



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

RAILWAY COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for moulders supplying coach builders, track and signalling projects: components, fire-rated and engineering 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 moulding coach interior fittings, electrical and cable parts, track fastening liners, dowels, pads and signalling components.

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 output target to sales@pratishnaengineers.com. The checklist in Section 09 lists what to include.

SECTION 01 · OVERVIEW

RAILWAY COMPONENTS & INJECTION MOULDING

A railway needs moulded parts in two very different places: inside the coach, where fire behaviour rules, and on the track, where load, insulation and weather rule.

WHERE INJECTION MOULDING FITS IN RAILWAY SUPPLY

Coach building in India is running at high volume. Indian Railways reports more than 42,600 LHB coaches built between 2014 and 2025, and over 4,224 in 2025-26 up to November 2025^[1]. Every coach carries hundreds of moulded trim, fitting, vent, electrical and cable-management parts. Track and signalling add a second market: liners, dowels, pads and insulated joint parts bought in very large numbers.

For coach interiors, RDSO moved its fire-retardant material specifications toward EN 45545^[6], and a 2026 Indian Railways specification for 200 km/h trains calls for furnishing to EN 45545-2 HL3^[7]. On the track, glass-filled nylon liners are used in track-circuited sections to RDSO drawings^[8].

MAIN COMPONENT CATEGORIES

COACH TRIM Bezels, cover caps, interior fittings	PANELS & SEATING Wall and ceiling panels, seat shells, luggage racks	PASSENGER FITTINGS Grab handles, stanchion end caps, tray table hinges	HVAC Air vent louvres and grilles
TOILET & AMENITY Hooks, dispensers, bezels	ELECTRICAL & CABLE Junction boxes, connector bodies, cleats, clips, saddles	TRACK FASTENING Rail clip liners, sleeper dowels, rail pads	SIGNALLING Insulated joint parts, trackside enclosures

WHY INJECTION MOULDING SUITS THESE PARTS

- Fire-rated compounds moulded into finished shapes with fixings and clips.
- Repeatable liner and insulator dimensions over millions of parts.
- Metal inserts moulded in for structural fittings.

TYPICAL MANUFACTURING CHALLENGES

- FR compounds with narrow processing windows.
- Fire approval tied to material and wall thickness^[5].
- Nylon moisture and glass-fibre wear.
- Large flat parts beside tiny high-volume clips.

WHICH PARTS ARE MOULDED, AND WHICH ARE NOT

Rubber and EPDM rail pads are compounded and vulcanised, not injection moulded; HDPE, EVA and TPEE pads are. Large cabinets and some panels are made in GRP, aluminium composite or metal^[7]. This guide covers the thermoplastic injection-moulded parts.

KEY REQUIREMENTS FOR RAILWAY COMPONENTS

FIRE CLASSIFICATION Interior parts are mapped to a requirement set (R1 to R26) and a hazard level HL1 to HL3 ^{[2][3]} .	SUPPLIER APPROVAL Indian Railways supply needs RDSO approval; drawings fix the geometry ^[8] .	ELECTRICAL INSULATION Liners and joint parts separate track circuits; housings need tracking and glow-wire performance.
LOAD & CREEP Liners, grab handles and joint parts carry permanent or passenger loads.	OUTDOOR DURABILITY UV, moisture and low-temperature impact for trackside parts.	TRACEABILITY Safety-related parts need batch and material records.

SECTION 02 · COMPONENTS

MAJOR RAILWAY COMPONENTS

The railway parts covered by this guide, their materials and what each asks of the moulding process.

