



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

AUTOMOTIVE COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for automotive plastic component manufacturers: components, materials, mould requirements, production planning, automation, quality, worked examples and what to send for a machine recommendation.

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WHO THIS GUIDE IS FOR

Owners, plant and production managers, process engineers and purchase teams at Tier 1 and Tier 2 suppliers moulding car, two-wheeler and commercial-vehicle parts.

HOW TO USE IT

Sections 01 to 04 define the part, material and mould. Section 05 plans output. Sections 06 to 09 cover automation, quality, examples and your enquiry. Clamp force and shot sizing are covered in our Machine Selection Guide.

NEED A RECOMMENDATION?

Send your drawing, material, part weight, cavities and programme volume to sales@pratishnaengineers.com. The checklist in Section 09 lists what to include.

SECTION 01 · OVERVIEW

AUTOMOTIVE PLASTIC COMPONENTS & INJECTION MOULDING

Where plastics sit in a vehicle, which parts are injection moulded and what the automotive supply chain expects from a moulder.

HOW MUCH PLASTIC GOES INTO A VEHICLE

The American Chemistry Council reports that the average North American light vehicle contained 428 pounds of plastics and polymer composites in 2025, making up more than half of the vehicle's volume but less than 10% of its weight^[1].

In India, SIAM data for FY 2025-26 shows wholesales of 46.43 lakh passenger vehicles and 2.17 crore two-wheelers^[2]. Cars, two-wheelers and electric vehicles all carry moulded body, lighting, electrical and battery parts.

MAIN COMPONENT CATEGORIES

EXTERIOR BODY Fenders, two-wheeler mudguards, motorcycle side panels	INTERIOR Instrument panels, control knobs, decorative bezels	LIGHTING Head lamp lenses, tail lamp lenses	ELECTRICAL Connectors, fuse boxes, relay housings, junction boxes, sensor housings
FIXINGS Clips and fasteners	AIR INTAKE Air filter housings	BATTERIES Battery containers, covers and lids, terminal covers	ELECTRIC VEHICLES EV battery pack housings, EV charging guns

WHY INJECTION MOULDING SUITS THESE PARTS

- Complex shapes with clips, bosses, ribs and locating features in one part.
- Repeatable dimensions shot after shot, which vehicle assembly depends on.
- Moulded-in colour and texture on trims and two-wheeler panels.

TYPICAL MANUFACTURING CHALLENGES

- Large visible parts free of sinks, flow lines and gloss variation.
- Warpage of glass-filled electrical and battery parts.
- Many variants and colours across vehicle models.
- Documented, approved processes under customer quality systems.

WHERE MOULDING SITS IN THE AUTOMOTIVE SUPPLY CHAIN

COMPOUNDER OEM-approved grade	DRYING PA, PC, PBT, ABS	INJECTION MOULDING Tier 2 / Tier 1	SECONDARY paint, plate, seal	ASSEMBLY modules, inserts	APPROVAL PPAP, inspection	VEHICLE LINE OEM assembly
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KEY REQUIREMENTS FOR AUTOMOTIVE COMPONENTS

DIMENSIONAL FIT Parts assemble to mating parts at vehicle level, so locating features and warpage are controlled to the drawing.	SURFACE APPEARANCE Visible parts need consistent colour, gloss and texture, with no sinks, weld lines or tiger stripes.	ELECTRICAL & FIRE SAFETY Connectors, fuse boxes and EV parts use glass-filled, flame-retardant PA66 or PBT. EV pack covers may face thermal-runaway tests ^[8] .
INTERIOR FLAMMABILITY FMVSS 302 limits horizontal burn rate to 102 mm/min for materials within 13 mm of the occupant space ^[3] .	IMPACT & DURABILITY Fenders, mudguards and battery containers must survive impact, vibration, UV and temperature cycling.	QUALITY SYSTEM Suppliers work to IATF 16949 and customer-specific requirements ^[4] , with part approval through PPAP ^[5] .

