Grooved Pins, Half Length Grooved with Gorge

DIN 1469

Passkerbstifte mit Hals

Dimensions in mm

1 Definition and purpose

Grooved pins according to this Standard are positive or non-positive connecting elements. They are used for holding retaining rings, retaining washers, springs, etc., the grooved pin being seated firmly in the accommodating hole, for which tolerance zone H11 is recommended.

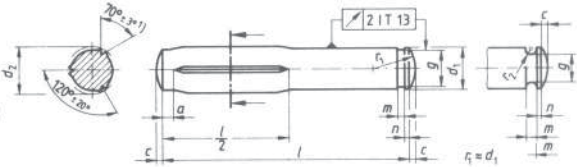
2 Other relevant Standards see page 2

3 Dimensions, designation

Type A with slot for retaining rings according to DIN 471 Part 1

Type B with slot for retaining washers according to DIN 6799

Type C with rounded slot



Designation of a grooved pin, half length grooved, with gorge Type A, of nominal diameter d_1 = 5 mm and length l = 30 mm, made of 9 SMnPb 28 K (St):

Grooved pin DIN 1469 – A 5 x 30 – St

Table 1.

d_1 Nominal dimension		2	2,5	3	4	5	6	8	10	12	14	16	20	25
per. dev.		h9			h11									
a	$+\frac{1}{0}$	0,7	1	1	1,5	1,5	2	2	2,5	2,5	2,5	2,5	3	3
c	≈	0,25	0,3	0,4	0,5	0,6	0,8	1	1,2	1,6	1,6	2	2,5	3
Type A g	h11	–	–	2,8	3,8	4,8	5,7	7,6	9,6	11,5	13,4	15,2	19	23,9
Type A m	H13	–	–	0,5	0,5	0,7	0,8	0,9	1,1	1,1	1,1	1,1	1,3	1,3
Type B g	h11	1,5	1,9	2,3	3,2	4	5	7	9	10	12	15	19	24
Type B m		0,44	0,54	0,64	0,64	0,74	0,74	0,94	1,15	1,25	1,35	1,55	1,8	2,05
per. dev.		$+\frac{0,02}{0}$			$+\frac{0,03}{0}$				$+\frac{0,06}{0}$					
Type C g		1	1,2	1,5	2,4	2,8	3,8	5	6,8	8,2	9,6	11	14	18
Type C m	$\pm$ ½ IT 14	0,8	0,8	1	1,4	1,6	1,6	2	2,6	3	3	4	5	6
r_2		0,4	0,4	0,5	0,7	0,8	0,8	1	1,3	1,5	1,5	2	2,5	3
n		0,8	0,8	1	1,4	1,6	1,6	2	2,6	3	3	4	5	6
Shear force[2] double shear kN min.		2,85	4,25	6,15	10,6	16,5	22,8	40,5	63,2	91,0	124	156,8	236,5	370,1
l js15		Diameter over groove edges d_2 [1]												
6		2,15	2,65	3,20	4,25	5,25	6,30	8,30	10,35	12,35	14,35	16,40	20,50	25,5
8														
10														
12														
16														
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90														
100														
110														
120														
140														
160														
per. dev. for d_2		$+\frac{0,05}{0}$			± 0,05				± 0,1					

The normal commercial lengths lie between the stepped lines. Intermediate lengths are permissible but should be avoided if possible.

General tolerances DIN 7168 – medium

1) and 2) see page 2

Continued on pages 2 to 4
Explanations on page 4

Other relevant Standards

DIN 267 Part 1	Bolts, screws, nuts and similar threaded and formed parts; technical conditions of delivery, general information
DIN 267 Part 5	Bolts, screws, nuts and similar threaded and formed parts; technical conditions of delivery, testing and acceptance
DIN 1651	Free cutting steels; technical conditions of delivery
DIN 7168	General tolerances (tolerances on dimensions without tolerance indication); linear and angular dimensions

4 Weights

The weights according to Table 2 apply to grooved pins made from steel.

Table 2.

Nominal diameter d_1	2	2,5	3	4	5	6	8	10	12	14	16	20	25
l	Weight (7,85 kg/dm³) kg/1000 pieces ≈												
6	0,142	0,221	0,318										
8	0,190	0,299	0,429										
10	0,240	0,376	0,540	0,950	1,49	2,23							
12	0,289	0,453	0,651	1,15	1,80	2,67							
16	0,388	0,606	0,873	1,55	2,42	3,55	6,53	10,0	14,5				
20	0,487	0,761	1,09	1,95	3,04	4,43	7,89	12,5	18,0	24,0			
25	0,611	0,965	1,37	2,44	3,81	5,49	9,85	15,5	22,5	30,2			
30	0,735	1,15	1,64	2,94	4,57	6,55	11,8	18,6	26,9	36,5	49,7	79,8	128
35			1,91	3,43	5,33	7,22	13,8	21,7	31,5	42,5	56,7	92,0	147
40			2,20	3,92	6,12	8,90	15,8	24,8	36,0	48,5	63,8	104	166
45				4,42	6,88	10,0	17,7	27,9	40,5	54,5	71,7	116	185
50				4,91	7,65	11,1	19,7	31,0	45,0	60,6	80,0	128	204
55				5,40	8,42	12,2	21,7	34,1	49,5	66,6	87,6	141	223
60				5,90	9,19	13,3	23,6	37,2	54,0	72,7	95,6	153	242
65						14,4	25,6	40,3	58,5	78,8	103	165	262
70						15,5	27,6	43,3	63,0	84,8	111	178	281
75						17,2	29,6	46,4	67,5	90,8	119	191	301
80						18,9	31,6	49,5	72,0	96,9	127	203	320
90							35,5	55,7	81,0	109	143	228	358
100							39,6	61,9	90,0	121	158	252	397
110								68,1	99,0	133	174	277	435
120								74,3	108	145	190	302	474
140								86,5	126	169	222	351	551
160								98,8	144	193	254	400	628

