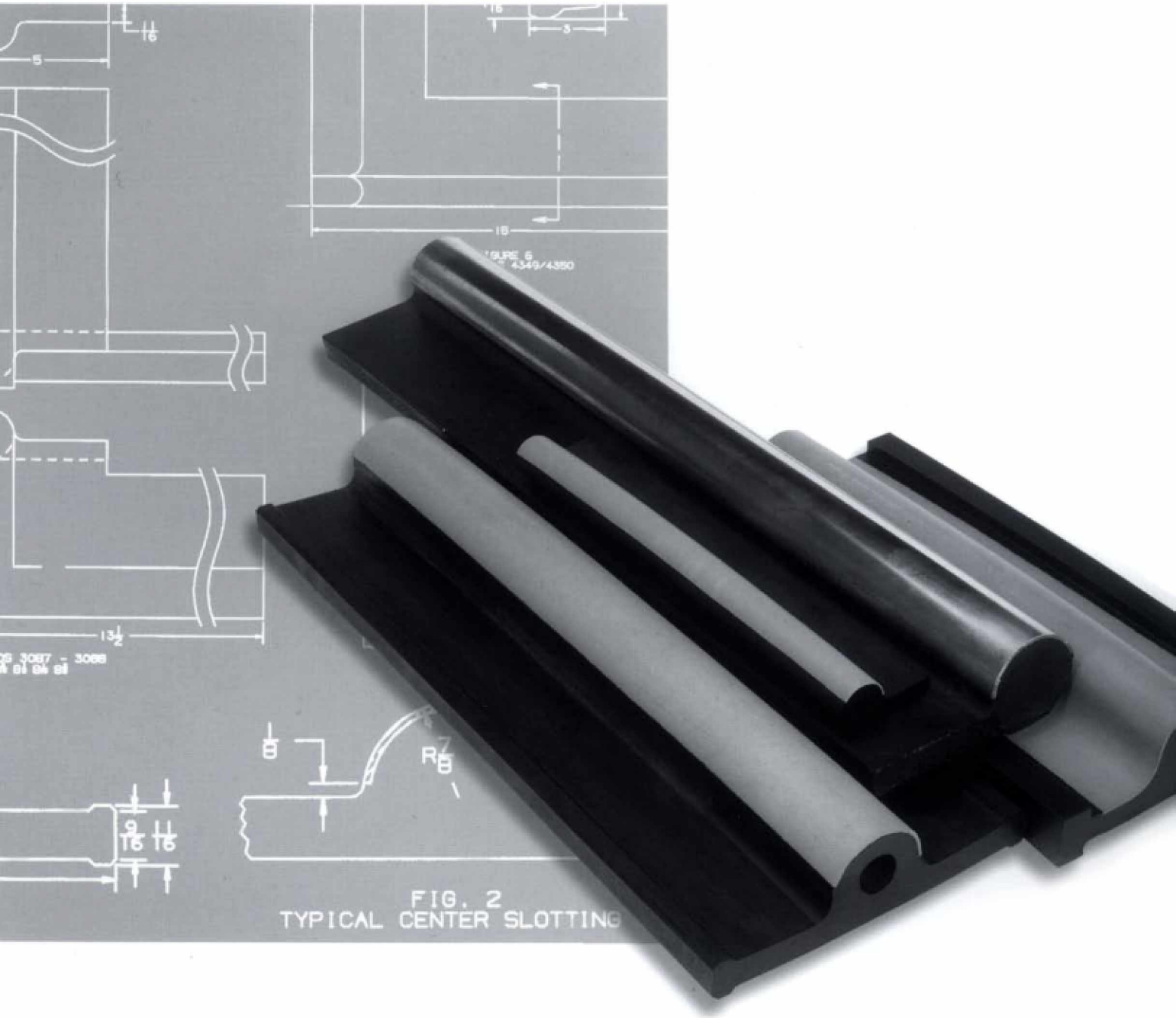
Rubber Gate Seals

Engineering Information and Product Specifications



Seals Unlimited Inc.

Table 0f Contents

Table 0f Contents

TYPICAL SEAL APPLICATIONS

Before choosing the type of seal, the designer has to select the correct method. For most hydraulic conditions, seals can be divided into two major categories—seals for "low head" and "high head" gates.

Low Head Gates

Where conditions favor using water pressure to aid in achieving a water-tight closure, "J" type, or music note seals, are most frequently used. Other types have also been developed to meet certain conditions within this category. Here are a few suggestions:

1. **Flat, Vertical Lift Gates, Bulkheads, Stop Logs**
   The seals, when mounted on the face of the gates, are simple in design and easy to install. A single plane seal mounted to the face of the gate is the most economical. When necessary, a transition across the width of the gate can be provided. We recommend that you check for available corners before making a selection that requires custom molded corners.
2. **Large Miter Lock Gates**
   They are generally sealed along the bottom edge with a "lamb chop" seal (4" thick bulb 8.50" wide with a 1.25" stem - Rubber Mold No. 2990).
3. **Small Miter Lock Gates**
   Often used as a modified "J" seal, with a sharp or slightly radiused corner on the sealing edge of the bulb. Some have used an angle-shaped bottom seal (Mold No. 3545). The vertical seals are usually "J" seals. At the miter contact, the "J" seals are occasionally mounted on each gate, so that the seal on one gate will contact the seal of the other, allowing easy deflection of the stem.
4. **Radial Tainter (Spillway) Gates**
   These gates are subject to greater dimensional changes due to thermal expansion and contraction, and should use a wider "J" seal to allow greater deflection of the side seals. Angle-shaped seals are also used as side seals. A recent addition to the line is an angle-shaped side seal with a clamping knob. **This seal eliminates the need to drill bolt holes and allows for easy adjustment after the gates are installed.**
5. **Debris**
   Where debris may be present, a guard to prevent damage to bottom seals is often provided.

High Head Gates

For most high head installations, pressure actuated seals are used. The pressure source is usually the head pressure of the reservoir itself. On fixed-wheel gates, the seal is set for bare contact. This does not add to the friction load during gate movement because the pressures on both sides of the seal are equalized. As the pressure downstream of the gate drops, the seal, under the influence of the head pressure, moves toward the seal plate. Such seals are double-stem (center bulb) seals, and should be clamped only on the extreme edges of the seal.

The stems on these seals should be compressed on the edge knobs by the clamp bars, not toward the center or the bulb. The seal's ability to move toward the seal plate is not restricted.

All-rubber seals tend to "extrude" into the space between the clamp bar and the seal plate. For this reason such seals are usually brass-clad. Brass-clad seals also have a lower coefficient of friction than all-rubber seals. A disadvantage of metal-clad seals is their rigidity, which eliminates the usual benefits of rubber's elasticity.

Bonding a layer of fluorocarbon (PTFE) to the sealing surface of a rubber seal allow it to retain its flexibility, while preventing the seal from being drawn into the space between the clamp bar and seal plate.

MOLDED VS. EXTRUDED

Seals Unlimited Inc. recommends molded seals be used exclusively in hydraulic struc- tures. The following problems exist with extruded gate seals:

1. Cross sectional dimensions vary much more than molded seals.
2. Inferior physical properties.
3. While extruded seals initially cost less, the cost advantage will be nullified over the long term due to the lack of durability and functionality.

SOLID OR HOLLOW BULB SEALS

1. **Comparison of Effectiveness**
   Some engineers specify hollow bulb seals for low head use, presuming they seal more effectively at low heads because of the

greater surface contact, or “nip” area. Others feel that the pressure “per square inch” is higher in solid bulb seals because of the reduced contact area.

2. Contact Area: Contact Bond
Proponents of solid bulb seals hold that the compression, or contact bond of rubber to the seal plate resulting from prolonged gate closure is greater by reason of the larger surface contact area of hollow seals. Therefore, solid bulb seals, requiring less starting force, are desirable.

3. Elastic Memory
The prolonged compression of a hollow seal reduces its ability to recover to the original shape when the pressure is removed. Prolonged compression or distortion of a solid bulb seal, especially at low heads has almost no effect on its recoverability.

4. Comparative Costs
Hollow bulb seals are usually more costly than solid.

5. Plugs for Hollow Seals
At splices or joints of seals, soft rubber plugs are used in the holes to seal them. These are cemented into place. The purpose of these plugs is:

(a) To enable the gate fabricator to cut the seals to a precise length.
(b) To present a full face of the seal ends for cementing or vulcanizing.

Plugs should never be used as “dowels.” They do not increase the strength of either vulcanized or cemented splices. Single plugs, if extended into the ends of both seals, will misalign the seal ends to the degree the holes are off-center. Plugs should be inserted and cut flush when the seal is finally trimmed.

METAL-CLAD SEALS

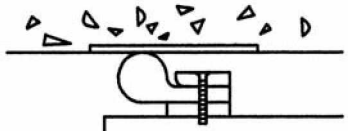
1. Purpose
Metal-clad seals (brass or stainless steel), are used for two principal purposes:

(a) To reduce the friction load required to submerge or lift the gate.
(b) To prevent the seal from “extruding” or being jammed into the clamp bar and the seal plate from the venturi action of the water when the gate is closing under an unbalanced head.

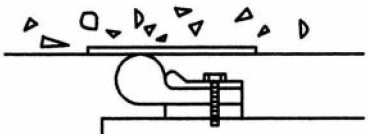
Metal cladding does not prolong the life of the seal. A metal surface is not nearly as resistant to abrasion as rubber.

2. Advantages of Metal-Clad Seals
(a) Coefficient of Friction
Each installation encompasses a number of variables and should be individually analyzed. Most designers use a coefficient of 0.65 for metal seals. Some use a factor as low as 0.30. Since gates vary from project to project, we recommend a factor of about 0.35 or 0.45.
(b) Extruding Under Pressure
The metal on the sealing or contact face of the seals eliminates the tendency of the seal to extrude between the seal plate and the clamp bar. Some designers reduce the size of the gap with an all-rubber gate seal and a shaped or thicker clamp bar. See Sketch A & B.

SKETCH A



SKETCH B



3. Disadvantages of Metal Clad Seals
(a) Cost
Depending upon seal configuration and design details, metal clad seals will cost from 3 to 5 times more than all-rubber seals.
(b) Rigidity
The principal objection to metal clad seals is that they are so rigid that some of the most apparent advantages of the rubber portion, such as its flexibility and resistance to wear, are lost. Some designers resort to using only a quadrant of metal as shown in Figure 1, Mold No. 2329. In this instance, the edge of the metal is placed exactly in the center of the sealing face so that the metal edge bears against the seal face. The quad rant of cladding is downstream, which prevents the seal from being drawn in by the water flow.

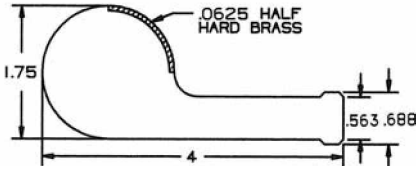


FIG. 1 NO. 2329

Other designs call for slotting the center of the metal—see Fig. 2, or the edges as shown in Fig. 3. Slotted edges are preferred because they eliminate season cracking along the centerline.

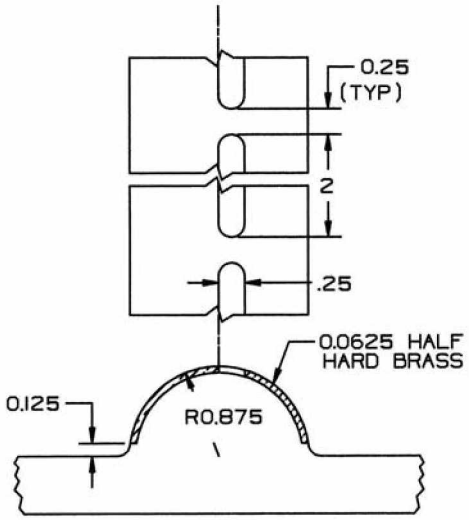


FIG. 2

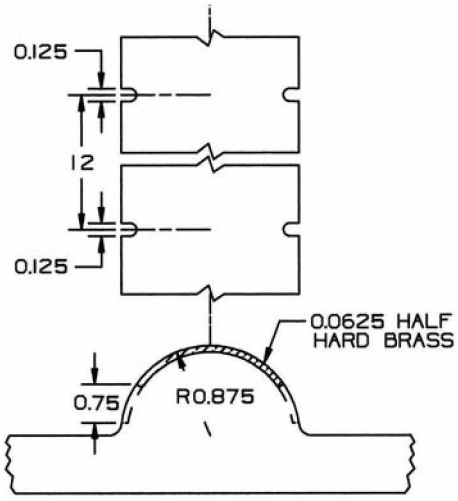


FIG. 3

4. Maximum Lengths of Metal-Clad Seals

Rubber seals and other continuous lengths of molded rubber products are stepped through the mold in the press as each "cure" is completed. This occurs at intervals of 6 to 8 feet along the seal's length, depending upon the size or bulk of the cross section.

Most seal manufacturers avoid producing metal clad seals in lengths longer than the mold lengths. The main reason for this is because a weakness in the rubber-to-metal bond strength is likely at each step cure. Seals Unlimited uses a technique that eliminates this problem and allows fabrication of longer lengths.

Long seals are difficult to handle during fitting, shipping and final attachment. The danger of bending or "kinking" the metal and the higher per foot cost in longer lengths make it desirable to stay below the recommended maximum length of 30 feet.

Most design engineers, especially those experienced in the use of metal-clad seals, agree that such seals can be successfully employed in maximum mold lengths of 9' 6". Their specifications must call for seals with tightly fitted square cut ends.

Usually, such joints are satisfactory and do not require rubber cement. Some require that rubber cement be used as a "caulking" compound to prevent leakage. Cement should never be applied except upon final attachment of the seals to the gate in the field.

This assures that:

1) A tight-fitting dry joint has been achieved.
2) The cemented joint remains clean for the best possible bond.

5. Splices in Metal-Clad Seals

Some engineers do not believe that splicing with butt joints is sound. They have developed alternative jointing procedures. These methods are costly and of doubtful value.
The best procedure is to vulcanize lengths of seal together as they are being attached to the gates. This can be done with electrically-heated splicing molds.

When splicing metal-clad seals, joints must be square cut (at right angles). Such a joint will have a lower tensile strength than the original material, possibly as low as 35 percent of the original material. However, such joints are adequate for the purpose.
(See "Fabricated Corners", Pg. 6.)

6. Specifications for Metal-Clad Seals

(a) Rubber
For rubber specifications refer to "Typical Rubber Specifications," pages 11-14.

(b) Metal
Fabric reinforced seals are still called for in certain applications. Usually the specs requiring this type of seal are antiquated unless the stem portion of the seal has to be extremely rigid. The Fabric reinforcement is a costly and unnecessary feature.

SEAL CORNERS

Two types of seal corners may be used. They are:

1. Full Molded Corners

Most corners listed in the following pages are full molded. This means that the raw rubber compound is charged into a steel mold, then vulcanized under high pressure and heat, and molded into the final shape and size as shown.

Choosing seals that can be produced with existing tooling assures the lowest cost. Full-molded corners are the best and strongest available. If a quantity of gates is involved, or if the same corners will be used for other projects or structures, it is still desirable to use full-molded corners. Although corner molds are comparatively expensive, the cost, when amortized over the larger quantity, is well worth it.

2. Fabricated Corners

Whenever a full-molded corner is available it should be used.

