



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

MEDICAL SECTOR COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for medical disposable, diagnostic and device-part moulders: 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 and validation engineers and purchase teams moulding syringes, IV and luer parts, lab consumables, diagnostics, closures and device parts.

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

MEDICAL SECTOR COMPONENTS & INJECTION MOULDING

Medical moulding covers billions of single-use parts and a smaller number of precision device parts. In both, the process has to be validated, not only the part inspected.

WHERE INJECTION MOULDING FITS IN THE MEDICAL SECTOR

Syringes, IV set parts, luer fittings, pipette tips, microplates, test cassettes, specimen containers, closures and dosing cups are moulded in high-cavitation tools. Device housings, mechanism parts, inhaler and pen-injector components are lower volume but tighter in tolerance.

In India, the Medical Devices Rules, 2017 license manufacture by risk class: Class A and B through State Licensing Authorities after a quality management system audit, Class C and D through the Central Licensing Authority^[1]. All medical devices now fall under these Rules^[2]. Tubing, bag film, needles, glass and rubber or silicone bulbs are made by other processes.

MAIN COMPONENT CATEGORIES

SYRINGES Barrels, plungers, needle hubs, veterinary syringes	INFUSION IV set parts, luer fittings, fluid connectors	LAB CONSUMABLES Pipette tips, microplates, Petri dishes, trays	DIAGNOSTICS Test cassettes, kit housings, blood tubes
CONTAINERS & CLOSURES Specimen pots, vial closures, droppers, dosing cups	RESPIRATORY Oxygen mask parts, inhaler actuators, spacers	DEVICES Housings, mechanism parts, pen injectors	HOSPITAL & DENTAL Sharps bins, trays, instrument handles, dental parts

WHY INJECTION MOULDING SUITS THESE PARTS

- Micron-level features repeated across many cavities.
- Sterile, single-use parts at very low unit cost.
- Clear, thin-walled parts in one shot.

TYPICAL MANUFACTURING CHALLENGES

- Cavity-to-cavity variation, not average size, sets yield.
- Resin must survive the chosen sterilisation^[5].
- Validation and traceability behind every change.

WHERE MOULDING SITS IN THE PRODUCT CHAIN

RESIN medical grade, CoA	DRYING PC, PET, COP, PA	INJECTION MOULDING validated process	ASSEMBLY print, insert, pack	STERILISATION EtO, gamma, steam	RELEASE lot records, tests	USE hospital, lab, home
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WHERE THE PARTS ARE USED

HOSPITALS Syringes, IV sets, sharps bins, trays, device housings.	LABORATORIES Tips, plates, dishes, tubes and trays.	DIAGNOSTICS Rapid test cassettes and kit housings.	PHARMA AND HOME CARE Closures, droppers, dosing cups, inhalers and pens.
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KEY REQUIREMENTS FOR MEDICAL PARTS

BIOCOMPATIBILITY Evaluated under ISO 10993-1 within a risk management process ^[4] .	CONNECTOR SAFETY Luer connectors follow ISO 80369-7 to prevent misconnection ^[3] .	STERILISATION Each method rules out different resins ^{[5][6]} .
DOSE AND VOLUME Tip bores, graduations and well volumes are validated dimensions.	TRACEABILITY Resin lot, cavity and machine traced for each batch.	CLARITY AND CLEANLINESS Clear parts, no flash in flow paths, no particulates.

SECTION 02 · COMPONENTS

MAJOR MEDICAL SECTOR COMPONENTS

The medical parts covered by this guide, grouped by family, with their materials and what each asks of the moulding process.

