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**“पुराने को छोड़ नये के तरफ”**

Jawaharlal Nehru

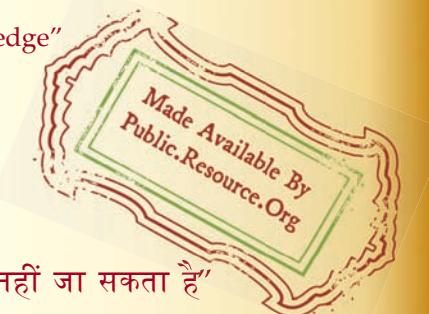
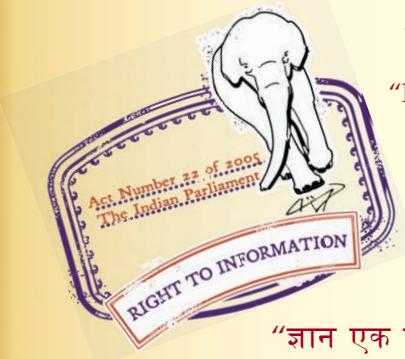
“Step Out From the Old to the New”

IS 2998 (1982): Cold Forged Steel Rivets for Cold Closing  
(1 to 16 mm Diameter) [PGD 31: Bolts, Nuts and Fasteners  
Accessories]

**“ज्ञान से एक नये भारत का निर्माण”**

Satyanaaranay Gangaram Pitroda

Invent a New India Using Knowledge



**“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”**

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”





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*Indian Standard*

**SPECIFICATION FOR  
COLD FORGED STEEL RIVETS FOR COLD CLOSING  
(1 TO 16 mm DIAMETER)**

*(First Revision)*

**1. Scope** — Covers the requirements of cold forged rivets, for cold closing in the diameter range 1 to 16 mm, intended for general engineering purposes.

**2. Material** — The rivets shall be manufactured from the following two grades or any other suitable steel specified by the purchaser:

- a) **Grade 1** — Steel class 1A of IS : 1875-1978 'Specification for carbon steel billets, blooms, slabs and bars for forgings (fourth revision)', and
- b) **Grade 2** — Steel 10C4 of IS : 1570 (Part II)-1979 'Schedules for wrought steels: Part II Carbon steels (unalloyed steels) (first revision)'.

**3. Dimensions**

**3.1** The dimensions of rivets shall be as given in Tables 1 to 4.

**3.2** Where the rivets with snap head and counter sunk head are made with flat edge, they shall conform to the values given in IS : 10102-1982 'Technical supply conditions for rivets'.

**3.3** The preferred nominal diameter-length combinations are given in Table 5.

**4. Method of Manufacture** — The rivets shall be made by cold heading process and shall be suitably annealed.

**5. Acceptance Tests**

**5.1 General** — The sampling and acceptance criteria of the rivets shall be in accordance with IS : 10102-1982.

**5.2 Tests for Material** — The material used in the manufacture of the rivets shall be tested as per stipulations of the relevant material specification indicated under 2.

**5.3 Shear Test** — When tested by the method prescribed in IS : 10102-1982 the rivets shall satisfy a minimum shear strength as follows:

Grade 1 — 230 MPa

Grade 2 — 200 MPa

**5.4 Hardness Test** — When tested according to IS : 1500-1968 'Method for Brinell hardness test for steel (first revision)' the hardness on the head of rivet shall be as follows:

Grade 1 — 48 to 73 HRB (91 to 127 VPN)

Grade 2 — 56 to 78 HRB (100 to 139 VPN)

**5.5 Head Soundness Test** — When tested by method prescribed in IS : 10102-1982 the rivets, at room temperature, shall withstand the test without exhibiting any sign of cracking at the fillet between the head and the shank.

**6. Designation**

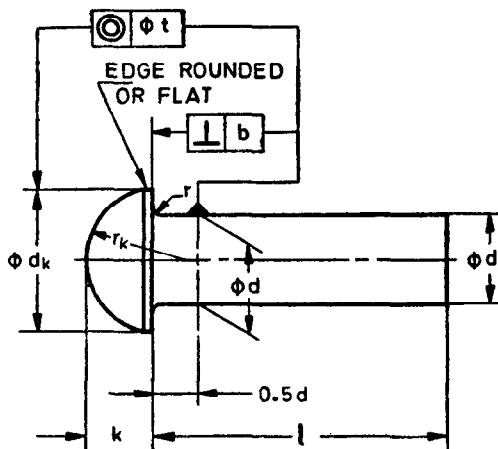
**6.1** A snap head rivet of 6 mm diameter having a length of 30 mm and made, for example, from material Grade 1 shall be designated as:

