 480 | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | | | |
| | Seventh | 80 | 560 | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | | | |
| N | First | 125 | 125 | | | | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | | | | |
| | Second | 125 | 250 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | | | | |
| | Third | 125 | 375 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | | | | |
| | Fourth | 125 | 500 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | | | | |
| | Fifth | 125 | 625 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | | | | |
| | Sixth | 125 | 750 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | | | | |
| | Seventh | 125 | 875 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | | | | |
| P | First | 200 | 200 | | | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | | | | | |
| | Second | 200 | 400 | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | | | | | |
| | Third | 200 | 600 | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | | | | | |
| | Fourth | 200 | 800 | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | | | | | |
| | Fifth | 200 | 1000 | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | | | | | |
| | Sixth | 200 | 1200 | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | | | | | |
| | Seventh | 200 | 1400 | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | | | | | |
| Q | First | 315 | 315 | | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | | | | | | |
| | Second | 315 | 630 | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | | | | | | |
| | Third | 315 | 945 | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | | | | | | |
| | Fourth | 315 | 1260 | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | | | | | | |
| | Fifth | 315 | 1575 | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | | | | | | |
| | Sixth | 315 | 1890 | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | | | | | | |
| | Seventh | 315 | 2205 | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | | | | | | |
| R | First | 500 | 500 | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 5 | 1 7 | 2 9 | | | | | | | | | | | | | | | | |
| | Second | 500 | 1000 | | | 0 3 | 0 3 | 1 4 | 1 5 | 1 6 | 3 8 | 4 10 | 7 14 | | | | | | | | | | | | | | | | |
| | Third | 500 | 1500 | | | 0 3 | 1 4 | 2 5 | 2 6 | 3 8 | 6 10 | 8 13 | 13 19 | | | | | | | | | | | | | | | | |
| | Fourth | 500 | 2000 | | | 1 3 | 2 4 | 3 6 | 3 7 | 5 10 | 8 13 | 12 17 | 19 25 | | | | | | | | | | | | | | | | |
| | Fifth | 500 | 2500 | | | 1 3 | 2 4 | 3 6 | 3 8 | 7 11 | 11 15 | 17 20 | 25 29 | | | | | | | | | | | | | | | | |
| | Sixth | 500 | 3000 | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 14 17 | 21 23 | 31 33 | | | | | | | | | | | | | | | | |
| | Seventh | 500 | 3500 | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 18 19 | 25 26 | 37 38 | | | | | | | | | | | | | | | | |

▼ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

Ac = Acceptance number.

Re = Rejection number.

▲ = Use first sampling plan above arrow (refer to preceding page, when necessary).

* = Use corresponding single sample plan (or alternatively, use multiple plan below, where available).

\# = Acceptance not permitted at this sample size

## *Table IV-B—Multiple sampling plans for tightened inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | | 0.015 | | 0.025 | | 0.040 | | 0.065 | | 0.10 | | 0.15 | | 0.25 | | 0.40 | | 0.65 | | 1.0 | | 1.5 | | 2.5 | | 4.0 | | 6.5 | | 10 | |
| | | | | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re |
| A | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | ↓ | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | First | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | * | | | | # | 2 | # | 2 |
| | Second | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 |
| | Third | 2 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 |
| | Fourth | 2 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 3 |
| | Fifth | 2 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 1 | 3 |
| | Sixth | 2 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 3 |
| | Seventh | 2 | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 3 | 4 |
| E | First | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | # | 2 | # | 2 |
| | Second | 3 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 |
| | Third | 3 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 |
| | Fourth | 3 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 4 |
| | Fifth | 3 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 4 |
| | Sixth | 3 | 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | 5 |
| | Seventh | 3 | 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 4 | 5 |
| F | First | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | # | 2 | # | 2 |
| | Second | 5 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 |
| | Third | 5 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 |
| | Fourth | 5 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 4 |
| | Fifth | 5 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 4 |
| | Sixth | 5 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | 5 |
| | Seventh | 5 | 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 4 | 5 |
| G | First | 8 | 8 | | | | | | | | | | | | | | | | | | | | | | | # | 2 | # | 2 | # | 3 | # | 4 |
| | Second | 8 | 16 | | | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 | 0 | 3 | 1 | 5 |
| | Third | 8 | 24 | | | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 | 1 | 4 | 2 | 6 |
| | Fourth | 8 | 32 | | | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 4 | 2 | 5 | 3 | 7 |
| | Fifth | 8 | 40 | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 4 | 3 | 6 | 5 | 8 |
| | Sixth | 8 | 48 | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | 5 | 4 | 6 | 7 | 9 |
| | Seventh | 8 | 56 | | | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 |
| H | First | 13 | 13 | | | | | | | | | | | | | | | | | | | | | # | 2 | # | 2 | # | 3 | # | 4 | 0 | 4 |
| | Second | 13 | 26 | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 | 0 | 3 | 1 | 5 | 2 | 7 |
| | Third | 13 | 39 | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 | 1 | 4 | 2 | 6 | 4 | 9 |
| | Fourth | 13 | 52 | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 4 | 2 | 5 | 3 | 7 | 6 | 11 |
| | Fifth | 13 | 65 | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 4 | 3 | 6 | 5 | 8 | 9 | 12 |
| | Sixth | 13 | 78 | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | 5 | 4 | 6 | 7 | 9 | 12 | 14 |
| | Seventh | 13 | 91 | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 14 | 15 |
| J | First | 20 | 20 | | | | | | | | | | | | | | | | | | | | | # | 2 | # | 2 | # | 3 | # | 4 | 0 | 4 |
| | Second | 20 | 40 | | | | | | | | | | | | | | | | | | | | | # | 2 | 0 | 3 | 0 | 3 | 1 | 5 | 2 | 7 |
| | Third | 20 | 60 | | | | | | | | | | | | | | | | | | | | | 0 | 2 | 0 | 3 | 1 | 4 | 2 | 6 | 4 | 9 |
| | Fourth | 20 | 80 | | | | | | | | | | | | | | | | | | | | | 0 | 3 | 1 | 4 | 2 | 5 | 3 | 7 | 6 | 11 |
| | Fifth | 20 | 100 | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 2 | 4 | 3 | 6 | 5 | 8 | 9 | 12 |
| | Sixth | 20 | 120 | | | | | | | | | | | | | | | | | | | | | 1 | 3 | 3 | 5 | 4 | 6 | 7 | 9 | 12 | 14 |
| | Seventh | 20 | 140 | | | | | | | | | | | | | | | | | | | | | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 14 | 15 |

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 15 | | 25 | | 40 | | 65 | | 100 | | 150 | | 250 | | 400 | | 650 | | 1000 | | | | | | | | | | | |
| | | | | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | | | | | | | | | | |
| A | | | | ↓ | | ↓ | | * | | * | | * | | * | | * | | * | | * | | * | | | | | | | | | | | |
| B | | | | | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | | | | | | | | | | |
| C | | | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | ++ | | | | | | | | | | | | | |
| D | First | 2 | 2 | # | 2 | # | 3 | # | 4 | 0 | 4 | 0 | 6 | 1 | 8 | 3 | 10 | 6 | 15 | | | | | | | | | | | | | | |
| | Second | 2 | 4 | 0 | 3 | 0 | 3 | 1 | 5 | 2 | 7 | 3 | 9 | 6 | 12 | 10 | 17 | 16 | 25 | | | | | | | | | | | | | | |
| | Third | 2 | 6 | 0 | 3 | 1 | 4 | 2 | 6 | 4 | 9 | 7 | 12 | 11 | 17 | 17 | 24 | 26 | 36 | | | | | | | | | | | | | | |
| | Fourth | 2 | 8 | 1 | 3 | 2 | 5 | 3 | 7 | 6 | 11 | 10 | 15 | 16 | 22 | 24 | 31 | 37 | 46 | | | | | | | | | | | | | | |
| | Fifth | 2 | 10 | 1 | 3 | 3 | 6 | 5 | 8 | 9 | 12 | 14 | 17 | 22 | 25 | 32 | 37 | 49 | 55 | | | | | | | | | | | | | | |
| | Sixth | 2 | 12 | 2 | 3 | 4 | 6 | 7 | 9 | 12 | 14 | 18 | 20 | 27 | 29 | 40 | 43 | 61 | 64 | | | | | | | | | | | | | | |
| | Seventh | 2 | 14 | 3 | 4 | 6 | 7 | 9 | 10 | 14 | 15 | 21 | 22 | 32 | 33 | 48 | 49 | 72 | 73 | | | | | | | | | | | | | | |
| E | First | 3 | 3 | # | 3 | # | 4 | 0 | 4 | 0 | 6 | 1 | 8 | 3 | 10 | 6 | 15 | | | | | | | | | | | | | | | | |
| | Second | 3 | 6 | 0 | 3 | 1 | 5 | 2 | 7 | 3 | 9 | 6 | 12 | 10 | 17 | 16 | 25 | | | | | | | | | | | | | | | | |
| | Third | 3 | 9 | 0 | 3 | 2 | 6 | 4 | 9 | 7 | 12 | 11 | 17 | 17 | 24 | 26 | 36 | | | | | | | | | | | | | | | | |
| | Fourth | 3 | 12 | 1 | 4 | 3 | 7 | 6 | 11 | 10 | 15 | 16 | 22 | 24 | 31 | 37 | 46 | | | | | | | | | | | | | | | | |
| | Fifth | 3 | 15 | 2 | 5 | 5 | 8 | 9 | 12 | 14 | 17 | 22 | 25 | 32 | 37 | 49 | 55 | | | | | | | | | | | | | | | | |
| | Sixth | 3 | 18 | 3 | 6 | 7 | 9 | 12 | 14 | 18 | 20 | 27 | 29 | 40 | 43 | 61 | 64 | | | | | | | | | | | | | | | | |
| | Seventh | 3 | 21 | 4 | 6 | 9 | 10 | 14 | 15 | 21 | 22 | 32 | 33 | 48 | 49 | 72 | 73 | | | | | | | | | | | | | | | | |
| F | First | 5 | 5 | 0 | 4 | 0 | 4 | 0 | 6 | 1 | 8 | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 5 | 10 | 1 | 4 | 2 | 7 | 3 | 9 | 6 | 12 | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 5 | 15 | 2 | 5 | 4 | 9 | 7 | 12 | 11 | 17 | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 5 | 20 | 3 | 7 | 6 | 11 | 10 | 15 | 16 | 22 | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 5 | 25 | 5 | 8 | 9 | 12 | 14 | 17 | 22 | 25 | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 5 | 30 | 7 | 9 | 12 | 14 | 18 | 20 | 27 | 29 | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 5 | 35 | 9 | 10 | 14 | 15 | 21 | 22 | 32 | 33 | | | | | | | | | | | | | | | | | | | | | | |
| G | First | 8 | 8 | 0 | 4 | 0 | 6 | 1 | 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 8 | 16 | 2 | 7 | 3 | 9 | 6 | 12 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 8 | 24 | 4 | 9 | 7 | 12 | 11 | 17 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 8 | 32 | 6 | 11 | 10 | 15 | 16 | 22 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 8 | 40 | 9 | 12 | 14 | 17 | 22 | 25 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 8 | 48 | 12 | 14 | 18 | 20 | 27 | 29 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 8 | 56 | 14 | 15 | 21 | 22 | 32 | 33 | | | | | | | | | | | | | | | | | | | | | | | | |
| H | First | 13 | 13 | 0 | 6 | 1 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 13 | 26 | 3 | 9 | 6 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 13 | 39 | 7 | 12 | 11 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 13 | 52 | 10 | 15 | 16 | 22 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 13 | 65 | 14 | 17 | 22 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 13 | 78 | 18 | 20 | 27 | 29 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 13 | 91 | 21 | 22 | 32 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| J | First | 20 | 20 | 1 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 20 | 40 | 6 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 20 | 60 | 11 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 20 | 80 | 16 | 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 20 | 100 | 22 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 20 | 120 | 27 | 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 20 | 140 | 32 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

↓ = Use first sampling plan below arrow (refer to continuation of table on following page, when necessary). If sample size equals or exceeds lot or batch size, do 100 percent inspection.

* = Use corresponding single sampling plan (or alternatively, use double sampling plan below, where available).

↑ = Use first sampling plan above arrow.

\# = Acceptance not permitted at this sample size

Ac = Acceptance number.

Re = Rejection number.

# *Table IV-B—Multiple sampling plans for tightened inspection (Master table)*

*(Continued)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| K | First | 32 | 32 | | | | | | | * | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | |
| | Second | 32 | 64 | | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | |
| | Third | 32 | 96 | | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | |
| | Fourth | 32 | 128 | | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | |
| | Fifth | 32 | 160 | | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | |
| | Sixth | 32 | 192 | | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | |
| | Seventh | 32 | 224 | | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | |
| L | First | 50 | 50 | | | | | | * | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | |
| | Second | 50 | 100 | | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | |
| | Third | 50 | 150 | | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | |
| | Fourth | 50 | 200 | | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | |
| | Fifth | 50 | 250 | | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | |
| | Sixth | 50 | 300 | | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | |
| | Seventh | 50 | 350 | | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | |
| M | First | 80 | 80 | | | | | * | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | | |
| | Second | 80 | 160 | | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | | |
| | Third | 80 | 240 | | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | | |
| | Fourth | 80 | 320 | | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | | |
| | Fifth | 80 | 400 | | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | | |
| | Sixth | 80 | 480 | | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | | |
| | Seventh | 80 | 560 | | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | | |
| N | First | 125 | 125 | | | | * | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | | | |
| | Second | 125 | 250 | | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | | | |
| | Third | 125 | 375 | | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | | | |
| | Fourth | 125 | 500 | | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | | | |
| | Fifth | 125 | 625 | | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | | | |
| | Sixth | 125 | 750 | | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | | | |
| | Seventh | 125 | 875 | | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | | | |
| P | First | 200 | 200 | | | * | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | | | | |
| | Second | 200 | 400 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | | | | |
| | Third | 200 | 600 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | | | | |
| | Fourth | 200 | 800 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | | | | |
| | Fifth | 200 | 1000 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | | | | |
| | Sixth | 200 | 1200 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | | | | |
| | Seventh | 200 | 1400 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | | | | |
| Q | First | 315 | 315 | | * | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | | | | | |
| | Second | 315 | 630 | | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | | | | | |
| | Third | 315 | 945 | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | | | | | |
| | Fourth | 315 | 1260 | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | | | | | |
| | Fifth | 315 | 1575 | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | | | | | |
| | Sixth | 315 | 1890 | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | | | | | |
| | Seventh | 315 | 2205 | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | | | | | |
| R | First | 500 | 500 | * | | | # 2 | # 2 | # 2 | # 4 | 0 4 | 0 6 | 1 8 | | | | | | | | | | | | | | | | |
| | Second | 500 | 1000 | | | | # 2 | 0 3 | 0 3 | 1 5 | 2 7 | 3 9 | 6 12 | | | | | | | | | | | | | | | | |
| | Third | 500 | 1500 | | | | 0 2 | 0 3 | 1 4 | 2 6 | 4 9 | 7 12 | 11 17 | | | | | | | | | | | | | | | | |
| | Fourth | 500 | 2000 | | | | 0 3 | 1 4 | 2 5 | 3 7 | 6 11 | 10 15 | 16 22 | | | | | | | | | | | | | | | | |
| | Fifth | 500 | 2500 | | | | 1 3 | 2 4 | 3 6 | 5 8 | 9 12 | 14 17 | 22 25 | | | | | | | | | | | | | | | | |
| | Sixth | 500 | 3000 | | | | 1 3 | 3 5 | 4 6 | 7 9 | 12 14 | 18 20 | 27 29 | | | | | | | | | | | | | | | | |
| | Seventh | 500 | 3500 | | | | 2 3 | 4 5 | 6 7 | 9 10 | 14 15 | 21 22 | 32 33 | | | | | | | | | | | | | | | | |
| S | First | 800 | 800 | | | # 2 | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 800 | 1600 | | | # 2 | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 800 | 2400 | | | 0 2 | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 800 | 3200 | | | 0 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 800 | 4000 | | | 1 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 800 | 4800 | | | 1 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 800 | 5600 | | | 2 3 | | | | | | | | | | | | | | | | | | | | | | | |

▲ = Use first sampling plan below arrow. If sample size equals or exceeds lot or batch size, do 100 percent inspection.

▼ = Use first sampling plan above arrow (refer to preceding page, when necessary).

\# = Acceptance not permitted at this sample size.

Ac = Acceptance number.

Re = Rejection number.

* = Use corresponding single sampling plan (or alternatively, use multiple sampling plan below, where available).

# *Table IV-C—Multiple sampling plans for reduced inspection (Master table)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (reduced inspection)† | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | | 0.015 | | 0.025 | | 0.040 | | 0.065 | | 0.10 | | 0.15 | | 0.25 | | 0.40 | | 0.65 | | 1.0 | | 1.5 | | 2.5 | | 4.0 | | 6.5 | |
| | | | | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re |
| A | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | |
| B | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | |
| C | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | |
| D | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | |
| E | | | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | |
| F | First | 2 | 2 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | | | | | # 2 | | # 2 | | # 3 | |
| | Second | 2 | 4 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | # 2 | | # 3 | | # 3 | |
| | Third | 2 | 6 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 2 | | 0 3 | | 0 4 | |
| | Fourth | 2 | 8 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 0 5 | |
| | Fifth | 2 | 10 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 1 6 | |
| | Sixth | 2 | 12 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 1 5 | | 1 6 | |
| | Seventh | 2 | 14 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 1 3 | | 1 5 | | 2 7 | |
| G | First | 3 | 3 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | ↕ | | ↕ | | # 2 | | # 2 | | # 3 | | # 3 | |
| | Second | 3 | 6 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | # 2 | | # 3 | | # 3 | | 0 4 | |
| | Third | 3 | 9 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 2 | | 0 3 | | 0 4 | | 0 5 | |
| | Fourth | 3 | 12 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 0 5 | | 1 6 | |
| | Fifth | 3 | 15 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 1 6 | | 2 7 | |
| | Sixth | 3 | 18 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 1 5 | | 1 6 | | 3 7 | |
| | Seventh | 3 | 21 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 1 3 | | 1 5 | | 2 7 | | 4 8 | |
| H | First | 5 | 5 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | ↕ | | ↕ | | # 2 | | # 2 | | # 3 | | # 3 | | # 4 | |
| | Second | 5 | 10 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | # 2 | | # 3 | | # 3 | | # 4 | | 0 5 | |
| | Third | 5 | 15 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 2 | | 0 3 | | 0 4 | | 0 5 | | 1 6 | |
| | Fourth | 5 | 20 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 0 5 | | 1 6 | | 2 7 | |
| | Fifth | 5 | 25 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 0 4 | | 1 6 | | 2 7 | | 3 8 | |
| | Sixth | 5 | 30 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 0 3 | | 1 5 | | 1 6 | | 2 7 | | 3 7 | |
| | Seventh | 5 | 35 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | ↕ | | 1 3 | | 1 5 | | 2 7 | | 3 7 | | 4 8 | |
| J | First | 8 | 8 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | ↕ | | ↕ | | # 2 | | # 2 | | # 3 | | # 3 | | # 4 | | # 4 | |
| | Second | 8 | 16 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↕ | | # 2 | | # 3 | | # 3 | | 0 4 | | 0 5 | | 1 6 | |
| | Third | 8 | 24 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 2 | | 0 3 | | 0 4 | | 0 5 | | 1 6 | | 2 7 | |
| | Fourth | 8 | 32 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 0 4 | | 0 5 | | 1 6 | | 2 7 | | 3 8 | |
| | Fifth | 8 | 40 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 1 5 | | 1 6 | | 2 7 | | 3 7 | | 4 9 | |
| | Sixth | 8 | 48 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 1 5 | | 1 6 | | 2 7 | | 3 7 | | 4 9 | |
| | Seventh | 8 | 56 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 1 3 | | 1 5 | | 2 7 | | 3 7 | | 4 8 | | 6 10 | |
| K | First | 13 | 13 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | * | | ↕ | | ↕ | | # 2 | | # 2 | | # 3 | | # 3 | | # 4 | | # 4 | | 0 5 | |
| | Second | 13 | 26 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | # 2 | | # 3 | | # 3 | | 0 4 | | 0 5 | | 1 6 | | 1 7 | |
| | Third | 13 | 39 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 2 | | 0 3 | | 0 4 | | 0 5 | | 1 6 | | 2 8 | | 3 9 | |
| | Fourth | 13 | 52 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 0 4 | | 0 5 | | 1 6 | | 2 7 | | 3 8 | | 5 12 | |
| | Fifth | 13 | 65 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 0 4 | | 1 6 | | 2 7 | | 3 8 | | 5 10 | | 7 13 | |
| | Sixth | 13 | 78 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 0 3 | | 1 5 | | 1 6 | | 3 7 | | 4 9 | | 7 12 | | 10 15 | |
| | Seventh | 13 | 91 | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | ↓ | | 1 3 | | 1 5 | | 2 7 | | 4 8 | | 6 10 | | 9 14 | | 13 17 | |

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (reduced inspection)† | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 10 | | 15 | | 25 | | 40 | | 65 | | 100 | | 150 | | 250 | | 400 | | 650 | | 1000 | | | | | | | |
| | | | | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | Ac | Re | | | | | | |
| A | | | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | | | | | | |
| B | | | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | | | | | | |
| C | | | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | | | | | | |
| D | | | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | | | | | | |
| E | | | | ↓ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | ↕ | | | | | | | |
| F | First | 2 | 2 | # 3 | | # 4 | | # 4 | | 0 5 | | 0 6 | | | | | | | | | | | | | | | | | | | |
| | Second | 2 | 4 | 0 4 | | 0 5 | | 1 6 | | 1 7 | | 3 9 | | | | | | | | | | | | | | | | | | | |
| | Third | 2 | 6 | 0 5 | | 1 6 | | 2 8 | | 3 9 | | 6 12 | | | | | | | | | | | | | | | | | | | |
| | Fourth | 2 | 8 | 1 6 | | 2 7 | | 3 10 | | 5 12 | | 8 15 | | | | | | | | | | | | | | | | | | | |
| | Fifth | 2 | 10 | 2 7 | | 3 8 | | 5 11 | | 7 13 | | 11 17 | | | | | | | | | | | | | | | | | | | |
| | Sixth | 2 | 12 | 3 7 | | 4 9 | | 7 12 | | 10 15 | | 14 20 | | | | | | | | | | | | | | | | | | | |
| | Seventh | 2 | 14 | 4 8 | | 6 10 | | 9 14 | | 13 17 | | 18 22 | | | | | | | | | | | | | | | | | | | |
| G | First | 3 | 3 | # 4 | | # 4 | | 0 5 | | 0 6 | | | | | | | | | | | | | | | | | | | | | |
| | Second | 3 | 6 | 0 5 | | 1 6 | | 1 7 | | 3 9 | | | | | | | | | | | | | | | | | | | | | |
| | Third | 3 | 9 | 1 6 | | 2 8 | | 3 9 | | 6 12 | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 3 | 12 | 2 7 | | 3 10 | | 5 12 | | 8 15 | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 3 | 15 | 3 8 | | 5 11 | | 7 13 | | 11 17 | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 3 | 18 | 4 9 | | 7 12 | | 10 15 | | 14 20 | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 3 | 21 | 6 10 | | 9 14 | | 13 17 | | 18 22 | | | | | | | | | | | | | | | | | | | | | |
| H | First | 5 | 5 | # 4 | | 0 5 | | 0 6 | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 5 | 10 | 1 6 | | 1 7 | | 3 9 | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 5 | 15 | 2 8 | | 3 9 | | 6 12 | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 5 | 20 | 3 10 | | 5 12 | | 8 15 | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 5 | 25 | 5 11 | | 7 13 | | 11 17 | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 5 | 30 | 7 12 | | 10 15 | | 14 20 | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 5 | 35 | 9 14 | | 13 17 | | 18 22 | | | | | | | | | | | | | | | | | | | | | | | |
| J | First | 8 | 8 | 0 5 | | 0 6 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 8 | 16 | 1 7 | | 3 9 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 8 | 24 | 3 9 | | 6 12 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 8 | 32 | 5 12 | | 8 15 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 8 | 40 | 7 13 | | 11 17 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 8 | 48 | 10 15 | | 14 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 8 | 56 | 13 17 | | 18 22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | First | 13 | 13 | 0 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second | 13 | 26 | 3 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Third | 13 | 39 | 6 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fourth | 13 | 52 | 8 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Fifth | 13 | 65 | 11 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sixth | 13 | 78 | 14 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Seventh | 13 | 91 | 18 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

↓ = Use first sampling plan below arrow (refer to continuation of table on following page, when necessary). If sample size equals or exceeds lot or batch size, do 100 percent inspection.

↑ = Use first sampling plan above arrow.

* = Use corresponding single sampling plan (or alternatively, use multiple sampling plan below, where available).

++ = Use corresponding double sampling plan (or alternatively, use multiple sampling plan below, where available).

Ac = Acceptance number.

Re = Rejection number.

\# = Acceptance not permitted at this sample size

† = If, after the final sample, the acceptance number has been exceeded, but the rejection number has not been reached, accept the lot but reinstate normal inspection (see 10.1.4).

# *Table IV-C—Multiple sampling plans for reduced inspection (Master table)*

*(Continued)*

*(See 9.4 and 9.5)*

| Sample size code letter | Sample | Sample size | Cumulative sample size | Acceptable Quality Levels (reduced inspection)† | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| | | | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re |
| L | First | 20 | 20 | | | | | * | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | |
| | Second | 20 | 40 | | | | | | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | |
| | Third | 20 | 60 | | | | | | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | |
| | Fourth | 20 | 80 | | | | | | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | |
| | Fifth | 20 | 100 | | | | | | | | 0 3 | 0 4 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | |
| | Sixth | 20 | 120 | | | | | | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | |
| | Seventh | 20 | 140 | | | | | | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | |
| M | First | 32 | 32 | | | | | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | | |
| | Second | 32 | 64 | | | | | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | | |
| | Third | 32 | 96 | | | | | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | | |
| | Fourth | 32 | 128 | | | | | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | | |
| | Fifth | 32 | 160 | | | | | | | 0 3 | 1 6 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | | |
| | Sixth | 32 | 192 | | | | | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | | |
| | Seventh | 32 | 224 | | | | | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | | |
| N | First | 50 | 50 | | | | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | | | |
| | Second | 50 | 100 | | | | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | | | |
| | Third | 50 | 150 | | | | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | | | |
| | Fourth | 50 | 200 | | | | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | | | |
| | Fifth | 50 | 250 | | | | | | 0 3 | 0 4 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | | | |
| | Sixth | 50 | 300 | | | | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | | | |
| | Seventh | 50 | 350 | | | | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | | | |
| P | First | 80 | 80 | | | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | | | | |
| | Second | 80 | 160 | | | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | | | | |
| | Third | 80 | 240 | | | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | | | | |
| | Fourth | 80 | 320 | | | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | | | | |
| | Fifth | 80 | 400 | | | | | 0 3 | 0 4 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | | | | |
| | Sixth | 80 | 480 | | | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | | | | |
| | Seventh | 80 | 560 | | | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | | | | |
| Q | First | 125 | 125 | | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | | | | | |
| | Second | 125 | 250 | | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | | | | | |
| | Third | 125 | 375 | | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | | | | | |
| | Fourth | 125 | 500 | | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | | | | | |
| | Fifth | 125 | 625 | | | | 0 3 | 0 4 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | | | | | |
| | Sixth | 125 | 750 | | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | | | | | |
| | Seventh | 125 | 875 | | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | | | | | |
| R | First | 200 | 200 | | | # 2 | # 2 | # 3 | # 3 | # 4 | # 4 | 0 5 | 0 6 | | | | | | | | | | | | | | | | | |
| | Second | 200 | 400 | | | # 2 | # 3 | # 3 | 0 4 | 0 5 | 1 6 | 1 7 | 3 9 | | | | | | | | | | | | | | | | | |
| | Third | 200 | 600 | | | 0 2 | 0 3 | 0 4 | 0 5 | 1 6 | 2 8 | 3 9 | 6 12 | | | | | | | | | | | | | | | | | |
| | Fourth | 200 | 800 | | | 0 3 | 0 4 | 0 5 | 1 6 | 2 7 | 3 10 | 5 12 | 8 15 | | | | | | | | | | | | | | | | | |
| | Fifth | 200 | 1000 | | | 0 3 | 0 4 | 1 6 | 2 7 | 3 8 | 5 11 | 7 13 | 11 17 | | | | | | | | | | | | | | | | | |
| | Sixth | 200 | 1200 | | | 0 3 | 1 5 | 1 6 | 3 7 | 4 9 | 7 12 | 10 15 | 14 20 | | | | | | | | | | | | | | | | | |
| | Seventh | 200 | 1400 | | | 1 3 | 1 5 | 2 7 | 4 8 | 6 10 | 9 14 | 13 17 | 18 22 | | | | | | | | | | | | | | | | | |

▼ = Use first sampling plan below arrow. If sample size equals, or exceeds, lot or batch size, do 100 percent inspection.

