
**Acceptance sampling procedures
based on the allocation of priorities
principle (APP) —**

**Part 1:
Guidelines for the APP approach**

iTeh STANDARD PREVIEW
*Règles d'échantillonnage pour acceptation fondées sur le principe
d'attribution de priorités (APP) —
(standards.iteh.ai)
Partie 1: Lignes directrices relatives à l'approche APP*

ISO 28598-1:2017

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 5, *Acceptance sampling*.
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This first edition of ISO 28598-1 cancels and replaces ISO 13448-1:2005, of which it constitutes a minor revision to change the reference number from 13448-1 to 28598-1.

With the view to achieve a more consistent portfolio, TC 69/SC 5 has simultaneously renumbered the following standards, by means of minor revisions:

Old reference	New reference	Title
ISO 2859-10:2006	ISO 28590:2017	Sampling procedures for inspection by attributes — Introduction to the ISO 2859 series of standards for sampling for inspection by attributes
ISO 8422:2006	ISO 28591:2017	Sequential sampling plans for inspection by attributes
ISO 28801:2011	ISO 28592:2017	Double sampling plans by attributes with minimal sample sizes, indexed by producer's risk quality (PRQ) and consumer's risk quality (CRQ)
ISO 18414:2006	ISO 28593:2017	Acceptance sampling procedures by attributes — Accept-zero sampling system based on credit principle for controlling outgoing quality
ISO 21247:2005	ISO 28594:2017	Combined accept-zero sampling systems and process control procedures for product acceptance
ISO 14560:2004	ISO 28597:2017	Acceptance sampling procedures by attributes — Specified quality levels in nonconforming items per million
ISO 13448-1:2005	ISO 28598-1:2017	Acceptance sampling procedures based on the allocation of priorities principle (APP) — Part 1: Guidelines for the APP approach
ISO 13448-2:2004	ISO 28598-2:2017	Acceptance sampling procedures based on the allocation of priorities principle (APP) — Part 2: Coordinated single sampling plans for acceptance sampling by attributes

Cross references between the above listed documents have been corrected in the minor revisions.

In addition, in [5.1](#) and [6.1.3](#), the reference to ISO 2859 has been corrected to a reference to ISO 2859-1.

A list of all documents in the new ISO 28590 - ISO 28599 series of International Standards can be found on the ISO website.

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Introduction

The ISO 28598 series provides a new acceptance sampling methodology in support of quality management. This could be beneficial for users of ISO 9001 or ISO 9004. This part of ISO 28598 gives guidance and explains the methodology, which is based on the “allocation of priorities principle” (APP). ISO 28598-2 provides attributes sampling plans. Development of ISO 28598-3, to provide variables sampling plans, is under consideration.

The procedures in the ISO 28598 series have considerable advantages under certain circumstances. A novel feature is the ability to use practically any type of prior objective and subjective information when determining the appropriate sampling plan. Examples of such information are inspection results for previous lots, certification of quality management systems as being in conformity with ISO 9001, quality control data and customers' subjective estimates of the supplier's capability to provide the desired quality, all of which may be summarized in a trust level. This allows a progressive reduction in sample size as the customer's trust in the producer increases.

Another advantage of the procedures arises when successive inspections of the same lot are carried out by different parties (i.e. customer, producer and/or a third party). In the past, it was generally accepted that the parties should use similar inspection plans or schemes. This could sometimes prove impossible, due to the parties having different resources and capabilities for inspection. Moreover, due to sampling variability, in up to 25 % of cases the use of similar inspection plans or schemes could result in contradictory results between two parties. This can lead to considerable effort being required to resolve disputes that could have been avoided from the very beginning. The APP enables each of the parties to organize inspection in accordance with its own resources and capabilities for inspection, thereby significantly reducing the probability of occurrence of contradictory results. The parties are not required to coordinate their sampling plans with each other, only with specific requirements of the sampling plans such as customer's or supplier's risks.

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Acceptance sampling procedures based on the allocation of priorities principle (APP) —

Part 1: Guidelines for the APP approach

1 Scope

This part of ISO 28598 provides guidelines specifying the organizational principles of acceptance sampling in situations where the contract or the legislation provides for successive inspection to be carried out by different parties: the supplier, the customer and/or a third party.

These guidelines are designed for inspection of populations of any product supplied or delivered in discrete items in lots. They are applicable to

- supplier inspection (final inspection, product certification upon supplier's request),
- customer inspection (incoming inspection, audit inspection, acceptance sampling),
- third-party inspection (certification of product, inspection and supervision for observance of International Standard requirements, quality inspection carried out at the supplier, and/or customer, request),

where the quality levels and the lot acceptability criteria are specified unilaterally by the supplier or contractually by the supplier and the customer.

These guidelines are also applicable to situations when only one sampling inspection is actually needed.

NOTE Single sampling APP plans by attributes are given in ISO 28598-2.

