

BS EN 62058-11:2010



BSI Standards Publication

Electricity metering equipment (a.c.) — Acceptance inspection

Part 11: General acceptance inspection
methods

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Full document details: BS EN 62058-11:2010



National foreword

This British Standard is the UK implementation of EN 62058-11:2010. It was derived by CENELEC from IEC 62058-11:2008. Together with BS EN 62058-21:2010, it supersedes BS EN 60514:1995 which is withdrawn. Together with BS EN 62058-31:2010, it supersedes BS EN 61358:1996 which is withdrawn.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by tags (e.g. [C] [C]).

The UK participation in its preparation was entrusted to Technical Committee PEL/13, Electricity Meters.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 59104 4

ICS 17.220.20; 91.140.50

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2010.

Amendments/corrigenda issued since publication

Date	Text affected
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**Electricity metering equipment (a.c.) -
Acceptance inspection -
Part 11: General acceptance inspection methods
(IEC 62058-11:2008, modified)**

Equipement de comptage
de l'électricité (c.a.) -
Contrôle de réception -
Partie 11: Méthodes générales
de contrôle de réception
(CEI 62058-11:2008, modifiée)

Wechselstrom-Elektrizitätszähler -
Annahmeprüfung -
Teil 11: Allgemeine Verfahren
zur Annahmeprüfung
(IEC 62058-11:2008, modifiziert)

This European Standard was approved by CENELEC on 2010-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 13/1430/FDIS, future edition 1 of IEC 62058-11, prepared by IEC TC 13, Electrical energy measurement, tariff- and load control, was submitted to the IEC-CENELEC parallel vote.

A draft amendment, prepared by the Technical Committee CENELEC TC 13, Equipment for electrical energy measurement and load control, was submitted to the formal vote.

The combined texts were approved by CENELEC as EN 62058-11 on 2010-06-01.

EN 62058-11:2010, together with EN 62058-21:2010, supersedes EN 60514:1995 and, together with EN 62058-31:2010, EN 62058-11:2010 supersedes EN 61358:1996.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2011-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2013-06-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 2004/22/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62058-11:2008 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 2859-1 + corr. March	1999 2001	Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	-	-
ISO 2859-2	1985	Sampling procedures for inspection by attributes - Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection	-	-
ISO 2859-3	2005	Sampling procedures for inspection by attributes - Part 3: Skip-lot sampling procedures	-	-
ISO 3534-2	2006	Statistics - Vocabulary and symbols - Part 2: Applied statistics	-	-
ISO 3951-1	2005	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 3951-2	2006	Sampling procedures for inspection by variables - Part 2: General specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection of independent quality characteristics	-	-
ISO 5479	1997	Statistical interpretation of data - Tests for departure from the normal distribution	-	-

Annex ZZ (informative)

Coverage of Essential Requirements of EC Directives

This European Standard has been prepared under the mandate M/374 given to CENELEC by the European Commission and within its scope, the standard covers methods for statistical verification of conformity with the metrological requirements in connection the Modules F, D and H1.

EN 62058-11 specifies sampling plans, schemes and systems for lot-by-lot inspection by attributes or variables. In addition, a test procedure for 100 % inspection is specified, that can be used if the lot size is too small for sampling inspection or when sampling inspection has to be discontinued.

Table ZZ.1 provides the relationship between the Essential requirements of the MID and the stipulations of the EN 62058 series.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directives concerned.

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.

**Table ZZ.1 – Relationship between the Essential requirements of the MID
and the stipulations of the relevant standards**