▲ = Use first sampling plan above arrow (refer to preceding page when necessary).

Ac = Acceptance number.

Re = Rejection number.

\# = Acceptance not permitted at this sample size

† = If, after the final sample, the acceptance number has been exceeded, but the rejection number has not been reached, accept the lot, but reinstate normal inspection (see 10.1.4).

## *Table V-A—Factors for Determining Approximate Values for Average Outgoing Quality Limits for Normal Inspection (Single Sampling)*

*(See 11.4)*

| Code Letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | 2 | | | | | | | | | | | | | | | 18 | | | 42 | 69 | 97 | 160 | 220 | 330 | 470 | 730 | 1100 |
| B | 3 | | | | | | | | | | | | | | 12 | | | 28 | 46 | 63 | 110 | 150 | 220 | 310 | 490 | 720 | 1100 |
| C | 5 | | | | | | | | | | | | | 7.4 | | | 17 | 27 | 39 | 63 | 90 | 130 | 190 | 290 | 430 | 660 | |
| D | 8 | | | | | | | | | | | | 4.6 | | | 11 | 17 | 24 | 40 | 56 | 82 | 120 | 180 | 270 | 410 | | |
| E | 13 | | | | | | | | | | | 2.8 | | | 6.5 | 11 | 15 | 24 | 34 | 50 | 72 | 110 | 170 | 250 | | | |
| F | 20 | | | | | | | | | | 1.8 | | | 4.2 | 6.9 | 9.7 | 16 | 22 | 33 | 47 | 73 | | | | | | |
| G | 32 | | | | | | | | | 1.2 | | | 2.6 | 4.3 | 6.1 | 9.9 | 14 | 21 | 29 | 46 | | | | | | | |
| H | 50 | | | | | | | | 0.74 | | | 1.7 | 2.7 | 3.9 | 6.3 | 9.0 | 13 | 19 | 29 | | | | | | | | |
| J | 80 | | | | | | | 0.46 | | | 1.1 | 1.7 | 2.4 | 4.0 | 5.6 | 8.2 | 12 | 18 | | | | | | | | | |
| K | 125 | | | | | | 0.29 | | | 0.67 | 1.1 | 1.6 | 2.5 | 3.6 | 5.2 | 7.5 | 12 | | | | | | | | | | |
| L | 200 | | | | | 0.18 | | | 0.42 | 0.69 | 0.97 | 1.6 | 2.2 | 3.3 | 4.7 | 7.3 | | | | | | | | | | | |
| M | 315 | | | | 0.12 | | | 0.27 | 0.44 | 0.62 | 1.00 | 1.4 | 2.1 | 3.0 | 4.7 | | | | | | | | | | | | |
| N | 500 | | | 0.074 | | | 0.17 | 0.27 | 0.39 | 0.63 | 0.90 | 1.3 | 1.9 | 2.9 | | | | | | | | | | | | | |
| P | 800 | | 0.046 | | | 0.11 | 0.17 | 0.24 | 0.40 | 0.56 | 0.82 | 1.2 | 1.8 | | | | | | | | | | | | | | |
| Q | 1250 | 0.029 | | | 0.067 | 0.11 | 0.16 | 0.25 | 0.36 | 0.52 | 0.75 | 1.2 | | | | | | | | | | | | | | | |
| R | 2000 | | | 0.042 | 0.069 | 0.097 | 0.16 | 0.22 | 0.33 | 0.47 | 0.73 | | | | | | | | | | | | | | | | |

Note: For a more accurate AOQL, the above values must be multiplied by $\left(1 - \frac{\text{Sample size}}{\text{Lot or Batch size}}\right)$ (See 11.4)

## *Table V-B—Factors for Determining Approximate Values for Average Outgoing Quality Limits for Tightened Inspection (Single Sampling)*

*(See 11.4)*

| Code Letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | 2 | | | | | | | | | | | | | | | | | | | 42 | 69 | 97 | 160 | 260 | 400 | 620 | 970 |
| B | 3 | | | | | | | | | | | | | | | 12 | | | 28 | 46 | 65 | 110 | 170 | 270 | 410 | 650 | 1100 |
| C | 5 | | | | | | | | | | | | | | 7.4 | | | 17 | 27 | 39 | 63 | 100 | 160 | 250 | 390 | 610 | |
| D | 8 | | | | | | | | | | | | | 4.6 | | | 11 | 17 | 24 | 40 | 64 | 99 | 160 | 240 | 380 | | |
| E | 13 | | | | | | | | | | | | 2.8 | | | 6.5 | 11 | 15 | 24 | 40 | 61 | 95 | 150 | 240 | | | |
| F | 20 | | | | | | | | | | | 1.8 | | | 4.2 | 6.9 | 9.7 | 16 | 26 | 40 | 62 | | | | | | |
| G | 32 | | | | | | | | | | 1.2 | | | 2.6 | 4.3 | 6.1 | 9.9 | 16 | 25 | 39 | | | | | | | |
| H | 50 | | | | | | | | | 0.74 | | | 1.7 | 2.7 | 3.9 | 6.3 | 10 | 16 | 25 | | | | | | | | |
| J | 80 | | | | | | | | 0.46 | | | 1.1 | 1.7 | 2.4 | 4.0 | 6.4 | 9.9 | 16 | | | | | | | | | |
| K | 125 | | | | | | | 0.29 | | | 0.67 | 1.1 | 1.6 | 2.5 | 4.1 | 6.4 | 9.9 | | | | | | | | | | |
| L | 200 | | | | | | 0.18 | | | 0.42 | 0.69 | 0.97 | 1.6 | 2.6 | 4.0 | 6.2 | | | | | | | | | | | |
| M | 315 | | | | | 0.12 | | | 0.27 | 0.44 | 0.62 | 1.0 | 1.6 | 2.5 | 3.9 | | | | | | | | | | | | |
| N | 500 | | | | 0.074 | | | 0.17 | 0.27 | 0.39 | 0.63 | 1.0 | 1.6 | 2.5 | | | | | | | | | | | | | |
| P | 800 | | | 0.046 | | | 0.11 | 0.17 | 0.24 | 0.40 | 0.64 | 0.99 | 1.6 | | | | | | | | | | | | | | |
| Q | 1250 | | 0.029 | | | 0.067 | 0.11 | 0.16 | 0.25 | 0.41 | 0.64 | 0.99 | | | | | | | | | | | | | | | |
| R | 2000 | 0.018 | | | 0.042 | 0.069 | 0.097 | 0.16 | 0.26 | 0.40 | 0.62 | | | | | | | | | | | | | | | | |
| S | 3150 | | | 0.027 | | | | | | | | | | | | | | | | | | | | | | | |

Note: For a more accurate AOQL, the above values must be multiplied by $\left(1 - \frac{\text{Sample size}}{\text{Lot or Batch size}}\right)$ (See 11.4)

## *Table VI-A—Limiting Quality (in percent nonconforming) for Which $P_a$ = 10 Percent (for Normal Inspection, Single Sampling)*

*(See 11.6)*

| Code letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 |
| A | 2 | | | | | | | | | | | | | | | 68 | |
| B | 3 | | | | | | | | | | | | | | 54 | | |
| C | 5 | | | | | | | | | | | | | 37 | | | 58 |
| D | 8 | | | | | | | | | | | | 25 | | | 41 | 54 |
| E | 13 | | | | | | | | | | | 16 | | | 27 | 36 | 44 |
| F | 20 | | | | | | | | | | 11 | | | 18 | 25 | 30 | 42 |
| G | 32 | | | | | | | | | 6.9 | | | 12 | 16 | 20 | 27 | 34 |
| H | 50 | | | | | | | | 4.5 | | | 7.6 | 10 | 13 | 18 | 22 | 29 |
| J | 80 | | | | | | | 2.8 | | | 4.8 | 6.5 | 8.2 | 11 | 14 | 19 | 24 |
| K | 125 | | | | | | 1.8 | | | 3.1 | 4.3 | 5.4 | 7.4 | 9.4 | 12 | 16 | 23 |
| L | 200 | | | | | 1.2 | | | 2.0 | 2.7 | 3.3 | 4.6 | 5.9 | 7.7 | 10 | 14 | |
| M | 315 | | | | 0.73 | | | 1.2 | 1.7 | 2.1 | 2.9 | 3.7 | 4.9 | 6.4 | 9.0 | | |
| N | 500 | | | 0.46 | | | 0.78 | 1.1 | 1.3 | 1.9 | 2.4 | 3.1 | 4.0 | 5.6 | | | |
| P | 800 | | 0.29 | | | 0.49 | 0.67 | 0.84 | 1.2 | 1.5 | 1.9 | 2.5 | 3.5 | | | | |
| Q | 1250 | 0.18 | | | 0.31 | 0.43 | 0.53 | 0.74 | 0.94 | 1.2 | 1.6 | 2.3 | | | | | |
| R | 2000 | | | 0.20 | 0.27 | 0.33 | 0.46 | 0.59 | 0.77 | 1.0 | 1.4 | | | | | | |

## *Table VI-B—Limiting Quality (in nonconformities per hundred units) for Which $P_a$ = 10 Percent (for Normal Inspection, Single Sampling)*

*(See 11.6)*

| Code letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | 2 | | | | | | | | | | | | | | | 120 | | | 200 | 270 | 330 | 460 | 590 | 770 | 1000 | 1400 | 1900 |
| B | 3 | | | | | | | | | | | | | | 77 | | | 130 | 180 | 220 | 310 | 390 | 510 | 670 | 940 | 1300 | 1800 |
| C | 5 | | | | | | | | | | | | | 46 | | | 78 | 110 | 130 | 190 | 240 | 310 | 400 | 560 | 770 | 1100 | |
| D | 8 | | | | | | | | | | | | 29 | | | 49 | 67 | 84 | 120 | 150 | 190 | 250 | 350 | 480 | 670 | | |
| E | 13 | | | | | | | | | | | 18 | | | 30 | 41 | 51 | 71 | 91 | 120 | 160 | 220 | 300 | 410 | | | |
| F | 20 | | | | | | | | | | 12 | | | 20 | 27 | 33 | 46 | 59 | 77 | 100 | 140 | | | | | | |
| G | 32 | | | | | | | | | 7.2 | | | 12 | 17 | 21 | 29 | 37 | 48 | 63 | 88 | | | | | | |
| H | 50 | | | | | | | | 4.6 | | | 7.8 | 11 | 13 | 19 | 24 | 31 | 40 | 56 | | | | | | | |
| J | 80 | | | | | | | 2.9 | | | 4.9 | 6.7 | 8.4 | 12 | 15 | 19 | 25 | 35 | | | | | | | | |
| K | 125 | | | | | | 1.8 | | | 3.1 | 4.3 | 5.4 | 7.4 | 9.4 | 12 | 16 | 23 | | | | | | | | | | |
| L | 200 | | | | | 1.2 | | | 2.0 | 2.7 | 3.3 | 4.6 | 5.9 | 7.7 | 10 | 14 | | | | | | | | | | | |
| M | 315 | | | | 0.73 | | | 1.2 | 1.7 | 2.1 | 2.9 | 3.7 | 4.9 | 6.4 | 9.0 | | | | | | | | | | | | |
| N | 500 | | | 0.46 | | | 0.78 | 1.1 | 1.3 | 1.9 | 2.4 | 3.1 | 4.0 | 5.6 | | | | | | | | | | | | | |
| P | 800 | | 0.29 | | | 0.49 | 0.67 | 0.84 | 1.2 | 1.5 | 1.9 | 2.5 | 3.5 | | | | | | | | | | | | | | |
| Q | 1250 | 0.18 | | | 0.31 | 0.43 | 0.53 | 0.74 | 0.94 | 1.2 | 1.6 | 2.3 | | | | | | | | | | | | | | | |
| R | 2000 | | | 0.20 | 0.27 | 0.33 | 0.46 | 0.59 | 0.77 | 1.0 | 1.4 | | | | | | | | | | | | | | | | |

## *Table VII-A—Limiting Quality (in percent nonconforming) for Which $P_a$ = 5 Percent (for Normal Inspection, Single Sampling)*

*(See 11.6)*

| Code letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 |
| A | 2 | | | | | | | | | | | | | | | 78 | |
| B | 3 | | | | | | | | | | | | | | 63 | | |
| C | 5 | | | | | | | | | | | | | 45 | | | 66 |
| D | 8 | | | | | | | | | | | | 31 | | | 47 | 60 |
| E | 13 | | | | | | | | | | | 21 | | | 32 | 41 | 50 |
| F | 20 | | | | | | | | | | 14 | | | 22 | 28 | 34 | 46 |
| G | 32 | | | | | | | | | 8.9 | | | 14 | 18 | 23 | 30 | 37 |
| H | 50 | | | | | | | | 5.8 | | | 9.1 | 12 | 15 | 20 | 25 | 32 |
| J | 80 | | | | | | | 3.7 | | | 5.8 | 7.7 | 9.4 | 13 | 16 | 20 | 26 |
| K | 125 | | | | | | 2.4 | | | 3.8 | 5.0 | 6.2 | 8.4 | 11 | 14 | 18 | 24 |
| L | 200 | | | | | 1.5 | | | 2.4 | 3.2 | 3.9 | 5.3 | 6.6 | 8.5 | 11 | 15 | |
| M | 315 | | | | 0.95 | | | 1.5 | 2.0 | 2.5 | 3.3 | 4.2 | 5.4 | 7.0 | 9.6 | | |
| N | 500 | | | 0.60 | | | 0.95 | 1.3 | 1.6 | 2.1 | 2.6 | 3.4 | 4.4 | 6.1 | | | |
| P | 800 | | 0.38 | | | 0.59 | 0.79 | 0.97 | 1.3 | 1.6 | 2.1 | 2.7 | 3.8 | | | | |
| Q | 1250 | 0.24 | | | 0.38 | 0.50 | 0.62 | 0.84 | 1.1 | 1.4 | 1.8 | 2.4 | | | | | |
| R | 2000 | | | 0.24 | 0.32 | 0.39 | 0.53 | 0.66 | 0.85 | 1.1 | 1.5 | | | | | | |

## *Table VII-B—Limiting Quality (in nonconformities per hundred units) for Which $P_a$ = 5 Percent (for Normal Inspection, Single Sampling)*

*(See 11.6)*

| Code letter | Sample size | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | 2 | | | | | | | | | | | | | | | 150 | | | 240 | 320 | 390 | 530 | 660 | 850 | 1100 | 1500 | 2000 |
| B | 3 | | | | | | | | | | | | | | 100 | | | 160 | 210 | 260 | 350 | 440 | 570 | 730 | 1000 | 1400 | 1900 |
| C | 5 | | | | | | | | | | | | | 60 | | | 95 | 130 | 160 | 210 | 260 | 340 | 440 | 610 | 810 | 1100 | |
| D | 8 | | | | | | | | | | | | 38 | | | 59 | 79 | 97 | 130 | 160 | 210 | 270 | 380 | 510 | 670 | | |
| E | 13 | | | | | | | | | | | 23 | | | 37 | 48 | 60 | 81 | 100 | 130 | 170 | 230 | 310 | 440 | | | |
| F | 20 | | | | | | | | | | 15 | | | 24 | 32 | 39 | 53 | 66 | 85 | 110 | 150 | | | | | | |
| G | 32 | | | | | | | | | 9.4 | | | 15 | 20 | 24 | 33 | 41 | 53 | 68 | 95 | | | | | | | |
| H | 50 | | | | | | | | 6.0 | | | 9.5 | 13 | 16 | 21 | 26 | 34 | 44 | 61 | | | | | | | | |
| J | 80 | | | | | | | 3.8 | | | 5.9 | 7.9 | 9.7 | 13 | 16 | 21 | 27 | 38 | | | | | | | | | |
| K | 125 | | | | | | 2.4 | | | 3.8 | 5.0 | 6.2 | 8.4 | 11 | 14 | 18 | 24 | | | | | | | | | | |
| L | 200 | | | | | 1.5 | | | 2.4 | 3.2 | 3.9 | 5.3 | 6.6 | 8.5 | 11 | 15 | | | | | | | | | | | |
| M | 315 | | | | 0.95 | | | 1.5 | 2.0 | 2.5 | 3.3 | 4.2 | 5.4 | 7.0 | 9.6 | | | | | | | | | | | | |
| N | 500 | | | 0.60 | | | 0.95 | 1.3 | 1.6 | 2.1 | 2.6 | 3.4 | 4.4 | 6.1 | | | | | | | | | | | | | |
| P | 800 | | 0.38 | | | 0.59 | 0.79 | 0.97 | 1.3 | 1.6 | 2.1 | 2.7 | 3.8 | | | | | | | | | | | | | | |
| Q | 1250 | 0.24 | | | 0.38 | 0.50 | 0.62 | 0.84 | 1.1 | 1.4 | 1.8 | 2.4 | | | | | | | | | | | | | | | |
| R | 2000 | | | 0.24 | 0.32 | 0.39 | 0.53 | 0.66 | 0.85 | 1.1 | 1.5 | | | | | | | | | | | | | | | | |

# *Table VIII—Limit Numbers for Reduced Inspection*

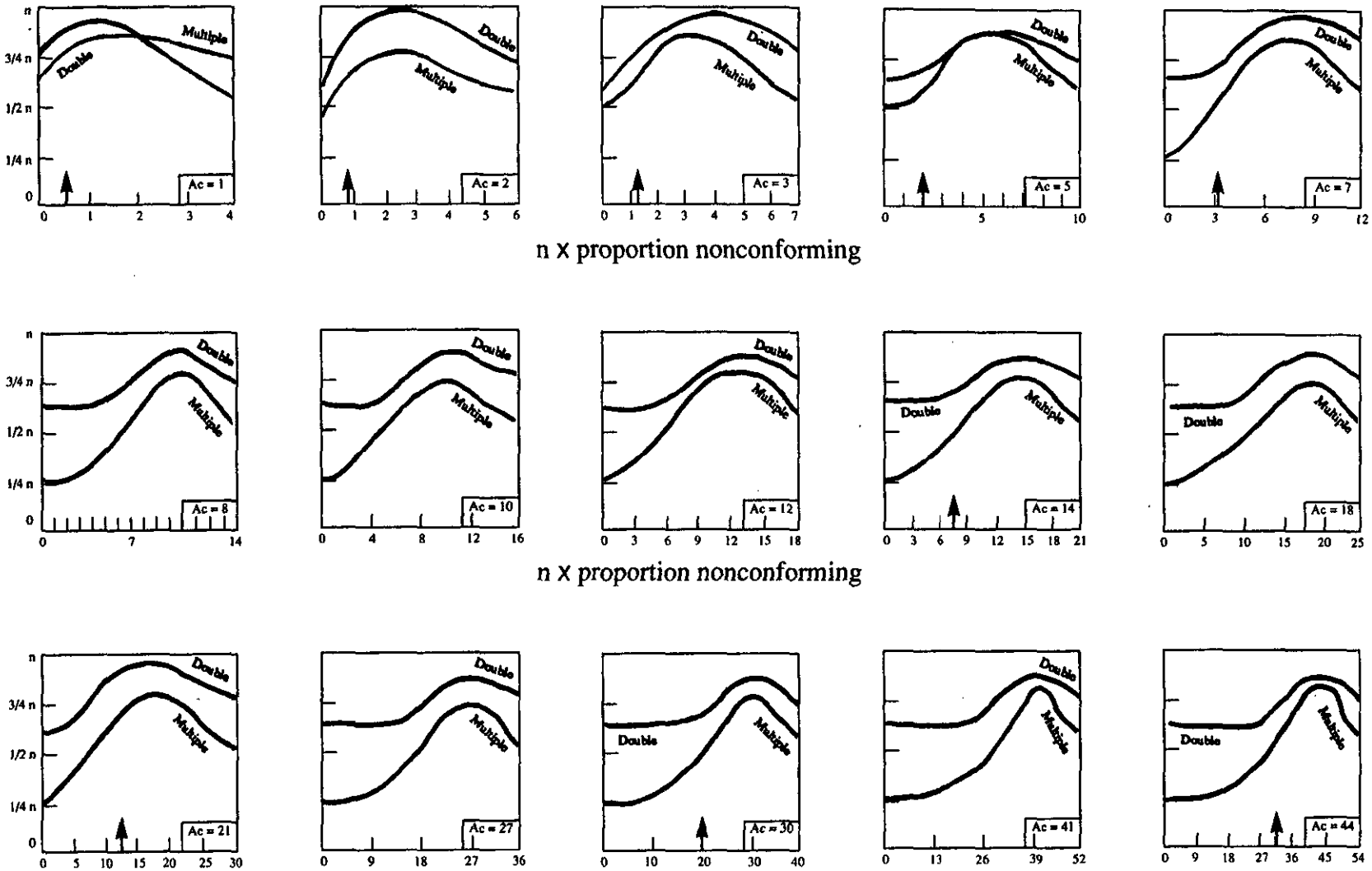
*(See 4.7.3)*

| Number of sample units from last 10 lots or batches | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| 20–29 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 8 | 14 | 22 | 40 | 68 | 115 | 181 |
| 30–49 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 1 | 3 | 7 | 13 | 22 | 36 | 63 | 105 | 178 | 277 |
| 50–79 | * | * | * | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 3 | 7 | 14 | 25 | 40 | 63 | 110 | 181 | 301 | |
| 80–129 | * | * | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 7 | 14 | 24 | 42 | 68 | 105 | 181 | 297 | | |
| 130–199 | * | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 7 | 13 | 25 | 42 | 72 | 115 | 177 | 301 | 490 | | |
| 200–319 | * | * | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 8 | 14 | 22 | 40 | 68 | 115 | 181 | 277 | 471 | | | |
| 320–499 | * | * | * | * | * | * | * | * | * | 0 | 0 | 1 | 4 | 8 | 14 | 24 | 39 | 68 | 113 | 189 | | | | | | |
| 500–799 | * | * | * | * | * | * | * | * | 0 | 0 | 2 | 3 | 7 | 14 | 25 | 40 | 63 | 110 | 181 | | | | | | | |
| 800–1249 | * | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 7 | 14 | 24 | 42 | 68 | 105 | 181 | | | | | | | | |
| 1250–1999 | * | * | * | * | * | * | 0 | 0 | 2 | 4 | 7 | 13 | 24 | 40 | 69 | 110 | 169 | | | | | | | | | |
| 2000–3149 | * | * | * | * | * | 0 | 0 | 2 | 4 | 8 | 14 | 22 | 40 | 68 | 115 | 181 | | | | | | | | | | |
| 3150–4999 | * | * | * | * | 0 | 0 | 1 | 4 | 8 | 14 | 24 | 38 | 67 | 111 | 186 | | | | | | | | | | | |
| 5000–7999 | * | * | * | 0 | 0 | 2 | 3 | 7 | 14 | 25 | 40 | 63 | 110 | 181 | | | | | | | | | | | | |
| 8000–12499 | * | * | 0 | 0 | 2 | 4 | 7 | 14 | 24 | 42 | 68 | 105 | 181 | | | | | | | | | | | | | |
| 12500–19999 | * | 0 | 0 | 2 | 4 | 7 | 13 | 24 | 40 | 69 | 110 | 169 | | | | | | | | | | | | | | |
| 20000–31499 | 0 | 0 | 2 | 4 | 8 | 14 | 22 | 40 | 68 | 115 | 181 | | | | | | | | | | | | | | | |
| 31500 & Over | 0 | 1 | 4 | 8 | 14 | 24 | 38 | 67 | 111 | 186 | | | | | | | | | | | | | | | | |

* = Denotes that the number of sample units from the last ten lots or batches is not sufficient for reduced inspection for this AQL. In this instance more than ten lots or batches may be used for the calculation, provided that the lots or batches used are the most recent ones in sequence, that they have all been on normal inspection, and that none has been rejected while on original inspection.

# *Table IX—Average sample size curves for double and multiple sampling plans (normal and tightened inspection)*

*(See 11.5)*




n = *Equivalent single sample size*
Ac = Single sample acceptance number
▲ = Reference point, shows performance at AQL for normal inspection

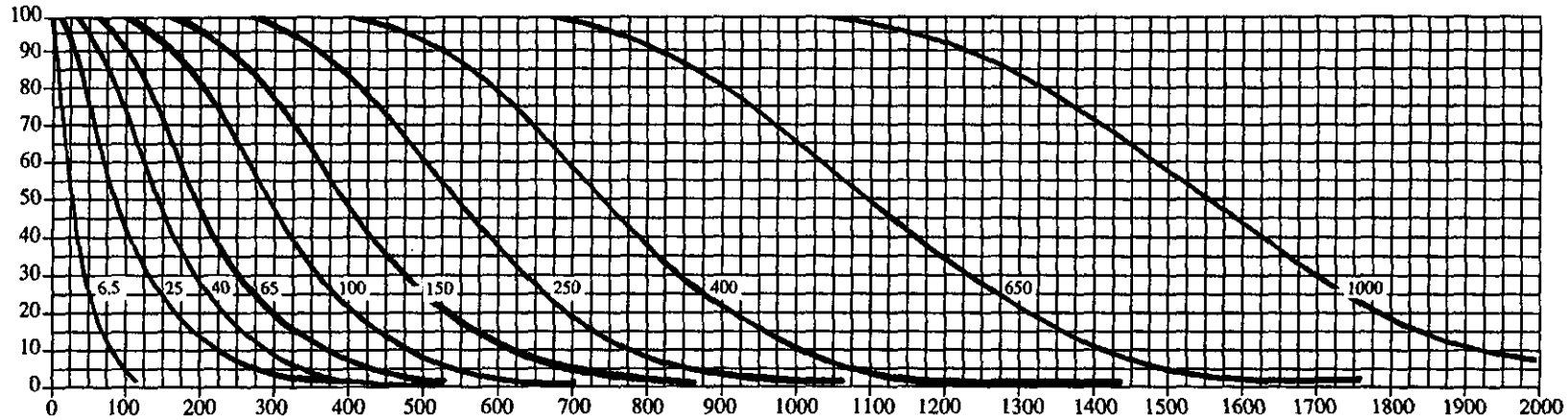
# *Table X-A–Tables for sample size code letter: A*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART A—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



TABLE X-A-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6.5 | 6.5 | 25 | 40 | 65 | 100 | 150 | X | 250 | X | 400 | X | 625 | X | 1000 |
| | p (in percent nonconforming) | p (in nonconformities per hundred units) | | | | | | | | | | | | | |
| 99.0 | 0.501 | 0.503 | 7.43 | 21.8 | 41.2 | 89.3 | 145 | 175 | 239 | 305 | 374 | 517 | 629 | 859 | 977 |
| 95.0 | 2.53 | 2.56 | 17.8 | 40.9 | 68.3 | 131 | 199 | 235 | 308 | 384 | 462 | 622 | 745 | 995 | 1122 |
| 90.0 | 5.13 | 5.27 | 26.6 | 55.1 | 87.2 | 158 | 233 | 272 | 351 | 432 | 515 | 684 | 812 | 1073 | 1206 |
| 75.0 | 13.4 | 14.4 | 48.1 | 86.4 | 127 | 211 | 298 | 342 | 431 | 521 | 612 | 795 | 934 | 1214 | 1354 |
| 50.0 | 29.3 | 34.7 | 83.9 | 134 | 184 | 284 | 383 | 433 | 533 | 633 | 733 | 933 | 1083 | 1383 | 1533 |
| 25.0 | 50.0 | 69.3 | 135 | 196 | 255 | 371 | 484 | 540 | 651 | 761 | 870 | 1087 | 1248 | 1568 | 1728 |
| 10.0 | 68.4 | 115 | 194 | 266 | 334 | 464 | 589 | 650 | 770 | 889 | 1006 | 1238 | 1409 | 1748 | 1916 |
| 5.0 | 77.6 | 150 | 237 | 315 | 388 | 526 | 657 | 722 | 848 | 972 | 1094 | 1335 | 1512 | 1862 | 2035 |
| 1.0 | 90.0 | 230 | 332 | 420 | 502 | 655 | 800 | 870 | 1007 | 1141 | 1272 | 1529 | 1718 | 2088 | 2270 |
| | | X | 40 | 65 | 100 | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | X |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-A-2—Sampling Plans for Sample Size Code Letter: A*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 6.5 | 6.5 | X | 10 | 15 | 25 | 40 | 65 | 100 | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 2 | ∇ | 0 1 | Use Code Letter D | Use Code Letter C | Use Code Letter B | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | 27 28 | 30 31 | 2 |
| Double | | ∇ | * | | | | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | (*) | |
| Multiple | | ∇ | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| | | Less than 10 | X | 10 | 15 | 25 | 40 | 65 | 100 | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | X | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | |

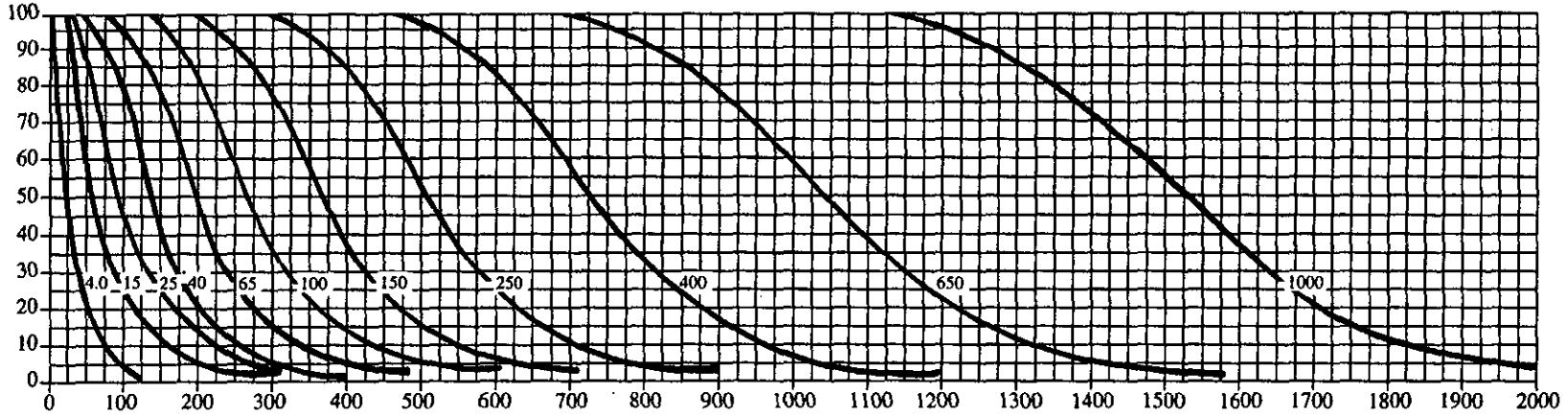
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number
Re = Rejection number
* = Use single sampling plan above (or alternatively use code letter D).
(*) = Use single sampling (or alternatively use code letter B).