Snap Head Rivet 6×30 Grade I IS : 2998

TABLE 1 DIMENSIONS FOR SNAP HEAD RIVETS

(Clause 3.1)

All dimensions in millimetres.



$$t = 2IT14 \text{ for } d \leq 8$$

$$t = 2IT15 \text{ for } d > 8$$

<i>d</i>	Nom	1.0	1.2	(1.4)	1.6	2.0	2.5	3.0	(3.5)	4.0	5.0	6.0	(7.0)	8.0	10	12	(14)	16	
<i>d</i>	Max	1.05	1.25	1.45	1.65	2.1	2.6	3.1	3.6	4.1	5.15	6.15	7.15	8.15	10.3	12.3	14.3	16.3	
<i>d</i>	Min	0.95	1.15	1.35	1.55	1.9	2.4	2.9	3.4	3.9	4.85	5.85	6.85	7.85	9.7	11.7	13.7	15.7	
<i>d<sub>s</sub></i>	Min	0.93	1.13	1.33	1.52	1.87	2.37	2.87	3.37	3.87	4.82	5.82	6.82	7.76	9.4	11.3	13.2	15.2	
<i>d<sub>k</sub></i>	Nom	1.6	1.92	2.24	2.56	5.2	4	4.8	5.6	6.4	8	9.6	11.2	12.8	16	19.2	22.4	25.6	
<i>d<sub>k</sub></i>	Max	1.8	2.12	2.44	2.76	3.45	4.25	5.05	5.85	6.65	8.3	9.9	11.5	13.1	16.36	19.6	22.8	26.1	
<i>d<sub>k</sub></i>	Min	1.4	1.82	2.04	2.36	2.95	3.75	4.55	5.35	6.15	7.7	9.3	10.9	12.5	15.64	18.8	22.0	25.1	
<i>k</i>	Nom	0.7	0.84	0.98	1.12	1.4	1.75	2.1	2.45	2.8	3.5	4.2	4.9	5.6	7	8.4	9.8	11.2	
<i>k</i>	Max	0.9	1.04	1.18	1.32	1.6	1.95	2.3	2.65	3.0	3.74	4.44	5.14	5.84	7.29	8.69	10.09	11.55	
<i>k</i>	Min	0.5	0.64	0.78	0.92	1.2	1.55	1.9	2.25	2.6	3.34	3.96	4.66	5.36	6.71	8.11	9.51	10.85	
<i>r</i>	Max									0.3				0.4		0.5	0.6	0.7	0.8
<i>r<sub>k</sub></i>	≈	1	1.2	1.4	1.6	1.9	2.4	2.8	3.4	3.8	4.6	5.7	6.6	7.5	8	9.5	11	13	

Note 1—Nominal diameters, *d* in parenthesis are of second preference.Note 2—For perpendicularity tolerance value, *b* see IS : 10102-1982.

Note 3—For permissible limits of shank diameter, see also IS : 10102-1982.

Note 4—Rivets shall be furnished with a definite radius under the head which shall not exceed the value *r* given.

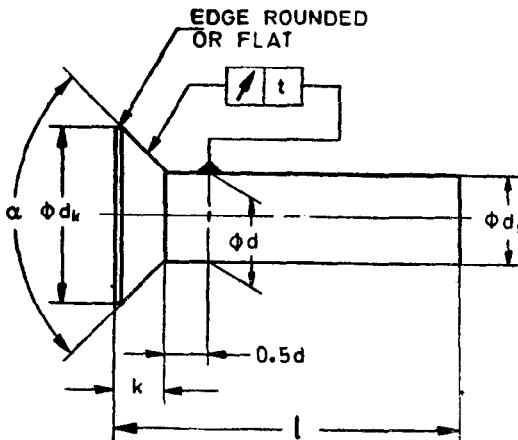
Note 5—The shape of head shall be forged into part of a sphere. Necessary flat land for trimming (see 3.1) on the head periphery is permissible.

Note 6—The values given for *r<sub>k</sub>* are meant for snap design and not for inspection purposes.