An alternative is a "Fabricated Corner." This means that pre-made, full-molded corners are spliced and vulcanized to the strip, as are corners No. 4344 and 4345, Fig. 7, or strip corner No. 4407, Fig. 8.

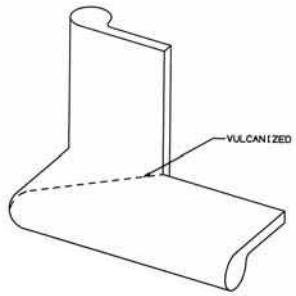


FIG. 7

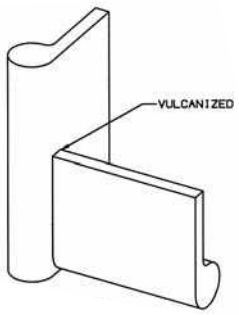


FIG. 8

Full-molded corners, when available, require no hand fitting, splicing, and are less costly than fabricated corners. When full-molded corner molds are not available and the service and operating conditions permit, fabricated corners should be considered.

SPLICING CRITERIA

Splice positions that cannot be accomplished, or which demand the construction of new and costly tooling are sometimes called for on drawings. By observing the following suggestions these difficulties can be avoided. The design engineer usually avoids placing a splice line through a bolt hole. As a result, he often selects a position exactly midway between bolt holes, thus limiting the seal fabricator to fixed positions which his tooling may not allow.

1. Vulcanized Factory Splices

Factory splices are made in vulcanizing presses under ideal conditions. The seals are firmly held and clamped during vulcanization in special splicing molds. The preferred method is a 90° right angle butt joint. Corner molds listed in our catalog indicate the maximum length of the corner pieces such tooling will produce.
To produce the best possible splice, a mini mum of 6" of "free" and "straight" strip must extend beyond the limits of the splice line in both directions. This strip allows a firmer "grip" in the splicing mold that is maintained during the splice cure. For this reason, a splice should not be positioned so close to the other leg of a corner that the free strip is eliminated.

2. Vulcanized Field Splices

These splices include field splices at the site, and those splices performed outside the rubber manufacturer's plant.

(a) Available Splicing Molds
Electrically heated splicing molds for some of the more popular sizes can be rented. Complete instructions and materials for making the splices are provided as part of the rental.

(b) Preparation
All-rubber seals should be spliced following the recommendations given on the preceding page.

(c) Metal-Clad Seal Splices
Metal-clad seals should not be bevel cut. Such splices are made without attempting to weld or otherwise make the metal continuous, since this would destroy the rubber to metal bond. The joint will leave a gap of .125" to .25" between the metal ends which will be completely filled with rubber. The mold produces an "overlay" of rubber that will

shrink. The overlay should be ground off flush or slightly above the metal's outer surface "after the assembled seal is mounted on the gate."

(d) Avoiding Abuses
Bending the seal sharply at the splice (the .125" to .25" rubber filled gap between the ends of the metal) is not a proper test of the splice. The stresses are exaggerated, centralized and concentrated at this gap. The force, while insufficient to break the rubber-to-rubber bond, will tend to break the rubber loose from the metal along the terminal edges. Another result is that the cladding could be irretrievably bent out of shape.

3. Other Field Splices

(a) Butt Fitted Splices
Unvulcanized field splices should never be made on a bevel. Pieces should be cut at a 90° (right) angle and butted tightly to produce a water-tight joint that will not "climb."

(b) Cemented Splices
Some designers specify a "cemented splice," "a cold cemented splice," or a "cold vulcanized splice." To avoid confusion, these may all be called "cemented splices." When such a "splice" is called out, it should be understood that while a good cement will produce some bond strength, no splice or bond strength should be stipulated. The best cemented splice is, in our opinion, inadequate to permit the removal of the seal from the gate for shipment or for the handling prior to re-attachment to the gate. The principle value of the cement is as a "caulking compound" to assure a water-tight seal, not as a bonding agent.

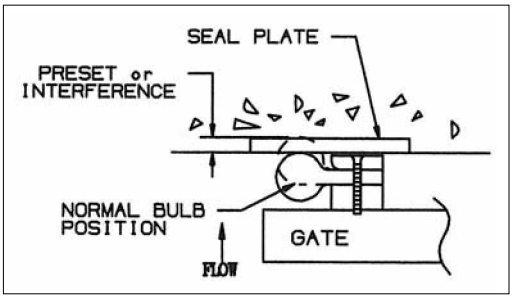
We suggest, therefore, that the designer word his requirements as follows:
"Seals shall be fitted by the fabricator to the gate in his shop by butting them tightly, one to the other. The ends of all pieces must be cut at right angles, not beveled. Seals should be cut, and/or dressed, slightly longer than required to permit such fitting without buckling or misalignment. No cement shall be used during such fitting."

These stipulations assure the designer of a good and careful fit since no cement is present to obscure the joint, or hide an ill-fitting joint. If the designer requires cement as an added precaution against leakage, he may add the following sentence to the above paragraph:

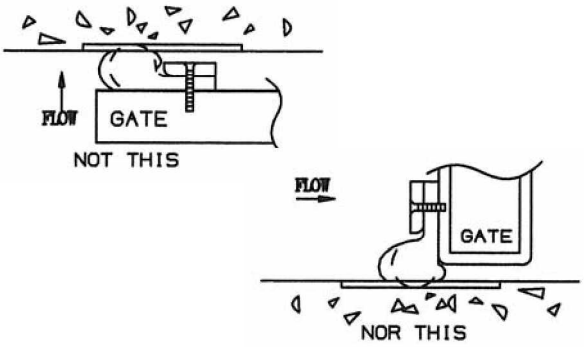
"Only during the final attachment of the seals to the gate should rubber cement be applied to assure a water-tight seal".

SEAL INSTALLATION

Proper seal installation of "J"-seals should utilize stem deflection as shown.



Wherever possible, seal compression (as shown below) should be avoided.

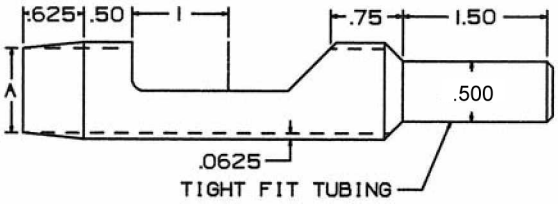


PRESET

A preset is the extent the stem should be placed under deflection. Preset should be held to the minimum to accomplish the adequate seal. A preset of .25" is advisable to keep friction load to a minimum.

BOLT HOLES

The clamp bars should be used to mark the locations on the holes. The holes should be drilled with a hollow drill bit as pictured below. Assistance in obtaining the drill bits can be given by a Seals Unlimited Representative.



DAM SEAL TOLERANCE CHARTS

Tolerances On Dam Seal Assembly Lengths

All Rubber Assemblies

SAE		METRIC	
0-5'	+0 -.125"	0 - 1.5m	+0 -3.18mm
Over 5' - 10'	+0 -.25"	Over 1.5 - 3.0m	+0 -6.35mm
Over 10' - 20'	+0 -.375"	Over 3.0 - 6.0m	+0 -9.53mm
Over 20' - 30'	+0 -.50"	Over 6.0 - 9m	+0 12.7mm
Over 30' - 40'	+0 -.75"	Over 9.1 - 12.2m	+0 -19.05mm
Over 40' - 50'	+0 -1"	Over 12.2m	+0 -25.4mm

Flurocarbon Clad Assemblies

SAE		METRIC	
0 - 5'	+.090" -.090"	0 - 1.5m	+2.29mm -2.29mm
Over 5' - 10'	+.150" -.150"	Over 1.5 - 3.0m	+3.8mm -3.8mm
Over 10' - 20'	+.200" -.200"	Over 3.0 - 6.0m	+5.08mm -5.08mm
Over 20' - 30'	+.250" -.250"	Over 6.0 - 9m	+6.35mm -6.35mm
Over 30'	+.250" -.375"	Over 9.1m	+6.35mm -9.35mm

Tolerances On Dam Seal Cross Sections

Size	Width of Cross Section	Bulb Height /Stem Height
0-5"	+.063" -.063"	+.063" -.063"
Over 5" - 7"	+.075" -.063"	+.063" -.063"
Over 7" - 10"	+.090" -.090"	+.063" -.063"
Over 10" & Up	+.120" -.120"	+.063" -.063"

COEFFICIENT OF FRICTION

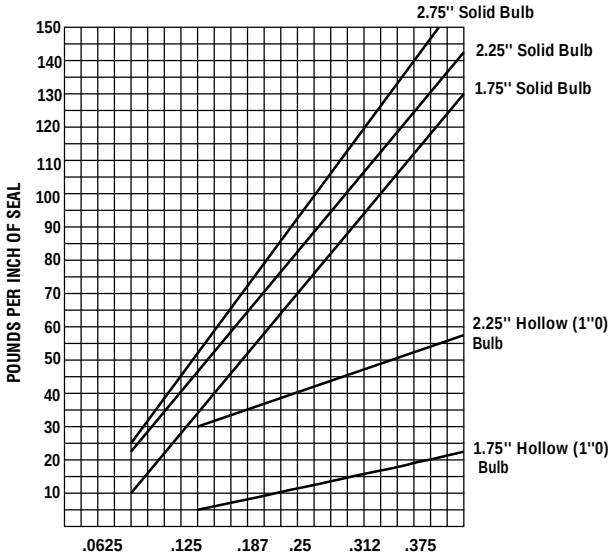
1. Rubber seals contacting to metal sealing surfaces. Coefficient of friction ranges from .65 to 1.5. Seals Unlimited suggests that a coefficient 1.0 be used.

2. Steel and brass-clad seals contacting to metal sealing surfaces. Coefficient of friction ranges from .30 to .65. Seals Unlimited suggests that a coefficient of .35 to .45 be used.

COMPRESSION AND DEFLECTION DATA

The following chart will serve as a guide for calculation of approximate loads required to compress the bulb portion of "J" seals in contemplated installations.

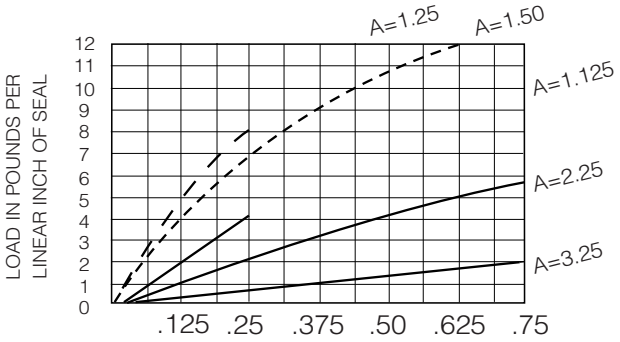
These values should be used as approximations because temperature, effect of aging, and repeated compressive cycles of the rubber will influence the results.



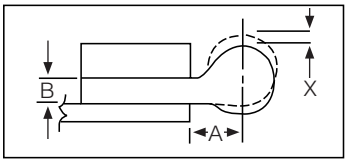
COMPRESSION

The information contained here is based upon tests believed to be reliable. However, we do not guarantee the results.

DEFLECTION



Deflection (X) In Inches



B = SOLID LINE =.562"
B = BROKEN LINE =.75"
B = DOTTED LINE =1"

LOAD REQUIRED ON A J-SEAL TO PRODUCE A GIVEN AMOUNT OF DEFLECTION.

HANDLING AND STORAGE PROCEDURES

RECOMMENDED STORAGE PROCEDURES FOR DAM SEALS

1. For shipping convenience, rubber seals may be rolled into tight coils. When furnished as seal assemblies, they can be coiled and/or folded and packed in the most economic sized crates or packages.

2. The distortion resulting from such packaging is minor and will not result in a permanent set detrimental to the use intended.

3. The seals should be removed from the crates upon arrival and laid out into their natural position until attached to the gates. If limited space is available, then it is recommended that seals be coiled in as large a coil as practical. Avoid kinks or other causes that would distort the cross section of the seal. Before mounting, minor distortions in the seals can be removed by placing them in their normal natural position in a warm building or by exposing them to direct sunlight for a few hours.

4. General storage conditions should be as follows:

(a) Seals Unlimited seals are built with the highest possible resistance to weathering. They are also built to withstand the ravages of oxygen, ozone and sunlight. Nothing can be done to avoid the presence of ozone and oxygen in the atmosphere, but it is desirable to avoid prolonged storage in direct sunlight. It is suggested that seals be stored in a shaded area.

(b) Avoid piling too high and do not store other items on top of rubber seals. Fluorocarbon and Brass Clad Seals should remain flat in the crate as packaged. Handling this type of seal with caution is essential, as bending or rolling fluorocarbon seals will cause irrevocable damage.

SPECIFICATIONS

Natural -103-

Rubber Specifications for Gate Seals

The rubber seals shall be molded only and the material shall be compounded of natural rubber and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following:

Physical Test	Test Value	Specifications
Tensile strength	3000 psi (min.)	Die C ASTM D412
Elongation at Rupture	450% (min.)	ASTM D412
300% Modulus	900 psi (min.)	ASTM D412
Durometer Hardness, Shore Type A	60 to 70	ASTM D2240
Water Absorption	10% change in volume (max.)	70 Hrs. @ 212°F ASTM D471
Compression Set	30% (max.)	ASTM D395 Method B 22 Hrs. @ 158°F
Tensile Strength After Oxygen Bomb Aging	80% (min.) of tensile strength	ASTM D572
Low Temperature Brittleness	Non-brittle after 3' @ -40°C	ASTM D2137, Method A, 9.3.2

SPECIFICATIONS
Natural -187-

Rubber Specifications for Gate Seals

The rubber seals shall be molded only and the material shall be compounded of natural rubber and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following:

Physical Test	Test Value	Specifications
Tensile Strength	2500 psi (min.)	Die C ASTM D412
Elongation at Rupture	400% (min.)	ASTM D412
Durometer Hardness, Shore Type A	50 to 60	ASTM D2240
Water Absorption	10% by volume (max.)	70 hrs. @ 212°F ASTM D471
Compression Set	25% (max.)	ASTM D395 Method B22 Hrs. at 158°F
Low Temperature Brittleness	Non-brittle after 3' @ -40°C	ASTM D2137, Method A, 9.3.2

SPECIFICATIONS
Natural -177-

Rubber Specifications for Gate Seals

The rubber seals shall be molded only and the material shall be compounded of natural rubber and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following:

Physical Test	Test Value	Specifications
Tensile Strength	2500 psi (min.)	ASTM D412
Elongation at Break	450% (min.)	ASTM D412
300% Modulus	900 psi (min.)	ASTM D412
Durometer Hardness, Shore Type A	45 +/- 5	ASTM D2240
Water Absorption	10% by weight (max.)	ASTM D471
Compression Set	30% (max.)	ASTM D395
Tensile Strength After Oxygen Bomb Aging	80% (min.) of tensile strength	ASTM D572
Low Temperature Brittleness	Non-brittle after 3' @ -40° C	ASTM D2137, Method A, 9.3.28

SPECIFICATIONS
Neoprene -501-

Rubber Specifications for Gate Seals

The rubber seals shall be molded only and the material shall be compounded of neoprene rubber and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following:

Physical Test	Test Value	Specifications
Tensile Strength	2500 psi (min.)	ASTM D412 - Die C
Elongation at Break	400% (min.)	ASTM D412
300% Modulus	900 psi (min.)	ASTM D412
Durometer Hardness Shore Type A	60 to 70	ASTM D2240
Water Absorption	10% by weight (max.)	ASTM D471, 48 hours @ 70°C
Compression Set	30% (max.)	ASTM D395 - Method B, 22 hours @ 212°C
Tensile Strength After Oxygen Bomb Aging	80% (min.) of tensile strength	ASTM D572
Low Temperature Brittleness	Non-brittle after 3' @ -25°C	ASTM D2137, Method A, 9.3.2

Specific Gravity 1.43 +/- .05

DEFLECTION:
Bending of the stem part of the seal under pressure from water or by interference.

