



**Metro Plastics Technologies, LLC.
Injection Mold Design and Build
Standards**

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1/6/2023
Rev. 9



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INTENT

This document is intended to be a guide, **not** an absolute specification. The intent is to design and build a tool that will produce a part as close to specification as possible, require the minimum of correction, and to achieve this goal in a timely and professional manner, in partnership with Metro.

It is Metro's responsibility to provide or facilitate all requisite information, specification, clarification, and approval to assure compatibility of its customer's product specification with the mold constructor's facilities and Metro's production facilities.

It is the mold designer/builder's responsibility to exercise experience, good judgment, and imagination to design and construct the best possible tool relative to part specifications.

Please apply all safety precautions, consistent mold construction practices, and prevailing regulations for effective and efficient results, as well as safe operation.

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I. Mold Construction Administration

1. **Preliminary Mold Design Drawings** displaying major features, general locations and dimensions (plan and elevation views of mold-base, cavity & core layout, injection, ejection, cooling, etc.) must be submitted to and approved by Metro's Tool Engineer or designee before the design is detailed, steel ordered, or construction commenced.
2. **Final Complete Mold Drawings** are due at mold delivery. This documentation shall include and clearly represent all component details, dimensions, wiring diagrams, detailed Bill-of-materials, sources and specifications required to replace any fabricated component, purchased part, or the whole mold consistent with the original.

Bill-of-materials is to contain complete description of all materials that are used in the mold construction: Material description, use location, key number, drawing location Component description, number required and supplier.

Steel certification documentation is required for the core and cavity blocks, and for the mold-base if it is fabricated.

The **measurement systems** used shall be consistent with the part-print for part core/cavity details (Metric or English). The English system shall be used for the rest of the mold to assure compatibility with standard components and molding machine specifications, unless otherwise specified.

All **drafting** is to be done to prevailing standards.

3. **Communications, Changes, and Approvals** are to be documented in letter or memo form and are to reference all applicable descriptive information (Part name, Part number, Revision level, Mold numbers, Job numbers, etc.).
4. **Model or Pattern masters**, when required, are the responsibility of mold vendor, unless otherwise agreed upon.
5. **CAD data or Prints** supplied by Metro or Metro's customer are expected to be complete and useable. If not, Metro requests immediate notification of the extent of the deficiency and anticipated impact on delivery and/or on cost, if it can be corrected.
6. **Dimensional and feature questions or issues** must be resolved before execution in the mold.

Metro welcomes all notification, cautions or suggestions that may be offered by the mold designer/constructor that will result in the correction of, solution of, or improvement to real or anticipated problems relating to part/mold/process issues.


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I. Mold Construction Administration

7. **Weekly Status Reporting** is required delineating progress--percent, features, tasks completed, and firm delivery date.
8. **Delays** impacting agreed upon delivery date must be communicated immediately with effect on schedule and with best new delivery date.
9. **Molds not conforming** to design, construction, or molded part specifications consistent with recommended or agreed upon materials or workmanship will be returned to the vendor for correction or replacement.
10. **Shipping arrangement** by vendor vehicle or common carrier shall be per stated terms or agreement for the safe and expedient transport of the mold to Metro. For correction of non-conforming design, materials or workmanship issues, the mold vendor is responsible for freight charges to and from Metro, until the mold/parts are approved.

Metro is responsible for shipping costs to and from the vendor for tuning, changing and/or texturing the mold.
11. **Packing slips and invoices** must note:
 - Metro's Customer, Part Name, Part Number, Rev-level
 - Metro PO Number
 - Metro Mold Number
12. **Send invoices to:**
 - Metro Plastics Technologies, LLC.
 - 17145 Metro Park Court
 - Noblesville, IN 46060
 - or to MetroAP@metroplastics.com

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General Mold Considerations



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II. General Mold Considerations

1. **Press specification:** size, platen size, tie-rod spacing, daylight, ejector pattern shall be specified by Metro.
2. **Locating-ring diameter:** 3.990-in., unless specified otherwise.
3. **Sprue-Bushing Radius:** 0.5-in., unless specified otherwise.
4. **Production or Prototype mold** shall be specified by Metro.
5. **Standard, Reversed-ejection or Three-plate mold** shall be specified.
6. **Standard-sprue, Hot-sprue, Hot-runner injection** shall be specified.
7. **Resin** shall be specified.
8. **Resin shrinkage factor** specification will be provided by Metro. It is understood that the part may not shrink in accordance with the resin supplier's recommendation due to various factors, and that mold adjustment may be required at Metro's cost.
9. **Nominal mold tolerances** are to be the nominal mean (basic) dimension plus/minus 0.0005-in. (0.013-mm).
10. **Parts employing high shrinkage resin or tight tolerance dimensions** require that the mold be constructed to the steel-safe side of tolerance or additional allowance, as specified, for ease of tune modifications.
11. **Mold core and cavity material specification:**

Use hardened steel typically for production core and cavity; pre-hard steel for low production or large parts as applicable.
Use hardened steel or nitride finish when abrasive resins/fillers are specified, especially for runner-blocks and gate inserts.
Use stainless steel (or nickel finish as specified) for corrosive resin applications.

Use copper alloy details wherever mold feature cooling is anticipated to be a problem.

Use toughened steels for details requiring resiliency. High quality re-melt H-13 steel is to be used especially when the cavity is to be textured, unless specified otherwise.
Cavity-inserts are to be of the same steel as the cavity to assure uniformity in texturing.

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12. **Core and cavity inserts** must be stress-relieved after finishing, especially if there has been considerable machining, grinding and polishing.
13. **P-20 or similar steel molds and mold plates** subject to machining stresses, or in excess of 2,000 lb., must be stress relieved after rough machining.
14. **Steel-to-steel slide interface surfaces** should be of dissimilar steel and have at least a 10-point Rockwell hardness differential.
15. **Slides/cams** and other wear prone areas should have easily replaceable inserted wear-plates of hardened steel or lamina-bronze.
16. **Legibly mark** all fabricated mold components to indicate material, grade and hardness employed. This must be consistent with notations on the mold drawing and Bill-of-materials.
17. **Purchased components** are to be standard and readily available from common sources whenever possible. Avoid custom components unless there is an overriding consideration. Use the least number of different sized components in the interest of stocking spares.
18. **Mold A & B plates** are typically to be of #2 steel (4130, Rc 28-34) with inserted core and cavity; #3 steel (P-20, Rc 29-36) if core and cavity are to be cut in the solid.
19. **Mold-bases** may be standard or custom, as long as materials and features are consistent with requirements and standards.

