

**GENERAL SPECIFICATION FOR CUP PLUG****1. SCOPE**

This specification describes the dimensional requirements for expansion plugs. Retention and sealing is produced by mechanical interference fit between plug and bore. Anaerobic sealant is often applied to the bore before plug installation to seal surface imperfections.

Alternate names for expansion plugs are:

- Cup plug
- Core plug
- Freeze plug

2. DIMENSIONS**Plug dimensions**

Shall conform to each of the dimensions shown in Table 1

Diameter Measurements, d (Fig. 2)

- Diameter measurements shall be taken 0.5mm from the edge of the plug.
- The diameter is the average of four equally spaced measurements taken from the perimeter of the cup plug.
- Diameter measurement is before plating.
- After plating, diameter may be 0.024mm greater than table 1 values.

Roundness Measurements

- Roundness is the difference between the max and min diameter measurement.
- Roundness must be less than 0.080mm for carbon steel and 304 stainless-steel.
- Roundness must be less than 0.100mm for 430 stainless-steel.

Taper Angle Measurement (Fig. 3)

- Shall be calculated based on diameter d and d_2 .
- Diameter d_2 shall be measured at a location equal or greater than h_2 .
- The distance between measurement d and d_2 is h' .
- The angle is equal to inverse TAN of $(d-d_2)/2/h'$

Inner Radius, r_2

Is equal to material thickness ± 0.5 mm. It is not necessarily mean centered and will vary among manufacture.

Thickness, S

Is measured in the domed portion of the plug.

Gage Diameter, d_5 , d_6 (Fig. 1)

Is intended to match the installation tool.

$$d_5 = \text{Min Bore Diameter} - 2 * S_{\text{Nom}} - 0.55 \text{ mm}$$

$$d_6 = d_5 - 2 * r_2 \text{ Nom.}$$



Surface Finish and Flatness, h_2

Applies to the full length of h_2 .

R_z 11 max

R_{max} 14

Traverse/evaluation length $\geq h_2$

Measured with 5 micron with skid less stylus

This surface must not be distorted and must be free from burrs, die marks, and pits of any size.

Recommended Hole Dimensions

For hole dimensions refer to Table 2

3. WORKMANSHIP

Plugs shall be free from visual contaminants, all hanging burrs, loose scale and slivers that can be dislodged in use and any other defects that can affect the function of the parts. Unless otherwise specified, surface finish on all surfaces shall be R_a 3.2 μm .

Figure 1 Plug Dimensions

