

Technical Tip #68 – Plain Cylindrical Pin Gages

Go-No Go plain cylindrical gages are used to ensure plain holes are within tolerance. If the Go member is long enough to check the entire depth of the hole, it will be used to check hole straightness from top to bottom.

Special design “locating” gages can be used to check the position of holes. Plain gages are commonly used to check the minor diameter of tapped holes produced by a drill prior to tapping.

Plain cylindrical gages are available in four classes: “XX”, “X”, “Y”, and “Z”. “XX” gages are made to the tightest tolerance and used for master or setting gages, or for part tolerances that are very precise. “X” tolerance gages are sometimes used for master gages or gaging close work. “Y” and “Z” gages are generally used for inspecting workpieces only.

Selecting the right class of cylindrical gage is very important to ensure that “bad” parts are rejected, that “good” parts are not rejected. If a lower class gage is used on a tight tolerance part, the gage tolerance will consume most of the part tolerance and reject the part as “bad”. In this case, a “good” part might be rejected. Gage manufacturers call this “thievery” when gage tolerance “steals” part tolerance.

To ensure acceptance of the maximum number of good parts, select a gage class using the “5% rule”. That is, the gage tolerance should be no more than 5% of the part tolerance.

For example, if the part tolerance is 0.001”, the gage tolerance should be no more than 0.00005”. Select a class that has a 0.00005” tolerance or less.

See the Kennametal Gages catalog for gage standards charts for classes and tolerances. You will find the catalog by visiting www.kennametal.com. and going to the Products/Metalworking/Tapping section.