COMPRESSION:
Seal contact by force with seal plate causing change in seal shape at contact area.

SLUICE GATE:
Usually a smaller rectangular type of gate used to control water level or flow, but may also be a small radial type of gate.

SWING GATE:
A small to medium size gate, used in a levee opening, that is equipped to swing on hinges from one end to open or close for flood control.

HYDRO PLANT:
A plant built in conjunction with a dam to provide for water flow through turbine generators creating electricity.

PUMP STATION:
A plant built with diesel or electric powered pumps to move water for drainage or storage, also such stations are built to move sewage to a treatment plant.

INTAKE GATE:
A gate provided to shut off flow of water into a water intake passage or penstock leading to a turbine.

WHEEL GATE:
A rectangular vertical lift gate designed with a number of wheels fixed on axles on each side which move up and down slots built in on either side of the gate opening. This type of gate is usually provided for water closure under high heads such as a service or emergency gate.

BULKHEAD:
A flat boxlike structure use to shut off water flow in a dam upstream from other gates or equipment, enabling repair or maintenance work.

STOPLOG:
Similar to a bulkhead but smaller and stacked in sections on top of each other, usually removable one at a time.

RADIAL GATE:
A gate with a curved skin or face plate connected with steel arms to a trunnion or axle. It is usually lifted or lowered by a cable connected to a hook at the top of the gate, rotating on the trunnion shaft as it is moved. This type of gate is used at an opening in the top of a dam to control the water reservoir level, since it can be opened partially to control the amount of flow.

TAINTER GATE:
Another name for a radial gate.

TAINTER VALVE:
A radial type gate used in a submerged location such as in a navigation lock where it is used to open or close water passages which flood or drain the lock.

TRASH RACK:
A metal grid structure placed upstream of a gate such as an intake gate to catch trash and debris preventing it from entering a water passage where it could damage equipment such as a turbine.

EMERGENCY LOCK BULKHEAD:
A large boxlike structure used to close off an area around a lock miter gate, so water can be pumped out leaving an area dry for repair work on the miter gate.

SPILLWAY:
An opening in a dam for water overflow usually closed off with some type of gate (radial or vertical lift) but may be uncontrolled, that is, just an open area for high water to overflow.

HEAD PRESSURE:
The pressure exerted by the weight of water per unit of are at any given depth below the surface (approx. 4 lb. per square inch per foot of depth).

CENTER BULB APPLICATION:
Most often used now as a top seal for a wheel type gate to control bulb movement (rollover) by fastening of the seal flanges on both sides of the bulb. Originally called a caisson seal, used also as a compression seal for sides and bottoms of heavy gates and doors.

DOUBLE BULB APPLICATION:
A double bulb type of seal used for gates where water flows both ways such as the mouth of river or tidal installation.

BULLNOSE SEAL:
A flat type of seal designed with a rounded or radiused nose or contact area. Sealing under compression the rounded nose allows the rubber to spread out on each side with less force of compression.

ROLLER GATE:
A gate used in a levee opening for flood control, usually being so wide or long that rollers are required at the bottom to support it during opening and closing.

MITER LOCK GATE:
One gate consists of two leaves hinged at the outer ends, closing with an angular or miter contact at the center. These gates are sealed at the bottom and may also have partial rubber sealing at both the miter and hinge or pintle ends.

SPECIFICATIONS
Fluorocarbon (Teflon) Clad Rubber Seals

Fabrication

The rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be 0.060" thick abrasion-resistant Fluorocarbon Film no. 4508, or approved equal, and shall have the following physical properties:

Physical Test	Test Value
Tensile strength	2000 psi (min.)
Elongation at Break	250% (min.)

The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded in lengths suitable for obtaining the finish lengths shown on the drawing and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, the fluorocarbon film shall be masked during bonding so as to prevent a bond for a length sufficient to hold the film securely during testing.

Testing

The fluorocarbon film shall be tested for adhesion bond in accordance with ASTM D 413, using either the machine method or the deadweight method. A 1" piece of seal shall be cut from the end of the seal which has been masked and subjected to tension at an angle relative to the dimensions of the rubber surface. There shall be no separation between the fluorocarbon film and the rubber when subjected to the following loads:

Thickness of Fluorocarbon Film	Machine Method at 2 inches Per Minute	Deadweight Method
0.060	30 lbs. per inch width	30 lbs. per inch width
0.030	30 lbs. per inch width	30 lbs. per inch width

Failure of any specimen to meet the requirements of the test used will be cause for rejection of the piece from which the test specimen was taken.

Mold Cross Reference Data

Mold No.	Sec. No.
1680	A-3
1905	H-2
1905-A	H-2
1906	H-2
2099	A-1
2100	A-2
2247	A-2
2247-A	A-4
2247-B	A-4
2247-C	C-6
2283	K-1
2284	H-7,H-8
2329	G-4
2330	G-4
2370	A-2
2440	H-7
2513	K-2
2514	A-1
2532	K-2
2532-A	K-7
2570	A-1
2575	A-1
2577-1	K-2
2577-2	K-2
2589	C-8
2590	C-8
2682	C-9
2683	C-9
2684	A-2
2685	C-3
2686	C-3
2765	K-1
2767	A-1
2774	A-2
2812	G-3
2918	H-3
2933	H-3
2950	A-1
2971	K-2
2982	A-4
2986	A-4
2990	G-5
3000	A-2
3000-A	A-5
3001	C-5
3019	L-9
3020	L-9
3032	A-9
3032-A	A-9
3033	A-9
3033-A	A-9
3053	G-4
3054	G-4
3070	A-10
3071	A-10
3073	A-1
3074	A-1
3085	A-8
3086	A-8
3087	A-5
3088	A-5
3171	E-3
3176	K-2
3197	H-17
3207	J-8
3220	C-7
3221	C-7
3237	L-12
3237-A	L-12
3238	J-3
3238-A	J-3
3238-B	J-3
3238-C	H-20
3238-D	H-20
3238-E	H-20
3251	K-4
3256	A-3
3312	K-1
3331	H-10
3368	A-2
3375	E-5
3399	K-9
3431	A-2
3435	A-2
3436	A-3
3441	F-3
3480	K-2
3492	G-1
3492-A	G-1
3493	J-10
3494	A-1
3495	A-1
3506	E-4
3507	E-4
3508	G-2
3512	L-2
3519	J-3
3533	F-5
3534	F-5
3536	F-5
3537	F-5
3538	H-18
3539	K-1
3540	K-1
3541	B-2
3542	B-2
3545	J-1,E-1
3579	A-2
3587	K-6
3589	H-8,H-9
3592	J-3
3599	J-8
3600	J-8
3602	A-1
3621	H-19
3621-A	H-17
3623	H-19
3625	A-1
3634	H-19
3635	H-19
3649	F-3
3650	F-3
3658	A-1
3677	H-1
3677-A	H-20
3677-M	H-21
3696	C-8
3697	C-8
3703	C-6
3704	C-6
3707	K-1
3720	G-3
3725	D-1
3726	D-1
3736	A-1
3752	J-6
3761	A-2
3761-1	E-2
3762	A-1
3767	A-2
3792	G-3
3794	G-3
3829	D-2
3839-R	F-8
3839-L	F-8
3844	A-7
3845	A-7
3885	H-17
3932	D-7
3933	G-2
3934	G-2
3935	H-17
3936	H-17
3942	B-8
3943	B-8
3944	K-2
3992	F-9
3993	F-9
4067	K-1
4068	L-10
4069	L-10
4071	A-2
4071-A	A-4
4071-B	A-4
4084	B-8
4084-A	F-2
4084-B	F-3
4094	J-8
4097	E-5
4107	K-9
4114	K-8
4115	G-3
4172	A-2
4172-A	A-6
4188	A-3
4190-A	K-7
4210-A	A-1
4218	C-8
4231	C-5
4231-A	C-5
4234	C-9
4235	C-9
4240	F-5
4249	K-5
4258	H-5
4259	G-1
4264	L-11
4275	J-8
4276	J-8
4282	H-4
4287	G-2
4308	F-7
4313	A-4
4314	A-4
4315	A-8
4316	A-8
4326	K-2
4344	A-6
4345	A-6
4349	E-1
4350	E-1
4351	L-14
4351-A	L-14
4351-B	L-14
4351-C	L-14
4352	A-2
4389	A-4
4390	A-3
4398	A-2
4404	B-3
4407	C-7
4414	H-21
4422	J-6
4431	A-7
4442	A-7
4442-A	A-7
4443	A-7
4443-A	A-7
4446	G-1
4447	J-1
4450	A-9
4468	A-2
4474	J-4
4477	K-3
4487	F-1
4488	F-1
4499	H-12
4504	H-12
4527	E-1
4539	A-2
4543	E-4
4544	B-8
4545	B-8
4558	A-3
4561	H-19
4591	K-3
4592	B-9,K-3
4593	B-9
4597	A-4
4598	A-4
4602	A-5
4603	A-2
4603-A	A-2
4604	B-3
4605	J-8
4616	L-15
4617	L-8
4618	L-15
4624	A-1
4629	E-8

Mold No.	Sec. No.
4646	L-11
4661	L-6
4665	F-2
4670	J-11
4671	J-11
4672	K-2
4677	K-1
4686	C-1
4694	B-8
4695	B-8
4703	C-2
4704	J-8
4706	K-5
4708	D-8
4709	D-8
4710	D-4
4712	J-13
4724	E-2
4725	E-2
4726	F-8
4727	A-7
4728	A-7
4730	J-4
4735	G-1
4736	B-7
4737	B-7
4740	A-3
4745	K-5
4750	L-9
4751	L-9
4759	G-3
4767	H-6
4786	L-7
4787	L-7
4788	H-6
4789	H-6
4796	B-1
4798	A-1
4800	L-10
4801	L-10
4802	G-1
4804	G-1
4804-A	F-2
4810	C-3
4811	C-2
4814	H-20
4815	G-1
4843	K-1
4861	E-7
4862	B-10

Mold No.	Sec. No.
4862	B-10
4863	B-10
4867	B-7
4868	B-7
4875	J-13
4876	K-3
4902	C-1
4903	C-1
4936	B-4
4938	K-5
4942	B-5
4951	K-3
4952	K-3
4953	A-4
4954	A-4
4960	H-8
4992	F-2
5000	A-4
5001	A-4
5006	H-6
5008	G-2
5019	H-13
5020	H-15
5032	B-1
5037	J-2
5039	J-2
5040	G-2
5056	H-10
5068	E-3
5089	A-3
5102	A-2
5104	K-3
5108	K-3
5109	K-3
5120	D-9
5121	D-9
5129	B-5
5130	B-5
5131	H-18
5135	K-2
5139	H-21
5149	J-14
5150	H-20
5166	L-5
5169	H-12
5172	K-2
5226	F-6
5254	J-1
5292	H-4
5298	F-4

Mold No.	Sec. No.
5299	F-4
5313	J-1
5315	B-9
5316	B-9
5345	A-9
5346	A-9
5391	D-2
5392	D-2
5398	K-10
5404	H-14
5414	K-9
5416	E-6
5422	J-4
5425	K-5
5440	L-1
5453	B-4
5454	B-4
5464	E-10
5465	E-10
5479	H-13
5497	B-4
5500	D-4
5549	L-1
5556	C-2
5566	J-8
5567	E-1
5568	E-1
5569	H-21
5574	H-19
5581	A-2
5583	E-7
5595	E-7
5596	E-7
5597	D-1
5603	F-9
5610	F-8
5616	H-21
5617	B-1
5618	A-2
5619	B-1
5679	H-20
5681	E-2
5688	J-8
5691	H-21
5694	E-3
5695	J-4
5697	J-4,J-7
5698	A-2
5723	F-6
5737	K-3

Mold No.	Sec. No.
5738	B-2
5739	B-2
5746	C-1
5748	J-8
5753	H-14
5755	J-10
5756	J-10
5757	J-10
5763	K-3
5775	G-2
5783	H-15
5798	H-17
5801	B-7
5802	F-9
5826	J-5
5831	D-2
5832	H-18
5840	K-10
5859	H-20
5873	D-6
5874	B-7
5875	B-7
5876	C-5
5877	C-5
5879	H-5
5894	J-8
5902	L-3
5903	L-4
5910	F-7
5911	H-9
5930	A-4
5931	A-4
5948	A-8
5949	A-8
5960	D-2
5993	K-5
5997	C-7
5998	C-7
5999	A-4
6015	H-18
6016	H-18
6017	H-18
6074	A-4
6075	A-4
6088	A-3
6091	C-4
6097	K-4
6151	J-2
6152	A-1
6184	D-1

Mold No.	Sec. No.
6184	D-1
6192	A-5
6193	A-5
6198	A-3
6215	A-1
6239	C-4
6251	H-18
6255	K-1
6258	G-1
6261	H-14
6262	A-6
6263	A-6
6270	H-22
6271	H-22
6275	H-6
6276	J-12
6277	H-7
6282	K-7
6285	J-8
6292	H-17
6298	L-5
6302	K-9
6317	A-5
6329	L-8
6336	K-9
6339	H-19
6341	H-19
6346	A-8
6360	H-16
6361	H-16
6362	H-16
6374	A-1
6394	E-12
6404	J-1
6424	L-3
6435	H-1
6438	H-1
6443	D-3
6471	A-2
6475	F-4
6486	K-4
6493	G-6
6501	~~A-1,A-2~~
6501-S	A-2
6501-T	A-2
6541	H-15
6560	F-8
6561	L-11
6609	H-14
6646	H-7

Mold No.	Sec. No.
6647	H-7
6656	K-1,K-4
6665	J-12
6678	G-6
6679	G-6
6680	G-6
6704	A-2
6709	H-1
6711	H-1
6775	J-5
6776	L-12
6790	H-21
6797	L-13
6798	L-7
6800	H-21
6801	E-6
6804	L-12
6805	L-12
6809	E-9
6810	E-9
6812	B-3
6813	B-3
6814	B-3
6816	D-6
6820	G-10
6832	L-2
6835	H-21
6841	A-11
6842	A-11
6846	L-4
6880	A-1
6883	A-3
6884	D-5
6885	D-5
6888	A-3
6896	L-4
6897	H-6
6900	G-7
6906	A-2
6909	H-22
6919	H-22
6954	H-18
6978	E-8
6979	E-11
6980	E-11
7001	E-11
7002	E-11
7012	D-7
7013	D-7
7025	A-3

