

Talyrond® 595H

Metrology of diamond turning tool tip waviness

TJ Campbell, Applications Engineer

In optics, single point diamond tips are employed to cut the optic surface. Form error or waviness, on the tool tip can be imparted onto the optical surface. The Talyrond® 595H can help manufacturers of these tips to characterise this form error to improve their process.

To measure these tips, they are angled upwards so the cylindrical cutting surface is parallel to the measurement column (as shown in figures 1 & 2).

The center of the cylinder is nominally aligned to the spindle center and an automated routine of partial roundness measurements is used to precisely center the component to <math><0.3 \mu\text{m}</math> of eccentricity.

With the component precisely aligned, the Talyrond® 595H's accurate air bearing spindle rotates the tip through the cutting sweep collecting data points every 0.005° . This metrology method allows for a single point of contact between the diamond or ruby stylus using one precision axis of measurement with an accuracy of $0.015 \mu\text{m}$.

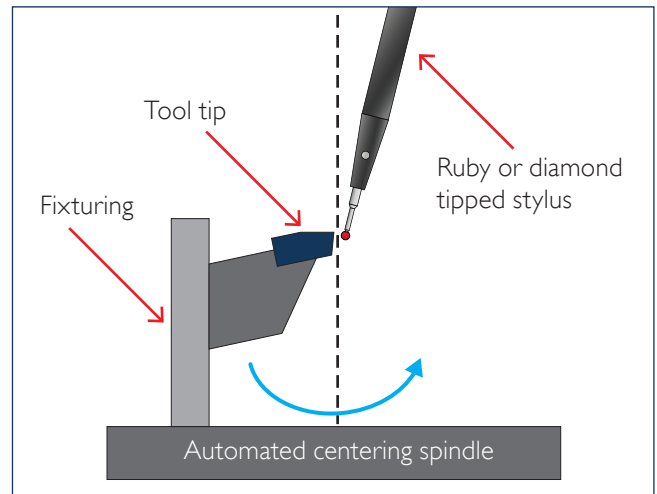


Figure 1 - Schematic of measurement setup

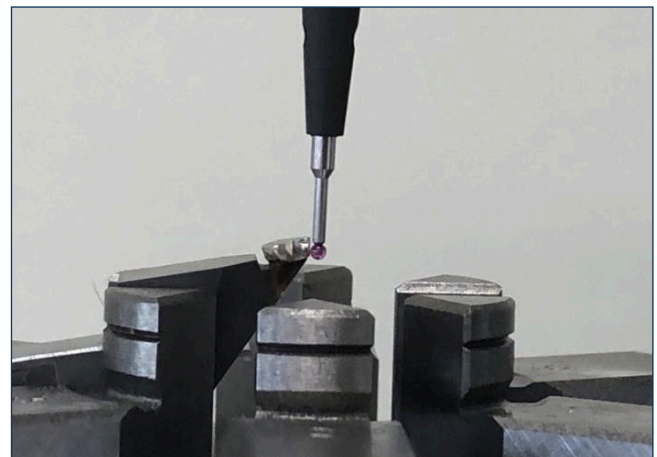


Figure 2 - Tool tip on the Talyrond® 595H

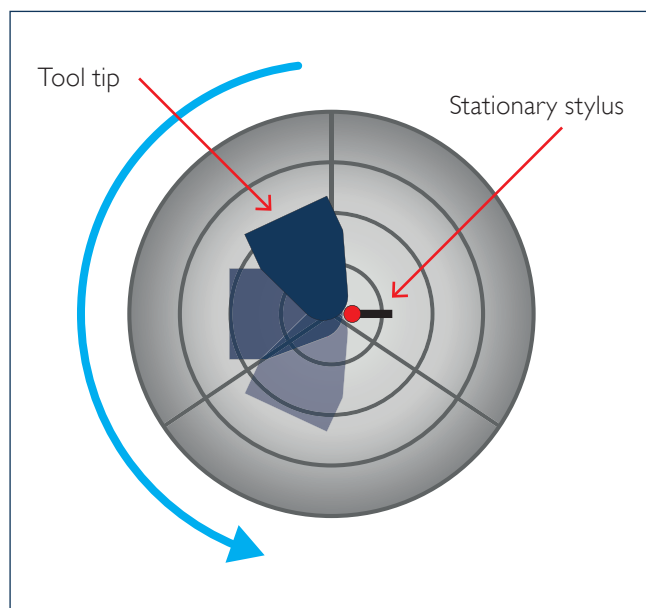


Figure 3 - Schematic of measurement



Figure 4 - Example waviness result

The Metrology Experts

Established in 1886, Taylor Hobson is the world leader in surface and form metrology and developed the first roundness and surface finish measuring instruments.

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