

Injection Mold Manufacturing Process Checklist (Industry-Standard)

Phase	Step	Owner	Inputs	Key Checks	Deliverables	Acceptance Criteria	Record / Proof	Risk
Phase 1: RFQ Intake & Feasibility								
Phase 1: RFQ Intake & Feasibility	Requirements capture	Customer + Tooling Eng	3D CAD, 2D drawing, volume, resin grade, cosmetic class, tolerances, color	Identify missing info: shrink rate, datum scheme, CTQs, surface finish, inserts	RFQ intake checklist	All CTQs + missing data logged; assumptions explicitly stated	RFQ checklist version + email thread	Medium
Phase 1: RFQ Intake & Feasibility	Initial manufacturability screen	Tooling Eng	CAD/drawing	Draft direction, undercuts, wall thickness, rib-to-wall ratio, gate vestige, ejector witness	DFM quick notes	High-risk features flagged with recommended changes	Marked-up CAD screenshots	High
Phase 1: RFQ Intake & Feasibility	Tooling concept & quote assumptions	Program / Tooling Eng	DFM notes + target life	2-plate vs 3-plate; side actions; hot runner; steel selection; expected sampling plan	Concept summary + quote scope	Scope boundaries + change control included (ECN process)	Quote rev + assumptions log	Medium
Phase 2: DFM & Mold Design								
Phase 2: DFM & Mold Design	Formal DFM review	Tooling Eng + Customer	CAD + drawing + resin	Gate location, parting line, ejection, venting, cooling sink/warp, weld lines	DFM report (rev controlled)	Customer-approved DFM; CTQs identified and traceable	Signed DFM PDF + revision history	High
Phase 2: DFM & Mold Design	Mold design (2D/3D)	Mold Designer	Approved DFM	Mold base, side actions, inserts, alignment, ejection stroke, safety blocks, wear parts	Mold design package	Design checklist 100% passed; release drawing set complete	Design review checklist + CAD release	High
Phase 2: DFM & Mold Design	Optional moldflow / filling analysis	CAE	Resin grade, process window	Fill pattern, pressure, shear, air traps, weld lines, warpage, cooling balance	CAE report + recommendations	Risks translated into design actions (vents/cooling/gate)	CAE report + action log	Medium
Phase 3: Machining & Finishing								
Phase 3: Machining & Finishing	Steel & standard components	Procurement + QA	BOM + specs	Steel grade, cleanliness, heat-treat route, certifications	Material certificates	Certs complete; traceability maintained	Mill cert / COC	Medium
Phase 3: Machining & Finishing	CNC machining (rough/finish)	Machining	Released drawings + CAD	Datums, CTQ dimensions, EDM stock allowance, surface finish	Machined components	CTQs within tolerance; datums verified	In-process inspection sheets	High
Phase 3: Machining & Finishing	EDM / wire EDM	EDM	EDM drawings	Corner radii, shutoff integrity, electrode wear compensation	EDM-finished features	Critical shutoffs meet blue-fit requirements	Blue-fit photos / check notes	High
Phase 3: Machining & Finishing	Heat treat / hardness verification	Supplier + QA	Steel requirements	Distortion control, hardness range, temper records	Heat treat report	Hardness within target range; distortion evaluated	Hardness report + before/after checks	Medium
Phase 3: Machining & Finishing	Polish / texture / coating	Finishing	Cosmetic class spec	SPI finish level, texture orientation, coating thickness	Finish records	Cosmetic area meets spec; no polish waves in optical zones	Finish sign-off checklist	Medium
Phase 4: Assembly & T0/T1								
Phase 4: Assembly & T0/T1	Mold assembly	Toolmaker	All components	Action smoothness, ejection stroke, return system, safety blocks	Assembly checklist	No binding; all safety elements present; motion verified	Assembly sign-off sheet	High
Phase 4: Assembly & T0/T1	Cooling & utilities verification	Tooling Eng + Molding	Water-line diagram	Leak check, flow path, quick-connect labeling, TC ports	Pre-tryout report	Pressure test passed; circuits verified and labeled	Leak test record + photos	Medium
Phase 4: Assembly & T0/T1	T0/T1 sampling + baseline process	Molding Eng	Resin, press plan	Short-shot study, V/P transfer, pack/hold, cooling time, ejection, flash risk	Tryout report + samples	Data captured; defects mapped; dimensions measured on CTQs	Tryout report, parameter sheet, photos	High
Phase 5: Debug & T2/T3								
Phase 5: Debug & T2/T3	Defect triage & root cause	Tooling + Molding Eng	Tryout report	Separate mold-caused vs process-caused issues; confirm with evidence	Action log (8D/ECN)	Each defect has root cause + corrective action + verification plan	Action log + before/after samples	High
Phase 5: Debug & T2/T3	Implement tool changes	Toolmaker	Approved ECN	Version control, re-measure CTQs, protect shutoffs and vents	Updated mold build	Change documented; CTQs re-verified; no new failure modes	ECN + measurement report	Medium
Phase 5: Debug & T2/T3	Re-tryout verification	Molding Eng + QA	Updated mold	Confirm defect closure; validate process window robustness	Re-tryout report	Defect closed; CTQ dimensions stable across run	Re-tryout data + sample set	Medium
Phase 6: Acceptance & SOP								
Phase 6: Acceptance & SOP	FAI / dimensional layout	QA	Drawing + CTQ list	Measurement method, gage plan, repeatability for CTQs	FAI report	All required dimensions reported; CTQs meet spec or deviation plan	FAI PDF + measurement data	High
Phase 6: Acceptance & SOP	Run-at-rate	Molding Eng	Process window	Cycle time stability, yield, scrap modes, tool temperature control	Run-at-rate report	Meets output/yield target for defined duration	Run logs + quality checks	Medium
Phase 6: Acceptance & SOP	Tooling dossier + handover	Program / QA	All prior records	Rev-controlled drawings, BOM, spares list, PM schedule, safe handling	Tool book (dossier)	Complete, organized, reproducible setup; traceable revisions	Dossier index + file list	Low
Knowledge Library & Engineering FAQs								
Type	Topic	Summary/Answer						
Knowledge Snippet	Mold Manufacturing Process Definition	Typically follows six gated phases: RFQ feasibility, DFM, design, machining/heat treat, assembly/sampling, and debug/acceptance.						
Knowledge Snippet	Tryout Report Requirements	Includes press data, resin lot, process parameters (V/P, cooling), defect map, and CTQ dimensional results.						
Knowledge Snippet	Acceptance Readiness	Ready when mechanical safety is verified, CTQs meet print, defects are closed, and the tool dossier is complete.						
FAQ	Meaning of T0 / T1 / T2	T0: Initial function check. T1: Data-quality sampling with CTQ measurement. T2+: Re-tryout after ECN/rewrite.						
FAQ	Non-negotiable Acceptance Criteria	Safe mechanical function, verified leak-free cooling, traceable process parameters, and as-built documentation.						
FAQ	Is Moldflow always required?	Most valuable for thin-walls, high-cosmetics, or warp-sensitive parts. Otherwise, engineered DFM may suffice.						