UDC 621.886.55

September 1983

Split pins

DIN 94

Splinte

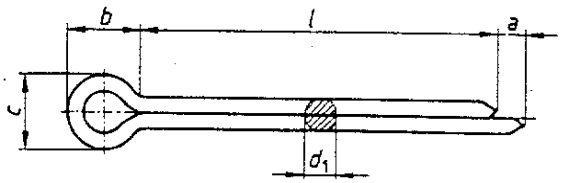
Supersedes October 1972 edition

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

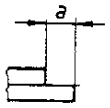
For connection with Standard ISO 1234 – 1976 published by the International Organization for Standardization (ISO), see Explanatory notes.

1 Dimensions, designation

Dimensions in mm



Shape of the split pin ends at the manufacturer's discretion



Designation of a split pin, nominal diameter d_1 = 5 mm and length l = 50 mm, made from steel (St):

Split pin DIN 94 – 5 X 50 – St

Table 1.

Nominal size		0,6	0,8	1	1,2	1,6	2	2,5	3,2
d_1 [1]	max.	0,5	0,7	0,9	1	1,4	1,8	2,3	2,9
	min.	0,4	0,6	0,8	0,9	1,3	1,7	2,1	2,7
a	max.	1,6	1,6	1,6	2,5	2,5	2,5	2,5	3,2
	min.	0,8	0,8	0,8	1,25	1,25	1,25	1,25	1,6
b	≈	2	2,4	3	3	3,2	4	5	6,4
c	min.	0,9	1,2	1,6	1,7	2,4	3,2	4	5,1
	max.	1	1,4	1,8	2	2,8	3,6	4,6	5,8

Nominal length	l min.	l max.	Weight (7,85 kg/dm³) kg per 1000 pieces ≈							
4	3,4	4,6								
5	4,4	5,6								
6	5,4	6,6			0,03					
8	7,25	8,75			0,04		0,1			
10	9,25	10,75			0,05		0,12	0,25		
12	11,1	12,9			0,06		0,14	0,28	0,51	
14	13,1	14,9			0,07		0,16	0,31	0,57	
16	15,1	16,9			0,08		0,18	0,34	0,63	
18	17,1	18,9			0,1		0,2	0,37	0,69	1
20	19	21					0,22	0,4	0,75	1,09
22	21	23					0,24	0,43	0,81	1,18
25	24	26					0,27	0,47	0,9	1,31
28	27	29					0,3	0,51	0,98	1,45
32	30,75	33,25					0,34	0,56	1,1	1,64
36	34,75	37,25						0,61	1,22	1,8
40	38,75	41,25						0,66	1,34	2
45	43,75	46,25							1,49	2,17
50	48,75	51,25							1,64	2,43
56	54,5	57,5								2,7
63	61,5	64,5								3,02
71	69,5	72,5								3,38
80	78,5	81,5								3,78

Split pins are normally manufactured in the sizes for which a weight has been marked.

[1] The nominal diameter of a split pin is at the same time the nominal diameter of the appropriate split pin hole. Tolerance H13 is recommended for this split pin hole for nominal diameters up to d_1 = 1,2 mm and tolerance H14 for nominal diameters from d_1 = 1,6 mm.

Continued on pages 2 to 5

Table 1. (continued)

	Nominal size	4	5	6,3	8	10	13	16	20
d_1 [1]	max.	3,7	4,6	5,9	7,5	9,5	12,4	15,4	19,3
	min.	3,5	4,4	5,7	7,3	9,3	12,1	15,1	19
a	max.	4	4	4	4	6,3	6,3	6,3	6,3
	min.	2	2	2	2	3,2	3,2	3,2	3,2
b	≈	8	10	12,6	16	20	26	32	40
c	min.	6,5	8	10,3	13,1	16,6	21,7	27	33,8
	max.	7,4	9,2	11,8	15	19	24,8	30,8	38,6

Nominal length	l min.	l max.	Weight (7,85 kg/dm³) kg per 1000 pieces ≈							
20	19	21	2,16	3,49						
22	21	23	2,28	3,74						
25	24	26	2,52	4						
28	27	29	2,76	4,49	8,04					
32	30,75	33,25	3,07	5	8,9					
36	34,75	37,25	3,39	5,49	9,76	15,9				
40	38,75	41,25	3,71	6	10,6	17,2				
45	43,75	46,25	4,11	6,61	11,7	18,9				
50	48,75	51,25	4,51	7,24	12,8	20,6				
56	54,5	57,5	5	8	14	22,6	38	69,5		
63	61,5	64,5	5,55	8,67	15,6	25	41,8	76		
71	69,5	72,5	6,2	9,86	17,3	27,7	46,2	83,4		
80	78,5	81,5	6,91	11	19,2	30,7	51,2	91,8		
90	88,25	91,75	7,71	12,2	21,3	34,1	56,7	101		
100	98,25	101,75	8,51	13,5	23,5	37,5	62,2	111	171	
112	110,25	113,75	9,46	15	26,1	41,5	66	122	188	
125	123	127	10,5	16,6	28,9	45,9	75,9	134	206	
140	138	142			32,1	51	84,2	148	228	
160	158	162							256	
180	178	182							285	
200	197,7	202,3							314	
224	221,7	226,3							349	
250	247,7	252,3							385	
280	277,4	282,6								

[1] See page 1.

