



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

BICYCLE COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for bicycle 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 bicycle makers and component suppliers.

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

BICYCLE COMPONENTS & INJECTION MOULDING

Which bicycle parts are injection moulded, where they sit on the bicycle and what riders and standards expect from them.

WHERE INJECTION MOULDING FITS IN BICYCLE MANUFACTURING

Frames, rims, chains and spokes are metal, but the parts a rider touches and sees are increasingly plastic: pedals, grips, reflectors, mudguards, chain guards, saddle shells, levers, bells and bottle cages. Drivetrain parts such as derailleur bodies and pulleys, cable end caps and ferrules are also moulded in engineering plastics.

India is a major producer. A 2021 KPMG report with AICMA puts production at 2.2 crore bicycles a year, making India the second largest producer in the world, with more than 4,000 MSMEs in Ludhiana^[1]. Each bicycle carries a set of moulded parts, so component makers run large, steady volumes, with demand linked to bicycle builds and seasonal sales.

MAIN COMPONENT CATEGORIES

PEDALS & CLIPS Pedal bodies, toe clips, pedal strap clips	RIDER CONTACT Handle grips, saddle bases and shells	SAFETY & VISIBILITY Cycle reflectors, bell housings and covers	GUARDS Cycle mudguards, chain guards, chainring guards
CONTROLS Brake levers, shift levers	DRIVETRAIN Derailleur bodies and pulleys	CABLE PARTS Cable end caps, ferrules	ACCESSORIES Water bottle cages

WHY INJECTION MOULDING SUITS THESE PARTS

- Complex shapes such as pedal treads, lever bodies and cages in one shot.
- Metal inserts, reflectors and soft grips combined by insert moulding and overmoulding.
- Low weight and corrosion-free parts compared with steel.

TYPICAL MANUFACTURING CHALLENGES

- Warpage and weld lines in glass-filled nylon parts.
- Bonding soft TPE to hard grip cores.
- Optical accuracy of reflector prisms.
- Tight price per part in a cost-driven market.

WHERE THE MOULDED PARTS SIT ON A BICYCLE

COCKPIT Grips, brake and shift levers, bell, front reflector.	DRIVETRAIN Pedals, toe clips, derailleur body and pulleys, chain and chainring guards.	FRAME-MOUNTED Mudguards, bottle cage, rear and wheel reflectors, cable end caps and ferrules.	SADDLE Saddle base or shell under foam and cover.
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KEY REQUIREMENTS FOR BICYCLE COMPONENTS

STRENGTH & FATIGUE ISO 4210-2 sets safety and performance requirements covering pedals, saddles, handlebars and more ^{[2][3]} .	VISIBILITY US rules require colourless front, red rear and colourless or amber pedal reflectors ^[4] .	WEATHERING Parts live outdoors: UV, rain, heat and cold, often with no cover.
GRIP & COMFORT Grips and saddles must stay bonded, soft and non-slip ^[5] .	LOW FRICTION & WEAR Pulleys, pivots and cable parts must run smoothly for years.	COST PER PART High volumes and tight prices make cycle time and scrap decisive.

