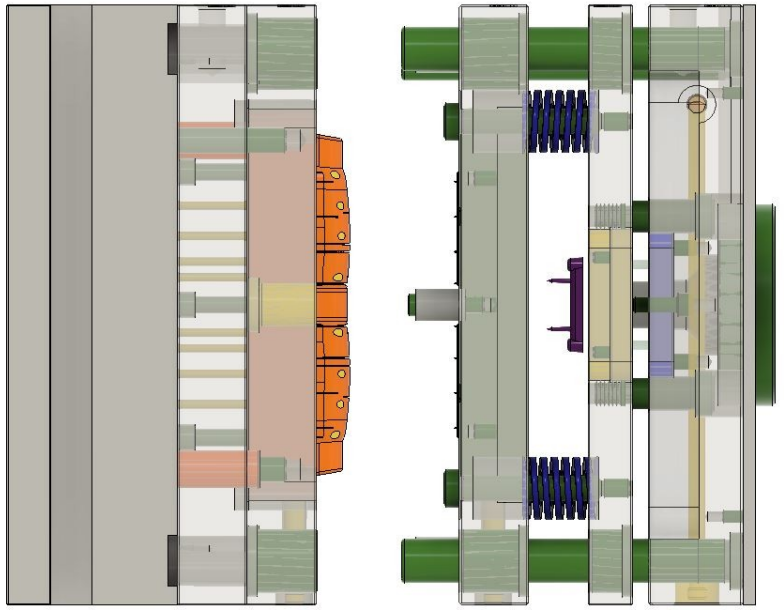
TRUE POSITION PLASTICS

DESIGN GUIDE

3-Plate Molds

Commonly called stripper plate molds

Why and when to use them, how they open, the latch systems that control them, and the problems to avoid.



2026 Edition

Why and when we use 3-plate molds

When part geometry requires multiple gates, especially center gating or gating on multiple edges, 3-plate molds become the tool of choice.

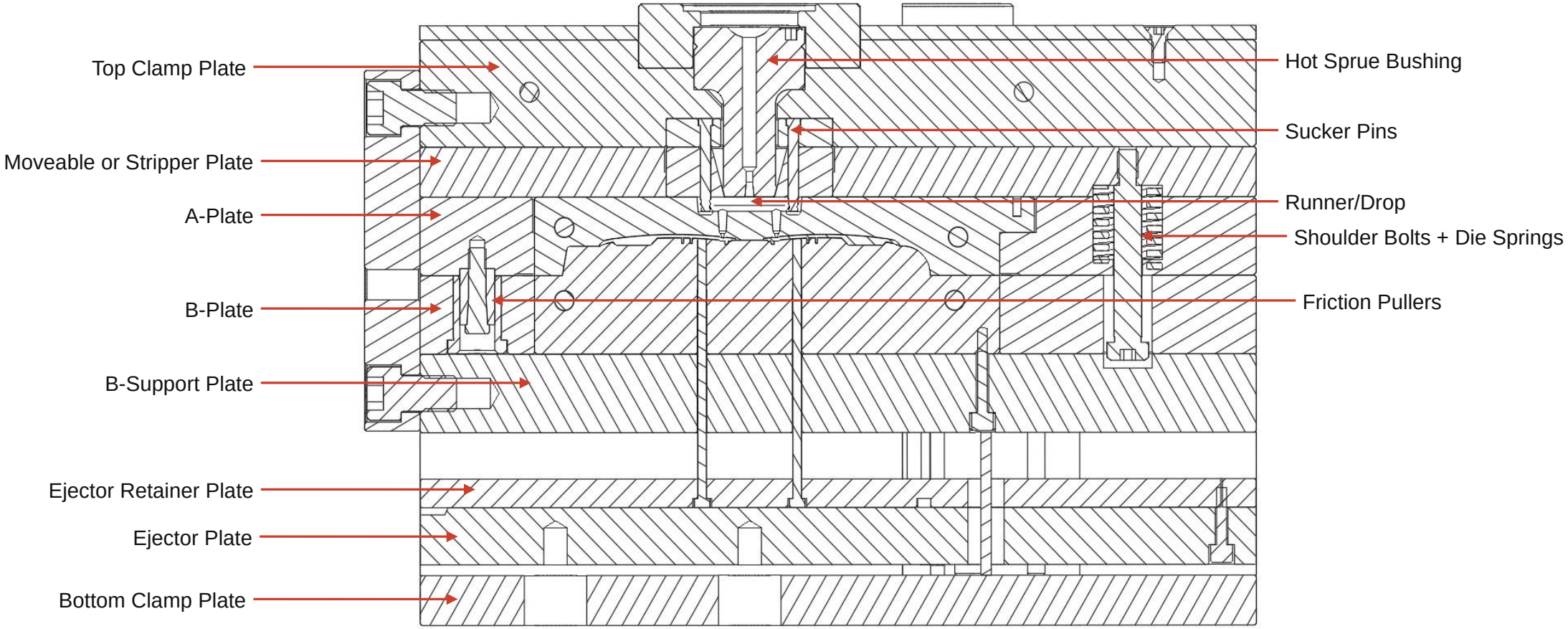
In a standard 2-plate mold every gate must end at the parting line. A 3-plate mold puts the runner on its own plate split, so gates can drop directly into the part surface wherever the part needs them.