SECTION 02 · COMPONENTS

MAJOR AUTOMOTIVE COMPONENTS

The injection-moulded automotive parts covered by this guide, their materials and what each asks of the moulding process.

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Fender	Front wing body panel	Modified or talc-filled PP, PA/PPO blend, TPO, ABS	Very large Class-A part; size drives the machine. Low warpage for gap and flush.
Instrument panel	Dashboard carrier and trims	Reinforced PP, ABS, PC/ABS, SMA, PPO	Large mould with many lifters; size drives the machine. Low odour and grain texture ^[9] .
Head lamp lens	Outer lens cover	PC, PMMA	Lens is PC with a scratch-resistant coating ^[6] . No specks, flow lines or weld lines in the light path.
Tail lamp lens	Rear combination lamp	PMMA, PC, ABS, PP	Lens is mainly PMMA; ABS or PP for housings. Colour-matched optics, often multi-shot.
Decorative bezel, control knob	Lamp and interior bezels, switch and HVAC knobs	ABS, PC/ABS, PC, ASA (bezels); ABS, PC, PC/ABS, POM, PBT (knobs)	Appearance parts, often plated or painted; gate marks kept out of view.
Automotive connector	Wiring harness connection	Glass-filled PA66, PA6, PBT	Glass-filled or flame-retardant engineering grades, not commodity plastics. Thin walls, latches, terminal cavities.
Fuse box, relay housing, junction box	Power distribution	PA66, PBT, PP, PA6	Glass-filled or flame-retardant PA66 or PBT. Many terminal pockets; flatness and latch function.
Sensor housing	Engine, chassis and body sensors	Glass-filled PBT, glass-filled PA6/PA66, PPS	Small precise parts, often with insert-moulded terminals. Sealing faces and dimensional stability.
Clip, fastener	Trim fixing, cable routing	POM, PA66, nylon, PP	Very high cavity counts. Snap-fit dimensions and consistent retention force.
Air filter housing	Engine air intake	PP, glass-filled PA6/PA66	Medium to large housing with sealing flange and clips. Flatness at the seal and heat resistance.
Battery container, cover / lid	Lead-acid battery case	Battery-grade PP, FR-ABS, ABS	Thin cell walls, deep draw and long strokes. Lid must seal to the container.
Battery terminal cover	Terminal insulation	PP, PVC, TPE	Small flexible part; PVC needs a corrosion-resistant screw and barrel.
Two-wheeler mudguard, side panel	Motorcycle and scooter body	PP, ABS, HDPE, nylon	Painted or moulded-in-colour surfaces. High volumes, many colour variants.
EV battery pack housing	Battery tray and cover	Glass-filled FR-PP (short or long fibre), glass-filled PA6/PA66, PC/ABS	Very large structural part; size drives the machine. Flame retardance and thermal-runaway performance ^[8] .
EV charging gun	Charging connector handle and body	FR-PBT, glass-filled FR-PA66/PA6, PC, PC/ABS, TPU	Flame-retardant glass-filled grades, insert-moulded contacts, TPU overmould for grip.

Not injection moulded: plastic fuel tanks and many ducts are blow moulded; seat foam is polyurethane.

APPEARANCE-CRITICAL Fenders, panels, lenses, bezels and knobs.	FUNCTION-CRITICAL Connectors, electrical boxes, sensors and EV parts.	SIZE-CRITICAL Instrument panels, battery containers and pack housings.
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SECTION 03 · MATERIALS

