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Fasteners
Technical delivery conditions
Design and dimensional accuracy

DIN 267 Part 2

Mechanische Verbindungselemente; technische Lieferbedingungen; Ausführung und Maßgenauigkeit

This standard, together with DIN ISO 4759 Part 1, May 1980 edition, supersedes April 1968 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

The previous edition of April 1968 of DIN 267 Part 2 has been partly superseded by the May 1980 edition of DIN ISO 4759 Part 1, which incorporates International Standard ISO 4759/1 – 1978 and serves as the basis or reference standard for product standards (dimensional standards) dealing with bolts, screws and nuts (see also Explanatory notes).

The international standard primarily applies to bolts, screws and nuts with metric thread, but can, like DIN 267 Part 2, also be applied as appropriate to other products such as tapping screws and wood screw.

1 Scope and field of application

This standard supplements DIN ISO 4759 Part 1 and applies to those product standards (dimensional standards) in which DIN 267 Part 2 is referred to, e.g. with regard to the surface roughness of bolts, screws and nuts.

Note. The illustrations providing information on the tolerances, which were included in the April 1968 edition of DIN 267 Part 2, have to a large extent been replaced by the specifications given in ISO 4759 Part 1. In this standard, only individual characteristics of fasteners, e.g. bolt lengths, have been toleranced, so that the individual product types are not illustrated, or are only shown in part. To simplify the use of both these standards, the previous illustrations have been assembled in Supplement 1 to DIN 267 Part 2.

In cases of doubt, the specifications given in the product standard or in ISO 4759 Part 1 and in this standard shall apply.

It is recommended that Standards ISO 4759 Part 1 and DIN 267 Part 2 should also be used for non-standardized fasteners and that these standards should be referred to giving details of the respective product grade in the purchase order documents.

2 General

ISO 4759 Part 1 shall apply with regard to the design and dimensional accuracy of fasteners (primarily of bolts, screws and nuts), unless other specifications are given in the individual product standards or purchase order documents. ISO 4759 Part 1 covers bolts, screws and nuts with nominal thread diameters from 1,6 up to and including 150 mm, assigned to the following three product grades:

product grade A (previously design m, medium),

product grade B (previously design mg, medium coarse) and

product grade C (previously design g, coarse),

the reference dimension for allocating the tolerances being the individual dimension specified in the relevant product standards (dimensional standards).

DIN 7168 Part 1 shall apply with regard to those dimensions which are not toleranced in this standard, nor in ISO 4759 Part 1, nor in the product standards (dimensional standards). In these cases, DIN 7168, accuracy grade m shall apply with regard to general tolerances assigned to product grade A (previously design m);

DIN 7168, accuracy grade g shall apply with regard to general tolerances assigned to product grades B and C (previously designs mg and g).

Note. The change of the previous nomenclature designs m, mg and g, to product grades A, B and C is based on the international specifications given in ISO 4759 Part 1. It is not necessary to amend existing documents accordingly.

A further product grade F (previously referred to as design f, fine) is specified in DIN 267 Part 6. This can be used, if required, for bolts, screws and nuts of up to 3 mm nominal thread diameter and takes into account the particular requirements of precision engineering.

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3 Thread tolerances

The following thread tolerances shall apply unless there are other requirements specified in the individual product standards (dimensional standards) or in the purchase order documents.

3.1 Product grades A and B

Metric as specified in DIN 13: tolerance quality medium (m);
thread engagement group N complying with DIN 13 Part 14.

Tolerance classes for commercial bolts, screws and nuts shall comply with DIN 13 Part 14.

Table 1.

Bolt	Nut
6g [1])	6H
[1]) 6h for bolts up to and including size M 1,4.	

(1) Thread tolerances for electroplated bolts, screws and nuts shall comply with DIN 267 Part 9.

(2) Thread tolerances for hot dip galvanized bolts, screws and nuts shall comply with DIN 267 Part 10.

Thread tolerances for bolts, screws and nuts made from steels with low temperature toughness or high temperature steels shall comply with DIN 2510 Part 2.

Thread tolerances for the thread ends of studs:
Sk 6 as specified in Supplement 14 to DIN 13 and DIN 14;
Sn 4 as specified in Supplement 14 to DIN 13 and DIN 14 or Fo (without interference fit thread = thread tolerance 6g for both thread ends) conforming to DIN 962.

(3) Thread tolerances for tapping screws shall comply with DIN 7970.

Thread tolerances for parts with pipe thread:
parallel threads shall comply with ISO 228 Part 1;
taper external threads shall comply with DIN 3858.

3.2 Product grade C

Metric as specified in DIN 13: tolerance quality coarse g;
thread engagement group N complying with DIN 13 Part 14.

Table 2.

Bolt	Nut
8g [1])	7H
[1]) The tolerances specified in DIN 59 130 shall be permitted for the external thread diameters.	