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Coach fitting, interior trim, bezels, cover caps	Coach interior finishing	FR PP, FR ABS, FR PC, FR PA6, FR PA6-GF, FR PBT	Fire approval is thickness-specific; FR packages cut impact; colour matching across several FR resins.
Coach interior part: wall and ceiling panels, seat shells, luggage racks, trim	Large interior surfaces and seating	FR PP, FR PC, FR PA6, FR PA6-GF30, FR PA66, PEI	R-set and hazard level drive material choice; panels and seat shells are large flat projected areas.
Grab handle, handrail bracket, stanchion end cap	Passenger support	FR PA6-GF30, FR PA66, FR PC, FR PP	Passenger-loaded; GF FR nylon usual; metal inserts for fixings.
Tray table hinge, latch and bracket set	Seat-back tables	FR PA66-GF, FR PA6-GF, FR PBT, FR PP	Cycle-life wear parts; cleaning-chemical resistance; small, multi-cavity.
HVAC air vent louvre and grille	Air distribution	FR PP, FR PC, FR PA6-GF, FR ABS	Slotted flat part; warp is the main reject; stricter fire requirement in the airflow.
Electrical housing, junction box, connector body	Coach electrics	FR PA6, FR PA66, FR PA6-GF30, FR PBT, PPS	Fire plus CTI and glow-wire requirements; dry nylon properly.
Cable cleats, clips, ties, conduit saddles	Cable management	FR PA6, FR PA66, FR PP, PPS	Tiny, very high volume; 16 to 32 cavities with hot runner; halogen-free grades.
Toilet module and amenity fitting	Hooks, dispensers, bezels	FR PP, FR ABS, FR PC, FR PA6	Cleaning agents; vandal resistance, concealed fixings, heavier walls.
Rail clip insulator, liner, guide plate (E-clip, SKL, Nabra)	Track fastening	PA6-GF, PA66-GF (20 to 35% glass), UV-stabilised PA66	Dimensional stability under load, moisture and UV; each type is a separate tool.
Plastic dowel / sleeve for concrete sleeper	Screw spike anchor in sleeper	PA6, PA66, HDPE	Pull-out resistance; thick section, cooling-limited cycle.
Rail insulator pad (rail, resilient, height-adjustment)	Under-rail pad	HDPE, EVA, TPEE, PA66-GF (rigid type)	Load-deflection curve is the specification; grooved surface; some carry a steel plate.
Insulated rail joint parts (end post, bushes, ferrules)	Track circuit separation	PA66-GF, PEI, PET-GF, composite grades	Dielectric strength under permanent load; creep; full traceability.
Trackside and signalling enclosure components	Outdoor equipment	FR PC (UV-stabilised), PA6-GF, PC/ASA, PBT-GF	UV stability and seal-face flatness for the IP rating; low-temperature impact.

Rubber and EPDM pads are vulcanised, not injection moulded. Large cabinets are often GRP or metal. Metal inserts and seals are bought-in parts.

GROUPING BY MOULDING DEMAND

FIRE-RATED INTERIOR

Trim, panels, handles, vents, amenity parts. Material approval first.

ELECTRICAL & CABLE

Housings and cleats. FR nylon, drying, cavitation.

TRACK & SIGNALLING

Liners, dowels, pads, joints. Dimensions, load and insulation.

SECTION 03 · MATERIALS

MATERIALS USED FOR RAILWAY COMPONENTS

Coach parts are chosen for fire behaviour first; track parts for strength, insulation and weathering. The same base polymer can appear in both roles in different grades.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
FR PP	Trim, panels, handles, vents, cleats, amenity parts	Low density, chemical resistance.	Easy flow; watch warp on flat parts.	Rated R-set and HL at your thickness.
FR ABS	Trim, vents, amenity parts	Good surface, easy colouring.	Dry before moulding.	Smoke and heat release limits.
FR PC, UV-stabilised FR PC, PC/ASA	Trim, panels, vents, enclosures	Toughness, clarity options.	Dry thoroughly; stress control.	Chemical cleaners; UV for outdoor use.
FR PA6, FR PA66	Housings, connectors, cleats, handles	Strength, FR with electrical use.	Must be dried ^[11] .	Moisture changes size and properties.
FR PA6-GF, FR PA66-GF	Handles, hinges, vents, housings	Stiff, load-bearing.	Abrasive glass; fibre orientation.	Impact reduced by FR package.
PA6-GF, PA66-GF, UV-stab. PA66	Rail liners, guide plates, joint parts	Strength, insulation, dimensional stability ^[8] .	Wear-resistant screw and steel; drying.	Moisture growth; condition before gauging.
PA6, PA66, HDPE	Sleeper dowels, rail pads (HDPE)	Tough, screw-holding.	Thick sections cool slowly ^[10] .	Pull-out and creep.
FR PBT, PBT-GF, PET-GF	Trim, hinges, housings, enclosures, joints	Dimensional stability, electrical use.	Dry; hot mould for crystallinity.	Hydrolysis in wet service.
PPS	Housings, cable parts	Inherent flame resistance, heat.	High melt and mould temperatures.	Brittle; cost.
PEI	Panels, seat shells, joint parts	Low smoke, used where HL3 is needed ^[5] .	Very high melt temperature; dry.	Cost; dedicated settings.
EVA, TPEE	Rail pads	Resilience, designed stiffness.	Consistent packing for stiffness.	Stiffness tolerance per batch.
Composite grades	Insulated rail joint parts	Per compound supplier.	Per supplier data.	Creep under clamped load.