SECTION 02 · COMPONENTS

MAJOR BICYCLE COMPONENTS

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

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Bicycle pedal	Pedal body on a metal spindle	Glass-filled nylon (PA6/PA66-GF), PP, ABS, PC	Plastic body over a metal spindle; reflectors are often insert-moulded in. Tread pins and thick bosses need sink control. Pedal reflectors must sit recessed from the edge ^[4] .
Toe clip / pedal strap clip	Foot retention	Nylon (PA), PP	Flexible yet strong clip geometry; consistent fit to the pedal cage.
Handle grip	Handlebar grip	TPE, TPR, PVC; PP or ABS inner core	Soft TPE or TPR outer overmoulded on a hard PP or ABS core, a two-part process. Bond strength and surface texture are key ^{[5][6]} .
Saddle base / shell	Saddle structure	Glass-filled nylon (PA-GF), PP	Rigid shell with integrated rail-mount points; foam and cover added later. Warpage and weld lines at rail mounts.
Cycle reflector	Front, rear, wheel and pedal reflectors	PMMA lens, ABS housing	PMMA lens for optical clarity with precise prism faces; must meet the applicable retro-reflective standard ^[4] .
Bell housing / cover	Bell body and dome	ABS, PP	Appearance part, often coloured or plated. Snap fits and mounting clamp.
Cycle mudguard	Front and rear fenders	PP, nylon (PA), ABS	Long, thin curved part; warpage and stiffness along the length. Mounting bosses and stays.
Chain guard / chainring guard	Chain and chainring cover	PP, ABS, nylon (PA)	Large flat or curved part; flatness and mounting points. Moulded-in colour and branding.
Brake / shift lever	Handlebar controls	Glass-filled nylon (PA-GF), POM, ABS	Load-bearing lever bodies in PA-GF; pivots and ratchets in POM. Fibre orientation and weld lines at pivot holes.
Derailleur body / pulley	Gear-change mechanism	Glass-filled nylon (PA-GF), POM	PA-GF for load-bearing bodies; POM pulley wheels for low friction. Tooth profile and bore accuracy.
Cable end cap / ferrule	Brake and gear cable ends	POM, nylon (PA), PP	Small multi-cavity part; bore and outer diameter fit to cable housing.
Water bottle cage	Bottle holder on frame	Glass-filled nylon (PA-GF), PP	High-strength GF nylon so the arms hold the bottle without cracking. Weld lines at arm roots.

HOW MANY OF EACH PART A BICYCLE NEEDS

PART	PER BICYCLE	PLANNING NOTE
Pedal bodies	2 (one LH, one RH)	Run as LH/RH pairs; each carries reflectors where required.
Grips, brake levers	2 each	Colour variants multiply part numbers.
Reflectors	Several	US rules call for front, rear, pedal (front and rear face of each pedal) and wheel side reflectors ^[4] .
Mudguards, chain guard, saddle, bell, cage	0 to 2 each, by model	Fitted on city and utility models; optional on others.
Cable end caps and ferrules	One per cable end	Number depends on brake and gear layout.

SECTION 03 · MATERIALS

MATERIALS USED FOR BICYCLE COMPONENTS

Glass-filled nylon carries load, POM runs against moving parts, PP and ABS cover and protect, and PMMA and TPE handle optics and grip.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
Glass-filled nylon (PA6/PA66-GF)	Pedals, saddle shells, levers, derailleur bodies, bottle cages	Strength, stiffness and fatigue resistance for load-bearing parts.	Hygroscopic: moisture above 0.2% harms moulding ^[9] . Glass fibre wears screws and causes anisotropic shrinkage.	Dimensional change with moisture; weld-line strength.
Nylon (PA)	Toe clips, mudguards, chain guards, cable parts	Toughness and flexibility.	Must be dried.	Stiffness drops as it absorbs moisture.
POM	Derailleur pulleys, lever pivots, cable end caps and ferrules	Stiff, low friction, wear and fatigue resistant; used for gears and bearings ^[10] .	Avoid overheating and long residence; keep PVC out of the barrel.	UV unless stabilised.
PP	Mudguards, chain guards, grip cores, clips, bells, pedals, cages, saddles	Low cost, tough, chemical resistant.	Shrinkage and warpage on long thin parts.	UV stabilisation for outdoor use; low stiffness.
ABS	Reflector housings, bells, chain guards, grip cores, levers, pedals	Rigid, good surface finish, paintable and platable.	Needs drying to avoid moisture streaks.	UV resistance outdoors.
PC	Pedal bodies	Tough and impact resistant.	Must be dried; high melt temperature.	Stress cracking with some chemicals.
PMMA (acrylic)	Reflector lenses	Clarity, surface hardness, weathering.	Needs drying; accurate filling of prism faces.	Lower impact strength than PC.
TPE, TPR	Handle grips	Soft, non-slip, vibration damping ^[5] .	Overmoulded on the core; TPE bonds well to PP, while ABS needs a matched grade ^[6] .	Delamination, UV and wear of the grade.
PVC	Handle grips	Soft, low cost.	Needs a corrosion-resistant screw and careful purging.	Narrow processing window.

