INJECTION MOLDING ROBOT SELECTION CHECKLIST

A practical 10-page guide to matching tonnage, stroke, payload, EOAT and cycle time before you request a quotation.

For production engineers, procurement teams and automation buyers

KEFAN ROBOT Injection molding robots | Custom EOAT | Automation integration

How to Use This Checklist

Complete the worksheet before selecting a robot model. The correct robot is the one that clears the mold, protects the part, meets the target cycle and leaves enough margin for real production variation.

Decision rule
Select from measured production data, not machine tonnage alone.

Project snapshot

Input	Your value	Why it matters
Company / plant	_____	Defines environment and support needs
IMM make / model	_____	Confirms interface and signal requirements
Machine tonnage	_____ ton	Starting point for robot size
Mold / cavity count	_____	Drives EOAT layout and payload
Target cycle	_____ sec	Sets the motion and release budget
Part material / weight	_____	Affects grip, cooling and handling

Use the checkboxes on pages 3-9 to capture decisions. Keep the completed final page with the quotation package so every supplier is working from the same assumptions.

1 | Match the Robot to Machine Tonnage

Machine tonnage is a useful filter, but it does not determine the robot by itself. Confirm tie-bar spacing, mold height, part drop direction and the actual reach needed at the mold center.

Record the machine envelope

Measurement	Value	Pass condition
Machine tonnage	_____ ton	Robot range includes this tonnage
Tie-bar spacing W x H	_____ x _____ mm	EOAT and arm clear tie bars
Mold width x height	_____ x _____ mm	Tool fits within work envelope
Mold open stroke	_____ mm	Robot can reach pick position
Part drop height	_____ mm	Release path is clear
Robot mounting	Top / side / floor	Matches machine and layout

Selection checks

[ ] The robot's rated tonnage range covers the machine.

[ ] Tie-bar and safety-door clearances are confirmed.

[ ] The mold center and part drop point are inside the work envelope.

[ ] Robot mounting and controller location fit the cell layout.

[ ] The selected model leaves at least 10 percent reach margin.

2 | Calculate Required Stroke

Stroke should be calculated from the machine reference point to the furthest required position, not from the nominal mold width. Include approach, pick, extraction and release positions.

Quick formula

Required stroke = approach + mold depth + extraction + release margin

Measure the path

Path segment	Measured	Margin
Approach to mold center	_____ mm	_____ mm
Mold depth / extraction	_____ mm	_____ mm
Transfer to release point	_____ mm	_____ mm
Release / conveyor reach	_____ mm	_____ mm
Total required stroke	_____ mm	Target: _____ mm

Do not forget

[ ] Mold open position is measured under real machine conditions.

[ ] Part and runner extraction angles are included.

[ ] Downstream conveyor or chute reach is included.

[ ] Cable chain, gripper and safety clearance are included.

[ ] The final stroke still works at the slowest safe speed.

3 | Confirm Payload and Inertia

Payload is more than part weight. Add the EOAT, vacuum cups, sensors, fittings, cables and any runner or insert carried during the move. Inertia rises quickly when mass is offset from the wrist.

Payload worksheet

Item	Mass	Center offset
Part(s)	_____ kg	_____ mm
Runner / sprue	_____ kg	_____ mm
EOAT frame	_____ kg	_____ mm
Vacuum / gripper hardware	_____ kg	_____ mm
Cables / sensors / fittings	_____ kg	_____ mm
Total moving payload	_____ kg	Max inertia: _____

Engineering margin

Use a margin for acceleration, vibration, temperature and future part changes. A payload that is technically within the catalogue limit may still be too close to the limit for a stable, fast cycle.

[ ] Payload is below the robot's continuous rated payload.

[ ] Wrist moment / inertia is checked, not only kilograms.

[ ] Acceleration and deceleration settings are compatible with the part.

[ ] The EOAT is stiff enough to avoid oscillation at release.

4 | Select the Right EOAT

EOAT determines whether the robot can pick reliably, protect cosmetic surfaces and release the part without adding unnecessary motion. Design around the part, runner and release sequence together.