Why choose a 3-plate mold?

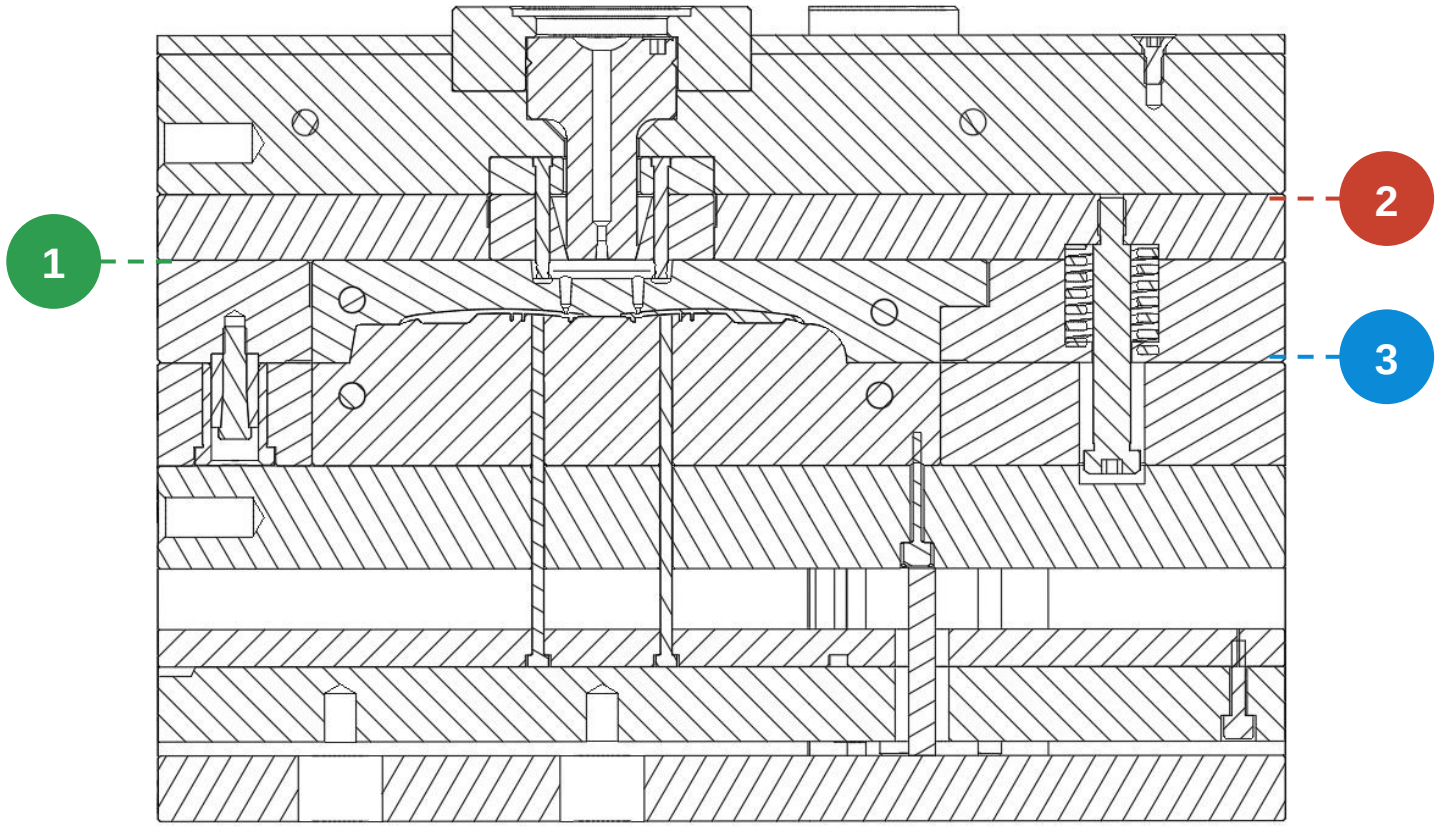
- Direct gating into the part; gates are broken and stripped in the mold
- Cleaner cosmetic surfaces
- Handles complex multi-cavity runner layouts
- Multi-gated flat panels, lenses, and shallow parts with tight cosmetics