# *Table X-B—Tables for sample size code letter: B*

## INDIVIDUAL PLANS

### CHART B—OPERATING CHARACTERISTICS CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



### TABLE X-B-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.0 | 4.0 | 15 | 25 | 40 | 65 | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X | 1000 |
| | p (in percent nonconforming) | p(in nonconformities per hundred units) | | | | | | | | | | | | | | | |
| 99.0 | 0.33 | 0.335 | 4.95 | 14.5 | 27.4 | 59.5 | 96.9 | 117 | 159 | 203 | 249 | 345 | 419 | 572 | 651 | 947 | 102 |
| 95.0 | 1.70 | 1.71 | 11.8 | 27.3 | 45.5 | 87.1 | 133 | 157 | 206 | 256 | 308 | 415 | 495 | 663 | 748 | 1065 | 1152 |
| 90.0 | 3.45 | 3.51 | 17.7 | 36.7 | 58.2 | 105 | 155 | 181 | 234 | 288 | 343 | 456 | 541 | 716 | 804 | 1131 | 1222 |
| 75.0 | 9.14 | 9.59 | 32.0 | 57.6 | 84.5 | 141 | 199 | 228 | 287 | 347 | 408 | 530 | 623 | 809 | 903 | 1249 | 1344 |
| 50.0 | 20.6 | 23.1 | 55.9 | 89.1 | 122 | 189 | 256 | 289 | 356 | 422 | 489 | 622 | 722 | 922 | 1022 | 1389 | 1489 |
| 25.0 | 37.0 | 46.2 | 89.8 | 131 | 170 | 247 | 323 | 360 | 434 | 507 | 580 | 724 | 832 | 1045 | 1152 | 1539 | 1644 |
| 10.0 | 53.6 | 76.8 | 130 | 177 | 223 | 309 | 392 | 433 | 514 | 593 | 671 | 825 | 939 | 1165 | 1277 | 1683 | 1793 |
| 5.0 | 63.2 | 99.9 | 158 | 210 | 258 | 350 | 438 | 481 | 565 | 648 | 730 | 890 | 1008 | 1241 | 1356 | 1773 | 1886 |
| 1.0 | 78.5 | 154 | 221 | 280 | 335 | 437 | 533 | 580 | 671 | 761 | 848 | 1019 | 1145 | 1392 | 1513 | 1951 | 2069 |
| | 6.5 | 6.5 | 25 | 40 | 65 | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-B-2—Sampling Plans for Sample Size Code Letter: B*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 4.0 | 4.0 | 6.5 | X | 10 | 15 | 25 | 40 | 65 | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 3 | ∇ | 0 1 | Use Code Letter A | Use Code Letter D | Use Code Letter C | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | 27 28 | 30 31 | 41 42 | 44 45 | 3 |
| Double | 2 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | 15 20 | 17 22 | 23 29 | 25 31 | 2 |
| | 4 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | 34 35 | 37 38 | 52 53 | 56 57 | 4 |
| Multiple | | ∇ | * | | | | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | |
| | | Less than 6.5 | 6.5 | X | 10 | 15 | 25 | 40 | 65 | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | X | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | |

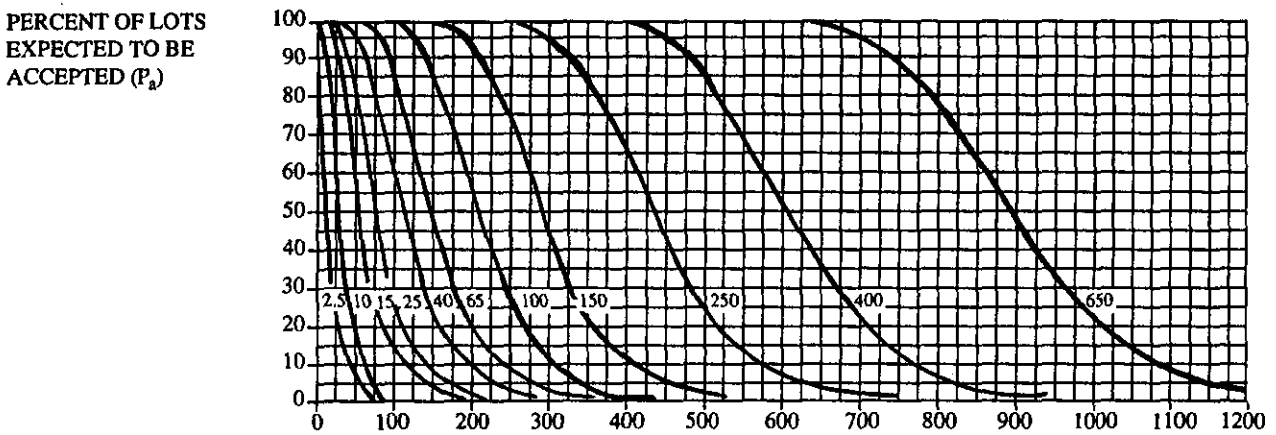
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number
Re = Rejection number
* = Use single sampling plan above (or alternatively use code letter E).
+ + = Use double sampling plan above (or alternatively use code letter D).

# *Table X-C—Tables for sample size code letter: C*

## INDIVIDUAL PLANS

### CHART C—OPERATING CHARACTERISTICS CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

### TABLE X-C-1— TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.5 | 10 | 2.5 | 10 | 15 | 25 | 40 | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X | 650 |
| | p (in percent nonconforming) | | p (in nonconformities per hundred units) | | | | | | | | | | | | | | | |
| 99.0 | 0.201 | 3.27 | 0.201 | 2.97 | 8.72 | 16.5 | 37.5 | 58.1 | 70.1 | 95.4 | 122 | 150 | 207 | 251 | 343 | 391 | 568 | 618 |
| 95.0 | 1.02 | 7.64 | 1.03 | 7.11 | 16.4 | 27.3 | 52.3 | 79.6 | 93.9 | 123 | 154 | 185 | 249 | 298 | 398 | 449 | 639 | 691 |
| 90.0 | 2.09 | 11.2 | 2.11 | 10.6 | 22.0 | 34.9 | 63.0 | 93.1 | 109 | 140 | 173 | 206 | 273 | 325 | 429 | 482 | 679 | 733 |
| 75.0 | 5.59 | 19.4 | 5.75 | 19.2 | 34.5 | 50.7 | 84.4 | 119 | 137 | 172 | 208 | 245 | 318 | 374 | 485 | 542 | 749 | 806 |
| 50.0 | 12.9 | 31.4 | 13.9 | 33.6 | 53.5 | 73.4 | 113 | 153 | 173 | 213 | 253 | 293 | 373 | 433 | 553 | 613 | 833 | 893 |
| 25.0 | 24.2 | 45.4 | 27.7 | 53.9 | 78.4 | 102 | 148 | 194 | 216 | 260 | 304 | 348 | 435 | 499 | 627 | 691 | 923 | 986 |
| 10.0 | 36.9 | 58.4 | 46.1 | 77.8 | 106 | 134 | 185 | 235 | 260 | 308 | 356 | 403 | 495 | 564 | 699 | 766 | 1010 | 1076 |
| 5.0 | 45.1 | 65.7 | 59.9 | 94.9 | 126 | 155 | 210 | 263 | 289 | 339 | 389 | 438 | 534 | 605 | 745 | 814 | 1064 | 1131 |
| 1.0 | 60.2 | 77.8 | 92.1 | 133 | 168 | 201 | 262 | 320 | 348 | 403 | 456 | 509 | 612 | 687 | 835 | 908 | 1171 | 1241 |
| | 4.0 | X | 4.0 | 15 | 25 | 40 | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-C-2—Sampling Plans for Sample Size Code Letter: C*

| Type of sampling plan | Cumulative sample size | Less than 2.5 | 2.5 | 4.0 | X | 6.5 | 10 | 15 | 25 | 40 | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X | 650 | 1000 | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 5 | ∇ | 0 1 | Use Code Letter B | Use Code Letter E | Use Code Letter D | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | 27 28 | 30 31 | 41 42 | 44 45 | Use Code Letter B | 5 |
| Double | 3<br>6 | ∇ | * | | | | 0 2<br>1 2 | 0 3<br>3 4 | 1 4<br>4 5 | 2 5<br>6 7 | 3 7<br>8 9 | 3 7<br>11 12 | 5 9<br>12 13 | 6 10<br>15 16 | 7 11<br>18 19 | 9 14<br>23 24 | 11 16<br>26 27 | 15 20<br>34 35 | 17 22<br>37 38 | 23 29<br>52 53 | 25 31<br>56 57 | | 3<br>6 |
| Multiple | | ∇ | * | | | | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | + + | | |
| | | Less than 4.0 | 4.0 | X | 6.5 | 10 | 15 | 25 | 40 | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X | 650 | X | 1000 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | |

∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number
Re = Rejection number
* = Use single sampling plan above (or alternatively use code letter F).
++ = Use double sampling plan above (or alternatively use code letter D).

# AMERICAN NATIONAL STANDARD

## SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY VARIABLES FOR PERCENT NONCONFORMING

AMERICAN SOCIETY FOR QUALITY CONTROL
611 East Wisconsin Avenue Milwaukee, WI 53202

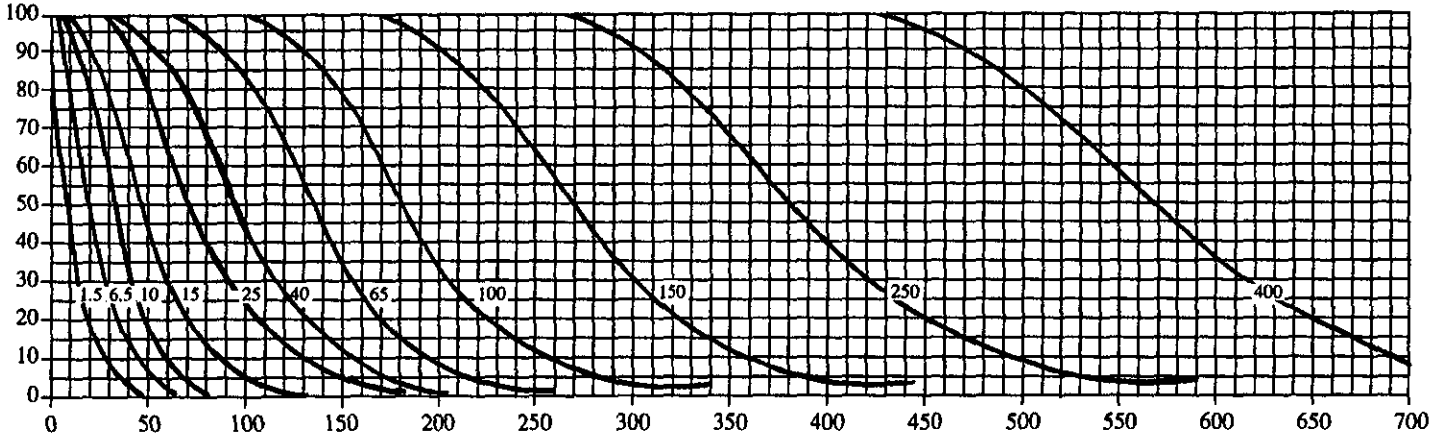
# *Table X-D—Tables for sample size code letter: D*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART D—OPERATING CHARACTERISTICS CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-D-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 6.5 | 10 | 1.5 | 6.5 | 10 | 15 | 25 | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X | 450 |
| | p (in percent nonconforming) | | | p (in nonconformities per hundred units) | | | | | | | | | | | | | | | |
| 99.0 | 0.126 | 1.97 | 6.08 | 0.126 | 1.86 | 5.45 | 10.3 | 22.3 | 36.3 | 43.8 | 59.6 | 76.2 | 93.5 | 129 | 157 | 215 | 244 | 355 | 386 |
| 95.0 | 0.639 | 4.64 | 11.1 | 0.641 | 4.44 | 10.2 | 17.1 | 32.7 | 49.8 | 58.7 | 77.1 | 96.1 | 116 | 156 | 186 | 249 | 281 | 399 | 432 |
| 90.0 | 1.32 | 6.88 | 14.7 | 1.31 | 6.65 | 13.8 | 21.8 | 39.4 | 58.2 | 67.9 | 87.8 | 108 | 129 | 171 | 203 | 268 | 301 | 424 | 458 |
| 75.0 | 3.53 | 12.1 | 22.1 | 3.60 | 12.0 | 21.6 | 31.7 | 52.7 | 74.5 | 85.5 | 108 | 130 | 153 | 199 | 234 | 303 | 339 | 468 | 504 |
| 50.0 | 8.30 | 20.1 | 32.1 | 8.66 | 21.0 | 33.4 | 45.9 | 70.9 | 95.9 | 108 | 133 | 158 | 183 | 233 | 271 | 346 | 383 | 521 | 558 |
| 25.0 | 15.9 | 30.3 | 43.3 | 17.3 | 33.7 | 49.0 | 63.9 | 92.8 | 121 | 135 | 163 | 190 | 217 | 272 | 312 | 392 | 432 | 577 | 617 |
| 10.0 | 25.0 | 40.6 | 53.8 | 28.8 | 48.6 | 66.5 | 83.5 | 116 | 147 | 162 | 193 | 222 | 252 | 309 | 352 | 437 | 479 | 631 | 672 |
| 5.0 | 31.2 | 47.1 | 60.0 | 37.4 | 59.3 | 78.7 | 96.9 | 131 | 164 | 180 | 212 | 243 | 274 | 334 | 378 | 465 | 509 | 665 | 707 |
| 1.0 | 43.8 | 59.0 | 70.7 | 57.6 | 83.0 | 105 | 126 | 164 | 200 | 218 | 252 | 285 | 318 | 382 | 429 | 522 | 568 | 732 | 776 |
| | 2.5 | 10 | X | 2.5 | 10 | 15 | 25 | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-D-2—Sampling Plans for Sample Size Code Letter: D*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 1.5 | 1.5 | 2.5 | X | 4.0 | 6.5 | 10 | 15 | 25 | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X | 400 | Higher than 400 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 8 | ∇ | 0 1 | Use Code Letter C | Use Code Letter F | Use Code Letter E | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | 27 28 | 30 31 | 41 42 | 44 45 | Δ | 8 |
| Double | 5 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | 15 20 | 17 22 | 23 29 | 25 31 | Δ | 5 |
| | 10 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | 34 35 | 37 38 | 52 53 | 56 57 | | 10 |
| Multiple | 2 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | 3 10 | 4 12 | 6 15 | 6 16 | Δ | 2 |
| | 4 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | 10 17 | 11 19 | 16 25 | 17 26 | | 4 |
| | 6 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | 17 24 | 19 27 | 26 36 | 29 39 | | 6 |
| | 8 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | 24 31 | 27 34 | 37 46 | 40 49 | | 8 |
| | 10 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | 32 37 | 36 40 | 49 55 | 53 58 | | 10 |
| | 12 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | 40 43 | 45 47 | 61 64 | 65 68 | | 12 |
| | 14 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | 48 49 | 53 54 | 72 73 | 77 78 | | 14 |
| | | Less than 2.5 | 2.5 | X | 4.0 | 6.5 | 10 | 15 | 25 | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X | 400 | X | Higher than 400 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.

∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.

Ac = Acceptance number

Re = Rejection number

* = Use single sampling plan above (or alternatively use code letter G).

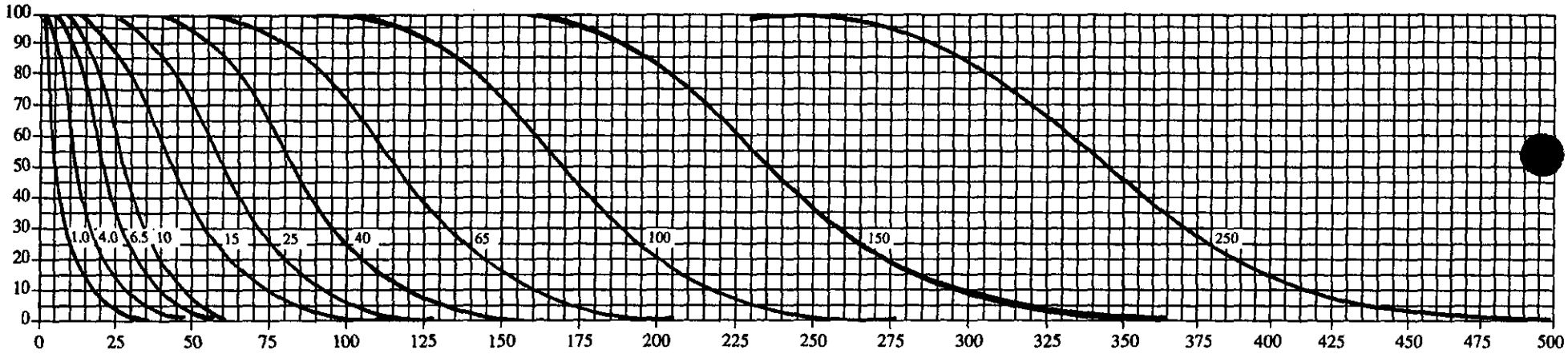
\# = Acceptance not permitted at this sample size.

# *Table X-E—Tables for sample size code letter: E*

## INDIVIDUAL PLANS

### CHART E—OPERATING CHARACTERISTICS CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

### TABLE X-E-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0 | 4.0 | 6.5 | 10 | 1.0 | 4.0 | 6.5 | 10 | 15 | 25 | X | 40 | X | 65 | X | 100 | X | 150 | X | 150 |
| | p (in percent nonconforming) | | | | p (in nonconformities per hundred units) | | | | | | | | | | | | | | | |
| 99.0 | 0.077 | 1.18 | 3.58 | 6.95 | 0.077 | 1.15 | 3.35 | 6.33 | 13.7 | 22.4 | 27.0 | 36.7 | 46.9 | 57.5 | 79.6 | 96.7 | 132 | 150 | 219 | 238 |
| 95.0 | 0.394 | 2.81 | 6.60 | 11.3 | 0.395 | 2.73 | 6.29 | 10.5 | 20.1 | 30.6 | 36.1 | 47.5 | 59.2 | 71.1 | 95.7 | 115 | 153 | 173 | 246 | 266 |
| 90.0 | 0.807 | 4.17 | 8.80 | 14.2 | 0.810 | 4.09 | 8.48 | 13.4 | 24.2 | 35.8 | 41.8 | 54.0 | 66.5 | 79.2 | 105 | 125 | 165 | 185 | 261 | 282 |
| 75.0 | 2.19 | 7.41 | 13.4 | 19.9 | 2.21 | 7.39 | 13.3 | 19.5 | 32.5 | 45.8 | 52.6 | 66.3 | 80.2 | 94.1 | 122 | 144 | 187 | 208 | 288 | 310 |
| 50.0 | 5.19 | 12.6 | 20.0 | 27.5 | 5.33 | 12.9 | 20.6 | 28.2 | 43.6 | 59.0 | 66.7 | 82.1 | 97.4 | 113 | 144 | 167 | 213 | 236 | 321 | 344 |
| 25.0 | 10.1 | 19.4 | 28.0 | 36.1 | 10.7 | 20.7 | 30.2 | 39.3 | 57.1 | 74.5 | 83.1 | 100 | 117 | 134 | 167 | 192 | 241 | 266 | 355 | 379 |
| 10.0 | 16.2 | 26.8 | 36.0 | 44.4 | 17.7 | 29.9 | 40.9 | 51.4 | 71.3 | 90.5 | 100 | 119 | 137 | 155 | 190 | 217 | 269 | 295 | 388 | 414 |
| 5.0 | 20.6 | 31.6 | 41.0 | 49.5 | 23.0 | 36.5 | 48.4 | 59.6 | 80.9 | 101 | 111 | 130 | 150 | 168 | 205 | 233 | 286 | 313 | 409 | 435 |
| 1.0 | 29.8 | 41.3 | 50.6 | 58.8 | 35.4 | 51.1 | 64.7 | 77.3 | 101 | 123 | 134 | 155 | 176 | 196 | 235 | 264 | 321 | 349 | 450 | 477 |
| | 1.5 | 6.5 | 10 | X | 1.5 | 6.5 | 10 | 15 | 25 | X | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

# TABLE X-E-2—SAMPLING PLANS FOR SAMPLE SIZE CODE LETTER: E

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 1.0 | 1.0 | 1.5 | X | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | X | 40 | X | 65 | X | 100 | X | 150 | X | 250 | Higher than 250 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 13 | ∇ | 0 1 | Use Code Letter D | Use Code Letter G | Use Code Letter F | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | 27 28 | 30 31 | 41 42 | 44 45 | Δ | [illegible] |
| Double | 8 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | 15 20 | 17 22 | 23 29 | 25 31 | Δ | 8 |
| | 13 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | 34 35 | 37 38 | 52 53 | 56 57 | | 13 |
| Multiple | 3 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | 3 10 | 4 12 | 6 15 | 6 16 | Δ | 3 |
| | 6 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | 10 17 | 11 19 | 16 25 | 17 27 | | 6 |
| | 9 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | 17 24 | 19 27 | 26 36 | 29 39 | | 9 |
| | 12 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | 24 31 | 27 34 | 37 46 | 40 49 | | 12 |
| | 15 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | 32 37 | 36 40 | 49 55 | 53 58 | | 15 |
| | 18 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | 40 43 | 45 47 | 61 64 | 65 68 | | 18 |
| | 21 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | 48 49 | 53 54 | 72 73 | 77 78 | | [illegible] |
| | | Less than 1.5 | 1.5 | X | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | X | 40 | X | 65 | X | 100 | X | 150 | X | 250 | X | Higher than 250 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.

∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.

Ac = Acceptance number

Re = Rejection number

* = Use single sampling plan above (or alternatively use code letter H).

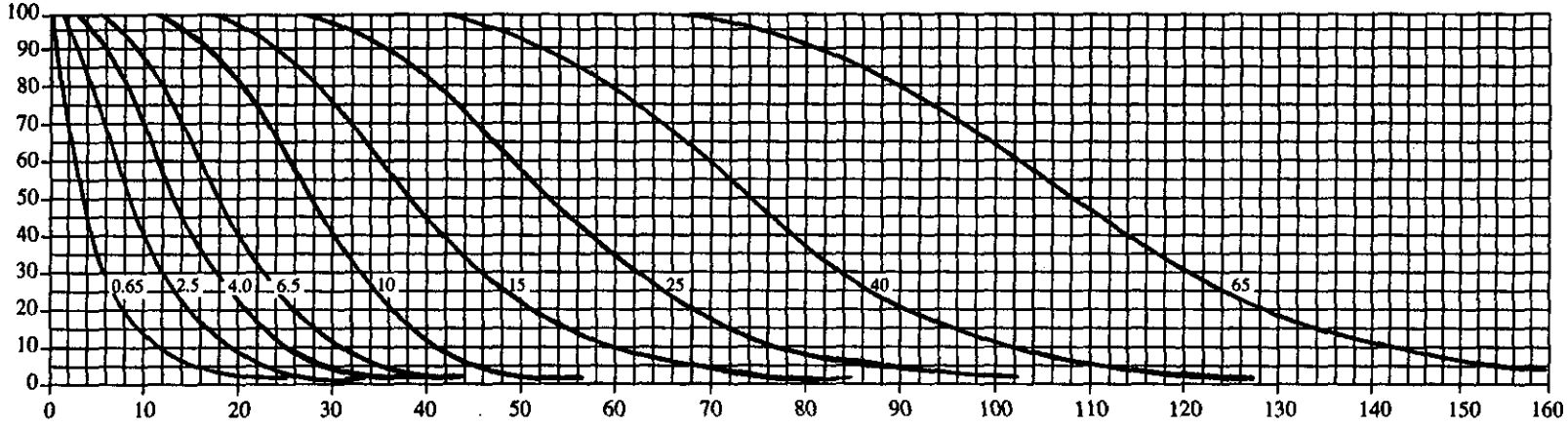
\# = Acceptance not permitted at this sample size.

# *Table X-F—Tables for sample size code letter: F*

## INDIVIDUAL PLANS

CHART F—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-F-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.65 | 2.5 | 4.0 | 6.5 | 10 | 0.65 | 2.5 | 4.0 | 6.5 | 10 | 15 | X | 25 | X | 40 | X | 65 |
| | p (in percent nonconforming) | | | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.0502 | 0.759 | 2.27 | 4.36 | 9.75 | 0.0503 | 0.743 | 2.18 | 4.12 | 8.93 | 14.5 | 17.5 | 23.9 | 30.5 | 37.4 | 51.7 | 62.9 |
| 95.0 | 0.256 | 1.80 | 4.22 | 7.14 | 14.0 | 0.256 | 1.78 | 4.09 | 6.83 | 13.1 | 19.9 | 23.5 | 30.8 | 38.4 | 46.2 | 62.2 | 74.5 |
| 90.0 | 0.525 | 2.69 | 5.64 | 9.03 | 16.6 | 0.527 | 2.66 | 5.51 | 8.72 | 15.8 | 23.3 | 27.2 | 35.1 | 43.2 | 51.5 | 68.4 | 81.2 |
| 75.0 | 1.43 | 4.81 | 8.70 | 12.8 | 21.6 | 1.44 | 4.81 | 8.65 | 12.7 | 21.1 | 29.8 | 34.2 | 43.1 | 52.1 | 61.2 | 79.5 | 93.4 |
| 50.0 | 3.41 | 8.25 | 13.1 | 18.1 | 27.9 | 3.47 | 8.39 | 13.4 | 18.4 | 28.4 | 38.3 | 43.3 | 53.3 | 63.3 | 73.3 | 93.3 | 108 |
| 25.0 | 6.70 | 12.9 | 18.7 | 24.2 | 34.8 | 6.93 | 13.5 | 19.6 | 25.5 | 37.1 | 48.4 | 54.0 | 65.1 | 76.1 | 87.0 | 109 | 125 |
| 10.0 | 10.9 | 18.1 | 24.5 | 30.4 | 41.5 | 11.5 | 19.4 | 26.6 | 33.4 | 46.4 | 58.9 | 65.0 | 77.0 | 88.9 | 101 | 124 | 141 |
| 5.0 | 13.9 | 21.6 | 28.3 | 34.4 | 45.6 | 15.0 | 23.7 | 31.5 | 38.8 | 52.6 | 65.7 | 72.2 | 84.8 | 97.2 | 109 | 133 | 151 |
| 1.0 | 20.6 | 28.9 | 35.8 | 42.1 | 53.2 | 23.0 | 33.2 | 42.0 | 50.2 | 65.5 | 80.0 | 87.0 | 101 | 114 | 127 | 153 | 172 |
| | 1.0 | 4.0 | 6.5 | 10 | X | 1.0 | 4.0 | 6.5 | 10 | 15 | X | 25 | X | 40 | X | 65 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-F-2—Sampling Plans for Sample Size Code Letter: F*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.65 | 0.65 | 1.0 | X | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | X | 25 | X | 40 | X | 65 | Higher than 65 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 20 | ∇ | 0 1 | Use Code Letter E | Use Code Letter H | Use Code Letter G | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 20 |
| Double | 13 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 13 |
| | 26 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 26 |
| Multiple | 5 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 5 |
| | 10 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 10 |
| | 15 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 15 |
| | 20 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 20 |
| | 25 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 25 |
| | 30 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 30 |
| | 35 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 35 |
| | | Less than 1.0 | 1.0 | X | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | X | 25 | X | 40 | X | 65 | X | Higher than 65 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.

∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.

Ac = Acceptance number.

Re = Rejection number.

* = Use single sampling plan above (or alternatively use code letter J).

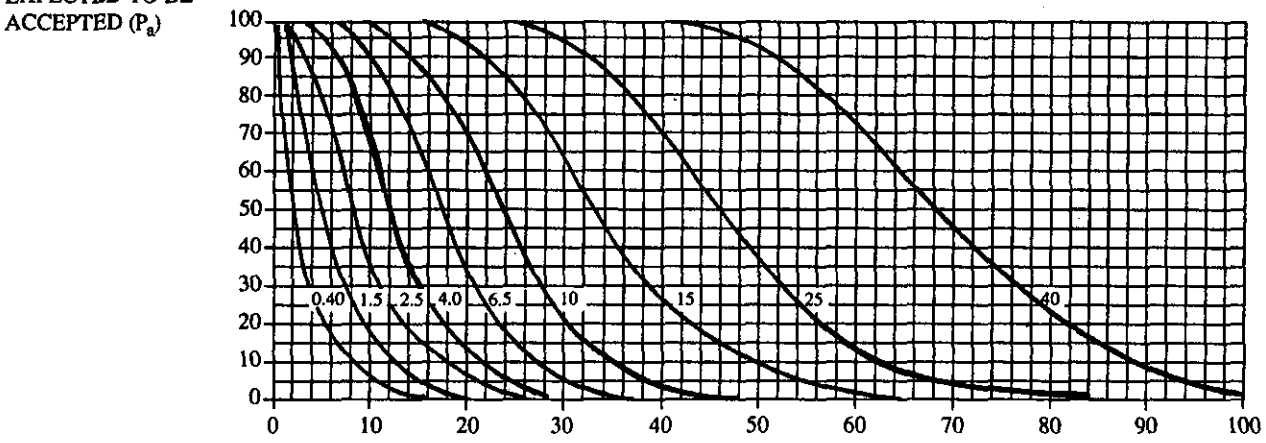
\# = Acceptance not permitted at this sample size.

# *Table X-G—Tables for sample size code letter: G*

## INDIVIDUAL PLANS

### CHART G—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

### TABLE X-G-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.40 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 0.40 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | X | 15 | X | 25 | X | 40 |
| | p (in percent nonconforming) | | | | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.0314 | 0.471 | 1.40 | 2.67 | 5.88 | 9.73 | 0.0314 | 0.464 | 1.36 | 2.57 | 5.58 | 9.08 | 11.0 | 14.9 | 19.1 | 23.4 | 32.3 | 39.3 |
| 95.0 | 0.160 | 1.12 | 2.60 | 4.38 | 8.50 | 13.1 | 0.160 | 1.11 | 2.56 | 4.26 | 8.17 | 12.4 | 14.7 | 19.3 | 24.0 | 28.9 | 38.9 | 46.5 |
| 90.0 | 0.329 | 1.67 | 3.49 | 5.56 | 10.2 | 15.1 | 0.329 | 1.66 | 3.44 | 5.45 | 9.85 | 14.6 | 17.0 | 21.9 | 27.0 | 32.2 | 42.7 | 50.8 |
| 75.0 | 0.895 | 3.01 | 5.42 | 7.98 | 13.4 | 19.0 | 0.899 | 3.00 | 5.40 | 7.92 | 13.2 | 18.6 | 21.4 | 26.9 | 32.6 | 38.2 | 49.7 | 58.4 |
| 50.0 | 2.14 | 5.19 | 8.27 | 11.4 | 17.5 | 23.7 | 2.17 | 5.24 | 8.36 | 11.5 | 17.7 | 24.0 | 27.1 | 33.3 | 39.6 | 45.8 | 58.3 | 67.7 |
| 25.0 | 4.24 | 8.19 | 11.9 | 15.4 | 22.3 | 29.0 | 4.33 | 8.41 | 12.3 | 16.0 | 23.2 | 30.3 | 33.8 | 40.7 | 47.6 | 54.4 | 67.9 | 78.0 |
| 10.0 | 6.94 | 11.6 | 15.8 | 19.7 | 27.1 | 34.1 | 7.20 | 12.2 | 16.6 | 20.9 | 29.0 | 36.8 | 40.6 | 48.1 | 55.6 | 62.9 | 77.4 | 88.1 |
| 5.0 | 8.94 | 14.0 | 18.4 | 22.5 | 30.1 | 37.2 | 9.36 | 14.8 | 19.7 | 24.2 | 32.9 | 41.1 | 45.1 | 53.0 | 60.8 | 68.4 | 83.4 | 94.5 |
| 1.0 | 13.4 | 19.0 | 23.8 | 28.1 | 36.0 | 43.2 | 14.4 | 20.7 | 26.3 | 31.4 | 41.0 | 50.0 | 54.4 | 63.0 | 71.3 | 79.5 | 95.6 | 107 |
| | 0.65 | 2.5 | 4.0 | 6.5 | 10 | X | 0.65 | 2.5 | 4.0 | 6.5 | 10 | X | 15 | X | 25 | X | 40 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-G-2—Sampling Plans for Sample Size Code Letter: G*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.40 | 0.40 | 0.65 | X | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | X | 15 | X | 25 | X | 40 | Higher than 40 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 32 | ∇ | 0 1 | Use Code Letter F | Use Code Letter J | Use Code Letter H | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 32 |
| Double | 20 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 20 |
| | 40 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 40 |
| Multiple | 8 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 8 |
| | 16 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 16 |
| | 24 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 24 |
| | 32 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 32 |
| | 40 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 40 |
| | 48 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 48 |
| | 56 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 56 |
| | | Less than 0.65 | 0.65 | X | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | X | 15 | X | 25 | X | 40 | X | Higher than 40 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter K).
# = Acceptance not permitted at this sample size.

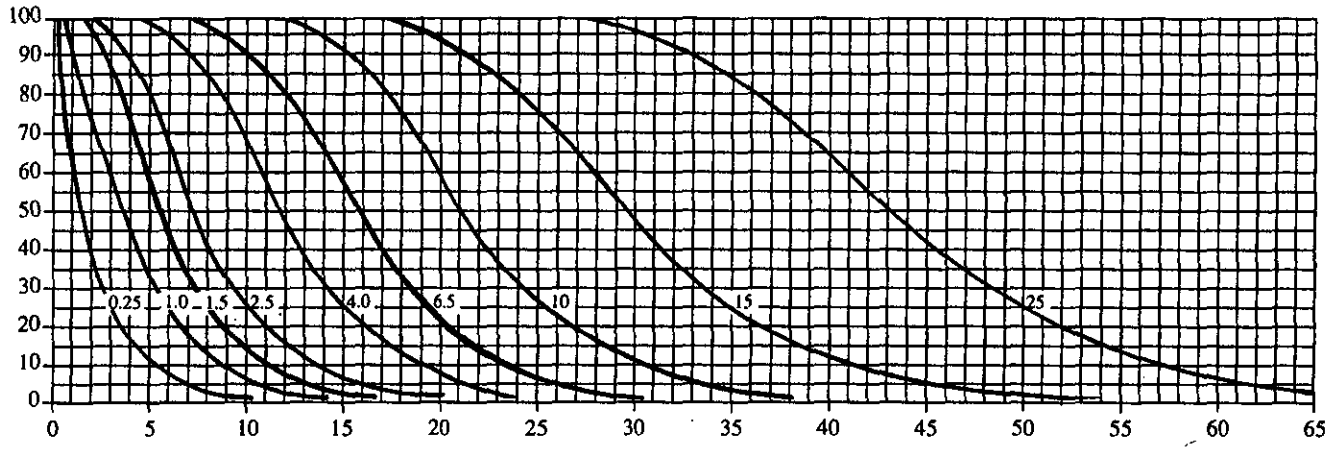
# *Table X-H—Tables for sample size code letter: H*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART H—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-H-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | 0.25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | X | 15 | X | 25 |
| | p (in percent nonconforming) | | | | | | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.0201 | 0.300 | 0.886 | 1.68 | 3.69 | 6.07 | 7.36 | 10.1 | 0.0201 | 0.297 | 0.872 | 1.65 | 3.57 | 5.81 | 7.01 | 9.54 | 12.2 | 15.0 | 20.7 | 25.1 |
| 95.0 | 0.103 | 0.715 | 1.66 | 2.78 | 5.36 | 8.22 | 9.72 | 12.9 | 0.103 | 0.711 | 1.64 | 2.73 | 5.23 | 7.96 | 9.39 | 12.3 | 15.4 | 18.5 | 24.9 | 29.8 |
| 90.0 | 0.211 | 1.07 | 2.22 | 3.53 | 6.43 | 9.54 | 11.2 | 14.5 | 0.210 | 1.06 | 2.20 | 3.49 | 6.30 | 9.31 | 10.9 | 14.0 | 17.3 | 20.6 | 27.3 | 32.5 |
| 75.0 | 0.574 | 1.92 | 3.46 | 5.10 | 8.51 | 12.0 | 13.8 | 17.5 | 0.575 | 1.92 | 3.45 | 5.07 | 8.44 | 11.9 | 13.7 | 17.2 | 20.8 | 24.5 | 31.8 | 37.4 |
| 50.0 | 1.38 | 33.3 | 5.31 | 7.29 | 11.3 | 15.2 | 17.2 | 21.2 | 1.39 | 3.36 | 5.35 | 7.34 | 11.3 | 15.3 | 17.3 | 21.3 | 25.3 | 29.3 | 37.3 | 43.3 |
| 25.0 | 2.73 | 5.29 | 7.69 | 10.0 | 14.5 | 18.8 | 21.0 | 25.2 | 2.77 | 5.39 | 7.84 | 10.2 | 14.8 | 19.4 | 21.6 | 26.0 | 30.4 | 34.8 | 43.5 | 49.9 |
| 10.0 | 4.50 | 7.56 | 10.3 | 12.9 | 17.8 | 22.4 | 24.7 | 29.1 | 4.61 | 7.78 | 10.6 | 13.4 | 18.5 | 23.5 | 26.0 | 30.8 | 35.6 | 40.3 | 49.5 | 56.4 |
| 5.0 | 5.82 | 9.14 | 12.1 | 14.8 | 19.9 | 24.7 | 27.0 | 31.6 | 5.99 | 9.49 | 12.6 | 15.5 | 21.0 | 26.3 | 28.9 | 33.9 | 38.9 | 43.8 | 53.4 | 60.5 |
| 1.0 | 8.80 | 12.6 | 15.8 | 18.7 | 24.2 | 29.2 | 31.7 | 36.3 | 9.21 | 13.3 | 16.8 | 20.1 | 26.2 | 32.0 | 34.8 | 40.3 | 45.6 | 50.9 | 61.1 | 68.7 |
| | 0.40 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | X | 0.40 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | X | 15 | X | 25 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-H-2—Sampling Plans for Sample Size Code Letter: H*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.25 | 0.25 | 0.40 | X | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | X | 15 | X | 25 | Higher than 25 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 50 | ∇ | 0 1 | Use Code Letter G | Use Code Letter K | Use Code Letter J | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 50 |
| Double | 32 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 32 |
| | 64 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 64 |
| Multiple | 13 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 13 |
| | 26 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 26 |
| | 39 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 39 |
| | 52 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 52 |
| | 65 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 65 |
| | 78 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 78 |
| | 91 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 91 |
| | | Less than 0.40 | 0.40 | X | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | X | 10 | X | 15 | X | 25 | X | Higher than 25 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter L).
\# = Acceptance not permitted at this sample size.

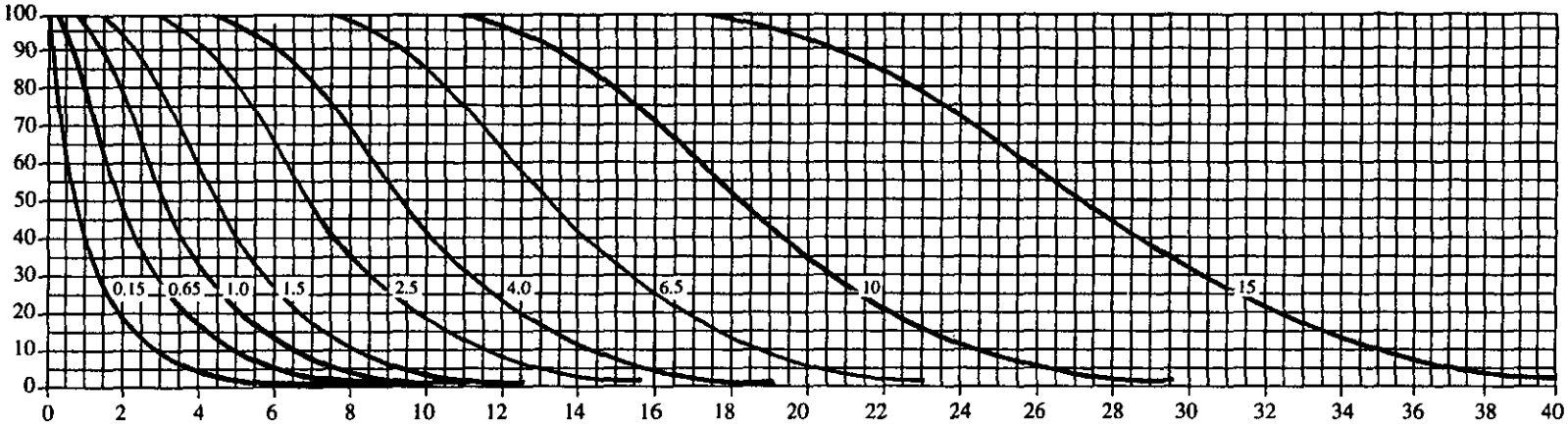
# *Table X-J—Tables for sample size code letter: J*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART J—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-J-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.15 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | 0.15 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | X | 15 |
| | p (in percent nonconforming) | | | | | | | | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.0126 | 0.187 | 0.550 | 1.04 | 2.28 | 3.73 | 4.51 | 6.17 | 7.93 | 9.76 | 0.0126 | 0.186 | 0.545 | 1.03 | 2.23 | 3.63 | 4.38 | 5.96 | 7.62 | 9.35 | 12.9 | 15.7 |
| 95.0 | 0.0641 | 0.446 | 1.03 | 1.73 | 3.32 | 5.07 | 6.00 | 7.91 | 9.89 | 11.9 | 0.064 | 0.444 | 1.02 | 1.71 | 3.27 | 4.98 | 5.87 | 7.71 | 9.61 | 11.6 | 15.6 | 18.6 |
| 90.0 | 0.132 | 0.667 | 1.39 | 2.20 | 3.99 | 5.91 | 6.90 | 8.95 | 11.0 | 13.2 | 0.132 | 0.665 | 1.38 | 2.18 | 3.94 | 5.82 | 6.79 | 8.78 | 10.8 | 12.9 | 17.1 | 20.3 |
| 75.0 | 0.359 | 1.201 | 2.16 | 3.18 | 5.30 | 7.50 | 8.61 | 10.9 | 13.2 | 15.5 | 0.360 | 1.20 | 2.16 | 3.17 | 5.27 | 7.45 | 8.55 | 10.8 | 13.0 | 15.3 | 19.9 | 23.4 |
| 50.0 | 0.863 | 2.09 | 3.33 | 4.57 | 7.06 | 9.55 | 10.8 | 13.3 | 15.8 | 18.3 | 0.866 | 2.10 | 3.34 | 4.59 | 7.09 | 9.59 | 10.8 | 13.3 | 15.8 | 18.3 | 23.3 | 27.1 |
| 25.0 | 1.72 | 3.33 | 4.84 | 6.30 | 9.14 | 11.9 | 13.3 | 16.0 | 18.6 | 21.3 | 1.73 | 3.37 | 4.90 | 6.39 | 9.28 | 12.1 | 13.5 | 16.3 | 19.0 | 21.7 | 27.2 | 31.2 |
| 10.0 | 2.84 | 4.78 | 6.52 | 8.16 | 11.3 | 14.3 | 15.7 | 18.6 | 21.4 | 24.2 | 2.88 | 4.86 | 6.65 | 8.35 | 11.6 | 14.7 | 16.2 | 19.3 | 22.2 | 25.2 | 30.9 | 35.2 |
| 5.0 | 3.68 | 5.79 | 7.66 | 9.41 | 12.7 | 15.8 | 17.3 | 20.3 | 23.2 | 26.0 | 3.74 | 5.93 | 7.87 | 9.69 | 13.1 | 16.4 | 18.0 | 21.2 | 24.3 | 27.4 | 33.4 | 37.8 |
| 1.0 | 5.59 | 8.01 | 10.1 | 12.0 | 15.6 | 18.9 | 20.5 | 23.6 | 26.6 | 29.5 | 5.76 | 8.30 | 10.5 | 12.6 | 16.4 | 20.0 | 21.8 | 25.2 | 28.5 | 31.8 | 38.2 | 42.9 |
| | 0.25 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | X | 0.25 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | X | 15 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | | | | | |

Note: Binomial distribution used for percent nonconforming computations; Poisson for nonconformities per hundred units.

## *Table X-J-2—Sampling Plans for Sample Size Code Letter: J*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.15 | 0.15 | 0.25 | X | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | X | 15 | Higher than 15 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 80 | ∇ | 0 1 | Use Code Letter H | Use Code Letter L | Use Code Letter K | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 80 |
| Double | 50 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 50 |
| | 100 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 100 |
| Multiple | 20 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 20 |
| | 40 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 40 |
| | 60 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 60 |
| | 80 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 80 |
| | 100 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 100 |
| | 120 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 120 |
| | 140 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 140 |
| | | Less than 0.25 | 0.25 | X | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | X | 6.5 | X | 10 | X | 15 | X | Higher than 15 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

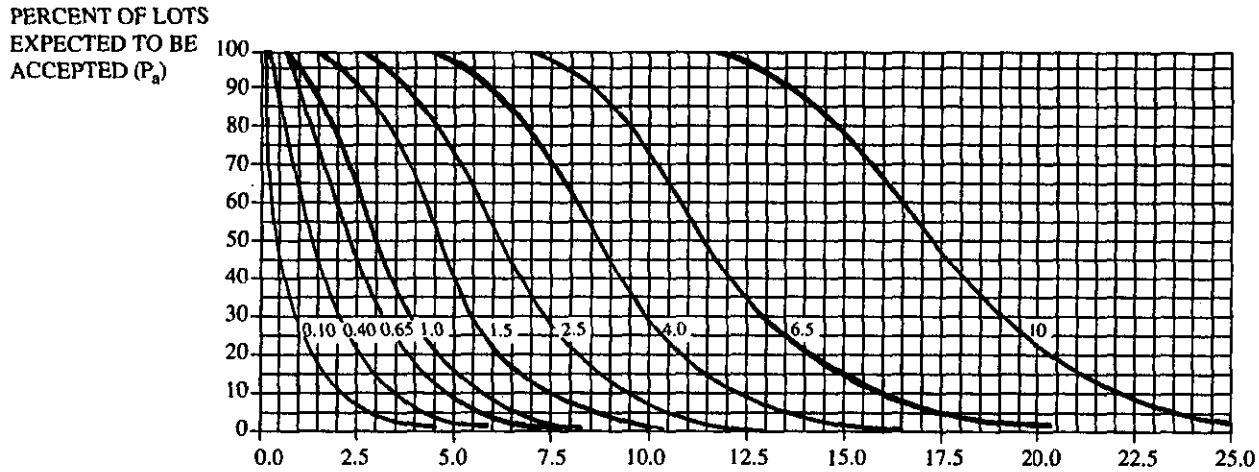
Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter M).
# = Acceptance not permitted at this sample size.

# *Table X-K—Tables for sample size code letter: K*

## INDIVIDUAL PLANS

### CHART K—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



### TABLE X-K-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | X | 4.0 | X | 6.5 | X | 10 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.00804 | 0.119 | 0.349 | 0.659 | 1.43 | 2.32 | 2.81 | 3.82 | 4.88 | 5.98 | 8.28 | 10.1 |
| 95.0 | 0.0410 | 0.284 | 0.654 | 1.09 | 2.09 | 3.18 | 3.76 | 4.94 | 6.15 | 7.40 | 9.95 | 11.9 |
| 90.0 | 0.0843 | 0.425 | 0.882 | 1.40 | 2.52 | 3.72 | 4.35 | 5.62 | 6.92 | 8.24 | 10.9 | 13.0 |
| 75.0 | 0.230 | 0.769 | 1.38 | 2.03 | 3.38 | 4.76 | 5.47 | 6.90 | 8.34 | 9.79 | 12.7 | 14.9 |
| 50.0 | 0.555 | 1.34 | 2.14 | 2.94 | 4.54 | 6.14 | 6.94 | 8.53 | 10.1 | 11.7 | 14.9 | 17.3 |
| 25.0 | 1.11 | 2.15 | 3.14 | 4.09 | 5.94 | 7.75 | 8.64 | 10.4 | 12.2 | 13.9 | 17.4 | 20.0 |
| 10.0 | 1.84 | 3.11 | 4.26 | 5.34 | 7.42 | 9.42 | 10.4 | 12.3 | 14.2 | 16.1 | 19.8 | 22.54 |
| 5.0 | 2.40 | 3.80 | 5.04 | 6.20 | 8.41 | 10.5 | 11.5 | 13.6 | 15.6 | 17.5 | 21.4 | 24.2 |
| 1.0 | 3.68 | 5.31 | 6.72 | 8.04 | 10.5 | 12.8 | 13.9 | 16.1 | 18.3 | 20.4 | 24.5 | 27.5 |
| | 0.15 | 0.65 | 1.0 | 1.5 | 2.5 | X | 4.0 | X | 6.5 | X | 10 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

## *Table X-K-2—Sampling Plans for Sample Size Code Letter: K*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.10 | 0.10 | 0.15 | X | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | X | 4.0 | X | 6.5 | X | 10 | Higher than 10 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 125 | ∇ | 0 1 | Use Code Letter J | Use Code Letter M | Use Code Letter L | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 125 |
| Double | 80 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 80 |
| | 160 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 160 |
| Multiple | 32 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 32 |
| | 64 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 64 |
| | 96 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 96 |
| | 128 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 128 |
| | 160 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 160 |
| | 192 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 192 |
| | 224 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 224 |
| | | Less than 0.15 | 0.15 | X | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | X | 4.0 | X | 6.5 | X | 10 | X | Higher than 10 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter N).
\# = Acceptance not permitted at this sample size.

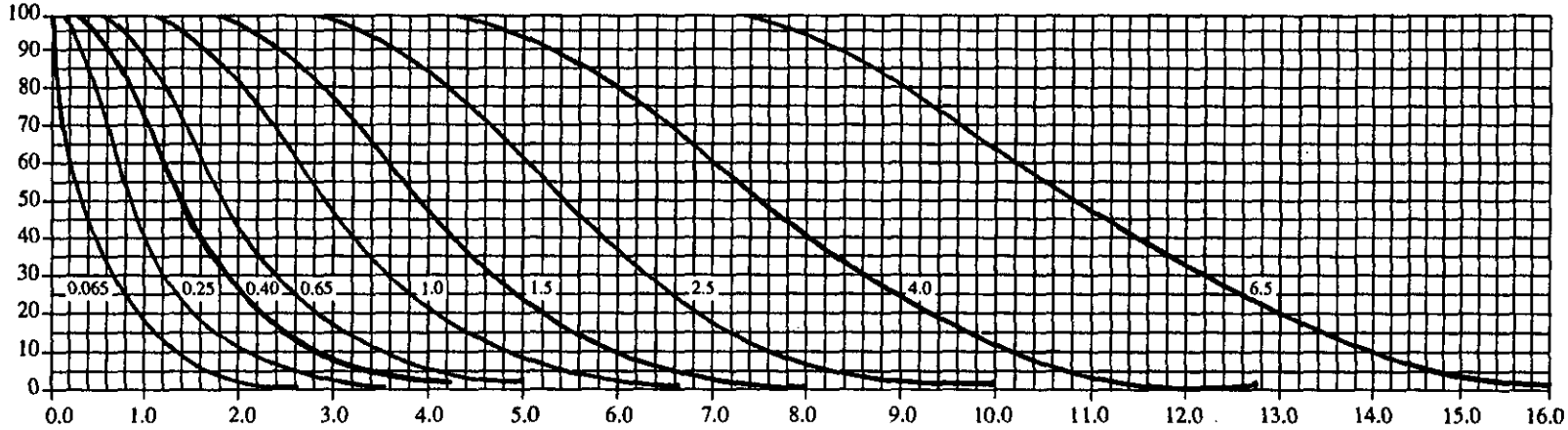
# *Table X-L—Tables for sample size code letter: L*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART L—OPERATING CHARACTERISTICS CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-L-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.065 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | X | 2.5 | X | 4.0 | X | 6.5 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.00503 | 0.0743 | 0.218 | 0.412 | 0.893 | 1.45 | 1.75 | 2.39 | 3.05 | 3.74 | 5.17 | 6.29 |
| 95.0 | 0.0256 | 0.178 | 0.409 | 0.683 | 1.31 | 1.99 | 2.35 | 3.08 | 3.84 | 4.62 | 6.22 | 7.45 |
| 90.0 | 0.0527 | 0.266 | 0.551 | 0.872 | 1.58 | 2.33 | 2.72 | 3.51 | 4.32 | 5.15 | 6.84 | 8.12 |
| 75.0 | 0.144 | 0.481 | 0.864 | 1.27 | 2.11 | 2.98 | 3.42 | 4.31 | 5.21 | 6.12 | 7.95 | 9.34 |
| 50.0 | 0.347 | 0.839 | 1.34 | 1.84 | 2.84 | 3.83 | 4.33 | 5.33 | 6.33 | 7.33 | 9.33 | 10.8 |
| 25.0 | 0.693 | 1.35 | 1.96 | 2.55 | 3.71 | 4.84 | 5.40 | 6.51 | 7.61 | 8.70 | 10.9 | 12.5 |
| 10.0 | 1.15 | 1.94 | 2.66 | 3.34 | 4.64 | 5.89 | 6.50 | 7.70 | 8.89 | 10.1 | 12.4 | 14.1 |
| 5.0 | 1.50 | 2.37 | 3.15 | 3.88 | 5.26 | 6.57 | 7.22 | 8.48 | 9.72 | 10.9 | 13.3 | 15.1 |
| 1.0 | 2.30 | 3.32 | 4.20 | 5.02 | 6.55 | 8.00 | 8.70 | 10.1 | 11.4 | 12.7 | 15.3 | 17.2 |
| | 1.0 | 0.40 | 0.65 | 1.0 | 1.5 | X | 2.5 | X | 4.0 | X | 6.5 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

# *Table X-L-2—Sampling Plans for Sample Size Code Letter: L*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.065 | 0.065 | 0.10 | X | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | X | 2.5 | X | 4.0 | X | 6.5 | Higher than 6.5 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 200 | ∇ | 0 1 | Use Code Letter K | Use Code Letter N | Use Code Letter M | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 200 |
| Double | 125 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 125 |
| | 250 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 250 |
| Multiple | 50 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 50 |
| | 100 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 100 |
| | 150 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 150 |
| | 200 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 200 |
| | 250 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 250 |
| | 300 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 300 |
| | 350 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 350 |
| | | Less than 0.10 | 0.10 | X | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | X | 2.5 | X | 4.0 | X | 6.5 | X | Higher than 6.5 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

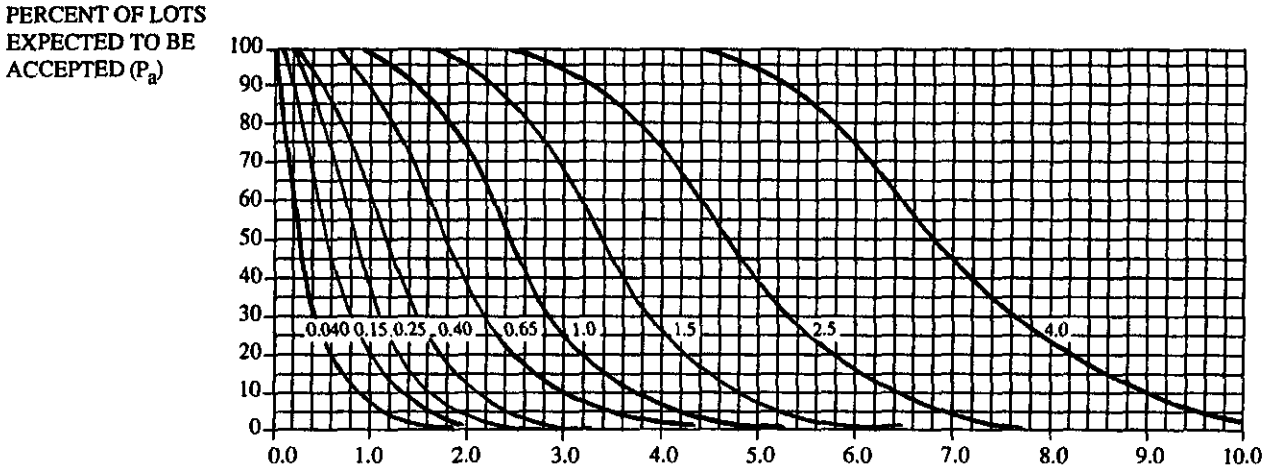
Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter P).
\# = Acceptance not permitted at this sample size.