General material behaviour only. Confirm property values on the supplier's data sheet for the exact grade.

OUTDOOR DURABILITY

UV PP, ABS and POM parts left outdoors need UV-stabilised grades or pigments; UV-stabilised POM grades exist for this purpose ^[10] .	MOISTURE Nylon parts absorb water in service, which changes stiffness and dimensions. Design fits with this in mind.	COLD & IMPACT Mudguards, guards and reflectors take knocks in cold weather; check impact at the lowest service temperature.
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WHAT THE STANDARDS SAY ABOUT MATERIALS

ISO 4210-2 sets performance tests for pedals, saddles and other sub-assemblies rather than naming materials^{[2][3]}, so the grade must pass the component test. For reflectors, US rules allow pedal reflector elements to be integral or attached, but recessed from the pedal edge^[4].

MATERIAL SELECTION QUESTIONS

- ☐ Does the part carry load or fatigue, pointing to PA-GF?
- ☐ Does it slide or rotate, pointing to POM?
- ☐ Will it sit in sunlight, and what UV stabilisation is specified?
- ☐ Which substrate and soft material pair are planned for grips?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Bicycle parts combine structure, inserts, optics and soft touch. Each of these adds its own demands on the mould.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN BICYCLE PARTS	MOULDING IMPLICATION
Metal inserts	Pedal spindle sleeves, lever pivots and threaded bushes.	Insert location in the mould, preheating where needed, consistent insert size.
Weld lines at holes	Pivot holes, rail mounts and cage arms carry load.	Gate position so weld lines avoid high-stress areas; good venting.
Glass-fibre orientation	Sets stiffness and shrinkage direction in PA-GF parts.	Gate position and flow path planned with the load path.
Thick bosses	Pedal bodies and lever hubs have thick sections.	Core out sections; control hold pressure and time to avoid sinks and voids.
Reflector prisms	Retro-reflection depends on accurate prism geometry.	Precision prism inserts, clean PMMA and controlled filling.
Soft-hard grips	Grips must not twist or peel.	Mechanical interlocks on the core plus a matched TPE grade ^[6] .
Long thin guards	Mudguards and chain guards must stay straight.	Uniform walls, ribs, balanced filling and even cooling.
Treads & textures	Pedal treads and grip patterns give traction.	Textured steel, draft on textured faces, clean release.

MOULD CONSIDERATIONS

ITEM	BICYCLE POINTS	ITEM	BICYCLE POINTS
Cavity layout	Cable parts and clips: 16 to 64 cavities. Pedals: LH/RH pairs. Guards and saddle shells: 1 or 2.	Steel & wear	Hardened inserts at gates and shut-offs for glass-filled nylon.
Runner	Hot runners for multi-cavity small parts; cold runners common on pedals and levers.	Moving cores	Slides for lever pivots, cage undercuts and pedal pin holes.
Two-shot or overmould	Grips need a second shot or a separate overmould mould.	Optical inserts	Replaceable prism inserts for reflectors.
Cooling	Even cooling for flat guards and saddle shells.	Mould size	Mudguard and chain guard moulds are long; check tie-bar spacing early.

SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Reflector assembly	Pedals, wheel and rear reflectors	Accurate pockets and snap fits for lens and housing.
Painting, plating, printing	Bells, guards, levers	Clean surface, low moulded-in stress.
Saddle covering	Saddle shells	Foam and cover attachment features held to shape.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Small cable parts run in high-cavity moulds; pedals run as LH/RH pairs; guards run one or two per cycle. Plan each against bicycle build volumes.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

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

EXAMPLE 1 · 32-CAVITY POM CABLE END CAP

32 × 3600 ÷ 10 s = 11,520 /h

× 0.85 utilisation = 9,792 /h

× 22 h = 215,424 /day

× 26 days = 5,601,024 /month

Working backwards: for 4,000,000 caps a month in 572 running hours (26 × 22), you need 6,993 per hour. Cavities = 6,993 × 10 ÷ (3600 × 0.85) = 22.9, so 24 cavities is the minimum and 32 gives headroom.

