



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

SPORTS & SAFETY COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for makers of helmets, protective guards, sports goods and fitness equipment parts: 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 moulding helmet shells and visors, guard shells, buckles, sports goods parts, fitness equipment and hydration fittings.

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

SPORTS & SAFETY COMPONENTS & INJECTION MOULDING

Helmets, guards, sports goods and fitness equipment combine a few large certified shells with many small working parts. This guide covers the injection-moulded ones.

WHERE INJECTION MOULDING FITS IN SPORTS AND SAFETY PRODUCTS

India's domestic sports goods market is estimated at about \$2.5 billion, with sports equipment near \$0.5 billion, and equipment exports of about \$275 million a year, concentrated in the Jalandhar and Meerut clusters^[1]. Much of that equipment is hand-made or stitched, while the plastic parts are moulded.

Two-wheeler helmets are the most regulated part. Under a Quality Control Order in force since 2021, only helmets certified to IS 4151:2015 may be sold, and BIS reports seizing more than 3,000 fake helmets in 2024-25^{[2][3]}. Limb and joint guards are often rated to EN 1621-1^[4].

MAIN COMPONENT CATEGORIES

HELMETS Shells, visors and face shields	HELMET HARDWARE Vents, visor pivots, retention buckles	BODY GUARDS Shin, knee and elbow guard shells	PADDING & MOUTH TPU lattice pads, inserts, stock mouthguards
SPORTS GOODS Studs, grips, end caps, bumpers, grommets	EYEWEAR Ski, MX and swim goggle frames	FITNESS Pulleys, collars, guards, weight plate rims	HYDRATION & WINTER Bottle caps, cages, boot and binding buckles

WHY INJECTION MOULDING SUITS THESE PARTS

- Consistent wall sections that certified impact tests depend on.
- Two-shot and overmoulded soft edges and grips.
- Small buckles, pivots and studs at high cavitation.

TYPICAL MANUFACTURING CHALLENGES

- Many products are part foam, part moulding.
- Warp on large thin curved shells.
- Optical PC and drying discipline^[5].
- Cold-weather impact and nylon conditioning.

WHICH PARTS ARE MOULDED, AND WHICH ARE NOT

INJECTION MOULDED	MADE BY ANOTHER PROCESS
PC, ABS, PC/ABS helmet shells, PC visors	Fibreglass, aramid and carbon shells (laid up); EPS and EPP liners (steam-moulded beads)
Guard shells, TPU lattice pads, stock mouthguards	EVA and PU foam backing; boil-and-bite mouthguards (formed from sheet)
Racket and bat end caps, bumpers, grommets	Composite frames; rubber-coated plates; blow-moulded bottle bodies

KEY REQUIREMENTS FOR SPORTS AND SAFETY PARTS

CERTIFIED IMPACT Helmets and guards are tested as finished products ^{[3][4]} .	WALL CONSISTENCY Impact performance depends on the shell section, not the finish.	RETENTION Buckles and straps sit in the certified load path ^[3] .
LOW-TEMPERATURE TOUGHNESS Ski, MX and binding parts must not crack in the cold.	BODY AND FOOD CONTACT Mouthguards and drinking-path parts need compliance data.	FATIGUE AND WEAR Pulleys, ratchets and hinges face repeated cycles.

