PO Box 2161
MANSFIELD, QLD, 4122
Ph: 07 3275 2097
Fax: 07 3014 8764

If you haven't found it, you probably haven't tried MBA

www.minibearings.com.au sales@minibearings.com.au

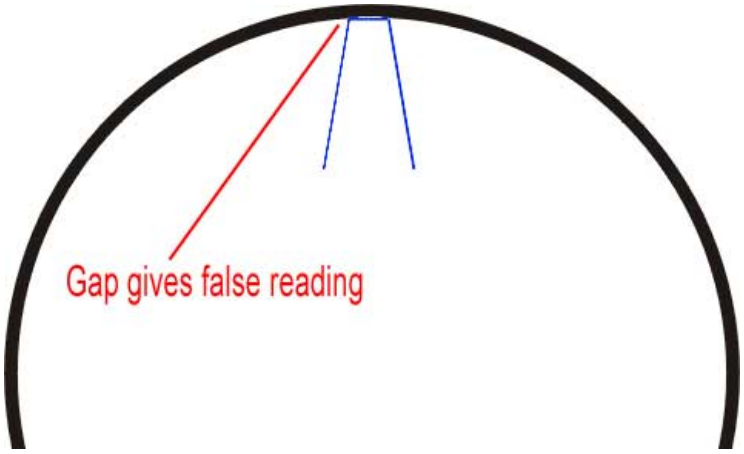
Measuring Miniature Bearings and Parts

This information sheet is intended to offer an insight into some common errors encountered when measuring miniature bearings or other miniature parts.

Digital Verniers

The most prevalent cause of incorrect measurements by our customers comes from the use of digital verniers. Digital verniers can lose their precision very quickly with rough handling or fast movements of the slider. Digital verniers need to be calibrated regularly, checked before a measurement is taken, and moved slowly into position against the object being measured.

Flat Measuring Piece



This is something people rarely take into account when measuring the inside diameter of round miniature parts. The measuring bar on the verniers has a very small flat on it – it is never razor sharp. When you place a flat object against the inside of a curved object you get a small gap between the objects. The width of the flat is not very large, usually around 0.2 to 0.3mm, but when you are measuring the inside of a 4mm diameter bearing 0.2mm flat is quite a lot. It is a little like trying to get an accurate measurement of a 200mm diameter bearing using verniers with a 10mm wide measuring bar.

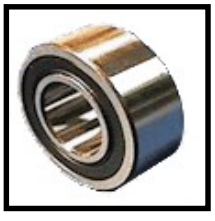
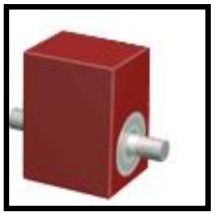
So if you are constantly measuring the inside of miniature bearings a little under their nominal size, this could be the reason.

Too Much Pressure

All verniers have some gap between their moving parts, otherwise they wouldn't be able to move. This gap is very small, but if you apply too much pressure when measuring parts, the gap will close up giving a very slightly false reading. When





MBA

PO Box 2161
MANSFIELD, QLD, 4122
Ph: 07 3275 2097
Fax: 07 3014 8764

If you haven't found it, you probably haven't tried MBA

www.minibearings.com.au sales@minibearings.com.au

measuring miniature parts this false reading can appear quite large in comparison with the diameter being measured.

Temperature

Something that is often overlooked is the effect of temperature on measurements. The size of all objects will vary with increases or decreases in temperature. Standard bearing tolerances are designated at around 24°C. A change in temperature will vary the size of an object by the co-efficient of thermal expansion for that object. The larger the object and the larger the temperature change, the greater the change in size.

Trying to be Too Accurate

We sometimes have customers say that they need a precision bearing and it must be "spot on" a particular size. This is impossible. All bearings are produced to within specified tolerances. A standard bearing under 10mm bore has tolerances of +0.000/-0.008mm at standard temperature of 24°C. This means that a bearing to suit a nominal 8mm shaft size can vary between 7.992 and 8.000 mm at standard temperature. The mating parts (shaft and housing) are also machined to a range of tolerances to suit the bearing depending on what type of fit is required. Higher precision bearings have closer tolerances, but are still subject to temperature change and the machining tolerances of the shaft and housing.

What's the Best Way to get the Right Size?

Assuming there is no part number on the item, measuring the bearing or part will usually be sufficient to identify the correct size. What we are saying is that you shouldn't be put off, and think that you have something special just because the size you measure is out by a few microns (1 micron = 0.001mm). Try to eliminate the common causes of error shown above. Whilst special sizes are sometimes made, the majority of the parts you measure will be standard sizes.

If in doubt, the best thing you can do is to try to get hold of the original manufacturers specifications for the part required.