



TECHNICAL BUYER'S GUIDE · PRATISHNA ENGINEERS

AGRICULTURE & IRRIGATION COMPONENTS INJECTION MOULDING MACHINE GUIDE

A practical guide for irrigation and farm plastic 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

Factory owners, plant and production managers, process engineers and purchase teams making drip, sprinkler, filter, fitting and farm plastic components.

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

AGRICULTURE & IRRIGATION COMPONENTS & INJECTION MOULDING

Which irrigation, crop, nursery and livestock parts are injection moulded, and what the market expects from them.

WHERE INJECTION MOULDING FITS IN IRRIGATION AND FARM PLASTICS

A drip or sprinkler system is built from many small plastic parts: emitters, take-offs, fittings, saddles, valves, filters, fertiliser injectors and sprinkler bodies. Most of these are injection moulded, while the pipes, laterals and drip tape they connect to are extruded. Farms also use moulded nursery, spraying, poultry and livestock parts.

In India, demand for irrigation parts follows micro-irrigation adoption. Under the Per Drop More Crop scheme, the government subsidises drip and sprinkler installation at 55% of cost for small and marginal farmers and 45% for other farmers, and 83.46 lakh hectares were covered between 2015-16 and 2023-24^[5].

MAIN COMPONENT CATEGORIES

DRIP IRRIGATION Drip emitters, take-offs, barb connectors, grommets, end caps, flush valves	FITTINGS & SADDLES Lateral fittings, pipe and clamp saddles	SPRINKLERS Sprinklers, micro-sprinklers, micro-jets	VALVES & FILTRATION Small valves, taps and cocks; screen and disc filters
FERTIGATION & SPRAYING Venturi fertiliser injectors, spray pump parts	NURSERY & GREENHOUSE Nursery pots, seedling trays, greenhouse clips	POULTRY EQUIPMENT Feeders, drinkers, nipple drinkers, chick feed trays	LIVESTOCK & HANDLING Livestock ear tags, agri crates

WHY INJECTION MOULDING SUITS THESE PARTS

- Fine flow paths, barbs, threads and snap fits are formed net-shape in one shot.
- Small parts run in high-cavity moulds at low cost per part.
- Sprinklers and spray pumps combine moulded parts in PP, POM and nylon.

TYPICAL MANUFACTURING CHALLENGES

- Holding emitter flow consistent across many cavities.
- Keeping flow paths and barbs free of flash as moulds wear.
- Even UV and colour masterbatch dispersion in small shots.

WHERE MOULDING SITS IN THE PRODUCT CHAIN

RESIN + MASTERBATCH PP, PE, POM, PA; UV and colour	DRYING PA, PC, ABS, TPU	INJECTION MOULDING emitters, fittings, bodies	DEGATING cold-runner moulds	ASSEMBLY emitters, sprinklers, pumps	TESTING flow, pressure, dimensions	PACKING to dealers and integrators
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KEY REQUIREMENTS FOR IRRIGATION AND FARM COMPONENTS

FLOW UNIFORMITY IS 13487 limits the coefficient of variation (Cv) to 5% for Category A emitters and 10% for Category B ^[1] . ISO 9261 sets 7% ^[4] .	FLOW-PATH ACCURACY The smallest flow-path dimension is measured to 0.02 mm and must not be below the declared value ^[1] .	PRESSURE & PULL-OUT Emitter assemblies are held at 1.2 times maximum working pressure without leaking, then at 2 times without damage ^[1] .
UV & LIGHT Plastic emitter parts exposed to light must be opaque and protected against UV degradation ^[1] .	CHEMICAL EXPOSURE Materials must suit water, fertilisers, irrigation chemicals and treated sewage water ^[1] .	HYGIENE & HANDLING Poultry and livestock parts must be easy to clean, and crates must stack and survive handling.