WHAT SETS THE CYCLE TIME

PHASE	BICYCLE INFLUENCE
Insert loading	Spindle sleeves, bushes and reflectors placed each cycle.
Injection & hold	Packing thick pedal and lever sections.
Cooling	Usually the largest share; rises roughly with wall thickness squared ^[8] .
Moving cores	Slides on levers, cages and pedals add time.
Second shot	Overmoulding grips adds a second stage.
Material	Undried PA causes splay and weak parts.

EXAMPLE 2 · PEDAL BODY, LH + RH FAMILY MOULD

1 pair per 40 s cycle = 90 pairs/h

× 0.85 = 76.5 pairs/h · × 22 h = 1,683 / day

× 26 days = 43,758 pairs/month

Insert and reflector loading usually sets this cycle. A robot or loading fixture keeps it steady.

Illustrative example. Cycle times of 10 s and 40 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.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

PA-GF PEDAL BODY MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
2 cavities (1 pair)	150 cm ²	95 t	112 t	192 g	153 bodies/h
4 cavities (2 pairs)	296 cm ²	187 t	220 t	380 g	306 bodies/h
8 cavities (4 pairs)	584 cm ²	369 t	435 t	752 g	612 bodies/h

Illustrative example. Force = projected area × clamp factor K × safety factor S. PA is commonly given 3 to 5 US tons per square inch^[7], about 0.42 to 0.70 t/cm²; K = 0.55 t/cm² and S = 1.15 assumed. Also assumed: 70 cm² and 90 g per body, runner area 10 / 16 / 24 cm² and weight 12 / 20 / 32 g, 40 s cycle, 85% utilisation. More cavities also mean more inserts to load per cycle.

PLANNING FROM BICYCLE VOLUME

Parts needed/month = Bicycles/month × Parts per bicycle

Illustrative: 50,000 bicycles a month need 50,000 pedal pairs. Example 2 gives about 43,758 pairs a month from one 1 + 1 mould, so a 2 + 2 mould or a second machine is needed.

MACHINE UTILISATION AND PLANNED DOWNTIME**COLOUR CHANGES**

Grips, guards and bells come in many colours; sequence runs to limit purging.

SEASONAL PEAKS

Plan capacity and mould readiness ahead of peak selling seasons.

DRYING

PA, PA-GF, PMMA, ABS and PC need drying before use.

INSERT SUPPLY

Spindle sleeves and reflectors must be on hand to keep the cycle running.

SECTION 06 • AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

In bicycle parts, automation mainly helps with insert loading, two-material grips and handling of long guards.

AUTOMATION	WHERE IT ADDS VALUE IN BICYCLE PARTS	WHEN IT USUALLY MAKES SENSE
Insert loading	Places spindle sleeves, bushes and reflector parts into pedal and lever moulds.	Insert-moulded pedals and levers where manual loading limits the cycle or safety.
Two-shot or transfer	Moves grip cores to the overmould station or runs both shots in one machine.	High-volume grips and soft-touch parts.
Robot take-out	Removes long mudguards and chain guards without bending them.	Large or thin parts that distort if dropped.
Sprue picker	Removes cold runners on pedal, lever and cage moulds.	Cold-runner moulds on continuous runs.
Conveyors & counting	Carries and counts small caps, ferrules and clips.	High-cavity small parts sold by count.
Assembly	Pedal body with spindle and reflectors; lever with pivot and spring; bell assembly.	Multi-part assemblies at bicycle-line volumes.
Vision inspection	Checks reflector prisms, short shots and missing inserts.	Safety-related parts such as reflectors and pedals.
Material handling	Central drying for PA and PMMA; colour dosing for PP and ABS.	Several machines on the same materials.