# *Table X-M—Tables for sample size code letter: M*

## INDIVIDUAL PLANS

### CHART M—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

### TABLE X-M-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.040 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | X | 1.5 | X | 2.5 | X | 4.0 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.0039 | 0.0472 | 0.138 | 0.261 | 0.567 | 0.923 | 1.11 | 1.51 | 1.94 | 2.37 | 3.28 | 3.99 |
| 95.0 | 0.0163 | 0.113 | 0.260 | 0.434 | 0.830 | 1.26 | 1.49 | 1.96 | 2.44 | 2.94 | 3.95 | 4.73 |
| 90.0 | 0.0335 | 0.169 | 0.350 | 0.554 | 1.00 | 1.48 | 1.72 | 2.23 | 2.74 | 3.27 | 4.34 | 5.16 |
| 75.0 | 0.0913 | 0.305 | 0.548 | 0.805 | 1.34 | 1.89 | 2.17 | 2.74 | 3.31 | 3.89 | 5.05 | 5.93 |
| 50.0 | 0.220 | 0.533 | 0.849 | 1.17 | 1.80 | 2.43 | 2.75 | 3.39 | 4.02 | 4.66 | 5.93 | 6.88 |
| 25.0 | 0.440 | 0.855 | 1.24 | 1.62 | 2.36 | 3.07 | 3.43 | 4.13 | 4.83 | 5.52 | 6.90 | 7.92 |
| 10.0 | 0.731 | 1.23 | 1.69 | 2.12 | 2.94 | 3.74 | 4.13 | 4.89 | 5.64 | 6.39 | 7.86 | 8.95 |
| 5.0 | 0.951 | 1.51 | 2.00 | 2.46 | 3.34 | 4.17 | 4.58 | 5.38 | 6.17 | 6.95 | 8.47 | 9.60 |
| 1.0 | 1.46 | 2.11 | 2.67 | 3.19 | 4.16 | 5.08 | 5.52 | 6.40 | 7.24 | 8.08 | 9.71 | 10.9 |
| | 0.065 | 0.25 | 0.40 | 0.65 | 1.0 | X | 1.5 | X | 2.5 | X | 4.0 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

# *Table X-M-2—Sampling Plans for Sample Size Code Letter: M*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.040 | 0.040 | 0.065 | X | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | X | 1.5 | X | 2.5 | X | 4.0 | Higher than 4.0 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 315 | ∇ | 0 1 | Use Code Letter L | Use Code Letter P | Use Code Letter N | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 315 |
| Double | 200 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 200 |
| | 315 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 400 |
| Multiple | 80 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 80 |
| | 160 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 160 |
| | 240 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 240 |
| | 320 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 320 |
| | 400 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 400 |
| | 480 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 480 |
| | 560 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 560 |
| | | Less than 0.065 | 0.065 | X | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | X | 1.5 | X | 2.5 | X | 4.0 | X | Higher than 4.0 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter Q).
\# = Acceptance not permitted at this sample size.

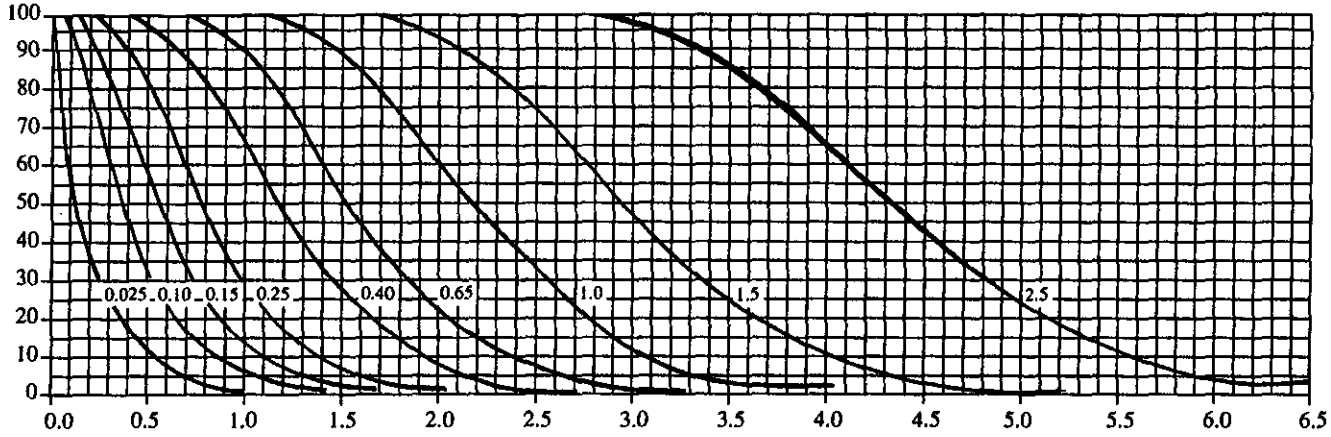
# *Table X-N—Tables for sample size code letter: N*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART N—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-N-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.025 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | X | 1.0 | X | 1.5 | X | 2.5 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.00201 | 0.0297 | 0.087 | 0.165 | 0.357 | 0.581 | 0.701 | 0.954 | 1.22 | 1.50 | 2.07 | 2.51 |
| 95.0 | 0.0103 | 0.0711 | 0.164 | 0.273 | 0.523 | 0.796 | 0.939 | 1.23 | 1.54 | 1.85 | 2.49 | 2.98 |
| 90.0 | 0.0211 | 0.106 | 0.220 | 0.349 | 0.630 | 0.931 | 1.09 | 1.40 | 1.73 | 2.06 | 2.73 | 3.25 |
| 75.0 | 0.0575 | 0.192 | 0.345 | 0.507 | 0.844 | 1.19 | 1.37 | 1.72 | 2.08 | 2.45 | 3.18 | 3.74 |
| 50.0 | 0.139 | 0.336 | 0.535 | 0.734 | 1.13 | 1.53 | 1.73 | 2.13 | 2.53 | 2.93 | 3.73 | 4.33 |
| 25.0 | 0.277 | 0.539 | 0.784 | 1.02 | 1.48 | 1.94 | 2.16 | 2.60 | 3.04 | 3.48 | 4.35 | 4.99 |
| 10.0 | 0.461 | 0.778 | 1.06 | 1.34 | 1.85 | 2.35 | 2.60 | 3.08 | 3.56 | 4.03 | 4.95 | 5.64 |
| 5.0 | 0.599 | 0.949 | 1.26 | 1.55 | 2.10 | 2.63 | 2.89 | 3.39 | 3.89 | 4.38 | 5.34 | 6.05 |
| 1.0 | 0.921 | 1.33 | 1.68 | 2.01 | 2.62 | 3.20 | 3.48 | 4.03 | 4.56 | 5.09 | 6.12 | 6.87 |
| | 0.040 | 0.15 | 0.25 | 0.40 | 0.65 | X | 1.0 | X | 1.5 | X | 2.5 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

## *Table X-N-2—Sampling Plans for Sample Size Code Letter: N*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Less than 0.025 | 0.025 | 0.040 | X | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | X | 1.0 | X | 1.5 | X | 2.5 | Higher than 2.5 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 500 | ∇ | 0 1 | Use Code Letter N | Use Code Letter R | Use Code Letter Q | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 500 |
| Double | 315 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 315 |
| | 630 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 630 |
| Multiple | 125 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 125 |
| | 250 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 250 |
| | 375 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 375 |
| | 500 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 500 |
| | 615 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 625 |
| | 750 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 750 |
| | 875 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 875 |
| | | Less than 0.040 | 0.040 | X | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | X | 1.0 | X | 1.5 | X | 3.5 | X | Higher than 2.5 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above (or alternatively use code letter R).
\# = Acceptance not permitted at this sample size.

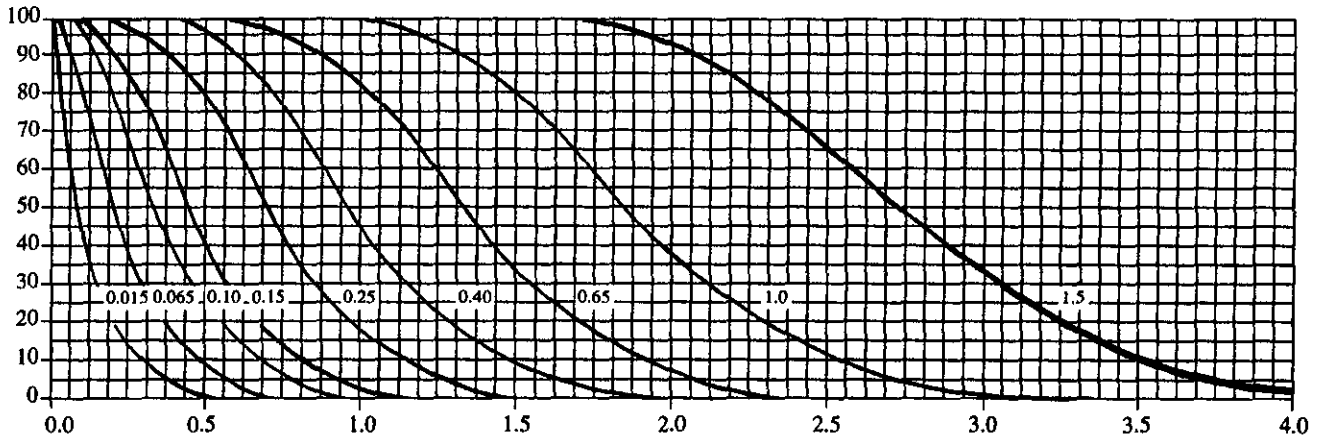
# *Table X-P—Tables for sample size code letter: P*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART P—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-P-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.015 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | X | 0.65 | X | 1.0 | X | 1.5 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.00126 | 0.0186 | 0.0545 | 0.103 | 0.223 | 0.363 | 0.438 | 0.596 | 0.762 | 0.935 | 1.29 | 1.57 |
| 95.0 | 0.00641 | 0.0444 | 0.102 | 0.171 | 0.327 | 0.498 | 0.587 | 0.771 | 0.961 | 1.16 | 1.56 | 1.86 |
| 90.0 | 0.0132 | 0.0665 | 0.138 | 0.218 | 0.394 | 0.582 | 0.679 | 0.878 | 1.08 | 1.29 | 1.71 | 2.03 |
| 75.0 | 0.0360 | 0.120 | 0.216 | 0.317 | 0.527 | 0.745 | 0.855 | 1.08 | 1.30 | 1.53 | 1.99 | 2.34 |
| 50.0 | 0.0866 | 0.210 | 0.334 | 0.459 | 0.709 | 0.959 | 1.08 | 1.33 | 1.58 | 1.83 | 2.33 | 2.71 |
| 25.0 | 0.173 | 0.337 | 0.490 | 0.639 | 0.928 | 1.21 | 1.35 | 1.63 | 1.90 | 2.17 | 2.72 | 3.12 |
| 10.0 | 0.288 | 0.486 | 0.665 | 0.835 | 1.16 | 1.47 | 1.62 | 1.93 | 2.22 | 2.52 | 3.09 | 3.52 |
| 5.0 | 0.374 | 0.593 | 0.787 | 0.969 | 1.31 | 1.64 | 1.80 | 2.12 | 2.43 | 2.74 | 3.34 | 3.78 |
| 1.0 | 0.576 | 0.830 | 1.05 | 1.26 | 1.64 | 2.00 | 2.18 | 2.52 | 2.85 | 3.18 | 3.82 | 4.29 |
| | 0.025 | 0.10 | 0.15 | 0.25 | 0.40 | X | 0.65 | X | 1.0 | X | 1.5 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

## *Table X-P-2—Sampling Plans for Sample Size Code Letter: P*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.010 | 0.015 | 0.025 | X | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | X | 0.65 | X | 1.0 | X | 1.5 | Higher than 1.5 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 800 | ∇ | 0 1 | Use Code Letter N | Use Code Letter R | Use Code Letter Q | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 800 |
| Double | 500 | ∇ | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 500 |
| | 1000 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 1000 |
| Multiple | 200 | ∇ | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 200 |
| | 400 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 400 |
| | 600 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 600 |
| | 800 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 800 |
| | 1000 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 1000 |
| | 1200 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 1200 |
| | 1400 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 1400 |
| | | Less than 0.025 | 0.025 | X | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | X | 0.65 | X | 1.0 | X | 1.5 | X | Higher than 1.5 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
∇ = Use next subsequent sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above.
\# = Acceptance not permitted at this sample size.

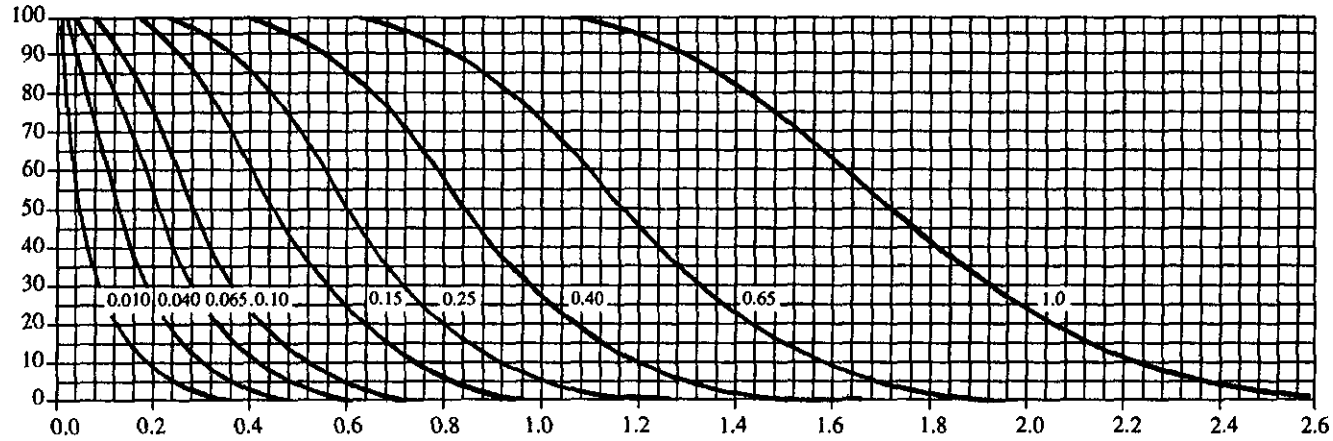
# *Table X-Q—Tables for sample size code letter: Q*

## INDIVIDUAL PLANS

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

CHART Q—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-Q-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.010 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | X | 0.40 | X | 0.65 | X | 1.0 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.000804 | 0.0119 | 0.0349 | 0.0659 | 0.143 | 0.232 | 0.281 | 0.382 | 0.488 | 0.598 | 0.828 | 1.01 |
| 95.0 | 0.00410 | 0.0284 | 0.0654 | 0.109 | 0.209 | 0.318 | 0.376 | 0.494 | 0.615 | 0.740 | 0.995 | 1.19 |
| 90.0 | 0.00843 | 0.0425 | 0.0882 | 0.140 | 0.252 | 0.372 | 0.435 | 0.562 | 0.692 | 0.824 | 1.09 | 1.30 |
| 75.0 | 0.0230 | 0.0769 | 0.138 | 0.203 | 0.338 | 0.476 | 0.547 | 0.690 | 0.834 | 0.979 | 1.27 | 1.49 |
| 50.0 | 0.0555 | 0.134 | 0.214 | 0.294 | 0.454 | 0.614 | 0.694 | 0.853 | 1.01 | 1.17 | 1.49 | 1.73 |
| 25.0 | 0.111 | 0.215 | 0.314 | 0.409 | 0.594 | 0.775 | 0.864 | 1.04 | 1.22 | 1.39 | 1.74 | 2.00 |
| 10.0 | 0.184 | 0.311 | 0.426 | 0.534 | 0.742 | 0.942 | 1.04 | 1.23 | 1.42 | 1.61 | 1.98 | 2.25 |
| 5.0 | 0.240 | 0.380 | 0.504 | 0.620 | 0.841 | 1.05 | 1.15 | 1.36 | 1.56 | 1.75 | 2.14 | 2.42 |
| 1.0 | 0.368 | 0.531 | 0.672 | 0.804 | 1.05 | 1.28 | 1.39 | 1.61 | 1.83 | 2.04 | 2.45 | 2.75 |
| | 0.015 | 0.065 | 0.10 | 0.15 | 0.25 | X | 0.40 | X | 0.65 | X | 1.0 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

# *Table X-Q-2—Sampling Plans for Sample Size Code Letter: Q*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | X | 0.010 | 0.015 | X | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | X | 0.40 | X | 0.65 | X | 1.0 | Higher *than* 1.0 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 1250 | Use Code Letter R | 0 1 | Use Code Letter P | Use Code Letter S | Use Code Letter R | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 1250 |
| Double | 800 | | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 800 |
| | 1600 | | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 1600 |
| Multiple | 315 | | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 315 |
| | 630 | | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 630 |
| | 945 | | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 945 |
| | 1260 | | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 1260 |
| | 1575 | | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 1575 |
| | 1890 | | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 1890 |
| | 2205 | | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 2205 |
| | | 0.010 | 0.015 | X | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | X | 0.40 | X | 0.65 | X | 1.0 | X | Higher *than* 1.0 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | | |

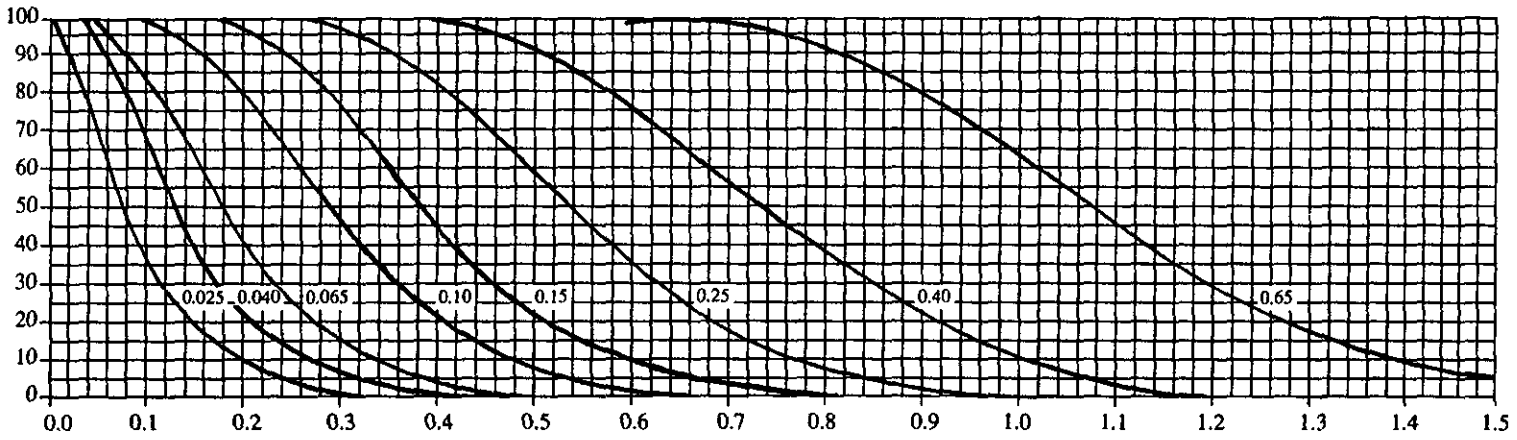
Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above.
\# = Acceptance not permitted at this sample size.

# *Table X-R—Tables for sample size code letter: R*

INDIVIDUAL PLANS

CHART R—OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of Submitted Product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE X-R-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptance Quality Levels (normal inspection) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | X | 0.25 | X | 0.40 | X | 0.65 |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | |
| 99.0 | 0.00743 | 0.0218 | 0.0412 | 0.0893 | 0.145 | 0.175 | 0.239 | 0.305 | 0.374 | 0.517 | 0.629 |
| 95.0 | 0.0178 | 0.0409 | 0.0683 | 0.131 | 0.199 | 0.235 | 0.308 | 0.384 | 0.462 | 0.622 | 0.745 |
| 90.0 | 0.0266 | 0.0551 | 0.0872 | 0.158 | 0.233 | 0.272 | 0.351 | 0.432 | 0.515 | 0.684 | 0.812 |
| 75.0 | 0.0481 | 0.0864 | 0.127 | 0.211 | 0.298 | 0.342 | 0.431 | 0.521 | 0.612 | 0.795 | 0.934 |
| 50.0 | 0.0839 | 0.134 | 0.184 | 0.284 | 0.383 | 0.433 | 0.533 | 0.633 | 0.733 | 0.933 | 1.08 |
| 25.0 | 0.135 | 0.196 | 0.255 | 0.371 | 0.484 | 0.540 | 0.651 | 0.761 | 0.870 | 1.09 | 1.25 |
| 10.0 | 0.194 | 0.266 | 0.334 | 0.464 | 0.589 | 0.650 | 0.770 | 0.889 | 1.01 | 1.24 | 1.41 |
| 5.0 | 0.237 | 0.315 | 0.388 | 0.526 | 0.657 | 0.722 | 0.848 | 0.972 | 1.09 | 1.33 | 1.51 |
| 1.0 | 0.332 | 0.420 | 0.502 | 0.655 | 0.800 | 0.870 | 1.01 | 1.14 | 1.27 | 1.53 | 1.72 |
| | 0.040 | 0.065 | 0.10 | 0.15 | X | 0.25 | X | 0.40 | X | 0.65 | X |
| | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | |

Note: Values given in the Table above are based on the Poisson distribution as an approximation to the binomial distribution (See 11.1 for details).

# *Table X-R-2—Sampling Plans for Sample Size Code Letter: R*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | Cumulative sample size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | X | 0.010 | 0.015 | X | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | X | 0.25 | X | 0.40 | X | 0.65 | Higher than 0.65 | |
| | | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | Ac Re | |
| Single | 2000 | 0 1 | Use Code Letter Q | Use Code Letter P | Use Code Letter S | 1 2 | 2 3 | 3 4 | 5 6 | 7 8 | 8 9 | 10 11 | 12 13 | 14 15 | 18 19 | 21 22 | Δ | 2000 |
| Double | 1250 | * | | | | 0 2 | 0 3 | 1 4 | 2 5 | 3 7 | 3 7 | 5 9 | 6 10 | 7 11 | 9 14 | 11 16 | Δ | 1250 |
| | 2500 | | | | | 1 2 | 3 4 | 4 5 | 6 7 | 8 9 | 11 12 | 12 13 | 15 16 | 18 19 | 23 24 | 26 27 | | 2500 |
| Multiple | 500 | * | | | | # 2 | # 2 | # 3 | # 4 | 0 4 | 0 4 | 0 5 | 0 6 | 1 7 | 1 8 | 2 9 | Δ | 500 |
| | 1000 | | | | | # 2 | 0 3 | 0 3 | 1 5 | 1 6 | 2 7 | 3 8 | 3 9 | 4 10 | 6 12 | 7 14 | | 1000 |
| | 1500 | | | | | 0 2 | 0 3 | 1 4 | 2 6 | 3 8 | 4 9 | 6 10 | 7 12 | 8 13 | 11 17 | 13 19 | | 1500 |
| | 2000 | | | | | 0 3 | 1 4 | 2 5 | 3 7 | 5 10 | 6 11 | 8 13 | 10 15 | 12 17 | 16 22 | 19 25 | | 2000 |
| | 2500 | | | | | 1 3 | 2 4 | 3 6 | 5 8 | 7 11 | 9 12 | 11 15 | 14 17 | 17 20 | 22 25 | 25 29 | | 2500 |
| | 3000 | | | | | 1 3 | 3 5 | 4 6 | 7 9 | 10 12 | 12 14 | 14 17 | 18 20 | 21 23 | 27 29 | 31 33 | | 3000 |
| | 3500 | | | | | 2 3 | 4 5 | 6 7 | 9 10 | 13 14 | 14 15 | 18 19 | 21 22 | 25 26 | 32 33 | 37 38 | | 3500 |
| | | 0.010 | 0.015 | X | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | X | 0.25 | X | 0.40 | X | 0.65 | X | Higher than 0.65 | |
| | | Acceptable Quality Levels (tightened inspection) | | | | | | | | | | | | | | | | |

Δ = Use next preceding sample size code letter for which acceptance and rejection numbers are available.
Ac = Acceptance number.
Re = Rejection number.
* = Use single sampling plan above.
\# = Acceptance not permitted at this sample size.

## *Table X-S—Tables for Sample Size Code Letter: S*

| Type of sampling plan | Cumulative sample size | Acceptable Quality Level (normal inspection) | |
|---|---|---|---|
| | | X | |
| | | Ac | Re |
| Single | 2000 | 1 | 2 |
| Double | 2000 | 0 | 2 |
| | 4000 | 1 | 2 |
| Multiple | 800 | # | 2 |
| | 1600 | # | 2 |
| | 2400 | 0 | 2 |
| | 3200 | 0 | 3 |
| | 4000 | 1 | 3 |
| | 4800 | 1 | 3 |
| | 5600 | 2 | 3 |
| | | 0.025 | |
| | | Acceptable Quality Level (tightened inspection) | |

Ac = Acceptance number.
Re = Rejection number.
# = Acceptance not permitted at this sample size.