SECTION 02 · COMPONENTS

MAJOR AGRICULTURE & IRRIGATION COMPONENTS

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

COMPONENT	APPLICATION	MATERIAL(S)	INJECTION MOULDING CONSIDERATIONS
Drip emitter	Meters water along a drip lateral	PP, PE, silicone, PC	Small shot in high-cavity moulds; tonnage follows cavity count. Pressure-compensating (PC) types add a silicone diaphragm. Labyrinth fill and flash control decide flow and Cv ^[1] .
Drip take-off, barb connector, grommet	Connect laterals to sub-mains	PP, PE	Barb sharpness and sealing lips decide leak-tightness and pull-out. Soft grommets need gentle ejection.
Drip line end cap, flush valve	Close and flush lateral ends	PP	Small multi-cavity parts; consistent grip and sealing on the lateral.
Lateral fitting, pipe / clamp saddle	Joiners, tees, elbows; saddle take-offs on pipes	PP, glass-filled PP, PE	Side cores for outlets; threads and clamp faces. Glass-filled PP for load-bearing saddles.
Irrigation valve, tap, cock (small)	Line control and isolation	PP, glass-filled PP, POM	Glass-filled PP for threaded and pressure parts. POM for moving internals. Unscrewing or split cores for threads.
Screen / disc filter	Protects emitters from clogging	PP, nylon	Threaded pressure housings, fine disc grooves that must fill completely and stay flat.
Venturi fertiliser injector	Draws fertiliser into the line	POM, PP	POM chosen for chemical resistance to fertilisers; check solution pH against the grade's limits ^[8] . Precise throat bore.
Sprinkler, micro-sprinkler, micro-jet	Overhead, under-tree and nursery irrigation	POM, ABS, PP, nylon, PC	Multi-material: POM for moving parts, PP, ABS or nylon for bodies. Micro-jets are often one piece. Nozzle bores need dimensional stability.
Spray pump part	Knapsack and power sprayers	PP, POM, nylon	PP body; POM or nylon for pump and moving parts. Sealing faces and wear surfaces.
Nursery pot, seedling tray, greenhouse clip	Nursery production and crop support	PP, PE, HDPE, ABS (pots); PP (trays); PP, PE (clips)	Thin walls over large areas on pots and trays. Seedling trays in PS, PET or PVC are thermoformed, a different process.
Poultry feeder, drinker, feed tray	Feed and water in poultry houses	PP, PE	Larger parts in low-cavity moulds. Flatness, stacking and easy cleaning.
Poultry nipple drinker	Drinking-line valve	PP, ABS	Small precise body assembled with a stainless-steel pin or valve.
Livestock ear tag	Animal identification	TPU, nylon, PC	Flexible TPU body with a nylon buckle or pin; marking area must stay legible.
Agri crate	Produce handling and transport	HDPE, PP	Large mould, long flow and stacking features. Size decides the machine; tonnage varies with crate size.

Not injection moulded: drip laterals, drip tape, HDPE and PVC pipes, which are extruded; PE laterals are specified under IS 12786^[6]. IS 13487 does not cover emitters integral to the pipe or micro-tubes^[1]; ISO 9261 covers emitting pipe as well as emitters^[3].

FLOW-CRITICAL PARTS

Drip emitters, micro-jets and venturi injectors. Cavity balance, venting and shot repeatability matter more than clamp force.

PRESSURE-CRITICAL PARTS

Fittings, saddles, valves, filters and take-offs. Barb and thread geometry, weld lines and grade decide performance.

SIZE-CRITICAL PARTS

Crates, pots, trays and poultry feeders. Mould width, height and stroke usually decide the machine first.

SECTION 03 · MATERIALS

MATERIALS USED FOR IRRIGATION COMPONENTS

Polyolefins carry most of the volume. Engineering plastics are used where a part moves, wears or carries pressure. The grade is chosen per component.

