



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

PUMPS & VALVES COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for pump and valve makers and their moulding suppliers: 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 impellers, diffusers, pump housings, valve bodies, valve internals, seal carriers, strainers, solenoid parts and pump 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

PUMPS & VALVES COMPONENTS & INJECTION MOULDING

Plastic has moved from pump covers into the wetted, pressure-carrying and rotating parts of pumps and valves. This guide covers those moulded parts.

WHERE INJECTION MOULDING FITS IN PUMPS AND VALVES

Domestic, agricultural and chemical pumps use moulded impellers, diffusers, volutes, casings, diaphragm heads, seal carriers and strainers. Valves use moulded bodies, balls, stems, handles, check and foot valve parts, and solenoid bobbins and guides. Pipe connectors, unions and adaptors join them to the system.

In India the Pumps (Quality Control) Order, 2023 covers a family of pumps, each under its own standard, such as IS 8034 for submersible, IS 14220 for openwell submersible and IS 9079 for monoset pumps^[1]. The BIS product manual for IS 14220 samples the materials for components as part of certification^[2], so moulded pump parts need material records that support the pump maker's licence. Pumps also have to meet the head, flow and efficiency guarantees of their standard, which ties the moulded hydraulic parts to the certificate.

MAIN COMPONENT CATEGORIES

HYDRAULIC PARTS Impellers and stage diffusers	PUMP HOUSINGS Volute, casings, motor housings, split cases	VALVE BODIES Ball, gate and plumbing valve bodies	VALVE INTERNALS Balls, seat carriers, stems
CHECK & FOOT VALVES Flaps, poppets, seats	DIAPHRAGM PUMPS Heads, manifolds, valve plates	SEAL & BEARING PARTS Seal carriers, wear rings, bearing housings	OTHER PARTS Strainers, solenoid parts, handles, fittings

WHY INJECTION MOULDING SUITS THESE PARTS

- Complex vane and volute shapes come out of the mould in one piece.
- Glass-filled PPS and PPA housings replace metal^[5].
- No corrosion in water, chemicals and slurries.

TYPICAL MANUFACTURING CHALLENGES

- Vane accuracy and balance on impellers.
- Weld lines and glass orientation in pressure parts.
- PVC and CPVC bodies need a PVC-ready machine^[8].

WHERE MOULDING SITS IN THE PRODUCT CHAIN

RESIN PPE, PPS-GF, PP, PVC	DRYING PA, PPS, PPA, PC	INJECTION MOULDING impellers, bodies	INSERTS sleeves, bushes, threads	ASSEMBLY pump stack, valve	TESTING pressure, leak, curve	PUMP SET motor and certification
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KEY REQUIREMENTS FOR PUMP AND VALVE PARTS

HYDRAULIC ACCURACY Vane and passage shape set the pump curve.	PRESSURE AND BURST Housings and bodies carry system and surge pressure ^[4] .	HYDROLYTIC STABILITY Parts stay stable in hot and cold water ^[4] .
CHEMICAL COMPATIBILITY Resin and seals match the media at operating temperature.	BALANCE AND FITS Rotors run true; seal faces stay flat.	POTABLE WATER Wetted parts may need drinking-water approval ^[4] .