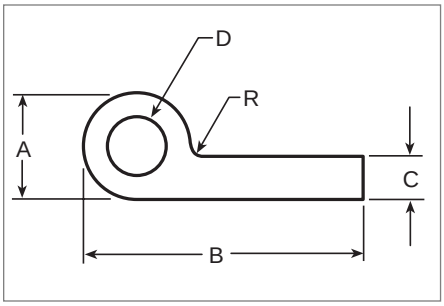
Mold No.	Sec. No.
7043	D-7
7044	J-9
7047	B-3
7048	B-3
7064	A-2
7090	A-1
7093	D-4
7113	C-10
7116	K-1
7174	K-8
7175	D-9
7182	G-7
7183	G-7
7184	G-7
7185	G-7
7186	G-8
7293	J-15
7428	L-17
7429	L-17
7430	C-11
7431	C-11
7433	H-22
7442	H-22
7470	L-16
7471	L-16
7472	L-17
7473	L-17
7501	J-15
7502	J-15
7513	A-6
7514	A-6
3203	E-13
8003	E-12
8005	A-2
8007	C-11
8009	L-19
8013	D-9,D-10
8014	B-11
8018	B-10
8019	K-9
8024	A-11
8037	J-15
8063	G-8
8067	G-9
8068-B	G-9
8068-C	G-9
8069	G-9
8070	G-9
8075	B-6
8081	E-14

Mold No.	Sec. No.
8082	E-14
8135	A-3
8200	L-6
8201	L-6
8202	E-13
8212	A-3
8237	E-3
8238	E-
38255	E-13
8292	B-12
8293	B-12
8302	J-7
8305	K-1
8309	J-12
8327	C-3
8328	C-3
8331	E-14
8343	L-18
8344	L-18
8345	E-15
8346	C-3
8347	C-3
8348	K-3
8349	L-2
8350	L-3
8353	L-1
8354	L-1
8355	B-6
8356	B-6
8357	B-6
8361	L-19
8362	B-12
8363	B-12
8364	B-12
8365	B-12
8374	A-3
8377	L-18
8425	G-1
8444	J-7
8456	J-12
8461	K-3,K-4
8464	D-8
8465	D-8
8478	C-5
8500	L-4
8501	L-7
8502	L-5
8509	G-4
8510	G-4
8513	E-15

Mold No.	Sec. No.
8514	E-15
8515	E-15
8516	E-15
8517	A-2
8527	C-3
8528	C-3
8529	B-2,B-4
8531	G-5
8537	G-5
8537-M	G-5
8538	D-10
8539	D-10
8542	H-2
8559	G-5
8564	C-3
8569	H-23
8570	K-7
8581	H-19
8604	A-3
8605	A-2
8606	K-3,K-4
8625	A-3
8626	A-2
8632	G-2
8634	K-4
8635	A-10
8636	A-10
8639	K-1,K-4
8641	H-11
8643	F-6
8644	F-6
8652	G-3
8691	A-3
8694	J-1
8712	H-11
8716	A-1
8717	K-3
8721	J-7
8754	J-6
8755	J-2
8766	J-8
8768	G-3
8770	G-3
8771	J-6
8780	D-3
8781	D-3
8784	J-8
8808	A-2
8809	C-11
8810	C-11

Mold No.	Sec. No.
8811	C-10
8825	D-10
8827	A-2
8832	L-6
8839	G-3
8905	H-11
8906	H-11
8907	H-11
8924	L-18
8928	H-2
8929	H-2
8932	A-8
8933	A-8
8978	H-21
8987	K-10
9020	K-2
9037	H-3,H-5
9054	A-1
9055	G-1
9073	K-1
9100	B-1
9103	J-5
9104	J-5
9111	A-2
9123	A-1
9123-A	A-1
9156	A-1
9817	K-2

"J" Seal Strip, Simple 90° Corners & Special Transition Corners

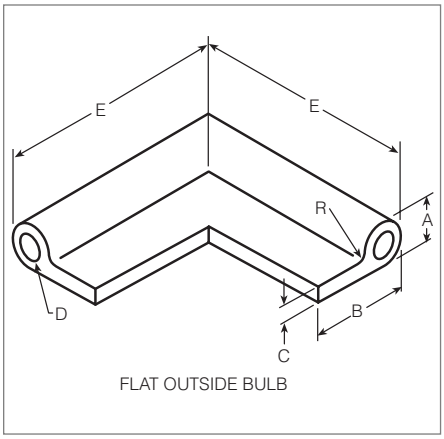


NO.	A	B•	C	D••	R
3625	.875	4.00 •	.31	••	.125
2570/3736	1.00	4.50	.50	••	.44
6880	1.00	6.00 •	.31	••	.375
6215	1.25	5.00 •	.50	••	.19
6501	1.50	5.00 •	.50	••	.25
9156	1.63	5.75	.63	••	.25
2514	1.75	7.00 •	.56	••	.31
2767	1.75	6.00	.68	••	.25
2575	1.75	6.00 •	.875	••	.31
3762	1.75	6.00	.75	••	.31
6152	1.75	7.00	.75	••	.31
8716	2.00	5.00 •	.56	••	.44
7090	2.00	6.00 •	.63	••	.375
6374	2.00	6.00 •	.75	••	.25
3073	2.00	6.00 •	.875	••	.19
3495	2.00	6.00 •	1.00	••	.25
9123	2.00	10.0 •	1.00	••	.25
9123-A	2.00	10.0	.875	••	.25
4798	2.125	6.00 •	.75	••	.375
4210-A	2.25	6.00 •	.56	••	.31
3658	2.25	9.00 •	.75	••	.31
2099	2.25	9.00 •	1.00	••	.25
4624	2.38	7.00 •	1.00	••	.25
3494	2.50	5.00 •	1.00	••	.50
3602	2.50	6.00 •	.875	••	.75
2950	2.75	9.25	1.00	••	.38
3074	3.00	7.00 •	1.00	••	.44
9054	3.75	7.50	1.50	••	.38

• MOLDS WILL PRODUCE ANY WIDTH LESS THAN MAXIMUM

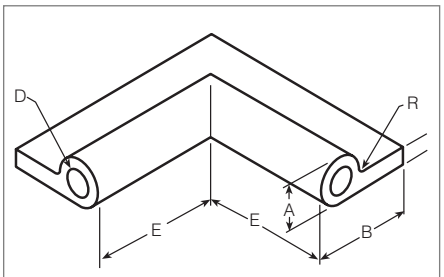
•• MOLDS WILL PRODUCE EITHER SOLID BULB SEALS OR SEAL WITH ANY SIZE HOLE REQUIRED.

••• AS REQUIRED WHEN THESE MOLD NUMBERS ARE SPECIFIED IT WILL BE ASSUMED, IN THE ABSENCE OF QUALIFYING DESCRIPTIONS, THAT THE CROSS SECTION IS SOLID, (WITHOUT CENTER HOLE IN THE BULB), THE FULL WIDTH SHOWN, AND WITHOUT FABRIC OR FLUORO-CARBON COVERING.



FLAT OUTSIDE BULB

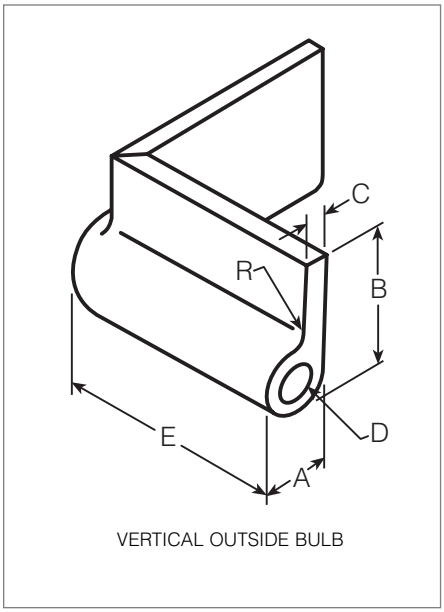
NO.	A	B•	C	D••	E	R
3761	.875	2.25•	.31	••	10	.125
6906	1.00	6.00•	.31	••	12	.38
3368	1.00	4.50	.50	••	15	.44
8808	1.00	4.50•	.50	••	7	.44
6704	1.25	4.00•	.50	••	15	.19
6501-S	1.50	5.00•	.50	••	12	.25
2247	1.75	5.00•	.56	••	16	.31
4071	1.75	7.00•	.56	••	24	.31
2774	1.75	5.00•	.69	••	20	.31
5698	1.75	6.00•	.875	••	•••	.31
8605	2.00	6.00•	.75	••	•••	.25
9111	2.00	5.00	.56	••	12	.44
8517	2.00	6.00•	.63	••	10	.38
3431	2.00	6.00•	.875	••	15	.19
5102	2.00	6.00•	1.00	••	16	.25
4603-A	2.25	6.00•	.56	••	18	.31
4603	2.25	9.00•	.75	••	18	.31
2370	2.25	6.00•	1.00	••	16	.25
5581	2.25	7.00•	1.00	••	21	.25
2684	2.38	6.00•	1.00	••	16.50	.25
3767	2.50	6.00•	.875	••	15	.38
4172	2.75	6.00•	1.00	••	•••	.38
4539	2.75	9.00•	1.00	••	18	.38
4468	3.00	7.00•	1.00	••	18	.44



FLAT INSIDE BULB

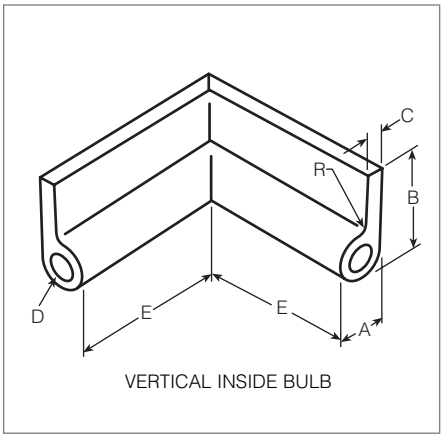
NO.	A	B•	C	D••	E	R
4398	.875	2.25	.31	••	11.25	.125
8626	1	6•	.31	••	12	.38
4352	1	4.50	.50	••	13	.44
6471	1.25	4•	.50	••	•••	.19
3000	1.75	7•	.56	••	14.25	.31
6501-T	1.50	5•	.50	••	12	.25
8005	2	6•	.875	••	16.50	.25
4431	2	6•	1	••	•••	.25
8827	2.25	5.38	.56	••	10	.31
3435	2.25	6•	.75	••	10.125	.31
5618	2.50	6•	.875	••	12	.50
2100	2.25	5.75•	1	••	9.25	.25
3579	2.75	9.25	1	••	8.75	.38
7064	3	7•	1	••	14.50	.44

- • MOLDS WILL PRODUCE ANY WIDTH LESS THAN MAXIMUM
- •• MOLDS WILL PRODUCE EITHER SOLID BULB SEALS OR SEALS WITH ANY SIZE HOLE REQUIRED.
- ••• AS REQUIRED WHEN THESE MOLD NUMBERS ARE SPECIFIED IT WILL BE ASSUMED, IN THE ABSENCE OF QUALIFYING DESCRIPTIONS, THAT THE CROSS SECTION IS SOLID, (WITHOUT CENTER HOLE IN THE BULB), THE FULL WIDTH SHOWN, AND WITHOUT FABRIC OR FLUORO-CARBON COVERING.



VERTICAL OUTSIDE BULB

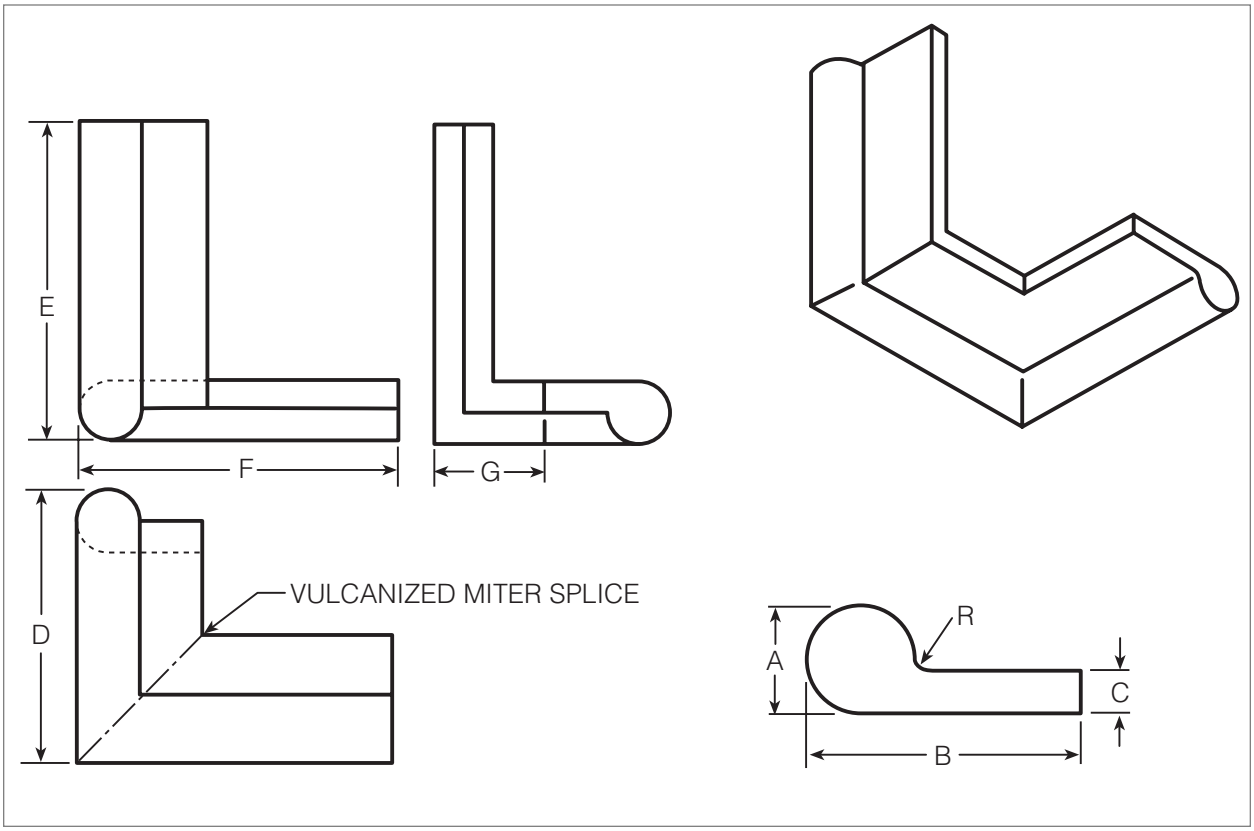
NO.	A	B•	C	D••	E	R
4558	.875	2.25•	.31	••	•••	.125
6198	1	4.50•	.50	••	•••	.44
6888	125	4•	.50	••	15	.19
8212	1.75	6.25•	.56	••	12	.31
4188	1.75	4•	.69	••	16	.31
4746	1.75	5•	.69	••	16	.31
8374	1.50	6•	.50	••	•••	.25
4740	2	6•	1	••	20	.25
8604	2	6•	.75	••	16	.31
4390	2.25	6•	1	••	16	.25
3256	2.75	6•	1	••	14.50	.38
8135	2.75	7•	1	••	14	.38