# *Table XI—Average Outgoing Quality Limit Factors for ANSI-Z14 Scheme Performance*

*(In nonconformities per hundred units, also applicable to percent nonconforming for AQL less than 15 with specific values for percent nonconforming shown in parentheses)*

| Code Letter | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | | | | | | | | | | | | | | | (11) 13 | | | 30 | 48 | 78 | 130 | 200 | 310 | 450 | 710 | 1100 |
| B | | | | | | | | | | | | | | (6.8) 7.5 | | | 19 | 32 | 52 | 84 | 130 | 210 | 300 | 480 | 710 | 1100 |
| C | | | | | | | | | | | | | (4.4) 4.7 | | | (12) 12 | 20 | 31 | 51 | 78 | 130 | 180 | 290 | 430 | 660 | |
| D | | | | | | | | | | | | (2.8) 2.9 | | | (7.0) 7.0 | (13) 12 | 20 | 32 | 49 | 76 | 120 | 180 | 270 | 410 | | |
| E | | | | | | | | | | | (1.9) 1.9 | | | (4.5) 4.5 | (7.5) 7.4 | (13) 12 | 20 | 30 | 47 | 69 | 110 | 170 | 260 | | | |
| F | | | | | | | | | | (1.2) 1.2 | | | (2.9) 2.9 | (4.9) 4.8 | (7.9) 7.8 | (14) 13 | 20 | 31 | 45 | 71 | | | | | | |
| G | | | | | | | | | (.74) .75 | | | (1.8) 1.8 | (3.0) 3.0 | (4.9) 4.9 | (8.7) 7.9 | (13) 13 | 18 | 28 | 45 | | | | | | | |
| H | | | | | | | | (.47) .47 | | | (1.2) 1.2 | (2.0) 2.0 | (3.2) 3.1 | (5.1) 5.1 | (8.0) 7.8 | (13) 13 | 18 | 29 | | | | | | | | |
| J | | | | | | | (.30) .30 | | | (.72) .72 | (1.2) 1.2 | (2.0 2.0 | (3.2) 3.2 | (5.0) 4.9 | (7.7) 7.6 | (12) 12 | 18 | | | | | | | | | |
| K | | | | | | .19 | | | .46 | .77 | 1.3 | 2.1 | 3.2 | 4.9 | 7.2 | 12 | | | | | | | | | | |
| L | | | | | .12 | | | .29 | .48 | .78 | 1.3 | 2.0 | 3.1 | 4.5 | 7.1 | | | | | | | | | | | |
| M | | | | .075 | | | .18 | .31 | .50 | .80 | 1.3 | 2.0 | 2.9 | 4.5 | | | | | | | | | | | | |
| N | | | .047 | | | .12 | .20 | .31 | .51 | .78 | 1.3 | 1.8 | 2.9 | | | | | | | | | | | | | |
| P | | .030 | | | .072 | .12 | .20 | .32 | .49 | .76 | 1.2 | 1.8 | | | | | | | | | | | | | | |
| Q | .019 | | | .046 | .077 | .13 | .21 | .32 | .49 | .72 | 1.2 | | | | | | | | | | | | | | | |
| R | | | .029 | .048 | .078 | .13 | .20 | .31 | .45 | .71 | | | | | | | | | | | | | | | | |

Note: For a better approximation to the AOQL, the above values must be multiplied by $\left(1 - \frac{\text{Normal Plan Sample Size}}{\text{Lot or Batch Size}}\right)$

## *Table XII–Limiting Quality for ANSI-Z14 Scheme Performance for Which $P_a$ = 10 Percent*

*(In nonconformities per hundred units, also applicable to percent nonconforming for AQL less than 15 with specific values for percent nonconforming shown in parentheses)*

| Code Letter | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | | | | | | | | | | | | | | | (53.6) 76.7 | | | 130 | 194 | 266 | 334 | 464 | 650 | 889 | 1240 | 1750 |
| B | | | | | | | | | | | | | | (36.9) 46.0 | | | 77.8 | 130 | 177 | 223 | 309 | 433 | 593 | 825 | 1170 | 1680 |
| C | | | | | | | | | | | | | (25.0) 28.8 | | | (40.6) 48.6 | 77.8 | 106 | 134 | 185 | 260 | 356 | 495 | 699 | 1010 | |
| D | | | | | | | | | | | | (16.2) 17.7 | | | (26.8) 29.9 | (40.6) 48.6 | 66.5 | 83.5 | 116 | 162 | 222 | 309 | 437 | 631 | | |
| E | | | | | | | | | | | (10.9) 11.5 | | | (18.1) 19.4 | (26.8) 29.9 | (36.0) 40.9 | 51.4 | 71.3 | 100 | 137 | 190 | 269 | 388 | | | |
| F | | | | | | | | | | (6.94) 7.19 | | | (11.6) 12.2 | (18.1) 19.4 | (24.5) 26.6 | (30.4) 33.4 | 46.4 | 65.0 | 88.9 | 124 | | | | | | |
| G | | | | | | | | | (4.50) 4.60 | | | (7.56) 7.78 | (11.6) 12.2 | (15.8) 16.6 | (19.7) 20.9 | (27.1) 29.0 | 40.6 | 55.6 | 77.4 | | | | | | | |
| H | | | | | | | | (2.84) 2.88 | | | (4.77) 4.86 | (7.56) 7.78 | (10.3) 10.6 | (12.9) 13.4 | (17.8) 18.5 | (24.7) 26.0 | 35.6 | 49.5 | | | | | | | | |
| J | | | | | | | (1.83) 1.84 | | | (3.08) 3.11 | (4.77) 4.86 | (6.52) 6.65 | (8.16) 8.35 | (11.3) 11.6 | (15.7) 16.2 | (21.4) 22.2 | 30.9 | | | | | | | | | |
| K | | | | | | 1.15 | | | 1.94 | 3.11 | 4.26 | 5.34 | 7.42 | 10.4 | 14.2 | 19.8 | | | | | | | | | | |
| L | | | | | .731 | | | 1.23 | 1.94 | 2.66 | 3.34 | 4.64 | 6.50 | 8.89 | 12.4 | | | | | | | | | | | |
| M | | | | .460 | | | .778 | 1.23 | 1.69 | 2.12 | 2.94 | 4.13 | 5.64 | 7.86 | | | | | | | | | | | | |
| N | | | .288 | | | .486 | .778 | 1.06 | 1.34 | 1.85 | 2.60 | 3.56 | 4.95 | | | | | | | | | | | | | |
| P | | .184 | | | .311 | .486 | .665 | .835 | 1.16 | 1.62 | 2.22 | 3.09 | | | | | | | | | | | | | | |
| Q | .115 | | | .194 | .311 | .426 | .534 | .742 | 1.04 | 1.42 | 1.98 | | | | | | | | | | | | | | | |
| R | | | .123 | .194 | .266 | .334 | .464 | .650 | .889 | 1.24 | | | | | | | | | | | | | | | | |

## *Table XIII—Limiting Quality for ANSI-Z1.4 Scheme Performance for Which $P_a$ = 5 Percent*

*(In nonconformities per hundred units, also applicable to percent nonconforming for AQL less than 15 with specific values for percent nonconforming shown in parentheses)*

| Code Letter | Acceptable Quality Level | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.010 | 0.015 | 0.025 | 0.040 | 0.065 | 0.10 | 0.15 | 0.25 | 0.40 | 0.65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 |
| A | | | | | | | | | | | | | | | (63.2) 99.8 | | | 158 | 237 | 315 | 388 | 526 | 722 | 972 | 1340 | 1860 |
| B | | | | | | | | | | | | | | (45.1) 59.9 | | | 94.9 | 158 | 210 | 258 | 350 | 481 | 648 | 890 | 1240 | 1770 |
| C | | | | | | | | | | | | | (31.2) 37.4 | | | (47.1) 59.3 | 94.9 | 126 | 155 | 210 | 289 | 389 | 534 | 745 | 1060 | |
| D | | | | | | | | | | | | (20.6) 23.0 | | | (31.6) 36.5 | (47.1) 59.3 | 78.7 | 96.9 | 131 | 180 | 243 | 334 | 465 | 665 | | |
| E | | | | | | | | | | | (13.9) 15.0 | | | (21.6) 23.7 | (31.6) 36.5 | (41.0) 48.4 | 59.6 | 80.9 | 111 | 150 | 205 | 286 | 409 | | | |
| F | | | | | | | | | | (8.94) 9.36 | | | (14.0) 14.8 | (21.6) 23.7 | (28.3) 31.5 | (34.4) 38.8 | 52.6 | 72.2 | 97.2 | 133 | | | | | | |
| G | | | | | | | | | (5.81) 5.99 | | | (9.14) 9.49 | (14.0) 14.8 | (18.4) 19.7 | (22.5) 24.2 | (30.1) 32.9 | 45.1 | 60.8 | 83.4 | | | | | | | |
| H | | | | | | | | (3.68) 3.74 | | | (5.79) 5.93 | (9.14) 9.49 | (12.1) 12.6 | (14.8) 15.5 | (19.9) 21.0 | (27.0) 28.9 | 38.9 | 53.4 | | | | | | | | |
| J | | | | | | | (2.37) 2.40 | | | (3.74) 3.79 | (5.79) 5.93 | (7.66) 7.87 | (9.41) 9.69 | (12.7) 13.1 | (17.3) 18.0 | (23.2) 24.3 | 33.4 | | | | | | | | | |
| K | | | | | | 1.50 | | | 2.37 | 3.79 | 5.04 | 6.20 | 8.41 | 11.5 | 15.6 | 21.4 | | | | | | | | | | |
| L | | | | | .951 | | | 1.51 | 2.37 | 3.15 | 3.88 | 5.26 | 7.22 | 9.72 | 13.3 | | | | | | | | | | | |
| M | | | | .599 | | | .949 | 1.51 | 2.00 | 2.46 | 3.34 | 4.58 | 6.17 | 8.47 | | | | | | | | | | | | |
| N | | | .374 | | | .593 | .949 | 1.26 | 1.55 | 2.10 | 2.89 | 3.89 | 5.34 | | | | | | | | | | | | | |
| P | | .240 | | | .379 | .593 | .787 | .969 | 1.31 | 1.80 | 2.43 | 3.34 | | | | | | | | | | | | | | |
| Q | .150 | | | .237 | .379 | .504 | .620 | .841 | 1.15 | 1.56 | 2.14 | | | | | | | | | | | | | | | |
| R | | | .151 | .237 | .315 | .388 | .526 | .722 | .972 | 1.33 | | | | | | | | | | | | | | | | |

# *Table XIV–Average Sample Size Tables for ANSI-Z1.4 Scheme Performance (Single Sampling)*

Table XIV—A Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code A

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6.5 | 6.5 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 | | | | |
| | * | p (in nonconformities per hundred units) | | | | | | | | | | | | | |
| 99.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 95.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 90.0 | 2.1 | 2.1 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 75.0 | 2.5 | 2.5 | 2.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 50.0 | 2.9 | 2.9 | 2.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 25.0 | 3.0 | 3.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 10.0 | 3.0 | 3.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 5.0 | 3.0 | 3.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |
| 1.0 | 3.0 | 3.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | | | |

A

Table XIV—B Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code B

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.0 | 4.0 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 | | | |
| | * | p (in nonconformities per hundred units) | | | | | | | | | | | | | |
| 99.0 | 2.1 | 2.1 | 2.7 | 2.6 | 2.5 | 2.7 | 2.4 | 2.7 | 2.5 | 2.7 | 2.4 | 2.7 | | | |
| 95.0 | 2.6 | 2.6 | 3.1 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 90.0 | 3.1 | 3.1 | 3.3 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 75.0 | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 50.0 | 4.8 | 4.8 | 4.8 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 25.0 | 5.0 | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 10.0 | 5.0 | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 5.0 | 5.0 | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |
| 1.0 | 5.0 | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | |

B

Table XIV—C Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code C

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.5 | 10 | 2.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | | |
| | p (in percent nonconforming) | | p (in nonconformities per hundred units) | | | | | | | | | | | | |
| 99.0 | 2.4 | 3.7 | 2.4 | 3.6 | 3.5 | 4.0 | 4.2 | 4.1 | 4.1 | 4.2 | 4.3 | 4.0 | 3.4 | | |
| 95.0 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 | 4.9 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 90.0 | 4.7 | 5.4 | 4.7 | 5.4 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 75.0 | 6.5 | 6.5 | 6.5 | 6.6 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 50.0 | 7.8 | 7.7 | 7.8 | 7.7 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 25.0 | 8.0 | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 10.0 | 8.0 | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 5.0 | 8.0 | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |
| 1.0 | 8.0 | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | |

C

Table XIV—D Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code D

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 6.5 | 10 | 1.5 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | |
| | p (in percent nonconforming) | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 3.7 | 5.8 | 5.3 | 3.7 | 5.7 | 5.1 | 6.2 | 6.6 | 6.6 | 5.9 | 5.8 | 7.0 | 6.1 | 5.4 | |
| 95.0 | 5.7 | 7.7 | 7.4 | 5.7 | 7.6 | 7.2 | 7.8 | 7.9 | 8.0 | 7.9 | 7.9 | 8.0 | 8.0 | 7.9 | |
| 90.0 | 7.4 | 8.6 | 7.9 | 7.4 | 8.6 | 7.8 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 75.0 | 11 | 11 | 8.0 | 11 | 11 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 50.0 | 13 | 13 | 8.0 | 13 | 13 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 25.0 | 13 | 13 | 8.0 | 13 | 13 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 10.0 | 13 | 13 | 8.0 | 13 | 13 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 5.0 | 13 | 13 | 8.0 | 13 | 13 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| 1.0 | 13 | 13 | 8.0 | 13 | 13 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |

D

* p (in percent nonconforming)

# *Table XIV–Average Sample Size Tables for ANSI-Z1.4 Scheme Performance (Single Sampling)*

Table XIV—E Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance Code E

E

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0 | 4.0 | 6.5 | 10 | 1.0 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 |
| | p (in percent nonconformities) | | | | p (in nonconformities per hundred units) | | | | | | | | | | |
| 99.0 | 6.0 | 9.4 | 8.6 | 11 | 6.0 | 9.3 | 8.4 | 10 | 11 | 10 | 9.8 | 8.9 | 10 | 11 | 8.6 |
| 95.0 | 9.2 | 12 | 12 | 13 | 9.2 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 90.0 | 12 | 14 | 13 | 13 | 12 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 75.0 | 17 | 17 | 13 | 13 | 17 | 17 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 50.0 | 19 | 19 | 13 | 13 | 19 | 19 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 25.0 | 20 | 20 | 13 | 13 | 20 | 20 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 10.0 | 20 | 20 | 13 | 13 | 20 | 20 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 5.0 | 20 | 20 | 13 | 13 | 20 | 20 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 1.0 | 20 | 20 | 13 | 13 | 20 | 20 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

Table XIV—F Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance Code F

F

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .65 | 2.5 | 4.0 | 6.5 | 10 | .65 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 |
| | p (in perent nonconforming) | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 9.5 | 14.6 | 13.4 | 15.7 | 17.9 | 9.5 | 14.5 | 13.2 | 15.3 | 16.8 | 17.8 | 16.2 | 15.1 | 15.7 |
| 95.0 | 14.4 | 19.1 | 18.5 | 19.5 | 19.0 | 14.4 | 19.0 | 18.3 | 19.3 | 19.8 | 20.0 | 19.9 | 19.8 | 19.9 |
| 90.0 | 18.6 | 21.5 | 19.7 | 19.9 | 20.0 | 18.6 | 21.5 | 19.6 | 19.9 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 75.0 | 26.1 | 26.2 | 20.0 | 20.0 | 20.0 | 26.0 | 26.2 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 50.0 | 31.0 | 30.9 | 20.0 | 20.0 | 20.0 | 31.0 | 30.9 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 25.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 10.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 5.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| 1.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 32.0 | 32.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |

Table XIV—G Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance Code G

G

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .4 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .4 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 |
| | p (in percent nonconforming) | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 15.5 | 25.1 | 21.4 | 25.0 | 28.1 | 28.6 | 15.5 | 24.9 | 21.3 | 24.6 | 27.1 | 27.0 | 26.8 | 24.4 | 26.3 |
| 95.0 | 23.1 | 31.7 | 29.5 | 31.2 | 31.9 | 32.0 | 23.1 | 31.7 | 29.4 | 31.0 | 31.7 | 31.8 | 31.9 | 31.8 | 31.9 |
| 90.0 | 29.7 | 34.6 | 31.4 | 31.9 | 32.0 | 32.0 | 29.7 | 34.6 | 31.4 | 31.8 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 75.0 | 41.1 | 41.4 | 32.0 | 32.0 | 32.0 | 32.0 | 41.1 | 41.4 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 50.0 | 48.6 | 48.3 | 32.0 | 32.0 | 32.0 | 32.0 | 48.6 | 48.3 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 25.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 10.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 5.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| 1.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 50.0 | 50.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |

Table XIV—H Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance Code H

H

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 |
| | p (in percent nonconforming) | | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 23.8 | 36.3 | 35.6 | 40.3 | 43.1 | 42.4 | 43.4 | 23.8 | 36.2 | 35.3 | 39.8 | 42.1 | 40.8 | 40.5 | 41.9 | 42.7 |
| 95.0 | 36.0 | 47.7 | 47.8 | 49.2 | 49.7 | 49.8 | 50.0 | 36.0 | 47.6 | 47.7 | 49.0 | 49.6 | 49.6 | 49.8 | 49.9 | 50.0 |
| 90.0 | 46.5 | 53.7 | 49.6 | 49.9 | 50.0 | 50.0 | 50.0 | 46.5 | 53.7 | 49.6 | 49.9 | 49.9 | 50.0 | 50.0 | 50.0 | 50.0 |
| 75.0 | 65.1 | 65.6 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 65.1 | 65.6 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| 50.0 | 77.6 | 77.1 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 77.6 | 77.2 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| 25.0 | 79.9 | 79.9 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 79.9 | 79.9 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| 10.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| 5.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| 1.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 80.0 | 80.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |

**AVERAGE SAMPLE SIZE SCHEME PERFORMANCE**

* p (in percent nonconforming)

# *Table XIV–Average Sample Size Tables for ANSI-Z1.4 Scheme Performance (Single Sampling)*

Table XIV—J Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code J

J

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .15 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .15 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 |
| | p (in percent nonconforming) | | | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 38.3 | 58.0 | 52.9 | 64.2 | 68.3 | 68.7 | 64.2 | 64.7 | 38.3 | 57.9 | 52.8 | 63.7 | 67.3 | 67.1 | 61.7 | 60.5 | 73.5 |
| 95.0 | 57.5 | 76.2 | 73.4 | 78.6 | 79.5 | 79.7 | 79.6 | 79.8 | 57.5 | 76.1 | 73.2 | 78.5 | 79.3 | 79.6 | 79.3 | 79.3 | 80.0 |
| 90.0 | 74.0 | 85.5 | 78.5 | 79.8 | 79.9 | 80.0 | 80.0 | 80.0 | 74.0 | 85.4 | 78.4 | 79.8 | 79.9 | 80.0 | 80.0 | 80.0 | 80.0 |
| 75.0 | 103 | 103 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 103 | 103 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| 50.0 | 121 | 121 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 121 | 121 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| 25.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| 10.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| 5.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| 1.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 125 | 125 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |

Table XIV—K Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code K

K

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | .10 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 |
| | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 59.6 | 90.5 | 82.4 | 99.6 | 109 | 105 | 101 | 92.6 | 107 |
| 95.0 | 90.1 | 119 | 114 | 123 | 124 | 124 | 124 | 124 | 125 |
| 90.0 | 116 | 134 | 123 | 125 | 125 | 125 | 125 | 125 | 125 |
| 75.0 | 163 | 164 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 50.0 | 194 | 193 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 25.0 | 200 | 200 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 10.0 | 200 | 200 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 5.0 | 200 | 200 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |
| 1.0 | 200 | 200 | 125 | 125 | 125 | 125 | 125 | 125 | 125 |

Table XIV—L Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code L

L

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | .065 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 |
| | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 95.6 | 145 | 132 | 153 | 168 | 178 | 162 | 151 | 157 |
| 95.0 | 144 | 190 | 183 | 193 | 198 | 200 | 199 | 198 | 199 |
| 90.0 | 185 | 214 | 196 | 199 | 200 | 200 | 200 | 200 | 200 |
| 75.0 | 258 | 260 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 50.0 | 306 | 304 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 25.0 | 315 | 315 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 10.0 | 315 | 315 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 5.0 | 315 | 315 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 1.0 | 315 | 315 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |

Table XIV—M Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code M

M

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | .04 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 |
| | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 149 | 244 | 207 | 240 | 264 | 263 | 268 | 242 | 263 |
| 95.0 | 226 | 312 | 288 | 304 | 312 | 313 | 314 | 313 | 315 |
| 90.0 | 292 | 342 | 309 | 313 | 315 | 315 | 315 | 315 | 315 |
| 75.0 | 408 | 411 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| 50.0 | 485 | 483 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| 25.0 | 500 | 499 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| 10.0 | 500 | 500 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| 5.0 | 500 | 500 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| 1.0 | 500 | 500 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |

# *Table XIV–Average Sample Size Tables for ANSI-Z1.4 Scheme Performance (Single Sampling)*

Table XIV—N Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code N

N

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .025 | .10 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | | | | | | |
| | p (in nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 238 | 362 | 353 | 398 | 421 | 407 | 405 | 419 | 427 | | | | | | |
| 95.0 | 360 | 476 | 477 | 490 | 496 | 496 | 498 | 499 | 499 | | | | | | |
| 90.0 | 465 | 537 | 496 | 499 | 499 | 500 | 500 | 500 | 500 | | | | | | |
| 75.0 | 651 | 656 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |
| 50.0 | 776 | 772 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |
| 25.0 | 799 | 799 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |
| 10.0 | 800 | 800 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |
| 5.0 | 800 | 800 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |
| 1.0 | 800 | 800 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | | | | | | |

Table XIV—P Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code P

P

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .015 | .065 | .10 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | | | | | | |
| | p (in nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 378 | 576 | 523 | 634 | 670 | 667 | 610 | 598 | 730 | | | | | | |
| 95.0 | 572 | 759 | 730 | 784 | 793 | 795 | 792 | 793 | 800 | | | | | | |
| 90.0 | 738 | 854 | 784 | 798 | 799 | 800 | 800 | 800 | 800 | | | | | | |
| 75.0 | 1027 | 1035 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |
| 50.0 | 1214 | 1208 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |
| 25.0 | 1249 | 1249 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |
| 10.0 | 1250 | 1250 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |
| 5.0 | 1250 | 1250 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |
| 1.0 | 1250 | 1250 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | | | | | | |

Table XIV—Q Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code Q

Q

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .01 | .04 | .065 | .10 | .15 | .25 | .40 | .65 | 1.0 | | | | | | |
| | p (in nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 596 | 905 | 824 | 996 | 1090 | 1050 | 1010 | 926 | 1070 | | | | | | |
| 95.0 | 901 | 1190 | 1140 | 1230 | 1240 | 1240 | 1250 | 1240 | 1250 | | | | | | |
| 90.0 | 1160 | 1340 | 1230 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 75.0 | 1630 | 1640 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 50.0 | 1940 | 1930 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 25.0 | 2000 | 2000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 10.0 | 2000 | 2000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 5.0 | 2000 | 2000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |
| 1.0 | 2000 | 2000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | | | | | | |

Table XIV—R Tabulated Values for Average Sample Size for ANSI-Z1.4 Scheme Performance — Code R

R

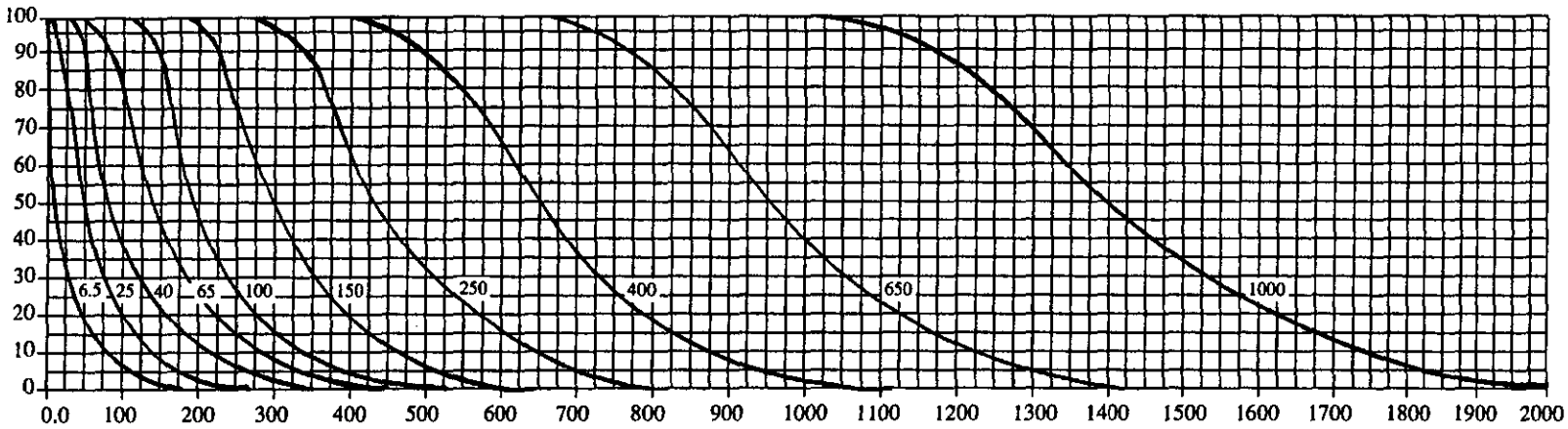
| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .025 | .040 | .065 | .10 | .15 | .25 | .40 | .65 | | | | | | | |
| | p (in nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 1450 | 1320 | 1530 | 1680 | 1780 | 1620 | 1510 | 1570 | | | | | | | |
| 95.0 | 1900 | 1830 | 1930 | 1980 | 2000 | 1990 | 1980 | 1990 | | | | | | | |
| 90.0 | 2140 | 1960 | 1990 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 75.0 | 2600 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 50.0 | 3040 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 25.0 | 3150 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 10.0 | 3150 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 5.0 | 3150 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |
| 1.0 | 3150 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | | | | | | | |

**AVERAGE SAMPLE SIZE SCHEME PERFORMANCE**

## *Scheme Performance with Switching Rules*

### *Chart XV-A Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

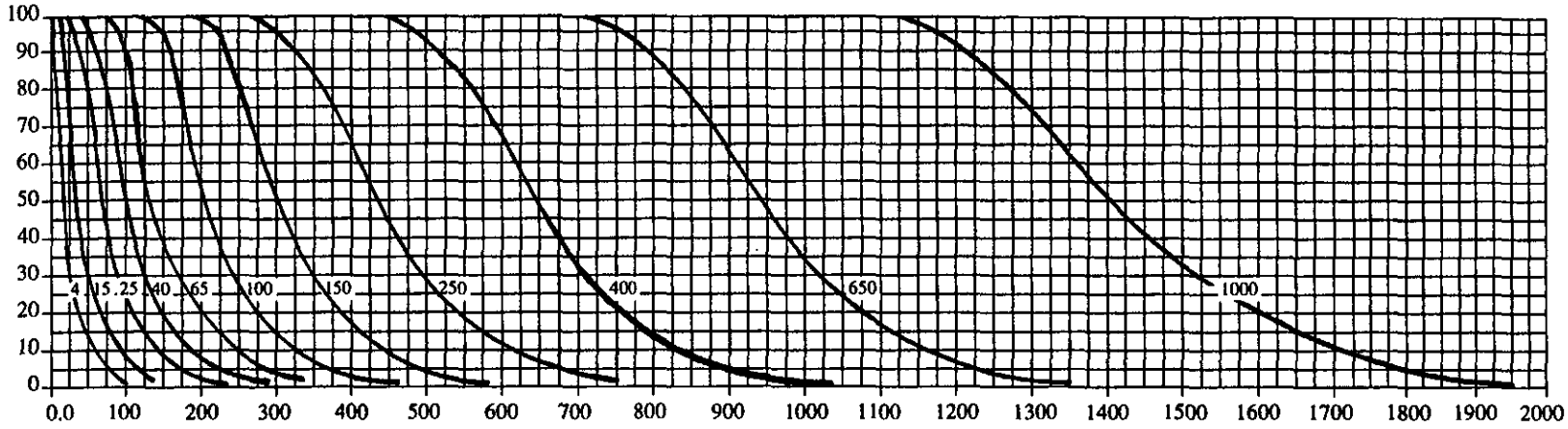
TABLE XV-A-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6.5 | 6.5 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 | | | | |
| | p (in percent nonconforming) | p (in nonconformities per hundred units) | | | | | | | | | | | | | |
| 99.0 | 0.501 | 0.502 | 7.43 | 21.8 | 41.2 | 89.1 | 145 | 239 | 374 | 628 | 977 | | | | |
| 95.0 | 2.50 | 2.53 | 17.5 | 38.7 | 66.1 | 123 | 192 | 302 | 456 | 734 | 1110 | | | | |
| 90.0 | 4.84 | 4.96 | 24.6 | 47.9 | 79.9 | 138 | 214 | 333 | 497 | 783 | 1180 | | | | |
| 75.0 | 10.8 | 11.4 | 38.0 | 63.7 | 103 | 162 | 248 | 380 | 560 | 855 | 1270 | | | | |
| 50.0 | 21.2 | 23.8 | 57.8 | 88.5 | 138 | 195 | 294 | 443 | 642 | 948 | 1400 | | | | |
| 25.0 | 37.0 | 46.3 | 89.9 | 135 | 196 | 256 | 372 | 540 | 761 | 1090 | 1570 | | | | |
| 10.0 | 53.6 | 76.7 | 130 | 194 | 266 | 334 | 464 | 650 | 889 | 1240 | 1750 | | | | |
| 5.0 | 63.2 | 99.8 | 158 | 237 | 315 | 388 | 526 | 722 | 972 | 1340 | 1860 | | | | |
| 1.0 | 78.4 | 154 | 221 | 332 | 420 | 502 | 655 | 871 | 1140 | 1530 | 2090 | | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-B Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; *in nonconformities per hundred units for AQLs >10*)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