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Syringe barrel and plunger; veterinary syringe	Dosing and injection	Medical PP, COP/COC, PC, PE, POM, TPE (gasket)	32 to 128 cavities with hot runner. Barrel ID and concentricity by cavity. Plunger core shift. Vet syringes may be reusable, POM ratchets.
Needle hub and catheter hub	Holding the cannula	PP, PE, PC, PUR	Insert moulded over a steel cannula; pull-out strength, no flash in the flow path.
IV set component; luer lock and slip fittings, caps; fluid connectors (Y, stopcock, check valve, needle-free)	Infusion and fluid lines	Medical PP, PC, ABS, PE, POM, COP	Set of 8 to 12 mouldings. Luer taper to ISO 80369; flash on taper or thread is a reject. Stopcock plug to body fit sets leak and torque.
Pipette tip; 96-well microplate and PCR plate	Lab liquid handling	Medical PP (high melt flow), PS, PC	Deep thin walls: straightness and tip concentricity. Plate flatness and well-to-well volume.
Petri dish; specimen and urine container; blood collection tube	Culture, sampling, collection	PS, PP, HDPE, PET, PE (closure), TPE (stopper)	Clear flat bases, leak-proof threads, vacuum-holding closures. Lot traceability.
Diagnostic and rapid test cassette; test kit housing	Diagnostic tests	Medical PS, ABS, PP, PC	Ribs and windows position the strip; snap closure compression is validated. Family tools for base and lid.
Medical equipment part (levers, gears, manifolds); medical device housing	Reusable equipment	PC, PC/ABS, ABS, PP, PEEK, POM, PA, PBT, PSU	Parts must survive repeated sterilisation. Housings stress-crack from disinfectant wipes.
Sharps disposal bin; medication tray; laboratory and diagnostic tray	Hospital and lab handling	PP copolymer, HDPE, PP, HIPS, ABS, PETG, PS, conductive/ESD PP	Large area bins; lid and body shrink as a pair. Tray flatness and handling datums.
Oxygen mask component; inhaler actuator and spacer	Respiratory delivery	PP, PC, soft PVC, TPE, LDPE, HDPE, POM, PBT	Mask shell often not moulded. Actuator orifice sets the spray and dose; resin E&L data.
Dental component (impression tray, mixing tip, aligner case, instrument handle)	Dental care	PP, PC, ABS, PETG, POM, PA	Split by sterilisation route. Mixing tip helix and release. Aligner cases use a living hinge.
Pharma vial closure and tamper-evident cap; dropper; dosing cup and spoon	Pharma packaging and dosing	PP, HDPE, LDPE, PE, PS, PC	High cavitation with balanced hot runner. Child-resistant and tamper features, tip bore and graduations validated.
Single-use surgical instrument handle and body; autoinjector and pen injector component	Surgery and drug delivery	PC, ABS, PP, PA, PA12, TPE, COP/COC, POM, PBT, PEEK	TPE grip overmould with its own biocompatibility data. Pen parts carry the tightest tolerances.

Tubing, bag film, needles, springs, glass, rubber stoppers and LSR bulbs are outside this guide.

GROUPING BY MOULDING DEMAND

HIGH-CAVITATION DISPOSABLES Syringes, tips, closures, luer parts. Cavity balance.	CLEAR AND FLAT Dishes, plates, cassettes, trays. Flatness and clarity.	PRECISION DEVICE PARTS Mechanisms, pens, housings. Tolerance and stress.
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SECTION 03 · MATERIALS

