

INSPECTING A PRISMATIC PART 321

Class Vocabulary

Term	Definition
Actual Local Size	A size dimension that indicates the measurement of a section of a feature that is formed by an intersecting imaginary plane. Also called cross-sectional dimension, actual local size is often measured with calipers or a micrometer.
Actual Mating Envelope	AME. A geometrically perfect shape that is a best fit around a feature. AME can be established by inspecting a feature's height with a functional gage, as well as inspecting the feature's cross sectional dimensions.
Angularity	A three-dimensional orientation tolerance that describes the allowable variability in the angular relationship between a surface and a datum. Angularity is a related tolerance.
CAD	Computer-aided design. A computer software program that aids in the automated design and technical precision drawing of a part, product, process, or building. A CAD model can be used like a part drawing.
Calipers	A measuring instrument with a pair of jaws on one end and a long beam containing a marked scale of unit divisions. The jaws can measure both internal and external features.
Coordinate Measuring Machine	CMM. A sophisticated measuring instrument with a flat polished table and a suspended probe that measures parts in three-dimensional space. CMMs can measure using either contact or noncontact methods.
Cross-Sectional Dimension	A size dimension that indicates the measurement of a section of a feature that is formed by an intersecting imaginary plane. Also called actual local size, cross-sectional dimensions are often measured with calipers or a micrometer.
Dial Indicator	A measuring instrument with a contact point attached to a spindle and gears that move a pointer on the dial. Two opposing dial indicators can be used to measure the flatness, profile of a surface, angularity, and parallelism of a prismatic part.
Flatness	A three-dimensional form tolerance that describes the allowable variability in the shape and appearance of a surface that lies in a plane. Flatness is an individual tolerance.
Functional Gage	A gage representing a worst case mating part that provides a simple pass/fail assessment of the inspected part. Functional gages often can quickly inspect several features at once.
Gage Wire	Wire of a standardized diameter length that is used to measure part features during inspection. Gage wire is used to inspect the straightness, profile of a line, and perpendicularity of a prismatic part.
Height Gage	A measuring device with a column mounted on a base such as a granite surface plate, a unit that slides up and down, an indicator, and an arm that extends out. Height gages are used to measure vertical and other distances.
Hypotenuse	The longest side of a right triangle always opposite the 90 degree angle. To find the measurement of a hypotenuse, use the Pythagorean theorem ($A^2 + B^2 = C^2$) and solve for C.
Maximum Material Condition	MMC. The point at which a feature contains the greatest amount of material within its acceptable size limit. The smallest acceptable hole and the largest acceptable shaft are examples of MMC.
Micrometer	A U-shaped measuring instrument with a threaded spindle that slowly advances toward a small anvil. Micrometers are available in numerous types for measuring assorted dimensions and features.
Optical Comparator	A sophisticated measuring instrument that projects an image of a part onto a screen to compare the shape, size, and location of its features to the original. Also called optical projectors, they can measure both surface and profile features of either the length and width of a part but not the depth.
Parallelism	A three-dimensional orientation tolerance that describes the equal distance between pairs of points, lines, or planes. Parallelism is a related tolerance.
Perpendicularity	A three-dimensional orientation tolerance that describes the allowable variability in the 90° angular relationship between a surface and a datum. Perpendicularity is a related tolerance.
Position	A three-dimensional geometric tolerance that controls how much the location of a feature can deviate from its true position. Position is a related tolerance.

Precision Square	An L-shaped tool that forms a 90° angle. Precision squares are used to inspect the perpendicularity of one surface in comparison with another.
Prismatic Part	A solid geometric figure with two end faces that are parallel polygons whose corners are connected by perpendicular lines.
Profile Of A Line	A two-dimensional profile tolerance that describes the allowable variability in the contour of the edge seen in the section view. Profile of a line can be either an individual or a related tolerance.
Profile Of A Surface	A three-dimensional profile tolerance that describes the allowable variability in the contour of a surface. Profile of a surface can be either an individual or a related tolerance.
Pythagorean Theorem	A mathematical rule describing how sides of a right triangle are related. The Pythagorean theorem states that the sum of the square of both sides equals the square of the hypotenuse ($A^2 + B^2 = C^2$).
Regardless Of Feature Size	RFS. A modifier indicating that the stated tolerance for a feature applies regardless of its actual size within an acceptable size limit. If the location is controlled regardless of feature size, it should be inspected with a variable gage.
Sine Bar	A measuring device used to measure angles. A steel bar with matching cylinders at each end set up work at various angles for the machining and inspection of parts.
Size Dimension	A dimension that indicates a linear measurement. Size dimensions are inspected first during part inspection.
Straightness	A two-dimensional form tolerance that describes allowable variability in the shape and appearance of a line in a section view. Straightness is an individual tolerance.
Tolerances	An unwanted but acceptable variation or deviation from a desired dimension of a part. The object will still meet specifications.
Total Indicator Reading	TIR. The absolute value of the total deviation of a dial indicator's movement. TIR is calculated to inspect the total runout of a cylindrical part or the flatness of a prismatic part.
True Position	The imaginary perfect position of a feature described by the design specifications. The location of a feature's true position is determined by the positional tolerance.
True Profile	The perfect, imaginary profile described by the design specifications. The profile tolerances compare the actual profile of a feature to the true profile.
Virtual Condition	VC. A constant worst case imaginary boundary used when parts are toleranced for assembly that is defined by the collective effects of a feature's size and geometric tolerance. For an external feature, the VC is the outer boundary. For an internal feature, the VC is the inner boundary.