Thread tolerances for electroplated bolts and nuts shall comply with DIN 267 Part 9.

Thread tolerances for hot dip galvanized bolts, screws and nuts shall comply with DIN 267 Part 10.

(4) Thread tolerances for wood screws shall comply with DIN 7998.

4 Surface finish

4.1 The requirements given in subclause 4.4 shall apply with regard to the surface finish of fasteners.

4.2 For coated surfaces, e.g galvanized or phosphatized surfaces, the quality of the finish shall where necessary be the subject of particular agreement, since the roughness of the surface can be significantly altered by the coating and the values specified in subclause 4.4 apply to the surface before treatment.

4.3 The parts shall first be examined visually. The test shall be carried out in accordance with DIN 4775. DIN 267 Part 19 and Part 20 shall be referred to with regard to surface discontinuities. For example in cases where there is disagreement on the results of visual examination, subclause 4.4 shall apply with respect to the surface roughness.

4.4 Surface roughness for fasteners assigned to product grades A and B

See table 3, page 3.

5 Geometrical tolerances

Geometrical tolerances shall be in accordance with ISO 4759 Part 1, unless other requirements are specified in product standards (dimensional standards) or purchase order documents.

5.1 Tolerances for widths across flats

5.1.1 Hexagon heads

As specified in ISO 4759 Part 1, except that for product grade A hexagons up to 4 mm width across flats, the tolerance class shall be h12 instead of h13.

5.1.2 Hexagon sockets

As specified in ISO 4759 Part 1 or in this standard.

5.2 Widths across corners for hexagon heads and square heads

ISO 4759 Part 1 (see also DIN 475 Part 1) shall apply with regard to the minimum of the width across corners of hexagon heads and square heads.

5.3 Tolerances for slot widths

As specified in ISO 4759 Part 1.

5.4 Tolerances for cross recesses

As specified in DIN 7962.

5.5 Tolerances for thread ends (projecting lengths of bolts)

As specified in DIN 78.

Table 3.

Measurement location			R_z [4]		
			$P < 2{,}5$ $l_m = 0{,}4$ $\lambda_c = 0.08$	$P \geqq 2{,}5$ $l_m = 1{,}25$ $\lambda_c = 0{,}25$	As in DIN 4768 Part 1
Thread flanks [1] [2]	Bolts	rolled	6,3	10	–
		machine cut	16	25	–
	Nuts		25	40	–
Bearing faces [2]	Cold finished		16	25	–
	Hot finished		25	40	–
Shank of bolts [1]	Cold finished		–	–	50
	Hot finished		–	–	100
Visible surfaces [3]			10	–	–

1) Because of the notch stress, the thread root of external threads shall not have a roughness greater than that of the thread flanks. Visual examination is sufficient for this purpose.

2) Does not apply for tapping screws.

3) Only for bolts having a nominal thread diameter of up to 6 mm, e.g. as specified in DIN 84, DIN 85, DIN 920 to DIN 925, DIN 963 to DIN 966, also DIN 7971 to DIN 7973, DIN 7976 and DIN 7981 to DIN 7985 and similar bolts.

4) The R_z values for thread flanks, bearing faces and visible surfaces are based on the measurement parameters l_m and λ_c specified here. Because of the small surfaces, they deviate from the conditions of measurement specified in DIN 4768 Part 1. Normal comparison surface samples with R_z values in accordance with DIN 4768 Part 1 cannot therefore be used in such cases.

In the table

P is the pich of thread;
l_m is the total measured length (see DIN 4768 Part 1);
λ_c is the limiting shaft length (see DIN 4768 Part 1).

Standards referred to and other documents

DIN	13 Part 14	ISO metric screw threads; principles of a tolerance system for screw threads from 1 mm diameter upwards
Supplement 14 to DIN 13 and DIN 14		Metric screw threads for interference fit fastenings without sealing action (for inserted ends of studs)
DIN	78	Thread ends and lengths of projection of bolt ends for ISO metric threads in accordance with DIN 13
DIN	84	Slotted cheese head screws
DIN	85	Slotted pan head screws
Supplement 1 to DIN	267 Part 2	Fasteners; technical delivery conditions; designs and dimensional accuracy; examples of tolerance indications
DIN	267 Part 6	Fasteners; technical delivery conditions; designs and accuracy of measurement for product grade F
DIN	267 Part 9	Fasteners; technical delivery conditions; electroplated components
DIN	267 Part 10	Fasteners; technical delivery conditions; hot dip galvanized parts
DIN	267 Part 19	Fasteners; technical delivery conditions; surface discontinuities on bolts and screws
DIN	267 Part 20	Fasteners; technical delivery conditions; surface discontinuities on nuts
DIN	475 Part 1	Widths across flats for bolts, screws, valves and fittings
DIN	920	Slotted pan head screws with small head
DIN	925	Slotted countersunk (flat) head screws with full dog point
DIN	962	Screws, bolts, studs; designations, types and designs
DIN	963	Slotted countersunk (flat) head screws (countersunk heads in accordance with ISO)
DIN	964	Slotted raised countersunk (oval) head screws (countersunk heads in accordance with ISO)
DIN	965	Cross recessed countersunk (flat) head screws (countersunk heads in accordance with ISO)
DIN	966	Cross recessed countersunk (oval) head screws (countersunk heads in accordance with ISO)
DIN	2510 Part 2	Bolted connections with reduced shank; metric thread with large clearance; nominal dimensions and limits