MID Annex I	Subject	EN 62058-11	EN 62058-21	EN 62058-31
	NOTE The text in this column is for orientation. For the full text see the MID.			
1	Allowable Errors			
1.1	Under rated operating conditions and in the absence of disturbance	–	5.6 Accuracy tests, Table Z2 5.7 Verification of the register	5.6 Accuracy tests, Table Z2 5.7 Verification of the register
1.2	Under rated operating conditions and in the presence of disturbance	–	–	–
1.3	Climatic, mechanical and EM environment and other influence quantities to be specified by the manufacturer	–	–	–
1.3.1	Climatic environments, upper and lower temperature limit	–	–	–
1.3.2	Mechanical environments, vibration and shock	–	–	–
1.3.3	Electromagnetic environments, unless otherwise laid down in the appropriate instrument-specific annexes.	–	–	–
1.3.4	Other influence quantities	–	–	–
1.4	Carrying out the tests	–	–	–
1.4.1	Basic rules for testing and determination of errors	–	5.6, Accuracy test	5.6, Accuracy test
1.4.2	Ambient humidity	–	–	–
2	Reproducibility	–	–	–
3	Repeatability	–	4.3	4.3
4	Discrimination and Sensitivity	–	–	–
5	Durability	–	–	–
6	Reliability	–	–	–
7	Suitability		5.3 AC voltage test	5.3 AC voltage test
7.1	No feature likely to facilitate fraudulent use, possibilities for unintentional misuse minimal	–	–	–
7.2	Suitable for intended use under practical working conditions, no unreasonable demand of the user	–	–	–

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
	7.3	Errors of a utility measuring instrument at flows or currents outside the controlled range not unduly biased.	–	–	–
	7.4	When the measurand is constant over time, the measuring instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.	N.A.	N.A.	N.A.
	7.5	Robust and materials of construction suitable for the intended use conditions.	–	–	–
	7.6	Designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. Software that is critical for the metrological characteristics identifiable. Metrological characteristics not inadmissibly influenced by the associated software.	–	–	–
8		Protection against corruption	–	–	–
	8.1	Metrological characteristics not influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the measuring instrument.	–	–	–
	8.2	Hardware component critical for metrological characteristics designed so that it can be secured. Security measures to provide evidence of an intervention.	–	–	–
	8.3	Software that is critical for metrological characteristics shall be identified as such and shall be secured. Software identification. Evidence of an intervention available for a reasonable period of time.	–	–	–
	8.4	Measurement data, critical software and metrologically important parameters stored or transmitted adequately protected against accidental or intentional corruption.	–	–	–
	8.5	For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.	–	–	–

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
9		Information to be borne by and to accompany the instrument	–	–	–
	9.1	Shall bear the following inscriptions: - manufacturers mark or name; - information in respect of accuracy. When applicable: - information in respect of the conditions of use; - measuring capacity; - measuring range; - identity marking; - number of the EC-type examination certificate or the EC design examination certificate; - information whether or not additional devices providing metrological results comply with the provisions of this Directive on legal metrological control.	–	5.2	5.2
	9.2	For too small instruments, marking on packaging and in any accompanying documents	N.A.	N.A.	N.A.
	9.3	Accompanying information on - operation and where relevant - rated operating conditions; - mechanical and electromagnetic environment classes; - the upper and lower temperature limit, whether condensation is possible or not, open or closed location; - instructions for installation, maintenance, repairs, permissible adjustments; - instructions for correct operation and any special conditions of use; - conditions for compatibility with interfaces, sub-assemblies or measuring instruments.	–	–	–
	9.4	Utility meters do not require individual instruction manuals.	–	–	–
	9.5	Decimal scale interval	–	–	–
	9.6	Material measure	N.A.	N.A.	N.A.
	9.7	Units of measurement and symbols in accordance with Community legislation	–	–	–
	9.8	Marks and inscriptions clear, non-erasable, unambiguous and non-transferable.	–	–	–

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
10		Indication of result	–	–	–
	10.1	Display or hard copy	N.A.	N.A.	N.A.
	10.2	Indication of result clear and unambiguous. Easy reading.	N.A.	N.A.	N.A.
	10.3	Hard copy easily legible and not erasable	N.A.	N.A.	N.A.
	10.4	Direct sales trading transactions	N.A.	N.A.	N.A.
	10.5	Fitted with a metrologically controlled display accessible without tools to the consumer. The reading of this display is the measurement result that serves as the basis for the price to pay.	5.7 Verification of the register	5.7 Verification of the register	5.7 Verification of the register
11		Further processing of data to conclude the trading transaction	N.A.	N.A.	N.A.
	11.1	Durable record of the measurement result (other than utility meter)	N.A.	N.A.	N.A.
	11.2	Durable proof of the measurement result	N.A.	N.A.	N.A.
12		Conformity evaluation Designed so as to allow ready evaluation of its conformity with the appropriate requirements of this Directive.	–	–	–
Annex MI-003		ACTIVE ELECTRICAL ENERGY METERS			
1		Accuracy	–	–	–
2		Rated operating conditions	–	–	–
3		MPEs		5.6 Accuracy tests, Table Z2 5.7 Verification of the register	5.6 Accuracy tests, Table Z2 5.7 Verification of the register
4		Permissible effect of disturbances	–	–	–
	4.1	General – Special EM environment	–	–	–
	4.2	Effect of disturbances of long duration	–	–	–
		Reversed phase sequence	–	–	–
		Voltage unbalance (only applicable to polyphase meters)	–	–	–
		Harmonic contents in the current circuits	–	–	–
		DC and harmonics in the current circuit	–	–	–
		Fast transient bursts	–	–	–

