















GD&T Symbols Reference Chart

This is your convenient guide for Geometric Dimensioning and Tolerancing (GD&T) symbols. Click on any link below to learn more about each GD&T symbol or concept. You can also download a PDF version of this information by clicking the button:

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Control Type	Characteristic	GD&T Symbol	Notes
Form	Flatness		Controls form (shape) of size and non-size features.
	Straightness		Datum reference is not allowed
	Circularity (Roundness)		Controls form (shape) of size features only.
	Cylindricity		Datum reference

	Perpendicularity		is not allowed. Controls orientation (tilt) of surfaces, axes, or median planes for size and non-size features.
Orientation No relation between features	Parallelism		Datum reference required.
	Angularity		Optional: Angularity symbol may be used for all orientation controls.
Location	Position		Locates center points, axes and median planes for size features. Can also control orientation.
	Profile of a Surface		Locates surfaces by

			describing a tolerance zone around the surface or line.
	Profile of a Line		Can also be used to control size, form, and orientation based on datum reference.
Runout	Total Runout		Controls surface coaxiality
	Circular Runout		Can also control form and orientation of surfaces
Location of derived median points.	Concentricity		Locates derived median points of a feature
	Symmetry		Not common, consider position, runout, or

profile
instead

Feature Control Frames: Modifiers

Symbol	Modifier	Notes
	Free State	Only applies if part is otherwise restrained.
	Least Material Condition (LMC)	Useful to maintain minimum wall thickness
	Maximum Material Condition (MMC)	Provides bonus tolerance only for a feature of size
	Projected Tolerance Zone	Useful on threaded holes for long studs
	Regardless of Feature Size (RFS)	Not part of the 1994 standard
	Tangent Plane	Useful for interfaces where form is not required
	Unilateral	Appears in the 2009 version and refers to unequal profile distribution

A *Feature Control Frame* describes the conditions and tolerances of a geometric control on a part's feature.

Notes:

"RFS" means regardless of feature size. It simply means that whatever GD&T callout you make, it is controlled independently of the size dimension of the part. RFS is the default condition of all geometric tolerances (by rule #2 of GD&T) and requires no callout.