



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

OPTICAL COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for makers of plastic lenses, light guides, eyewear frames and optical mounts: components, materials, mould requirements, production planning, automation, quality, worked examples and what to send for a machine recommendation.

INDEX

Click any heading to go to that section

01	OPTICAL COMPONENTS & INJECTION MOULDING	02
02	MAJOR OPTICAL COMPONENTS	03
03	MATERIALS USED FOR OPTICAL COMPONENTS	04
04	COMPONENT DESIGN & MOULD REQUIREMENTS	05
05	PRODUCTION CAPACITY & CYCLE-TIME PLANNING	06
06	AUTOMATION & PRODUCTION EFFICIENCY	07
07	QUALITY, TESTING & COMMON DEFECTS	08
08	PRACTICAL MACHINE-SELECTION EXAMPLES	09
09	MACHINE BUYER'S CHECKLIST	10
10	PRATISHNA ENGINEERS & TECHNICAL CONSULTATION	11

WHO THIS GUIDE IS FOR

Owners, plant and production managers, process engineers and purchase teams moulding lenses, light guides, eyewear frames and parts, cases, lens holders and fibre-optic housings.

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

OPTICAL COMPONENTS & INJECTION MOULDING

Optical moulding covers two different jobs: transparent parts whose surfaces bend or guide light, and precision mounts and frames that hold those parts in place.

WHERE INJECTION MOULDING FITS IN OPTICAL PRODUCTS

Moulded optics now sit in LED lighting, sensors, cameras, displays, eyewear and instruments. Plastic lenses are moulded from optical PMMA, PC and COP/COC into mirror-finished cavities, and their main tolerances are centre thickness, outer diameter and radius of curvature^[3]. Around the optics sit frames, holders, barrels, cases and connector housings, which are opaque but still precision parts.

In India, eye protectors are covered by IS 5983:1980, and the BIS product manual for it asks that each consignment of material comes with a supplier test certificate or a recognised laboratory report^[1]. For moulders of safety and visor lenses this makes material traceability part of the job, alongside the optical and impact tests of the standard.

MAIN COMPONENT CATEGORIES

PRECISION LENSES Camera, sensor, LED and collimator lenses	THICK LENSES Sections above about 5 mm	LIGHT GUIDES Light guide plates, light pipes	FRESNEL & DIFFUSERS Fresnel lenses, diffuser panels
EYEWEAR LENSES Sunglass, safety and visor lenses	EYEWEAR FRAMES Fronts, temples, tips, pads, hinge covers	MOUNTS & MICRO-OPTICS Lens holders, barrels, camera module barrels	HOUSINGS & CASES Fibre connectors, windows, spectacle cases

WHY INJECTION MOULDING SUITS THESE PARTS

- The polished cavity surface is copied onto every part.
- Aspheric and micro-structured surfaces cost little extra once the insert exists.
- TR90 frames are moulded, while acetate frames are cut from sheet^[10].

TYPICAL MANUFACTURING CHALLENGES

- Shrinkage varies with wall thickness and process^[3].
- Sink marks on thick lenses^[7] and warp on light guides^[6].
- Dust, moisture and stress all show in a clear part.

WHERE MOULDING SITS IN THE PRODUCT CHAIN

RESIN PMMA, PC, COP, TR90	DRYING to low moisture	INJECTION MOULDING clean cell	DEGATING no touch on optics	COATING hard coat, AR, anti-fog	INSPECTION optical and dimensional	ASSEMBLY mounts, frames, modules
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KEY REQUIREMENTS FOR OPTICAL PARTS

SURFACE REPLICATION The optical face must copy an SPI A1 mirror cavity ^[3] .	DIMENSIONAL STABILITY Centre thickness, diameter and curvature stay in tolerance ^[3] .	LOW STRESS Moulded-in stress shows as birefringence and distortion ^[9] .
CLEAN PARTS Precision optics are moulded in ISO Class 6 or 7 cleanrooms ^[3] .	IMPACT SAFETY Eye protectors meet IS 5983 requirements ^{[1][2]} .	ALIGNMENT Mounts, barrels and connectors hold optics concentric.