SECTION 02 · COMPONENTS

MAJOR PUMPS & VALVES COMPONENTS

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

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Pump impeller	Centrifugal pumps	PPS-GF, PPO/PPE (Noryl type), POM, PC, PA66-GF, PVDF	Low, predictable shrinkage lets vanes hit the pump curve ^[3] . Balance is the acceptance test; keep weld lines away from vane roots.
Diffuser (stage vane ring, cross-over)	Multistage and submersible pumps	PPS-GF, PPO/PPE (Noryl type), PA66-GF, POM	Vane profile sets stage efficiency ^[3] . Stacked stages need cavity-to-cavity consistency. Reinforcement may be moulded in.
Pump housing (volute, casing, motor housing, split case)	Pump body	PPS-GF40 (Ryton type), PPA-GF (Amodel type), PA66-GF, PP, PVDF, PC	Glass-filled PPS and PPA as structural grades ^[5] . Potable-water parts finish formed in the mould ^[5] . Seal-face flatness and burst pressure tested.
Valve body	Ball, plumbing and process valves	uPVC, CPVC, PP, PPS-GF, PA66-GF, PVDF	Even walls and smooth bores for burst life. Flash-free seal faces and O-ring grooves. Unscrewing cores for threads. PVC-ready machine for PVC and CPVC ^[8] .
Ball valve ball, seat carrier, stem	Valve internals	uPVC, CPVC, PP, POM, PVDF	Smaller machines than the body. Ball sphericity and finish decide leak yield and torque. PTFE seats are machined, not moulded.
Valve handle, lever, actuator cover	Operation	PA6-GF, PA66-GF, PP, ABS, POM	Drive socket carries the torque; glass-filled nylon where PP would creep. Dry nylon ^[10] . UV and chemical grades outdoors.
Non-return, check and foot valve parts	Backflow and suction	PP, PVDF, POM, PA66-GF, TPE (flap)	Flat seat and consistent flap or poppet stiffness set cracking pressure. TPE flaps overmoulded or fitted. Metal springs.
Diaphragm pump head, manifold, valve plate	Dosing and transfer pumps	PP, PVDF, PPS-GF, PA66-GF	Flatness across clamped faces stops weeping. Passages need draft; trapped air affects priming. Diaphragm not moulded.
Mechanical seal carrier, wear ring, bearing housing	Running-clearance parts	PPS-GF, PA66-GF, POM, PEEK	Dimensional stability wet and hot. Insert moulding round metal sleeves or bushes is common.
Strainer basket, filter housing, sight bowl	Suction and line filtration	PP, SAN, PC, PA66-GF, PVDF	Weld lines at every opening: venting and gates decide collapse strength. Clear bowls need stress-crack resistance.
Solenoid valve bobbin, body, plunger guide	Solenoid valves	PA66-GF, PBT-GF, PPS-GF	Heat ageing near the coil; flash-free winding faces. Precise plunger bore. Insert moulding round the guide tube.
Pump connector, union, adaptor, pipe fitting	Pipe connections	uPVC, CPVC, PP, PA66-GF, PVDF	PVC processing constraints as for bodies ^[8] . Unscrewing or collapsible cores. Seal on the face and O-ring groove.

PTFE seats, elastomer or PTFE diaphragms, ceramic seal faces and metal springs are bought-in or made by other processes.

GROUPING BY MOULDING DEMAND

HYDRAULIC AND ROTATING Impellers, diffusers, seal carriers. Shrinkage, balance and matched sets.	PRESSURE-CARRYING Housings, valve bodies, fittings, strainers. Walls, weld lines and seal faces.	SMALL FUNCTIONAL Balls, stems, poppets, flaps, bobbins. Cavities, finish and repeatability.
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Some parts appear in both the pump and the valve range, such as unions and adaptors. Where a pump maker buys moulded valve parts, or the reverse, one specification per part avoids two versions of the same mould.

SECTION 03 · MATERIALS

MATERIALS USED FOR PUMPS & VALVES COMPONENTS

Pump and valve resins are chosen for the media, temperature, pressure and dimensional stability first, and for cost second.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
PPO/PPE (Noryl type)	Impellers, diffusers	Hydrolytic stability, low mould shrinkage ^{[3][4]} .	Dimensional control; GF grades for pressure parts ^[4] .	Solvent resistance by grade.
PPS-GF	Impellers, housings, bodies, seal carriers, solenoid parts	Heat and chemical resistant; about 40% GF used for housings ^[5] .	High melt and mould temperatures; abrasive glass.	Weld line strength.
PPA-GF	Housings	Stiff structural grade ^[5] .	Dry before moulding; hot mould.	Moisture in service by grade.
PA66-GF, PA6-GF	Impellers, housings, handles, strainers, solenoid parts	Strong, tough.	Must be dried ^[10] .	Moisture changes size in water.
POM	Impellers, balls, stems, valve parts	Stiff, low friction; used in pumps and valves ^[9] .	Never mixed in a barrel with PVC.	Not advised outside pH 4 to 9 ^[9] .
uPVC, CPVC	Valve bodies, balls, fittings	Chemical resistant; CPVC for hotter water.	Degrades if overheated ^[7] ; corrosion-resistant screw and steel ^[8] .	Temperature limits.
PP	Housings, bodies, check parts, diaphragm heads, strainers	Chemical resistant, low cost.	Shrinkage and warp.	Creep under load.
PVDF	Chemical pump and valve parts	High chemical resistance.	High melt temperature; special barrel.	Cost.
PC, SAN	Sight bowls, impellers, housings	Clear, stiff; PC tough.	Dry well; polished mould.	Stress cracking in some media.
PBT-GF	Solenoid bobbins, bodies	Stable, heat resistant.	Dry before moulding.	Hydrolysis in hot water.
PEEK	High-load seal and wear parts	High temperature and load.	Very high temperatures.	Cost; dedicated set-up.
ABS, TPE	Handles, covers; check valve flaps	ABS rigid; TPE soft sealing.	ABS dry; TPE bond pair.	Media compatibility.

