Standards and other documents referred to

DIN 13 Part 13	ISO metric screw threads; series of preferred sizes for screws, bolts and nuts from 1 mm to 52 mm diameter and limits of sizes
DIN 13 Part 15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN 267 Part 1	Fasteners; technical delivery conditions; general requirements
DIN 267 Part 9	Fasteners; technical delivery conditions; electroplated components
DIN 267 Part 11	Fasteners; technical delivery conditions; stainless and acid resistant steel components (with addenda to ISO 3506)
DIN 267 Part 18	Fasteners; technical delivery conditions; non-ferrous metal components
DIN 7168	General tolerances for linear and angular dimensions and geometrical tolerances (not to be used for new designs)
DIN 22416	Electrical equipment for use in potentially explosive atmospheres in mining; assemblies with triangular nuts; safety requirements
DIN 22417	Electrical equipment for use in potentially explosive atmospheres in mining; triangular wrenches
ISO 898-2 : 1980	Mechanical properties of fasteners; nuts with specified proof load values
ISO 4759-1 : 1978	Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 to 150 mm and product grades A, B and C

Bergverordnung über die Zulassung von schlagwettergeschützten und explosionsgeschützten elektrischen Betriebsmitteln [7]).

Other relevant standard

DIN 22424 Electrical equipment for use in potentially explosive atmospheres in mining; triangular head bolts

Previous editions

DIN 22425: 04.55x, 04.89.

Amendments

In comparison with the April 1989 edition, data on the surface finish are no longer included in the standard designation.

International Patent Classification

E 21 F 17/00
F 16 B 37/00
F 16 B 41/00
H 02 B 1/12
H 01 H 9/04

[7]) Obtainable from: *Verlag Glückauf GmbH*, Postfach 10 39 45, D-4300 Essen-Kray (sales No. 702).

UDC 629.11.012.332.2-218.8 : 629.113/.118 November 1982

Disc wheels for motor vehicles and trailers
Fasteners for stud centring

DIN 74361 Part 2

Scheibenräder für Kraftwagen und Anhängefahrzeuge; Befestigungselemente für Bolzenzentrierung

Supersedes October 1976 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.

Dimensions in mm

1 Field of application

This standard specifies requirements for fasteners for stud-centred disc wheels on motor vehicles and trailers.

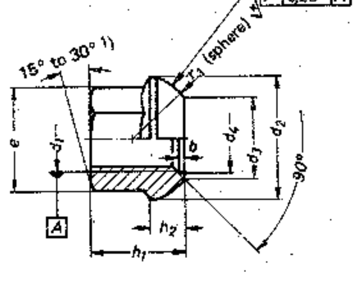
Any necessary draft on the hexagon shall be within the tolerance on the width across flats.

$\sqrt{y} = \sqrt{R_z\ 16}$; other surfaces: $\sqrt{R_z\ 25}$.

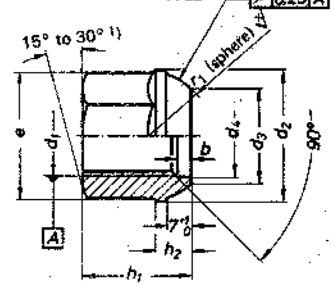
2 Nuts

Spherical collar nuts (A)

A 12 to A 20



A 22

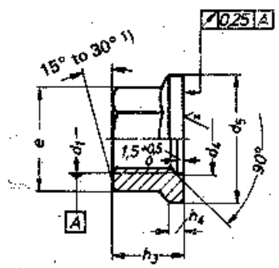


Screw thread countersunk down to thread diameter.

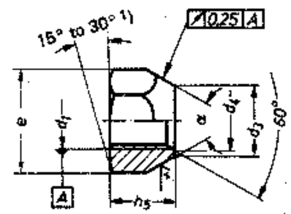
Designation of an M 12 × 1,5 (12) spherical collar nut (A) assigned to property class 8:

Wheel nut DIN 74361 – A 12 – 8

Hexagon nut with flange (B)



Conical nut (F)



Screw thread countersunk down to thread diameter.