MATERIAL	TYPICAL COMPONENTS	RELEVANT PROPERTIES	PROCESSING CONSIDERATIONS	LIMITATIONS TO CHECK
PP	Emitters, fittings, caps, valves, filters, sprinkler and pump bodies, pots, trays, crates, poultry parts	Good chemical resistance, low density, easy to mould.	Semi-crystalline: plan for shrinkage and warpage. Even masterbatch dispersion in small shots.	UV stabilisation for field use; creep under sustained load.
Glass-filled PP	Threaded and pressure fittings, saddles, valves	Higher stiffness and creep resistance than unfilled PP.	Wear-resistant screw and barrel; fibre orientation causes warpage.	Weld-line strength on pressure parts.
PE / HDPE	Emitters, take-offs, grommets, clips, pots, crates, poultry parts	Flexible and tough; HDPE adds stiffness for crates.	High shrinkage. Melt density well below solid density, which reduces delivered shot weight ^[7] .	Low stiffness in thin sections; UV protection.
POM (acetal)	Sprinkler moving parts, micro-sprinkler spinners, venturi injectors, valve and pump internals	Stiff, low friction, low moisture absorption; sprinkler parts are a listed application ^[8] .	Sensitive to overheating and long residence. Keep PVC out of the same barrel.	DuPont advises against use outside pH 4 to 9 ^[8] .
Nylon (PA)	Sprinkler bodies, filters, pump parts, ear-tag buckles	Strength and toughness.	Hygroscopic: moisture above 0.2% harms moulding ^[9] , so drying is essential.	Dimensions change as it absorbs water.
ABS	Sprinkler bodies, nursery pots, nipple drinker bodies	Rigid, good surface finish.	Needs drying to avoid moisture streaks.	Weathering unless stabilised.
PC	Drip emitters, sprinkler parts, ear tags	Tough and dimensionally stable.	Must be dried; high melt temperature.	Stress cracking with some chemicals.
TPU	Livestock ear tag bodies	Flexible, tear and abrasion resistant.	Needs drying; soft parts need careful ejection.	Long-term outdoor ageing of the grade.
Silicone	Diaphragms in pressure-compensating emitters	Elastic recovery for flow regulation.	Usually a separate liquid silicone process or a bought-in part.	Regulation must hold over service life.

General material behaviour only; confirm values on the supplier's data sheet for the exact grade. PS, PET and PVC appear only in thermoformed seedling trays, a different process.

WHAT THE STANDARDS SAY ABOUT MATERIALS

IS 13487 asks that emitter materials suit water, fertilisers and chemicals used in irrigation, including treated sewage water, do not support algae or bacteria as far as possible, and that exposed plastic parts be opaque and UV protected^[1].

In a greenhouse trial of 38 commercial drippers on reclaimed water, pressure-compensating online models lost the most uniformity, which the authors linked to biofilm on the diaphragm^[4].

MATERIAL SELECTION QUESTIONS

- ☐ Will the part sit in sunlight, and what UV stabilisation is specified?
- ☐ Which fertilisers, acids or chlorine will it meet, and at what pH?
- ☐ Does it carry pressure, or move and wear?
- ☐ Which test standard applies: IS 13487, ISO 9261 or a customer specification?

SECTION 04 · DESIGN & MOULD

COMPONENT DESIGN & MOULD REQUIREMENTS

For irrigation parts, the mould and cavity layout usually decide quality and profitability before the machine does.

DESIGN FEATURES THAT AFFECT MOULDING

FEATURE	WHY IT MATTERS IN IRRIGATION PARTS	MOULDING IMPLICATION
Labyrinth flow path	Tooth geometry sets the emitter's flow rate and pressure response. Flow-path surfaces must be free of grooves or projections ^[1] .	Complete filling of fine teeth, good venting, no flash. Tooling accuracy is measured in hundredths of a millimetre.
Minimum flow-path dimension	Declared by the manufacturer and checked in production ^[1] . Governs clogging sensitivity and filtration needs.	Steel wear and parting-line damage change it over time. Plan inspection by cavity.
Barbs & grip rings	Seal the part in the lateral and resist pull-out under pressure.	Sharp, repeatable barb edges. Avoid parting lines across sealing diameters where possible.
Threads	Filter housings, valves and adaptors use BSP or similar threads.	Unscrewing cores, collapsible cores or split cavities. Affects mould thickness and cycle.
Wall thickness	Thick sections in fittings cause sinks and voids that weaken barbs and threads.	Core out thick areas. Cooling time rises roughly with the square of wall thickness ^[10] .
Diaphragm seats & snap fits	PC emitter regulation depends on the seat and cover geometry holding the diaphragm.	Flatness and tight tolerance on both halves. Moulding and assembly must be treated as one process.
Filter inlets & disc grooves	Small openings protect the flow path. Disc grooves set filtration grade.	Fine features must fill without flash; flat discs need uniform cooling.
Marking	IS 13487 requires manufacturer name, flow rate, flow direction arrow and uniformity category on each emitter, with flow rate allowed by colour ^[1] .	Engraved cavity inserts; cavity numbers help trace a flow deviation to one cavity. Colour change planning.