General material behaviour only. Confirm media compatibility at operating temperature and drinking-water approvals with the resin supplier.

MATERIAL SELECTION QUESTIONS

- ☐ What media, concentration and temperature?
- ☐ What working and surge pressure?
- ☐ Is potable-water approval needed?
- ☐ Rotating, sliding or static part?
- ☐ Are metal inserts or sleeves moulded in?
- ☐ Must the part match an existing metal part?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Pump and valve moulds carry the hydraulic shape. Vane angles, passages, seal faces and bores are set in steel and must repeat shot after shot.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN PUMPS AND VALVES	MOULDING IMPLICATION
Vanes and passages	Set the pump curve and stage efficiency ^[3] .	Split cores or collapsible inserts; low-shrink grades.
Rotating symmetry	Impellers must run in balance.	Centre or ring gates for even glass orientation.
Pressure walls	Housings and bodies carry burst and surge pressure.	Even walls, weld lines away from high stress.
Seal faces, O-ring grooves	Leak paths in bodies, heads and fittings.	Flatness, no parting-line flash on seal zones.
Threads	Unions, adaptors, valve ends.	Unscrewing or collapsible cores.
Metal inserts	Sleeves, bushes, guide tubes.	Insert location, pre-heat and retention.
Perforated walls	Strainer baskets.	Many weld lines; venting and gate layout.

MOULD CONSIDERATIONS

ITEM	PUMP AND VALVE POINTS	ITEM	PUMP AND VALVE POINTS
Cavities	Housings and bodies: 1 or 2. Impellers: 1 to 4. Poppets, stems: 8 to 32.	Steel	Wear-resistant for glass-filled; corrosion-resistant for PVC.
Gating	Balanced flow for rotors; PVC runners balanced ^[7] .	Venting	Good venting for weld lines and PVC burns.
Core pulls	Hydraulic cores for ports and volutes.	Finish forming	Potable-water faces finished in the mould ^[5] .
Cooling	Sets the cycle; rises roughly with wall thickness squared ^[12] .	Mould size	Large housings need platens and long strokes.

ONE VALVE, SEVERAL MOULDS

BODY	BALL AND STEM	HANDLE	UNION NUTS
Largest part; sets the biggest machine.	Smaller machines; finish and roundness.	Glass-filled nylon; drive socket.	Threads; unscrewing cores.

SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Insert moulding	Seal carriers, bearing housings, solenoid guides	Seats for sleeves, bushes and tubes; insert pre-heat.
Balancing	Impellers	Even walls and fibre orientation to limit correction.
Assembly and testing	Pump stacks, valves, diaphragm heads	Datums, bores and seal faces held to size.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Pump and valve parts are engineering parts with thick walls and hot moulds, so cycles are longer than for consumer goods. Output is planned per part family.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

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

EXAMPLE 1 · 4-CAVITY PPE IMPELLER

4 × 3600 ÷ 40 s = 360 /h

× 0.85 utilisation = 306 /h

× 22 h = 6,732 /day

× 26 days = 175,032 /month

EXAMPLE 2 · 2-CAVITY UPVC BALL VALVE BODY

2 × 3600 ÷ 60 s = 120 /h

× 0.85 = 102 /h · × 22 h = 2,244 /day

× 26 days = 58,344 /month

Working backwards: for 80,000 bodies a month in 572 running hours, you need 140 per hour. Cavities = $140 \times 60 \div (3600 \times 0.85) \approx 2.7$, so a 4-cavity mould or a second machine.