Designation of an M 20 × 1,5 (20) hexagon nut with flange (B), assigned to property class 8:

Nut DIN 74361 – B 20 – 8

Designation of an M 12 × 1,5 (12) conical nut (F), α = 60° (60), assigned to property class 8:

Nut DIN 74361 – F 21 × 60 – 8

1) For stamped nuts, radius as produced by cold forming.

Continued on pages 2 to 5

Table 1. Nuts (types A, B, F)

Thread size (d_1)	Symbol	b	d_2	d_3	d_4	d_5	h_1	h_2 1)	h_3	h_4 1)	h_6	r_1	Width across flats (SW)	e	α	Mass (7,85 kg/dm³) per 1000 units, in kg, ≈		
		$^{+0,5}_{0}$	$^{0}_{-0,5}$	$^{0}_{-0,5}$	H 13	$^{0}_{-0,5}$	$^{+1}_{0}$	±0,5	$^{+1}_{0}$	±0,5	±0,25	±0,1	h 13	min.	±1°	A	B	F
M 12 × 1,5	12	1	23	14,5	12,5	24	18	7,5	13	2,5	–	12	17	18,72	–	26	22	–
M 12 × 1,5	12	–	–	15	13	–	–	–	–	–	14	–	19	20,88	60° 90°	– –	– –	19,8 20,1
M 14 × 1,5	14	1,5	26	17	14,5	27	20	7,5	15	3	–	14	19	20,88	–	33	29	–
M 18 × 1,5	18	1,5	28	21	18,5	29	25	7,5	18	4	–	16	24	26,17	–	53	44	–
M 20 × 1,5	20	3	33	24,5	20,5	34	27	9	20	5	–	18	27	29,56	–	76	63	–
M 22 × 1,5	22	4	36	26,5	22,5	36	30	10,5	22	6	–	18	30	32,95	–	100	79	–

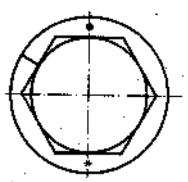
1) The draft is not included in the values given for h_2 and h_4.

Technical delivery conditions

Property class or material: 8 or 10, as specified in DIN 267 Part 4.
Type: mg, as specified in DIN 267 Part 2.
Surface: Znph r 5 f, as specified in DIN 50 942.
Marking:

Conical nuts F: property class and manufacturer's mark, as specified in ISO 898 Part 2.

Spherical collar nuts and hexagon nuts with flange: manufacturer's mark, and symbols denoting property class as in ISO 898 Part 2, the marking, however, being applied as illustrated (clock face system).



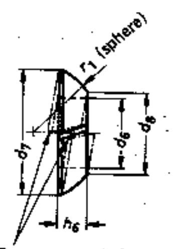
The illustration shows a spherical collar nut or a hexagon nut with flange, assigned to property class 10.

* Manufacturer's mark.

(As a departure from ISO 898 Part 2, the marking reference point shall not be located at a hexagon corner, but between two corners.)

3 Spring lock washers (C)

Dimensions apply for tightened condition of bolted connection.



Corners rounded.

Designation of a spring lock washer (C) with internal diameter, d_6 = 20,5 mm:

Spring lock washer DIN 74 361 – C 20,5

Table 2. Spring lock washers

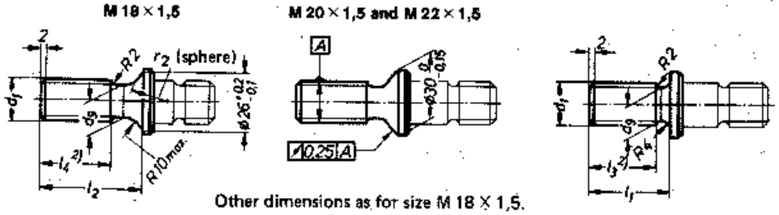
d_6 $^{+0,5}_{0}$	d_7 ≈	d_8 ≈	h_6 $^{+1}_{0}$	r_1 ±0,5	Mass (7,85 kg/dm³) per 1000 units, in kg, ≈
12,5	23	14,5	5	12	7,5
14,5	26	17	6	14	10,5
18,5	29	20	7	16	14
20,5	34	24	8	18	23
22,5	34	24	8	18	21

Material: spring steel as specified in DIN 17 221 or equivalent grade. Other materials shall be the subject of agreement.
Finish: hardened and tempered to HRC 44 to 51 (450 – 570 HV).