2 Material

St = steel

CuZn = copper-zinc alloy

Cu = copper

Al = Aluminium alloy

Other materials subject to agreement.

3 Finish

The surface shall be smooth and free from scale and burrs.

The strength of the split pin shall be such that the latter passes the test described in subclause 6.2.1.

The eyes shall be as round in shape as is possible and shall blend into the legs without sharp notches. When the legs are lying one on top of the other they shall have a circular cross section.

4 Surface protection

If surface protection is required,

a) DIN 267 Part 9 shall apply for galvanic coatings,

b) DIN 50 942 shall apply for phosphate coatings,

c) other surface coating shall be subject to agreement.

5 Requirements

DIN 267 Part 1 shall apply for the general requirements.

6 Acceptance testing

6.1 Testing for dimensional accuracy and finish

The specifications of DIN 267 Part 5 (at present at the stage of draft) shall apply as appropriate in testing for dimensional accuracy and finish. Table 2 applies for the major and minor properties; table 3 applies for the acceptable quality level.

Table 2. **Major and minor characteristics**

Major characteristic	Minor characteristic
Diameter d_1	Eye dimensions b and c Length l

Table 3. AQL values

Characteristic	Acceptable quality level (AQL)	
	for inspection for defects	for inspection for defective items
Major characteristic	1,5	1,5
Minor characteristic	2,5	4

6.2 Testing the mechanical properties

The specifications of DIN 267 Part 5 (at present at the stage of draft) shall apply for the tests on the mechanical properties and materials, the bending test described below being decisive for the assessment of the mechanical properties. Where items are determined to be defective, two alternative test pieces shall be taken for each test piece not passing the test; both alternative test pieces shall satisfy the requirements. If this is not the case, the batch concerned may be rejected.

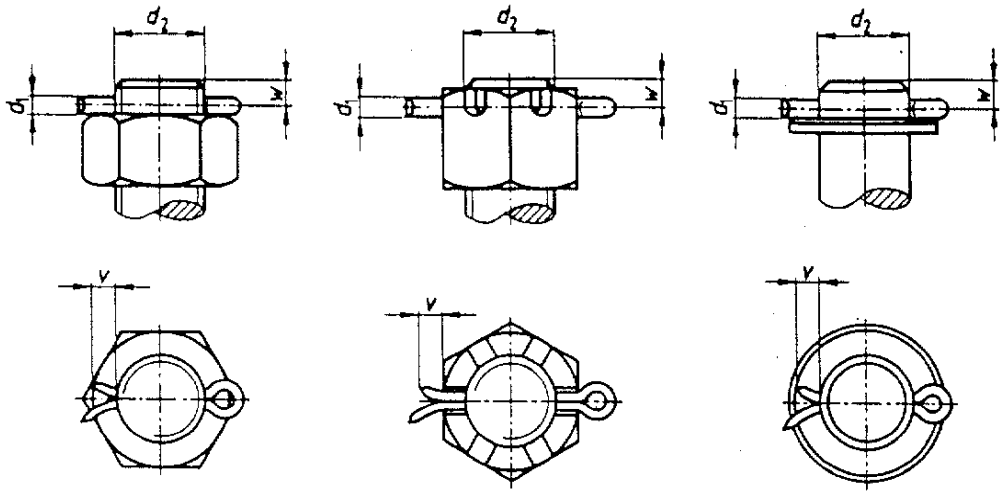
6.2.1 Bending test

The split pin to be tested shall be clamped from its eye to around half its length l.

Split pins with nominal diameters up to and including d_1 = 5 mm shall not display any cracks at the point of bending after the leg has been bent three times through 90°.

Split pins with nominal diameters exceeding d_1 = 5 mm shall withstand being bent twice in the same test.

7 Application



v length of projection of the short leg

Table 4.

Nominal diameter d_1			0,6	0,8	1	1,2	1,6	2	2,5	3,2	4	5	6,3	8	10	13	16	20
For diameter range d_2	Bolts [2]	over	–	2,5	3,5	4,5	5,5	7	9	11	14	20	27	39	56	80	120	170
		up to	2,5	3,5	4,5	5,5	7	9	11	14	20	27	39	56	80	120	170	–
	Clevis pins [3]	over	–	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160
		up to	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160	–
v		min.	3	3	4	5	5	6	6	8	8	10	12	14	16	20	25	32

[2] The thread major diameter or the diameter of the split pin point apply for the allocation for bolts.