Illustrative example. Cycle times of 40 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	PUMP AND VALVE INFLUENCE
Injection & hold	Hold on thick pressure walls.
Cooling	Usually the largest share ^[12] .
Mould actions	Core pulls and unscrewing.
Inserts	Sleeves and bushes loaded each cycle.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

PP CHECK VALVE POPPET MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
8 cavities	58 cm ²	23 t	27 t	37 g	1,360 /h
16 cavities	112 cm ²	45 t	53 t	72 g	2,720 /h
32 cavities	218 cm ²	88 t	103 t	141 g	5,440 /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: 6 cm² and 4 g per poppet, runner area 10 / 16 / 26 cm² and weight 5 / 8 / 13 g, 18 s cycle, 85% utilisation. Glass-filled engineering grades need factors from the resin supplier.

PLANNING TOTAL MACHINE HOURS

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

A pump or valve is a kit. Add hours for the housing, impellers, diffusers, internals and fittings, then divide by the running hours per machine (572 here).

Multistage pumps multiply the count: a pump with eight stages needs eight impellers and eight diffusers per unit. Size the impeller and diffuser moulds to the stage count, not only to the number of pumps.

MACHINE UTILISATION AND PLANNED DOWNTIME

MATERIAL CHANGES

PVC, PPS and nylons on dedicated machines where possible.

PVC PURGING

Purge PVC out before stops and material changes.

STAGE SETS

Multistage pumps need matched diffuser and impeller sets.

SEASONAL DEMAND

Agricultural pumps peak before the sowing seasons.

SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

In pump and valve moulding, automation mainly serves inserts, heavy parts and testing, where a manual step would affect quality or safety.

AUTOMATION	WHERE IT ADDS VALUE IN PUMP AND VALVE PARTS	WHEN IT USUALLY MAKES SENSE
Robot take-out	Housings, bodies and impellers placed without damage.	Heavy parts and long cycles.
Insert loading	Metal sleeves, bushes and guide tubes.	Seal carriers and solenoid parts at volume.
Sprue picker	Poppets, stems and small fittings.	Multi-cavity cold-runner moulds.
Degating and deflashing	Impellers and seal faces.	Where manual trimming affects balance or sealing.
Balancing stations	Impellers.	Every rotor before assembly.
Leak and pressure test	Valve bodies, housings, fittings.	Pressure parts on every lot or every part.
Material handling	Dryers and closed conveying for PA, PPS, PPA.	Every glass-filled engineering job.
Assembly	Valves, check valves, pump stacks.	Several parts per product at volume.

AUTOMATION BY PRODUCT GROUP

PRODUCT GROUP	MAIN AUTOMATION	WHY
Impellers, diffusers	Robot, balancing	Rotating parts, matched sets
Housings, valve bodies	Robot, leak test	Heavy pressure parts
Seal carriers, solenoid parts	Insert loading	Metal inserts every cycle
Poppets, stems, fittings	Sprue picker, counting	Small multi-cavity parts

DECIDING ON AUTOMATION

SAFETY OF PRESSURE PARTS Automated leak testing catches faults before the pump is built.	INSERTS Automatic loading keeps inserts in place and the cycle steady.	HEAVY PARTS Housings and bodies are hard to remove by hand every cycle.
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INTERFACES TO SPECIFY ON THE MACHINE

CORE PULLS Hydraulic circuits for ports, volutes and unscrewing.	ROBOT Signal interface and safety interlocks.	TEMPERATURE Hot-mould controllers for PPS and PPA.	AUXILIARIES Dryer, loader and conveyor links.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL engineering grade	MACHINE per machine hour	LABOUR inserts, testing	POWER heaters, mould heat	MOULD cores, wear steel	REJECTION leaks, balance	PACKING kits
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On housings and impellers in PPS or PPE, material dominates. On poppets and stems, cavities and cycle dominate. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