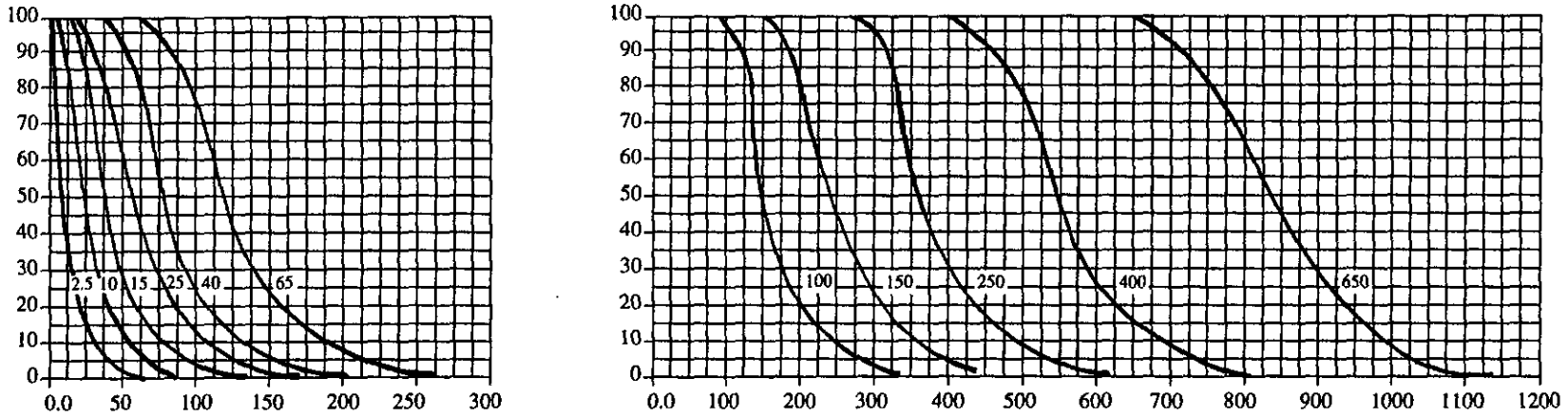
TABLE XV-B-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.0 | 4.0 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | 1000 | | | |
| | p (in percent nonconforming) | p (in nonconformities per hundred units) | | | | | | | | | | | | | |
| 99.0 | 0.467 | 0.468 | 5.46 | 16.2 | 31.4 | 60.2 | 92.5 | 154 | 244 | 401 | 637 | 1010 | | | |
| 95.0 | 1.96 | 1.98 | 11.6 | 25.8 | 44.4 | 81.9 | 128 | 201 | 304 | 489 | 742 | 1150 | | | |
| 90.0 | 3.40 | 3.46 | 15.9 | 31.9 | 53.3 | 92.2 | 143 | 222 | 332 | 522 | 785 | 1200 | | | |
| 75.0 | 6.94 | 7.19 | 23.8 | 42.4 | 68.8 | 108 | 165 | 253 | 373 | 570 | 850 | 1290 | | | |
| 50.0 | 13.4 | 14.4 | 35.1 | 59.0 | 92.0 | 130 | 196 | 295 | 428 | 632 | 931 | 1400 | | | |
| 25.0 | 24.2 | 27.8 | 53.9 | 89.9 | 131 | 171 | 248 | 360 | 507 | 725 | 1050 | 1540 | | | |
| 10.0 | 36.9 | 46.0 | 77.8 | 130 | 177 | 223 | 309 | 433 | 593 | 825 | 1170 | 1680 | | | |
| 5.0 | 45.1 | 59.9 | 94.9 | 158 | 210 | 258 | 350 | 481 | 648 | 890 | 1240 | 1770 | | | |
| 1.0 | 60.2 | 92.2 | 133 | 221 | 280 | 335 | 437 | 581 | 761 | 1020 | 1390 | 1950 | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-C Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

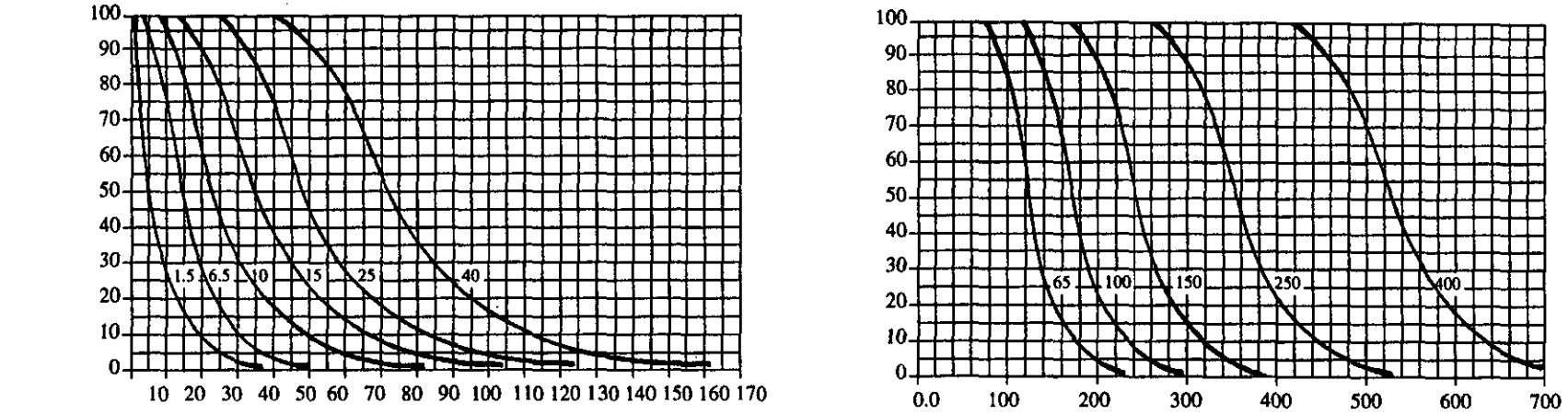
TABLE XV-C-1— TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.5 | 10 | 2.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | 650 | | |
| | p (in percent nonconforming) | | p (in nonconformities per hundred units) | | | | | | | | | | | | |
| 99.0 | 0.416 | 4.16 | 0.416 | 3.83 | 10.8 | 18.4 | 37.7 | 61.3 | 100 | 154 | 256 | 399 | 640 | | |
| 95.0 | 1.42 | 7.73 | 1.43 | 7.29 | 15.7 | 26.6 | 49.2 | 76.9 | 121 | 183 | 294 | 445 | 689 | | |
| 90.0 | 2.26 | 10.2 | 2.29 | 9.79 | 19.2 | 32.0 | 55.3 | 85.7 | 133 | 199 | 313 | 471 | 722 | | |
| 75.0 | 4.36 | 14.7 | 4.46 | 14.6 | 25.5 | 41.3 | 64.7 | 99.0 | 152 | 224 | 342 | 510 | 774 | | |
| 50.0 | 8.58 | 20.9 | 8.98 | 21.8 | 35.4 | 55.2 | 77.8 | 117 | 177 | 257 | 379 | 559 | 838 | | |
| 25.0 | 15.9 | 30.3 | 17.3 | 33.07 | 53.9 | 78.5 | 102 | 149 | 216 | 304 | 435 | 627 | 924 | | |
| 10.0 | 25.0 | 40.6 | 28.8 | 48.6 | 77.8 | 106 | 134 | 185 | 260 | 356 | 495 | 699 | 1010 | | |
| 5.0 | 31.2 | 47.1 | 37.4 | 59.3 | 94.9 | 126 | 155 | 210 | 289 | 389 | 534 | 745 | 1060 | | |
| 1.0 | 43.7 | 58.9 | 57.6 | 83.0 | 133 | 168 | 201 | 262 | 348 | 457 | 612 | 835 | 1170 | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-D Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

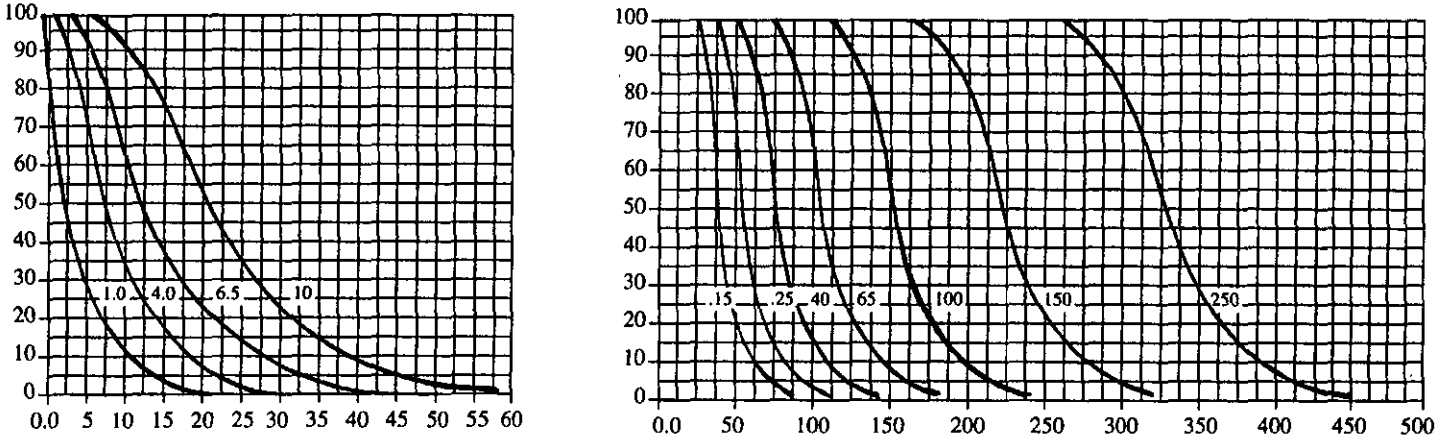
### TABLE XV-D-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 6.5 | 10 | 1.5 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 | 400 | |
| | p (in percent nonconforming) | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.272 | 2.55 | 7.86 | 0.273 | 2.43 | 7.20 | 11.6 | 23.7 | 38.3 | 64.1 | 99.7 | 160 | 252 | 403 | |
| 95.0 | 0.911 | 4.73 | 10.7 | 0.915 | 4.57 | 10.1 | 16.6 | 30.8 | 48.0 | 75.7 | 114 | 184 | 278 | 431 | |
| 90.0 | 1.43 | 6.26 | 12.7 | 1.44 | 6.10 | 12.1 | 20.0 | 34.6 | 53.5 | 83.2 | 124 | 196 | 294 | 451 | |
| 75.0 | 2.73 | 9.10 | 16.2 | 2.77 | 9.07 | 15.9 | 25.8 | 40.4 | 61.9 | 95.0 | 140 | 214 | 319 | 484 | |
| 50.0 | 5.38 | 13.1 | 21.3 | 5.53 | 13.5 | 22.1 | 34.5 | 48.6 | 73.4 | 111 | 161 | 237 | 349 | 524 | |
| 25.0 | 10.1 | 19.4 | 30.3 | 10.7 | 20.7 | 33.7 | 49.0 | 64.0 | 92.9 | 135 | 190 | 272 | 392 | 577 | |
| 10.0 | 16.2 | 26.8 | 40.6 | 17.7 | 29.9 | 48.6 | 66.5 | 83.5 | 116 | 162 | 222 | 309 | 437 | 631 | |
| 5.0 | 20.6 | 31.6 | 47.1 | 23.0 | 36.5 | 59.3 | 78.7 | 96.9 | 131 | 180 | 243 | 334 | 465 | 665 | |
| 1.0 | 29.8 | 41.3 | 58.9 | 35.5 | 51.1 | 83.0 | 105 | 126 | 164 | 218 | 285 | 382 | 522 | 732 | |

## *Scheme Performance with Switching Rules*

## *Chart XV-E Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE XV-E-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

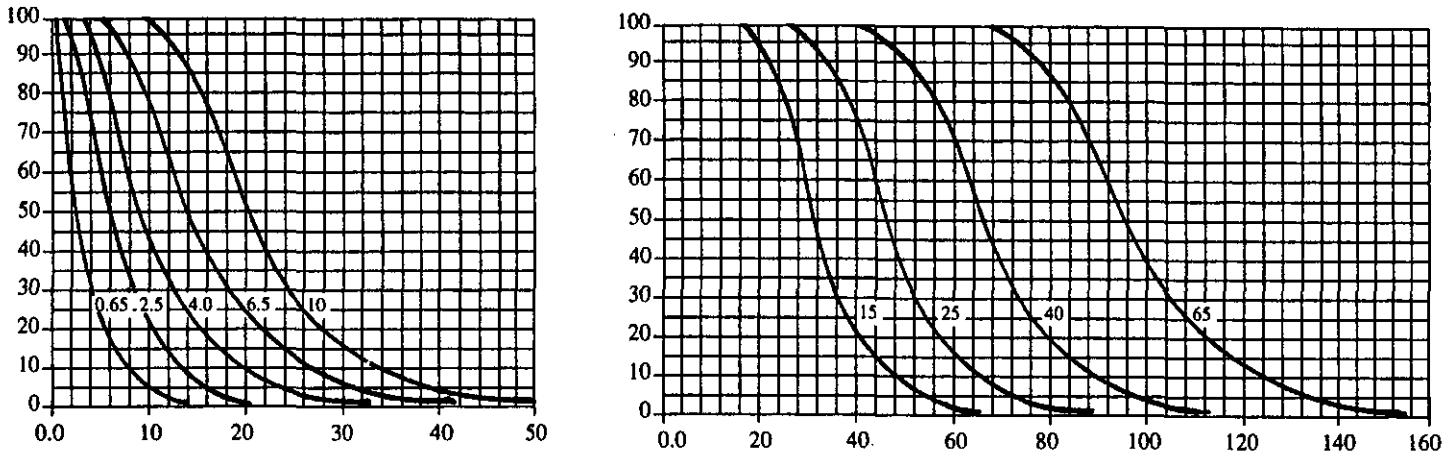
| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0 | 4.0 | 6.5 | 10 | 1.0 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | 100 | 150 | 250 |
| | p (in percent nonconforming) | | | p (in nonconformities per hundred units) | | | | | | | | | | | |
| 99.0 | 0.165 | 1.53 | 4.64 | 7.62 | 0.165 | 1.48 | 4.41 | 7.13 | 14.4 | 23.7 | 39.3 | 62.2 | 100 | 153 | 248 |
| 95.0 | 0.558 | 2.88 | 6.42 | 10.9 | 0.560 | 2.82 | 6.19 | 10.2 | 18.9 | 29.6 | 46.6 | 70.6 | 113 | 171 | 265 |
| 90.0 | 0.889 | 3.86 | 7.64 | 12.9 | 0.893 | 3.80 | 7.42 | 12.3 | 21.3 | 32.9 | 51.2 | 76.5 | 120 | 181 | 278 |
| 75.0 | 1.74 | 5.77 | 9.88 | 16.2 | 1.75 | 5.76 | 9.80 | 15.9 | 24.9 | 38.1 | 58.4 | 86.2 | 132 | 196 | 298 |
| 50.0 | 3.51 | 8.55 | 13.3 | 20.7 | 3.58 | 8.70 | 13.6 | 21.2 | 29.9 | 45.2 | 68.1 | 98.8 | 146 | 215 | 322 |
| 25.0 | 6.70 | 12.9 | 19.4 | 28.0 | 6.94 | 13.5 | 20.7 | 30.2 | 39.4 | 57.2 | 83.1 | 117 | 167 | 241 | 355 |
| 10.0 | 10.9 | 18.1 | 26.8 | 36.0 | 11.5 | 19.4 | 29.9 | 40.9 | 51.4 | 71.3 | 100 | 137 | 190 | 269 | 388 |
| 5.0 | 13.9 | 21.6 | 31.6 | 41.0 | 15.0 | 23.7 | 36.5 | 48.4 | 59.6 | 80.9 | 111 | 150 | 205 | 286 | 409 |
| 1.0 | 20.6 | 28.9 | 41.3 | 50.6 | 23.1 | 33.2 | 51.1 | 64.7 | 77.3 | 101 | 134 | 176 | 235 | 321 | 450 |

## *Scheme Performance with Switching Rules*

## *Chart XV-F Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE XV-F-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

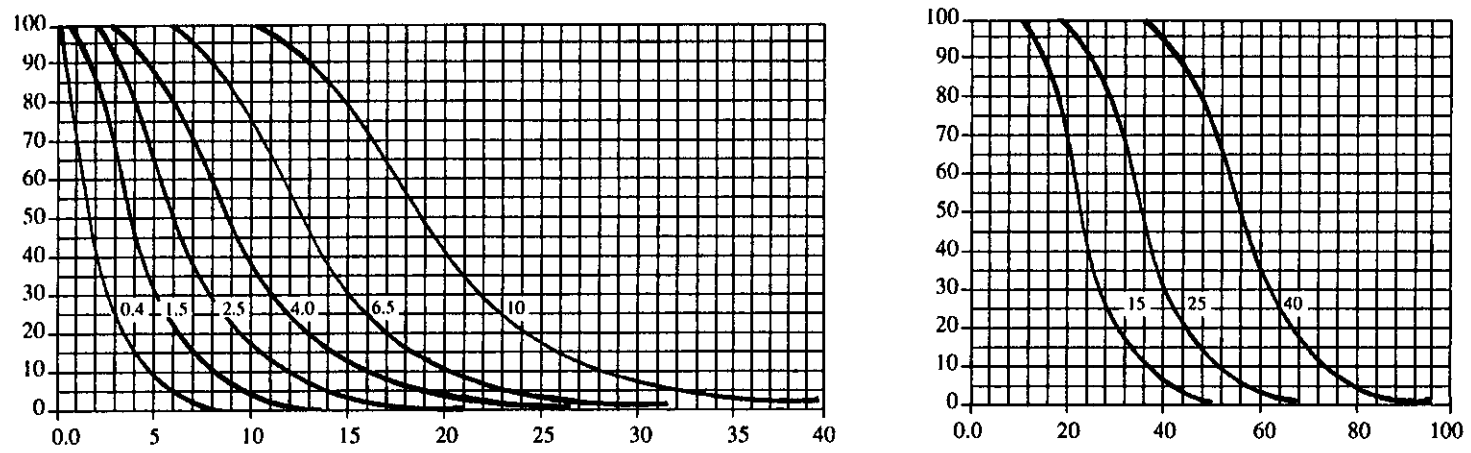
| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .65 | 2.5 | 4.0 | 6.5 | 10 | .65 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 | 65 | |
| | p (in percent nonconforming) | | | | | p (in nonconformities per hundred units) | | | | | | | | | |
| 99.0 | 0.104 | .978 | 2.94 | 4.93 | 10.1 | 0.104 | .958 | 2.84 | 4.72 | 9.41 | 15.0 | 25.0 | 39.5 | 64.9 | |
| 95.0 | 0.357 | 1.85 | 4.11 | 6.94 | 13.0 | 0.358 | 1.82 | 4.02 | 6.69 | 12.3 | 19.2 | 30.2 | 45.7 | 73.4 | |
| 90.0 | 0.571 | 2.47 | 4.91 | 8.24 | 14.4 | 0.572 | 2.45 | 4.82 | 8.00 | 13.8 | 21.4 | 33.3 | 49.7 | 78.3 | |
| 75.0 | 1.11 | 3.66 | 6.40 | 10.4 | 16.5 | 1.11 | 3.66 | 6.37 | 10.3 | 16.2 | 24.8 | 38.0 | 56.0 | 85.5 | |
| 50.0 | 2.22 | 5.40 | 8.71 | 13.6 | 19.2 | 2.24 | 5.46 | 8.85 | 13.8 | 19.5 | 29.4 | 44.3 | 64.2 | 94.8 | |
| 25.0 | 4.24 | 8.21 | 12.9 | 18.7 | 24.3 | 4.34 | 8.43 | 13.5 | 19.6 | 25.6 | 37.2 | 54.0 | 76.1 | 109 | |
| 10.0 | 6.94 | 11.6 | 18.1 | 24.5 | 30.4 | 7.19 | 12.2 | 19.4 | 26.6 | 33.4 | 46.4 | 65.0 | 88.9 | 124 | |
| 5.0 | 8.94 | 14.0 | 21.6 | 28.3 | 34.4 | 9.36 | 14.8 | 23.7 | 31.5 | 38.8 | 52.6 | 72.2 | 97.2 | 133 | |
| 1.0 | 13.4 | 19.0 | 28.9 | 35.8 | 42.1 | 14.4 | 20.7 | 33.2 | 42.0 | 50.2 | 65.5 | 87.1 | 114 | 153 | |

## *Scheme Performance with Switching Rules*

## *Chart XV-G Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

PERCENT OF LOTS EXPECTED TO BE ACCEPTED ($P_a$)

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection)

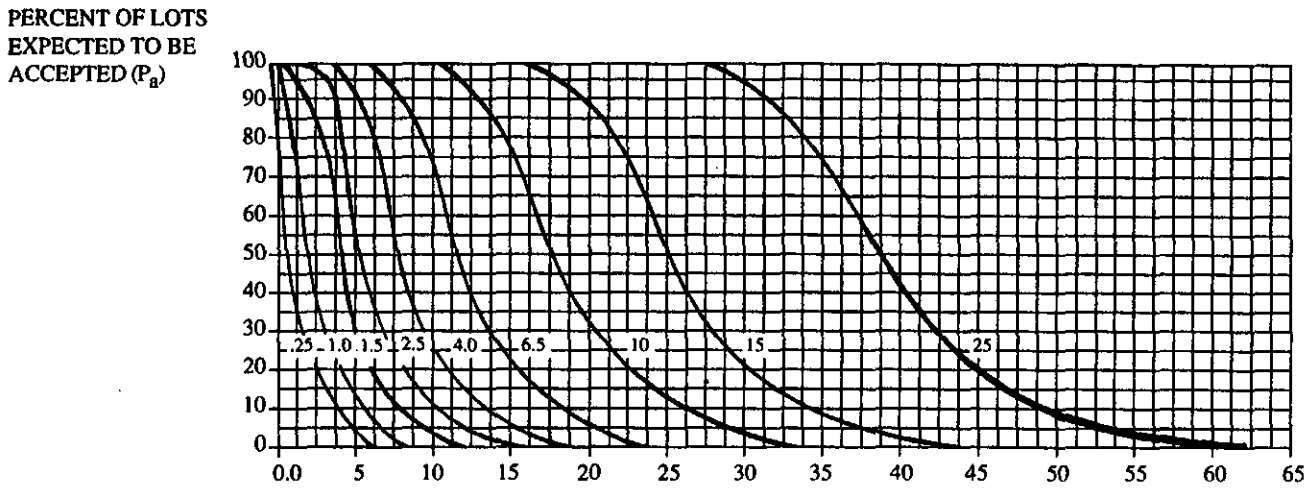
TABLE XV-G-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .4 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .4 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 | 40 |
| | p (in percent nonconforming) | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 0.0643 | 0.571 | 1.80 | 3.02 | 6.12 | 10.0 | 0.0643 | .564 | 1.77 | 2.95 | 5.88 | 9.49 | 15.5 | 24.6 | 40.3 |
| 95.0 | 0.223 | 1.12 | 2.54 | 4.28 | 7.96 | 12.6 | 0.223 | 1.11 | 2.51 | 4.18 | 7.69 | 12.0 | 18.9 | 28.6 | 45.9 |
| 90.0 | 0.357 | 1.53 | 3.05 | 5.09 | 8.87 | 13.9 | 0.358 | 1.52 | 3.01 | 5.00 | 8.64 | 13.4 | 20.8 | 31.1 | 48.9 |
| 75.0 | 0.703 | 2.32 | 3.99 | 6.49 | 10.2 | 15.7 | 0.706 | 2.32 | 3.98 | 6.45 | 10.1 | 15.5 | 23.7 | 35.0 | 53.4 |
| 50.0 | 1.42 | 3.46 | 5.48 | 8.54 | 12.1 | 18.2 | 1.43 | 3.48 | 5.53 | 8.63 | 12.2 | 18.3 | 27.7 | 40.1 | 59.2 |
| 25.0 | 2.74 | 5.30 | 8.21 | 11.9 | 15.5 | 22.3 | 2.78 | 5.39 | 8.43 | 12.3 | 16.0 | 23.2 | 33.8 | 47.6 | 67.9 |
| 10.0 | 4.50 | 7.56 | 11.6 | 15.8 | 19.7 | 27.1 | 4.60 | 7.78 | 12.2 | 16.6 | 20.9 | 29.0 | 40.6 | 55.6 | 77.4 |
| 5.0 | 5.81 | 9.14 | 14.0 | 18.4 | 22.5 | 30.1 | 5.99 | 9.49 | 14.8 | 19.7 | 24.2 | 32.9 | 45.1 | 60.8 | 83.4 |
| 1.0 | 8.80 | 12.5 | 19.0 | 23.8 | 28.1 | 36.0 | 9.22 | 13.3 | 20.7 | 26.3 | 31.4 | 41.0 | 54.4 | 71.4 | 95.6 |

# *Scheme Performance with Switching Rules*

## *Chart XV-H Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

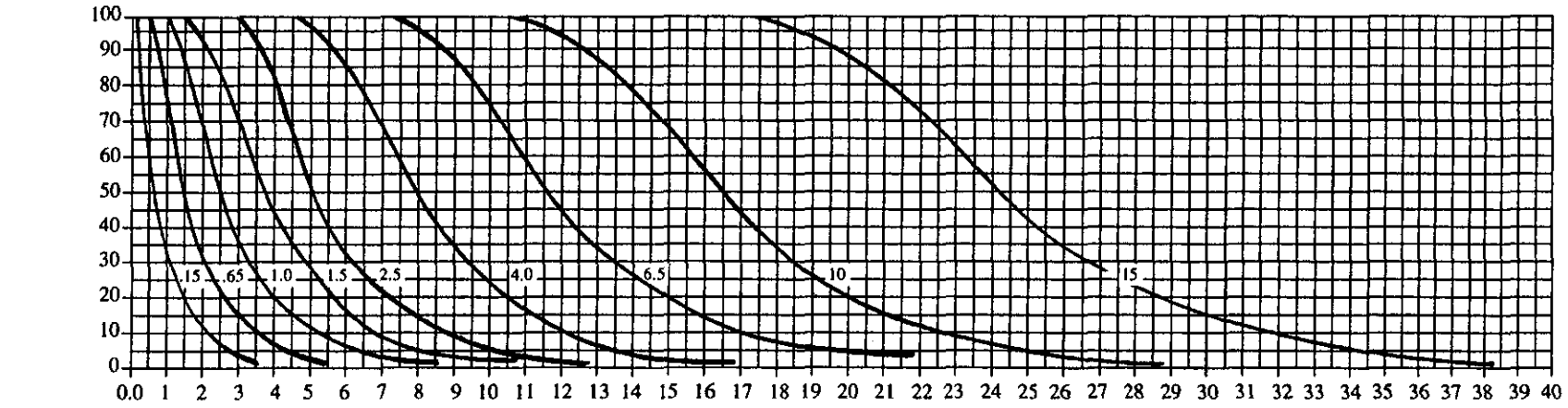
TABLE XV-H-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .25 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 | 25 |
| | p (in percent nonconforming) | | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 0.0416 | 0.386 | 1.09 | 1.87 | 3.86 | 6.33 | 10.4 | 0.0416 | 0.383 | 1.08 | 1.84 | 3.77 | 6.14 | 10.0 | 15.4 | 25.6 |
| 95.0 | 0.143 | 0.733 | 1.59 | 2.70 | 5.03 | 7.92 | 12.6 | 0.143 | 0.729 | 1.57 | 2.66 | 4.92 | 7.69 | 12.1 | 18.3 | 29.4 |
| 90.0 | 0.229 | 0.983 | 1.93 | 3.23 | 5.62 | 8.76 | 13.7 | 0.229 | 0.979 | 1.92 | 3.20 | 5.53 | 8.57 | 13.3 | 19.9 | 31.3 |
| 75.0 | 0.445 | 1.46 | 2.55 | 4.15 | 6.52 | 10.0 | 15.4 | 0.446 | 1.46 | 2.55 | 4.13 | 6.47 | 9.90 | 15.2 | 22.4 | 34.2 |
| 50.0 | 0.893 | 2.17 | 3.52 | 5.49 | 7.74 | 11.7 | 17.6 | 0.898 | 2.18 | 3.54 | 5.52 | 7.78 | 11.7 | 17.7 | 25.7 | 37.9 |
| 25.0 | 1.72 | 3.34 | 5.30 | 7.70 | 10.0 | 14.5 | 21.0 | 1.73 | 3.37 | 5.39 | 7.85 | 10.2 | 14.9 | 21.6 | 30.4 | 43.5 |
| 10.0 | 2.84 | 4.77 | 7.56 | 10.3 | 12.9 | 17.8 | 24.7 | 2.88 | 4.86 | 7.78 | 10.6 | 13.4 | 18.5 | 26.0 | 35.6 | 49.5 |
| 5.0 | 3.68 | 5.79 | 9.14 | 12.1 | 14.8 | 19.9 | 27.0 | 3.74 | 5.93 | 9.49 | 12.6 | 15.5 | 21.0 | 28.9 | 38.9 | 53.4 |
| 1.0 | 5.59 | 8.01 | 12.5 | 15.8 | 18.7 | 24.1 | 31.6 | 5.76 | 8.30 | 13.3 | 16.8 | 20.1 | 26.2 | 34.8 | 45.7 | 61.2 |

