UDC 621.886.15-034.14 November 1978

Spring-Type Straight Pins

(Roll Pins)
Light-weight Type

DIN 7346

Spannstifte (Spannhülsen), leichte Ausführung

Dimensions in mm

1 Definition and purpose

Spring-type straight pins (also known as roll pins) to this Standard are pins made of spring steel, rolled from strip and having a slot along their length and one or two chamfers to permit insertion. They are mainly used for connecting two or more parts of an assembly and are suitable for withstanding shear loads. They can also be used for bolted joints where it is desired to avoid relative movement of the bolted parts without applying a high prestress.

The nominal diameter of spring type straight pins is also the nominal diameter of the accommodating hole, for which tolerance zone H 12 should be used.

N o t e : With very high loads, it is advisable to use compound spring-type pins. According to the nature of the load and the particular installation conditions, the following combinations can exist:

Light-weight type DIN 7346 outside + light-weight type inside
Light-weight type DIN 7346 outside + heavy type DIN 1481 inside
Heavy type DIN 1481 outside + light-weight type DIN 7346 inside
Heavy type DIN 1481 outside + heavy type inside

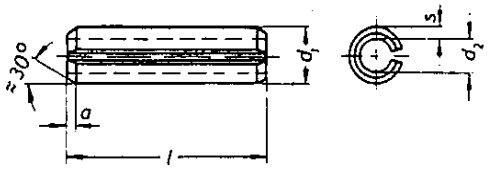
2 Other relevant Standards

DIN	125	Washers, medium (previously bright) type, primarily for hexagon bolts and nuts
DIN	267 Part 5	Bolts, screws, nuts and similar threaded and formed parts; technical conditions of delivery, testing and acceptance
DIN	7168 Part 1	General tolerances; linear and angular dimensions
DIN	17 222	Cold-rolled steel strip for springs; technical conditions of delivery
DIN	50 133 Part 1	Testing of metallic materials; Vickers hardness testing, test load range: 49 to 980 N (5 to 100 kp)

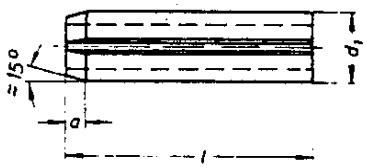
Continued on pages 2 to 5
Explanations on page 5

3 Dimensions, designation

up to 7 mm nominal diameter



from 8 mm nominal diameter



Designation of a spring-type straight pin of 10 mm nominal diameter and length l = 40 mm:

Spring-type straight pin DIN 7346 – 10 x 40

Table 1.

Nominal diameter 1)		2	2,5	3	3,5	4	4,5	5	6	7	8	10	11	12	13
a		0,2	0,25	0,25	0,3	0,5	0,5	0,5	0,7	0,7	1,5	2	2	2	2
Before insertion d_1	min.	2,3	2,8	3,3	3,8	4,4	4,8	5,4	6,4	7,5	8,5	10,5	11,5	12,5	13,5
	max.	2,4	2,9	3,5	4	4,6	5	5,6	6,7	7,8	8,8	10,8	11,8	12,8	13,8
d_2	≈	1,9	2,3	2,7	3,1	3,4	3,8	4,4	4,9	6	7	8,5	9,5	10,5	11
s		0,2	0,25	0,3	0,35	0,5	0,5	0,5	0,75	0,75	0,75	1	1	1	1,25
Shearing force 2) kN	Single shear	0,75	1,2	1,75	2,3	4	4,4	5,2	9	10,5	12	20	22	24	33
	Double shear	1,5	2,4	3,5	4,6	8	8,8	10,4	18	21	24	40	44	48	66