**TABLE 2 DIMENSIONS FOR FLAT COUNTERSUNK HEAD (90°/60°) RIVETS**

(Clause 3.1)

All dimensions in millimetres.



$$t = 2lT14 \text{ for } d \leq 8$$

$$t = 2lT15 \text{ for } d > 8$$

<i>d</i>	Nom Max Min	1 1.05 0.95	1.2 1.25 1.15	(1.4) 1.45 1.35	1.6 1.65 1.55	2.0 2.1 1.9	2.5 2.6 2.4	3.0 3.1 2.9	(3.5) 3.6 3.4	4.0 4.1 3.9	5.0 5.15 4.85	6.0 6.15 5.85	(7.0) 7.15 6.85	8.0 8.15 6.85	10 10.3 9.7	12 12.3 11.7	(14) 14.3 13.7	16 16.3 15.7
<i>d<sub>s</sub></i>	Min	0.93	1.13	1.33	1.52	1.87	2.37	2.87	3.37	3.87	4.82	5.82	6.82	7.76	9.4	11.3	13.2	15.2
<i>d<sub>k</sub></i>	Nom Max Min	2 2 1.75	2.4 2.4 2.25	2.8 2.8 2.65	3.2 3.2 2.9	4 4 3.7	5 5 4.7	6 6 5.7	7 7 6.64	8 8 7.64	10 10 9.64	12 12 11.57	14 14 13.57	16 16 15.57	20 20 19.48	24 24 23.48	28 28 27.48	32 32 31.38
<i>k</i> ≈ Ref		0.5	0.6	0.7	0.7	.0.8	1.0	1.25	1.5	1.75	2	2.5	3	3.5	4	5.2	6.1	6.9
<i>α</i>	+5° 0	90°														60°		

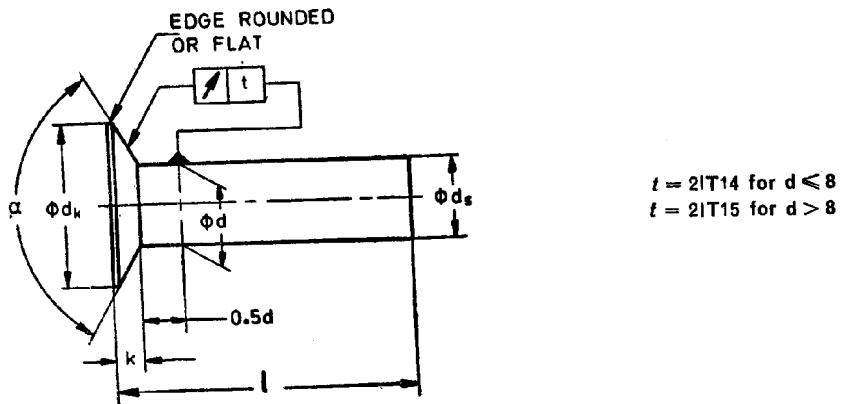
**Note 1**—The nominal diameters, *d* in parenthesis are of second preference.

**Note 2**—For permissible limits of shank diameter, see also IS : 10102-1982.

TABLE 3 DIMENSIONS FOR FLAT COUNTERSUNK HEAD (120°) RIVETS

(Clause 3.1)

All dimensions in millimetres.



$d$	Nom	1	1.2	(1.4)	1.6	2.0	2.5	3.0	(3.5)	4.0	5.0	6.0	(7.0)	8.0	10	12	(14)	16
	Max	1.05	1.25	1.45	1.65	2.1	2.6	3.1	3.6	4.1	5.15	6.15	7.15	8.15	10.3	12.3	14.3	16.3
	Min	0.95	1.15	1.35	1.55	1.9	2.4	2.9	3.4	3.9	4.85	5.85	6.85	7.85	9.7	11.7	13.7	15.7
$d_s$	Min	0.93	1.13	1.33	1.52	1.87	2.37	2.87	3.37	3.87	4.82	5.82	6.82	7.76	9.4	11.3	13.2	15.2
$d_s$	Nom	2	2.4	2.8	3.2	4	5	6	7	8	10	12	14	16	20	24	28	32
$d_s$	Max	2	2.4	2.8	3.2	4	5	6	7	8	10	12	14	16	20	24	28	32
$d_s$	Min	1.75	2.25	2.65	2.9	3.7	4.7	4.7	6.64	7.64	9.64	11.57	13.57	15.57	19.48	23.48	27.48	31.38
k Ref	=	0.29	0.343	0.406	0.468	0.58	0.725	0.87	1.015	1.16	1.45	1.74	2.03	2.32	2.9	3.48	4.06	4.64

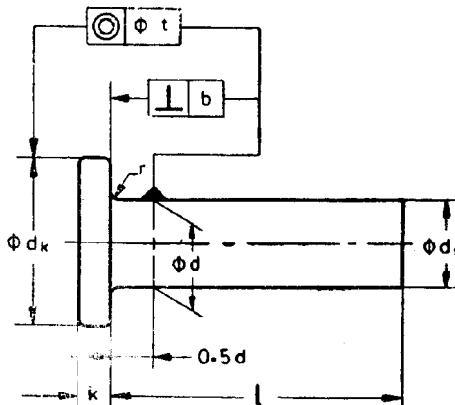
Note 1—The nominal diameters,  $d$  in parenthesis are of second preference.

