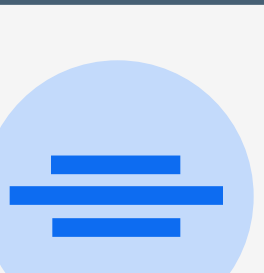
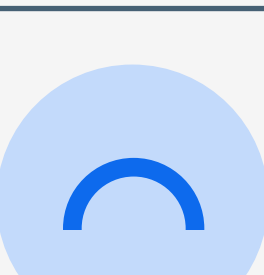
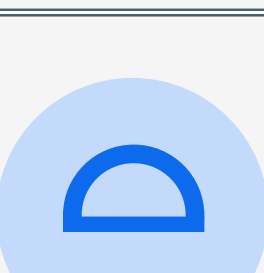
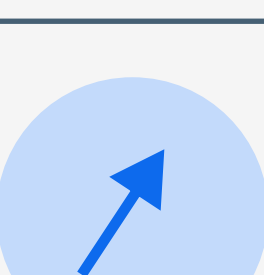
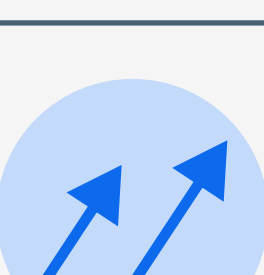
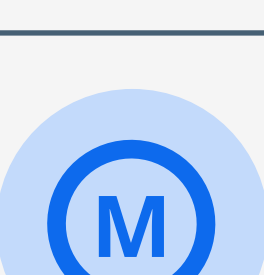
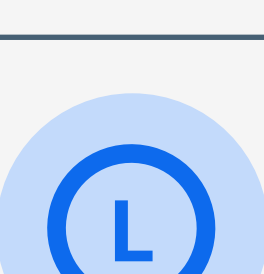


Symbol & Name		Description	When To Use	Drawing Examples
	Flatness	All surface points must fall between two parallel planes. (No datum.)	Mating/sealing faces need even contact; fixtures need stable seating.	Base plate surface lies flush on the granite table without rocking.
	Straightness	Axis deviation limited inside a small cylindrical zone. (Feature of size.)	Guide shafts/spindles need true axes for smooth motion and low wear.	Long shaft runs within straightness limits—no mid-span bow.
	Cylindricity	Entire cylindrical surface must fit a single coaxial tolerance cylinder.	Rotating/press-fit cylinders must run true along their length.	Bearing journal conforms to one coaxial cylinder along its full length.
	Circularity (Roundness)	Every cross-section must fit between two concentric circles. (No datum.)	Isolated round sections need uniformity without building a DRF.	Turned shaft section measures uniformly round at every angle.
	Parallelism	Surface/axis oriented parallel to the datum within a defined zone.	Opposed faces/axes must track together to avoid tilt or pinch.	Top face of a machined block remains parallel to the bottom datum face.
	Perpendicularity	Surface/axis oriented 90° to the datum within a defined zone.	Bores to seats; square load paths; accurate alignments.	Milled edge is square (90°) to the datum surface.
	Angularity	Surface/axis oriented at a specified basic angle (≠90°) to a datum.	Non-right-angle features critical to meshing/flow/assembly.	Chamfer held at 45° relative to the base datum.
	Position	Locates an axis/center at true position (cylindrical zone; uses datums).	Patterns/pins/bores must assemble reliably across suppliers.	Flange bolt-hole centers located at their true positions on the pattern.
	Concentricity	Median points align to a datum axis.	Mass-center alignment for balance—usually replace with position/runout.	Stepped shaft's small diameter shares the same center as the pilot bore.
	Symmetry	Feature midplane centered on a datum plane.	Keep equal clearance/load on both sides of a midplane.	Forked slot walls are equally spaced about the center plane.
	Profile of a Surface	Entire surface must lie within a 3D tolerance band.	Freeform/compound faces must follow CAD for function/aesthetics.	Car-door outer skin follows CAD surface within the profile band.
	Profile of a Line	Any chosen section must lie within a 2D tolerance band.	Control edge/section smoothness where visual fit matters.	Bumper opening section matches the specified template curve.
	Circular Runout	Limits section variation during rotation about a datum axis.	Control face “wobble” at each section to reduce vibration.	Brake disc face shows minimal variation over one revolution.
	Total Runout	Limits full-surface variation during rotation.	Full-length journals/sealing surfaces must run true (NVH, leaks).	Driveshaft journal tracks true along its entire length while rotating.
	MMC (Maximum Material Condition)	Adds bonus tolerance as the feature departs from max material.	Clearance fits: pins/holes when assembly ease matters but strength is unaffected.	Locating hole at its smallest size permits bonus position tolerance.
	LMC (Least Material Condition)	Adds bonus tolerance as the feature departs from least material.	Edge distance / wall-thickness protection near holes or cutouts.	Edge-near hole retains minimum wall by using LMC bonus.
None	RFS (Regardless of Feature Size)	No bonus; geometry held regardless of actual size.	Optical mounts, sealing features, precision location despite clearance.	Alignment bore held at position regardless of actual size.