MATERIALS USED FOR AUTOMOTIVE COMPONENTS

Automotive grades are compounds tailored to one application. The OEM material specification sets the grade, not the moulder.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
PP compounds, TPO, HDPE	Fenders, instrument panels, battery containers and lids, air filter housings, mudguards, side panels	Low cost, impact resistance; talc and reinforcement add stiffness. Low-odour grades for interiors ^[9] .	Talc and rubber phases can cause tiger stripes ^[10] . Plan for shrinkage and warpage.	Scratch resistance, paint adhesion, emissions.
FR-PP, glass-filled	EV battery pack housings	Stiffness with flame retardance. A 4 mm FR glass-filled PP sheet has passed a UL 2596 thermal-runaway test ^[8] .	Long-fibre grades need low-shear screws and gates to keep fibre length.	Warpage on large flat areas.
ABS, FR-ABS, ASA, SMA	Instrument panels, bezels, knobs, side panels, battery lids	Good surface, paintable and platable. ASA for outdoor use; FR-ABS for battery parts.	Needs drying; sensitive to moisture streaks and gloss variation.	UV resistance of ABS; chemical attack.
PC, PC/ABS	Head lamp lenses, bezels, knobs, EV pack and charging gun parts	Transparent (PC), tough.	Must be dried. Lenses get a scratch-resistant coating ^[6] ; specks cause scrap after coating ^[7] .	Scratching and UV without coating; stress cracking.
PMMA	Tail lamp lenses, head lamp parts	Clarity, surface hardness, weathering.	Needs drying; controlled filling in optical areas.	Lower impact strength than PC.
PA6 / PA66 (glass-filled, FR), PA/PPO	Connectors, fuse and junction boxes, sensor and air filter housings, EV parts, fenders (PA/PPO)	Strength, stiffness, heat resistance; FR grades for electrical parts.	Hygroscopic: moisture above 0.2% harms moulding ^[13] . Glass fibre wears screws and causes anisotropic shrinkage.	Dimensional change with moisture.
PBT (glass-filled, FR)	Connectors, relay and sensor housings, charging guns, knobs	Dimensional stability, electrical properties, low moisture uptake.	Must be dried; thin walls and latches need fast, even filling.	Hydrolysis at high heat and humidity.
PPO, PPS	Instrument panels (PPO), sensor housings (PPS)	Heat resistance, dimensional stability.	PPS runs at high melt and mould temperatures.	Cost; PPS flash on thin parting lines.
POM	Clips, fasteners, knobs	Stiffness, low friction, fatigue resistance.	Avoid overheating and long residence; keep PVC out of the barrel.	UV unless stabilised.
TPE, TPU, PVC	Terminal covers, charging gun grips	Flexible, soft touch, insulating.	TPU needs drying; PVC needs a corrosion-resistant screw and purging.	Bond when overmoulded; heat ageing.

General material behaviour only. Confirm property values against the grade data sheet and the OEM material specification.

WHAT THE REQUIREMENTS SAY ABOUT MATERIALS

FMVSS 302 applies a horizontal burn test to materials within 13 mm of the occupant compartment, with a maximum burn rate of 102 mm per minute^[3]. OEM specifications may add odour and fogging limits.

MATERIAL SELECTION QUESTIONS

- ☐ Which OEM material specification applies?
- ☐ Is the part visible, painted, plated or moulded-in-colour?
- ☐ Does it need flame retardance or electrical insulation?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Most automotive quality issues are designed in or designed out before the first shot. Mould size and complexity also decide the machine.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN AUTOMOTIVE PARTS	MOULDING IMPLICATION
Class-A surfaces	Visible faces must be free of sinks, flow lines, gloss bands and gate marks.	Gate position, sequential valve gating, mould temperature control, grain or polish quality.
Ribs, bosses & clip towers	Needed for stiffness and fixing, but thick sections behind Class-A faces show as sinks.	Keep ribs thinner than the wall; core out bosses; control hold pressure and time.
Locating features	Datums and locators set gap and flush at vehicle level.	Warpage control and stable cooling so locators stay in position.
Undercuts & snap fits	Clips and integrated fixings avoid screws and extra parts.	Lifters, slides and collapsible cores; more mould thickness and moving parts.
Glass-fibre parts	Fibre orientation sets strength and shrinkage direction.	Gate placement, weld-line position away from load and sealing areas.
Optical areas	Lens and light-guide surfaces must transmit light evenly.	Polished steel, no weld lines in the light path, contamination control.
Inserts & terminals	Connectors and brackets may carry metal terminals, bushes or nuts.	Insert loading, locating pins and consistent insert temperature.