Mold base, mold plates, and cavity side-walls must be adequately sized to accommodate design, process, reliability and longevity requirements consistent with good mold making practices. Where there is question, use increased size, support, or quality, rather than compromise the application.
20. **Support pillars** must be of sufficient size, number, and uniform in placement to adequately support the cavity plate and assure the mold will not warp or deflect under production conditions; especially beneath the runner and the cavity parting-line.

Support pillars are to be pre-loaded 0.001-in. (0.03-mm) higher than the outer rails.
21. **Cavity parting-line** perimeter is to have 1 1/2 to 2-in. bearing surface shut-off with the excess surface relieved. This bearing surface must adequately support the press tonnage specified and resist parting-line hobbing or coining.

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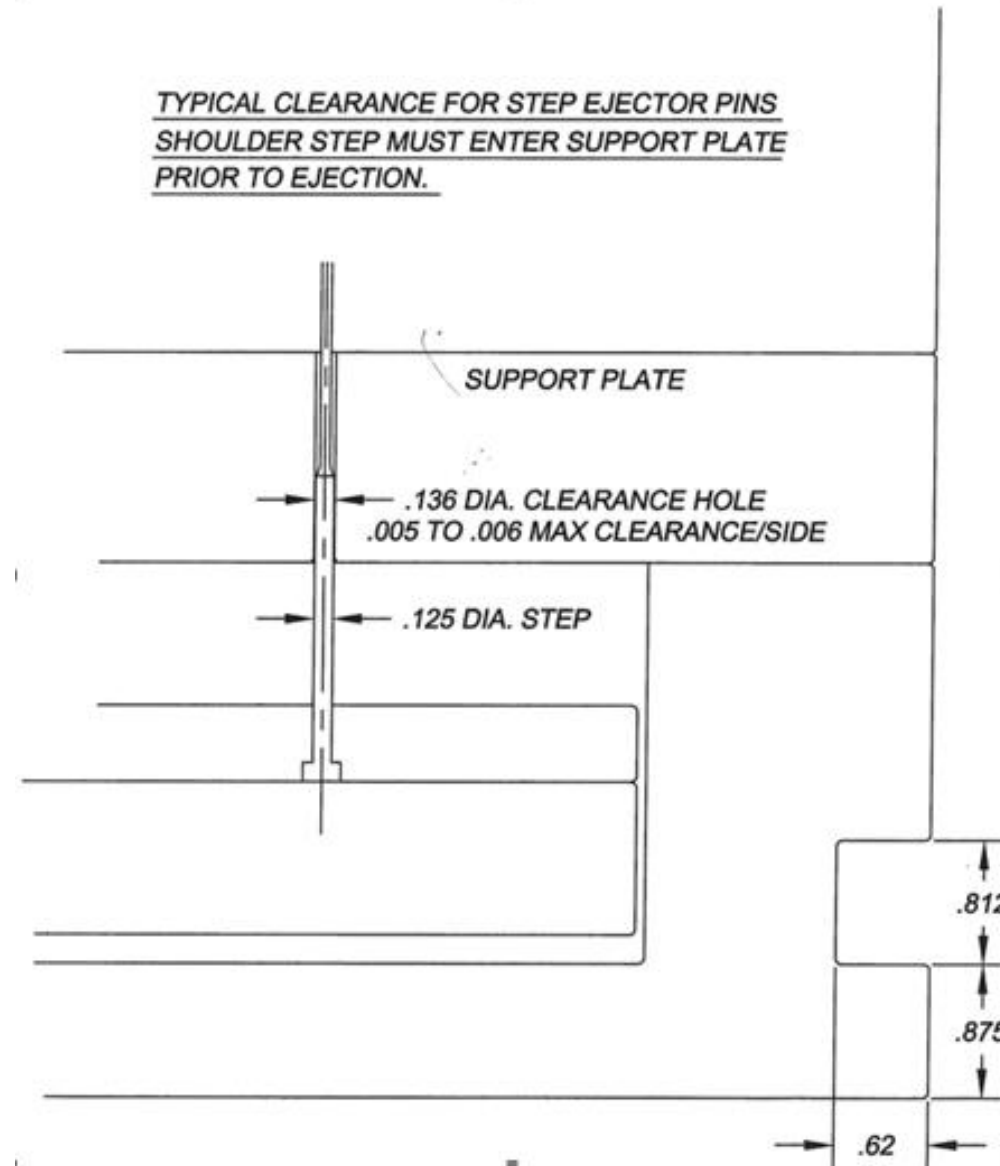
II. General Mold Considerations

22. **Core and cavity inserts** are to be pre-loaded 0.002-in. (0.05-mm) higher than the overall mold base surface.
23. **Parting-line locks** must be provided to prevent shifting of core to cavity alignment where mold details will sustain high side loads, or where critically matched core/cavity parting-lines or details are present: parting-line surface bar-locks, or perimeter-locks installed at four sides are recommended. Do not use cone-locks.
24. **Parting-line vents** must be installed to sufficiently allow air/gas to escape at injection, and relief of vacuum at part ejection. Venting is typically to be done on the cavity parting surface.
- Cavities are to be vented at the anticipated furthest (last) point(s) to fill, as well as, at corners, and nominal intervals in between.
- Vents are to be of depth appropriate for the resin being molded. Typically, 0.0015-0.0020-in. (0.03-0.05-mm) deep within 0.125-in. (3.18-mm) of cavity parting-line edge, then deepened to 0.030-in.(0.76-mm) to edge of mold.
- Through-mold passive vents** must encounter unrestricted venting to the atmosphere through drilled holes or machined channels.
25. **Ejector-pins** having more than 1-in. (25.4-mm) stroke are to be vented by grinding circumferentially to a depth consistent with the specified resin for a length of 0.150-in. (3.8-mm) from the tip, then a ground flat 0.020-in. (0.5mm) running from this point down the remaining length. (Pin size may be a factor; Metro Engineering to advise).