MOULD CONSIDERATIONS

ITEM	IRRIGATION-SPECIFIC POINTS	ITEM	IRRIGATION-SPECIFIC POINTS
Cavity layout	Emitters and caps: 32 to 128+ cavities. Fittings: 4 to 32. Housings and poultry parts: 1 to 2.	Side actions	Tee and elbow outlets need side cores; threaded bodies need unscrewing.
Runner	Hot runners remove runner scrap and suit high-cavity emitter moulds. Cold runners cost less but add regrind and projected area.	Ejection	Tiny parts need reliable stripping and separation from the runner. Soft grommets need gentle ejection.
Balance	Naturally balanced layouts keep emitter weight, and therefore flow, even across cavities.	Steel & wear	Glass-filled grades and long runs wear shut-offs and gates; plan replaceable inserts.
Venting	Labyrinth teeth trap air. Poor venting gives short shots and burns in the flow path.	Mould size	High-cavity and side-action moulds grow wide quickly. Check width against tie-bar spacing early.
Cooling	Uniform cooling limits warpage of flat emitters and discs, and sets the cycle.	Maintenance	Vent cleaning and shut-off checks on a fixed schedule protect Cv.

DESIGN REVIEW Ask the mould maker for the cavity layout, runner type, mould width and closed height before you choose a machine. These four figures decide the machine as much as the part does.

SECTION 05 · PRODUCTION PLANNING

PRODUCTION CAPACITY & CYCLE-TIME PLANNING

How many parts a machine makes depends on cavities, cycle time and how many hours it actually runs. For emitters, the target is often set by drip-line extrusion output.

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 · 64-CAVITY FLAT EMITTER

64 × 3600 ÷ 12 s = 19,200 /h
 × 0.85 utilisation = 16,320 /h
 × 22 h = 359,040 /day
 × 26 days = 9,335,040 /month
 × 300 days = 107.7 million /year

At 0.4 m emitter spacing, one kilometre of drip line uses 2,500 emitters, so one day's output covers about 144 km of lateral.

WHAT SETS THE CYCLE TIME

PHASE	IRRIGATION-SPECIFIC INFLUENCE
Injection & hold	Short for thin emitters; longer for thick fitting and filter walls where sinks must be packed out.
Cooling	Usually the largest share; rises roughly with wall thickness squared ^[10] .
Open & close	Longer stroke for deep parts; unscrewing cores add time.
Ejection	Reliable drop of tiny parts; runner separation.
Handling	Robot or picker speed, conveyor, counting.
Material	Undried PA or unstable masterbatch feed causes stoppages and rejects.

EXAMPLE 2 · 16 MM LATERAL TEE, 16 CAVITIES

16 × 3600 ÷ 18 s = 3,200 /h
 × 0.85 = 2,720 /h · × 22 h = 59,840 /day
 × 26 days = 1,555,840 /month

Working backwards: for 2,000,000 tees a month in 572 running hours (26 × 22), you need 3,497 per hour. Cavities = 3,497 × 18 ÷ (3600 × 0.85) ≈ 20.6, so a 24-cavity mould or a second 16-cavity mould.

Illustrative example. Cycle times of 12 s and 18 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

FLAT EMITTER MOULD	PROJECTED AREA	CALCULATED FORCE	RATED AT 85%	SHOT (PE)	EFFECTIVE OUTPUT
32 cavities	76 cm ²	35 t	41 t	28 g	8,160 /h
64 cavities	148 cm ²	68 t	80 t	50 g	16,320 /h
96 cavities	220 cm ²	101 t	119 t	72 g	24,480 /h

Illustrative example. Force = projected area × clamp factor K × safety factor S, with K = 0.40 t/cm² and S = 1.15 assumed. Also assumed: 2.0 cm² and 0.5 g per emitter, runner area 12 / 20 / 28 cm² and runner weight 12 / 18 / 24 g, 12 s cycle and 85% utilisation for all three. A larger mould may need a longer cycle and costs more; two smaller sets add flexibility if one mould is down.

MACHINE UTILISATION AND PLANNED DOWNTIME

COLOUR CHANGES

Flow-rate colour coding means frequent changes on emitter and dripper lines. Group runs by colour.

MOULD CARE

Vent cleaning and shut-off checks protect Cv. Schedule them rather than waiting for flow drift.