MOULD CONSIDERATIONS

ITEM	AUTOMOTIVE-SPECIFIC POINTS	ITEM	AUTOMOTIVE-SPECIFIC POINTS
Cavity layout	Fenders, instrument panels, pack housings: 1 cavity or LH/RH family. Connectors and clips: 8 to 64 cavities.	Moving cores	Many lifters and slides on instrument panels and bezels; unscrewing on threaded housings.
Runner	Hot runners with sequential valve gates on long, large parts to control weld lines and fill.	Steel & wear	Glass-filled grades wear gates and shut-offs. Plan hardened inserts.
Surface	Grain texture or high polish. Texture must match across parts in the same vehicle.	Mould size	Fender, instrument panel and battery pack moulds are large and heavy. Get mould width, height, thickness and weight early.
Cooling	Conformal or dense cooling to control warpage and cycle on large parts.	Traceability	Date stamps, cavity numbers and material codes moulded into the part.

SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Painting	Fenders, mudguards, motorcycle side panels	Low moulded-in stress, clean surface, no release-agent residue.
Chrome plating	Decorative bezels, knobs	Plating-grade ABS or PC/ABS, controlled surface, even filling.
Sealing and welding	Battery lid to container, lamp lens to housing	Flat, repeatable sealing flanges and consistent dimensions between parts.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Automotive output is planned against vehicle programme volumes. Small parts run in multi-cavity moulds; large panels often share a machine with other moulds.

OUTPUT

Parts/hour = Cavities × 3600 ÷ Cycle time (s)

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

Utilisation covers mould changes, start-up, maintenance and rejects.

EXAMPLE 1 · 16-CAVITY CONNECTOR HOUSING

16 × 3600 ÷ 20 s = 2,880 /h

× 0.85 utilisation = 2,448 /h

× 22 h = 53,856 /day

× 26 days = 1,400,256 /month

Working backwards: for 1,000,000 housings a month in 572 running hours (26 × 22), you need 1,748 per hour. Cavities = 1,748 × 20 ÷ (3600 × 0.85) ≈ 11.4, so a 12-cavity mould is the minimum and 16 gives headroom.

WHAT SETS THE CYCLE TIME

PHASE	AUTOMOTIVE-SPECIFIC INFLUENCE
Injection & hold	Long hold on thick bosses and clip towers to control sinks.
Cooling	Usually the largest share; rises roughly with wall thickness squared ^[12] .
Open & close	Long strokes on fenders, battery containers and panels.
Moving cores	Lifters, slides and unscrewing add time.
Part removal	Robot take-out of large parts, insert loading.
Material	Undried PA, PC or PBT causes stoppages and rejects.

EXAMPLE 2 · MOTORCYCLE SIDE PANEL, LH + RH FAMILY MOULD

Programme: 3,00,000 vehicle sets / year

1 set per 45 s cycle = 80 sets/h

Run time needed = 3,00,000 ÷ 80 = 3,750 h

Available = 300 × 22 × 0.85 = 5,610 h

Result: the programme uses about 67% of one machine's effective hours. The rest can take colour changes or another mould; plan the mould-change time that sharing adds.

Illustrative example. Cycle times of 20 s and 45 s, 85% utilisation, 22 h per day, 26 days per month and 300 days per year are assumptions. Actual requirements depend on the component, material, mould and production conditions.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

CONNECTOR MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
8 cavities	42 cm ²	27 t	31 t	56 g	1,224 /h
16 cavities	80 cm ²	51 t	60 t	108 g	2,448 /h
24 cavities	118 cm ²	75 t	88 t	160 g	3,672 /h

Illustrative example. Force = projected area × clamp factor K × safety factor S. PA and PC are commonly given 3 to 5 US tons per square inch^[11], about 0.42 to 0.70 t/cm²; K = 0.55 t/cm² and S = 1.15 assumed. Also assumed: 4 cm² and 6 g per housing, runner area 10 / 16 / 22 cm², runner weight 8 / 12 / 16 g, 20 s cycle, 85% utilisation.