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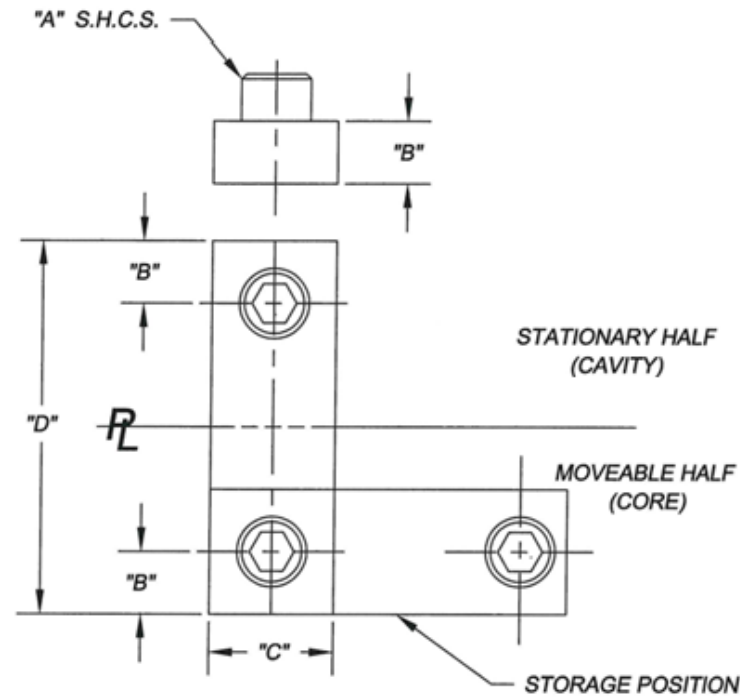
Step Ejector pin design:



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26. **Vent blind pockets** (buried ribs, studs and features) to assure fill without burning and release, using active vented ejector-pins, or vented lifters, where possible. Use passive steel-line edge vents and channels at inserts or where active venting is not possible.
27. **Additional process aids**--vents, part retaining core hookers, internal runners, and ejector-pins--may be specified at the discretion of the Tool Engineer or Process Engineer.
28. **Mold safety-strap design:**



	"A"	"B"	"C"	"D"
LESS THAN OR EQUAL TO 5000 LBS.	3/8-16	1/2	1"	3"
GREATER THAN 5000 LBS. LESS THAN 10000 LBS.	1/2-13	3/4	1 1/2"	4"

TYPICAL SAFETY STRAP
LOCATE ON EACH END OF MOLD

NOTE: FOR 3 PLATE MOLDS AND STRIPPER "C" & "D" ARE TBD BY OVERALL STACK HEIGHT. BECAUSE OF STRAP STORAGE THE STRAP MUST BE STAMPED WITH THE TOOL NUMBER

The safety-strap is to be painted RED for OSHA compliance.

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29. **Pry-slots** are required at all plate-to-plate corner split-lines to facilitate die-bar separation of the mold plates.
30. **Threaded lifting-ring (eye-bolt) holes** are required on all sides of each mold half, on individual mold plates and on large inserts or slides weighing 20-lb. or more, located with respect to balance point and adequately sized for safe handling.

0-500	lb. wt.	.500-in. thd.	x	1.25-in. deep
500-2,000		.750		1.50
2-4,000		.750		1.50
4-8,000		1.00		1.50
8-12,000		1.00		1.50
12-20,000		1.50		3.00

31. **Nozzle Tip threaded hole** is to be installed on the top side of the mold. Thread size to be 7/8in – 14 with depth of 1.0in. Stamp “Nozzle Tip” next to the tapped hole for identification.
32. **Plate edges** to have 45-degree x 1/16-in. (1.57-mm) or .030 R. chamfer.
33. **Assembled plates and rails** are to be doweled and bolted together.
34. **Face-loaded inserts**, are to fit a minimum of 3/4-in. (19-mm) deep into pocket; tapered sides, or with minimum of 50% depth from parting-line and remainder of insert relieved. Provide threaded jack-out diameter at retaining bolt hole through plate or detail if face retained. Chamfer bottom edges of insert.
35. **Logo or model number interchangeable inserts** are to be inserted on the face of mold for ease of change-over whenever possible and steel-lines are not objectionable. This must be customer approved by Metro.
- For **Model number or Revision number on core-pin** or ejector-pin provide retainer screw access through to the back-plate so mold will not have to be torn down to change.
36. **Different insert set-ups**, if with ejector-pins, must have dedicated set of pins identified specifically relative to that set-up.
37. **Leader-pins** to be headed type, of sufficient size and standard component; 4 per mold (unless Unit-die insert). They must extend beyond any B-half details to ensure aligned engagement of details and to provide protective stand-off for details. Offset one of the four leader-pin bushings to assure proper mold halves orientation. Mark all plates with “O”.

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II. General Mold Considerations

38. **Leader-pin bushings** are to be installed in through-holes to avoid trapping debris and to allow venting. No graphite type bushings are to be used.
39. **Tall or narrow core inserts** where height above parting-line exceeds thickness, and where subject to high side loading from injection pressure and possible shifting, likely yielding uneven part wall-section, are to be constructed in one piece with sufficiently sized heal-flange, and installed from plate rear.
- Also, consider for core stabilization, a tapered telescoping interface between any through-hole coring feature and mating surface.
40. **Shut-off** typical angle is 5-degree; 3-degree minimum.
41. **Mold clamp-slots** are to be full width of mold.
42. **Ejector-pins** are to be nitrited "EX" or through-hardened as required, per DME specs. or equivalent.
43. **Core-pins** are to be through-hardened "" or "CX" per DME specs. or equivalent.
44. **Stripper-rings, ejector-blades, ejector-bars** or other such non-standard ejector items are to be nitrited.
45. **Welding**, if required, must be done expertly and with the approval of Metro's Tool Engineer.
- Should a cavity require welding due to an error in workmanship, Metro reserves the right to reject that cavity and require a new one be immediately constructed at the vendor's expense.
- Steels are to be thoroughly pre heated, hot-welded, and post stress-relieved per steel suppliers recommended procedure to assure proper bond to the parent metal and consistent hardness.
46. **No shims** are to be used in mold construction.
47. In **final assembly**, use FISKE BROS. REFINING, LUBRIPLATE FML-2 or equivalent grease on moving details that contact the molding surface and where there is a chance grease may migrate to the molding surface.
48. **Mold shipment preparation** must be completed with suitable surface protectant, adequate environment protection, and blocked and strapped to a pallet for shipment. All orifices are to be plugged or taped over to avoid moisture and debris entry.