DIN 3858	Whitworth pipe threads; parallel internal thread and taper external thread for pipe unions
DIN 4768 Part 1	Determination of surface roughness R_a, R_z and R_{max} with electric stylus instruments; basic data
DIN 4775	Measuring the surface roughness of workpieces; visual and tactile comparison; methods by means of contact stylus instruments
DIN 7168 Part 1	General tolerances; linear and angular dimensions
DIN 7962	Cross recesses for screws; modified version of ISO 4757
DIN 7970	Threads and thread ends for tapping screws
DIN 7971	Slotted pan head tapping screws
DIN 7972	Slotted countersunk (flat) head tapping screws
DIN 7973	Slotted raised countersunk (oval) head tapping screws
DIN 7976	Hexagon head tapping screws
DIN 7981	Cross recessed pan head tapping screws
DIN 7982	Cross recessed countersunk (flat) head tapping screws
DIN 7983	Cross recessed raised countersunk (oval) head tapping screws
DIN 7984	Hexagon socket head cap screws with reduced height of head
DIN 7985	Recessed raised cheese (fillister) head screws
DIN 7998	Threads and thread ends for wood screws
DIN 59 130	Steel bars; hot rolled round steel for bolts and rivets; dimensions; permissible deviations of dimension and form
ISO 228 Part 1	Pipe threads where pressure-tight joints are not made on the thread; designations, dimensions and tolerances
ISO 4759 Part 1	Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 to 150 mm; product grades A, B and C

Previous editions

DIN 266: 03.31; DIN 589: 07.31, 01.34; DIN Kr 550: 03.36; DIN 267: 06.40, 01.43, 01.54, 12.60; DIN 267 Part 1: 04.37; DIN 267 Part 2: 04.37, 04.68

Amendments

The following amendments have been made in comparison with the April 1968 edition:

a) The contents of the standard has been completely revised and harmonized with ISO 4759 Part 1.

b) The previous designs m, mg and g have been redefined as product grades A, B and C.

c) The specification relating to surface finish has been revised and harmonized with DIN 4768 Part 1.

d) The previous illustrations including the dimensional tolerances have been reassembled in Supplement 1 to DIN 267 Part 2.

e) See Explanatory notes.

Explanatory notes

ISO 4759/1 – 1978 is based on the April 1968 edition of DIN 267 Part 2 and was published in 1978 after a long period of preparation. A German version appeared in May 1980 as DIN ISO 4759 Part 1, replacing major parts of the above-mentioned edition of DIN 267 Part 2. However, since not all of the requirements previously specified in DIN 267 Part 2 are covered by ISO 4759 Part 1, DIN 267 Part 2 was not withdrawn but has been amended so as now to form a Supplement to DIN ISO 4759 Part 1.

Since the international standard does not specify individual products, but only tolerances for the characteristics of bolts, screws and nuts, the previous illustrations have been assembled as in Supplement 1 to DIN 267 Part 2, in order to simplify the use of both these standards.

ISO 4759 Part 1 provides no information regarding the quality of surface finish for fasteners because no uniform international basis could be found for this.

Furthermore, there was the view that for bolts, screws and nuts it is not necessary to specify surface finish because the given manufacturing processes lead to particular surfaces, which should not then be rigidly governed by specified peak-to-valley heights and which, in any case, cannot usually be unambiguously measured, due to the size and geometry of the products.

Nevertheless, on a national level it was desirable to have specifications which are roughly equivalent or even identical to the previous specifications and which can be defined by means of comparison samples, so that only in cases of doubt would it be necessary to agree on appropriate procedures and to take measurements. In this standard, surface data have been included on the basis of R_z, and this value should be checked where suitable standardized rules can be agreed, which are capable of providing unambiguous, comparable readings for peak-to-valley heights, on short measured lengths.

The previous designs m, mg and g have been redefined as product grades A, B and C in ISO 4759 Part 1.

In clause 3, all the relevant standards dealing with thread tolerances for fasteners have been included since ISO 4759 Part 1 deals only with tolerances for ISO metric screw threads.

International Patent Classification

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