

JIS

JAPANESE INDUSTRIAL STANDARD

Hot headed rivets

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Hot headed rivets

B 1214-1995

1. Scope This Japanese Industrial Standard specifies the hot headed⁽¹⁾ rivets made of steel for general purposes, boilers and ships (hereafter referred to as "rivets").

Note ⁽¹⁾ This means that the heads are formed by plastic working at the temperature of transformation point or higher of the material, but it does not mean that these are formed by hot caulking.

Remarks: The standard cited in this Standard is as follows:

JIS G 3104 Steel bars for rivet

2. Types The rivets shall be classified into seven types of round head rivets, countersunk head rivets, cheese head rivets, raised countersunk head rivets, round head rivets for boilers, raised countersunk head rivets for boilers, and raised countersunk head rivets for ships according to the shapes of head and distinction of use for boilers or for ships.

3. Mechanical properties

3.1 Toughness of head When the rivets have been tested in accordance with the specifications of 7.(1)(a), neither any breakage at the conjunction part of the head and shank, nor any cracking at underhead fillet shall take place.

3.2 Toughness of shank When the rivets have been tested in accordance with the specifications of 7.(1)(b), no crack shall take place on the periphery of flattened test piece.

4. Shapes and dimensions The shapes and dimensions of the rivets shall be in accordance with Table 1.

Table 1. Shapes and dimensions

Type	Shape and dimensions
Round head rivet	Attached Table 1
Countersunk head rivet	Attached Table 2
Cheese head rivet	Attached Table 3
Raised countersunk head rivet	Attached Table 4
Round head rivet for boiler	Attached Table 5
Raised countersunk head rivet for boiler	Attached Table 6
Raised countersunk head rivet for ship	Attached Table 7

5. Surface conditions The surface of the rivet shall be smooth, and be free from cracks and harmful defects in use such as flaws, burrs, flashes and peelings.

Informative reference: The flashes should preferably be such extent as not exceeding m and n of the following Informative reference Table 1.

Informative reference Table 1. Widths and thicknesses of flashes

Unit: mm

	10	12	13	14	16	18	19	20	22	24	25	27	28	30	32	33	36	40	44
Nominal diam.																			
Width (m)	0.3				0.4	0.5				0.6									
Thickness (n)	0.4				0.5	0.6				0.7				0.8					

6. Materials The materials of the rivets shall be in accordance with Table 2. However, when other materials than given in the Table are to be used, it shall be subject to the agreement between the purchaser and supplier.

Table 2. Materials

Type	Material	Main use
Round head rivet	SV330 of JIS G 3104	For general use
Countersunk head rivet		
Cheese head rivet		
Raised countersunk head rivet		
Round head rivet for boiler	SV400 of JIS G 3104	For boiler
Raised countersunk head rivet for boiler		
Raised countersunk head rivet for ship		For ship

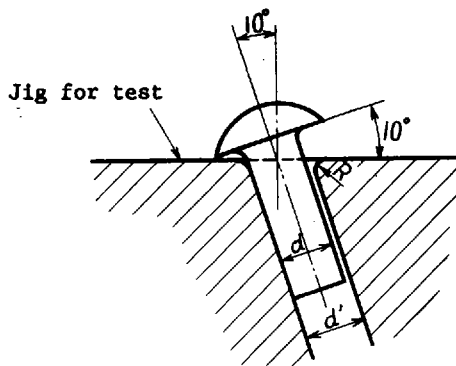
7. Inspections The inspections of the rivets shall be in accordance with the following:

Further, the sampling inspection plan in the lot inspection shall be subject to the agreement between the purchaser and supplier.

(1) **Inspection on mechanical properties** The inspection on mechanical properties shall be in accordance with the following:

(a) **Toughness of head** Insert the rivet into the hole of jig for test inclined 10° in respect to the vertical line as given in Fig. 1, and strike the head until its bearing surface comes in close contact with the surface of the jig at an ordinary temperature, the results shall conform to the requirements of 3.1.

Fig. 1. Inspection on toughness of head



d : nominal diameter of rivet
 d' : diameter of hole
 R : about $0.2d$

Diameter of hole of jig for test

Unit: mm

Nominal diameter	Diameter of hole d'	Nominal diameter	Diameter of hole d'	Nominal diameter	Diameter of hole d'
10	$10^{+0.90}_{+0.75}$	19	$19^{+1.17}_{+0.96}$	28	$28^{+1.17}_{+0.96}$
12	$12^{+0.93}_{+0.75}$	20	$20^{+1.17}_{+0.96}$	30	$30^{+1.37}_{+1.16}$
13	$13^{+0.93}_{+0.75}$	22	$22^{+1.17}_{+0.96}$	32	$32^{+1.42}_{+1.17}$
14	$14^{+0.93}_{+0.75}$	24	$24^{+1.17}_{+0.96}$	33	$33^{+1.42}_{+1.17}$
16	$16^{+0.93}_{+0.75}$	25	$25^{+1.17}_{+0.96}$	36	$36^{+1.42}_{+0.17}$
18	$18^{+1.13}_{+0.95}$	27	$27^{+1.17}_{+0.96}$	40	$40^{+1.42}_{+1.17}$

- (b) **Toughness of shank** Sample the test piece of $1.5d$ in length from the shank of the rivet as given in Fig. 2, and apply the compressive load in its axial direction at an ordinary temperature until the height becomes $1/3d$ as given in Fig. 3. The results shall conform to the requirement of 3.2.