DRYING

PA and wet regrind must be dried before use^[9]. Size the dryer to the hourly throughput.

LINE MATCHING

If emitters feed your own drip line, match moulding output to extruder demand plus a buffer stock.

SECTION 06 • AUTOMATION

AUTOMATION & PRODUCTION EFFICIENCY

Irrigation parts are small, sold by count and produced in large numbers. Automation earns its place where it removes handling, counting and inspection labour, or holds the cycle steady.

AUTOMATION	WHERE IT ADDS VALUE IN IRRIGATION AND FARM PARTS	WHEN IT USUALLY MAKES SENSE
Sprue picker / robot	Removes runners from cold-runner fitting and emitter moulds; separates parts from runner for regrind.	Multi-cavity cold-runner moulds running continuously; where manual removal varies the cycle.
Conveyor & separator	Carries free-falling parts away from the mould area; separates parts and runners.	Almost every high-cavity emitter, cap and fitting mould.
Counting & weighing	Emitters and fittings are packed and sold by count. Weigh-counting avoids manual counting.	High volumes of small parts; customer packs of fixed quantity.
Emitter feeding	Orients inline emitters and feeds them into the drip-line extruder.	Integrated moulders who also extrude laterals.
Automated assembly	PC emitters (body and silicone diaphragm), valves, filters and sprinkler heads.	Multi-part products where assembly labour exceeds moulding labour.
Vision inspection	Detects short shots, flash in flow paths and missing features before assembly.	Flow-critical parts; high-cavity moulds where one bad cavity can go unnoticed.
Material handling	Vacuum loaders, masterbatch dosing units, dryers for PA and regrind.	Colour-coded products, multiple machines, hygroscopic materials.
Side core & unscrew control	Hydraulic or electric core-pull sequences for tees, threaded filters and valves.	Any mould with side actions or threads.

DECIDING ON AUTOMATION

VOLUME & LABOUR Continuous 24-hour running of small parts makes manual removal, counting and packing the largest labour cost.	GEOMETRY Tiny free-falling parts suit conveyors; multi-part PC emitters suit automated assembly; deep parts may need a robot.	QUALITY & REPEATABILITY An automated, fixed-time cycle gives steadier cavity weights, which supports Cv on emitters.
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INTERFACES TO SPECIFY ON THE MACHINE

ROBOT & PICKER Signal interface and safety interlocks for part and runner removal.	HOT RUNNER Number of temperature zones for the hot-runner system on high-cavity moulds.	CORE PULLS Circuits and sequencing for side cores and unscrewing on fittings and filters.	AUXILIARIES Conveyor, counter, loader, dosing unit and dryer connections.
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WHERE THE COST OF A MOULDED PART COMES FROM

MATERIAL resin + UV and colour masterbatch	MACHINE depreciation per machine hour	LABOUR operation, handling, packing	POWER kWh per part	MOULD cost ÷ lifetime parts, maintenance	REJECTION scrap, regrind value	PACKING bags, cartons, counting
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For a part weighing a gram or less, material is a small share of the total and machine hours, labour and rejects dominate. That is why cavity count, cycle time and automation are usually the strongest levers for emitters and small fittings. For heavier parts such as filter housings and poultry drinkers, resin and cooling time take a larger share. Use your own resin, power and labour rates to compare options; the balance differs from plant to plant.

SECTION 07 · QUALITY

QUALITY, TESTING & COMMON DEFECTS

An irrigation part is judged in the field by flow uniformity, leak-free joints and life outdoors. Most of those results are decided in the mould.

EMITTER TESTS IN IS 13487

TEST	WHAT THE STANDARD DESCRIBES ^[1]	LINK TO MOULDING
Construction	Emitters opened or sectioned; no grooves, projections, cracks or cavities in flow paths.	Flash, short shots, voids
Flow-path dimension	Smallest dimension measured on at least 3 emitters to 0.02 mm; not below declared value.	Tool wear, cavity accuracy
Hydrostatic pressure	5 min at 0.4 × Pmax, 5 min at 0.8 × Pmax, 60 min at 1.2 × Pmax without leakage; then 5 min at 2 × Pmax without damage or pull-out.	Barb geometry, weld lines, sinks
Pull-out	Online: 40 N perpendicular to the pipe for 1 h. In-line: axial force from pipe size, max 500 N.	Barb profile, material stiffness
Uniformity of emission rate	At least 25 emitters. Category A: mean within 5% of nominal, Cv not over 5%. Category B: 10% and 10%.	Cavity balance, shot repeatability
Flow vs pressure & exponent	Flow curve within 5% (A) or 10% (B) of the published curve. Exponent below 0.2 classed as regulated.	Labyrinth and diaphragm-seat accuracy

Figures from the IS 13487:1992 text. IS 13487:2024 has since been published^[2]; confirm current clauses and certification requirements.