In bicycle plants, automation usually pays back first where hands go into the mould every cycle, as with pedal inserts, and where long guards distort when dropped. Bicycle-line volumes then make assembly and counting the next target.

TWO-SHOT MOULDING OR SEPARATE OVERMOULDING FOR GRIPS

POINT	TWO-SHOT IN ONE MACHINE	CORE MOULDED, THEN OVERMOULDED
Equipment	Machine with two injection units and a rotary or transfer mould.	Two standard machines, or one machine with two moulds.
Handling	Core stays in the mould; no reloading.	Cores loaded by hand or robot into the overmould.
Flexibility	Best for long runs of one grip design.	Easier to vary colours and designs.

INTERFACES TO SPECIFY ON THE MACHINE

ROBOT Signal interface and safety interlocks for loading and take-out.	HOT RUNNER Zones for multi-cavity cap and clip moulds.	CORE PULLS Circuits for slides on levers, cages and pedals.	SECOND SHOT Two-shot or overmould capability for grips.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL resin + colour	MACHINE cost per machine hour	LABOUR loading, assembly	POWER kWh per part	MOULD amortisation, upkeep	REJECTION scrap, rework	PACKING by count or set
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On glass-filled nylon pedals and levers, material and insert cost are a large share. On small caps and clips, machine hours and handling dominate. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

Bicycle parts are judged on strength, visibility and feel, often after months outdoors.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Bicycle safety tests	ISO 4210-2 sets safety and performance requirements for bicycles and sub-assemblies, with test methods for pedals and drive systems and for saddles in other parts of ISO 4210 ^{[2][3]} .	Weld lines, voids, fibre orientation, insert retention
Reflectors	US rules require front, rear, pedal and side reflectors meeting reflectance values over set angles; pedal reflectors must be recessed from the pedal edge ^[4] .	Prism accuracy, lens clarity, pocket depth
Grip bond	Twist and pull checks on grips to confirm the soft layer stays bonded.	TPE grade, core surface, interlocks, temperatures
Dimensional	Pedal thread and spindle fit, pulley bores, cable cap fit, lever pivots.	Shrinkage, moisture, cavity match
Weathering & impact	UV exposure and impact checks on guards, mudguards and reflectors, per customer specification.	UV grade, moulded-in stress, drying

Test methods and limits come from the applicable standard or customer specification. Confirm the current edition and the rules in each market.

IN-PROCESS CONTROLS

WEIGHT BY CAVITY	INSERT CHECK	GAUGES	MOISTURE
Flags short shots and drift early.	Presence and position of inserts every cycle.	Go / no-go on threads, bores and pivots.	Resin moisture checks for PA and PA-GF.

TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE BICYCLE PART	AREAS TO INVESTIGATE
Weak weld lines	Flow fronts meeting at pivot holes or cage arms	Cracking under load	Gate position, melt temperature, venting
Warpage	Fibre orientation, uneven cooling	Bent mudguards, rocking saddle shells	Cooling layout, gate position, packing
Sink & voids	Thick pedal and lever sections	Weak bosses, poor appearance	Wall design, hold pressure and time
Delamination	Poor TPE-substrate match, cold core, contamination	Grips that twist or peel	Grade pairing, interlocks, core temperature
Splay	Moisture in PA, PMMA or ABS	Silver streaks, lower strength	Dryer settings, dew point, hopper time
Short shot	Blocked vents, low shot, cold mould	Incomplete reflector prisms or treads	Venting, injection speed, mould temperature
Flash	Worn shut-offs, low clamp force	Sharp edges on grips, pedals and levers	Parting line, clamp setting, pressure profile

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · POM CABLE END CAP		VOLUME + FIT
APPLICATION · MATERIAL	Brake and gear cable end cap · POM	
CHARACTERISTICS	Very small part; bore and outer diameter fit	
CAVITIES · OUTPUT	32 · about 9,800 per hour at a 10 s cycle (Section 05)	
MOULD CONSIDERATIONS	Balanced hot or cold runner, core pins for bores, venting	
SECONDARY	Counting and bagging	
EVALUATE Tonnage is modest for a part this small, so shot repeatability, a small screw sized to the shot and fast cycling matter more. STILL NEEDED part weight, projected area, runner design, monthly volume.		