MATERIALS USED FOR MEDICAL SECTOR COMPONENTS

Medical resins are chosen for sterilisation, contact and clarity first, and for moulding second. The grade, not just the polymer, has to be medical and documented.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
PP (medical, high MFR, copolymer)	Syringes, tips, plates, closures, IV parts, bins	Autoclave good ^[5] ; low cost.	High MFR fills thin walls fast.	Gamma fair: use radiation-stable grades ^[5] .
PE, LDPE, HDPE	Plungers, closures, hubs, droppers, bins	Soft to rigid; chemical resistant.	High shrinkage.	Heat resistance.
COP / COC	Barrels, pen parts, luer fittings	Glass-like clarity; gamma good ^[5] .	Dry; polished tools.	Cost; autoclave fair ^[5] .
PC, PC/ABS	Connectors, housings, dishes, drip chambers	Clear, tough; gamma good, autoclave fair ^[5] .	Must be dried.	Stress cracking from disinfectants.
ABS	IV parts, cassettes, housings, trays	Rigid, easy to mould.	Dry before moulding.	Chemical and heat limits.
PS, HIPS	Petri dishes, plates, cassettes, trays	Clear (PS), flat, low shrinkage.	Easy to mould flat.	Not autoclavable; brittle (PS).
PET, PETG	Blood tubes, trays, dental cases	Clear, gas barrier (PET).	Dry thoroughly.	Heat resistance.
POM	Stopcocks, pen and vet mechanisms, dental parts	Low friction, stiff ^[9] .	Controlled melt temperature.	Not for gamma ^[5] ^[6] .
PA, PA12, PBT	Mechanism parts, handles, spacers	Strong, stable.	Dry PA and PBT.	Moisture in PA.
PEEK, PSU	Reusable equipment and dental parts	PSU: hundreds of autoclave cycles; PEEK: all methods ^[6] .	High melt and mould temperatures.	Cost.
TPE, PUR, soft PVC	Grips, gaskets, stoppers, mask parts	Soft touch, sealing.	Grade matched to substrate ^[7] .	Own biocompatibility data.
Conductive / ESD PP	Lab trays, inhaler parts	Charge control.	Higher viscosity, filler.	Resistance range.

General guidance from the cited charts. Confirm each grade with the resin supplier's medical data.

WHAT THE STANDARDS ASK OF THE MATERIAL

ISO 10993-1 Biological evaluation by nature and duration of body contact, within ISO 14971 risk management ^[4] .	STERILISATION ROUTE EtO, gamma and steam each exclude some resins; gamma needs stabilised PP ^[5] .	DOCUMENTS CoA per lot, change notification and extractables data for drug-contact parts.
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MATERIAL SELECTION QUESTIONS

- ☐ Single-use or reusable, and how many sterilisation cycles?
- ☐ Skin, blood, tissue or drug contact, and for how long?
- ☐ Disinfectants used on the part in service?
- ☐ Clarity needed to read a level, plate or test line?
- ☐ Radiolucency needed near X-ray, CT or MRI?
- ☐ Will the supplier notify grade and site changes?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

Medical moulds are built for cavity-to-cavity sameness. A 64-cavity tool is only as good as its worst cavity.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN MEDICAL PARTS	MOULDING IMPLICATION
Luer tapers and threads	Connection safety to ISO 80369-7 ^[3] .	Core finish, no flash on taper or thread, gauge every cavity.
Long thin cores	Barrels, plungers, pipette tips, blood tubes.	Core support, balanced fill, core-shift control.
Small bores and orifices	Drop volume, spray plume, flow rate.	Pin wear and size tracked as validated dimensions.
Clear windows and bases	Reading levels, plates and test lines.	Polished steel, clean gates, no flow marks.
Snap and compression fits	Cassettes, kit housings, closures.	Shrinkage matched between base and lid tools.
Inserts	Cannulas in needle and catheter hubs.	Insert loading, location and pull-out strength.
Living hinges	Aligner and dental cases, flip caps.	Flow across the hinge, flex while warm ^[8] .

MOULD CONSIDERATIONS

ITEM	MEDICAL POINTS	ITEM	MEDICAL POINTS
Cavities	Syringes, tips, closures: 32 to 128. Device parts: 1 to 8.	Steel	Corrosion-resistant, polishable stainless grades.
Hot runner	Balance sets scrap rate; valve gates on clear parts.	Cavity ID	Each cavity marked for traceability.
Cooling	Sets cycle and wall uniformity ^[11] .	Cleanliness	No grease on moulding faces; clean ejection.
Venting	Thin walls and deep cores trap air.	Change control	Any tool repair triggers requalification.
Gates	Kept away from tapers and sealing faces.	Wear	Pins and cores measured on a schedule.

PLANNING A DEVICE FAMILY

SET TOOLING	MATCHED PAIRS	FAMILY TOOLS	SPARES
IV sets and kits need 8 to 12 matched tools.	Barrel and plunger, base and lid tools cavity for cavity.	Base and lid in one tool keep shrinkage matched.	Spare inserts for wear-critical cores and pins.