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Finish
Considerations



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III. Finish Considerations

1. **Cavity and core finish** are to be per specification.

Unless noted, cavity finish is to be SPI #A3 (#15 micron range diamond buff); core finish #B3 (320-grit paper).

All cutter-marks and EDM-finish are to be removed from molding surfaces.

2. **Draw-polish** all vertical or near-vertical molding surfaces to an SPI #A3 finish; especially “buried “ ribs and bosses.

3. **Engraving** to be per specification, on surface or on insert.

4. **Revision level alpha-numeric designations** are to be engraved on changeable core-pin or ejector-pin when possible.

5. **Individual cavity identification** is required in multiple-cavity molds typically on the core-side where specified.

6. **Surface texture** is to be per specification.

7. **Textured side-walls** must have 1-degree of draft in addition to 1-degree of draft for every 0.001-in. (0.025-mm) of texture depth.

Should this not be accommodated in the part design, please confirm to the Tool Engineer for review with the customer.

8. **Molds specified to include texture or engraving** must be sampled and dimensionally approved and/or corrected prior to completion, unless subject to prior agreement. An additional 2 to 3-weeks should be figured into the schedule to cover this interval, after mold is dimensional approved.

9. **Mold texture** is a factor of pattern configuration, depth and peak-count. These are to be uniform and consistent with the texture specified.

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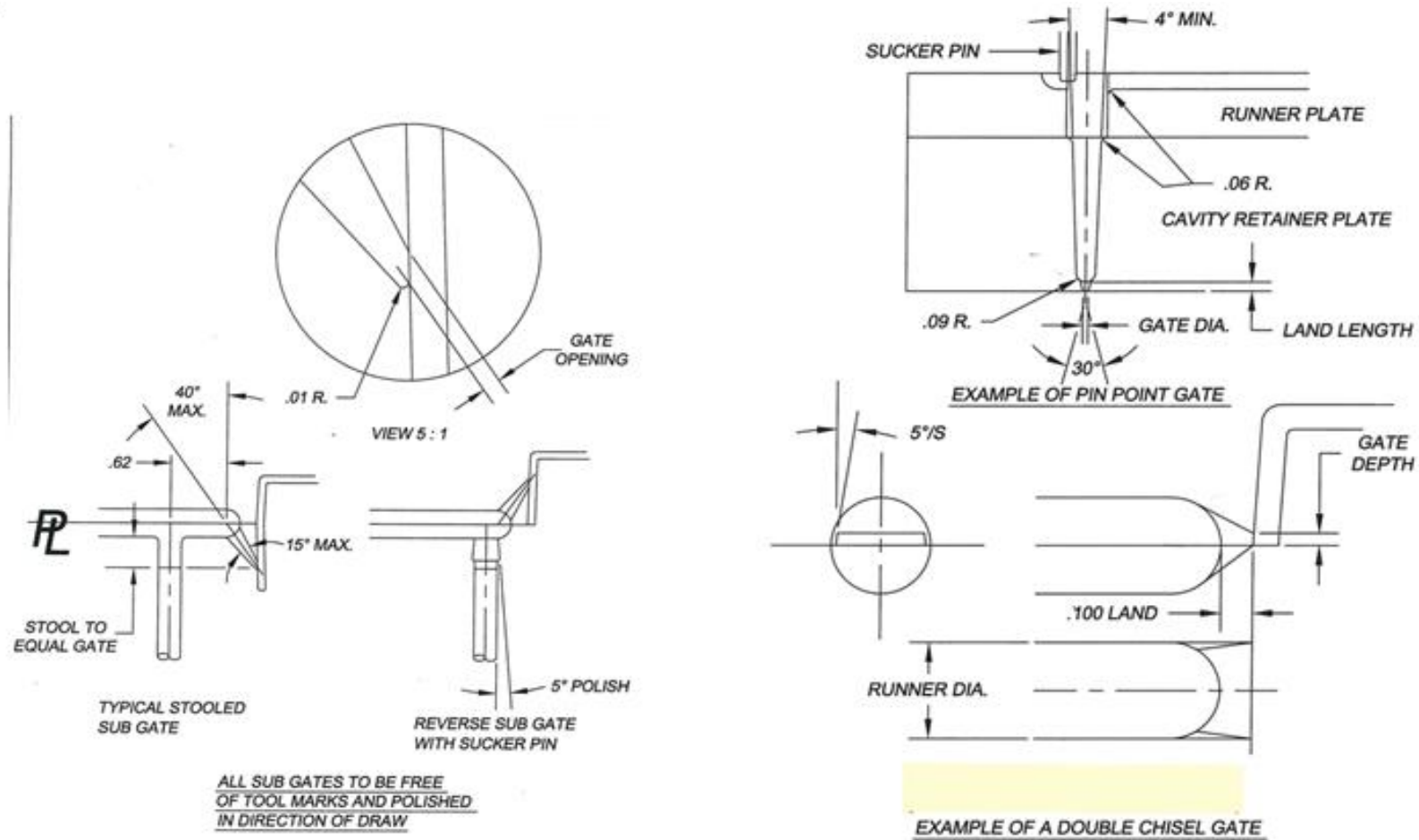
Injection Considerations



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IV. Injection Considerations