SECTION 02 · COMPONENTS

MAJOR OPTICAL COMPONENTS

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

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Optical lens (camera, sensor, LED, collimator)	Focusing and shaping light	Optical PMMA, optical PC, COP/COC	Mirror-finish cavity, slow fill, long pack. Process stability, not tool accuracy, limits tolerance ^[3] .
Thick-wall lens (above about 5 mm)	Automotive and LED lenses	Optical PMMA, optical PC	Cooling and sink dominated ^[7] . Multilayer moulding often used ^[8] . Minutes per part, not seconds.
Light guide (plate, light pipe)	Backlights, indicators	Optical PMMA, optical PC, QD-PC composite, COP	Wedge section with micro-dots ^[5] . Injection pressure drives warp; warp spoils luminance uniformity.
Fresnel lens, diffuser panel	Lighting, sensors	Optical PMMA, optical PC	Large thin part: replication competes with flatness. Injection-compression used.
Sunglass, safety and visor lens (plano)	Eye protection, sunglasses	PC, optical PMMA, TPU (coating after)	PC for impact-rated lenses. Base curve and centre thickness are optical specifications. Coatings are a separate process.
Instrument window, cover lens	Displays and gauges	Optical PC, PMMA, copolyester	Flatness and no flow lines; stress shows under polarised light. Clean handling and packing.
Spectacle frame (front, temples)	Eyewear	TR90 / Grilamid-type PA, PA12, nylon, PEI, PC	Thin temples fill without hesitation marks; cooling sets flexibility. Watch front warp, lot colour and lens groove.
Temple tip, nose pad, hinge cover	Eyewear comfort parts	TPE, TPU, soft PVC, TR90, PC	Often overmoulded on the temple or a metal core; validate the bond. Skin-contact compliance.
Spectacle cover / case (case, lid, clip-on cover)	Protective cases	PP, ABS, SAN, PC, TPE	Two-part case or PP living hinge flexed after ejection. TPE overmould, IMD. Sink on A-surfaces.
Lens holder, barrel, optical mount	Holding optics in line	PC-GF, PA6-GF, PPS, POM, PEI	Bore concentricity and datums; matte texture and light-trap ribs. Black low-outgassing grades.
Camera module / sensor lens barrel	Micro-optics	LCP, PC, COP, PPA, PEI	Micro-moulding with milligram shots; micron thread and seat tolerances; cleanroom.
Fibre connector housing, ferrule holder (LC/SC)	Fibre-optic connectors	PEI, PPS, LCP, PBT-GF	Micron alignment; grades that survive reflow and cycling. Ceramic ferrules are not moulded.

Acetate frames are cut from sheet^[10], silicone nose pads are LSR moulded and ceramic ferrules are sintered; these are outside this guide.

MOULDING ROUTES USED FOR OPTICAL PARTS

ROUTE	TYPICAL PARTS	WHY IT IS USED
Conventional precision moulding	Small lenses, windows, mounts, frames	Standard route with slow fill and long pack ^[3]
Multilayer moulding	Thick-wall lenses	Builds thick sections in layers to limit sink ^[8]
Injection-compression	Fresnel lenses, diffusers, some light guides	Fills large thin cavities at lower pressure and stress
Variotherm (rapid heat cycle)	Light guides, micro-structured parts	Hot cavity for replication, then cooling
Micro-moulding	Camera barrels, micro-optics	Milligram shots with micron tolerances