4 Studs (connecting dimensions)

For double-wheel attachment (D) — M 18 × 1,5 — M 20 × 1,5 and M 22 × 1,5

For single-wheel attachment (E)



Other dimensions as for size M 18 × 1,5.

Designation of an M 18 × 1,5 (18) stud for double-wheel attachment (D) with connecting dimensions as specified in this standard, assigned to property class 8.8:

Stud DIN 74 361 – D 18 – 8.8

Table 3. Studs

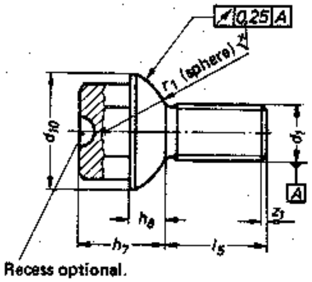
Thread size (d_1)	Symbol	d_9 $^{0}_{-0,3}$	l_1 ±0,5	l_2 ±0,5	l_3 min.	l_4 min.	r_2 $^{0}_{-0,1}$
M 12 × 1,5	12	Connecting dimensions not specified.					
M 14 × 1,5	14						
M 18 × 1,5	18	15,5	34	42	28	29	15,5
M 20 × 1,5	20	17,5	38	47	29	34	17,5
M 22 × 1,5	22	19,5	43	55	32	38	17,5

Technical delivery conditions

Property class or material: 8.8, 10.9 as specified in ISO 898 Part 1 and *VDA-Werkstoffblatt* (VDA Materials specification) 231-01.
Design: mg, as specified in DIN 267 Part 2.
Surface: Znph r 5 f, as specified in DIN 50 942.
Marking: as specified in ISO 898 Part 1.

2) Studs without thread undercut also permitted, with the thread length then being at least equal to l_3 or l_4.

Spherical collar stud (G)



z_1 as specified in DIN 78.

Designation of an M 14 X 1,5 (14) spherical collar stud (G) of length l_5 = 24 mm and assigned to property class 8.8:

Stud DIN 74 361 – G 14 × 24 – 8.8

Table 4. **Spherical collar studs**

Thread size (d_1)	Symbol	d_{10} $^{+1,5}_{-0,5}$	h_7 $^{+1}_{-0,5}$	h_8 ±0,5	l_5 ±0,5	r_1 ±0,1	Width across flats (SW) h 13	e min.	Mass (7,85 kg/dm³) per 1000 units, in kg, ≈
M 12 × 1,5	12	22,5	18	7,5	**21**	12	17	18,72	56
M 14 × 1,5	14	26	20	8,0	**24**	14	19	20,88	77
M 14 × 1,5	14	24	18	6,0	**18**	14	19	20,88	63
M 18 × 1,5	18	29	25	8,0	**25**	16	24	26,17	143

Technical delivery conditions

Property class or material: 8.8, 10.9 as specified in ISO 898 Part 1 and *VDA-Werkstoffblatt* 231-01.
Design: mg, as specified in DIN 267 Part 2.
Surface: Znph r 5 f, as specified in DIN 50 942.
Marking: as specified in ISO 898 Part 1.