MID Annex I		Subject	EN 62058-11	EN 62058-21	EN 62058-31
		Magnetic fields	–	–	–
		HF (radiated RF) electromagnetic field;	–	–	–
		Conducted disturbances introduced by radio-frequency fields	–	–	–
		Oscillatory waves immunity	–	–	–
	4.3	Permissible effect of transient electromagnetic phenomena	–	–	–
	4.3.1	Behavior during and immediately after a disturbance Recovery Critical change value	–	–	–
	4.3.2	Critical change value for overcurrent	–	–	–
5		Suitability			
	5.1	Measurement error below the rated operating voltage	–	–	–
	5.2	Display of total energy - sufficient number of digits - not resettable during use	–	–	–
	5.3	Retain energy register reading for 4 months	–	–	–
	5.4	Running with no load	–	5.4 Test of no-load condition	5.4 Test of no-load condition
	5.5	Starting	–	5.5 Starting, Table Z1	5.5 Starting, Table Z1
6		Units	–	–	–
7		Putting into use	–	–	–
		CONFORMITY ASSESSMENT B + F or B + D or H1.	Specifies 100% testing and sampling inspection methods to support modules F, D and H1	–	–

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INTRODUCTION

This part of IEC 62058 describes – based on relevant standards established by ISO TC 69 SC 5 – general acceptance inspection methods of newly manufactured electricity meters, supplied in lots of 50 and above. The method of acceptance of smaller lots should be agreed upon by the manufacturer and the customer.

In this standard, it has been taken into account that modern, automated manufacturing processes operated under quality management systems allow to keep the quality level under tight control.

This standard, together with IEC 62058-21, containing particular requirements for acceptance inspection of electromechanical meters for active energy, and IEC 62058-31, containing particular requirements for acceptance inspection of static meters for active energy, cancels and replaces the following standards:

- IEC 60514: *Acceptance inspection of class 2 alternating-current watt-hour meters* and
- IEC 61358: *Acceptance inspection for direct connected alternating current static watt-hour meters for active energy (classes 1 and 2)*.

Main changes in this standard compared to those earlier standards:

- it is based on the latest standards established by ISO TC 69 SC 5;
- the rules for switching between normal, tightened and reduced inspection have been adopted;
- the procedures for inspection of isolated lots have been adopted;
- the procedures for skip-lot sampling have been adopted;
- for inspection by variables, the “*R*” method has been eliminated and the “*σ*” method has been adopted.

ELECTRICITY METERING EQUIPMENT (a.c.) – ACCEPTANCE INSPECTION –

Part 11: General acceptance inspection methods

1 Scope

The general acceptance inspection methods specified in this part of IEC 62058 apply to newly manufactured electricity meters produced and supplied in lots of 50 and above.

☐ The process described herein can be used for assessment of conformity with the requirements of the Directive 2004/22/EC of the European Parliament and of the Council on measuring instruments (MID), using:

- Module D, Declaration of conformity to type based on quality assurance of the production process:
 - Final product inspection and testing;
- Module F, Declaration of conformity to type based on product verification:
 - Verification of conformity with the metrological requirements by examination and testing of every instrument; or
 - Statistical verification of conformity with the metrological requirements;
- Module H1, Declaration of conformity based on full quality assurance plus design examination:
 - Final product inspection and testing.

When the process is used within module F, the inspection methods selected shall meet the requirements specified in 5.3 of Annex F of the MID. See 5.5 below.