SECONDARY OPERATIONS THAT SHAPE THE MOULD

OPERATION	TYPICAL PARTS	WHAT IT ASKS OF THE MOULDED PART
Printing	Syringe graduations, labels	Consistent outside diameter and surface.
Assembly and bonding	IV sets, connectors, pens	Bond surfaces and fits held to size.
Sterilisation	Most single-use parts	Resin and wall stable after the chosen method ^[5] .

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

Medical disposables run in the millions per month. The plan is set by cavities, validated cycle time and how much time requalification takes.

OUTPUT

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

Effective/hour = Parts/hour × Utilisation

Day = Effective/hour × Hours run

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

EXAMPLE 1 · 48-CAVITY PP SYRINGE BARREL

48 × 3600 ÷ 12 s = 14,400 /h
 × 0.85 utilisation = 12,240 /h
 × 22 h = 269,280 /day
 × 26 days = 7,001,280 /month

EXAMPLE 2 · 16-CAVITY PC LUER CONNECTOR

16 × 3600 ÷ 20 s = 2,880 /h
 × 0.85 = 2,448 /h · × 22 h = 53,856 /day
 × 26 days = 1,400,256 /month

Working backwards: 1.5 million IV sets a month with two connectors each need 3,000,000 in 572 running hours, or 5,245 per hour. Cavities = $5,245 \times 20 \div (3600 \times 0.85) \approx 34$, so a 48-cavity mould or three 16-cavity moulds.

Illustrative example. Cycle times of 12 s and 20 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	MEDICAL INFLUENCE
Injection	Fast fill of thin walls and deep cores.
Cooling	Usually the largest share; rises roughly with wall thickness squared ^[11] .
Ejection	Clean release of long cores.
Handling	Robot take-out in cavity order.

BALANCING CAVITIES, CLAMP FORCE AND OUTPUT

PP SYRINGE BARREL MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT	EFFECTIVE OUTPUT
32 cavities	160 cm ²	64 t	76 t	96 g	8,160 /h
48 cavities	240 cm ²	97 t	114 t	144 g	12,240 /h
64 cavities	320 cm ²	129 t	152 t	192 g	16,320 /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^[10], about 0.28 to 0.42 t/cm²; K = 0.35 t/cm² and S = 1.15 assumed. Also assumed: 5 cm² and 3 g per barrel, hot runner with no cold runner, 12 s cycle, 85% utilisation.

PLANNING BY SET

Parts per month = Sets per month × Parts of that type per set

An IV set or test kit needs several moulded parts. Work out each mould from its own count, then add the machine hours.

VALIDATION TIME IN THE PLAN

A new mould, a tool repair, a resin change or a move to another machine can each need a documented requalification before parts are released. Build this time into the machine plan, and keep a validated backup machine for high-volume parts where the customer allows it.

MACHINE UTILISATION AND PLANNED DOWNTIME

LINE CLEARANCE Remove all parts and resin between products.	CLEANING Scheduled mould and area cleaning.	START-UP CHECKS First-off inspection by cavity before release.	PIN WEAR Planned replacement of wear-critical inserts.
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SECTION 06 · AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

In medical moulding, automation is often part of the quality system: fewer hands on the part, and every part kept in cavity order.

AUTOMATION	WHERE IT ADDS VALUE IN MEDICAL PARTS	WHEN IT USUALLY MAKES SENSE
Robot take-out in cavity order	Keeps tips, plates and barrels traceable by cavity.	High-cavitation tools; racked products.
Insert loading	Places cannulas for needle and catheter hubs.	Every insert-moulded hub.
Vision inspection	Checks flash, short shots, bores and black specks.	Safety-critical and clear parts.
Racking and stacking	Loads pipette tips into racks, stacks plates and dishes.	Lab consumables sold racked or sleeved.
Assembly cells	Syringes, IV sets, connectors, closures with liners.	Multi-part products at volume.
Printing	Syringe graduations after moulding.	Every printed barrel.
Resin handling	Closed conveying and drying with lot records.	Medical grades that must stay traceable.
Data logging	Shot data by lot and cavity.	Validated processes and audits.