A pump or valve part is judged under pressure and in rotation: it must hold, seal and run true for years in water or chemicals.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Pump certification	Certified under the Pumps QCO ^[1] ; component materials checked ^[2] .	Material records, grade control
Burst and fatigue	Burst, fluctuating pressure and creep rupture tests ^[4] .	Weld lines, glass orientation, walls
Leak and seal	Seal faces, O-ring grooves and threads under pressure.	Flatness, flash, core position
Balance	Impeller balance before assembly.	Gating, fibre orientation, core shift
Pump curve	Head and flow tested on the assembled pump.	Vane accuracy, shrinkage
PVC fittings	Socket fittings to IS 7834 where applicable ^[6] .	Sockets, voids, weld lines
Media compatibility	Soak or run tests at operating temperature.	Grade, moulded-in stress

Test methods and limits come from the applicable standard or customer specification; confirm the current edition.

WHERE REJECTS USUALLY COME FROM

PROCESS Weld lines, voids and warp from gates, hold and temperature.	MATERIAL Moist engineering grades and degraded PVC.	HANDLING Vaness and seal faces damaged after moulding.
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IN-PROCESS CONTROLS

MOISTURE Dryer checks for PA, PPA, PPS and PC.	WEIGHT Flags short shots and core shift.	FLATNESS Seal faces on a fixture.	GAUGES Bores, threads and O-ring grooves.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE PART	AREAS TO INVESTIGATE
Weak weld lines	Flow fronts meeting behind vanes or ports	Cracks under pressure or speed	Gate position, venting, melt temperature
Imbalance	Uneven fibre orientation, core shift	Vibration at speed	Gating, core support, cooling
Warp	Uneven cooling, glass orientation	Leaking seal faces	Cooling, gating, hold
Voids, sinks	Thick pressure walls, short hold	Low burst pressure	Hold pressure and time, wall design
Flash on seal zones	Worn shut-offs, low clamp	Leaks, trimming	Parting line, clamp setting
Burn marks	Degraded PVC or trapped air ^[7]	Weak bodies and fittings	Temperatures, residence time, venting
Splay	Moisture in PA, PPA or PC ^[10]	Weaker parts	Drying
Exposed glass	Machining after moulding	Fibres at wetted faces	Finish form in the mould ^[5]

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · PPE IMPELLER		ROTATING
APPLICATION · MATERIAL	Closed impeller for a domestic pump · modified PPE (Noryl type)	
CHARACTERISTICS	Curved vanes between two shrouds; balance tested	
CAVITIES · OUTPUT	4 · about 306 per hour at 40 s (Section 05)	
MOULD CONSIDERATIONS	Collapsible or split vane cores, centre gating	
SECONDARY	Balancing, assembly into the pump stack	
EVALUATE Tonnage needs projected area; shot repeatability, mould temperature control and even filling for balance decide the machine. STILL NEEDED CAD projected area, vane core design, volume per size.		

B · UPVC BALL VALVE BODY		PVC + CORES
APPLICATION · MATERIAL	Ball valve body · uPVC compound	
CHARACTERISTICS	Pressure body with threaded or socket ends and seal seats	
CAVITIES · OUTPUT	2 · about 102 per hour at 60 s (Section 05)	
MOULD CONSIDERATIONS	Unscrewing or core pulls, corrosion-resistant steel	
SECONDARY	Ball, stem and seat assembly, leak testing	
EVALUATE PVC-ready screw and barrel, accurate temperature control and core-pull circuits drive the choice; tonnage needs projected area. STILL NEEDED compound data, mould drawing, size range, volume.		

C · PP CHECK VALVE POPPET		HIGH CAVITY
APPLICATION · MATERIAL	Check valve poppet · PP	
CHARACTERISTICS	About 4 g, 6 cm ² projected area (assumed); flat seat face	
CAVITIES · OUTPUT	16 · about 2,720 per hour at 18 s (Section 05)	
MOULD CONSIDERATIONS	Balanced runner, flat seat, venting	
SECONDARY	Spring and seal assembly, cracking-pressure test	
EVALUATE The Section 05 table gives about 45 t calculated and a 72 g shot, so a clamp rated around 53 t or more. STILL NEEDED CAD projected area, media, volume.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · IMPELLER	B · VALVE BODY	C · POPPET
Main limit	Balance, vane accuracy	PVC processing, cores	Cavities, cycle
Clamp force	Needs projected area	Needs projected area	About 53 t rated
Auxiliaries	Mould temperature, balancing	Core-pull control, leak test	Sprue picker, 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 pump or valve part.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Part weight, runner weight, wall thickness
- ☐ Resin grade and glass content
- ☐ Seal faces, bores and threads
- ☐ Metal inserts or sleeves