VERTICAL INSIDE BULB

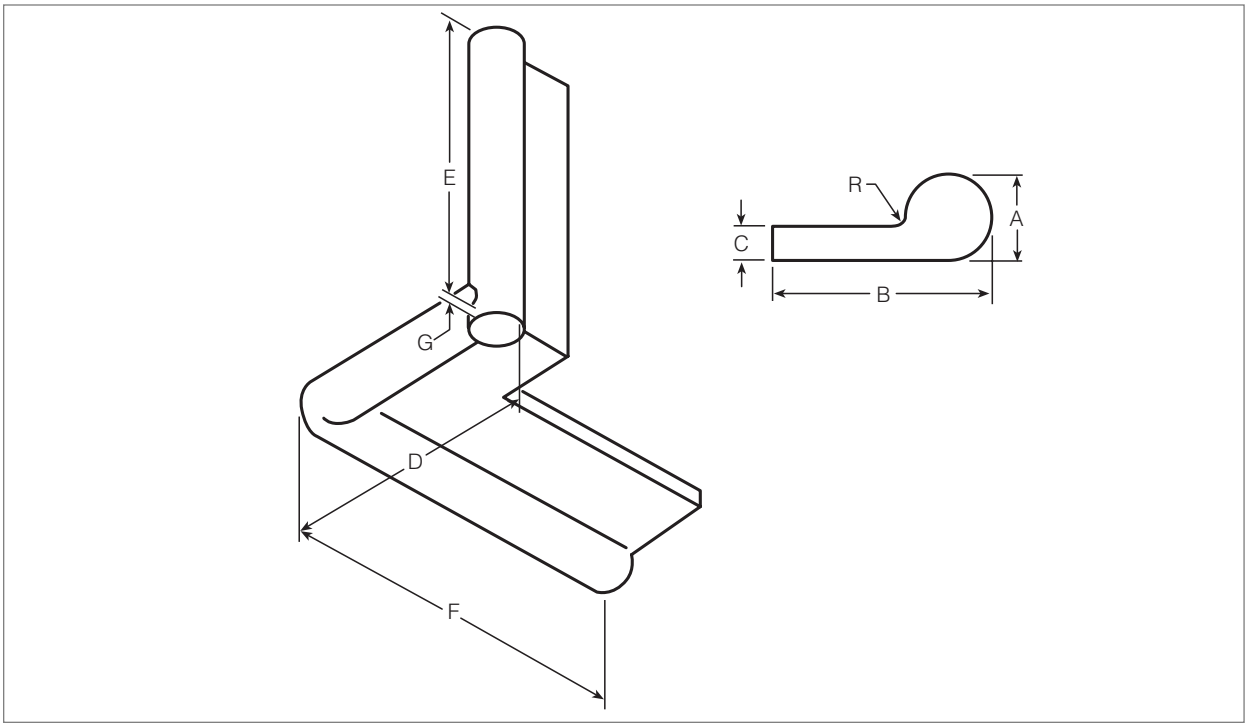
NO.	A	B•	C	D••	E	R
5089	.875	2.25•	.31	••	9.75	.125
6088	1	4.50•	.50	••	•••	.44
8691	1.75	5•	.56	••	16	.31
1680	1.75	6	.63	••	12	.31
6883	1.75	6•	.75	••	12	.31
8625	1.75	5•	.875	••	12	.31
3436	2.25	4.875•	.75	••	15	.31
7025	2.75	7•	1	••	12	.38

- • MOLDS WILL PRODUCE ANY WIDTH LESS THAN MAXIMUM
- •• MOLDS WILL PRODUCE EITHER SOLID BULB SEALS OR SEALS WITH ANY SIZE HOLE REQUIRED.
- ••• AS REQUIRED WHEN THESE MOLD NUMBERS ARE SPECIFIED IT WILL BE ASSUMED, IN THE ABSENCE OF QUALIFYING DESCRIPTIONS, THAT THE CROSS SECTION IS SOLID, (WITHOUT CENTER HOLE IN THE BULB), THE FULL WIDTH SHOWN, AND WITHOUT FABRIC OR FLUORO-CARBON COVERING.

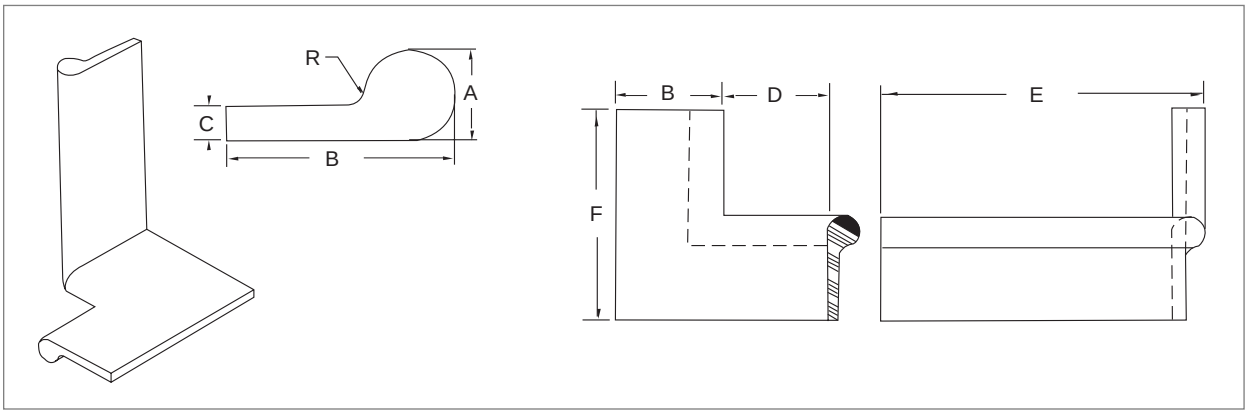


NO.	A	B•	C	D••	E	F	G	R
4597	.875	2.25	.31	6.19	10•	11•	3.94	.13
4598	.875	2.25	.31	12.00••	10•	11	9.75••	.13
4953 & 4954	1.00	4.50	.50	5.69	10	10	1.19	.31
2247B & OPP	1.75	4.00••	.56	6.75•	16	•••	2.75•	.31
5930 &5931	1.75	4.00	.56	6.13	16••	•••	2.13	.31
2247A & OPP	1.75	5.00	.56	7.00•	16	18	3.75	.31
5000 & 5001	1.75	5.00	.75	9.06	17	17	4.06	.31
4071B & OPP	1.75	6.00••	.56	8.00•	16••	•••	2.00•	.31
9150 / 9151	1.75	6.00••	.75	10.38•	16	•••	4.38•	.25
5999	1.75	6.00	.875	7.38	12	15	1.38	.31
4313 & 4314	2.00	4.75	1.00	7.00	•••	15	5.75	.31
4389	2.25	4.75	1.00	7.00	•••	12	3.25	.25
6074 & 6075	2.25	6.00	.75	10.00	16	16	4.00	.31
2982 & 2986	2.50	4.75	1.00	10.38	12	12	5.63	.25

- • MOLDS WILL PRODUCE ANY WIDTH LESS THAN MAXIMUM
- •• MOLDS WILL PRODUCE EITHER SOLID BULB SEALS OR SEALS WITH ANY SIZE HOLE REQUIRED.
- ••• AS REQUIRED WHEN THESE MOLD NUMBERS ARE SPECIFIED IT WILL BE ASSUMED, IN THE ABSENCE OF QUALIFYING DESCRIPTIONS, THAT THE CROSS SECTION IS SOLID, (WITHOUT CENTER HOLE IN THE BULB), THE FULL WIDTH SHOWN, AND WITHOUT FABRIC OR FLUORO-CARBON COVERING.

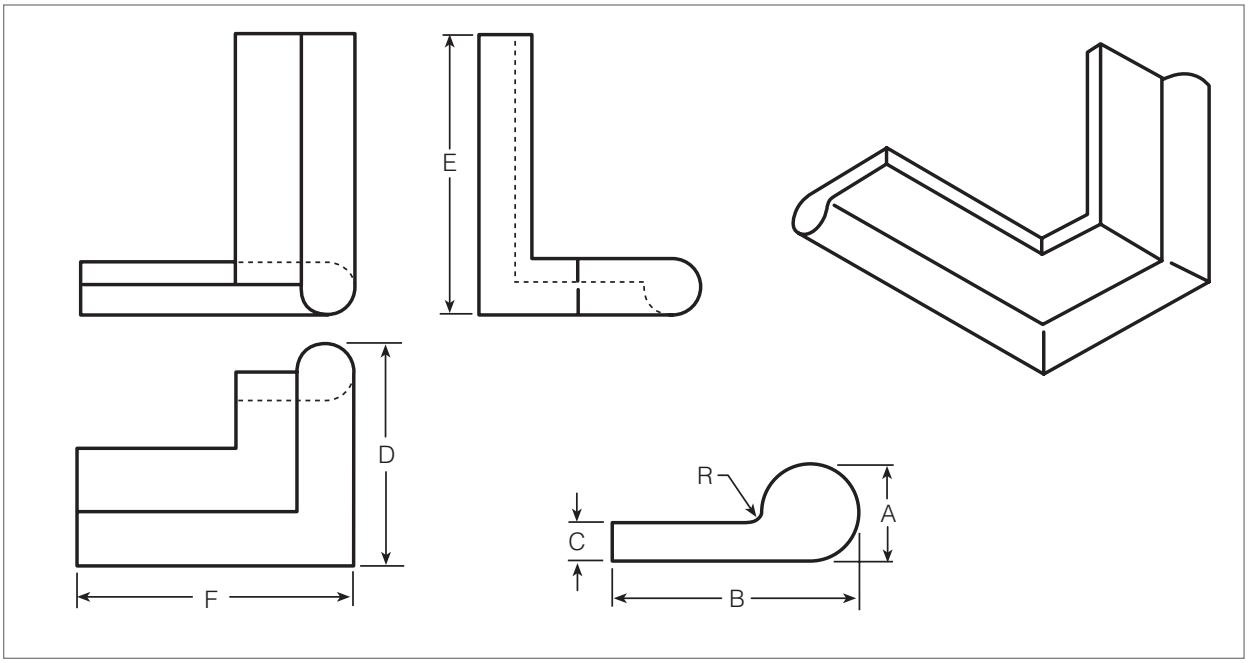


NO.	A	B	C	D	E	F	G	R
3087 & 3088	1.75	5	.69	7.75	14.50	13.50	.25	.25R
6317 & OPP.	.875	2.25	.31	3.13	10	10	-	.13R
6192 & 6193	1.75	4	.56	8	12*	12*	-	.31R



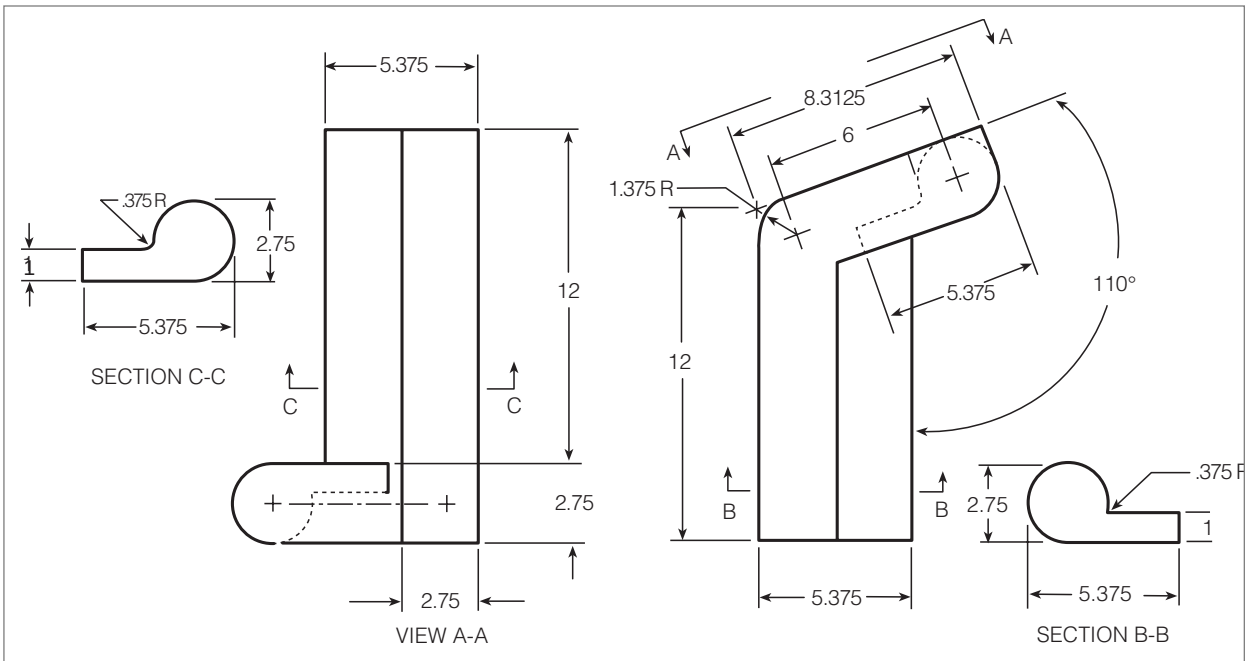
NO.	A	B	C	D	E	F	R
3000A & OPP. R	1.75	5	.56	.63*	12	***	.38R
4602 & OPP.	2.75	7**	1.00	1.25	***	***	.31R

* MINIMUM ** MAXIMUM *** AS REQUIRED

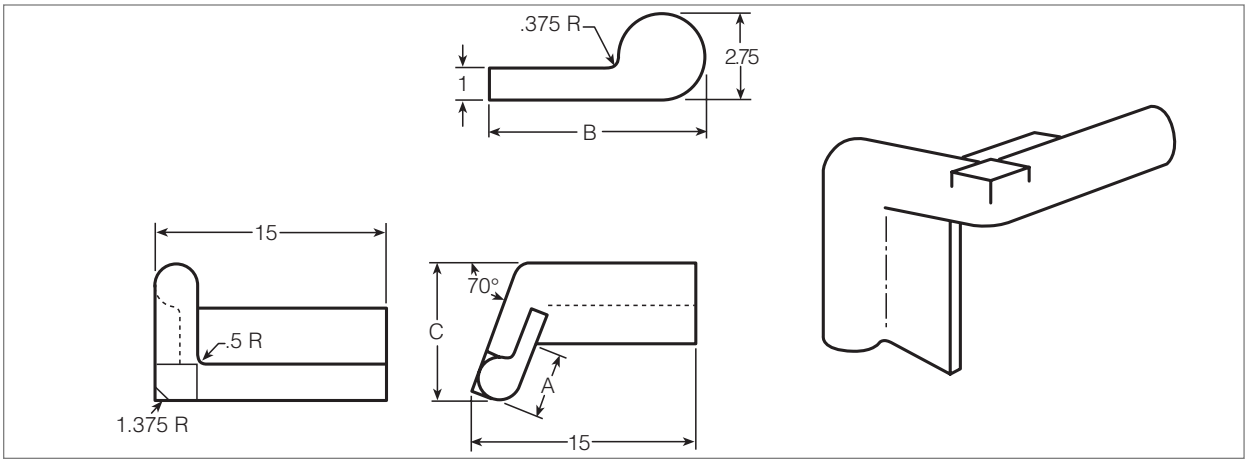


NO.	A	B	C	D	E	F	R
6262 & 6263	2	6	1	8.00	15	15	.31R
4344 & 4345	1.75	5**	.56	6.25*	16	16	.31R
4172-A & OPP.	2.75	6	1	11.13*	14.50	***	.31R

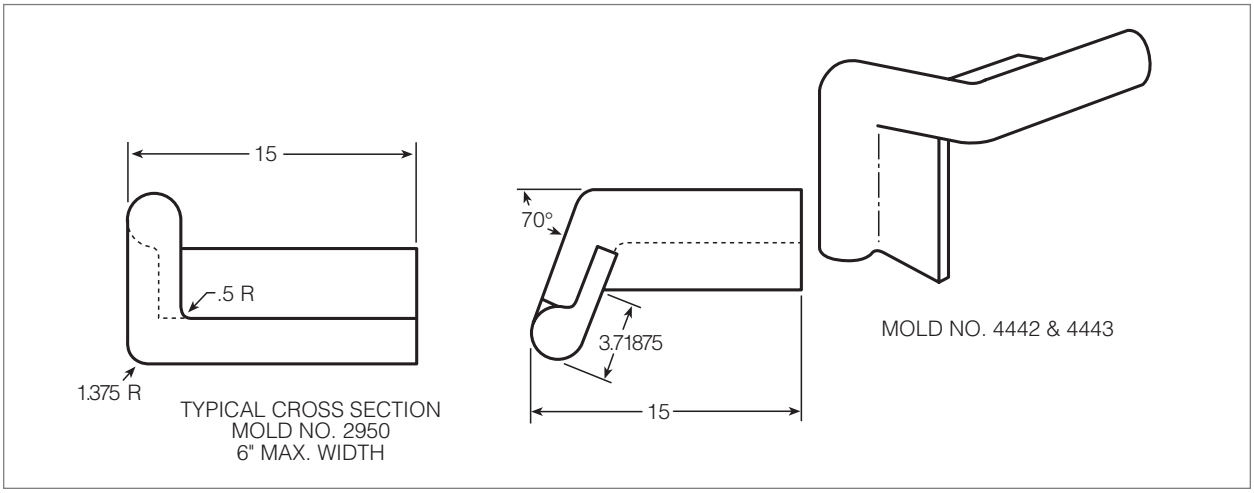
*** AS REQUIRED ** MAX. * MIN.