AUTOMATION BY PRODUCT GROUP

PRODUCT GROUP	MAIN AUTOMATION	WHY
Syringes, tips, closures	Robot, vision, racking	Millions of parts in cavity order
Hubs and catheters	Insert loading, pull test	Cannula placed every cycle
Connectors and IV parts	Vision, assembly	Flash and fit are safety defects
Device parts	Robot, data logging	Low volume, tight tolerance

DECIDING ON AUTOMATION

CONTAMINATION Every hand removed from the part lowers contamination risk.	TRACEABILITY Cavity order and shot data are easier to keep automatically.	VOLUME Millions of parts per month cannot be sorted by hand.
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INTERFACES TO SPECIFY ON THE MACHINE

ROBOT Signal interface and safety interlocks.	HOT RUNNER Zone control and alarms.	DATA Shot data export and audit trail.	AUXILIARIES Dryer, loader, vision and conveyor.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL medical grade	MACHINE per machine hour	LABOUR inspection, packing	POWER kWh per part	MOULD many cavities	REJECTION cavity defects	PACKING clean, sterile
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On disposables, machine hours per thousand parts and scrap from the worst cavity dominate. On device parts, validation, inspection and resin cost weigh more. Use your own rates to compare options.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

A medical part is released on evidence: a validated process, cavity-by-cavity data and traceable resin, backed by the tests its standard sets.

TESTS AND CHECKS

CHECK	WHAT IT INVOLVES	LINK TO MOULDING
Process validation	Installation, operational and performance qualification (IQ, OQ, PQ) of machine, mould and process.	Stable settings, documented window
Luer connectors	Dimensions and performance for 6% (Luer) taper connectors to ISO 80369-7 ^[3] .	Taper finish, flash, thread form
Biological evaluation	Planned under ISO 10993-1 by type and duration of contact ^[4] .	Resin grade, additives, cleanliness
After sterilisation	Function and appearance retested after the chosen method ^[5] .	Resin choice, residual stress
Cavity capability	Critical dimensions measured on every cavity; capability index reviewed.	Hot runner balance, cooling, wear
Functional tests	Leak, vacuum, torque, glide force, drop volume, fill level to the device specification.	Bores, seals, threads, graduations
Visual	Flash, black specks, particulates, clarity.	Resin handling, purging, mould cleanliness

Test methods and limits come from the device standard and the customer specification. Confirm the current editions.

IN-PROCESS CONTROLS

FIRST-OFF All cavities checked before release.	WEIGHT BY CAVITY Flags imbalance early.	VISION Flash and specks on every shot.	RESIN RECORDS Lot, drying and regrind rules logged.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE PART	AREAS TO INVESTIGATE
Flash on taper or thread	Worn shut-offs, high pressure	Leak or misfit; functional reject	Tool condition, pack pressure
Core shift, bent tips	Long unsupported cores, unbalanced fill	Uneven walls, off-centre bores	Core support, gate balance
Cavity-to-cavity variation	Hot runner imbalance, uneven cooling	Some cavities out of size	Zone temperatures, cooling circuits
Black specks	Degraded resin, dirty hopper or barrel	Visual reject in clear parts	Purging, residence time, handling
Short shots	Thin walls, blocked gate or vent	Incomplete parts	Injection speed, vents, gates
Warped plates and dishes	Uneven cooling, early ejection	Will not seat in readers	Cooling, ejection timing
Splay, bubbles	Moisture in PC, PET, COP	Clarity loss, weak parts	Drying
Stress cracking	Moulded-in stress plus disinfectants	Housing cracks in use	Melt and mould temperature, design

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · PP SYRINGE BARREL		HIGH CAVITATION
APPLICATION · MATERIAL	5 ml syringe barrel · medical PP	
CHARACTERISTICS	About 3 g, 5 cm ² projected per cavity (assumed), long core	
CAVITIES · OUTPUT	48 · about 12,240 per hour at 12 s (Section 05)	
MOULD CONSIDERATIONS	Hot runner balance, core support, cavity ID	
SECONDARY	Printing, assembly with plunger, sterilisation	
EVALUATE The Section 05 table gives about 97 t calculated and a 144 g shot, so a clamp rated around 114 t or more. Cavity-to-cavity consistency matters more than tonnage. STILL NEEDED CAD projected area, grade, hot runner layout, volume.		