General material behaviour only. Fire classification belongs to a specific grade, colour and thickness. Confirm with the compound supplier and test report.

WHAT EN 45545-2 ASKS OF THE MATERIAL

The standard assigns each part a position code and requirement set: interior wall panels fall under R1^[2], seat shells under R6^[5]. Limits on smoke density, heat release and toxicity tighten from HL1 to HL3^[4]. Smoke density is measured on specimens of set thickness^[5], so a thinner wall may need its own test.

MATERIAL SELECTION QUESTIONS

- ☐ Which R-set and hazard level apply?
- ☐ Is a tested grade certified at your wall thickness and colour?
- ☐ Indoor, outdoor, or track-circuited service?
- ☐ Permanent load, cycling or passenger load?
- ☐ Is RDSO approval of the part required?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Railway moulds range from large flat panel tools to 32-cavity clip moulds and abrasion-proof liner tools. Fire-rated and glass-filled grades shape the steel, gating and venting choices.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN RAILWAY PARTS	MOULDING IMPLICATION
Wall thickness	Fire approval is tied to tested thickness ^[5] .	Hold nominal wall; no thinning to save cycle.
Large flat areas	Panels, seat shells and grilles.	Warp control; balanced cooling; clamp from footprint.
Slots and louvres	Vent grilles.	Many shut-offs; weld lines; venting.
Metal inserts	Grab handles, brackets, some pads.	Insert seats and retention; loading every cycle.
Load faces	Liners and guide plates bear clip toe load ^[8] .	Fibre orientation, gate position, flatness.
Thick sections	Dowels, liners, joint parts.	Sinks and voids; cooling-limited cycle ^[10] .
Hidden fixings	Vandal-resistant amenity and trim parts.	Undercuts, lifters, side actions.
Seal faces	Trackside enclosures.	Flatness for the IP gasket.

MOULD CONSIDERATIONS

ITEM	RAILWAY POINTS	ITEM	RAILWAY POINTS
Cavity layout	Clips and cleats: 16 to 32. Liners, dowels: 2 to 8. Panels: 1.	Steel	Hardened, wear-resistant steel for glass-filled nylon.
Runner	Hot runner suits high-volume clips; valve gates for large cosmetic parts.	Corrosion	FR additives can attack steel; ask the compound supplier.
Gating	Gate away from load faces on liners and handles.	Cooling	Even cooling on panels and grilles to limit warp.
Venting	FR additives can outgas; vents need regular cleaning.	Families	E-clip, SKL and Nabla liners are separate tools.

DESIGNING AROUND THE APPROVAL

FREEZE THE GRADE A new resin or colour may need new fire tests.	FREEZE THE WALL Change thickness only with the test lab.	FREEZE THE DRAWING RDSO drawing changes need approval ^[8] .	RECORD THE TOOL Cavity marks help trace approved parts.
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SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Insert moulding or post-insertion	Handles, brackets, pads with steel plates	Accurate insert seats; controlled shrinkage.
Assembly	Tray table hinges and latches, junction boxes	Snap fits, pin bores and hinge faces to size.
Moisture conditioning	Nylon liners and dowels	Stable size after conditioning before gauging.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Railway plants mix very high-count parts such as cable clips and liners with low-count coach sets. Plan the high-volume parts by cavities and cycle, and the coach parts by set and delivery schedule.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