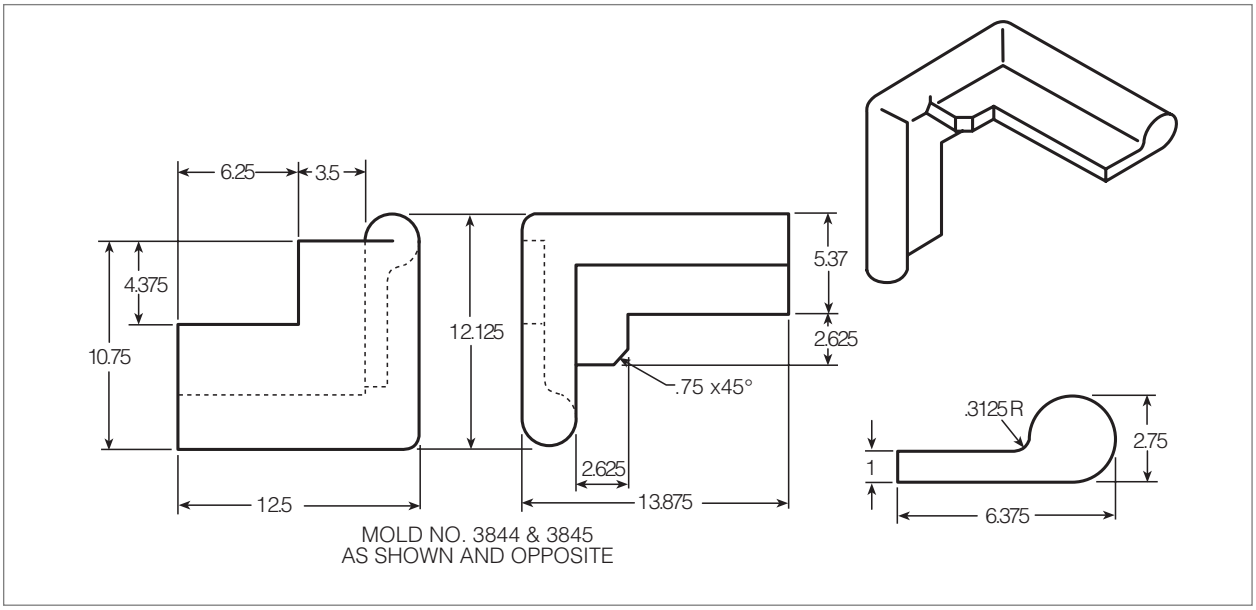


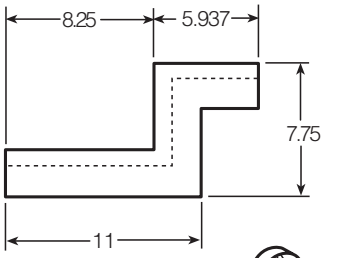
MOLD NO. 7513 & 7514

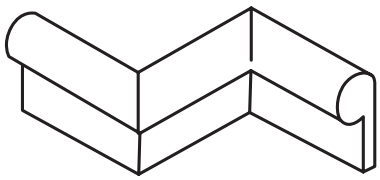


NO.	A	B	C
4727 & 4728	2.25	7	8.75
4442A & 4443A	3.72	6	9.13

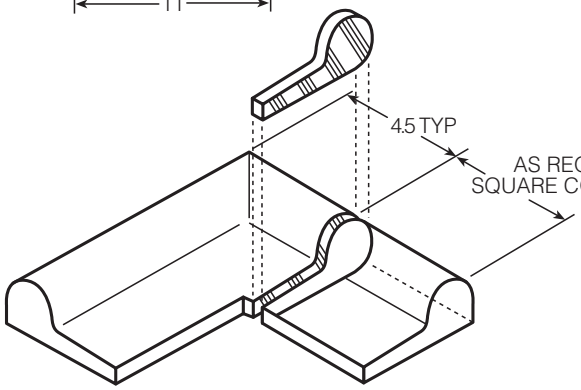




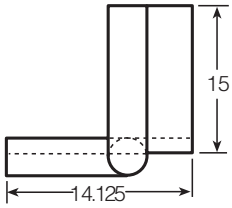


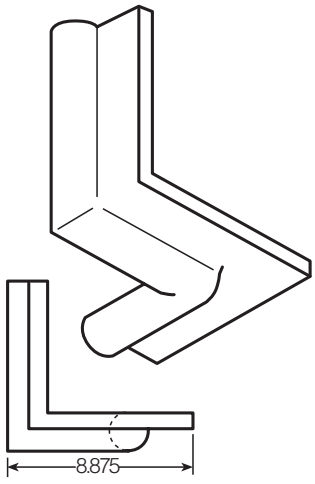


MOLD NO. 4315 & 4316
AS SHOWN AND OPPOSITE
TYPICAL CROSS SECTION

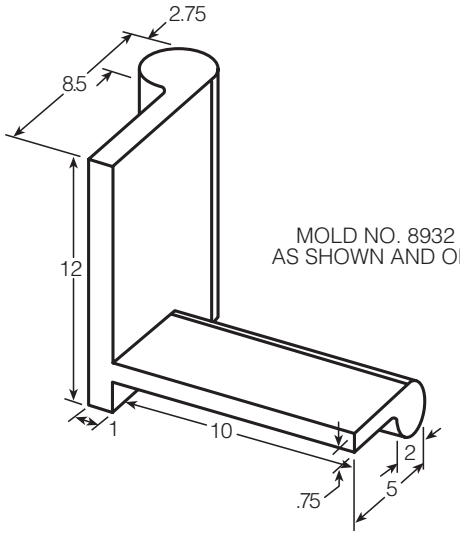


MOLD NO. 6346
AS SHOWN AND OPPOSITE

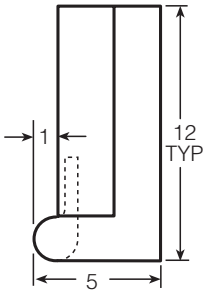


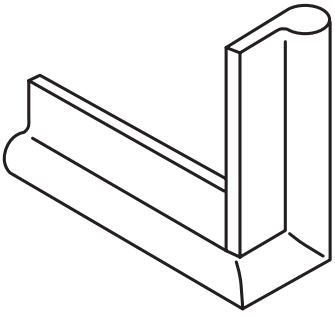


MOLD NO. 3085 & 3086
AS SHOWN AND OPPOSITE

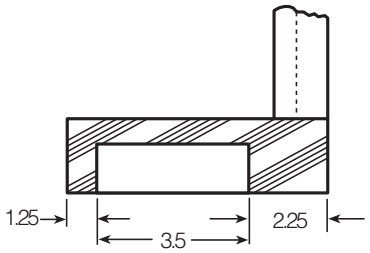


MOLD NO. 8932 / 8933
AS SHOWN AND OPPOSITE

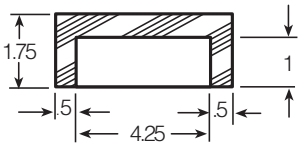




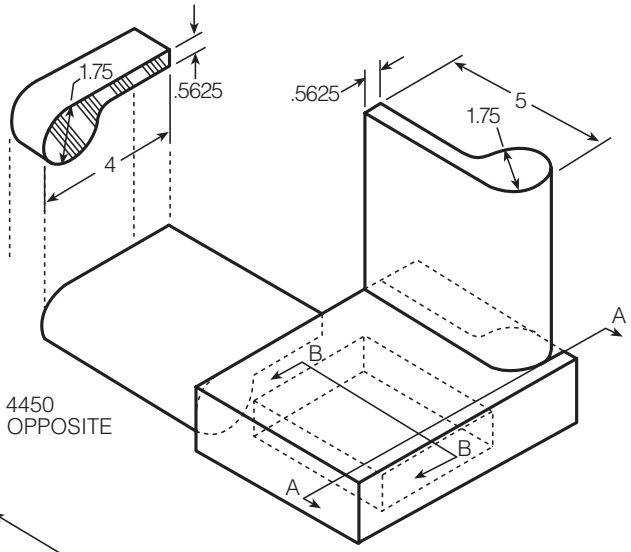
MOLD NO. 5948 & 5949
AS SHOWN AND OPPOSITE



SECTION A-A



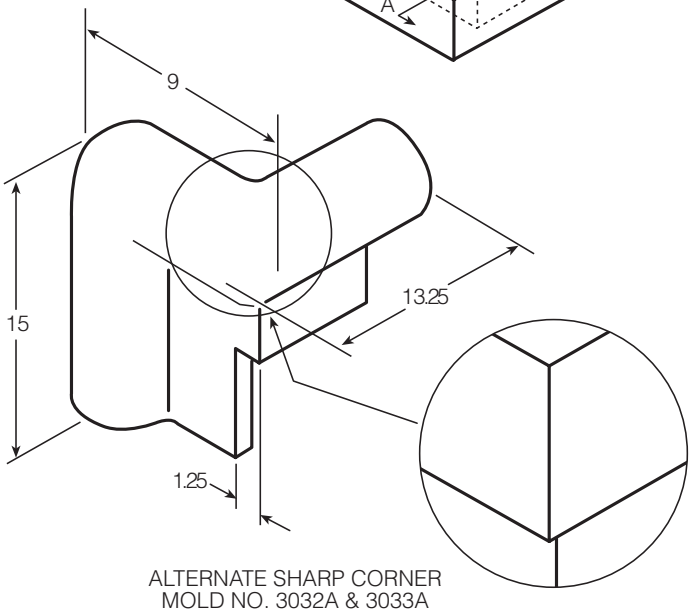
SECTION B-B



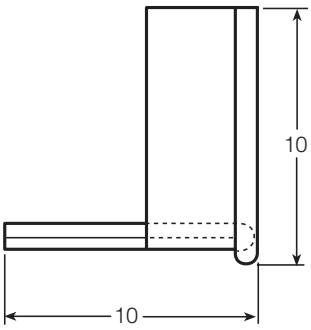
MOLD NO. 4450
AS SHOWN AND OPPOSITE

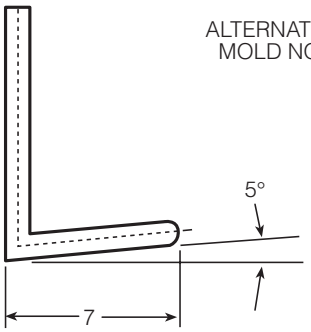
MOLD NO. 3032 & 3033
AS SHOWN AND OPPOSITE
TRANSITION SEALS FOR
CULVERT VALVE

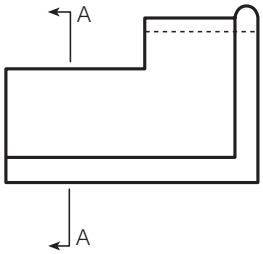
TYPICAL BULB CROSS
SECTION PG. A-1
MOLD NO. 2950

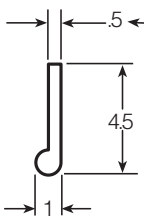


ALTERNATE SHARP CORNER
MOLD NO. 3032A & 3033A



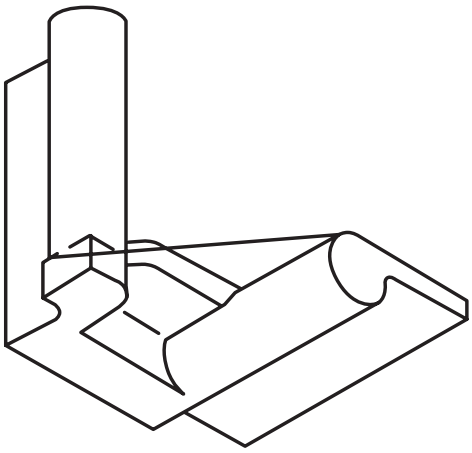


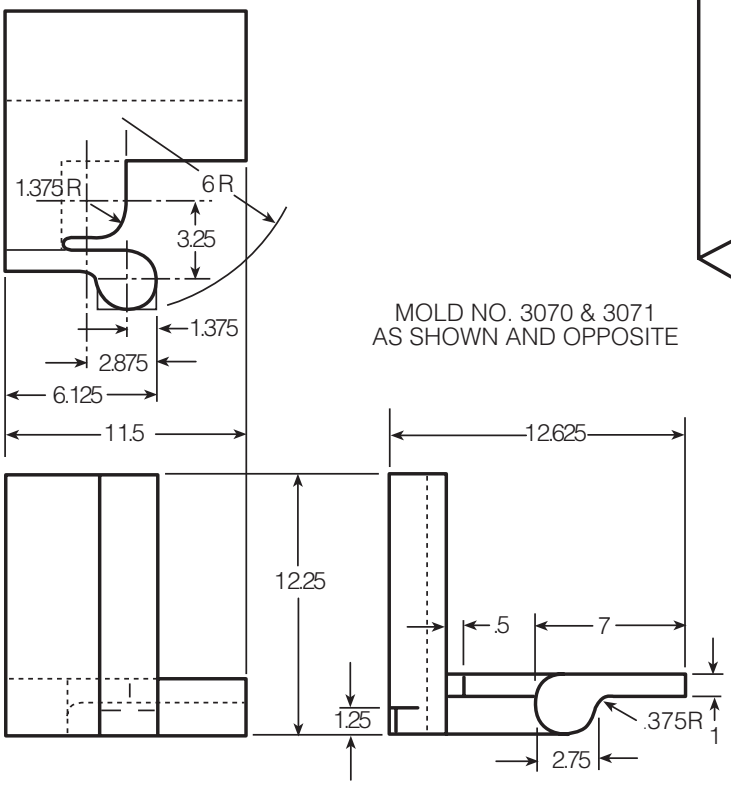




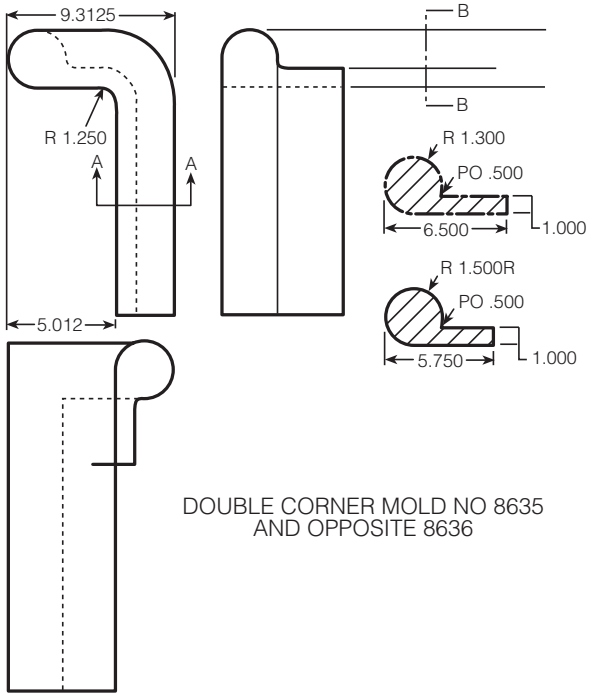
MOLD NO. 5345 & 5346
AS SHOWN AND OPPOSITE