The guidelines provided by this part of ISO 28598 may be applied in developing standards on acceptance sampling for standard inspection models, specific items or quality levels, as well as in developing contracts, specifications and instructions. In contractual use of the APP, the parties concerned should acknowledge in the contract that they approve of its principles (also by referring to the present guidelines). The parties may also provide for the use of the APP in disputes and arbitration.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 2859-2, *Sampling procedures for inspection by attributes — Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection*

ISO 2859-3, *Sampling procedures for inspection by attributes — Part 3: Skip-lot sampling procedures*

ISO 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

ISO 3951-1, *Sampling procedures for inspection by variables — Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 28591, *Sequential sampling plans for inspection by attributes*

ISO 8423, *Sequential sampling plans for inspection by variables for percent nonconforming (known standard deviation)*

ISO 9000:2015, *Quality management systems — Fundamentals and vocabulary*

ISO 28598-2:2017, *Acceptance sampling procedures based on the allocation-of-priorities principle (APP) — Part 2: Coordinated single sampling plans for acceptance sampling by attributes*

3 Terms, definitions, symbols and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 3534-2, ISO 9000 and ISO 28598-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 Terms and definitions

3.1.1

normative quality limit

NQL

limiting value of the lot quality level specified for the purpose of acceptance as a guaranteed lot quality level

Note 1 to entry: A limiting quality (LQ) may also be considered to be a guaranteed lot quality level although in that case the guarantee is assured only by a sampling plan that has a low probability of acceptance when the lot is of the LQ. Normally it requires large sample sizes. A specified NQL should be considered as a lot quality level guaranteed in part by a sampling plan and in part through supplementary evidence supporting the supplier's capability to satisfy the specified requirements. A sampling plan for LQ is utilized in the case of prior distrust in the lot quality. A sampling plan for a NQL depends on the level of trust in the lot quality and encourages a supplier to submit evidence other than the inspection data in support of the declared quality. In a variety of situations it allows a considerable decrease in the cost of inspection for both the supplier and the customer.

3.1.2

satisfactory lot

lot for which the actual quality level is not worse than the specified NQL

3.1.3

unsatisfactory lot

lot for which the actual quality level is worse than the specified NQL

3.1.4

customer's risk on supplier inspection

β_0

for an acceptance sampling plan fixed by the supplier, the maximum probability of a decision that classifies a lot as satisfactory when the actual lot quality level is worse than the specified NQL

3.1.5

supplier's risk on customer inspection

α_0

for an acceptance sampling plan fixed by the customer, the maximum probability of a decision that classifies a lot as unsatisfactory when the actual lot quality level is not worse than the specified NQL

3.1.6 schematic customer's risk at supplier inspection

β_a

maximum probability of accepting the lot when the lot quality level in a sequence of lots is unsatisfactory and the sampling scheme specified by a supplier is used

Note 1 to entry: A schematic risk takes into account the probability of switching to inspection plans of differing severity.

3.1.7 schematic supplier's risk at customer inspection

α_a

maximum probability of non-acceptance of the lot when the lot quality level in a sequence of lots is satisfactory and the sampling scheme specified by a customer is used

Note 1 to entry: A schematic risk takes into account the probability of switching to inspection plans of differing severity.

3.1.8 arbitration situation

situation which arises due to sampling variation when a customer rejects a lot which was accepted by the supplier on supplier inspection using the same quality level

3.1.9 arbitration characteristic curve

curve that provides a probability that a lot with a specific quality level will be classified as satisfactory by the sampling plan used by the supplier and as unsatisfactory by the sampling plan used by the customer

3.1.10 inspecting party

any party that organizes and conducts sampling inspection of the lot for the purpose of acceptance

Note 1 to entry: It may be the supplier, customer or a third party.

3.1.11 trust level

customer's estimate of the weight of prior, supplementary and indirect evidence of the supplier's capability to fulfill the specified quality requirements

3.1.12 supplier

organization or person that provides a product

[SOURCE: ISO 9000:2015, definition 3.2.5 – modified.]

3.1.13 customer

organization or person that receives a product

[SOURCE: ISO 9000:2015, definition 3.2.4 – modified.]

3.2 Symbols and abbreviated terms

Ac acceptance number

APP allocation of priorities principles

AQL acceptance quality limit

LQ limiting quality

NQL	normative quality limit
TQM	total quality management
n	sample size
N	lot size
T1 to T7	trust levels
α_0	supplier's risk on customer inspection
α_a	schematic supplier's risk at customer inspection
β_0	customer's risk on supplier inspection
β_a	schematic customer's risk at supplier inspection

4 General overview of quality

4.1 Quality measures

The most common measures of quality are the percentage of nonconforming items and the number of nonconformities per 100 items of product. However, in general cases there may be other characteristics, especially in the inspection of friable, liquid, or linearly or spatially stretched kinds of product. The particular quality measure is specified in standards, specifications or contracts.

NOTE The inspections organized on the basis of these guidelines are treated not as an instrument for economic and psychological pressure upon the supplier to enhance quality of the lots, but as an instrument for information support and determination of the relations among the parties mentioned above in matters of lot quality. Each party has the opportunity to protect its interests and rights while still observing the interests and rights of the other parties. Thus, the ISO 28598 system treats the supplier, customer and third-party inspection plans as an integrated and coordinated system.

4.2 Role of information on quality assurance

The efficiency resulting from using the principles stated in these guidelines increases with the degree of attention the supplier and customer pay to the quality assurance aspects of information. The efficiency depends on the amount and integrity of prior information (the more the amount of positive information and the greater its integrity, the less the amount of sampling that is required). Prior information is taken into account in defining initial data for choosing sampling plans (first of all in defining the customer's risk on supplier inspection) and in constructing sampling schemes. These guidelines treat acceptance sampling as one of the elements in the information processes among the parties. In other words, sampling procedures are treated together with all data on quality.

[Annex A](#) gives the main aspects of the allocation of priorities principle (APP).

[Annex B](#) gives recommendations for choosing the customer's risk for supplier inspection.

5 Selection of a sampling system

5.1 Relations between sampling systems

The acceptance sampling system of the present guidelines supplement ISO 2859-1, ISO 3951-1, ISO 28591 and ISO 8423. The following information should be referred to for the selection from these International Standards.