EOAT decision matrix

Question	Decision	Notes
Part surface	Vacuum / gripper / hybrid	_____
Part temperature	_____ deg C	Cooling before pick: _____
Part orientation	Fixed / rotated	Required angle: _____
Runner handling	Separate / combined	Weight: _____ kg
Release method	Blow-off / drop / place	Release point: _____
Sensors	Presence / vacuum / part	I/O points: _____

Design checks

[ ] All contact points avoid critical cosmetic surfaces.

[ ] Vacuum level or grip force is enough at the fastest move.

[ ] EOAT changeover and maintenance access are practical.

[ ] Part-present sensing prevents a dropped part from repeating.

[ ] The release action does not add a hidden dwell to the cycle.

5 | Optimize the Full Cycle

The robot is only one part of the molding cycle. Map every wait, handshake and dwell. The best cycle improvement often comes from overlapping safe actions, shortening release time or moving the pick point closer to the mold center.

Cycle-time map

Action	Current sec	Target sec
Mold open / robot entry	_____	_____
Pick and vacuum confirm	_____	_____
Extraction / transfer	_____	_____
Release / runner drop	_____	_____
Robot exit / mold close	_____	_____
Total robot window	_____	_____

Optimization rule

Reduce waits first; increase speed only after grip, clearance and safety are proven.

[ ] Robot motion overlaps with safe mold or ejector actions.

[ ] Vacuum confirmation is fast and stable.

[ ] The release point is close to the next process step.

[ ] Acceleration profiles are tuned for part stability.

6 | Confirm Signals, Safety and Integration

A mechanically correct robot can still fail at commissioning if machine signals, safety circuits and handshakes are not agreed early. Confirm the interface standard and the responsibility for each signal.

Interface checklist

Area	Confirm	Owner
Machine interface	EUROMAP 67 / other: _____	_____
Ready / busy / complete	Signal list attached	_____
Mold open / ejector	Interlock sequence agreed	_____
Part present / vacuum	Fault response agreed	_____
Safety circuit	Door, E-stop, gate reset	_____
Downstream equipment	Conveyor / vision / pack	_____

[ ] A complete I/O list is included with the quotation.

[ ] Safety validation is planned before production release.

[ ] Fault modes leave the mold and operator in a safe state.

[ ] Manual recovery and maintenance modes are defined.

7 | Compare Total Cost of Ownership

The lowest purchase price is not always the lowest production cost. Compare the robot, EOAT, integration, commissioning, training and the expected cost of downtime over the useful life of the cell.

Quotation comparison

Cost item	Supplier A	Supplier B
Robot and controller	$ _____	$ _____
EOAT and sensors	$ _____	$ _____
Conveyor / peripherals	$ _____	$ _____
Integration and programming	$ _____	$ _____
Installation / training	$ _____	$ _____
Spare parts / warranty	$ _____	$ _____
Estimated 3-year total	$ _____	$ _____

Ask before deciding

[ ] What is included in commissioning and acceptance testing?

[ ] What response time and spare-parts coverage is included?

[ ] Is the quoted cycle based on measured parts and mold conditions?

[ ] Can the cell support the next part or mold family?

Final Sign-Off Checklist

Use this page at the quotation review. A supplier should be able to answer every line with a drawing, calculation, signal list or test result.

Ready to request a recommendation

[ ] Machine tonnage, tie-bar spacing and mold envelope are recorded.

[ ] Stroke and release positions are calculated with margin.

[ ] Payload and wrist inertia are confirmed for the complete EOAT.

[ ] EOAT contact points, sensing and release are defined.

[ ] Robot window and full molding cycle targets are documented.

[ ] Machine interface, safety and recovery sequence are agreed.

[ ] Quotation compares total cost, support and future flexibility.

[ ] Drawings, I/O list, cycle assumptions and acceptance criteria are attached.

NEXT STEP

Send this completed checklist with your machine tonnage, part weight and target cycle. KEFAN engineers can confirm robot structure, stroke, payload, EOAT and integration requirements before quotation.

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This guide is an engineering starting point. Final robot selection should be validated against the actual machine, mold, part and production sequence.