Where, the dimension d is the nominal diameter of the rivet. However, if it is impossible to carry out at the ordinary temperature, it may also be performed by heating to the caulking temperature of approx. 800°C in use of rivet.

Fig. 2. Test piece

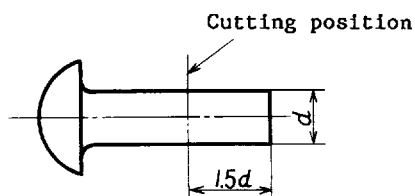
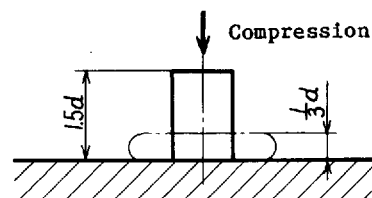


Fig. 3. Compressive load



- (2) Inspection on shape and dimensions The inspection on shape and dimensions shall be carried out by the direct measurement, limit gauges or other method, and the results shall conform to the requirements of 4.
- (3) Appearance inspection The appearance inspection shall be carried out by the visual inspection, and the results shall conform to the requirements of 5.

8. Designation The rivets shall be designated by the number of the Standard⁽²⁾, type⁽³⁾, nominal diameter (d) $\times$ length (l) and material. However, if any item is particularly required to designate, it shall be appended after the above.

Notes ⁽²⁾ The number of the Standard may be omitted unless particularly required.

⁽³⁾ When the number of the Standard is not used in the designation, the name of type is prefixed with "hot". However, when it is not necessary and those of for boilers and for ships, this may also be omitted.

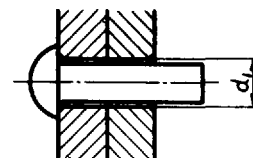
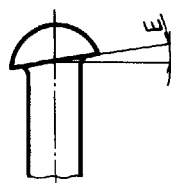
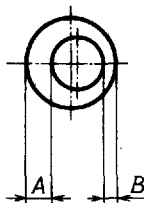
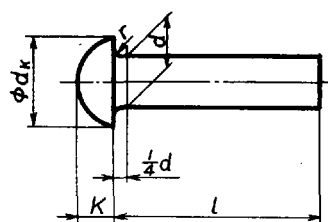
Examples: JIS B 1214		Round head rivet	16 $\times$ 40	SV330
		Hot countersunk head rivet	20 $\times$ 50	SV330
		Round head rivet for boiler	13 $\times$ 30	SV400
(The number of the Standard)		(Type)	($d \times l$)	(Material)

9. Marking on package Each package shall be marked with the following information on its outer surface.

- (1) Type
- (2) $d \times l$
- (3) Material
- (4) Quantity and designated item
- (5) Manufacturer's name or abbreviation

Attached Table 1. Round head rivets

Eccentricity
of head Inclination of
bearing surface



Unit: mm

Nominal diameter(*)	Column 1	10	12			16			20	
	Column 2				14		18			22
	Column 3			13				19		
Shank diameter (d)	*	10	12	13	14	16	18	19	20	22
	Tolerance	+0.6 0					+0.8 0			
Diameter of head (d _k)	*	16	19	21	22	26	29	30	32	35
	Tolerance	+0.5 -0.25		+0.55 -0.3			+0.6 -0.35			
Height of head (K)	*	7	8	9	10	11	12.5	13.5	14	15.5
	Tolerance	+0.6 0					+0.8 0			
Radius under head (r) ⁽⁵⁾	Max.	0.5	0.6	0.65	0.7	0.8	0.9	0.95	1.0	1.1
A-B	Max.	0.5	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.1
E	Max.	2°								
Hole diameter (d ₁)	(Reference)	11	13	14	15	17	19.5	20.5	21.5	23.5
Length (l)	Basic dimension	10								
		12	12							
		14	14	14						
		16	16	16	16					
		18	18	18	18	18				
		20	20	20	20	20	20			
		22	22	22	22	22	22	22		
		24	24	24	24	24	24	24	24	
		26	26	26	26	26	26	26	26	
		28	28	28	28	28	28	28	28	28
		30	30	30	30	30	30	30	30	30
		32	32	32	32	32	32	32	32	32
		34	34	34	34	34	34	34	34	34
		36	36	36	36	36	36	36	36	36
		38	38	38	38	38	38	38	38	38
		40	40	40	40	40	40	40	40	40
		42	42	42	42	42	42	42	42	42
		45	45	45	45	45	45	45	45	45
		48	48	48	48	48	48	48	48	48
		50	50	50	50	50	50	50	50	50
			52	52	52	52	52	52	52	52
			55	55	55	55	55	55	55	55
			58	58	58	58	58	58	58	58
			60	60	60	60	60	60	60	60
				62	62	62	62	62	62	62
				65	65	65	65	65	65	65
					68	68	68	68	68	68
					70	70	70	70	70	70
						72	72	72	72	72
						75	75	75	75	75
						80	80	80	80	80
							85	85	85	85
							90	90	90	90
								95	95	95
								100	100	100
									105	105
									110	110
										115
										120
	Tolerance	+1.0 0							+1.5 0	

* Basic dimension

Notes ⁽⁴⁾ Select those from column 1 preferentially, and from column 2 and column 3 in order, as required.⁽⁵⁾ The numerical value of r is of the maximum of radius under head, and the underhead shall be rounded in any case.