Standards referred to and other documents

DIN 78	Thread ends and lengths of projection of bolt ends for ISO metric threads as specified in DIN 13
DIN 267 Part 2	Fasteners; technical delivery conditions; designs and dimensional accuracy; examples of tolerance indications
DIN 267 Part 4	Fasteners; technical delivery conditions; property classes for nuts (previous classes)
DIN 17 221	Hot rolled steel for quenched and tempered springs; quality specifications
DIN 50 942	Phosphating of metals; principles, methods of test
ISO 898 Part 1	Mechanical properties of fasteners; bolts, screws and studs
ISO 898 Part 2	Mechanical properties of fasteners; nuts with specified proof load values
ISO 1302	Technical drawings; method of indicating surface texture on drawings
VDA-Werkstoffblatt 231-01 [3])	*Mechanische Eigenschaften von Verbindungselementen; Schrauben* (Mechanical properties of fasteners; studs and bolts)

Previous editions

DIN KrW 225 and KrW 226: 12.31; DIN Kr 4361 Part 2: 04.39; DIN 74 361 Part 2: 05.52, 02.55, 06.55, 10.68, 10.76.

Amendments

The following amendments have been made to the October 1976 edition.

a) The standard designation has been harmonized with DIN 820 Part 27.
b) The specification of surface finish now complies with ISO 1302.
c) The reference to DIN 267 Parts 3 and 7 has been replaced by a reference to ISO 898 Part 1.
d) The reference to DIN 267 Part 8 has been replaced by a reference to ISO 898 Part 2.
e) A reference to *VDA-Werkstoffblatt* 231-01 has been included.

International Patent Classification

B 60 B 3/00

3) Obtainable from *DKF Dokumentation Kraftfahrwesen e.V.*, Postfach 15 08, Etzelstraße 1, D-7120 Bietigheim-Bissingen

UDC 629.11.012.332.2-218.8 : 629.113/.118 November 1979

Disc wheels for motor vehicles and trailers
Dimensions and fasteners
for attachment with centring on wheel bore

DIN 74 361
Part 3

Scheibenräder für Kraftwagen und Anhängefahrzeuge; Anschlußmaße und Befestigungselemente für Mittenzentrierung

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.

See Explanatory notes for connection with ISO 4107.

Dimensions in mm

1 Field of application

This standard specifies requirements for the attachment of disc wheels with 15° tapered rims as covered in DIN 78 022, on commercial vehicles and trailers.

Design-related details left unspecified, such as shape of wheel disc and connection between rim and wheel disc, are to be selected as appropriate.

2 For other standards to be observed, see page 4.

3 Dimensions, designation

Single-wheel attachment

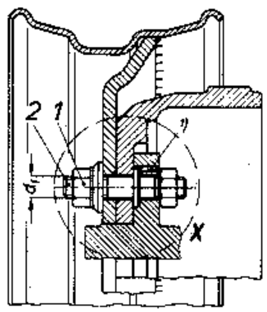
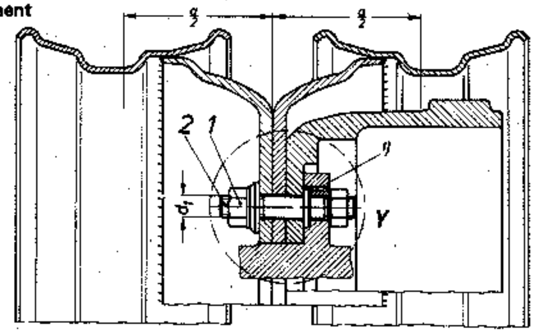


Figure 1.

Twin-wheel attachment



a = centre line distance of rims/tyres

Figure 2.

1 Wheel nut with thrust plate, as specified in table 2.

2 Stud thread size (d_1) as given in table 2; length to be calculated from relevant equation given in this table.

1) The method of locking the stud against turning is illustrated by way of example only.

Continued on pages 2 to 4

Detail X
(shown without item Nos. 1 and 2)

Detail Y
(shown without item Nos. 1 and 2)

d_5 and d_6 shown enlarged.