l	per. dev.	Weight (7.85 kg/dm³) kg/1000 pieces ≈													
4	+ 0,5 0	0,034	0,054	0,078	0,106	0,168	0,193								
5		0,043	0,067	0,097	0,132	0,210	0,241	0,271							
6		0,051	0,080	0,116	0,159	0,252	0,289	0,325							
8		0,068	0,107	0,155	0,212	0,336	0,385	0,433							
10		0,085	0,134	0,193	0,264	0,420	0,481	0,541	0,930	1,11	1,30	2,14	2,32	2,63	3,51
12	+ 1 0	0,102	0,161	0,232	0,317	0,504	0,578	0,650	1,12	1,33	1,55	2,57	2,78	3,16	4,22
14		0,119	0,187	0,271	0,370	0,588	0,674	0,758	1,30	1,55	1,81	3,00	3,24	3,68	4,92
16		0,136	0,214	0,309	0,423	0,672	0,770	0,866	1,49	1,77	2,07	3,43	3,71	4,21	5,62
18		0,153	0,241	0,348	0,476	0,756	0,866	0,974	1,67	1,99	2,33	3,86	4,16	4,74	6,32
20		0,170	0,267	0,386	0,528	0,840	0,962	1,08	1,86	2,21	2,59	4,29	4,63	5,26	7,03
22		0,187	0,294	0,425	0,581	0,924	1,06	1,19	2,05	2,44	2,85	4,72	5,10	5,79	7,73
24		0,204	0,321	0,464	0,634	1,01	1,16	1,30	2,23	2,66	3,11	5,14	5,56	6,31	8,43
26		0,221	0,347	0,502	0,687	1,09	1,25	1,41	2,42	2,88	3,77	5,57	6,03	6,84	9,13
28		0,238	0,374	0,541	0,740	1,18	1,35	1,52	2,60	3,10	3,63	6,00	6,48	7,36	9,84
30		0,255	0,400	0,579	0,792	1,26	1,44	1,62	2,79	3,32	3,88	6,43	6,95	7,89	10,5
32				0,618	0,845	1,34	1,54	1,73	2,98	3,54	4,14	6,86	7,40	8,42	11,2
36				0,695	0,951	1,51	1,73	1,95	3,49	3,99	4,66	7,72	8,32	9,47	12,6
40				0,772	1,06	1,68	1,92	2,16	3,72	4,43	5,18	8,57	9,30	10,5	14,1
45						1,89	2,16	2,44	4,18	4,98	5,83	9,64	10,4	11,8	15,8
50						2,10	2,40	2,70	4,65	5,54	6,48	10,7	11,6	13,2	17,6
55								2,98	5,12	6,09	7,12	11,8	12,7	14,5	19,3
60								3,25	5,58	6,64	7,77	12,9	13,9	15,8	21,1
65								3,52	6,04	7,20	8,42	13,9	15,0	17,1	22,8
70								3,79	6,51	7,75	9,06	15,0	16,2	18,4	24,6
75								4,06	6,98	8,30	9,71	16,1	17,4	19,7	26,3
80								4,33	7,44	8,86	10,4	17,1	18,5	21,0	28,1
85	+ 1,5 0								7,90	9,41	11,0	18,2	19,7	22,4	29,9
90									8,37	9,96	11,7	19,3	20,6	23,7	31,6
95									8,84	10,6	12,3	20,4	22,0	25,0	33,4
100									9,30	11,1	13,0	21,4	23,2	26,3	35,1
120											15,5	25,7	27,8	31,6	42,2
140												30,0	32,4	36,8	49,2
160												34,3	37,1	42,1	56,2
180														47,4	63,2

For 1) and 2) see page 3

Table continued on page 3

Table 1. (continued)