SECTION A-A

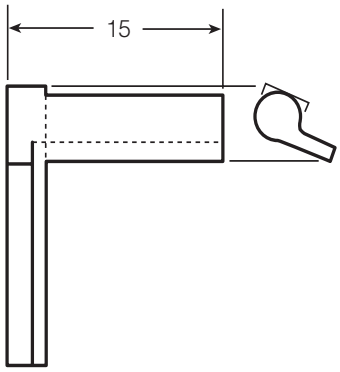




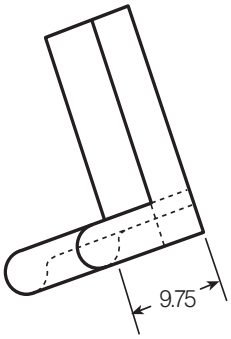
MOLD NO. 3070 & 3071
AS SHOWN AND OPPOSITE

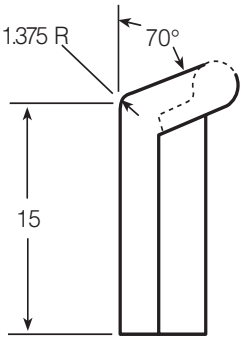


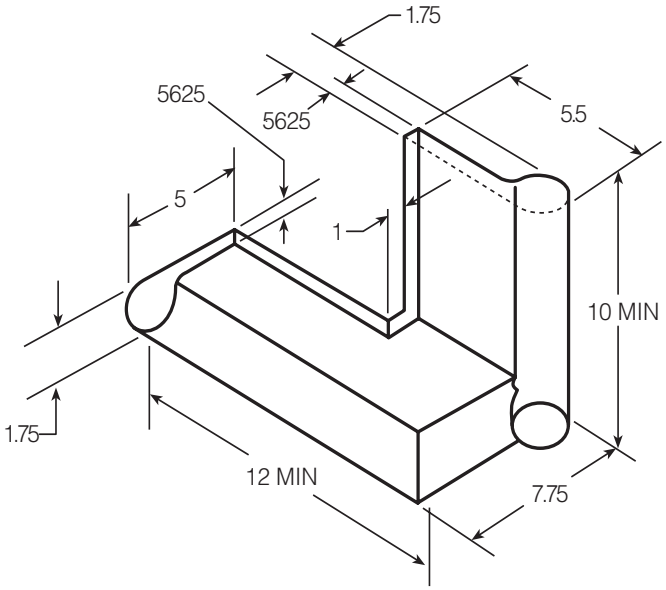
DOUBLE CORNER MOLD NO 8635
AND OPPOSITE 8636



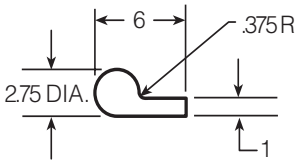
MOLD NO.'S 6841 & 6842
AS SHOWN AND OPPOSITE 8636





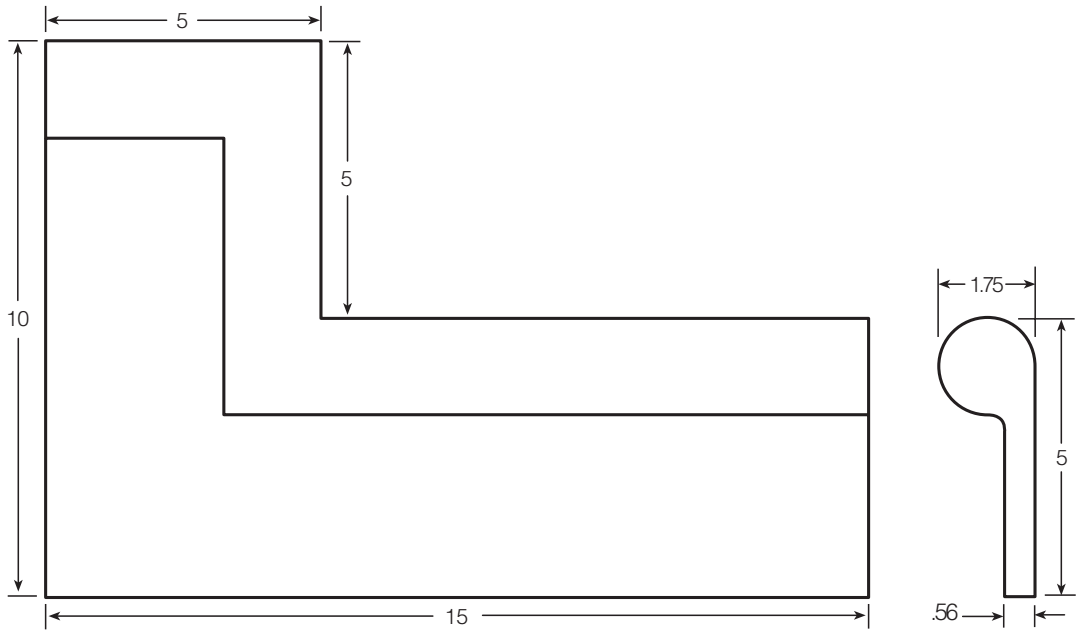


MOLD NO. 8024
AS SHOWN AND OPPOSITE

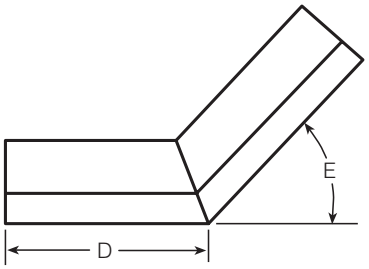


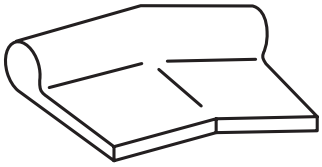
TYPICAL CROSS-SECTION
(USE WITH MOLD NO. 2950)

"J" Seal Transition Corners & Misc. Angles

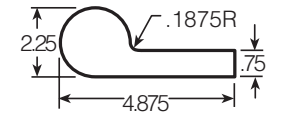


MOLD NO. 9100
AS SHOWN AND OPPOSITE





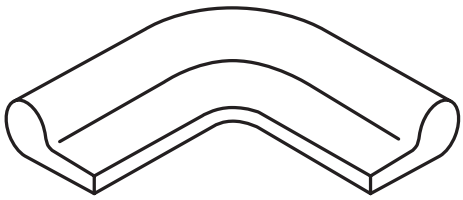
NO.	A	B	C	D	E	R
5617	2.50	6	.875	22 TYP	53°	.375R
5619	2.50	6	.875	21 TYP	69°	.375R
4796	2.75	6	1	15 TYP	45°	.375R
5032	2.75	9.25	1	18 TYP	45°	.375R

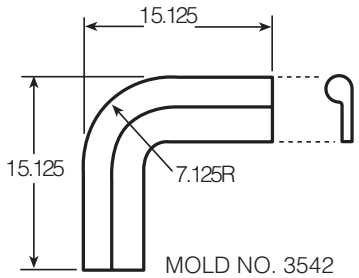


TYPICAL CROSS SECTION

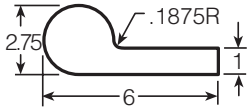
MOLD NO. 3541
MOLD NO. 3542

MOLD NO. 3542



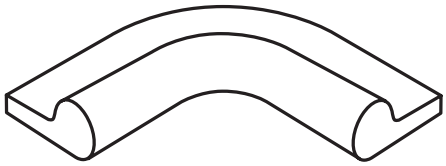


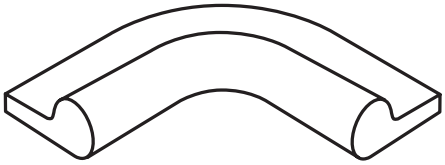
MOLD NO. 3542



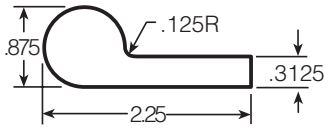
TYPICAL CROSS SECTION
MOLD NO. 3706

MOLD NO. 3541

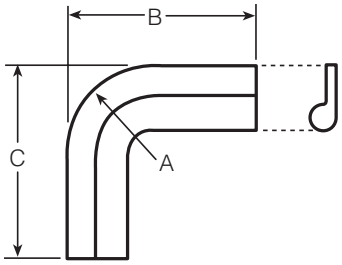




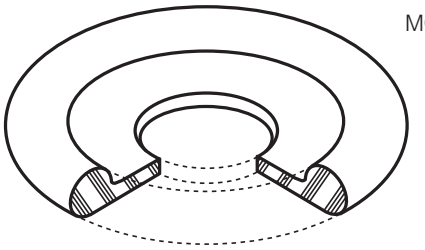
MOLD NO. 3706



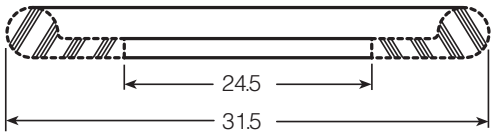
TYPICAL CROSS SECTION
MOLD NO. 8529

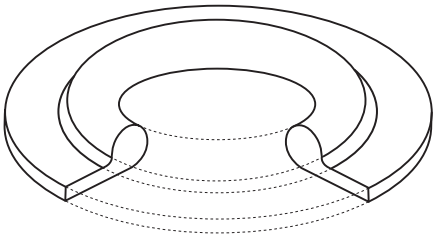


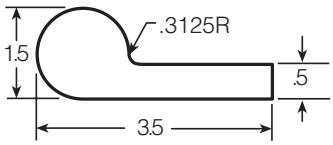
NO.	A	B	C
3541	7.375	15.50	15.50
3706	10.437	21	21
8529	9.25	12	12



MOLD NO. 5739

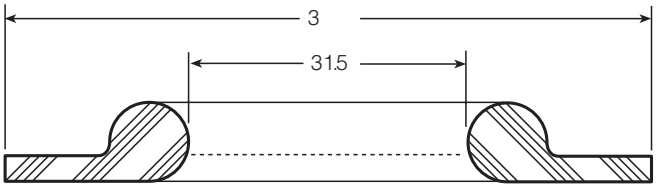


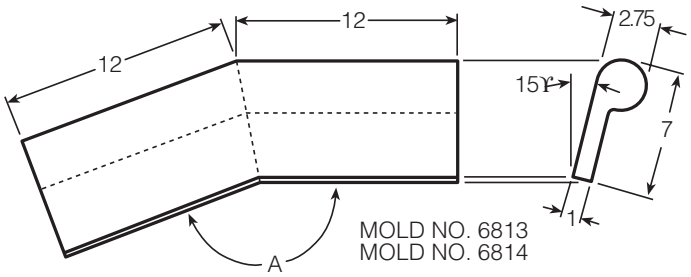




TYPICAL CROSS SECTION

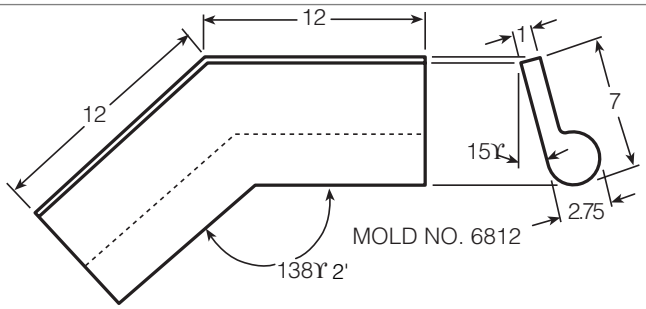
MOLD NO. 5738



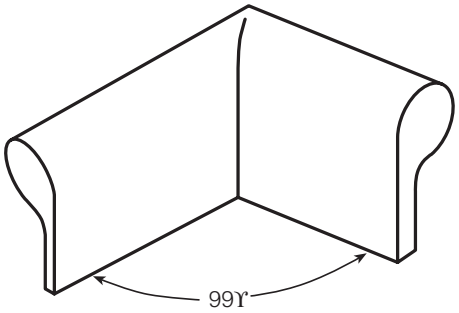


MOLD NO. 6813
MOLD NO. 6814

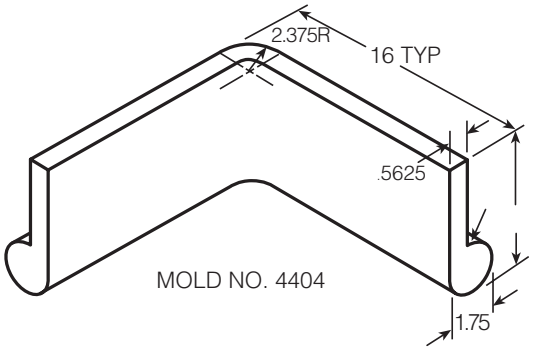
NO.	A
6813	138°26'
6814	161°34'



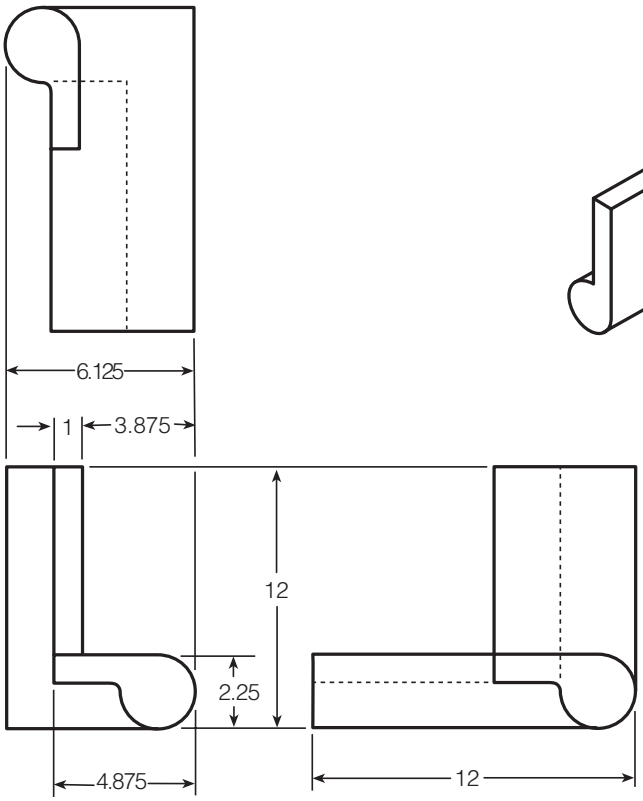
MOLD NO. 6812



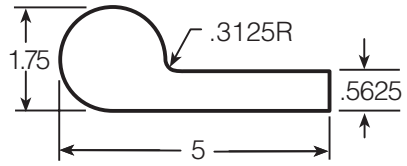
MOLD NO. 4604
BULB CROSS SECTION
SAME AS 4404 BELOW