	2-plate (cold runner)	3-plate	Hot runner
Gate location	Parting line only	Anywhere on the part	Anywhere on the part
Degating	Manual or sub gate	Automatic, in the mold	None: no runner
Runner scrap	Yes	Yes, more (drops)	None or minimal
Tooling cost	Lowest	Moderate	Highest
Daylight needed	Least	Most: three openings	Moderate
Best for	Edge-gated parts	Center or multi-gate at low cost	High volume, no scrap, cosmetic gates

3-plate mold nomenclature (friction puller style)



The opening sequence: three plate splits



Numbers mark where each plate split opens on the section view.

1 Split 1 · Breaking the gates

Die springs force this first opening. The sucker pins break the runner/drop away from the molded part.

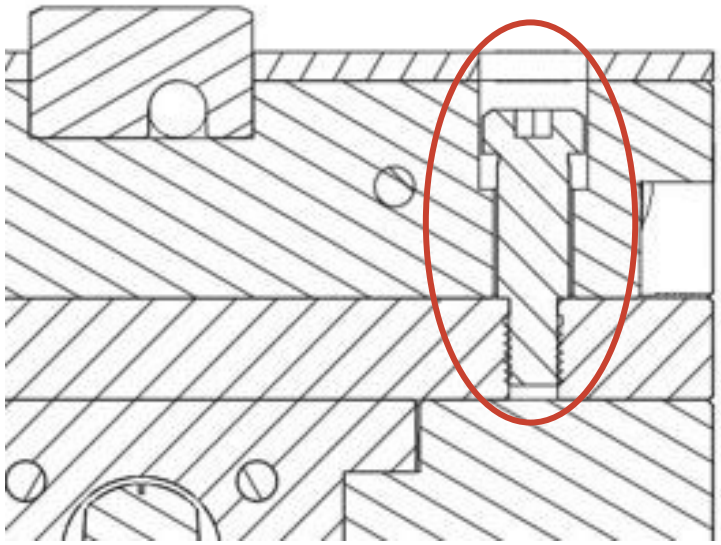
2 Split 2 · Stripping the runner

Friction pullers hold split 3 closed, so this opens second. The runner/drop is stripped off the sucker pins and falls free.

3 Split 3 · Opening the parting line

The plate finally overcomes the friction pullers and the main parting line opens so the part can be ejected.

Controlling the sequence: stop bolts and stroke



This is the second set of shoulder bolts (not shown in the section views). During plate split 2 they bottom out in this counterbore, forcing plate split 3 to happen.

Size each opening for its job

- Split 1: just enough to break the gates cleanly off the part.
- Split 2: enough for the runner/drop to strip off the sucker pins and fall free, or for a robot to pick it. The drop is usually the longest thing in the tool.
- Split 3: normal part ejection and removal.