B · PC LUER LOCK CONNECTOR		SAFETY CRITICAL
APPLICATION · MATERIAL	IV line connector · medical PC	
CHARACTERISTICS	1.5 cm ² per cavity plus 20 cm ² runner (assumed); taper and thread	
CAVITIES · OUTPUT	16 · about 2,448 per hour at 20 s (Section 05)	
MOULD CONSIDERATIONS	Unscrewing or collapsible cores, polished taper	
SECONDARY	Vision check, assembly into the set	
EVALUATE At K = 0.5 t/cm ² and S = 1.15: 44 × 0.5 × 1.15 ≈ 25 t, so a clamp rated around 30 t or more. Drying, shot repeatability and unscrewing drive the choice. STILL NEEDED drawing, grade, ISO 80369-7 gauges, volume.		

C · PC/ABS DEVICE HOUSING		DEVICE PART
APPLICATION · MATERIAL	Monitor or pump housing · PC/ABS	
CHARACTERISTICS	2 cavities, 150 cm ² each plus 15 cm ² runner (assumed)	
CAVITIES · OUTPUT	2 · set by device volume	
MOULD CONSIDERATIONS	Low stress, textured surface, bosses	
SECONDARY	Assembly, disinfectant resistance test	
EVALUATE At K = 0.5 t/cm ² and S = 1.15: 315 × 0.5 × 1.15 ≈ 181 t, so a clamp rated around 213 t or more. Low moulded-in stress protects against wipe cracking. STILL NEEDED drawing, grade, cleaning agents, volume.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · SYRINGE BARREL	B · LUER CONNECTOR	C · DEVICE HOUSING
Main limit	Cavity consistency	Taper quality, unscrewing	Stress, surface
Clamp force	About 114 t rated	About 30 t rated	About 213 t rated
Auxiliaries	Robot, vision, printing	Dryer, vision	Dryer, robot

Illustrative example. Actual requirements depend on the component, material, mould and production conditions. $K = 0.5 \text{ t/cm}^2$ for PC and PC/ABS is an assumption.

SECTION 09 • BUYER CHECKLIST

MACHINE BUYER'S CHECKLIST

What to prepare before asking an injection moulding machine manufacturer for a recommendation on a medical part.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Critical dimensions and tolerances
- ☐ Resin grade and medical documents
- ☐ Inserts, bores and sealing features
- ☐ Part and runner weight

PRODUCTION

- ☐ Monthly volume and growth
- ☐ Cavity count and target cycle
- ☐ Operating hours and shifts
- ☐ Cavity-order packing or racking
- ☐ Backup machine needs

MOULD

- ☐ New or existing mould; size and weight
- ☐ Hot runner zones and valve gates
- ☐ Unscrewing or core pulls
- ☐ Cavity identification
- ☐ Previous machine specification, if any

MEDICAL APPLICATION

- ☐ Device class and customer QMS needs
- ☐ Sterilisation method and cycles
- ☐ Body or drug contact
- ☐ Validation (IQ, OQ, PQ) scope
- ☐ Clean moulding requirements

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 MEDICAL PARTS
1	What shot and cycle repeatability does the machine hold at my shot?	Cavity consistency on 32 to 128 cavities.
2	Which documents do you provide to support IQ and OQ?	Process validation.
3	Can shot data be logged and exported with an audit trail?	Traceability and audits.
4	How many hot runner zones and valve gate circuits are supported?	Balanced high-cavitation tools.
5	What robot, vision and insert-loading interfaces are available?	Cavity-order take-out and hubs.
6	Is the machine suitable for a clean moulding area?	Oil, dust and lubrication control.
7	Are unscrewing and core-pull circuits available?	Luer threads and closures.
8	What is the energy use per thousand parts at my cycle?	Low cost per disposable.
9	How are control software changes managed and recorded?	Changes can affect validation.
10	What installation, training and spare-parts support is included?	Validated lines cannot wait for parts.

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 sterilisation route, validation or clean 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

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