

Injection Molding DFM Checklist

Design for Manufacturability — Pre-Tooling Review

✓	★ Wall Thickness (Critical)
☐	Nominal wall thickness defined and documented for each material
☐	All walls within 25% of nominal thickness
☐	No sudden thick-to-thin transitions without gradual taper (3:1 min ratio)
☐	Cored-out bosses and ribs – no solid thick sections
✓	★ Draft Angles (Critical)
☐	All vertical surfaces have minimum 0.5° draft (polished) or 1° draft (standard)
☐	Textured surfaces have draft $\geq 1.5^\circ$ per side (verify with mold texture spec sheet)
☐	Deep cavities (>50 mm) have increased draft – 1° per 25 mm depth minimum
☐	No zero-draft surfaces in the direction of mold opening
✓	★ Undercuts (Critical)
☐	All undercuts identified in 3D review (side holes, clips, threads, recesses)
☐	Each undercut assigned to: eliminate / lifter / side action / hand insert
☐	Tooling cost and lead time impact of each undercut estimated
☐	Snap-fit geometry reviewed – compliant beam preferred over rigid side-action hook
✓	Ribs and Bosses
☐	Rib thickness 40–60% of nominal wall
☐	Rib height $\leq 3 \times$ wall thickness
☐	Rib base fillet radius $\geq 0.25 \times$ rib thickness
☐	Bosses not adjacent to outer walls (minimum 2× wall gap)
☐	Boss wall thickness 40–60% of nominal wall
☐	Boss height $\leq 2 \times$ boss outer diameter

✓ Gate and Parting Line	
☐	Gate location proposed and approved – not on Class-A cosmetic surfaces
☐	Weld line locations predicted (Moldflow recommended for structural parts)
☐	Weld lines located away from high-stress zones
☐	Parting line placement defined – at geometric edges where possible
☐	No stepped parting lines on Class-A surfaces
✓ Material and Shrinkage	
☐	Material specification confirmed (grade, filler, color)
☐	Shrinkage rate documented and applied to mold cavity dimensions
☐	Anisotropic shrinkage considered for glass-filled or long-fiber materials
☐	Material compatibility with mold steel confirmed (corrosive materials → stainless)
✓ Cooling and Ejection	
☐	Cooling circuit layout reviewed – uniform temperature distribution targeted
☐	Ejector pin locations on structural/non-cosmetic surfaces
☐	Sufficient ejector pin area to prevent deformation at ejection
☐	No undercut or sharp re-entrant geometry in ejection direction

★ *Critical items must be resolved before tooling release.*