B · GLASS-FILLED NYLON PEDAL BODY		STRUCTURE + INSERTS
APPLICATION · MATERIAL	City bicycle pedal · PA6 or PA66-GF (grade to be confirmed)	
CHARACTERISTICS	About 90 g, 70 cm ² projected area (assumed); spindle sleeve and reflector pockets	
CAVITIES · OUTPUT	LH + RH pair · about 76 pairs per hour at 40 s (Section 05)	
MOULD CONSIDERATIONS	Insert location, gates away from spindle bore, hardened inserts for glass fibre	
SECONDARY	Reflector fitting, spindle and bearing assembly	
EVALUATE The Section 05 table gives about 95 t calculated and a 192 g shot for one pair, so a clamp rated around 112 t or more. Insert loading, drying and a wear-resistant screw matter as much as tonnage. STILL NEEDED CAD projected area, insert design, pedal test requirements.		

C · TWO-MATERIAL HANDLE GRIP		BOND + FEEL
APPLICATION · MATERIAL	Handlebar grip · PP or ABS core with TPE or TPR outer	
CHARACTERISTICS	Tube-shaped core with a soft textured outer layer	
CAVITIES · OUTPUT	Core and overmould cavities matched · volume set by bicycle builds	
MOULD CONSIDERATIONS	Core interlocks, long core pins, textured outer cavity	
SECONDARY	End caps, packing in pairs	
EVALUATE Decide between two-shot moulding in one machine and overmoulding pre-moulded cores in a second machine. Material pairing sets bond strength ^[6] . STILL NEEDED grip drawing, core and TPE grades, target volume.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · CABLE CAP	B · PEDAL BODY	C · GRIP
Main limit	Shot size, cycle speed	Inserts, glass fibre	Two-material process
Clamp force	Small; needs projected area	About 112 t rated for one pair	Needs projected area
Auxiliaries	Conveyor, counter	Dryer, insert loading	Transfer or two-shot unit

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 bicycle component.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Part weight, runner weight, wall thickness
- ☐ Material grade, including glass content
- ☐ Critical dimensions: threads, bores, pivots
- ☐ Inserts, reflectors or soft layers

PRODUCTION

- ☐ Monthly and yearly volume per part
- ☐ Colour and model variants
- ☐ Cavity count and target cycle time
- ☐ Operating hours and shifts
- ☐ Assembly and packing plan

MOULD

- ☐ New or existing mould; size and weight
- ☐ Hot or cold runner; number of zones
- ☐ Slides, core pulls and insert locations
- ☐ Two-shot or overmould requirement
- ☐ Previous machine specification, if any

BICYCLE APPLICATION

- ☐ Bicycle type and target markets
- ☐ Safety standard to be met (for example ISO 4210)
- ☐ Reflector requirements for the market
- ☐ UV and weather exposure
- ☐ Load, fatigue and wear expectations

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 BICYCLE PARTS
1	Which screw and barrel options suit glass-filled nylon?	Wear on pedals, levers, cages and saddle shells.
2	What shot repeatability does the machine hold at my shot size?	Fit of pulleys, caps and pivots.
3	Can the machine run two-shot or overmoulding for grips?	Soft-hard grip production.
4	What robot and insert-loading interfaces are supported?	Inserted pedals and levers.
5	How many core-pull circuits are available?	Slides on levers, cages and pedals.
6	Will my longest mould fit the tie-bar spacing?	Mudguard and chain guard moulds.
7	How many hot-runner zones can the control run?	Multi-cavity caps, ferrules and clips.
8	Can the control store settings for each mould and colour?	Frequent colour and model changes.
9	What is the energy use per part at my cycle?	Tight price per part.
10	What installation, training and spare-parts support is included?	Seasonal peaks need reliable 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 • other process requirements such as inserts, overmoulding or automation.

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