It is noted, that the requirements of 5.3 of Annex F of the MID do not take into account the switching rules between normal, tightened and reduced inspection. Those switching rules, mandatory with lot-by-lot inspection, when properly applied, ensure adequate protection to the customer against poor quality, and provide incentives to the manufacturer to produce consistently good quality. ☐

2 Normative references

The following referenced documents are indispensable for the application 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 2859-1:1999, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 2859-1:1999/Cor 1:2001

ISO 2859-2:1985, *Sampling procedures for inspection by attributes – Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection*

ISO 2859-3:2005, *Sampling procedures for inspection by attributes – Part 3: Skip-lot sampling procedures*

ISO 3534-2:2006 Ed. 2 *Statistics – Vocabulary and symbols – Part 2: Applied statistics*

ISO 3951-1:2005 Ed. 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 3951-2:2006 Ed. 1, *Sampling procedures for inspection by variables – Part 2: General specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection of independent quality characteristics*

ISO 5479:1997, *Statistical interpretation of data – Tests for departure from the normal distribution*

3 Terms and definitions

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

NOTE In this standard, the term “meter” means any kind of metering equipment in the Scope of TC 42, e.g. meters for active or reactive energy, time switches, ripple control receivers, etc. The term “customer” is used with the same meaning as “consumer” and the term “manufacturer” is used with the same meaning as the term “supplier”.

3.1 Sources of data

3.1.1 **characteristic** distinguishing feature

NOTE 1 A characteristic can be inherent or assigned.

NOTE 2 A characteristic can be qualitative or quantitative.

[ISO 3534-2, 1.1.1 modified]

3.1.2 **population** (reference) totality of items under consideration

[ISO 3534-2, 1.2.1. modified]

3.1.3 **lot** definite part of a population constituted under essentially the same conditions as the population with respect to the sampling purpose

NOTE The sampling purpose can, for example, be to determine lot acceptability, or to estimate the mean value of a particular characteristic.

[ISO 3534-2, 1.2.4]

3.1.4 **isolated lot** lot separated from the sequence of lots in which it was formed and not forming part of a current sequence

[ISO 3534-2, 1.2.5]

3.1.5 **re-submitted lot** lot which previously has been designated as not acceptable and which is submitted again for inspection after having been further treated, tested, sorted, reprocessed, etc.

[ISO 3534-2, 1.2.9]

3.1.6 **item** **entity** anything that can be described and considered separately; for the purposes of this standard, an electricity meter

[ISO 3534-2, 1.2.11 modified]

3.1.7 **nonconforming item** item with one or more nonconformities

[ISO 3534-2, 1.2.12]

3.1.8 **defective item** item with one or more defects

[ISO 3534-2, 1.2.13]

3.1.9

sampling unit unit

one of the individual parts into which a population is divided

[ISO 3534-2, 1.2.14 modified]

3.1.10

nonconforming unit

unit with one or more nonconformities

[ISO 3534-2, 1.2.15]

3.1.11

sample

subset of a population made up of one or more sampling units

[ISO 3534-2, 1.2.17 modified]

3.1.12

sample size

number of sampling units in a sample

NOTE In a multistage sample, the sample size is the total number of sampling units at the conclusion of the final stage of sampling.

[ISO 3534-2, 1.2.26]

3.2 Types of sampling

3.2.1

sampling

act of drawing or constituting a sample

[ISO 3534-2, 1.3.1]

3.2.2

simple random sampling

sampling where a sample of n sampling units is taken from a population in such a way that all the possible combinations of n sampling units have the same probability of being taken

[ISO 3534-2, 1.3.4 modified]

3.2.3

acceptance sampling

sampling after which decisions are made to accept or not to accept a lot based on sample results

[ISO 3534-2, 1.3.17 modified]

3.3 Specifications, values and test results

3.3.1

specification limit

limiting value stated for a characteristic

[ISO 3534-2, 3.1.3]

3.3.2

upper specification limit

U

specification limit that defines the upper limiting value

[ISO 3534-2, 3.1.4]

3.3.3

lower specification limit

L

specification limit that defines the lower limiting value

[ISO 3534-2, 3.1.5]

3.3.4

single specification limit

specification limit where the decision criteria is applied only to one limit

[ISO 3534-2, 3.1.7]

3.3.5

combined double specification limit

specification limit where the decision criteria is applied collectively to the upper and lower limits

[ISO 3534-2, 3.1.8]

3.3.6

combined control

requirement when nonconformity beyond both the upper and the lower specification of a quality characteristic belongs to the same class, to which a single AQL is applied

[ISO 3951-2, 3.17, modified]

3.3.7

nonconformity

non-fulfilment of a requirement

NOTE See notes to "defect".