IN-PROCESS CHECKS FOR THE MOULDING FLOOR

WEIGHT BY CAVITY Weigh parts from each cavity regularly. A drifting cavity weight is an early warning of flow variation.	FLOW SAMPLING Sample flow tests on emitters per shift or batch, traced to cavity number.	DIMENSIONS Barb diameters, threads, orifices and flatness with go / no-go gauges and optical measurement.	PRESSURE & VISUAL Burst checks on fittings and housings; visual or camera check for flash and streaks.
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TROUBLESHOOTING COMMON DEFECTS

DEFECT	POSSIBLE CAUSES	EFFECT ON THE IRRIGATION PART	AREAS TO INVESTIGATE
Flash	Worn shut-offs, damaged vents, excess injection or hold pressure, clamp too low	Flash in a labyrinth changes flow; on barbs it causes leaks	Parting line, clamp setting, pressure profile
Short shot	Unbalanced runner, blocked vents, low speed or shot size	Incomplete labyrinth teeth in end cavities	Runner balance, venting, injection rate
Cavity weight variation	Runner imbalance, hot-runner zone differences, worn check ring	Direct cause of higher Cv	Weights by cavity, heater zones, screw cushion stability
Warpage	Uneven cooling, high PP/PE shrinkage, fibre orientation	Flat emitters and discs do not seat or bond	Cooling layout, mould temperature, hold time
Sinks & voids	Thick sections, short hold, gate freezing early	Weak barbs and threads, leaks at test	Wall design, gate size, hold pressure and time
Streaks / black specks	Poor masterbatch mixing, degraded material, wet PA	Uneven UV protection, rejects	Back pressure, residence time, drying

SECTION 08 · WORKED EXAMPLES

PRACTICAL MACHINE-SELECTION EXAMPLES

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

A · FLAT INLINE EMITTER		FLOW-CRITICAL
APPLICATION · MATERIAL	Inline drip laterals for row crops · PE grade compatible with the lateral	
CHARACTERISTICS	About 0.5 g, 2.0 cm ² projected area (assumed); fine labyrinth, flat bonding face	
CAVITIES · OUTPUT	64, cold runner · matched to drip-line extrusion demand (Section 05: about 16,000 per hour)	
MOULD CONSIDERATIONS	Balanced runner or hot runner, labyrinth venting, uniform cooling for flatness, cavity marking	
EVALUATE The cavity table in Section 05 gives about 68 t calculated and a 50 g PE shot, so a clamp rated around 80 t or more. Shot repeatability and injection rate matter more than extra tonnage. STILL NEEDED actual projected area from CAD, runner design, mould width against tie-bar spacing, target Cv category.		

B · PRESSURE-COMPENSATING DRIP EMITTER		FLOW + ASSEMBLY
APPLICATION · MATERIAL	Drip lines on slopes and long runs · PP or PE body (to be confirmed), silicone diaphragm	
CHARACTERISTICS	Moulded body parts plus a diaphragm; diaphragm seat sets regulation (exponent below 0.2) ^[1]	
CAVITIES · OUTPUT	High-cavity body moulds, count not yet fixed · output may be limited by diaphragm assembly	
MOULD CONSIDERATIONS	Seat flatness and tolerance, labyrinth venting, matched cavities for mating parts	
EVALUATE No tonnage can be stated yet. Decide how the silicone diaphragm is sourced and assembled, and whether mating parts run in a family mould or separate moulds. Reclaimed-water users may report faster clogging on PC types ^[4] . STILL NEEDED drawings, grades, diaphragm source, cavity plan, monthly volume.		