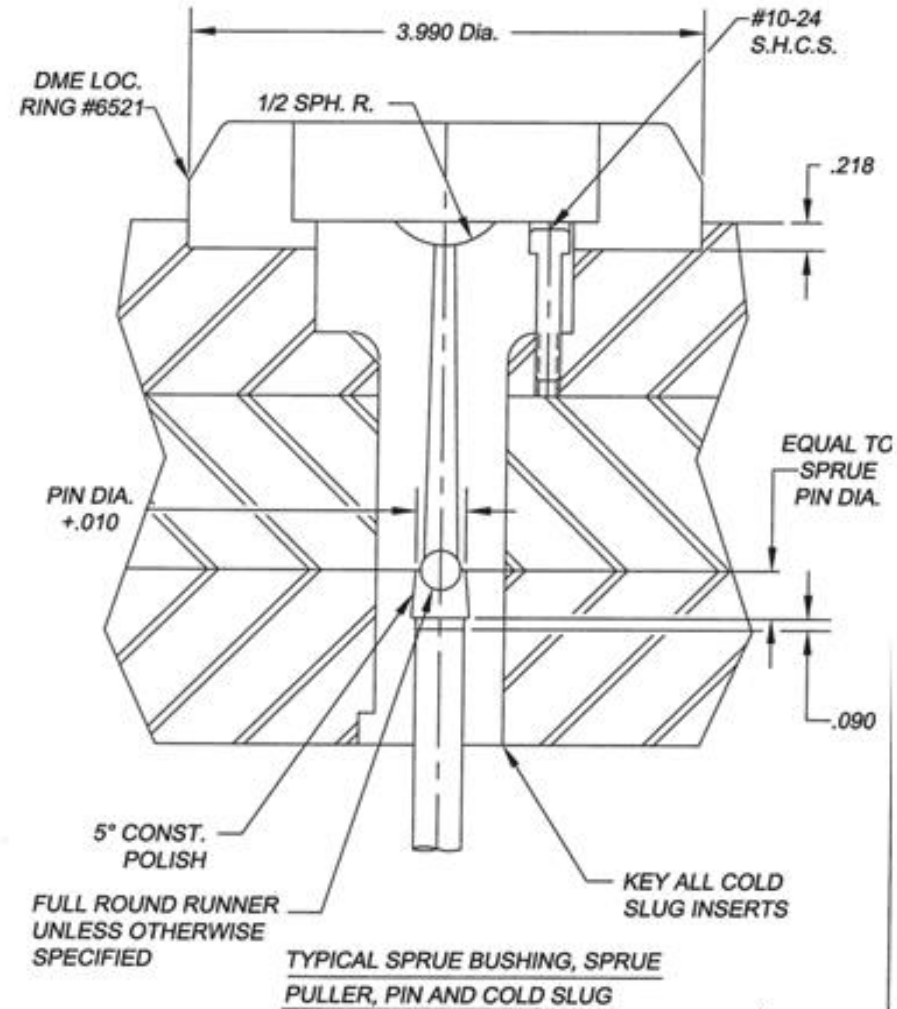
1. **Size sprue, runner, and gate** per resin suppliers' minimum recommendations for acceptable fill pressure, rate, and shear. This information is to be supplied by the Tool Engineer. See gate design options below.



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IV. Injection Considerations

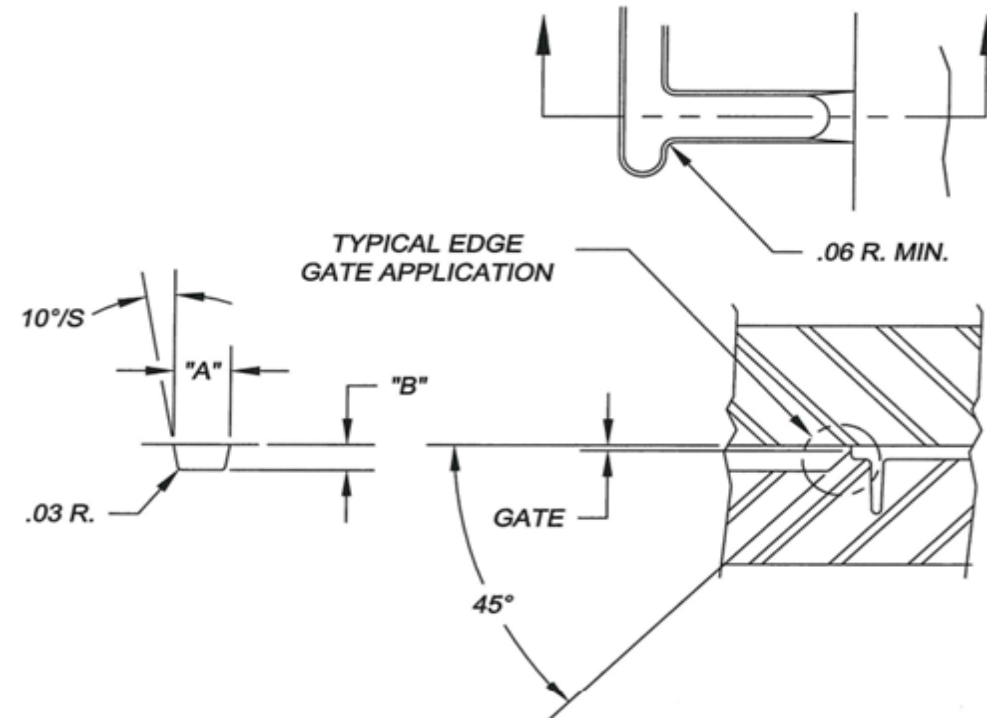
2. **Sprue, runner and gate** are to be smooth, uniform and free of Cutter marks, edges or abrupt linear transitions.
3. **Typical Sprue Design:**
4. Keep **sprue length** as short as practical.