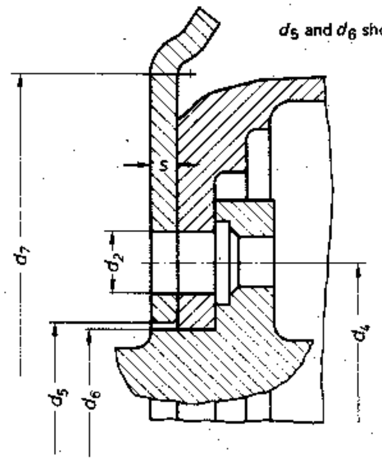


Figure 3.

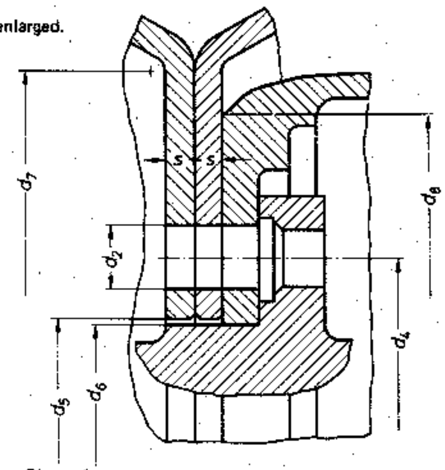


Figure 4.

The edges of stud holes and centre hole shall be deburred.

The maximum permissible unbalance shall be subject to agreement.

Wheels conforming to this standard shall be marked by stamping, in compliance with DIN 7829.

Table 1.

Number of stud holes X pitch circle diameter (main connecting dimensions)	Pitch circle diameter, d_4 2)		Wheel bore diameter, d_5 3)		Wheel centring hub diameter, d_6 4)		Minimum disc flat diameter, d_7	Diameter of wheel system, d_8		Stud hole diameter, d_2		Thread size of relevant stud (d_1) (recommended values)	Maximum wheel disc thickness, s
		Limit dev.		Limit dev.		Limit dev.			Limit dev.		Limit dev.		
6 X 205	205	±0,3	161	$^{+0,2}_{0}$	160,8	$^{0}_{-0,5}$	255	250	$^{0}_{-5}$	21	$^{+1}_{0}$	M 18 X 1,5	12
6 X 245	245	±0,3	202	$^{+0,2}_{0}$	201,8	$^{0}_{-0,5}$	295	290	$^{0}_{-5}$	21	$^{+1}_{0}$	M 18 X 1,5	12
8 X 275	275	±0,3	221	$^{+0,2}_{0}$	220,8	$^{0}_{-0,5}$	325	320	$^{0}_{-5}$	24	$^{+1}_{0}$	M 20 X 1,5	16
10 X 335	335	±0,3	281	$^{+0,2}_{0}$	280,8	$^{0}_{-0,5}$	390	385	$^{0}_{-5}$	26	$^{+1}_{0}$	M 22 X 1,5	16

2) In the case of profiled discs, measured on wheel in assembly.

3) Measured on discs in the unfinished condition, without any coating, using a plug gauge. The wheel bore shall have no recesses.

4) For interrupted centring (i.e. where recesses are provided in the hub), the limit deviations shall be $^{0}_{-0,2}$.

Maximum permissible deviations of form of the wheel disc according to the customer's specifications.

Wheel nut with thrust plate (H)

Check whether the above is protected by proprietary rights!

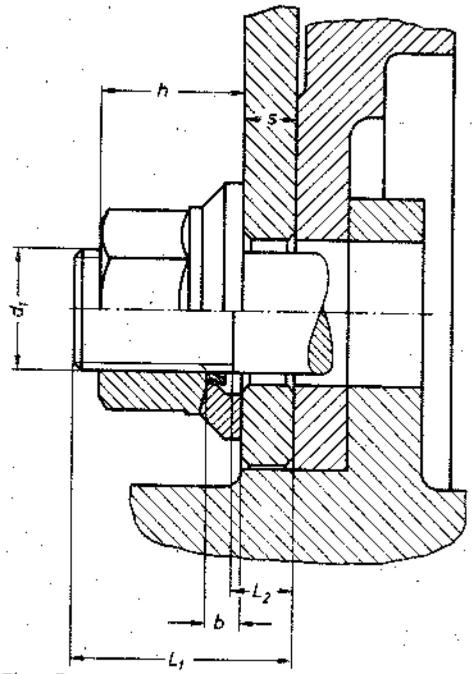


Figure 5.