## *Scheme Performance with Switching Rules*

## *Chart XV-J Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

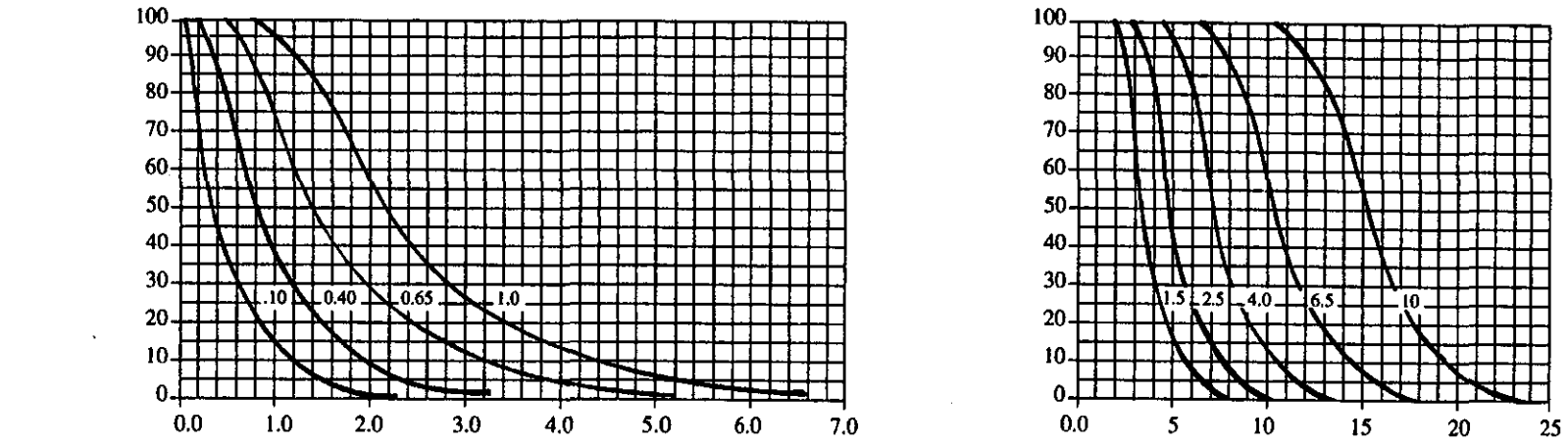
TABLE XV-J-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .15 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | .15 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | 15 |
| | p (in percent nonconforming) | | | | | | | | p (in nonconformities per hundred units) | | | | | | | | |
| 99.0 | 0.0260 | 0.240 | 0.715 | 1.16 | 2.39 | 3.88 | 6.49 | 10.2 | 0.0260 | 0.239 | 0.710 | 1.15 | 2.35 | 3.80 | 6.35 | 9.87 | 15.9 |
| 95.0 | 0.0896 | 0.458 | 1.01 | 1.68 | 3.12 | 4.89 | 7.74 | 11.8 | 0.0897 | 0.457 | 1.00 | 1.66 | 3.08 | 4.80 | 7.56 | 11.4 | 18.4 |
| 90.0 | 0.144 | 0.617 | 1.21 | 2.01 | 3.49 | 5.43 | 8.48 | 12.7 | 0.144 | 0.615 | 1.20 | 2.00 | 3.46 | 5.35 | 8.32 | 12.4 | 19.6 |
| 75.0 | 0.282 | 0.928 | 1.59 | 2.59 | 4.06 | 6.23 | 9.58 | 14.2 | 0.282 | 0.928 | 1.59 | 2.58 | 4.04 | 6.19 | 9.50 | 14.0 | 21.4 |
| 50.0 | 0.571 | 1.39 | 2.20 | 3.44 | 4.85 | 7.31 | 11.0 | 16.0 | 0.573 | 1.39 | 2.21 | 3.45 | 4.86 | 7.34 | 11.1 | 16.1 | 23.7 |
| 25.0 | 1.10 | 2.14 | 3.34 | 4.85 | 6.32 | 9.15 | 13.3 | 18.6 | 1.11 | 2.16 | 3.37 | 4.90 | 6.40 | 9.29 | 13.5 | 19.0 | 27.2 |
| 10.0 | 1.83 | 3.08 | 4.77 | 6.52 | 8.16 | 11.3 | 15.7 | 21.4 | 1.84 | 3.11 | 4.86 | 6.65 | 8.35 | 11.6 | 16.2 | 22.2 | 30.9 |
| 5.0 | 2.37 | 3.74 | 5.79 | 7.66 | 9.41 | 12.7 | 17.3 | 23.2 | 2.40 | 3.79 | 5.93 | 7.87 | 9.69 | 13.1 | 18.0 | 24.3 | 33.4 |
| 1.0 | 3.62 | 5.19 | 8.01 | 10.1 | 12.0 | 15.6 | 20.5 | 26.6 | 3.69 | 5.31 | 8.30 | 10.5 | 12.6 | 16.4 | 21.8 | 28.5 | 38.2 |

# *Scheme Performance with Switching Rules*

## *Chart XV-K Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



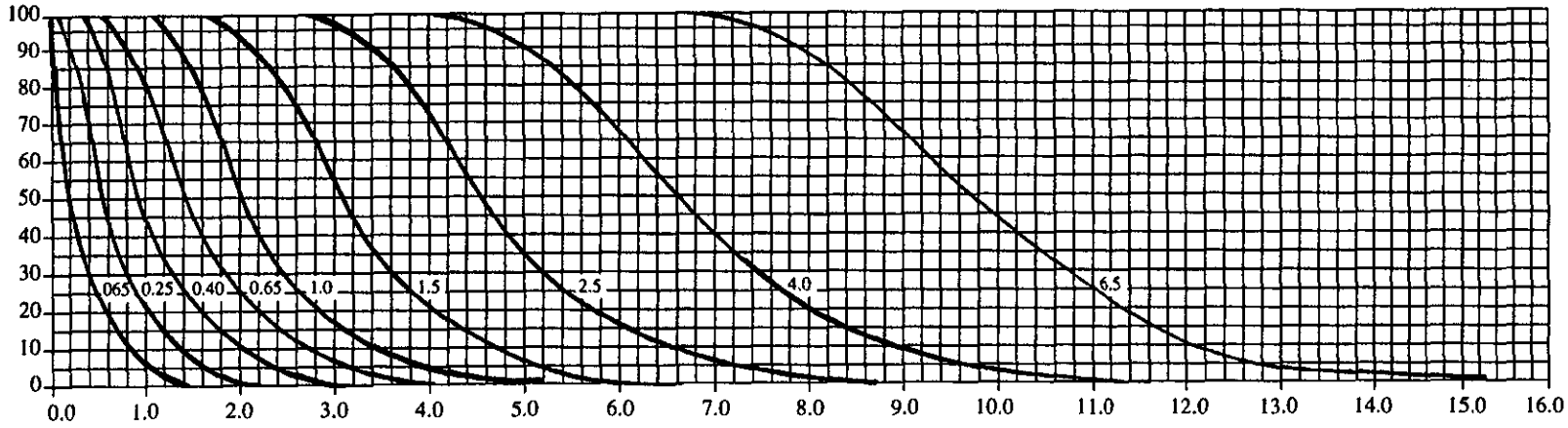
TABLE XV-K-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .10 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | 10 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.0167 | 0.153 | 0.455 | 0.738 | 1.49 | 2.43 | 4.01 | 6.34 | 10.3 | | | | | | |
| 95.0 | 0.0573 | 0.292 | 0.643 | 1.06 | 1.97 | 3.07 | 4.84 | 7.32 | 11.7 | | | | | | |
| 90.0 | 0.0916 | 0.392 | 0.771 | 1.28 | 2.21 | 3.43 | 5.33 | 7.96 | 12.5 | | | | | | |
| 75.0 | 0.178 | 0.586 | 1.02 | 1.65 | 2.59 | 3.96 | 6.08 | 8.96 | 13.7 | | | | | | |
| 50.0 | 0.359 | 0.873 | 1.42 | 2.21 | 3.11 | 4.70 | 7.08 | 10.3 | 15.2 | | | | | | |
| 25.0 | 0.694 | 1.35 | 2.16 | 3.14 | 4.10 | 5.94 | 8.65 | 12.2 | 17.4 | | | | | | |
| 10.0 | 1.15 | 1.94 | 3.11 | 4.26 | 5.34 | 7.42 | 10.4 | 14.2 | 19.8 | | | | | | |
| 5.0 | 1.50 | 2.37 | 3.79 | 5.04 | 6.20 | 8.41 | 11.5 | 15.6 | 21.4 | | | | | | |
| 1.0 | 2.31 | 3.32 | 5.31 | 6.73 | 8.04 | 10.5 | 13.9 | 18.3 | 24.5 | | | | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-L Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

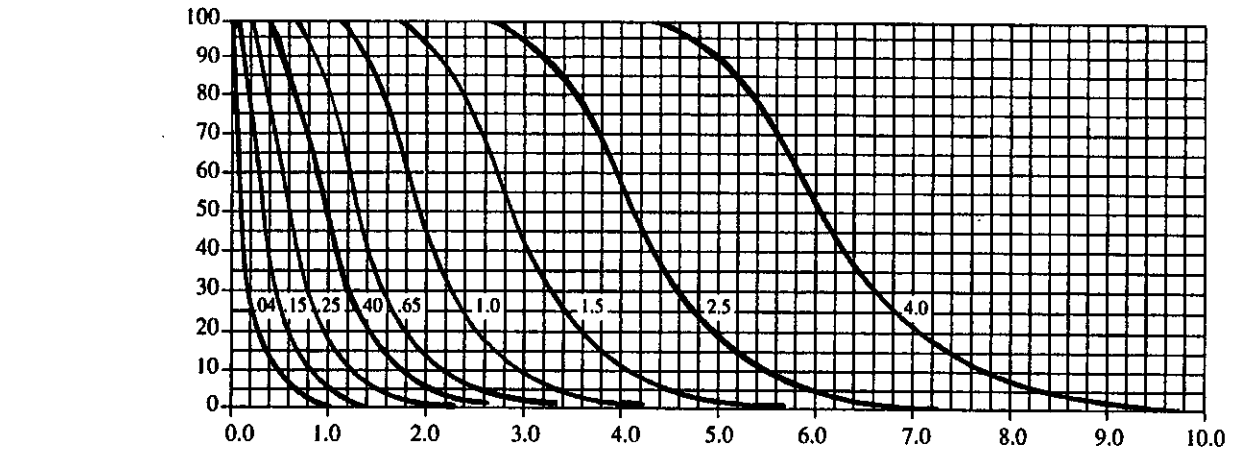
TABLE XV-L-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .065 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | 6.5 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.0104 | 0.0957 | 0.284 | 0.472 | 0.941 | 1.50 | 2.50 | 3.95 | 6.49 | | | | | | |
| 95.0 | 0.0358 | 0.183 | 0.402 | 0.669 | 1.23 | 1.92 | 3.02 | 4.57 | 7.34 | | | | | | |
| 90.0 | 0.0574 | 0.246 | 0.482 | 0.800 | 1.38 | 2.14 | 3.33 | 4.97 | 7.83 | | | | | | |
| 75.0 | 0.112 | 0.369 | 0.637 | 1.03 | 1.62 | 2.48 | 3.80 | 5.60 | 8.55 | | | | | | |
| 50.0 | 0.228 | 0.554 | 0.885 | 1.38 | 1.95 | 2.94 | 4.43 | 6.42 | 9.48 | | | | | | |
| 25.0 | 0.441 | 0.856 | 1.35 | 1.96 | 2.56 | 3.72 | 5.40 | 7.61 | 10.9 | | | | | | |
| 10.0 | 0.731 | 1.23 | 1.94 | 2.66 | 3.34 | 4.64 | 6.50 | 8.89 | 12.4 | | | | | | |
| 5.0 | 0.951 | 1.51 | 2.37 | 3.15 | 3.88 | 5.26 | 7.22 | 9.72 | 13.3 | | | | | | |
| 1.0 | 1.46 | 2.11 | 3.32 | 4.20 | 5.02 | 6.55 | 8.71 | 11.4 | 15.3 | | | | | | |

# *Scheme Performance with Switching Rules*

## *Chart XV-M Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



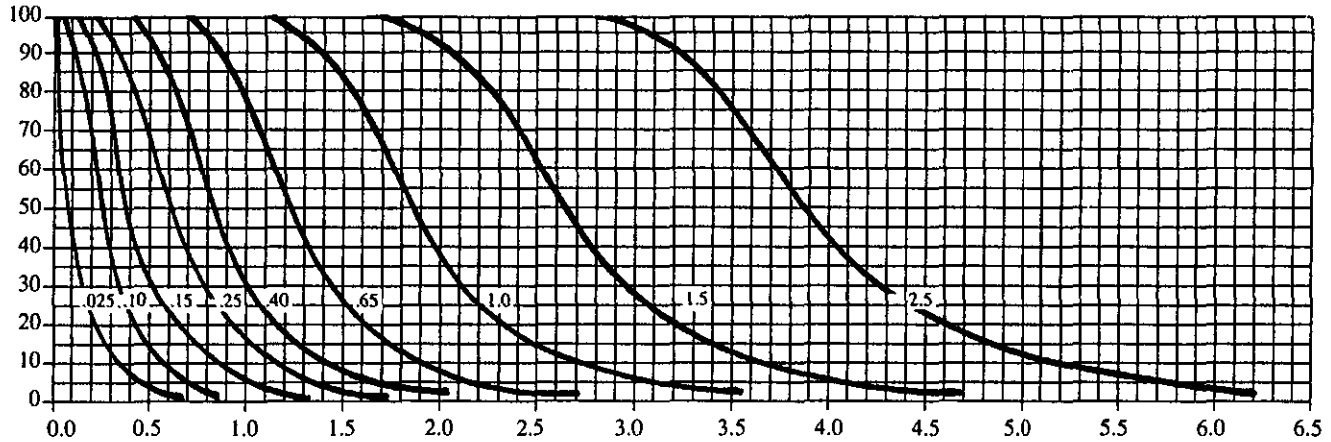
TABLE XV-M-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .04 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | 4.0 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.00665 | 0.0574 | 0.181 | 0.300 | 0.598 | 0.967 | 1.57 | 2.50 | 4.08 | | | | | | |
| 95.0 | 0.0228 | 0.113 | 0.255 | 0.425 | 0.781 | 1.22 | 1.92 | 2.90 | 4.66 | | | | | | |
| 90.0 | 0.0364 | 0.154 | 0.306 | 0.508 | 0.878 | 1.36 | 2.11 | 3.16 | 4.97 | | | | | | |
| 75.0 | 0.0711 | 0.233 | 0.404 | 0.655 | 1.03 | 1.57 | 2.41 | 3.56 | 5.43 | | | | | | |
| 50.0 | 0.143 | 0.349 | 0.562 | 0.876 | 1.23 | 1.86 | 2.81 | 4.08 | 6.02 | | | | | | |
| 25.0 | 0.278 | 0.539 | 0.856 | 1.25 | 1.63 | 2.36 | 3.43 | 4.83 | 6.90 | | | | | | |
| 10.0 | 0.460 | 0.778 | 1.23 | 1.69 | 2.12 | 2.94 | 4.13 | 5.64 | 7.86 | | | | | | |
| 5.0 | 0.599 | 0.949 | 1.51 | 2.00 | 2.46 | 3.34 | 4.58 | 6.17 | 8.47 | | | | | | |
| 1.0 | 0.922 | 1.33 | 2.11 | 2.67 | 3.19 | 4.16 | 5.53 | 7.25 | 9.71 | | | | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-N Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



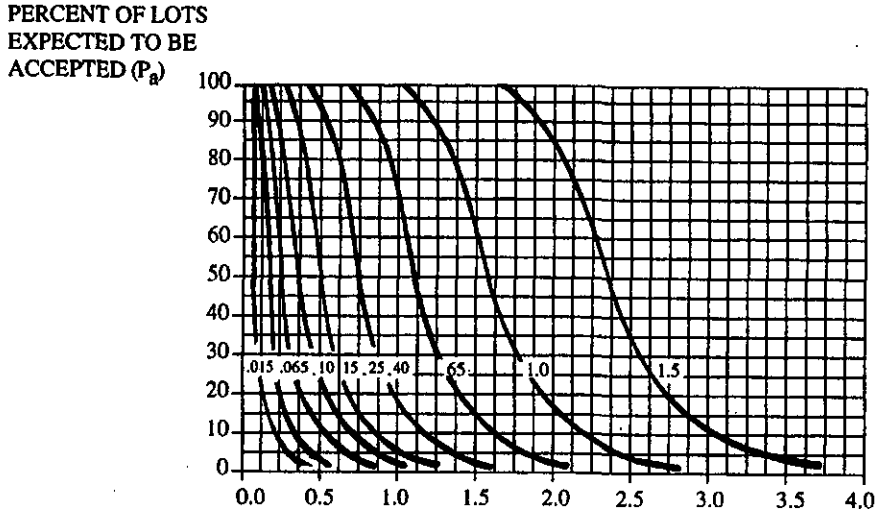
TABLE XV-N-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .025 | .10 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | 2.5 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.00416 | 0.0383 | 0.108 | 0.184 | 0.377 | 0.613 | 1.00 | 1.54 | 2.56 | | | | | | |
| 95.0 | 0.0143 | 0.0729 | 0.157 | 0.266 | 0.492 | 0.769 | 1.21 | 1.83 | 2.94 | | | | | | |
| 90.0 | 0.0229 | 0.0979 | 0.192 | 0.320 | 0.553 | 0.857 | 1.33 | 1.99 | 3.13 | | | | | | |
| 75.0 | 0.0446 | 0.146 | 0.255 | 0.413 | 0.647 | 0.990 | 1.52 | 2.24 | 3.42 | | | | | | |
| 50.0 | 0.0898 | 0.218 | 0.354 | 0.552 | 0.778 | 1.17 | 1.77 | 2.57 | 3.79 | | | | | | |
| 25.0 | 0.174 | 0.337 | 0.539 | 0.785 | 1.02 | 1.49 | 2.16 | 3.04 | 4.35 | | | | | | |
| 10.0 | 0.288 | 0.486 | 0.778 | 1.06 | 1.34 | 1.85 | 2.60 | 3.56 | 4.95 | | | | | | |
| 5.0 | 0.374 | 0.593 | 0.949 | 1.26 | 1.55 | 2.10 | 2.89 | 3.89 | 5.34 | | | | | | |
| 1.0 | 0.576 | 0.830 | 1.33 | 1.68 | 2.01 | 2.62 | 3.48 | 4.57 | 6.12 | | | | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-P Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



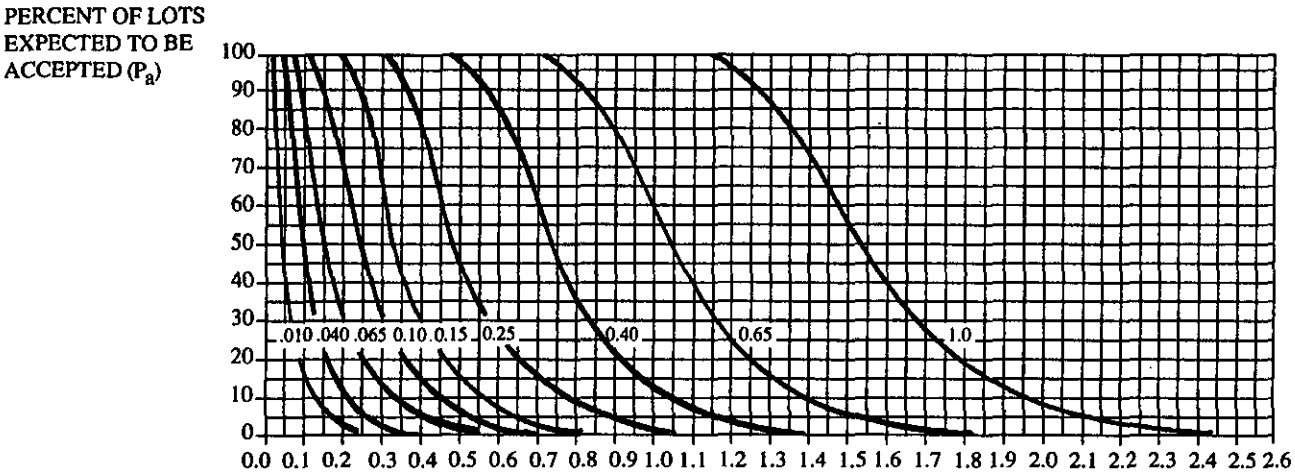
TABLE XV-P-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (*normal inspection*) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .015 | .065 | .10 | .15 | .25 | .40 | .65 | 1.0 | 1.5 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.00263 | 0.0240 | 0.0713 | 0.116 | 0.236 | 0.381 | 0.636 | 0.989 | 1.59 | | | | | | |
| 95.0 | 0.00901 | 0.0457 | 0.101 | 0.166 | 0.308 | 0.480 | 0.757 | 1.14 | 1.84 | | | | | | |
| 90.0 | 0.0144 | 0.0616 | 0.121 | 0.200 | 0.346 | 0.535 | 0.832 | 1.24 | 1.96 | | | | | | |
| 75.0 | 0.0283 | 0.0928 | 0.159 | 0.258 | 0.404 | 0.619 | 0.950 | 1.40 | 2.14 | | | | | | |
| 50.0 | 0.0573 | 0.139 | 0.221 | 0.345 | 0.486 | 0.734 | 1.11 | 1.61 | 2.37 | | | | | | |
| 25.0 | 0.111 | 0.216 | 0.337 | 0.490 | 0.640 | 0.929 | 1.35 | 1.90 | 2.72 | | | | | | |
| 10.0 | 0.184 | 0.311 | 0.486 | 0.665 | 0.835 | 1.16 | 1.62 | 2.22 | 3.09 | | | | | | |
| 5.0 | 0.240 | 0.379 | 0.593 | 0.787 | 0.969 | 1.31 | 1.80 | 2.43 | 3.34 | | | | | | |
| 1.0 | 0.369 | 0.531 | 0.830 | 1.05 | 1.26 | 1.64 | 2.18 | 2.85 | 3.82 | | | | | | |

## *Scheme Performance with Switching Rules*

## *Chart XV-Q Operating Characteristic Curves for ANSI Z14 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.



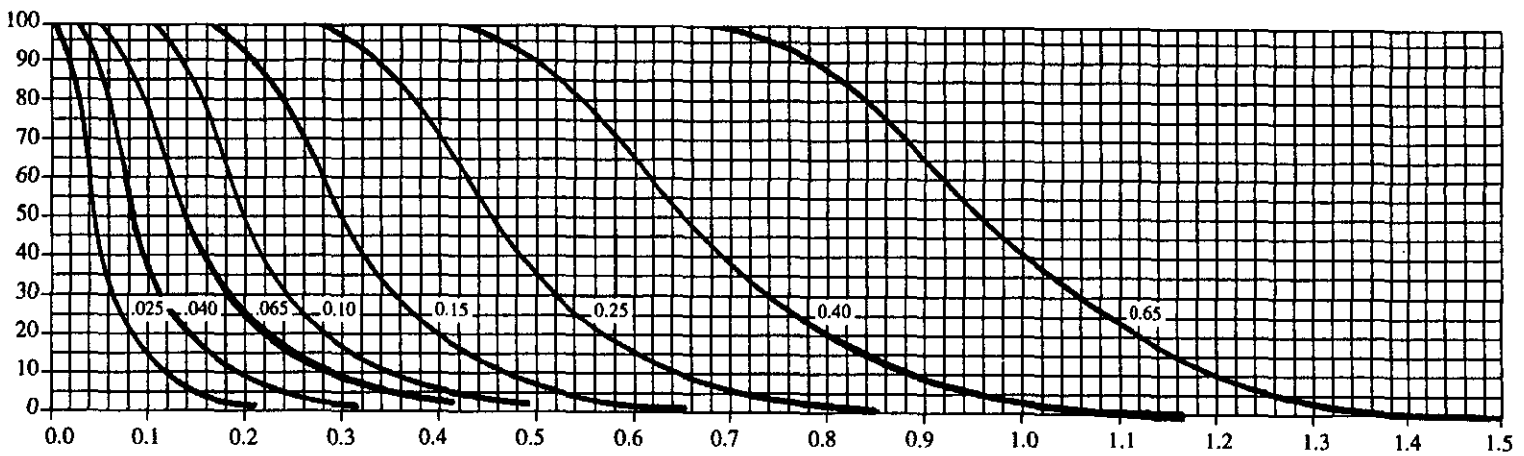
TABLE XV-Q-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .01 | .04 | .065 | .10 | .15 | .25 | .40 | .65 | 1.0 | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.00167 | 0.0153 | 0.0455 | 0.0738 | 0.149 | 0.243 | 0.401 | 0.634 | 1.03 | | | | | | |
| 95.0 | 0.00573 | 0.0292 | 0.0643 | 0.106 | 0.197 | 0.307 | 0.484 | 0.732 | 1.17 | | | | | | |
| 90.0 | 0.00915 | 0.0392 | 0.0771 | 0.128 | 0.221 | 0.343 | 0.533 | 0.796 | 1.25 | | | | | | |
| 75.0 | 0.0178 | 0.0586 | 0.102 | 0.165 | 0.259 | 0.396 | 0.608 | 0.896 | 1.37 | | | | | | |
| 50.0 | 0.0358 | 0.0873 | 0.142 | 0.221 | 0.311 | 0.470 | 0.708 | 1.03 | 1.52 | | | | | | |
| 25.0 | 0.0694 | 0.135 | 0.216 | 0.314 | 0.410 | 0.594 | 0.865 | 1.22 | 1.74 | | | | | | |
| 10.0 | 0.115 | 0.194 | 0.311 | 0.426 | 0.534 | 0.742 | 1.04 | 1.42 | 1.98 | | | | | | |
| 5.0 | 0.150 | 0.237 | 0.379 | 0.504 | 0.620 | 0.841 | 1.15 | 1.56 | 2.14 | | | | | | |
| 1.0 | 0.231 | 0.332 | 0.531 | 0.673 | 0.804 | 1.05 | 1.39 | 1.83 | 2.45 | | | | | | |

# *Scheme Performance with Switching Rules*

## *Chart XV-R Operating Characteristic Curves for ANSI Z1.4 Scheme Performance*

(Curves for double and multiple sampling are matched as closely as practicable)




Quality of submitted product (p, in percent nonconforming for AQLs ≤10; in nonconformities per hundred units for AQLs >10)

Note: Figures on curves are Acceptable Quality Levels (AQLs) for normal inspection.

TABLE XV-R-1—TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR ANSI Z1.4 SCHEME PERFORMANCE

| $P_a$ | Acceptable Quality Levels (normal inspection) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | .025 | .040 | .065 | .10 | .15 | .25 | .40 | .65 | | | | | | | |
| | p (in percent nonconforming or nonconformities per hundred units) | | | | | | | | | | | | | | |
| 99.0 | 0.00957 | 0.0284 | 0.0473 | 0.0941 | 0.150 | 0.250 | 0.395 | 0.649 | | | | | | | |
| 95.0 | 0.0183 | 0.0402 | 0.0669 | 0.123 | 0.192 | 0.302 | 0.457 | 0.734 | | | | | | | |
| 90.0 | 0.0246 | 0.0482 | 0.0800 | 0.138 | 0.214 | 0.333 | 0.497 | 0.783 | | | | | | | |
| 75.0 | 0.0369 | 0.0637 | 0.103 | 0.162 | 0.248 | 0.380 | 0.560 | 0.855 | | | | | | | |
| 50.0 | 0.0554 | 0.0885 | 0.138 | 0.195 | 0.294 | 0.443 | 0.642 | 0.948 | | | | | | | |
| 25.0 | 0.0856 | 0.135 | 0.196 | 0.256 | 0.372 | 0.540 | 0.761 | 1.09 | | | | | | | |
| 10.0 | 0.123 | 0.194 | 0.266 | 0.334 | 0.464 | 0.650 | 0.889 | 1.24 | | | | | | | |
| 5.0 | 0.151 | 0.237 | 0.315 | 0.388 | 0.526 | 0.722 | 0.972 | 1.33 | | | | | | | |
| 1.0 | 0.211 | 0.332 | 0.420 | 0.502 | 0.656 | 0.871 | 1.14 | 1.53 | | | | | | | |

# INDEX OF TERMS WITH SPECIAL MEANINGS