Nominal diameter 1)		14	16	18	20	21	23	25	28	30	35	40	45	50
a		2	2	2	2	2	3	3	3	3	3	4	4	4
Before insertion d_1	min.	14,5	16,5	18,5	20,5	21,5	23,5	25,5	28,5	30,5	35,5	40,5	45,5	50,5
	max.	14,8	16,8	18,9	20,9	21,9	23,9	25,9	28,9	30,9	35,9	40,9	45,9	50,9
d_2	≈	11,5	13,5	15	16,5	17,5	19,5	21,5	23,5	25,5	28,5	32,5	37,5	40,5
s		1,5	1,5	1,75	2	2	2	2	2,5	2,5	3,5	4	4	5
Shearing force 2) kN	Single shear	42	49	63	79	84	92	101	140	151	245	317	360	500
	Double shear	84	98	126	158	168	184	202	280	302	490	634	720	1000
l	Per. dev.	Weight (7.85 kg/dm³) kg/1000 pieces ≈												
10	+0,5 0	4,48	5,20	6,81	8,64									
12		5,37	6,25	8,18	10,4									
14		6,27	7,29	9,54	12,1	12,8	14,1	15,4	21,6	23,3				
16		7,16	8,33	10,9	13,8	14,6	16,1	17,6	24,6	26,6				
18		8,06	9,37	12,3	15,5	16,4	18,1	19,8	27,7	29,9				
20		8,95	10,4	13,6	17,3	18,2	20,1	22,0	30,8	33,2	53,4	69,9	79,1	109
22		9,85	11,5	15,0	19,0	20,1	22,1	24,2	33,9	36,6	58,8	76,9	87,0	120
24		10,7	12,5	16,4	20,7	21,9	24,1	26,4	37,0	39,9	64,1	83,9	94,9	131
26	+1 0	11,6	13,5	17,7	22,5	23,7	26,1	28,6	40,1	43,2	69,4	90,9	103	142
28		12,5	14,6	19,1	24,2	25,5	28,1	30,8	43,1	46,5	74,8	97,9	111	153
30		13,4	15,6	20,4	25,9	27,4	30,1	33,0	46,2	49,9	80,1	105	119	164
32		14,3	16,7	21,8	27,6	29,2	32,2	35,2	49,3	53,3	85,5	112	127	174
36		16,1	18,7	24,5	31,1	32,8	36,2	39,6	55,5	59,8	96,1	126	142	196
40		17,9	20,8	27,3	34,5	36,5	40,2	43,9	61,6	66,5	107	140	158	218
45		20,1	23,4	30,7	38,8	41,0	45,2	49,5	69,3	74,8	120	157	178	245
50		22,4	26,0	34,1	43,2	45,0	50,2	55,0	77,0	83,1	134	175	198	273
55		24,6	28,6	37,5	47,5	50,2	55,3	60,4	84,8	91,4	147	192	217	300
60		26,8	31,2	40,9	51,8	54,7	60,3	65,9	92,4	99,7	160	210	237	327
65		29,1	33,8	44,3	56,1	59,3	65,3	71,4	100	108	174	227	257	354
70		31,3	36,4	47,7	60,4	63,8	70,3	76,9	108	116	187	245	277	382
75		33,6	39,0	51,1	64,8	68,4	75,4	82,4	115	125	200	262	296	409
80		35,8	41,6	54,5	69,1	73,0	80,4	87,9	123	133	214	280	316	436
85		38,0	44,2	57,9	73,4	77,5	85,4	93,4	131	141	227	297	336	463
90	+1,5 0	40,3	46,8	61,3	77,7	82,1	90,4	98,9	139	150	240	315	356	491
95		42,5	49,4	64,7	82,0	86,0	95,5	104	146	158	254	332	376	518
100		44,8	52,0	68,1	86,3	91,2	100	110	154	166	267	349	395	545
120		53,7	62,5	81,8	104	109	121	132	185	199	320	419	474	654
140		62,6	72,9	95,4	121	128	141	154	216	233	374	489	553	763
160		71,6	83,3	109	138	146	161	176	246	266	427	559	633	872
180		80,6	93,7	123	155	164	181	198	277	299	481	629	712	981
200		89,6	104	136	173	182	201	220	308	332	534	699	791	1090

1) Because spring-type straight pins are used for bolted joints, some of the nominal diameters do not correspond to the series normally selected for pins (see Section 4).

