

Quick Guide to Surface Roughness

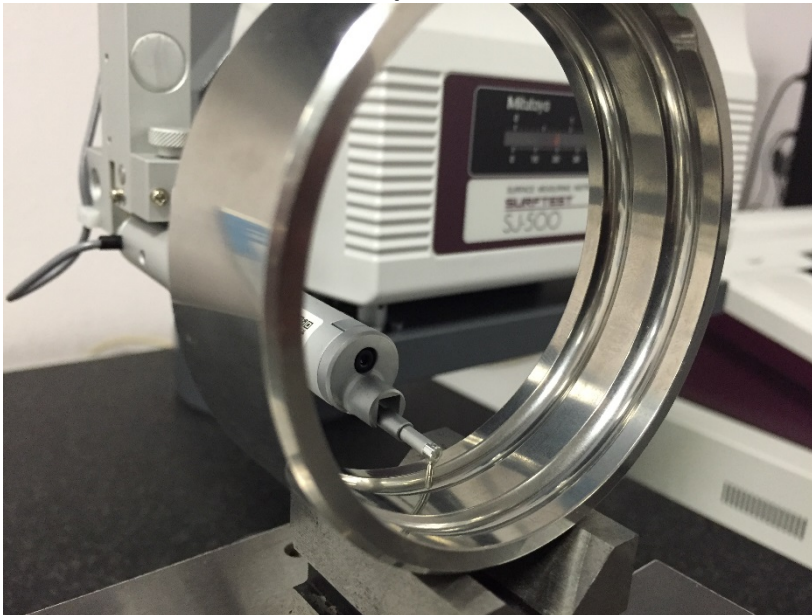
Equipment Selection Guide: Surface Roughness (1 of 3)

5 Reasons to Ditch Comparative Surface Measurement

Whether your part is flat, round, big, small, made of metal or plastic, a surface roughness callout is to be expected to be on your print. Without this callout, rotating and sliding parts can fail prematurely. Quality labs and machine shops that use roughness comparators and references are likely to pass non-conforming parts because they provide a poor job of accurately identifying surface roughness. A profilometer is surface roughness measuring device that uses a drive unit to trace a diamond-tipped detector along the surface of a part, picking up the miniscule but significant surface grooves of the part. Testing surfaces with these machines is the most accurate and acceptable way to achieve a true, quantifiable roughness value.

Give brief explanation on what a profilometer is and what it does.

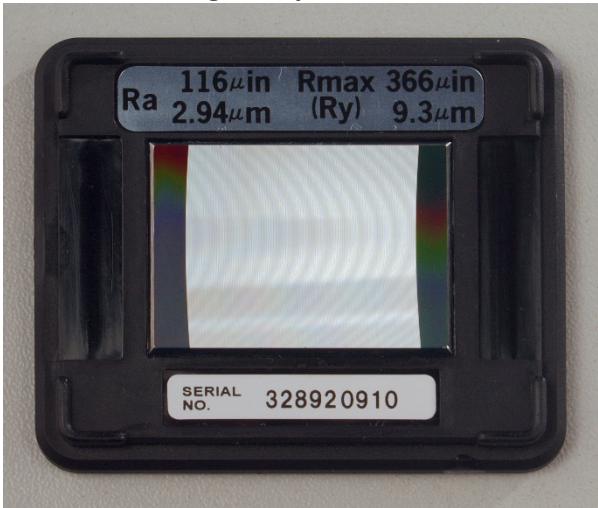
1. Can't measure hard-to-reach places



Problem: Comparators cannot check inside diameters, narrow grooves, and processes that don't produce a lay such as: injection molding, powder metallurgy, and investment casting that will require multiple traces.

Solution: Profilometers

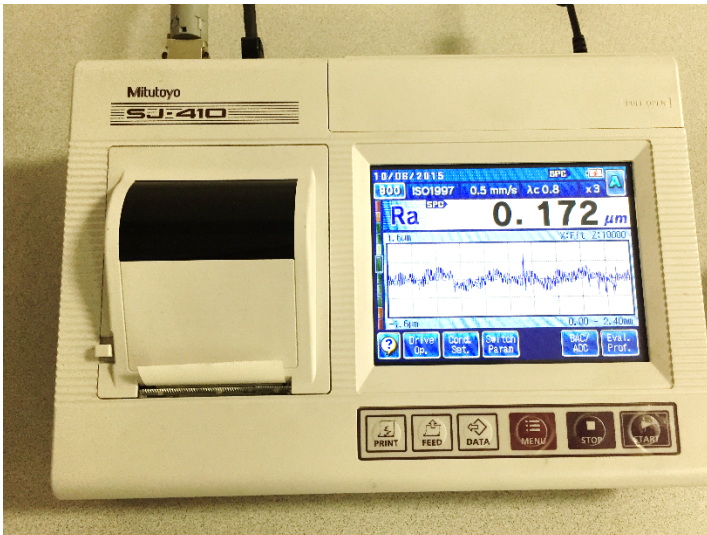
2. Limited to a single Ra parameter.



Problem: Comparators are limited to a single R_a parameter. When parameters or machine processes change, comparators become obsolete. Part drawings can specify a number of different parameters depending on the application of the part. Profilometers can calculate roughness values according to the print such as: the arithmetic average (R_a), root mean squared (R_q), highest peak (R_p), deepest valley (R_v), max peak to valley (R_y), etc.

Solution: One profilometer can replace all known comparators. Give an explanation.

3. No variable data



Problem: Comparators lack variable data, accuracy and dependability to track process capability.

Solution: Data from your profilometer is more reflective of the drawing requirements as well as operator accountability. The display unit will show the roughness value according to the specified value, as well as the waveform of the data picked up by the detector for the measured sampling length that can be printed or outputted to a spreadsheet or statistical processing software. How does it do this?

4. Operator variation

Problem: Good luck with a Gage R&R. Repeatability and reproducibility tests are difficult, if not impossible to pass with a comparator.

Solution: Drive units and detectors on a profilometer are designed to trace a path with a high accuracy and repeatability to pass a Gage R&R so the data is less dependent on operator variation

5. Your finger can't measure in the millionths



Problem: You will have better luck scratching off a lotto ticket. This is especially true on finer finishes.

Solution:

For more information on surface roughness, form and contour, please call your local Mitutoyo representative or visit our website at www.mitutoyo.com. Can we add a phone number (yours???) so customers can contact us directly?

Next Month: Skid vs. Skidless