

Measuring Dowel Pins Is Tougher Than You Think

By Joe Greenslade

Recently we have had several calls asking for help on correctly measuring the diameters of standard and oversized dowel pins. These requests are coming in because of measurement discrepancies between pin manufacturers, distributors, and end users.

used to measure dowel pins must have a minimum resolution of .000020 inches (twenty millionths of an inch). This practice is suggested so that you have enough increments to be able to clearly determine if the measurement is inside or outside of the required specification.

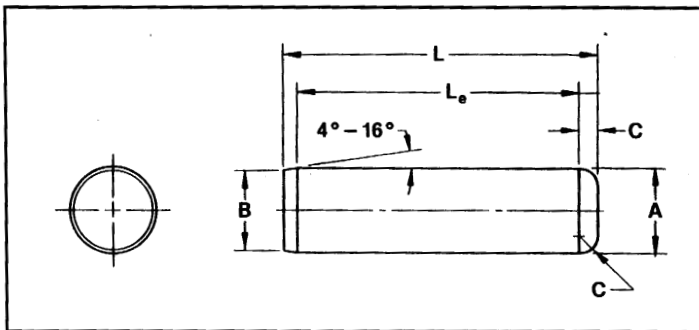


Figure 1. Typical dowel pin.

At a quick glance most people assume that a dowel pin should be very easy to inspect because its basic dimensions are a simple diameter and a simple length. This assumption is in error because of the fact that the standard total tolerance on dowel pins is only .0002 inches (two ten thousandths of an inch). Good measuring practice requires that you use a measuring instrument having a resolution with a minimum of 10 increments within the total tolerance. This means that the instrument

You cannot use a standard micrometer, caliper, dial, or digital indicator to measure dowel pins accurately. The most practical instrument set up to measure dowel pins accurately is what is called a bench comparator combined with a short travel measuring cartridge head connected to a digital readout. This instrumentation has a resolution of .000005 inches (five millionths of an inch). This equipment can be connected to a printer to record the

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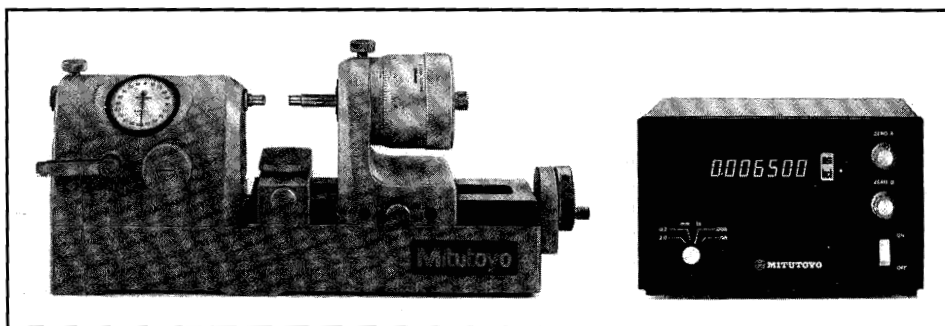


Figure 2. Bench comparator with digital readout for measuring dowel pins and other items very precisely.

dowel pin diameter size readings for future verification. The bench comparator is designed to provide a constant measuring pressure which is important in obtaining consistent readings when measuring in these extremely small tolerance ranges.

The cost of this instrument system is between \$4,300 and \$4,700 depending on whether the printer and its accessories are included or not. Grade A gage blocks must be used to set up the instrument for measuring. Pictures of the bench comparator and readout are shown in Figure 2.

Another important consideration when



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measuring within these close tolerances is the environment in which the measurements are made. If a supplier and purchaser of dowel pins measure the same pins with the same instruments, but do the measurements in rooms differing in temperature of 10 degrees F or more, they may obtain different measurements. For this reason it is recommended that all suppliers and purchasers of dowel pins should make acceptance measurements of dowel pin diameters in calibration environments. That is in a room having a temperature of 68 degrees F \pm 1 degree F and a maximum of 50 percent humidity. The pins should be placed in this area for 2 to 24 hours before measurement so that they stabilize at that temperature before being measured.

This seems like a lot of expense and trouble to measure a simple dowel pin, but the facts remain that in products having a total tolerance of only .0002 inches, this kind of care is required to obtain accurate measurements which will correlate between two or more parties.

It appears that many suppliers of dowel pins have not taken this kind of care in measuring these products in the past. To measure dowel pins accurately and repeatably this is the kind of equipment and procedures which need to be used. As long as instruments of insufficient resolution without pressure control, are used in uncontrolled environments, dowel pin measurement controversies will continue to arise for suppliers. \square

— Meet the Author —

Meet and hear Joe Greenslade speak on "Dealing Effectively with Customer Quality Complaints" on Wednesday, May 13 at 9:00 a.m. to 10:00 a.m. at the National Industrial Fastener Show and Conference.

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