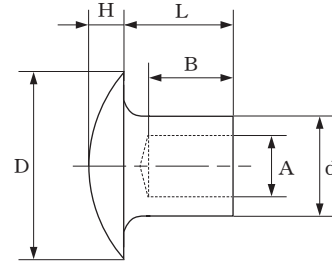


Self-Piercing Rivet



[MOVIE] <http://www.byora.co.jp/index/products/movies/self-piercing.html>

Shape and symbols of standard dimensions



Name

Low round Self-piercing 3 × 3.5

- ① Type of head (Low round, flat and countersunk)
- ② Rivet type (Self-piercing)
- ③ Nominal diameter (See the specification table.)
- ④ Under-head shank length (See the specification table.)

Material

Standard specification : Steel (high-carbon steel)
 Special specification : Stainless steel or aluminum
 (Please ask us.)

Surface treatment

Zinc plating, nickel plating, chrome plating,
 Geomet or head baked finish

Specification table

Unit (mm)

| Nominal diameter | | 2 | 3 | 3.6 | | | 4 | | | 5 | | | | |
|--------------------------------------|-----------|-----------|-----|-------|-----|-----|-----------|-----|-----|-----|-----|-----|-----|-----|
| d | Standard | 2 | 3 | 3.6 | | | 4 | | | 5 | | | | |
| | Tolerance | +0.02 | | | | | ±0.05 | | | | | | | |
| D | Standard | 3.7 | 5.5 | 6.6 | | | 7.4 | | | 9.6 | | | | |
| | Tolerance | 0 -0.3 | | | | | 0 -0.4 | | | | | | | |
| H | Standard | 0.6 | 1.0 | 1.2 | | | 1.5 | | | 1.8 | | | | |
| | Tolerance | ±0.05 | | | | | | | | | | | | |
| A | | 1.2 | 1.8 | 2.2 | | | 2.4 | | | 2.9 | | | | |
| B | | 1.5 | | L×0.8 | | | | | | | | | | |
| L | | 2.0 | 2.3 | 3.5 | 3.9 | 4.2 | 4.5 | 4.5 | 5.0 | 5.5 | 5.5 | 6.0 | 6.5 | 7.0 |
| Recommended total material thickness | | 0.3 | 0.4 | 0.9 | 1.0 | 1.6 | 2.1 | 1.8 | 2.3 | 2.8 | 1.8 | 2.6 | 3.1 | 3.6 |
| | | 0.6 | 0.8 | 1.6 | 1.8 | 2.1 | 2.6 | 2.3 | 2.8 | 3.2 | 2.6 | 3.3 | 3.8 | 4.3 |

Note) (1) The size of a self-piercing rivet is subject to trial fastening.

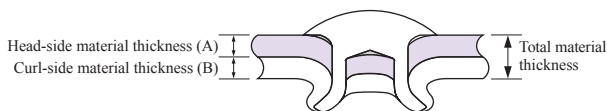
(2) Please ask us for the following requirements.

- (i) The types of workpieces are different from steel plates for general mechanical structures.
- (ii) The difference in thickness between the two workpieces is extremely large.
- (iii) The total material thickness is outside the recommended fastening range.

(3) Flat head and countersunk rivets are made to order.

Fastening strength measurement test

Fastening conditions

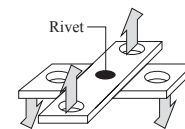


[Test Example] Cold-rolled steel plate, Material thickness: Intermediate value of fastening range
 [Rivet] Self-piercing rivet (steel)

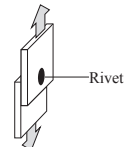
Test method

[Testing machine]
 Testing machine : Compliant with the JIS B 7721
 Test speed : 15 mm/min

[Tensile strength test method]
 *JIS Z 3137



[Shear strength test method]
 *JIS Z 3136



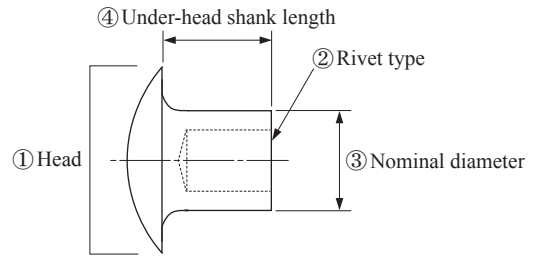
| Fastening test conditions (mm) | | | | Strength measurement result (kN) | |
|--------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------|
| Rivet | Head-side material thickness (A) | Curl-side material thickness (B) | Total material thickness (A + B) | Tensile fracture | Shear fracture |
| 2 × 2 | 0.25 | 0.25 | 0.50 | 0.24 | 0.58 |
| 3 × 3.5 | 0.60 | 0.60 | 1.20 | 1.18 | 1.97 |
| 3.6 × 4.5 | 1.20 | 1.20 | 2.40 | 2.97 | 4.21 |
| 4 × 5.5 | 1.60 | 1.60 | 3.20 | 4.80 | 6.90 |
| 5 × 7 | 1.60 | 2.30 | 3.90 | 9.10 | 11.20 |

Note) The strength values given in the brochure are measurement results obtained by our testing. They may vary with the type or thickness of materials used.
 In designing, be sure to allow a safety factor of at least three to one.

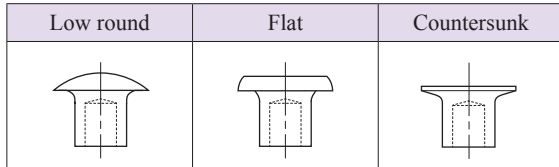
Name

Low round Self-piercing 3 × 3.5

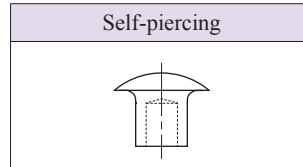
- ① Type of head (Low round, flat and countersunk)
- ② Rivet type (Self-piercing)
- ③ Nominal diameter (See the specification table.)
- ④ Under-head shank length (See the specification table.)



Types of heads



Rivet type



Nominal diameter / Under-head shank length

Unit (mm)

| Nominal diameter | 2 | | 3 | | 3.6 | | | 4 | | | | 5 | | | |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Under-head L | 2.0 | 2.3 | 3.0 | 3.5 | 3.9 | 4.2 | 4.5 | 4.0 | 4.5 | 5.0 | 5.5 | 5.5 | 6.0 | 6.5 | 7.0 |
| Fastening range | 0.3 | 0.4 | 0.4 | 0.9 | 1.0 | 1.6 | 2.1 | 1.2 | 1.8 | 2.3 | 2.8 | 2.0 | 2.7 | 3.2 | 3.7 |
| | 0.6 | 0.8 | 1.2 | 1.6 | 1.8 | 2.1 | 2.6 | 1.8 | 2.3 | 2.8 | 3.2 | 2.7 | 3.2 | 3.7 | 4.3 |

Note) The table is based on assumption that workpieces of SPCC (painted or plated) with hardness of Hv120 or equivalent are fastened.

Rivet installation criteria (Countersunk rivets and sealed self-piercing rivets (see page 22) are excluded.)

| External quality | Space under head | There shall be no space between the head and around the workpiece. |
|------------------|------------------|--|
| | Height | Rivet shank diameter x 0.5 (guide) |
| | Buck-tail | There shall be no large cracks. |
| | Constriction | There shall be no constriction around the workpiece. |
| | Eccentricity | The buck-tail shall have an almost uniform shape. |
| | Diameter | Rivet shank diameter x (1.5 to 1.7) (guide) |

Comparison of strength with other fastening techniques

Shear strength(kN)