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

EXAMPLE 1 · 32-CAVITY FR PA66 CABLE CLIP

32 × 3600 ÷ 15 s = 7,680 /h

× 0.85 utilisation = 6,528 /h

× 22 h = 143,616 /day

× 26 days = 3,734,016 /month

EXAMPLE 2 · 4-CAVITY PA66-GF RAIL LINER

4 × 3600 ÷ 45 s = 320 /h

× 0.85 = 272 /h · × 22 h = 5,984 /day

× 26 days = 155,584 /month

Working backwards: for 250,000 liners a month in 572 running hours, you need 437 per hour. Cavities = $437 \times 45 \div (3600 \times 0.85) \approx 6.4$, so a 7 or 8-cavity mould or a second machine.

Illustrative example. Cycle times of 15 s and 45 s, 85% utilisation, 22 h per day and 26 days per month are assumptions. Actual requirements depend on the component, material, mould and production conditions.

WHAT SETS THE CYCLE TIME

PHASE	RAILWAY INFLUENCE
Injection & hold	FR and GF grades need controlled filling.
Cooling	Largest share on thick liners and dowels; rises roughly with wall thickness squared ^[10] .
Actions	Lifters and side cores on trim.
Inserts	Metal inserts in handles and brackets.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

FR PA66 CABLE CLIP MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
8 cavities	20 cm ²	14 t	16 t	24 g	1,632 /h
16 cavities	40 cm ²	28 t	32 t	48 g	3,264 /h
32 cavities	80 cm ²	55 t	65 t	96 g	6,528 /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^[9], about 0.42 to 0.70 t/cm²; K = 0.6 t/cm² and S = 1.15 assumed. Also assumed: 2.5 cm² and 3 g per clip, hot runner with no cold runner, 15 s cycle, 85% utilisation.

PLANNING COACH-SET PRODUCTION

Machine hours = Σ (parts per coach × coaches per month ÷ effective output per part)

Run this for every part in the coach set, then compare with the 572 running hours per machine used in these examples. Parts with few pieces per coach can share machines.

Clips, cleats, liners and dowels run continuously on dedicated multi-cavity moulds. Coach interior parts run by set against coach factory schedules, grouped by grade and colour. Signalling and joint parts run in traceable project lots.

MACHINE UTILISATION AND PLANNED DOWNTIME**DRYING**

Nylon, PC, PBT and PEI need dryer time before each run^[11].

COLOUR CHANGES

Coach interiors use colour-matched sets.

PURGING

FR and high-temperature grades need thorough purging.

SCHEDULES

Coach sets follow factory delivery dates.

SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

Railway automation splits by product: take-out and insert handling for coach parts, cavity separation and counting for clips, and gauging for track parts.

AUTOMATION	WHERE IT ADDS VALUE IN RAILWAY PARTS	WHEN IT USUALLY MAKES SENSE
Robot take-out	Panels, seat shells, grilles: large parts that scratch or warp if handled roughly.	Large cosmetic parts and long cycles.
Insert loading	Metal inserts in grab handles, brackets and pads.	Insert parts at steady volume.
Hot runner and separation	Cable clips and cleats in 16 to 32 cavities.	Very high counts, no runner to remove.
Dryers and closed conveying	Nylon, PC, PBT, PEI.	Every hygroscopic grade; several machines.
Conveyors and counting	Clips, cleats, liners, dowels sold by count.	High-volume commodity parts.
Cooling fixtures	Flat panels and grilles.	Where warp causes fit problems.
Inline gauging	Liner and guide plate dimensions.	Approved track parts at volume.
Assembly	Tray table hinges, latches, junction boxes.	Multi-part fittings at volume.