SECTION 02 · COMPONENTS

MAJOR SPORTS & SAFETY COMPONENTS

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

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Helmet shell	Two-wheeler and sports helmets	PC, ABS, PC/ABS, PA	Uniform wall is what the impact test measures; composite shells and EPS liners are other processes.
Helmet visor / face shield	Rider eye and face protection	Optical PC	Mirror-finish tool, stress-free slow-packed cycle; coatings applied after moulding.
Helmet vent, visor pivot, retention hardware	Vents, pivots, chin-strap buckles	PA6-GF, POM, ABS, PC, TPE	POM for sliding and ratchet faces; GF nylon for loaded pivots; retention parts are certified with the helmet.
Shin guard	Football and hockey players	PP, PE, PC, TPU, TPE	Large thin curved shell; warp decides fit; foam backing is bought in; two-shot soft edge.
Knee / elbow guard shell and strap hardware	Cycling, skating, MX	PP, PE, TPU, TPE, POM (buckles)	Articulated plates with TPE hinges suit two-shot; certification on the finished guard.
Protective padding (pads, inserts, guards)	Impact absorbing layers	TPU, TPE, rate-sensitive elastomer compounds, PP (carrier)	Only lattice pads, inserts and carriers are moulded; thin long flow paths need fast fill and venting.
Mouthguard	Contact sports	EVA, TPE, TPU	Stock guards and dual-density frames only; skin and mucosa contact data required.
Sports goods component (studs, grips, frames, caps)	Rackets, bats, boots	PA6-GF, PA66-GF, POM, TPU, ABS, PP, TPE	A family of parts; studs often have metal inserts; grips are TPE on a rigid core.
Sport goggle and eyewear frame	Ski, MX, swim	TPU, TPE, PC, PP, PA	Soft face seal with rigid lens carrier, often two-shot; flexible in the cold.
Boot, skate and binding buckle, ratchet, frame	Winter and skate sports	PA6-GF, PA66-GF, POM, TPU	Cyclic load at low temperature; POM ratchet teeth; design on conditioned nylon data.
Fitness equipment part (end caps, pulleys, collars, guards)	Gym machines	PA6-GF, PA66-GF, POM, ABS, PP, TPE	Pulleys are precision wear parts; ABS guards are cosmetic; load-path parts are fatigue tested.
Gym weight plate rim, guard and collar	Free weights	PP copolymer, HDPE, PA6-GF, TPE	Repeated drops; impact copolymer and generous radii; thick sections cool slowly.
Water bottle, cage and hydration fittings	Caps, valves, bite nozzles, cages	PP, HDPE, copolyester, PA6-GF, TPE (valve)	Bodies are blow moulded; drinking-path parts need food-contact compliance; cages are fatigue parts.

EPS and EPP liners, foam backing, composite shells and frames, rubber plates and blow-moulded bottles are outside this guide. Straps and metal inserts are bought in.

GROUPING BY MOULDING DEMAND

LARGE CERTIFIED SHELLS

Helmet shells, visors, guard shells. Wall consistency and warp.

SMALL WORKING PARTS

Buckles, pivots, studs, pulleys. Cavitation, wear and fatigue.

SOFT AND TWO-MATERIAL

Grips, goggle frames, pads, edges. Overmoulding and bonding.

SECTION 03 · MATERIALS

MATERIALS USED FOR SPORTS & SAFETY COMPONENTS

Sports and safety parts use hard shells, engineering plastics for moving parts and soft elastomers for contact surfaces, often in the same product.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
PC, optical PC	Helmet shells, visors, goggle carriers, guards	High impact, transparent grades.	Dry at 120 °C to 0.02% moisture or less; hot mould for low stress ^[5] .	Scratching; chemical stress cracking.
ABS, PC/ABS	Helmet shells, vents, fitness guards, sports parts	Toughness, good surface.	Dry before moulding.	Cold impact of plain ABS.
PA, PA6-GF, PA66-GF	Pivots, studs, buckles, frames, pulleys, cages	Strength, stiffness, fatigue.	Must be dried ^[8] ; abrasive glass.	Design on conditioned properties.
POM	Buckles, ratchets, slides, pulleys	Stiff, low friction, wear.	Keep separate from PVC; controlled mould temperature.	Notch sensitivity at corners.
PP, PP copolymer	Guard shells, grips, plate rims, bottle caps, carriers	Light, tough copolymer grades.	Shrinkage and warp on thin shells.	Low-temperature impact of homopolymer.
PE, HDPE	Guard shells, plate rims, bottle fittings	Tough, impact resistant.	Easy flow; high shrinkage.	Stiffness and heat.
TPU	Guard shells, lattice pads, goggle seals, mouthguards, grips	Abrasion resistance, flexibility.	Dry before moulding; bonding in two-shot.	Hardness range per grade.
TPE	Grips, edges, hinges, valves, goggle seals	Soft touch, overmouldable.	Bond depends on substrate.	Compression set.
EVA	Stock mouthguards, soft bite surfaces	Soft, low temperature processing.	Low melt temperatures.	Body contact data.
Rate-sensitive elastomers	Impact pads and inserts	Soft at rest, stiffen on impact.	Per compound supplier.	Tested on the finished pad.
Copolyester	Hydration fittings	Clear, tough.	Dry before moulding.	Food-contact documentation.