1) The groove angle 70° ± 3° and the diameter over the groove edges d_2 apply only to grooved pins made of 9 SMnPb 28 K (St).

2) A check should be made in each particular case to determine whether these shear forces can be fully taken into acount according to the design parameters.

5 Material

St = 9 SMnPb 28 K according to DIN 1651

Other materials, for example 45 S 20 K (according to DIN 1651), X 12 CrMoS 17 (according to DIN 17 440), X 12 CrNiS 18 8 (according to DIN 17 440), AlCuMgPb F37 (according to DIN 1747 Part 1), CuZn38Pb 1.5 F41 (according to DIN 17 671 Part 1), as well as plastics or special heat treatments by agreement.

6 Finish

Surface: Normal finish bright, oiled

Other finishes by agreement, e.g. galvanic coatings according to DIN 267 Part 9 or phosphate coatings according to DIN 50 942.

7 Requirements

DIN 267 Part 1 applies for general requirements

8 Testing

8.1 Testing of dimensional accuracy and finish

The provisions of DIN 267 Part 5 apply, as appropriate, for the testing of dimensional accuracy and finish.

For the main and subsidiary features, Table 3 applies; for the acceptable quality limit, Table 4 of this Standard applies.

Table 3. **Main and subsidiary features**

Main feature	Subsidiary feature
Nominal diameter d_1 Diameter over groove edges d_2 Recess diameter and width	Nominal length l

Table 4. AQL **values**

Nature of feature	Acceptable quality limit AQL	
	for testing of features	for testing for faulty parts
Main feature	1,5	1,5
Subsidiary feature	2,5	2,5

8.2 Testing the mechanical characteristics and materials

The provisions of DIN 267 Part 5 apply, as appropriate, for testing the mechanical characteristics and materials.

A Standard is being prepared for the shear test.

9 Examples of application

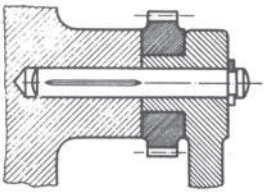

Figure 1. With slot for retaining washer according to DIN 6799 as spindle for lever with ratchet wheel

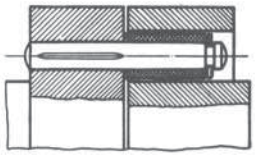

Figure 2. With slot for retaining ring according to DIN 471 Part 1 as load transfer pin of a disc clutch

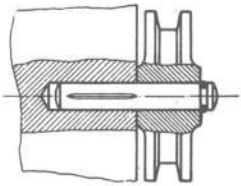

Figure 3. With rounded slot as shaft for pulley

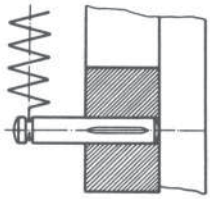

Figure 4. With rounded slot as pin for suspension of spring

Further Standards

DIN 1470 Grooved pins, full length parallel-grooved, with pilot
DIN 1471 Grooved pins, full length taper-grooved
DIN 1472 Grooved pins, half length taper-grooved
DIN 1473 Grooved pins, full length parallel-grooved with chamfer
DIN 1474 Grooved pins, half length reverse-grooved
DIN 1475 Grooved pins, third length centre-grooved
DIN 1476 Round head grooved pins
DIN 1477 Countersunk head grooved pins

Explanations

Compared with the September 1966 edition of DIN 1469, this subsequent edition contains the following amendments and additions:

a) The nominal diameter 13 mm has been deleted.
b) The series of lengths has been changed to some extent and brought into line with the internationally standard series of lengths for connecting elements.
c) The position and shape of the grooves has been specified.
d) Double shear forces have been adopted. A Standard for an appropriate shear test is being prepared.
e) Information on the material has been given. Instead of the previous strength category 6S, the material 9 SMnPb 28 K has been stipulated because the new strength categories according to DIN 267 Part 2 are not applicable to grooved pins. A reference has also been made to other materials the use of which is subject to special agreement.
f) Technical conditions of delivery have been included and brought into line with DIN 267 Part 1 and Part 5.
g) The standard designation has been amended.
h) The content of the Standard has been revised editorially.
j) The Standards DIN 471 on retaining rings and DIN 6799 on retaining washers are at present being revised. It is proposed when this is done to change the tolerance on the recess widths m and possibly also the nominal dimensions. It is intended to adopt these changes in DIN 1469 as soon as final decisions have been taken on the above Standards.