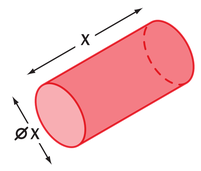
GD&T Symbols and Guidelines Cheat Sheet

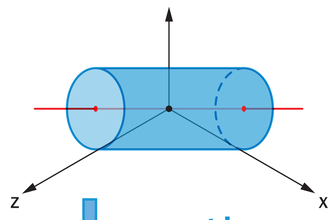
Provided by GD&T Basics - www.gdandtbasics.com

To learn more about our premium GD&T Training Program visit our website or contact us at : info@gdandtbasics.com

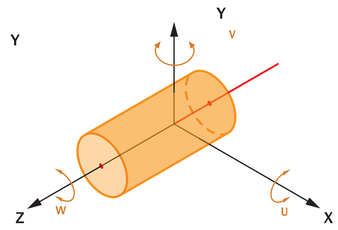
The 4 Fundamental Elements of GD&T:



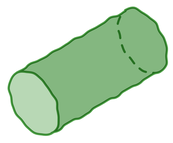
Size



Location

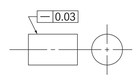
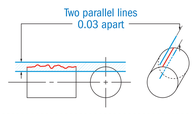
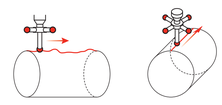
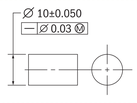
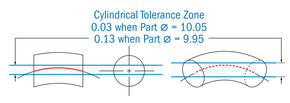
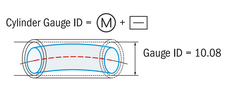
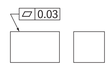
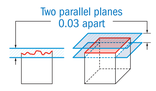
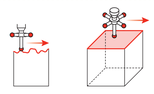
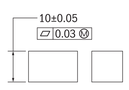
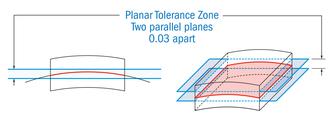
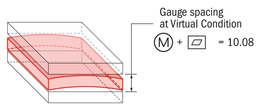
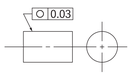
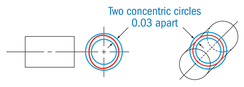
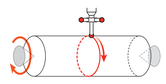
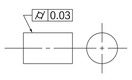
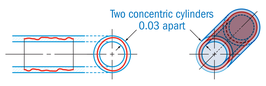
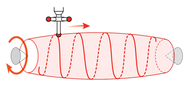
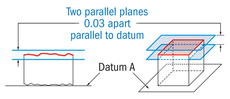
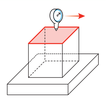
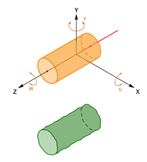
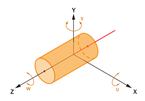
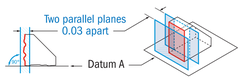
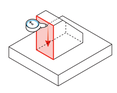
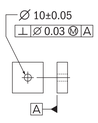
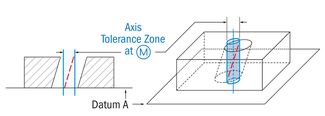
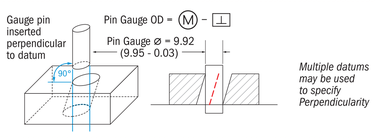
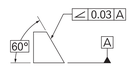
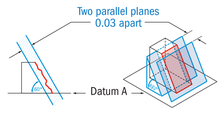
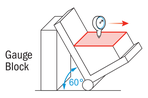
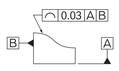
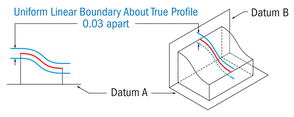


Orientation



Form

All drawings made in first angle projection

SYMBOL	NAME	ON DRAWING	TOLERANCE ZONE	GAUGING	SURFACES	FEATURES OF SIZE
FORM						
—	**Straightness** (Surface)				**F** 	**F** (Derived Median Line and Plane) 
— Ⓜ	**Straightness** (Derived Median Line w/ Ⓜ)					
▱	**Flatness** (Surface)					
▱ Ⓜ	**Flatness** (Derived Median Plane w/Ⓜ)					
○	**Circularity**					
⌭	**Cylindricity**					
ORIENTATION						
//	**Parallelism**			 Flat datum block (Datum A) Gauge kept parallel to datum	**OF** 	**O** 
⊥	**Perpendicularity** (Feature)			 Flat datum block (Datum A) Gauge kept perpendicular to datum		
⊥ Ⓜ	**Perpendicularity** (Feature of Size w/ Ⓜ)			 *Multiple datums may be used to specify Perpendicularity*		
∠	**Angularity**			 Gauge Block		
PROFILE						
⌒	**Profile of a line**	 *Basic dimensions (not shown) are required to define the True Profile when datums are used.*		Gauge must follow true profile. Profile is usually measured with a CMM.	**SLOF**	
⌓	**Profile of a surface**	*Basic dimensions (not shown) are required to define the True Profile when datums are used.*		Gauge must follow true profile. Profile is usually measured with a CMM.		
LOCATION						
⌖	**Position**			Measure X and Y location and compare to the true position. $2X\sqrt{(Actual X - True X)^2 + (Actual Y - True Y)^2}$ This formula must be less than the Ø True Position tolerance	None	**LO**
⌖ Ⓜ	**Position** (Maximum Material Condition)		Gauge Hole Ø = Virtual Condition (Largest Pin Size [MMC] + Position Tol.)	FUNCTIONAL GAUGING: For an External Feature / For an Internal Feature Gauge Pin Ø = Virtual Condition (Smallest Hole Size [MMC] - Position Tol.)		
◎	**Concentricity**	*Diameter Symbol is required*		The following is usually done with a CMM: 1. Determine Datum axis 2. Measure referenced surface 3. Determine if central axis falls in TZ	Distribution/ Evenness of Form Only	**LOF** (Derived Median Points)
⌯	**Symmetry**		Two parallel planes 0.03 apart	Datum A Plane The following is usually done with a CMM: 1. Determine Datum plane 2. Measure both surfaces of features 3. Determine if midpoints fall in TZ		
RUNOUT						
↗	**Runout**		Datum A Fixed axially + Rotated	Datum A Fixed + Rotated *Can also be used on flat surfaces perpendicular to the datum axis*	**LOF**	
⌰	**Total Runout**		Datum A Fixed axially + Rotated	Datum A Fixed + Rotated *Can also be used on flat surfaces perpendicular to the datum axis*		