C · DISC FILTER HOUSING		PRESSURE + SIZE
APPLICATION · MATERIAL	Head-unit filtration · PP or nylon (grade and glass content to be confirmed)	
CHARACTERISTICS	Threaded, pressure-bearing body with sealing faces and a thick wall	
CAVITIES · OUTPUT	1 to 2 cavities · lower volume, long cooling time because of wall thickness	
MOULD CONSIDERATIONS	Unscrewing core, deep draw, gate position away from weld lines at threads	
EVALUATE Tonnage cannot be set without the drawing. Opening stroke, daylight and ejector stroke are likely to decide the machine. Glass fibre calls for a wear-resistant screw and barrel; PA needs drying. STILL NEEDED projected area, wall thickness, pressure rating, mould size and closed height.		

WHAT DECIDED THE MACHINE IN EACH EXAMPLE

SELECTION FACTOR	A · INLINE EMITTER	B · PC EMITTER	C · FILTER HOUSING
Main limit	Shot repeatability, injection rate	Assembly rate, two-part matching	Stroke, daylight, mould size
Clamp force	Set by 64 cavities, not part size	Depends on final cavity counts	Needs drawing and wall data
Screw & barrel	Standard, sized for a small shot	Depends on PP or PE body	Wear-resistant for glass fibre
Auxiliaries	Conveyor, counting, hot-runner control	Automated assembly, vision	Unscrewing control, dryer for PA

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 an irrigation or farm component.

COMPONENT

- ☐ 2D drawing and 3D CAD model
- ☐ Overall dimensions and wall thickness
- ☐ Part weight and runner weight
- ☐ Material and grade, including masterbatch
- ☐ Critical tolerances: barbs, threads, orifices, labyrinth
- ☐ Projected area per cavity, if known

PRODUCTION

- ☐ Required quantity per hour, day or month
- ☐ Yearly volume and seasonal peaks
- ☐ Planned cavity count
- ☐ Target cycle time
- ☐ Operating hours and shifts
- ☐ Drip-line extrusion output, for inline emitters

MOULD

- ☐ Existing or new mould
- ☐ Mould width, height and closed thickness
- ☐ Mould weight
- ☐ Hot or cold runner; number of hot-runner zones
- ☐ Side cores, unscrewing cores, inserts
- ☐ Previous machine specification, if any

IRRIGATION APPLICATION

- ☐ Nominal flow rate; PC or non-PC
- ☐ Uniformity category targeted (A or B)
- ☐ Lateral OD, wall thickness and working pressure
- ☐ UV exposure and required stabilisation
- ☐ Fertiliser, acid or chlorine exposure
- ☐ Target standard: IS 13487, ISO 9261 or customer specification

QUESTIONS TO ASK BEFORE YOU BUY A MACHINE

#	QUESTION	WHY IT MATTERS FOR IRRIGATION PARTS
1	What is the shot weight repeatability of the injection unit at my shot size?	Shot variation on a 64-cavity emitter mould shows up as flow variation.
2	What injection rate can the unit deliver with my screw diameter?	Fine labyrinths across many cavities must fill before the melt freezes.
3	Will my mould width pass between the tie bars with handling clearance?	High-cavity and side-action moulds are wide.
4	What are the minimum and maximum mould thickness and opening stroke?	Hot-runner, unscrewing and deep-part moulds.
5	Are core-pull and unscrewing circuits available, and how many?	Tees, elbows, threaded filters and valves.
6	What screw and barrel options suit glass-filled PA, PP-GF or PVC?	Wear and corrosion on filter, valve and fitting materials.
7	How many hot-runner zones and robot interfaces does the control support?	High-cavity emitter moulds and automation.
8	What dry cycle time can the clamp achieve at my stroke?	Emitter cycles are short, so clamp movement is a real share of the cycle.
9	Can the control store settings for each mould and colour, and log shot data?	Frequent colour and mould changes; traceability when flow drifts.
10	What installation, training and spare-parts support is included?	Machines often run around the clock through peak demand.

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 requirements such as flow rate or automation.

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Actual injection moulding machine and process requirements vary according to the component design, material, mould, production volume, machine configuration and operating conditions. The information, examples, calculations and recommendations provided should be independently evaluated and verified for the specific application before making any equipment, process or production decision. Information obtained from third-party sources remains subject to the accuracy and limitations of those sources.

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