Note 2—For permissible limits of shank diameter, see also IS: 10102-1982.

TABLE 4 DIMENSIONS FOR FLAT HEAD RIVETS

(Clause 3.1)

All dimensions in millimetres.



$$t = 2IT14 \text{ for } d \leq 8$$

$$t = 2IT15 \text{ for } d > 8$$

<i>d</i>	<i>Nom</i>	1	1.2	(1.4)	1.6	2	2.5	3	(3.5)	4	5	(7)	8	10	12	14	16	
	<i>Max</i>	1.05	1.25	1.45	1.65	2.1	2.6	3.1	3.6	4.1	5.15	6.15	8.15	10.3	12.3	14.3	16.3	
	<i>Min</i>	0.95	1.15	1.35	1.5	2.4	2.4	3.9	3.4	3.9	4.85	5.85	7.85	9.7	11.7	13.7	15.7	
<i>d<sub>s</sub></i>	<i>Min</i>	0.93	1.13	1.33	1.52	1.87	2.37	2.87	3.37	3.87	4.82	5.82	6.82	7.76	9.4	11.3	13.2	15.2
<i>d<sub>k</sub></i>	<i>Nom</i>	2	2.4	2.8	3.2	4	5	6	7	8	10	12	14	16	20	24	28	32
	<i>Max</i>	2	2.4	2.9	3.2	4	5	6	7	8	10	12	14	16	20	24	28	32
	<i>Min</i>	1.75	2.25	2.65	2.9	3.7	4.7	5.7	6.64	7.64	9.64	11.57	13.57	15.57	19.48	23.48	27.48	31.38
<i>k</i>	<i>Nom</i>	0.25	0.3	0.35	0.4	0.5	0.625	0.75	0.875	1	1.25	1.5	1.75	2	2.5	3.0	3.5	4.0
	<i>Max</i>	0.35	0.4	0.55	0.6	0.8	0.925	1.05	1.175	1.3	1.65	1.9	2.25	2.5	3.00	3.6	4.1	4.6
	<i>Min</i>	0.25	0.3	0.35	0.4	0.5	0.625	0.75	0.875	1	1.25	1.5	1.75	2	2.5	3.0	3.5	4.0
<i>r</i>	<i>Max</i>	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8

Note 1—The nominal diameters, *d* in parenthesis are of second preference.

Note 2—For permissible limits of shank diameter, see also IS : 10102-1982.

Note 3—For perpendicularity tolerance value, *b* see IS : 10102-1982.Note 4—Rivets shall be furnished with definite radius under the head which shall not exceed the value, *r* given.

**TABLE 5 DIAMETER LENGTH COMBINATIONS FOR COLD FORGED RIVETS**

(Clause 3.3)

All dimensions in millimetres.

! TOL +0.5 0 +1.0 0 FOR d ≤ 10 FOR d > 10	NOMINAL DIAMETER d																	
	1	1.2	(1.4)	1.6	2	2.5	3	(3.5)	4	5	6	(7)	8	10	12	(14)	16	
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RIVET HOLE DIAMETER (FOR REFERENCE)	BASIC TOL H12	1.05	1.25	1.45	1.65	2.1	2.6	3.1	3.6	4.2	5.3	6.3	7.3	8.4	10.5	13	15	17

Note 1 — The nominal diameters in parenthesis are of second preference.

Note 2 — The preferred lengths are between the stepped lines.

**6.2** A countersunk head rivet, with a countersink angle of 90°, diameter 4 mm, length 24 mm and made, for example, from material Grade 2 shall be designated as:

Countersunk Head (90°) Rivet 4×24 Grade 2 IS : 2998

## 7. General Requirements

**7.1** The general requirements for the supply of rivets and their workmanship shall be in accordance with IS : 10102-1982.

**7.2** Limits of surface cracks on rivets shall be in accordance with IS : 10102-1982.

## 8. Marking

**8.1** All rivets over 5 mm diameter shall be marked with the manufacturer's trade-mark and a letter 'C' on the head in raised figure.