General material behaviour only. PC, nylon and TPU all need drying^{[5][8]}, so plan dryers around these combinations. Confirm grade data, cold impact and contact compliance with the supplier.

MATERIAL COMBINATIONS IN ONE PRODUCT

PRODUCT	HARD PARTS	WORKING PARTS	SOFT PARTS
Helmet	PC or PC/ABS shell, optical PC visor	POM buckle, PA6-GF pivot	TPE vent or trim details
Shin, knee or elbow guard	PP or PE shell	POM strap buckle	TPU or TPE edge and hinges

MATERIAL SELECTION QUESTIONS

- ☐ Which test does the finished product face, and at which temperature?
- ☐ Does it touch skin, mouth or drinks?
- ☐ Is it a wear or fatigue part, and is it two-shot, overmoulded or assembled?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Sports and safety tools range from polished single-cavity shell and visor moulds to multi-cavity buckle tools and two-shot moulds for soft edges and grips.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN SPORTS AND SAFETY PARTS	MOULDING IMPLICATION
Shell wall	Impact tests measure the finished shell.	Balanced filling; hold nominal wall across the dome.
Optical surfaces	Visors and goggle lenses need clear, low-distortion vision.	Polished steel, clean dry material, slow packing.
Thin curved shells	Guards must sit flat on the body.	Even cooling; warp control; ejection support.
Snap and ratchet teeth	Buckles and adjusters carry load and cycles.	Sharp detail without notches; POM shrink control.
Lattice and honeycomb	Pads absorb impact through thin cells.	Fast injection; venting at every cell.
Soft-to-hard joins	Grips, edges, goggle seals, hinges.	Two-shot or overmould tooling and bond design.
Metal inserts	Studs and some pulleys.	Insert seats, retention, loading each cycle.
Thick rims	Weight plate rims and collars.	Sinks and voids; cooling-limited cycle ^[7] .

MOULD CONSIDERATIONS

ITEM	SPORTS AND SAFETY POINTS	ITEM	SPORTS AND SAFETY POINTS
Cavity layout	Shells and visors: 1. Guard shells: 1 to 4. Buckles, studs: 8 to 32.	Steel	Polished, hardened steel for optical PC.
Gating	Gate shells for balanced flow over the dome.	Cooling	Even cooling on shells; conformal where needed.
Two-shot	Rotating platen or core-back for soft edges and grips.	Wear	Hardened inserts for glass-filled nylon.
Venting	Critical on lattice pads and visors.	Sizes	Each shell size or guard size is often its own tool.

KEEPING CERTIFIED PARTS UNCHANGED

FREEZE THE GRADE A new resin can change impact results.	FREEZE THE WALL Thinning a shell may void the test.	FREEZE THE BUCKLE Retention parts are tested with the helmet ^[3] .	MARK THE TOOL Cavity and date marks aid traceability.
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SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Coating	Visors and goggle lenses	Clean, stress-free surfaces that accept coatings.
Foam lamination or liner assembly	Shin and knee guards, helmet shells	Stable shell shape and bonding faces.
Hardware assembly	Buckles, pivots, strap adjusters	Pin bores, slots and hinge faces to size.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Sports and safety plants run large shells one at a time and small hardware in multi-cavity tools. Seasonal demand and size ranges make planning as important as cycle time.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