[ISO 3534-2, 3.1.11]

3.3.8

defect

non-fulfilment of a requirement related to an intended or specified use

NOTE 1 The distinction between the concepts defect and nonconformity is important as it has legal connotations, particularly those associated with product liability issues. Consequently, the term "defect" should be used with extreme caution.

NOTE 2 The intended use by the customer can be affected by the nature of the information, such as operating or maintenance instructions, provided by the customer.

[ISO 3534-2, 3.1.12]

3.4 Types of inspection

3.4.1

conformity evaluation

systematic examination of the extent to which an item/entity fulfils specified requirements

[ISO 3534-2, 4.1.1]

3.4.2

inspection

conformity evaluation by observation and judgement accompanied as appropriate by measurement, testing or gauging

[ISO 3534-2, 4.1.2]

3.4.3

inspection by attributes

inspection by noting the presence, or absence, of one or more particular characteristic(s) in each of the items in the group under consideration, and counting how many items do, or do not, possess the characteristic(s), or how many such events occur in the item

NOTE When inspection is performed by simply noting whether the item is nonconforming or not, the inspection is termed inspection for nonconforming items. When inspection is performed by noting the number of nonconformities on each unit, the inspection is termed inspection for number of nonconformities.

[ISO 3534-2, 4.1.3 modified]

3.4.4

inspection by variables

inspection by measuring the magnitude(s) of the characteristic(s) of an item

[ISO 3534-2, 4.1.4]

3.4.5

100 % inspection

inspection of selected characteristic(s) of every item in the group under consideration

[ISO 3534-2, 4.1.5]

3.4.6

sampling inspection

inspection of selected items in the group under consideration

[ISO 3534-2, 4.1.6]

3.4.7

acceptance sampling inspection

acceptance inspection where the acceptability is determined by means of sampling inspection

[ISO 3534-2, 4.1.8]

3.4.8

normal inspection

inspection which is used when there is no reason to think that the quality level achieved by the process differs from a specified level

[ISO 3534-2, 4.1.10]

3.4.9

reduced inspection

inspection less severe than normal inspection, to which the latter is switched when inspection results of a predetermined number of lots indicate that the quality level achieved by the process is better than that specified

[ISO 3534-2, 4.1.11]

3.4.10

switching score

indicator that is used under normal inspection to determine whether the current inspection results are sufficient to allow for a switch to reduced inspection

[ISO 2859-1, 3.1.23]

3.4.11

tightened inspection

inspection more severe than normal inspection, to which the latter is switched when inspection results of a predetermined number of lots indicate that the quality level achieved by the process is poorer than that specified

[ISO 3534-2, 4.1.12]

3.4.12

isolated lot inspection

inspection of a unique lot or one separated from the sequence of lots in which it was produced or collected

[ISO 3534-2, 4.1.14]

3.4.13

lot-by-lot inspection

inspection of a product submitted in a series of lots

[ISO 3534-2, 4.1.15]

3.4.14

original inspection

inspection of a lot, or other amount, not previously inspected

NOTE This is in contrast, for example, to inspection of a lot which has previously been designated as not acceptable and which is submitted again for inspection after having been further sorted, reprocessed, etc.

[ISO 3534-2, 4.1.16]

3.4.15

acceptance inspection

inspection to determine whether a lot or other amount is acceptable

[ISO 3534-2, 4.1.17]

3.5 Types of acceptance sampling inspection

3.5.1

single acceptance sampling inspection

acceptance sampling inspection in which the decision, according to a defined rule, is based on the inspection results obtained from a single sample of predetermined size, n

[ISO 3534-2, 4.2.2]

3.5.2

double acceptance sampling inspection

multiple acceptance sampling inspection in which at most two samples are taken

NOTE The decisions are made according to defined rules.