SECTION 03 · MATERIALS

MATERIALS USED FOR OPTICAL COMPONENTS

Transparent parts are chosen on transmission, index, moisture and impact; mounts and frames on stiffness, flexibility and stability.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
Optical PMMA	Lenses, light guides, Fresnel, windows	About 92% transmission at 3 mm; index about 1.49 ^[4] .	Dry below 0.04% moisture ^[4] ; shrink 0.2 to 0.8% ^[3] .	Brittle; long cooling in thick parts ^[8] .
Optical PC, QD-PC	Lenses, eyewear, windows, light guides	High impact; index about 1.585 ^[4] .	Shrink 0.5 to 0.7% ^[4] ; hot mould, dry well.	Birefringence ^[9] ; scratches without hard coat.
COP / COC	Precision and camera lenses, light guides	Near-zero moisture absorption ^[4] .	Clean, dry handling.	Cost; supply of grades.
Copolyester	Instrument windows	Clear, tough.	Dry before moulding.	Check heat and chemical limits.
TR90, PA12, nylon	Frames, temples, tips	Light, flexible, holds shape.	Dry before moulding; cooling sets flexibility.	Moisture changes size.
PEI	Frames, mounts, micro barrels, connectors	Stiff, heat resistant.	Very high melt and mould temperatures.	Cost; dedicated set-up.
PC-GF, PA6-GF, PBT-GF	Lens holders, mounts, connectors	Stiff, stable.	Gate for concentricity; wear-resistant steel.	Differential warp.
PPS, LCP, PPA	Micro barrels, connectors, mounts	Heat resistant, stable.	High temperatures; fast freezing.	Weld line strength; cost.
POM	Lens holders, mounts	Stiff, low friction.	Never mixed in a barrel with PVC.	Poor bonding.
PP, ABS, SAN	Spectacle cases and covers	PP living hinges; ABS and SAN rigid.	ABS and SAN need drying.	Sink on A-surfaces.
TPE, TPU, soft PVC	Tips, pads, case overmoulds	Soft, skin contact.	Bond pair must be validated.	Skin-contact compliance.

General material behaviour only. Confirm grade data with the resin supplier.

MATCHING THE MATERIAL TO THE JOB

NEED	MATERIALS IN THIS GUIDE	MAIN CHECK
Best clarity	Optical PMMA, COP/COC	Moisture, brittleness
Impact and eye protection	Optical PC	Stress, coating
Flexible frames	TR90, PA12, nylon	Drying, colour lots
Mounts, connectors, soft parts	PEI, PPS, LCP, PPA, GF grades; TPE, TPU, soft PVC	Concentricity; bond and skin contact

MATERIAL SELECTION QUESTIONS

- ☐ Transmission, index and wavelength range needed?
- ☐ Humidity and temperature in service?
- ☐ Impact rating or eye-protection standard?
- ☐ Coatings to be applied after moulding?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

In optical moulding the cavity is the product: its surface, temperature and filling pattern are copied into every part.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN OPTICAL PARTS	MOULDING IMPLICATION
Optical surfaces	Surface form and finish set image and light output.	SPI A1 polished inserts ^[3] ; no ejector marks on optics.
Thick sections	Sinks cause a local aberration in a lens ^[9] .	Gate design and effective packing ^[7] ; multilayer for very thick parts ^[8] .
Wedge sections	Light guides run thick to thin ^[5] .	Balanced melt front to limit warp ^[6] .
Micro-structures	Dots, prisms and Fresnel rings.	Mould temperature, variotherm or injection-compression.
Base curve	Eyewear lenses and visors.	Shrinkage control across the curve.
Thin flexible temples	TR90 frames bend in use.	Laminar filling; ejection that does not deform them.
Bores and datums	Mounts, barrels and connectors align optics.	Gate for concentricity; stable shrinkage.

MOULD CONSIDERATIONS

ITEM	OPTICAL POINTS	ITEM	OPTICAL POINTS
Cavities	Precision lenses: few, matched cavities. Frames: 1 or 2. Cases and tips: more.	Inserts	Diamond-turned, electroformed or polished; interchangeable.
Gates	Film or edge gates away from the optical zone ^[7] .	Cooling	Sets the cycle; rises roughly with wall thickness squared ^[12] .
Temperature	Accurate zones; variotherm for fine structures.	Ejection	On runners and flanges, not optical faces.
Venting	Clean venting avoids burns in clear parts.	Cleanliness	Sealed moulds and clean handling for optics.

MATCHED CAVITIES AND INSERTS

CAVITY MATCHING	INSERT CHANGES	FAMILY LIMITS	SPARE INSERTS
Optical cavities are corrected one by one.	Power or curve changes by swapping inserts.	Avoid family moulds for optics.	Keep spares for polished faces.

SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Coating	Eyewear lenses, visors, windows	Clean, stress-free surfaces and handling features off the optics.
Overmoulding	Temple tips, nose pads, case grips	Bond surfaces and locating features on the core part.
Optical assembly	Barrels, holders, connectors	Datums, bores and threads held to size.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Optical parts trade speed for quality. Long packing and cooling are part of the process, so output is planned around cavities and matched tooling rather than short cycles.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

Utilisation covers start-up, cleaning, insert changes, maintenance and rejects.

EXAMPLE 1 · 8-CAVITY PMMA LED LENS

8 × 3600 ÷ 45 s = 640 /h
 × 0.85 utilisation = 544 /h
 × 22 h = 11,968 /day
 × 26 days = 311,168 /month

EXAMPLE 2 · 2-CAVITY TR90 SPECTACLE FRONT

2 × 3600 ÷ 36 s = 200 /h
 × 0.85 = 170 /h · × 22 h = 3,740 /day
 × 26 days = 97,240 /month

Working backwards: for 150,000 fronts a month in 572 running hours, you need 262 per hour. Cavities = $262 \times 36 \div (3600 \times 0.85) \approx 3.1$, so a 4-cavity mould or a second machine.

Illustrative example. Cycle times of 45 s and 36 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	OPTICAL INFLUENCE
Injection & pack	Slow fill and long pack on lenses ^[3] .
Cooling	Largest share ^[12] ; thick PMMA needs far longer than PC ^[8] .
Mould heating	Variotherm adds heating and cooling time.
Handling	Robot take-out without touching optics.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

PP SPECTACLE CASE MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
1 cavity	95 cm ²	38 t	45 t	48 g	102 /h
2 cavities	188 cm ²	76 t	89 t	95 g	204 /h
4 cavities	372 cm ²	150 t	176 t	188 g	408 /h

Illustrative example. Force = projected area × clamp factor K × safety factor S. PP, PE and PS are commonly given 2 to 3 US tons per square inch^[11], about 0.28 to 0.42 t/cm²; K = 0.35 t/cm² and S = 1.15 assumed. Also assumed: 90 cm² and 45 g per case, runner area 5 / 8 / 12 cm² and weight 3 / 5 / 8 g, 30 s cycle, 85% utilisation. Transparent optical grades need their own factors from the resin supplier.

PLANNING TOTAL MACHINE HOURS

Machine hours = Σ (monthly volume per part ÷ effective output per part)

Add lenses, frames, mounts and cases separately, then divide by the running hours per machine (572 here). Thick lenses may need their own machines.

Thick lenses change the plan most. One published simulation for thick PMMA gave a total cooling time of 314 s, almost twice that of PC^[8], and very thick parts may need high holding pressure and therefore higher clamp force^[8]. Budget minutes per part and confirm with a trial.

MACHINE UTILISATION AND PLANNED DOWNTIME

START-UP

Optical parts need stable temperatures before good parts.

CLEANING

Purging and cleaning between clear and coloured runs.

INSERT CHANGES

Power, curve or model changes.

MATERIAL CHANGES

PMMA, PC and nylons on set machines where possible.

SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

In optical moulding, automation is mostly about not touching the part: clean take-out, degating, inspection and transfer to coating.

AUTOMATION	WHERE IT ADDS VALUE IN OPTICAL PARTS	WHEN IT USUALLY MAKES SENSE
Robot take-out	Removes lenses and light guides by runner or flange.	Any optical part; hand contact marks optics.
Automatic degating	Separates lenses from runners without stress.	Multi-cavity lens moulds.
Clean conveying and trays	Moves parts into clean packing trays.	Precision lenses, windows, light guides.
In-line coating transfer	Feeds lenses into hard coating.	Eyewear lenses and visors at volume.
Vision inspection	Checks inclusions, scratches and dimensions.	High-volume lenses and connectors.
Overmoulding cells	Temple tips, nose pads, case grips.	Frames and cases at volume.
Dryers and closed conveying	Keeps PMMA, PC and nylons dry and clean.	Every clear or nylon job.
Stacking and counting	Frames, cases and mounts packed by count.	Consumer eyewear and accessories.