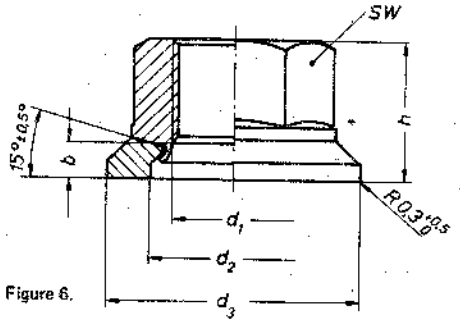


Figure 6.

Single-wheel attachment: $L_1 = s + h$ (minimum);

$L_2 = s + \frac{b}{2}$ (maximum).

Twin-wheel attachment: $L_1 = 2\,s + h$ (minimum);

$L_2 = 2\,s + \frac{b}{2}$ (maximum).

Designation of an M 20 × 1,5 (20) wheel nut with thrust plate (H), assigned to property class 10:

Wheel nut DIN 74 361 – H 20 – 10

Table 2.

Thread size (d_1)	Wheel nut with thrust plate				
	SW	d_2 +0,5 0	d_3 0 −0,5	h max.	b min.
M 18 × 1,5	27	25,5	40	25	4,5
M 20 × 1,5	30	28	45	27	4,5
M 22 × 1,5	32	30	46	27	4,5

4 Technical delivery conditions as specified in DIN 267 Parts 2, 4, 5, and 8

4.1 Property class or material

Wheel nuts with thrust plate: wheel nut body: 10 as specified in DIN 267 Part 4;
thrust plate: 34 CrMo 4, hardened to 350 to 450 HB.

Wheel studs: 10.9 as specified in ISO 898 Part 1.

4.2 Design

ng as specified in DIN 267 Part 2.

4.3 Finish

Znph r 5 f as specified in DIN 50 942.

Other standards to be observed

DIN 267 Part 2	Fasteners; technical delivery conditions; designs and dimensional accuracy; examples of tolerance indications
DIN 267 Part 4	Fasteners; technical delivery conditions; property classes for nuts (previous classes)
DIN 267 Part 5	Fasteners; technical delivery conditions; acceptance inspection (modified version of ISO 3269, 1984 edition)
DIN 7829	Rims and wheels; marking
DIN 50 942	Phosphating of metals; principles and methods of test
DIN 78 022 Part 1	15° tapered rims for commercial vehicles and trailers
ISO 898 Part 1	Mechanical properties of fasteners; bolts, screws and studs

Other relevant standards

DIN 7805 Part 4	Tyres for lorries, coaches, truck tractors and their trailers; tubeless tyres on 15° tapered rims
DIN 7805 Part 5	Tyres for lorries, coaches, truck tractors and their trailers; hub distances for twin tyres on 15° tapered rims
DIN 70 020 Part 5	Automotive engineering; tyres and wheels; concepts and measuring conditions
DIN 74 361 Part 1	Disc wheels for motor vehicles and trailers; connection dimensions for bolt centring
DIN 74 361 Part 2	Disc wheels for motor vehicles and trailers; fasteners for stud centring
DIN 74 362 Part 10	Brake drums for disc wheels of commercial vehicles and their trailers with dish and 10-bolt fastening; maximum external contour
DIN 78 027	Valves for tubeless vehicle tyres; valves for 15° tapered straight and angled rims

Explanatory notes

The wheel connecting dimensions given in this standard largely correspond to the specifications of ISO 4107, Road vehicles; wheels for commercial vehicles; dimensional characteristics of attachment on hub.

The ISO Standard, in an appendix, specifies connecting dimensions for stud hole centred wheels in addition to those for attachment with centring on wheel bore, but does not deal with fasteners.