
















GEOMETRIC DIMENSIONING + TOLERANCE

CHARACTERISTIC	SYMBOL	DATUMS	NOTES	TYPE OF TOLERANCE
Straightness (of an axis)		DATUMS NOT ALLOWED	*Rule #1 Overridden	Form
Straightness (of a surface element)			*Rule #1 Applies	
Flatness			Tolerance must be less than size	
Circularity			Tolerance must be less than size	
Cylindricity			Tolerance must be less than size	
Angularity		DATUMS REQUIRED	Also controls flatness of surface	Orientation
Perpendicularity			Feature modifiers OK if diameter is used	
Parallelism			Also controls flatness of surface	
Circular Runout		DATUMS REQUIRED	*Rule #1 Applies	Runout
Total Runout			*Rule #1 Applies	
Profile of a Line		DATUMS REQUIRED	*Rule #1 Applies	Profile
Profile of a Surface			*Rule #1 Applies	
Position		DATUMS REQUIRED	Can control surface boundary	Location
Concentricity			Controls opposing median points	
Symmetry			Controls opposing median points	

***Geometric Dimensioning & Tolerancing ASME Y14.5M-1994**

Rule #1 states that where only a tolerance of size is specified, the limits of size of an individual feature of size prescribe the extent to which variations in its geometric form, as well as its size, are allowed. No element of a feature shall extend beyond the MMC boundary of perfect form. The form tolerance increases as the actual size of the feature departs from MMC toward LMC. There is no perfect form boundary requirement at LMC.

TOLERANCE CLASSES

ABOVE	TO + INCLUDING	XXX	XX	X	Y	Z
.010-" .254mm	.825-" 20.96mm	.000010-" .00025mm	.000020-" .00050mm	.000040-" .00100mm	.000070-" .00175mm	.000100-" .00250mm
.825-" 20.96mm	1.510-" 38.35mm	.000015-" .00038mm	.000030-" .00075mm	.000060-" .00150mm	.000090-" .00225mm	.000120-" .00300mm
1.510-" 38.35mm	2.510-" 63.75mm	.000020-" .00050mm	.000040-" .00100mm	.000080-" .00200mm	.000120-" .00300mm	.000160-" .00400mm
2.510-" 63.75mm	4.510-" 114.55mm	.000025-" .00063mm	.000050-" .00125mm	.000100-" .00250mm	.000150-" .00375mm	.000200-" .00500mm
4.510-" 114.55mm	6.510-" 165.35mm	.000033-" .00083mm	.000065-" .00163mm	.000130-" .00325mm	.000190-" .00475mm	.000250-" .00625mm
6.510-" 165.35mm	9.010-" 228.85mm	.000040-" .00100mm	.000080-" .00200mm	.000160-" .00400mm	.000240-" .00600mm	.000320-" .00800mm
9.010-" 228.85mm	12.010-" 305.05mm	.000050-" .00125mm	.000100-" .00250mm	.000200-" .00500mm	.000300-" .00750mm	.000400-" .01000mm

Tolerances stated in chart are total allowed on any gage member.

DIRECTION OF TOLERANCES

Plug Gages:

- + Go Member—Tolerance applied to plus side
- + No Go Member—Tolerance applied to minus side
- + Master (Bilateral)—Tolerance is equally split plus and minus

Ring Gages:

- + Go Member—Tolerance applied to minus side
- + No Go Member—Tolerance applied to plus side
- + Master (Bilateral)—Tolerance is equally split plus and minus

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