A lens placed straight into a clean tray by a robot avoids fingerprints, scratches and dust that are hard to remove later.

AUTOMATION BY PRODUCT GROUP

PRODUCT GROUP	MAIN AUTOMATION	WHY
Precision and LED lenses	Robot, degating, vision	No contact with optics
Eyewear lenses, visors	Robot, coating transfer	Clean parts into coating
Frames, tips, cases	Overmoulding, counting	Multi-material, sold by count
Mounts, barrels, connectors	Vision, clean packing	Micron features

DECIDING ON AUTOMATION

QUALITY Handling damage is often the largest reject cause on clear parts.	CLEANROOM Automation keeps people out of the clean area.	VOLUME Frames, cases and pads justify overmoulding and counting cells.
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INTERFACES TO SPECIFY ON THE MACHINE

ROBOT Signal interface and safety interlocks.	MOULD HEATING Variotherm or extra temperature zones.	PROCESS DATA Shot data for traceability.	AUXILIARIES Dryer, loader and conveyor links.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL optical grade	MACHINE per machine hour	LABOUR handling, packing	POWER kWh per part	MOULD polished inserts	REJECTION sinks, specks	PACKING clean trays
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On precision lenses, rejection and mould cost dominate. On frames and cases, cavities and cycle time dominate. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

An optical part is judged by what the light does: surfaces, stress and cleanliness matter as much as dimensions.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Eye protectors	IS 5983 requirements, with tests to IS 7524 Parts I and II ^[2] ; material test certificates ^[1] .	Optical distortion, impact, material
Lens dimensions	Centre thickness, outer diameter and radius of curvature ^[3] .	Shrinkage, pack, mould temperature
Surface form	Sink or form error on optical faces ^[7] .	Gate, packing, wall thickness
Stress	Polariscope check for birefringence ^[9] .	Filling speed, pack, mould temperature
Light guide output	Luminance uniformity and warp ^{[5][6]} .	Melt front balance, pressure
Cosmetic	Specks, scratches, flow lines, splay.	Drying, cleanliness, handling
Frames and mounts	Lens groove, hinge fit, bore concentricity.	Warp, gate position

Test methods and limits come from the applicable standard or customer specification. Confirm the current edition and certification requirements for each product.

WHERE REJECTS USUALLY COME FROM

PROCESS Sinks, stress and warp: set by gate, pack and temperatures.	MATERIAL Moisture and degraded resin: splay, bubbles and specks.	HANDLING Scratches, fingerprints and dust after the mould opens.
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IN-PROCESS CONTROLS

MOISTURE Check resin moisture before every run ^[4] .	WEIGHT BY CAVITY Flags drift on matched cavities.	POLARISCOPE Spot checks for stress.	LIGHT-BOX Specks and scratches.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE PART	AREAS TO INVESTIGATE
Sink on optical face	Thick section, short or weak pack ^[7]	Local aberration ^[9]	Gate, pack, melt and mould temperature
Birefringence	Moulded-in stress, fast fill ^[9]	Distortion, colour fringes	Fill speed, pack, mould temperature
Warp	Unbalanced melt front, high pressure ^[6]	Uneven light output, poor fit	Injection pressure, mould temperature
Poor replication	Cold mould, low pressure	Weak diffusion or focus	Mould temperature, variotherm
Splay, bubbles	Moisture in PMMA, PC or PA ^[4]	Reject on clear parts	Drying, loader
Black specks	Degraded resin, dirty barrel	Reject on clear parts	Purging, residence time
Hesitation marks	Thin temple sections filling late	Visible lines, weak spots	Gate, injection speed
Scratches, dust	Handling and static	Cosmetic reject	Robot take-out, clean packing

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · PMMA LED COLLIMATOR LENS		OPTICAL
APPLICATION · MATERIAL	LED collimator lens · optical PMMA	
CHARACTERISTICS	Small lens with a flange; optical faces on both sides	
CAVITIES · OUTPUT	8 · about 544 per hour at 45 s (Section 05)	
MOULD CONSIDERATIONS	Polished inserts, edge gate on the flange, matched cavities	
SECONDARY	Robot degating, clean trays, vision check	
EVALUATE Tonnage is small; shot repeatability, temperature control, drying and clean handling decide quality. STILL NEEDED CAD projected area, optical tolerances, volume.		