[ISO 3534-2, 4.2.3]

3.5.3

skip-lot acceptance sampling inspection

acceptance sampling inspection in which some lots in a series are accepted without inspection, when the sampling results for a stated number of immediately preceding lots meet stated criteria

[ISO 3534-2, 4.2.5]

3.5.4

acceptance sampling inspection by variables

acceptance sampling inspection in which the acceptability of a process is determined statistically from measurements on specified quality characteristics of each item in a sample from a lot

NOTE Lots taken from an acceptable process are assumed to be acceptable.

[ISO 3534-2, 4.2.11]

3.5.5

acceptance sampling inspection by attributes

acceptance sampling inspection whereby the presence or absence of one or more specified characteristics of each item in a sample is observed to establish statistically the acceptability of a lot or process

[ISO 3534-2, 4.2.12]

3.6 Acceptance sampling inspection system aspects

3.6.1

acceptance sampling inspection system

collection of acceptance sampling plans or acceptance sampling schemes together with criteria by which appropriate plans or schemes may be chosen

[ISO 3534-2, 4.3.1]

3.6.2

acceptance sampling scheme

combination of acceptance sampling plans with switching rules for changing from one plan to another

[ISO 3534-2, 4.3.2]

3.6.3

acceptance sampling plan

plan which states the sample size(s) to be used and the associated criteria for lot acceptance

[ISO 3534-2, 4.3.3]

3.6.4

switching rule

instruction within an acceptance sampling scheme for changing from one acceptance sampling plan to another of greater or lesser severity of sampling based on demonstrated quality history

NOTE Normal, tightened, reduced inspection or discontinuation of inspection are examples of severity of sampling.

[ISO 3534-2, 4.3.4]

3.6.5

inspection level

index of the relative amount of inspection of an acceptance sampling scheme, chosen in advance, and relating the sample size to the lot size

NOTE 1 A lower/higher inspection level can be selected if experience shows that a less/more discriminating operating characteristic curve will be appropriate.

NOTE 2 The term should not be confused with severity of sampling which concerns switching rules, which operate automatically.

[ISO 3534-2, 4.3.5]

3.6.6

severity of sampling

degree of discrimination within an acceptance sampling scheme for changing from a normal to a reduced/tightened acceptance sampling plan if the quality of the submitted product or service improves/deteriorates

NOTE The term should not be confused with inspection level (4.3.5) which is independent of switching rules (4.3.4).

[ISO 3534-2, 4.3.6]

3.6.7

acceptance sampling procedure

operational requirements and/or instructions related to the use of a particular acceptance sampling plan

NOTE This covers the planned method of selection, withdrawal and preparation of sample(s) from a lot to yield knowledge of the characteristic(s) of the lot.

[ISO 3534-2, 4.3.7]

3.6.8

curtailed inspection

acceptance sampling procedure which contains a provision for stopping inspection when it becomes apparent that adequate data have been collected for a decision

[ISO 3534-2, 4.3.8]

3.6.9

sigma method

acceptance sampling inspection by variables using the presumed value of the process standard deviation

[ISO 3534-2, 4.3.9]

3.6.10

s method

acceptance sampling inspection by variables using the sample standard deviation

[ISO 3534-2, 4.3.10]

3.7 Acceptance criteria

3.7.1

rejection number

Re

smallest number of nonconformities or nonconforming items found in the sample by acceptance sampling by attributes that requires the lot to be not accepted, as given in the acceptance sampling plan

[ISO 3534-2, 4.4.1]

3.7.2

acceptance number

A_c

largest number of nonconformities or nonconforming items found in the sample by acceptance sampling by attributes that permits the acceptance of the lot, as given in the acceptance sampling plan

[ISO 3534-2, 4.4.2]

3.7.3

acceptability constant

k

constant depending on the specified value of the acceptance quality limit and the sample size used in the criteria for accepting the lot in an acceptance sampling plan by variables

NOTE Other acceptability constants are p^* and M , where p^* is the maximum acceptable estimate of the process fraction nonconforming. $M (= 100p^*)$ is an alternative notation in use.

[ISO 3534-2, 4.4.4]

3.7.4

maximum sample standard deviation

MSSD

largest sample standard deviation for a given sample size code letter and acceptance quality limit for which it is possible to satisfy the acceptance criterion for a double specification limit when the process variability is unknown

NOTE The MSSD depends on whether the double specification limits are combined, separate or complex and on the inspection severity (i.e. normal, tightened or reduced).