PRODUCTION

- ☐ Monthly volume per size
- ☐ Parts per pump or valve kit
- ☐ Cavity count and target cycle time
- ☐ Operating hours and shifts
- ☐ Seasonal peaks

MOULD

- ☐ New or existing mould; size and weight
- ☐ Core pulls and unscrewing
- ☐ Mould temperature needed
- ☐ Steel for glass-filled or PVC
- ☐ Previous machine specification, if any

PUMP AND VALVE APPLICATION

- ☐ Media, temperature, pressure
- ☐ Pump or valve standard
- ☐ Potable-water approval
- ☐ Balance, leak and burst tests
- ☐ Material records for certification

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 PUMP AND VALVE PARTS
1	Is a PVC-ready screw, barrel and nozzle available?	uPVC and CPVC bodies and fittings.
2	Which screw and barrel suit glass-filled PPS, PPA and PA?	Wear on structural grades.
3	How many core-pull and unscrewing circuits are available?	Ports, volutes and threads.
4	What shot and hold repeatability does the machine keep?	Impeller balance and burst life.
5	Can the machine run hot moulds for PPS and PPA?	Crystallinity and stability.
6	Will my housing mould fit, with the stroke it needs?	Large volutes and casings.
7	What robot and insert-loading interfaces are supported?	Sleeves, bushes and heavy parts.
8	Can the control log shot data per lot?	Pump certification and traceability.
9	What is the energy use per part at my cycle?	Long cycles on engineering grades.
10	What installation, training and spare-parts support is included?	Uptime through seasonal peaks.

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 media, pressure rating, potable-water approval or insert moulding.

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

TECHNICAL REFERENCES

- [1] Standphill India - BIS Certification for Submersible Pumpsets under IS 8034:2018 and the Pumps (Quality Control) Order, 2023 - <https://www.standphillindia.in/bis-certification-for-submersible-pumpsets.php>
- [2] Bureau of Indian Standards - Product Manual PM/IS 14220/3 for Openwell Submersible Pumpsets, July 2024 - <https://www.bis.gov.in/wp-content/uploads/2024/07/PM-IS-14220.pdf>
- [3] Webtrol Pumps - Injection Molding Our Impellers and Diffusers - <https://www.webtrol.com/injection-molding-impellers-and-diffusers.html>
- [4] SABIC - SABIC expands water management portfolio with new NORYL resin (WM330G) - <https://www.sabic.com/en/news/21782-sabic-expands-water-management-portfolio-with-new-noryl-resin>
- [5] Google Patents - US5642991A Sliding vane pump with plastic housing - <https://patents.google.com/patent/US5642991>
- [6] Bureau of Indian Standards - IS 7834-1 Injection moulded PVC socket fittings with solvent cement joints for water supplies - <https://archive.org/details/gov.in.is.7834.1.1987>
- [7] Polymers (via PMC) - Filling-Balance-Oriented Parameters for Multi-Cavity Molds in PVC Injection Molding - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9459958/>
- [8] Fictiv - PVC Injection Molding - <https://www.fictiv.com/articles/pvc-injection-molding>
- [9] DuPont / Delrin - Delrin Acetal Resin Design Guide, Module III - <https://www.delrin.com/wp-content/uploads/2023/10/Delrin-Design-Guide-Mod-3.pdf>
- [10] Plastrubution - Process Know-How: PA6 - https://www.plastrubution.co.uk/wp-content/uploads/2017/04/Plastrubution-Process_Know_How_PA6.pdf
- [11] Asaclean - Setting Correct Clamp Tonnage in Injection Molding - <https://www.asaclean.com/blog/setting-correct-clamp-tonnage-in-injection-molding>
- [12] Design World - Injection Molding Cooling Time: A Breakdown - <https://www.designworldonline.com/injection-molding-cooling-time-a-breakdown/>

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