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

EXAMPLE 1 · 16-CAVITY POM STRAP BUCKLE

16 × 3600 ÷ 18 s = 3,200 /h

× 0.85 utilisation = 2,720 /h

× 22 h = 59,840 /day

× 26 days = 1,555,840 /month

EXAMPLE 2 · 1-CAVITY PC/ABS HELMET SHELL

1 × 3600 ÷ 60 s = 60 /h

× 0.85 = 51 /h · × 22 h = 1,122 /day

× 26 days = 29,172 /month

Working backwards: for 50,000 shells a month in 572 running hours, you need 87 per hour. Cavities = $87 \times 60 \div (3600 \times 0.85) \approx 1.7$, so a second tool on another machine.

Illustrative example. Cycle times of 18 s and 60 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	SPORTS AND SAFETY INFLUENCE
Injection & hold	Slow packing on visors; fast fill on lattice pads.
Cooling	Shells and thick rims; rises roughly with wall thickness squared ^[7] .
Two-shot	Second shot and rotation add time.
Handling	Shells and visors removed without marks.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

PP SHIN GUARD SHELL MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
1 cavity	190 cm ²	76 t	90 t	50 g	102 /h
2 cavities	380 cm ²	153 t	180 t	100 g	204 /h
4 cavities	760 cm ²	306 t	360 t	200 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^[6], about 0.28 to 0.42 t/cm²; K = 0.35 t/cm² and S = 1.15 assumed. Also assumed: 180 cm² and 45 g per shell, runner 10 cm² and 5 g per cavity, 30 s cycle, 85% utilisation.

PLANNING A SIZE RANGE

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

Add every shell size, colour and hardware part, then compare with the 572 running hours per machine used in these examples.

Helmet shells and guards run by size and colour against seasonal orders, so a range of several sizes can need more machine hours than its total volume suggests. Small hardware such as buckles and studs runs continuously and builds stock for assembly.

MACHINE UTILISATION AND PLANNED DOWNTIME**DRYING**

PC, nylon and TPU need dryer time before each run^{[5][8]}.

COLOUR CHANGES

Helmets and guards come in many colours.

SEASON

Winter goods and school sports peak at set times.

TOOL POLISHING

Visor and shell tools need scheduled care.

SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

Automation in this industry protects surfaces on shells and visors, joins soft and hard materials, and counts small hardware.

AUTOMATION	WHERE IT ADDS VALUE IN SPORTS AND SAFETY PARTS	WHEN IT USUALLY MAKES SENSE
Robot take-out	Helmet shells and visors that scratch easily.	Large cosmetic and optical parts.
Two-shot or overmoulding cell	Soft edges, grips, goggle seals, TPE hinges.	Where it removes trimming or assembly.
Insert loading	Metal inserts in studs and pulleys.	Insert parts at steady volume.
Dryers and closed conveying	PC, nylon, TPU, copolyester.	Every hygroscopic grade.
Degating and separators	Buckles, studs, caps.	Multi-cavity cold-runner tools.
Clean handling	Visors before coating.	Optical parts where dust causes rejects.
Counting and bagging	Buckles, studs, end caps, spare parts.	Small parts sold by count.
Assembly and testing	Buckles, pivots, bottle valves.	Multi-part hardware at volume.

AUTOMATION BY PRODUCT GROUP

PRODUCT GROUP	MAIN AUTOMATION	WHY
Helmet shells, visors	Robot take-out, clean handling	Surface and optical quality
Guards, grips, goggle frames	Two-shot or overmould	Soft edges without trimming
Buckles, studs, pivots	Degating, counting, assembly	High counts, many small parts
Fitness and plate parts	Robot take-out, stacking	Heavy parts, long cycles