[ISO 3534-2, 4.4.7]

3.7.5

maximum process standard deviation

MPSD

largest process standard deviation for a given sample size code letter and AQL for which it is possible to satisfy the acceptance criterion for a double specification limit under all inspection severities (i.e. normal, tightened and reduced) when the process variability is known

NOTE The MPSD depends on whether the double specification limits are combined, separate or complex, but does not depend on the inspection severity.

[ISO 3534-2, 4.4.8]

3.7.6

quality statistic

Q

function of the specification limit, the sample mean and the sample or process standard deviation, used in assessing the acceptability of a lot

NOTE For the case of a single specification limit, the lot may be sentenced on the result of comparing quality characteristic, Q , with the acceptability constant, k

[ISO 3534-2, 4.4.9]

3.7.7

upper quality statistic

Q_u

function of the upper specification limit, the sample mean, and the sample or process standard deviation

NOTE For a single, upper specification limit, the lot is sentenced on the result of comparing the upper quality characteristic, Q_U , with the acceptability constant, k .

[ISO 3534-2, 4.4.10]

3.7.8

lower quality statistic

Q_L

function of the lower specification limit, the sample mean, and the sample or process standard deviation

NOTE For a single, lower specification limit, the lot is sentenced on the result of comparing the lower quality characteristic, Q_L , with the acceptability constant, k .

[ISO 3534-2, 4.4.11]

3.8 Types of operating characteristic curves

3.8.1

operating characteristic curve

curve showing the relationship between probability of acceptance of product and the incoming quality level for a given acceptance sampling plan

[ISO 3534-2, 4.5.1]

3.8.2

isolated lot operating characteristic curve

type A curve

operating characteristic curve applicable to isolated or individual lots, where the quality level relates to the lot

[ISO 3534-2, 4.5.2]

3.8.3

lot sequence operating characteristic curve

type B curve

operating characteristic curve applicable to a continuing series of lots from a given source, where the quality level relates to the process

[ISO 3534-2, 4.5.4]

3.9 Terms relating to operating characteristics

3.9.1

probability of acceptance

P_a

probability that, when using a given acceptance sampling plan, a lot will be accepted when the lot or process is of a specific quality level

[ISO 3534-2, 4.6.1]

3.9.2

consumer's risk

CR

β

probability of acceptance when the quality level has a value stated by the acceptance sampling plan as unsatisfactory

NOTE Quality level could relate to fraction nonconforming and be unsatisfactory to the LQL.

[ISO 3534-2, 4.6.2]

3.9.3

probability of non-acceptance

probability that, when using a given acceptance sampling plan, a lot will not be accepted when the lot or process is of a specified quality level

[ISO 3534-2, 4.6.3]

3.9.4

producer's risk

PR

α

probability of non-acceptance when the quality level has a value stated by the plan as acceptable

NOTE 1 Quality level could relate to fraction nonconforming and be acceptable to AQL.

NOTE 2 Interpretation of the producer's risk requires knowledge of the stated quality level.

[ISO 3534-2, 4.6.4]

3.9.5

consumer's risk point

CRP

point on the operating characteristic curve corresponding to a predetermined low probability of acceptance

NOTE 1 This low probability of acceptance is called the "consumer's risk" and the corresponding lot quality determined by the CRP for that risk is called the "consumer's risk quality" (CRQ).

NOTE 2 The type of operating characteristic curve needs to be specified.

[ISO 3534-2, 4.6.5]

3.9.6

producer's risk point

PRP

point on the operating characteristic curve corresponding to a predetermined high probability of acceptance

NOTE Interpretation of the producer's risk point requires knowledge of the stated quality level.

[ISO 3534-2, 4.6.7]

3.9.7

slope of operating characteristic curve

slope of the line joining the producer's risk point and the consumer's risk point on an operating characteristic curve

NOTE The nearer to vertical the slope of the line, the greater is the discriminatory power of the acceptance sampling plan.

[ISO 3534-2, 4.6.8]

3.9.8

consumer's risk quality

CRQ

Q_{CR}

quality level of a lot or process which, in the acceptance sampling plan, corresponds to a specified consumer's risk

NOTE The specified consumer's risk is usually 10 %.

[ISO 3534-2, 4.6.9]