

DIN 267-24**DIN**

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Supersedes
DIN 267-24:1983-08

**Fasteners –
Technical delivery conditions –
Part 24: Hardness classes for nuts without specified proof load values**

Mechanische Verbindungselemente –
Technische Lieferbedingungen –
Teil 24: Härteklassen für Muttern ohne festgelegte Prüfkräfte

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Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.



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Foreword

This standard has been prepared by Technical Committee NA 067-02-02 AA *Mechanische Eigenschaften für Muttern aus Stahl* of the *Normenausschuss Mechanische Verbindungselemente* (Fasteners Standards Committee).

Detailed explanatory information relating to the tightening and loadability of bolt-nut assemblies is given in the National Foreword and Annex to DIN EN 20898-2.

Amendments

This standard differs from DIN 267-24:1983-08 as follows:

- a) The normative references have been updated.
- b) The length of the foreword and introduction has been substantially reduced.
- c) The term “property class” has been replaced by “hardness class”:
- d) The additional symbol “2” designating that the use of Thomas steel is prohibited has been deleted.
- e) In the “Materials” clause, the materials are no longer dealt with separately according to the type of working.

Previous editions

DIN 266: 1931x-03

DIN 267: 1940-06, 1943-01, 1954-01, 1960-12

DIN 267-1: 1937-04

DIN 267-2: 1937-04

DIN 267-4: 1968-05, 1971-10

DIN 267-24: 1983-08

DIN 589: 1931-07, 1934-01

DIN Kr 550: 1936-03

Introduction

This standard contains hardness classes for nuts whose properties (usually the shape and dimensions) are such that they cannot be assigned definite load values but can only be classified according to their hardness and marked accordingly.

In Germany there is a demand for hardness classes to DIN 267-24 for nuts, but as yet there has been no corresponding standardization activity at the international level.

1 Scope

This standard contains hardness classes for nuts which do not have to withstand specified proof loads. The hardness classes specified have been classified according to minimum hardness values from which, however, no conclusions can be drawn with regard to the loadability of the nuts or their resistance to stripping. The functional properties of nuts depend on their form.

This standard does not apply to the following:

- nuts subjected to specified proof loads to DIN EN 20898-2 and DIN EN ISO 898-6;
- prevailing torque-type nuts to DIN EN ISO 2320;
- nuts with special requirements, such as weldability, corrosion resistance (see DIN EN ISO 3506-2), high-temperature strength (i.e. at temperatures over +300 °C) or low-temperature toughness (i.e. at temperatures below –50 °C (see DIN 267-13)).

NOTE Nuts made of free-cutting steel shall not be used at temperatures over +250 °C.

2 Normative references

The following reference 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.

DIN 267-13, *Fasteners — Technical delivery conditions — Part 13: Parts for bolt/nut assemblies with specific mechanical properties for use at temperatures ranging from –200 °C to +700 °C*

DIN EN 20898-2, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values; coarse pitch thread*

DIN EN ISO 898-6, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs*

DIN EN ISO 2320, *Prevailing torque type steel nuts — Mechanical and performance properties*

DIN EN ISO 3506-2, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 2: Nuts*

DIN EN ISO 6157-2, *Fasteners — Surface discontinuities — Part 2: Nuts*

DIN EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

DIN EN ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

DIN EN ISO 18265, *Metallic materials — Conversion of hardness values*

3 Designation

The hardness classes for nuts according to this standard are denoted by a combination of numbers and letters as shown in Table 1. The number indicates 1/10 of the minimum Vickers hardness; the letter H stands for hardness.

Table 1 — Symbols

Hardness class symbol	11H	14H	17H	22H
Vickers hardness HV 5 min.	110	140	170	220

4 Materials

Tables 2 and 3 specify limiting values for the chemical composition of steel. Alloyed steel is permitted.

Table 2 — Chemical composition of steel (except free-cutting steel)

Hardness class	Chemical composition in % (m/m) (product analysis) ^a			
	C max.	Mn min.	P max.	S max.
11H	0,50	–	0,110	0,150
14H	0,50	–	0,110	0,150
17H	0,58	0,30	0,060	0,150
22H	0,58	0,30	0,048	0,058

^a Chips for the product analysis shall be taken uniformly over the whole cross section.

Nuts of hardness class 22H shall be quenched and tempered.

Table 3 — Chemical composition of free-cutting steel

Hardness class	Chemical composition in % (m/m) (product analysis) ^a			
	C max.	Mn min.	P max.	S max.
11H, 14H, 17H	0,50	0,12	0,35	0,34

^a Chips for the product analysis shall be taken uniformly over the whole cross section.

5 Mechanical properties

The mechanical properties in Table 4 shall apply for testing at room temperature.

Table 4 — Mechanical properties

Mechanical property		Hardness class			
		11H	14H	17H	22H
Vickers hardness HV 5	min.	110	140	170	220
	max.	185	215	245	300
Brinell hardness HBW 30	min.	105	133	162	209
	max.	176	204	233	285

Conversion of hardness values according to DIN EN ISO 18265.

6 Testing

6.1 Hardness testing

Hardness testing shall be according to Vickers or Brinell.

Vickers hardness testing shall be to DIN EN ISO 6507-1.

Brinell hardness testing shall be to DIN EN ISO 6506-1.

The hardness shall be measured on one bearing surface of the nut. Measurements shall be taken at three places spaced 120° apart, and the hardness taken as the mean of these values.

In cases of doubt, the hardness test according to Vickers shall be the reference method.

6.2 Test of surface condition (surface integrity)

Testing of the surface condition shall be according to DIN EN ISO 6157-2.

7 Marking

7.1 Marking of hardness class

For nuts \geq M5 and the hardness class 22H, marking with the symbol denoting the hardness class is obligatory.

7.2 Marking of nuts with left-hand thread

Nuts with left-hand thread are recommended to be marked according to DIN EN 20898-2 if the type and size of the nut is such that this is technically feasible.