





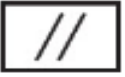









Type of Tolerance	Symbol	Characteristic	Description
Form		Straightness	Indicates the surface of the part or component must remain within designated tolerances and be flat. The part surface must not bend outside the designated tolerance area.
		Flatness	Specifies how flat a surface must be regardless of any other datum's or features. The flatness tolerance references two parallel planes used to define the zone where the surface must remain.
		Circularity	Describes how closely the feature or object is to a perfect circle and indicates there are no edges or corners on the part.
		Cylindricity	Describes how closely a feature or part comes to being a perfect cylinder. The tolerance for cylindricity is the 3D version of circularity
Orientation		Perpendicularity	Indicates that the connection between two parts should maintain a 90° or right angle. Could be applied to surfaces that mate together or on an axis.
		Angularity	Describes the specific orientation of one feature to another at a referenced angle
		Parallelism	Defines where two lines within a design should never meet. Parallelism is commonly used to indicate where two surfaces are parallel to each other. As in the opposite sides of a part.

Type of Tolerance	Symbol	Characteristic	Description
Location		Concentricity	Also known as coaxiality, concentricity is a tolerance that controls one parts central axis to another part.
		Symmetry	Defines the relationship between different measurement surfaces within a part over a centered datum plane.
		True Position	True position allows control of the exact location of a point or feature location on a part. Position represents the nominal value.
Runout		Runout	Specifies the amount of variance allowed in a rotating mechanical part or system. Runout is measured by rotating a part while maintaining a fixed plane to the datum indicated in the symbol.
		Total Runout	Specifies the amount of variation in the entire surface as the part is rotated. Radial variation and axial variation are measured and must be held within the tolerance.
Profile		Profile of a Line	The all inclusive symbol for surfaces profile tolerances can control the size, location, orientation or form of any surface feature.
		Profile of a surface	The all inclusive symbol for surfaces profile tolerances can control the size, location, orientation or form of any surface feature.