[3] It is recommended for applications in rail vehicles and in cases where clevis pins are subject to alternating shock loading that the next larger split pin be allocated to the clevis pin diameter.

The split pin hole distances w are guided by the prevailing conditions and by the shape of the end of the bolt or clevis pin. They are therefore specified in the separate dimensional standards. For example, DIN 962 applies for bolts with castle nuts (previously dimension $l - f$, specified as dimension l_h in DIN 962, at present at the stage of draft).

Standards referred to

DIN	267 Part 1	Fasteners; technical delivery conditions, general requirements
DIN	267 Part 5	(at present at the stage of draft) Fasteners; technical delivery conditions, acceptance testing
DIN	267 Part 9	Fasteners; technical delivery conditions, components with electroplated coatings
DIN	962	(at present at the stage of draft) Bolts and nuts, designation data, shapes and finishes
DIN	50942	Phosphating of metals; process principles, symbols and test methods
ISO	1234 – 1976	Split pins

Previous editions

DIN 92: 03.23, 10.36; DIN 94: 06.22, 05.24, 10.25, 10.36, 08.39, 10.72

Amendments

The following amendments have been made in comparison with the October 1972 edition:

The dimension a min. (length of the extended prong) and the mass of split pins in sizes commercially available have been included. The dimension recorded for the length of the projection of the split pin v has been corrected and related to the short leg. The content of the standard has been editorially revised.

Explanatory notes

In its October 1972 edition, DIN 94 was aligned with International Recommendation ISO/R 1234 – 1971. This Recommendation was converted into an International Standard in 1976, without any technical changes being made to the previous specifications.

Some nominal diameters and split pin diameters, as well as some lengths, were modified from the previous specifications when DIN 94 was aligned with ISO 1234; in some cases these lengths might have caused problems of interchangeability. The amended dimensions are once again compared below in tables taken from the Explanatory notes to the October 1972 edition, in consideration of existing documents of a different nature.

Table 5. **Split pin dimensions**

Nominal diameter = hole diameter			0,6	0,8	1	–	1,5	2	–	3	4	5	6	8	10	13	16	20
		previous	0,6	0,8	1	1,2	1,6	2	2,5	3,2	4	5	6,3	8	10	13	16	20
d_1	max.	previous	0,5	0,7	0,9	–	1,3	1,8	–	2,7	3,7	4,7	5,7	7,7	9,7	12,6	15,6	19,5
		new	0,5	0,7	0,9	1	1,4	1,8	2,3	2,9	3,7	4,6	5,9	7,5	9,5	12,4	15,4	19,3
	min.	previous	0,4	0,6	0,8	–	1,2	1,7	–	2,5	3,5	4,5	5,5	7,5	9,5	12,4	15,4	19,3
		new	0,4	0,6	0,8	0,9	1,3	1,7	2,1	2,7	3,5	4,4	5,7	7,3	9,3	12,1	15,1	19

The table shows that the previous split pins will fit into the new split pin holes and, conversely, the new split pins will fit into the previous split pin holes.

Table 6. **Split pin lengths**

l																		
	previous	4	5	6	8	10	12	–	15	–	18	20	22	25	28	30	–	35
	new	4	5	6	8	10	12	14	–	16	18	20	22	25	28	–	32	–

l																		
	previous	–	40	45	50	55	–	60	–	65	70	–	75	80	90	100	110	–
	new	36	40	45	50	–	56	–	63	–	–	71	–	80	90	100	–	112

l																
	previous	120	–	130	140	150	160	180	200	220	–	240	–	260	280	300
	new	–	125	–	140	–	160	180	200	–	224	–	250	–	280	–

The problem of interchangeability of split pin lengths was made more complex by the fact that, contrary to previous specifications, the nominal length was related to the short leg of the split pin. Thus, a universally valid recommendation for conversion could not be given in the October 1972 edition.

The new split pin dimensions, which had not been used in practice at that time did not originally allow the October 1972 edition to specify masses for the split pins. This revised edition has been supplemented accordingly.

The ISO Recommendation only specified a minimum dimension for the distance between the two ends in the case of the optional shape where the ends of the split pins are cut square (a min. = 0,5 a max.), in order to ease the opening of the ends of the split pins. This specification was also adopted into the ISO Standard. It has, however, since become clear that equal length legs also cause assembly difficulties where the ends of the split pins are pointed. Thus the minimum values for a in this revised edition of the standard have been made to refer to both types of split pin end.

The dimension v for the projection of the split pin was related to the long leg in the October 1972 edition of the standard. The dimension recorded for v was corrected, in accordance with the nominal length of the split pin, so that it now applies to the short leg.

International Patent Classification

F 16 B 39-04

B 21 G 7-08