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IV. Injection Considerations

6. Direct sprue-gate into part should have a **spherical flow-button** opposite the gate on core, if part design and customer allow.
7. Employ **balanced runner designs** with a minimum of sharp corner turns, arranged so equal flow reaches cavities simultaneously, and sized appropriately for the cavity volume; unless computer flow analysis is utilized.
8. **Preferred runner shape is full-round**; alternative is trapezoidal with 10-degree taper for stripper or three-plate applications.
Trapezoid Runner design and sizes:



"A"	.093	.125	.156	.187	.218	.250	.281	.312	.344	.375
"B"	.070	.094	.117	.140	.164	.187	.211	.234	.258	.281

TRAPEZOIDAL RUNNERS

IV. Injection Considerations

9. Runners are to have a **cold-well** at each 90-degree runner-leg change in direction, two times the runner diameter in length.
10. Provide **ejector-pins** at intersection of runner-legs and close enough to gates to assure smooth ejection.
11. **Vent runners** at each cold-well and on each ejector-pin.
12. Install **runner block-off** details in dissimilar part family molds, or make allowance for indexing sprue-bushing.
13. **Hot sprue-bushing connector** to be single-zone power/thermocouple: CKPTIC-1.
14. **Hot internal-nozzle** in a reversed mold must be serviceable from A-clamp-plate without having to disassemble mold.

Ensure adequate support around internal-nozzle, and provide a drool-sleeve.
15. **Recessed sprue-bushing clearance bore** must be minimum 2.5-in. (63.5-mm) diameter, plus taper for ease of resin drool removal.
16. Hot-runner molds must have generous **wire-raceway** in plates with wire-retainers or covers to accommodate wiring without binding or damage, and to allow removal of hot-runner components without having to remove all wiring and connectors.
17. **Heater accessories** are to be standard stock items when possible: 220/240-volt.
18. **Electrical splices** are to be insulated with high-temperature electrical tape and in compliance with electrical codes.
19. **Hot-runner multiple-zone power connectors** are to be:
1 or 2 zones: DME CKPTOC-1
3+Zones: 12-zone DME PIC-12-G.
20. **Hot-runner multiple-zone thermocouple connectors** are to be:
1 or 2 zones: DME CKPTOC-1
3+Zones: 12-zone DME PIC-12-G.

Do not splice thermocouple leads.

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IV. Injection Considerations

21. Adequately **support hot-runner manifold** opposite the nozzle seat.
22. Employ **sufficient bolt clamping of hot-runner** system to avoid system leakage.
23. **Hot-runner manifold** is to be installed so as to minimize heat transfer to the adjacent cooled plates.
24. **Insulation-board** is to be employed to form a thermal barrier between the mold clamp-plates and the platens when molds are to be heated, or mold is hot-runner type.
25. **Electrical components** must be listed on Mold Drawing Bill-of-materials: make, model, size, voltage, wattage, etc.
26. **Valve-gate hydraulic/pneumatic ports** (Mold-Masters, etc.) must be appropriately identified: Gate-open & Gate-closed.

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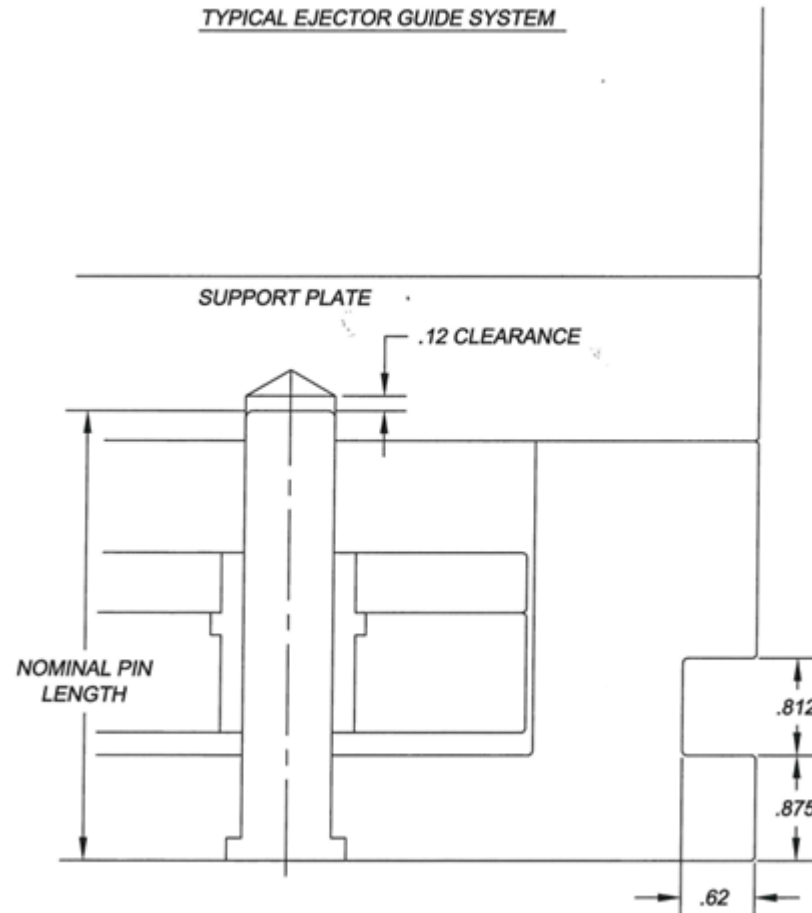
Ejection Considerations



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V. Ejection Considerations

1. **Ejection features** must be adequate to assure balanced, uniform, undistorted ejection of parts and features. Mold release spray use is not a reasonable option. Use too many rather than too few ejection details.
2. **Ejection systems must be guided** on a minimum of four guide-pins and bushings.