DECIDING ON AUTOMATION

SURFACE VALUE Handling marks on shells and visors are costly rejects.	LABOUR IN ASSEMBLY Buckles and overmoulded parts take many hand steps.	SEASONAL PEAKS Automated cells help meet short peaks with the same staff.
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INTERFACES TO SPECIFY ON THE MACHINE

ROBOT Signal interface and safety interlocks.	SECOND INJECTION For two-shot soft edges and grips.	CORE PULLS Undercuts on buckles and vents.	DATA Shot records for certified parts.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL PC, nylon, TPU	MACHINE per machine hour	LABOUR handling, assembly	POWER kWh per part, drying	MOULD polish, two-shot	REJECTION scratches, warp	PACKING by size, colour
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On helmet shells and visors, material and surface rejects dominate. On buckles and studs, machine hours and assembly dominate. Many sizes and colours multiply mould and change-over cost. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

Most safety products are certified as finished products, so the moulder's job is to make every shell, visor and buckle the same as the ones that passed.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Helmet certification	IS 4151:2015 covers materials, construction, impact, retention and chin strap tests, and quick-release checks ^[3] . BIS licence required ^[2] .	Shell wall, grade, buckle parts
Limb impact protectors	EN 1621-1: mean transmitted force 35 kN or less for Level 1, 20 kN or less for Level 2 ^[4] .	Pad and shell geometry
Protector conditioning	Ambient and wet impact after hydrolytic ageing are mandatory; hot and cold tests optional ^[4] .	Grade, hydrolysis resistance
Visor checks	Optical and scratch checks per the helmet standard used.	Drying, tool polish, stress
Fatigue and cycle tests	Buckles, ratchets, pulleys, cages per customer specification.	Weld lines, notches, conditioning
Cold impact	Goggle frames, bindings, buckles at low temperature.	Grade, moisture, stress
Contact compliance	Grade declarations for mouth, skin and drinking-path parts.	Approved grade, colourants

Confirm the current edition of each standard and whether certification applies to your product and market.

IN-PROCESS CONTROLS

SHELL WEIGHT Tracks wall consistency shot to shot.	WALL GAUGING Spot checks on shell sections.	MOISTURE PC at 0.02% or less ^[5] ; nylon dried ^[6] .	VISUAL Visors under inspection light.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE PART	AREAS TO INVESTIGATE
Splay, bubbles	Moisture in PC, nylon or TPU ^[5]	Visual reject, weaker shell	Drying time, dew point, hopper
Visor distortion, stress	Fast packing, cold mould	Poor vision, cracking	Mould temperature, hold profile
Scratches, marks	Handling, ejection	Cosmetic or optical reject	Take-out, ejector design, packing
Warp	Uneven cooling on thin shells	Guard does not sit flat	Cooling layout, hold, ejection
Short shots	Thin lattice cells, poor venting	Weak or incomplete pads	Injection speed, venting
Weld lines	Flow around vents and slots	Cracks on impact	Gate position, melt temperature
Poor soft-hard bond	Wrong TPE pairing, cold substrate	Edges peel from shells	Material pair, substrate temperature
Cold cracking	Dry nylon, notches, wrong grade	Buckle or frame failure	Conditioning, radii, grade

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · POM HELMET STRAP BUCKLE		HARDWARE VOLUME
APPLICATION · MATERIAL	Chin-strap buckle · POM	
CHARACTERISTICS	About 3 g, 3 cm ² projected area (assumed); latch teeth	
CAVITIES · OUTPUT	16 · about 2,720 per hour at 18 s (Section 05)	
MOULD CONSIDERATIONS	Balanced cold runner 20 cm ² and 8 g (assumed); sharp teeth, no notches	
SECONDARY	Degating, assembly, counting	
EVALUATE Area 68 cm ² × assumed K 0.5 t/cm ² × 1.15 ≈ 39 t, so a clamp rated around 46 t or more; shot about 56 g. Repeatability matters because the buckle is in the certified load path. STILL NEEDED K from the POM supplier, CAD area, volume.		

