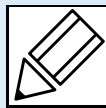


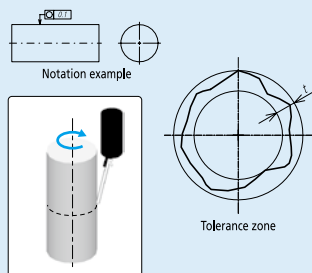
Quick Guide to Precision Measuring Instruments



Roundtest (Roundform Measuring Instruments)

Roundness

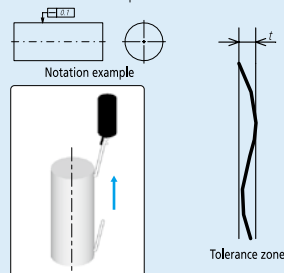
Any circumferential line must be contained within the tolerance zone formed between two coplanar circles with a difference in radii of t



Verification example using a roundness measuring instrument

Straightness

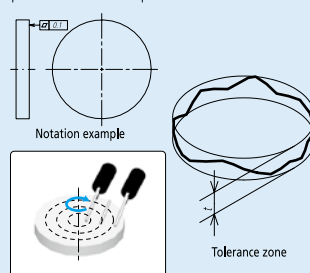
Any line on the surface must lie within the tolerance zone formed between two parallel straight lines a distance t apart and in the direction specified



Verification example using a roundness measuring instrument

Flatness

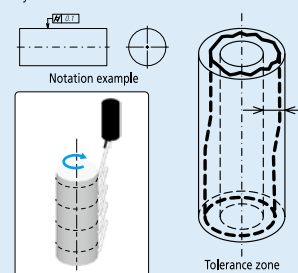
The surface must be contained within the tolerance zone formed between two parallel planes a distance t apart



Verification example using a roundness measuring instrument

Cylindricity

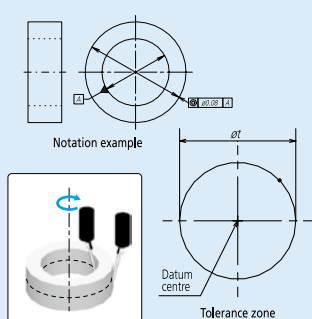
The surface must be contained within the tolerance zone formed between two coaxial cylinders with a difference in radii of t



Verification example using a roundness measuring instrument

Concentricity

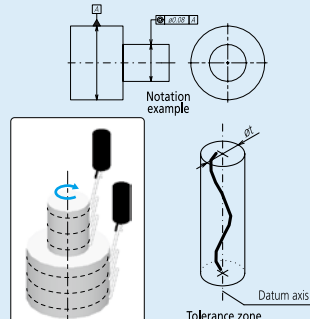
The centre point must be contained within the tolerance zone formed by a circle of diameter t concentric with the datum



Verification example using a roundness measuring instrument

Coaxiality

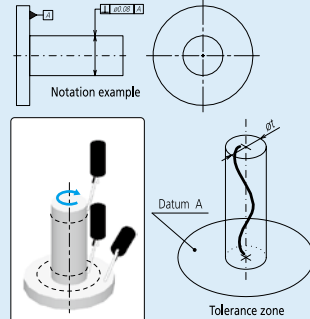
The axis must be contained within the tolerance zone formed by a cylinder of diameter t concentric with the datum



Verification example using a roundness measuring instrument

Perpendicularity

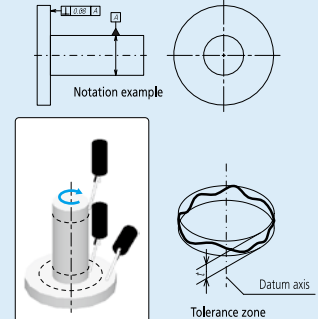
The line or surface must be contained within the tolerance zone formed between two planes a distance t apart and perpendicular to the datum



Verification example using a roundness measuring instrument

Total Runout

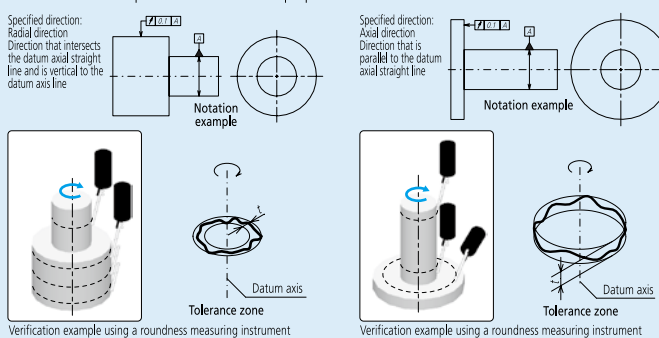
The surface must be contained within the tolerance zone formed between two coaxial cylinders with a difference in radii of t , or planes a distance t apart, concentric with or perpendicular to the datum



Verification example using a roundness measuring instrument

Circular Runout

The line must be contained within the tolerance zone formed between two coplanar and/or concentric circles a distance t apart concentric with or perpendicular to the datum

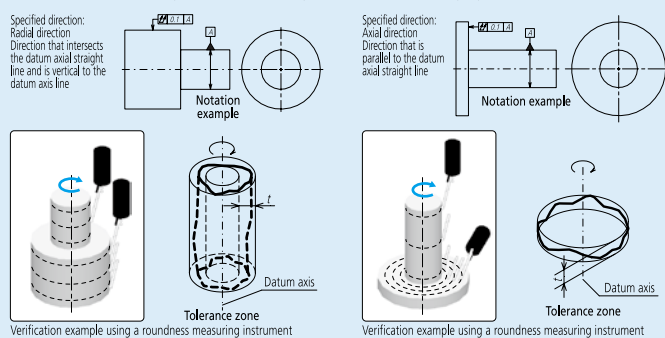


Verification example using a roundness measuring instrument

Verification example using a roundness measuring instrument

Total Runout

The surface must be contained within the tolerance zone formed between two coaxial cylinders with a difference in radii of t , or planes a distance t apart, concentric with or perpendicular to the datum



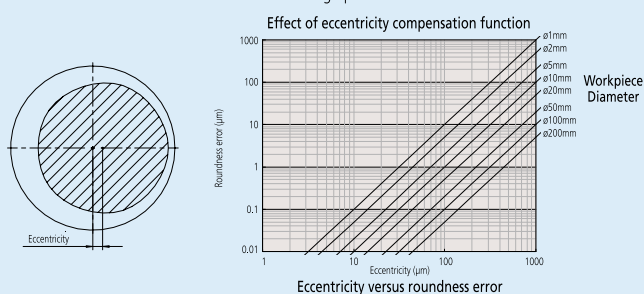
Verification example using a roundness measuring instrument

Verification example using a roundness measuring instrument

Adjustment prior to Measurement

Centering

A displacement offset (eccentricity) between the Roundtest's turntable axis and that of the workpiece results in distortion of the measured form (limaçon error) and consequently produces an error in the calculated roundness value. The larger the eccentricity, the larger is the error in calculated roundness. Therefore the workpiece should be centered (axes made coincident) before measurement. Some roundness testers support accurate measurement with a limaçon error correction function. The effectiveness of this function can be seen in the graph below.



Levelling

Any inclination of the axis of a workpiece with respect to the rotational axis of the measuring instrument will cause an elliptic error. Levelling must be performed so that these axes are sufficiently parallel.