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V. Ejection Considerations

3. **Return-pins and return-springs** are required. Spring loading of the ejector-plate is to be balanced and sufficient to preclude “cocking” the plate. Springs to be design with a maximum of 35% deflection. (Amount of travel + preload x 2.75 = free length of spring) Stops may be needed to prevent over compression of springs

Return pins are to be located so as not to interfere with efficient part removal by an operator.
4. Place **ejector-plate rest-buttons** behind return-pin locations, lifters and other large surface ejector details, and additional uniformly distributed locations to support the ejector plate.
5. Use **blade-ejectors** only where there is not a reasonable alternative.
6. **Ejector travel** must be sufficient to clear part and runner of all features.
7. Employ **two-stage ejection or accelerated ejection** if required to assure release from details, slides, lifters, and processing efficiency.
8. **Press Ejector-pattern** is to be per designated press layout.
9. **Ejector-pins, ejector-sleeves, etc.** are to be standard DME or equivalent quality--Metric or English.
10. **Minimum ejector-pin diameter** to be 1/16-in. (1.5-mm).
11. **Minimum ejector-pin bearing surface** is to be 5/8-in. (16-mm) up to 7/16- in. (11-mm) diameter pin; pins over 7/16-in. (11-mm) diameter must have a bearing surface equal to 1.5 times the pin diameter.
12. **Ejector-pins are typically to be flush** to 0.005-in. (.13-mm) above surface (into part).
13. **Contoured-end ejector-pins** must be keyed for proper orientation.
14. **Ejector pin-plate must be marked** with respective ejector-pin marked designation number.
15. **Boss details** must have sleeve-ejection or balanced adjacent ejector-pins for straight ejection.

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V. Ejection Considerations

16. **Lifter** tops are to be at least 0.005-in. (0.13-mm) short of the molding surface to provide a bearing surface, so the lifter does not catch on the adjacent lifter parting-line molded edge, when in action. Lifter tops are to be polished: SPI #B1.
17. **Lifters must release cleanly.** If there is a chance that parts may hang-up or be retained in lifter detail, parts must be guided by part feature or by imbedded ejector-pins to assure aligned parting. This may require secondary or accelerated ejection features to insure release from the imbedded pins.
18. **Moving actions** are to be mechanical if practical. Pay attention to functional fit tolerances, mold operating temperature and action timing for smooth operation.
19. **Slide/cam travel** must clear part by at least 0.062-in. (1.5-mm).
20. **Slide/cam** must be retained so it will not inadvertently leave the mold.
21. **Slide/cam** must be spring loaded in the open-position to avoid damage should slides be left in the in-position. Do not use spring-ball detent (Vlier) for this application.
Slide/cam spring and spring-guides should be kept internal, if possible; if not, provide protection bracket.
22. Employ internal **double wedge-locks** for parting-line slide/cam positive engagement. These are to be face mounted to the A-side whenever possible for ease of adjustment.
23. Slide/cam should have inserted **wear-plates and gibs** of hardened steel or lamina-bronze.
24. **Steel-to-steel slide interface surfaces** should have at least a 10-point Rockwell hardness differential.
25. Provide **cross-hatch grease-grooves** on slide/cam bottoms for grease retention and micro-trash well.
26. **Hydraulic cylinders** to be rated to 2000-psi.
27. **Hydraulic fittings** are to be NPT, unless otherwise specified.
28. Hydraulic cylinders are to be equipped with **valve quick-connect fittings**: Parker 6601-66 steel female coupling.
29. Equip hydraulic side actions with **limit-switches** to signal IN and OUT positions.
30. **Action sequence** must be stamped on mold and switch schematic detailed on mold prints.
31. **Avoid ejector-pins under hydraulic side-actions.**

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V. Ejection Considerations

32. If there is any possibility of actuated features contacting ejector features or opposite mold half features prior to positive return of the ejector system, a mechanical **positive-early-ejector-return** mechanism must be installed (DME Toggle-lock or Early-return return-pins).

This will avoid closing the mold with features forward, as well as avoid opening the mold with features stuck forward in the molding position, overcoming the return springs.

Critical or delicate situations such as these also require the back-up safety feature of installed limit switches.

Prominently mark the mold to warn that damage will occur if inappropriately activated.

NOTE: Any damaged or broken mold features encountered in mold operation, should such precautions not be taken, will be repaired or replaced at the mold vendor's expense.

33. **Externally projecting actions or features** must have protective bracket or steel rounds attached to the mold-base for stand-off protection and safety when in operation or in handling. If there is an action projecting from the bottom of the mold, legs or a protective bracket must be in place to allow the mold to sit level on the floor.
34. **"Buried" ribs or details on the non-ejector side** of the mold, must be evaluated for the need of ejector mechanism, and/or ejector/vent-pins to assure fill, ejection, and relief of trapped gas.
35. **Lifters and details that telescope** into the opposite side of the mold are to have venting features where practical to assure fill, and relief of trapped gas and vacuum.
36. **Reversed molds** must have hydraulic ejection actuation. Hooks and chains are not acceptable.
37. **Ejector-plate positive actuation** (press pull-back) accommodation when specified is to be 1/2-13 taped PKO-extensions flush with back plate.