MACHINE UTILISATION AND PLANNED DOWNTIME

MOULD CHANGES High part variety means frequent changes. Quick mould change reduces lost hours.	COLOURS & GRAINS Colour variants on bezels, knobs and two-wheeler panels need planned sequencing.	DRYING PA, PC, PBT and ABS need drying before moulding. Size dryers to throughput.	APPROVED PROCESS After part approval, process changes may need customer notification. Check customer requirements.
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SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

Automotive moulding is often automated to hold the cycle steady, protect Class-A surfaces during handling and give traceable, repeatable results.

Automation	Where it adds value in automotive parts	When it usually makes sense
Robot take-out	Removes fenders, instrument panels, battery containers and lamp parts without marking the surface; places them on conveyors or fixtures.	Large or appearance-critical parts; long cycles where manual removal varies the cycle.
Sprue picker	Removes cold runners from connector and clip moulds.	Multi-cavity cold-runner moulds on continuous runs.
Insert loading	Places terminals, bushes, nuts or metal brackets into the mould.	Insert-moulded connectors and brackets; where manual loading limits the cycle or safety.
Degating & trimming	Cuts gates and vestiges at the machine.	Visible parts where gate vestige must be controlled.
Downstream assembly	Clip fitting, welding of two halves, lamp assembly, foam or seal application.	Multi-part modules supplied as assemblies.
Vision & measurement	Checks short shots, missing clips, pin positions and part presence.	Safety or function-critical parts; high-cavity moulds.
Material handling	Central drying and conveying, dosing of masterbatch, regrind control.	Hygroscopic grades; several machines on the same materials.
Cooling & conveying	Carries large parts on fixtures or racks while they cool, to limit warpage.	Fenders, instrument panels and pack parts that distort if stacked warm.
Packing & labelling	Parts into returnable trays or bins, with traceability labels.	OEM-specified packaging and part identification.

DECIDING ON AUTOMATION

VOLUME & LABOUR Continuous shifts on vehicle programmes make manual handling the largest recurring cost.	GEOMETRY & SURFACE Large or glossy parts are easily marked by hand; robots place them the same way every cycle.	QUALITY & TRACEABILITY A fixed cycle supports stable dimensions, and automated data supports audits.
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INTERFACES TO SPECIFY ON THE MACHINE

ROBOT Signal interface and safety interlocks for take-out and insert loading.	HOT RUNNER Zones and valve-gate sequencing for fenders and instrument panels.	CORE PULLS Circuits for slides, lifters and unscrewing.	DATA Shot data logging for traceability and process monitoring.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL compound + colour	MACHINE cost per machine hour	LABOUR operation, handling	POWER kWh per part	MOULD amortisation, upkeep	REJECTION scrap, rework	PACKING trays, labels
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Engineering compounds make material a large share of cost on heavier parts, while machine hours and handling dominate on small high-cavity parts. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

Automotive quality is proven before production starts and then held with documented controls.

PART APPROVAL AND TESTING

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
PPAP	Shows that customer requirements are understood and that the process can make conforming parts at the quoted rate. Samples come from a production run of 1 to 8 hours and at least 300 consecutive parts, unless the customer specifies otherwise ^[5] .	Machine capability at production cycle and settings
Dimensional	Measurement on CMM and checking fixtures against drawing datums.	Warpage, shrinkage, cavity match
Appearance	Colour, gloss and grain checks against master samples.	Melt temperature, mould temperature, gating
Flammability	FMVSS 302 horizontal burn rate, 102 mm/min maximum ^[3] , or the OEM equivalent.	Material grade and additives
Environmental	Heat ageing, fluids, UV and humidity as per the OEM specification; thermal-runaway tests on EV pack parts ^[8] .	Material grade, moulded-in stress, drying
Mechanical	Impact, clip retention, burst or pressure tests on fluid parts.	Weld lines, voids, fibre orientation