2) A Standard for testing shear forces is being prepared.
A check should be made in each particular case to determine whether these shear forces can be fully taken into account according to the design parameters.

Intermediate lengths should be avoided if possible.

Lengths over 200 mm should be arranged in steps of 20 mm.

Normally, spring-type straight pins are manufactured in the sizes designated by the specified weight.

If, in special cases, spring-type straight pins of more than 7 mm nominal diameter are required with a chamfer at both ends, this must be agreed at the time of ordering.

General tolerances DIN 7168 – medium

4 Use for bolted joints

If spring-type straight pins are employed with bolted joints, the following arrangement should be used:

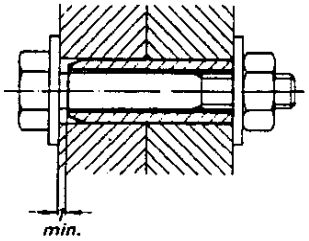


Table 2.

Nominal diameter	4,5	6	7	8	11	13	16	18	21	23	25	28	30	35	40	45	50
For screw	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M36	M39
Associated washer DIN 125	3,2	4,3	5,3	6,4	8,4	10,5	13	15	17	19	21	23	25	28	31	37	40

5 Material

Spring steel 55 Si 7 according to DIN 17 222

quenched and tempered to 422 up to 560 HV 5 (corresponding to 1400 to 1800 N/mm^2 tensile strength)

6 Finish

Rolled from strip

Surface protection by agreement [In the case of galvanic surface treatment the danger of hydrogen embrittlement should be borne in mind (see also DIN 267 Part 9)].

7 Requirements

The surface of the spring-type straight pins must be smooth and free from scale and burrs. The outer edges at the slot and at the ends should in general only be deburred, but may also be lightly rounded.

8 Inspection

8.1 Inspection for dimensional accuracy and finish

The provisions of DIN 267 Part 5 apply as appropriate for checking of dimensional accuracy and finish. For the main and subsidiary features, Table 3 applies; for the acceptable quality limit Table 4 applies.

Table 3. **Main and subsidiary features**

Main feature	Subsidiary feature, e.g.
Diameter d_1	Nominal length l Chamfers Surfaces

Table 4. AQL **values**

Features	Acceptable quality limit (AQL)	
	for inspection of features	for inspection for faulty parts
Main feature	1,5	1,5
Subsidiary feature	2,5	4

8.2 Checking of mechanical properties and materials

DIN 267 Part 5, together with the tests specified in Section 8.3 and Section 8.4, applies for checking the mechanical properties and materials.

8.3 Vickers hardness test according to DIN 50 133 Part 1

8.4 A Standard is being prepared for the shear test

Further Standards

DIN 1481 Spring type straight pins (roll pins), heavy type
DIN 7343 Spiral pins, normal type
DIN 7344 Spiral pins, heavy type

Explanations

Compared with the July 1960 edition, this subsequent edition of the Standard contains the following amendments and additions:

a) The term "Spannhülse" (roll pin) has been changed back to "Spannstift" (spring-type straight pin) because the term "Spannhülse" has not gained currency (see also "helical spring-type pins" DIN 7343 and DIN 7344) and also in international usage the term "Stift" ("pin" in English) is normally used. In addition, these standardized components are primarily used as pins.

b) The "Definition and purpose Section has been inserted at the start of the Standard. In addition a Section on "Other relevant Standards" has been included.

c) The design with a chamfer at both ends has been extended to nominal diameters up to 7 mm. In addition, there is a note that, by agreement, in special cases spring-type straight pins may also be supplied with a chamfer at both ends in nominal diameters over 7 mm.

d) Shearing forces have been specified for spring-type straight pins. A Standard on testing with such forces is in preparation.

e) The technical conditions of delivery for spring-type straight pins have been reworded and information on acceptance testing in accordance with DIN 267 Part 5 has been included.

f) The content of the Standard has been editorially revised and the information on use with bolted joints has been kept separate from that relating to the standardized component itself.