AUTOMATION BY PRODUCT GROUP

PRODUCT GROUP	MAIN AUTOMATION	WHY
Cable clips, cleats	Hot runner, conveyor, counting	Very high counts per hour
Handles, brackets	Insert loading	Insert placed every cycle
Panels, seat shells, grilles	Robot take-out, cooling fixture	Size, finish and warp
Liners, dowels, pads	Drying, counting, gauging	Approved dimensions over large lots

DECIDING ON AUTOMATION

VOLUME & LABOUR Clip and liner volumes make counting and packing costly by hand.	REPEATABILITY Steady cycles keep shrinkage and fire-tested geometry consistent.	PART SIZE Large panels are hard to remove without marks by hand.
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INTERFACES TO SPECIFY ON THE MACHINE

HOT RUNNER Zones for multi-cavity clip moulds.	ROBOT Signal interface and safety interlocks.	CORE PULLS Circuits for lifters and side actions.	DATA Shot records for traceability.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL FR and GF grades	MACHINE per machine hour	LABOUR handling, packing	POWER kWh per part, drying	MOULD wear-resistant steel	REJECTION warp, splay	PACKING by count or set
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Fire-rated and high-temperature compounds usually cost more than commodity grades, so material and scrap dominate on large interior parts. On clips and liners, machine hours and packing dominate. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

A railway part must pass two checks: the approval tests on the material or part, and the everyday dimensional and visual checks on every lot.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Smoke density	ISO 5659-2, Ds-4 value; HL2 needs 300 or lower for R6 parts ^{[4][5]} .	Grade, thickness, colour
Heat release	ISO 5660-1, MAHRE; for R1 and R6 about 90 kW/m² at HL2 and 60 at HL3 ^[4] .	Grade and wall section
Flame spread and toxicity	Further EN 45545-2 tests per requirement set ^{[2][3]} .	Same approved grade in production
Glow wire	Ignition from an overheated part on electrical items ^[12] .	FR grade, wall, degradation
Tracking (CTI)	Resistance to surface tracking on insulating parts ^[13] .	Grade, contamination, surface
Liner and joint parts	Dimensions to RDSO drawing; tests per the applicable IR specification ^[8] .	Shrinkage, conditioning, fibre
Mechanical	Load, drop and cycle tests on moulded parts, not datasheets.	Weld lines, voids, orientation

EN 45545 tests are done by accredited labs. Confirm the current edition, the R-set, the hazard level and the approval route for each part.

IN-PROCESS CONTROLS

MOISTURE Check drying before each nylon run ^[11] .	CONDITIONING Gauge nylon liners after moisture conditioning.	WEIGHT BY CAVITY Flags short shots in clip moulds.	FLATNESS Panels, grilles and seal faces.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE PART	AREAS TO INVESTIGATE
Splay, silver streaks	Moisture in nylon, PC or PBT ^[11]	Weaker parts, cosmetic reject	Drying time, dew point, hopper
Burn marks, discolouration	Overheated FR grade, long residence	Colour mismatch, lost FR performance	Barrel temperatures, shot to barrel ratio
Warp	Uneven cooling on flat parts	Rattle, poor fit in ducting	Cooling layout, hold, ejection
Sink marks & voids	Thick liner or dowel sections	Low strength, poor pull-out	Hold pressure and time, gate size
Weld lines	Flow around slots and holes	Cracks under load	Gate position, melt temperature, venting
Fibre on surface	Glass-filled grades, cold mould	Rough load faces	Mould temperature, injection speed
Brittle parts	Degraded or wet FR nylon	Fails drop and load tests	Drying, temperatures, regrind level
Oversize liners	Measured before conditioning	Rejected good parts	Conditioning, gauge timing

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · FR PA66 CABLE CLIP		VOLUME
APPLICATION · MATERIAL	Coach cable management clip · FR PA66	
CHARACTERISTICS	About 3 g, 2.5 cm ² projected area (assumed); snap latch	
CAVITIES · OUTPUT	32 on hot runner · about 6,528 per hour at 15 s (Section 05)	
MOULD CONSIDERATIONS	Balanced hot runner, venting for FR outgassing	
SECONDARY	Counting and bagging	
EVALUATE The Section 05 table gives about 55 t calculated and a 96 g shot, so a clamp rated around 65 t or more. Drying and consistent shot repeatability matter more than tonnage. STILL NEEDED CAD area, FR grade and its test report, volume.		