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Cooling Considerations



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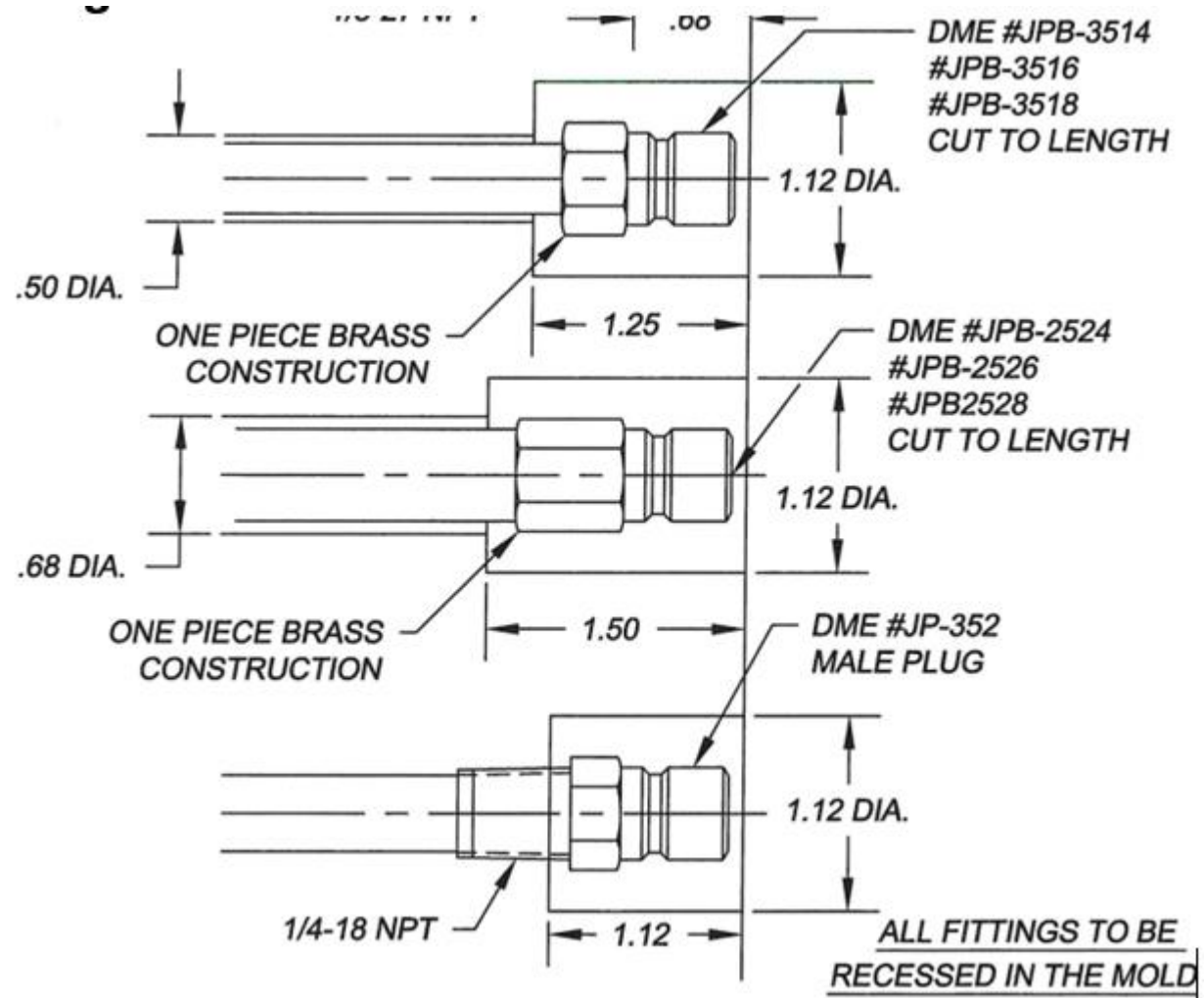
VI. Cooling Considerations

1. **Layout water-lines** for maximum temperature control and even distribution. Pay particular attention to heavy wall-sections and boss details.
2. Use **Copper alloy material** for improved heat transfer wherever mold feature cooling is an anticipated problem.
3. **Preferred water-line sizes** depending on mold size are 11/32-in., 7/16-in., 9/16-in. diameter.
4. **Place water-lines** in core/cavity inserts with clearance through the mold base; or, directly in plates, if in the solid; and, in large slide/cam details.
5. **Avoid O-ring seals**, if at all possible.
6. **Water-line INs and OUTs** must be stamped on mold and detailed on mold drawings.
7. **Water-lines**, typically, are to be no closer than:
 - * 5/8-in. (15.8-mm) for 9/16-in. diameter, or 1/2-in. (12.7-mm) for 7/16-in. diameter to any cavity/core molding surface
 - * 3/8-in. (9.5-mm) to an insert detail, lifter, or side action molding surface
 - * 1/4-in. (6.3-mm) to an ejector-pin or core-pin.
 - * 1 3/16-in. (30-mm) center/center.
8. Pay attention to deep drilled **water-line run-out**.
9. Use only **brass pipe-plugs**.
10. Use only **brass baffle-plugs and baffles** (1/16-in. stock). Do not use plastic or light-weight brass baffle stock.
11. Molds are to be supplied with recessed **quick-connect fittings**: DME Jiffy-tite 3/8-in.-ID male (JP-352, 353, 354), or equivalent.

Policy	Procedure	WI	Form	Retention
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VI. Cooling Considerations

12. Fittings are to be recessed as shown



Policy	Procedure	WI	Form	Retention
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VI. Cooling Considerations

13. **Nipples and fittings** should only protrude where there is no reasonable alternative. If they do, they should be protected from damage by a stand-off or bracket.
14. **Nipples and fittings** are not to interfere with clamp slots, side actions, other mold features, or molded part removal by an operator.
15. **Plugs and fittings** must be sealed, tight, non-leaking--pressure test to at least 200-psi for 15-min. Use Teflon tape or Teflon sealant.
16. **Cascade-fountains** may be used where through water-lines are not practical.
17. If water lines are to be located on the top of the mold, a **drain-channel** must be provided connecting recessed-fitting holes and the mold edge, to assure water will not run into cavity should there be a loose fitting.

Policy	Procedure	WI	Form	Retention
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Marking Considerations



METRO
Plastics Technologies, LLC

VII. Marking Considerations

1. **Vendor Tag to be mounted on the A Half Non-Operator side**

This information should also appear on the final mold prints delivered with the mold.

Vendor mold tag to include the following information:

- a. Metro Mold Number
- b. Owner: " PROPERTY OF
- c. Asset Number
- d. Part Number
- e. Part Number
- f. Vendor Name/Address
- g. Vendor Job Number
- h. Mold weight
- i. Shrink
- j. Ejector stroke
- k. Side-action sequence if applicable

2. **Mark multiple cavities** with cavity-number where specified.

3. **Mark alternative configuration set-up** inserts alphabetically or as specified.

4. **Mark cavity and core inserts, ejector-pins, slides, lifters, etc. and corresponding pocket, holes, etc.**, alpha-numerically to assure proper assembly location.

Policy	Procedure	WI	Form	Retention
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VII. Marking Considerations

5. **Inserts and pockets** shall have matched markings across edges, or where practical, to assure proper orientation: >/< or -/-.
6. **Mark -0- corner** for mold dimensional orientation on all plates.
7. **Material grade and hardness** must be marked on all mold plates, cores, cavities, details, slides, cams, lifters, etc.
8. **Valve-gate hydraulic ports** (Mold-Masters, etc.) must be appropriately identified: Gate-open & Gate-close

Policy	Procedure	WI	Form	Retention
8	8.2	80.7201ENG		



Job Information