IN-PROCESS CONTROLS

PROCESS DATA Monitor cushion, fill time and pressures per shot; flag drift early.	SPC Control charts on key dimensions and part weight, as the control plan requires.	FIRST-OFF / LAST-OFF Checks at each start-up and mould change.	TRACEABILITY Material lot, date stamp and cavity number tied to each batch.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE AUTOMOTIVE PART	AREAS TO INVESTIGATE
Sink marks	Thick ribs or bosses, short hold time, gate freezing early	Visible marks on Class-A trim faces	Rib design, hold pressure and time, gate size
Tiger stripes	Unstable flow front in talc and rubber-filled PP ^[10]	Gloss bands on unpainted fenders and panels	Grade, injection speed profile, mould temperature
Weld lines	Flow fronts meeting around holes or between gates	Visible lines; weak points on GF parts	Gate positions, valve-gate sequence, melt temperature
Warpage	Fibre orientation, uneven cooling, thin-thick transitions	Gap and flush failures at assembly	Cooling layout, gate position, packing
Black specks	Contamination or degraded material	Scrap on lenses, especially after coating ^[7]	Material handling, purging, residence time
Splay	Moisture in PA, PC, PBT or ABS	Silver streaks, lower strength	Dryer settings, dew point, hopper time
Flash	Worn shut-offs, low clamp, high pressure	Fit problems and trimming cost	Parting line, clamp setting, pressure profile

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

Three typical automotive parts show how the selection logic changes with the component. These are engineering illustrations with assumed inputs, not customer case studies.

A · GLASS-FILLED CONNECTOR HOUSING		PRECISION SMALL PART
APPLICATION · MATERIAL	Wiring harness connector · PA66-GF or PBT-GF (to be confirmed)	
CHARACTERISTICS	About 6 g, 4 cm ² projected area (assumed); thin walls, latches, terminal cavities	
CAVITIES · OUTPUT	16, cold runner · about 2,450 per hour (Section 05)	
MOULD CONSIDERATIONS	Balanced runner, venting at latches, hardened inserts for glass fibre	
SECONDARY	Terminal insertion downstream, or insert moulding; vision check of latches	
EVALUATE The Section 05 table gives about 51 t calculated and a 108 g shot, so a clamp rated around 60 t or more. Drying, a wear-resistant screw and repeatable filling matter as much as tonnage. STILL NEEDED actual grade, CAD projected area, runner design, insert requirement, customer Cpk targets.		

B · MOTORCYCLE SIDE PANEL, LH + RH		APPEARANCE + VOLUME
APPLICATION · MATERIAL	Motorcycle body panel · ABS or PP (grade to be confirmed)	
CHARACTERISTICS	Class-A painted or moulded-in-colour face, hidden clips and bosses, several undercuts	
CAVITIES · OUTPUT	1 + 1 family mould · about 67% of one machine for 3,00,000 sets a year (Section 05)	
MOULD CONSIDERATIONS	Gate position away from the visible face, slides for clips, even cooling	
SECONDARY	Painting or graphics, then packing on fixtures	
EVALUATE Tonnage cannot be set without projected area. Surface quality, sink control behind bosses and colour changeovers drive the setup; ABS needs drying. STILL NEEDED part and mould drawings, mould weight, shot weight, paint or colour specification.		

C · HEADLAMP OUTER LENS		OPTICAL QUALITY
APPLICATION · MATERIAL	Passenger car headlamp · optical PC with scratch-resistant coating ^[6]	
CHARACTERISTICS	Large curved transparent part; no specks or flow lines in the light path	
CAVITIES · OUTPUT	1 or 1 + 1 (LH/RH) · volume set by vehicle programme	
MOULD CONSIDERATIONS	Polished steel, gate outside optical zones, controlled cooling	
SECONDARY	Scratch-resistant coating, then lamp assembly and sealing	
EVALUATE Machine selection depends on the lens projected area, clean material handling, drying and repeatable injection. Contamination becomes scrap after coating ^[7] . STILL NEEDED lens drawing, grade, mould size, coating route, cleanliness requirement.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · CONNECTOR	B · SIDE PANEL	C · HEADLAMP LENS
Main limit	Repeatability, wear	Surface quality, mould size	Optical quality, cleanliness
Clamp force	Set by 16 cavities (about 60 t rated)	Needs projected area	Needs projected area
Screw & barrel	Wear resistant for glass fibre	Sized for the ABS or PP shot	Suited to optical PC, clean melt
Auxiliaries	Dryer, sprue picker, vision	Robot, dryer for ABS	Dryer, clean conveying, robot

Illustrative example. Actual requirements depend on the component, material, mould and production conditions.