B · PA66-GF RAIL CLIP LINER		WEAR + DIMENSIONS
APPLICATION · MATERIAL	Liner for a track-circuited section · PA66-GF	
CHARACTERISTICS	Thick load-bearing section; RDSO drawing geometry	
CAVITIES · OUTPUT	4 · about 272 per hour at 45 s (Section 05)	
MOULD CONSIDERATIONS	Hardened steel, gate away from load face, cooling	
SECONDARY	Conditioning, gauging, counting	
EVALUATE Assume 20 cm ² per liner plus 15 cm ² runner: 95 cm ² × 0.6 × 1.15 ≈ 66 t, so a clamp rated around 78 t or more. Wear-resistant screw and barrel for glass fibre drive the choice. STILL NEEDED drawing, grade, real projected area, volume.		

C · FR PC HVAC GRILLE		LARGE FLAT PART
APPLICATION · MATERIAL	Coach air vent grille · FR PC (to be confirmed)	
CHARACTERISTICS	Large slotted flat part; light for its size	
CAVITIES · OUTPUT	1 · set by coach build rate	
MOULD CONSIDERATIONS	Balanced cooling, many shut-offs, venting	
SECONDARY	Cooling fixture, packing by coach set	
EVALUATE The footprint sets tonnage even though the part is light, so platen size, tie-bar space and daylight matter. A tonnage needs the real projected area. STILL NEEDED CAD, fire classification, mould size, set quantity.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · CABLE CLIP	B · RAIL LINER	C · HVAC GRILLE
Main limit	Cavities, shot repeatability	Glass-fibre wear, cooling	Projected area, platen size
Clamp force	About 65 t rated	About 78 t rated	Needs projected area
Auxiliaries	Hot runner, dryer, counter	Dryer, gauging	Robot, cooling fixture

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 a coach, track or signalling part.

COMPONENT ☐ 2D drawing and 3D CAD model ☐ Part weight, runner weight, wall thickness ☐ Grade data and fire test report ☐ Inserts, seals and fixings ☐ RDSO drawing number, if any	PRODUCTION ☐ Monthly volume or coach sets per month ☐ Colour range and matching needs ☐ Cavity count and target cycle time ☐ Operating hours and shifts ☐ Packing by count or by set
MOULD ☐ New or existing mould; size and weight ☐ Side actions and lifters ☐ Hot or cold runner ☐ Steel for glass-filled grades ☐ Previous machine specification, if any	RAILWAY APPLICATION ☐ R-set and hazard level required ☐ Indoor, outdoor or trackside ☐ Electrical needs: CTI, glow wire ☐ Load, cycle or creep tests ☐ Traceability and records

DOCUMENTS TO REQUEST FROM THE MACHINE SUPPLIER

PLATEN DRAWING Tie-bar spacing, mounting holes, ejector pattern, nozzle details.	LAYOUT Footprint, robot and conveyor space, access.	UTILITIES Connected load, cooling water, air and oil needs.	TRIAL REPORT Trial or acceptance data at your settings.
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QUESTIONS TO ASK BEFORE YOU BUY A MACHINE

#	QUESTION	WHY IT MATTERS FOR RAILWAY PARTS
1	Is a wear-resistant screw and barrel available for glass-filled nylon?	Liners, handles, housings.
2	How accurate is barrel temperature control for FR grades?	Overheating harms FR performance and colour.
3	What shot repeatability does the machine hold at my shot size?	Clip moulds and approved part weights.
4	Will my largest panel or grille mould fit between the tie bars, with the daylight it needs?	Large flat interior parts.
5	How many hot runner zones and core-pull circuits can be connected?	Clip moulds and trim with lifters.
6	What robot and insert-loading interfaces are supported?	Panels and insert parts.
7	Can the machine log shot data for each lot?	Traceability for safety-related parts.
8	Can the control store settings for each part and colour?	Many parts per coach set.
9	What is the energy use per part at my cycle?	Long cooling-limited liner cycles.
10	What installation, training and spare-parts support is included?	Delivery schedules to coach factories.

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 · fire classification (R-set and hazard level), RDSO drawing or approval route, and inserts.

sales@pratishnaengineers.com · +91-22-66970281 / 82 · www.pratishnaengineers.com

A1-4, Vaibhav Ind. Premises, Opp. Oxford Chambers, Saki Vihar Road, Andheri (E), Mumbai 400 072, India

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