B · PC/ABS HELMET SHELL		CERTIFIED SHELL
APPLICATION · MATERIAL	Two-wheeler helmet shell · PC/ABS (to be confirmed)	
CHARACTERISTICS	Large curved dome; uniform wall is the test case	
CAVITIES · OUTPUT	1 · about 51 per hour at 60 s (Section 05)	
MOULD CONSIDERATIONS	Balanced gating over the dome, even cooling, polished surface	
SECONDARY	Liner assembly, painting or decoration	
EVALUATE Tonnage needs the projected area of each shell size; platen size, daylight for a deep core and shot consistency drive the choice. STILL NEEDED CAD for each size, grade, volume per size.		

C · PP SHIN GUARD SHELL		WARP + TWO MATERIALS
APPLICATION · MATERIAL	Football shin guard · PP with TPE edge option	
CHARACTERISTICS	About 45 g, 180 cm ² projected area (assumed); thin and curved	
CAVITIES · OUTPUT	2 · about 204 per hour at 30 s (Section 05)	
MOULD CONSIDERATIONS	Even cooling, ejection support, soft-edge option	
SECONDARY	Foam backing and strap assembly	
EVALUATE The Section 05 table gives about 153 t calculated, so a clamp rated around 180 t or more. A two-shot TPE edge adds a second injection unit. STILL NEEDED edge choice, CAD area, colours, volume.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · BUCKLE	B · HELMET SHELL	C · SHIN GUARD
Main limit	Cavities, repeatability	Shell size, wall consistency	Projected area, warp
Clamp force	About 46 t rated	Needs projected area	About 180 t rated
Auxiliaries	Degating, counter	Dryer, robot	Two-shot option, 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 a helmet, guard, sports goods or fitness part.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Part weight, runner weight, wall thickness
- ☐ Grade data, including cold impact
- ☐ Inserts and soft-touch areas
- ☐ Surface or optical requirements

PRODUCTION

- ☐ Monthly volume per size and colour
- ☐ Seasonal peaks
- ☐ Cavity count and target cycle time
- ☐ Operating hours and shifts
- ☐ Packing by size, colour or count

MOULD

- ☐ New or existing mould; size and weight
- ☐ Two-shot or overmould tooling
- ☐ Undercuts and core pulls
- ☐ Polish grade and steel
- ☐ Previous machine specification, if any

SPORTS & SAFETY APPLICATION

- ☐ Certification: IS 4151, EN 1621 or other
- ☐ Lowest service temperature
- ☐ Skin, mouth or food contact
- ☐ Fatigue or cycle test
- ☐ Which layers are foam or bought in

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 SPORTS AND SAFETY PARTS
1	What shot repeatability does the machine hold at my shot size?	Shell wall and certified part weight.
2	Is a second injection unit or rotary option available?	Two-shot edges, grips and goggle frames.
3	Will my deepest shell mould fit, with the opening stroke it needs?	Helmet shells and deep guards.
4	How is injection speed and packing profiled?	Fast lattice fill, slow visor packing.
5	What robot interfaces are supported?	Mark-free take-out of shells and visors.
6	Is a wear-resistant screw available for glass-filled nylon?	Pivots, studs, frames, pulleys.
7	Can the control store settings for each size and colour?	Wide size and colour ranges.
8	Can the machine log shot data by lot?	Traceability for certified products.
9	What is the energy use per part at my cycle?	Long shell and rim cycles.
10	What installation, training and spare-parts support is included?	Seasonal peaks need uptime.

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
1 • CALCULATE Clamp force and shot weight from part, cavities and grade.	2 • CHECK THE MOULD Size, stroke, core pulls and inserts.	3 • CHECK OUTPUT Cycle and cavities against your volume.	4 • CONFIGURE Screw, barrel, controls and auxiliaries.	

SEND YOUR COMPONENT & PRODUCTION REQUIREMENTS

Component drawing • material • part weight • mould details • cavity count • production requirement • the certification the finished product must pass, overmoulding or two-shot needs, and colours.

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