B · TR90 SPECTACLE FRONT		FLEXIBLE FRAME
APPLICATION · MATERIAL	Spectacle front · TR90 type polyamide	
CHARACTERISTICS	Thin rims with lens groove; bridge and hinge seats	
CAVITIES · OUTPUT	2 · about 170 per hour at 36 s(Section 05)	
MOULD CONSIDERATIONS	Laminar filling, even cooling, careful ejection	
SECONDARY	Hinge fitting, finishing, lens fitting	
EVALUATE Tonnage needs projected area; drying, repeatable cooling and colour consistency between lots drive the choice. STILL NEEDED mould drawing, part weight, colour range, volume.		

C · PP SPECTACLE CASE		LIVING HINGE
APPLICATION · MATERIAL	One-piece spectacle case · PP	
CHARACTERISTICS	About 45 g, 90 cm ² projected area (assumed); living hinge	
CAVITIES · OUTPUT	2 · about 204 per hour at 30 s (Section 05)	
MOULD CONSIDERATIONS	Hinge gating, A-surface, flexing after ejection	
SECONDARY	Hinge flexing, TPE grip overmould if used	
EVALUATE The Section 05 table gives about 76 t calculated and a 95 g shot, so a clamp rated around 89 t or more. STILL NEEDED CAD projected area, decoration, volume.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · LED LENS	B · SPECTACLE FRONT	C · SPECTACLE CASE
Main limit	Optical quality, stress	Drying, cooling, colour	Cavities, cycle
Clamp force	Needs projected area	Needs projected area	About 89 t rated
Auxiliaries	Robot, dryer, clean trays	Dryer, colour dosing	Hinge flexing, counting

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 lens, light guide, frame or optical mount.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Part weight, runner weight, wall thickness
- ☐ Resin grade and data sheet
- ☐ Optical tolerances and surface specification
- ☐ Overmoulded or inserted parts

PRODUCTION

- ☐ Monthly volume per part
- ☐ Model, power and colour range
- ☐ Cavity count and target cycle time
- ☐ Operating hours and shifts
- ☐ Cleanroom class, if any

MOULD

- ☐ New or existing mould; size and weight
- ☐ Gate type and location
- ☐ Variotherm or injection-compression
- ☐ Number of matched cavities
- ☐ Previous machine specification, if any

OPTICAL APPLICATION

- ☐ Eye-protection or product standard
- ☐ Transmission and wavelength range
- ☐ Coatings after moulding
- ☐ Stress and cosmetic limits
- ☐ Inspection method and sampling

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.

QUESTIONS TO ASK BEFORE YOU BUY A MACHINE

#	QUESTION	WHY IT MATTERS FOR OPTICAL PARTS
1	What shot and pack pressure repeatability does the machine hold at my shot size?	Lens thickness and curvature.
2	How accurate are barrel, nozzle and mould temperature controls?	Stress and replication.
3	Can the injection profile run slow, controlled fills with long pack?	Thick and precision lenses.
4	Is injection-compression or variotherm support available?	Light guides and Fresnel parts.
5	Can the machine run in or next to a cleanroom?	Precision optics.
6	What screw and barrel suit clear resins without specks?	PMMA, PC and COP.
7	What robot and take-out interfaces are supported?	No-touch handling.
8	Can the control log shot data per cavity and lot?	Traceability and matched cavities.
9	Which high-temperature resins can the barrel run?	PEI, PPS, LCP mounts and connectors.
10	What installation, training and spare-parts support is included?	Long optical qualification runs.

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 requirements such as optical tolerances, cleanroom class, coatings or eye-protection standard.

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