**8.2** *Certification Marking* — Details available with the Bureau of Indian Standards.

**9. Mode of Delivery** — Rivets shall be packed and delivered as specified in IS : 10102-1982.

## EXPLANATORY NOTE

This standard was first published in 1965. In the present revision, following modifications have been made:

- Sizes 1 to 16 mm have been covered instead of 1·6 to 10 mm covered in the earlier edition,
- Bend test and flattening test have been substituted by shear test and head soundness test as the latter are more realistic, and
- The method of representation of tolerances for form and position has been updated.

AMENDMENT NO. 1 MARCH 1984

TO

IS:2998-1982 SPECIFICATION FOR COLD FORGED STEEL  
RIVETS FOR COLD CLOSING (1 TO 16 mm DIAMETER)

(First Revision)

Corrigenda

(Page 2, Table 1):

- a) Under  $d_{Nom}$  8.0, for  $d_{Min}$  substitute '7.85' for '6.85'.
- b) Under  $d_{Nom}$  2.0, for  $d_k^{Nom}$  substitute '3.2' for '5.2'.
- c) Under  $d_{Nom}$  3.0, for  $r_{Max}$  substitute '0.2' for '0.3'.

(Page 3, Table 2) - Under  $d_{Nom}$  8.0, for  $d_{Min}$  substitute '7.85' for '6.85'.

(Page 4, Table 3):

- a) Under  $d_{Nom}$  2.0, for  $d_s^{Min}$  substitute '1.87' for '18.7'
- b) Under  $d_{Nom}$  3.0, for  $d_k^{Min}$  substitute '5.7' for '4.7'.

(Page 5, Table 4):

- a) Under  $d_{Nom}$  1.6, for  $d_{Min}$  substitute '1.55' for '1.5'.
- b) Under  $d_{Nom}$  2, for  $d_{Min}$  substitute '1.9' for '2.4'.
- c) Under  $d_{Nom}$  3, for  $d_{Min}$  substitute '2.9' for '3.9'.

(EDC 71)

**AMENDMENT NO. 2      DECEMBER 1984****TO****IS : 2998-1982   SPECIFICATION FOR COLD FORGED STEEL RIVETS  
FOR COLD CLOSING ( 1 to 16 mm DIAMETER )****( First Revision )****Corrigenda**

( *Page 1, clause 5.4* ) — Substitute the following hardness values for Grade 1 and Grade 2:

**Grade 1 — 56 to 78 HRB ( 100 - 139 VPN )**

**Grade 2 -- 48 to 73 HRB ( 91 - 127 VPN )**

( *Page 2, Table 1* ) — Under  $d$  Nom 1.2, for  $d_k$  Min substitute ' 1.72 ' for ' 1.82 '.

**Alterations**

( *Pages 3, 4 and 5 and Tables 2, 3 and 4* ) — Substitute the following values for  $d_k$  Min for the sizes given below:

$d$	1.2	(1.4)	(3.5)	4.0	5.0	6.0	7.0	8.0	10	12	14	16
	2.15	2.55	6.42	7.42	9.42	11.3	13.3	15.3	19.16	23.16	27.16	31
$d_k$ Min	for	for	for	for	for	for	for	for	for	for	for	for
	2.25	2.65	6.64	7.64	9.64	11.57	13.57	15.57	19.48	23.48	27.48	31.38

( *Page 6, Table 5, 1st column* ) — Substitute

$\begin{matrix} +0.5 \\ -0 \end{matrix}$  for  $l \leq 10$                   for                   $\begin{matrix} +0.5 \\ 0 \end{matrix}$  FOR  $d \leq 10$

$l$  TOL  $\begin{matrix} +1.0 \\ 0 \end{matrix}$  for  $10 < l \leq 20$                   ' $l$  Tol  $\begin{matrix} +1.0 \\ 0 \end{matrix}$  FOR  $d > 10$ '  
 $+1.5$  for  $l > 20$

**AMENDMENT NO. 3      JULY 1987**

**TO**

**IS:2998-1982    SPECIFICATION FOR COLD FORGED  
STEEL RIVETS FOR COLD CLOSING  
(1 to 16 mm DIAMETER)**

**(First Revision)**

**(Page 1,    clause 5.4 and Amendment No. 2) -  
Substitute the following for the existing matter:**

**"5.4 Hardness Test - When tested according to  
IS:1501-1984 'Method for vickers hardness test for  
metallic materials (second revision)' the hardness  
on the head of rivets shall be as under:**

**Grade 1 - 100 - 139 HV (56-78 HRB)**

**Grade 2 - 91 - 127 HV (48-73 HRB)"**

**(EDC 71)**