Check the press before you build

- Mold height + split 1 + split 2 + split 3 must fit within the press's maximum daylight. Three openings use far more daylight than a 2-plate tool.
- Support the floating plates on long guide pins from the top clamp plate through the full stroke.

Friction pullers vs. latch locks

A properly engineered 3-plate tool needs more than an extra plate. The right latch, alignment, and runner pull systems are critical.



Friction pullers

HASCO Z80 / Misumi equivalents

- Keep the A- and B-plates together while the stripper plate moves.
- Some people love them, some hate them. Used in about 8 of 10 Asia-built 3-plate molds.
- Adjusted properly, they do the job nicely; they wear and need periodic adjustment.



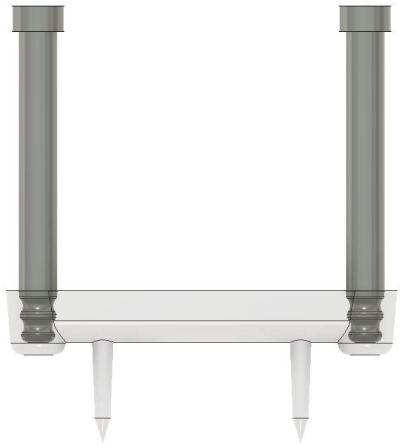
Latch locks

HASCO Z171 series or equivalent

- Control the plate separation sequence positively.
- The stripper plate opens ahead of the A-plate; A and B stay mechanically locked until a release arm pushes the cam.
- Simple, robust, and highly repeatable.

TPP preference

Components up close



Sucker pins & runner/drop

Undercut pins hold the runner on the stripper plate so the gates break at split 1, then release it at split 2.



Misumi friction pullers

Nylon-type plugs that grip a pocket in the mating plate to hold the A- and B-plates together.



HASCO latch lock

A mechanical lock and cam bar that releases the plates in a fixed order, every cycle.

Component images from HASCO and Misumi; for illustration only.

3-plate mold design guidelines

1 Size the pin-point gates

Small gates (typically about 0.030–0.060" / 0.8–1.5 mm) break cleanly. Taper the drop toward the gate so it pulls free.

2 Design the sucker pins

Pins need enough undercut to hold the runner at split 1, but must strip cleanly at split 2. Polish and vent them.

3 Give the drop room to fall

Split 2 opening must clear the full runner/drop height plus margin, or plan for a sprue picker or robot.

4 Use positive sequencing

Latch locks give a repeatable order every cycle. If friction pullers are used, set and check them at each PM.

5 Guide the floating plates

Run long guide pins from the top clamp through the stripper and A-plates; support them over the full stroke.

6 Confirm press daylight

Add all three openings to the mold height and check against the press's maximum daylight before the build.

Common 3-plate problems and fixes

Problem	Likely cause	Fix
Plates open out of sequence	Worn or mis-set friction pullers; weak or broken die springs	Adjust or replace pullers, replace springs, or convert to latch locks
Gates don't break cleanly	Gate too large, split 1 too short, sucker pins not holding	Reduce gate size, lengthen split 1, add undercut to the sucker pins
Runner hangs up or won't drop	Sucker pin undercut too aggressive; split 2 opening too short	Ease the pin undercut, add stroke, add a sprue picker or robot
Runner falls into the parting line	Split 3 opens before the drop clears	Fix the sequence; add stroke at split 2 so the drop is clear first
Plates binding or galling	Floating plates unsupported, short or worn guide pins	Longer guide pins and bushings sized for the plate weight; lubricate

We hope this helps you understand 3-plate molds.

About True Position Plastics

We specialize in complete tooling and process solutions, from DFM and mold design reviews to complex multi-cavity mold builds, including 3-plate systems, hot runner designs, and insert molding.

We work directly with trusted global mold vendors, providing full project management from quotation to first shots and press-side support during validation.

If you have an injection molding project, a mold design question, or need a second set of experienced eyes on your tooling, we're here to help.

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