SECTION 09 • BUYER CHECKLIST

MACHINE BUYER'S CHECKLIST

What to prepare before asking an injection moulding machine manufacturer for a recommendation on an automotive component.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Part weight, runner weight, wall thickness
- ☐ Material grade and OEM material specification
- ☐ Critical dimensions, datums and tolerances
- ☐ Surface: Class-A, grain, paint, plating

PRODUCTION

- ☐ Vehicle programme volume and start date
- ☐ Variants: LH/RH, colours, trim levels
- ☐ Cavity count and target cycle time
- ☐ Operating hours and shifts
- ☐ Other moulds planned on the same machine

MOULD

- ☐ Mould width, height, closed thickness, weight
- ☐ Hot runner zones and valve-gate sequencing
- ☐ Slides, lifters, unscrewing, core-pull circuits
- ☐ Insert loading and robot requirements
- ☐ Previous machine specification, if any

AUTOMOTIVE APPLICATION

- ☐ Interior, exterior, under-hood or electrical
- ☐ Heat, fluid, UV and flammability requirements
- ☐ Odour and emission limits for interior parts
- ☐ PPAP level and customer-specific requirements
- ☐ Traceability and data-logging requirements

DOCUMENTS TO REQUEST FROM THE MACHINE SUPPLIER

PLATEN DRAWING

Tie-bar spacing, mounting holes, ejector pattern, locating ring and nozzle radius.

LAYOUT

Machine footprint, robot and conveyor space, maintenance access.

UTILITIES

Connected load, cooling water, compressed air and oil requirements.

TRIAL REPORT

Mould trial or acceptance data at your production settings.

QUESTIONS TO ASK BEFORE YOU BUY A MACHINE

#	QUESTION	WHY IT MATTERS FOR AUTOMOTIVE PARTS
1	What shot weight repeatability does the machine hold at my shot size?	Dimensional capability and part approval depend on it.
2	Will my mould fit the platen, tie-bar spacing and daylight, with handling clearance?	Fender, instrument panel and battery moulds are large.
3	How many hot-runner zones and valve-gate outputs can the control run?	Sequential gating on fenders and instrument panels.
4	How many core-pull and unscrewing circuits are available?	Slides, lifters and threaded housings.
5	Which screw and barrel options suit glass-filled PA and PBT?	Wear on connectors and under-hood parts.
6	Can the machine log shot data per cycle and export it?	Traceability and process monitoring.
7	What robot and insert-loading interfaces are supported?	Take-out of large parts and insert moulding.
8	How quickly can moulds be changed?	High part variety and machine sharing.
9	What is the energy use per part at my cycle?	Long programmes make power a lasting cost.
10	What installation, training and spare-parts support is included?	Programmes run for years with delivery commitments.

SECTION 10 · TECHNICAL CONSULTATION

PRATISHNA ENGINEERS & TECHNICAL CONSULTATION

Pratishna Engineers Ltd. is a Mumbai-based injection moulding machine manufacturer with in-house design, manufacturing, assembly, testing and service, supplying plastic component manufacturers in India and international markets.

35+

YEARS OF EXPERIENCE

9,000+

MACHINES SUPPLIED

1,000+

CUSTOMERS

In-house

DESIGN TO SERVICE

Machines are used for automotive, packaging, electrical and electronics, medical, consumer, agriculture and industrial applications.

OUR TECHNICAL APPROACH

COMPONENT	MATERIAL	MOULD	PRODUCTION REQUIREMENT	MACHINE CONFIGURATION
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SEND YOUR COMPONENT & PRODUCTION REQUIREMENTS

Component drawing · material · part weight · mould details · cavity count · production requirement · other process requirements such as surface finish, inserts or automation.

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