MOLD NO. 4404

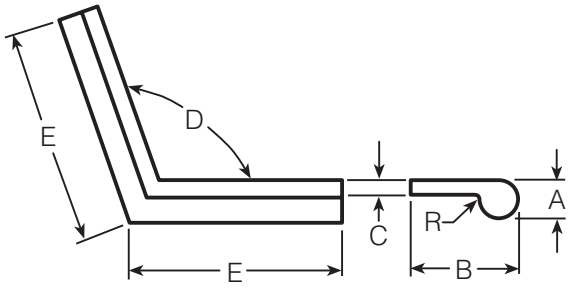


MOLD NO. 7047 & 7048

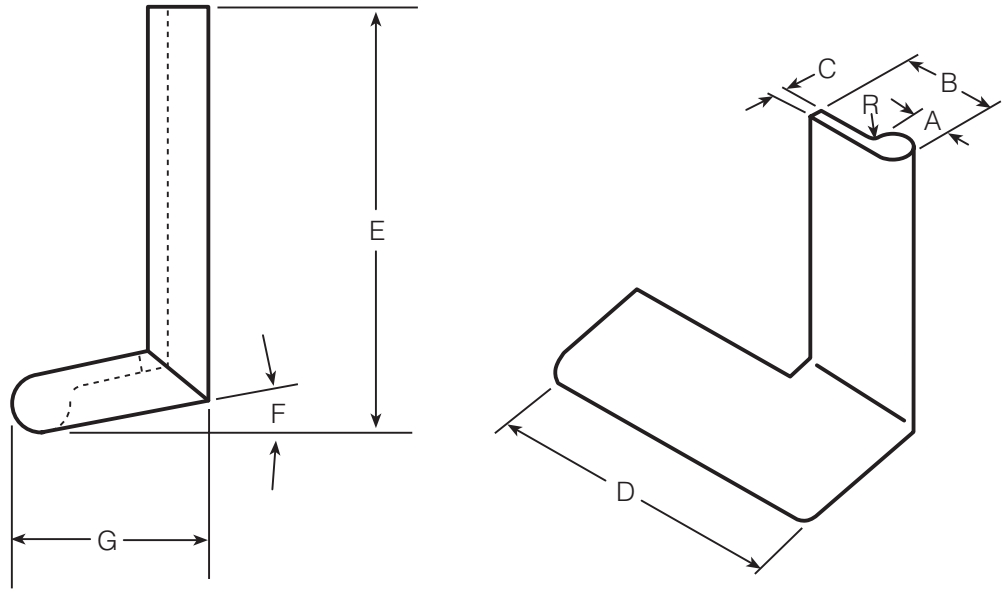


TYPICAL CROSS SECTION

MOLD NO. 8529



NO.	A	B	C	D	E	R
5497 & OPP.	1.75	5	.562	112.50°	15	.312R



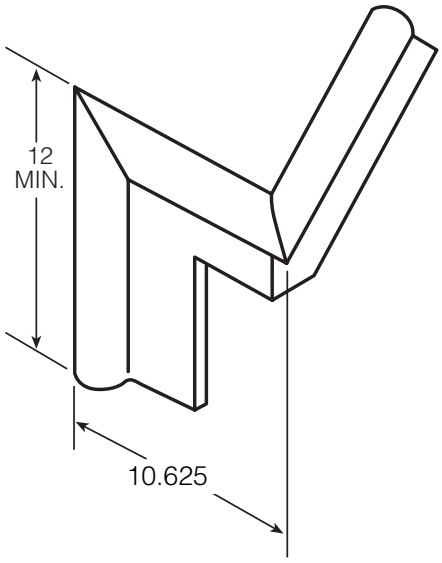
NO.	A	B	C	D	E	F	G	R
5453 & 5454	1.75	4	.562	12	12	13°	5.687	.312R
4936••	2.25	6	1	15	11.375	18.50°	10.50	.25R

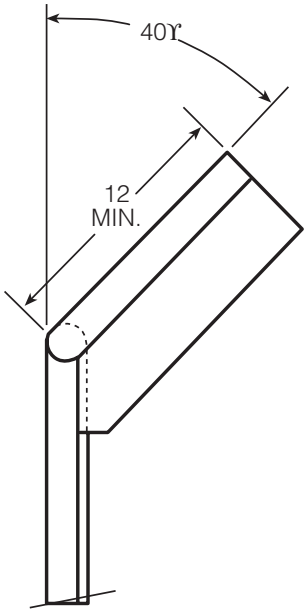
••As shown only

MOLD NO. 5129 & 5130
AS SHOWN AND OPPOSITE

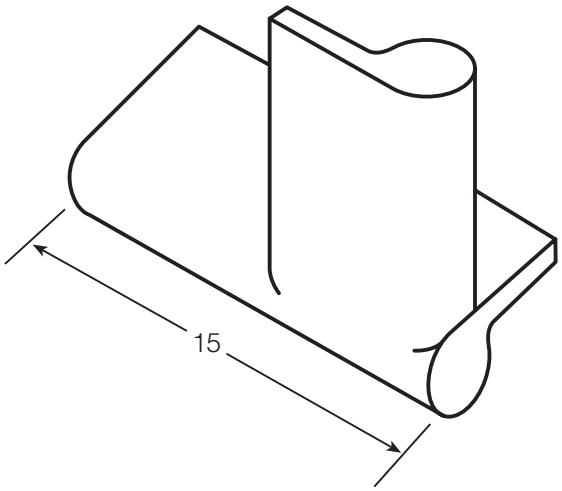
TYPICAL CROSS SEcTION
PG A1, MOLD NO.2514

5'' MAX. WIDTH

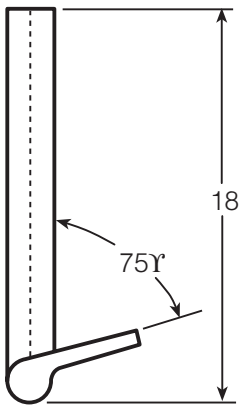




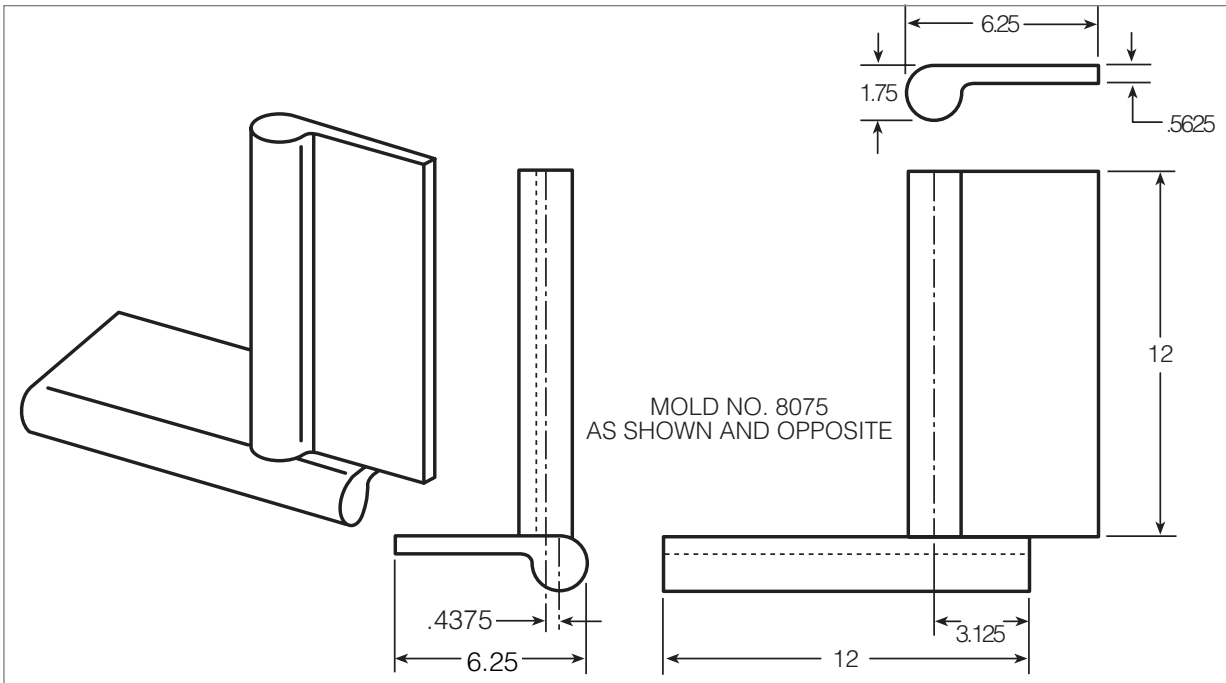
MOLD NO. 4942
AS SHOWN AND OPPOSITE

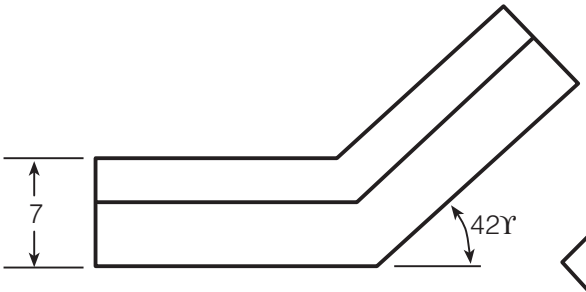


TYPICAL CROSS SECTION
PG. A1, MOLD NO. 3762

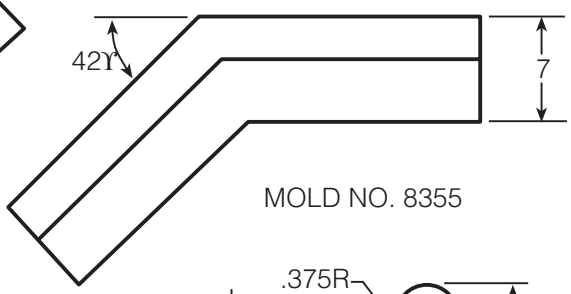


.5" DIA. OPTIONAL

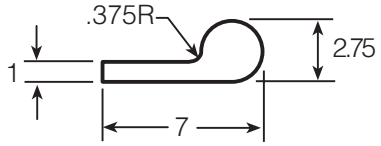




MOLD NO. 8356

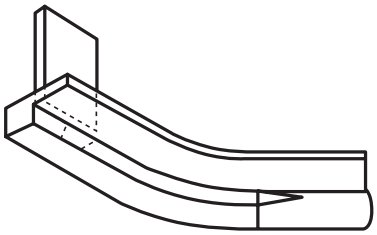


MOLD NO. 8355

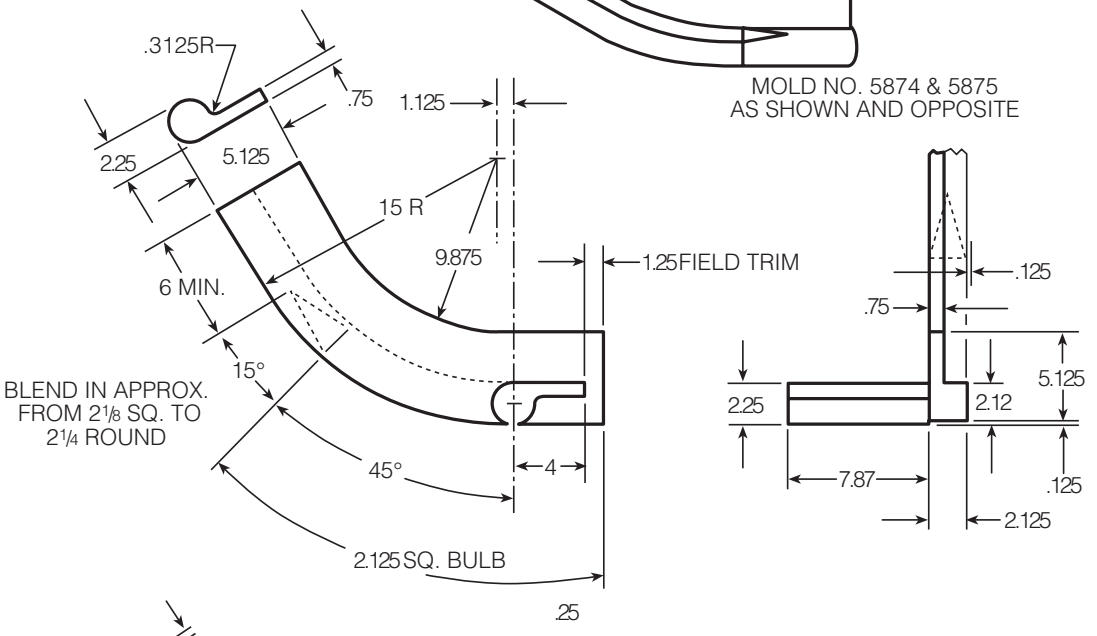


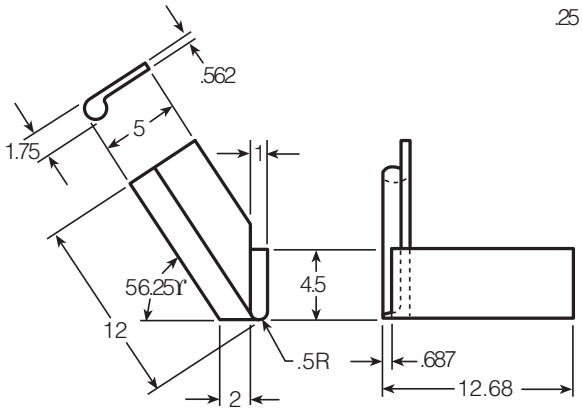
TYPICAL CROSS SECTION

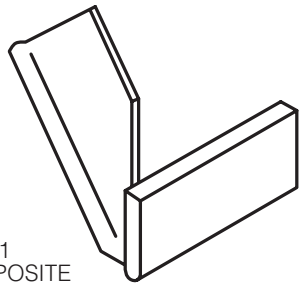
MOLD NO. 8357



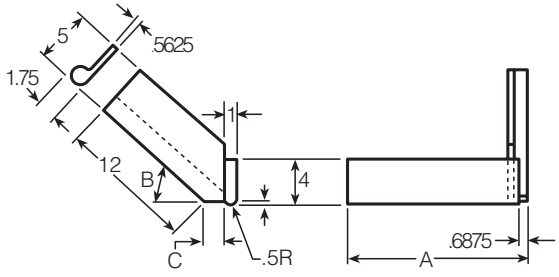
MOLD NO. 5874 & 5875
AS SHOWN AND OPPOSITE



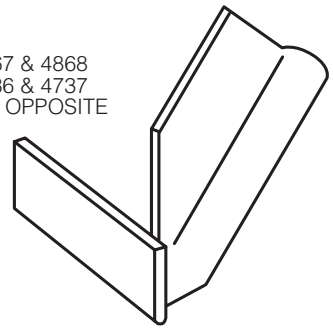




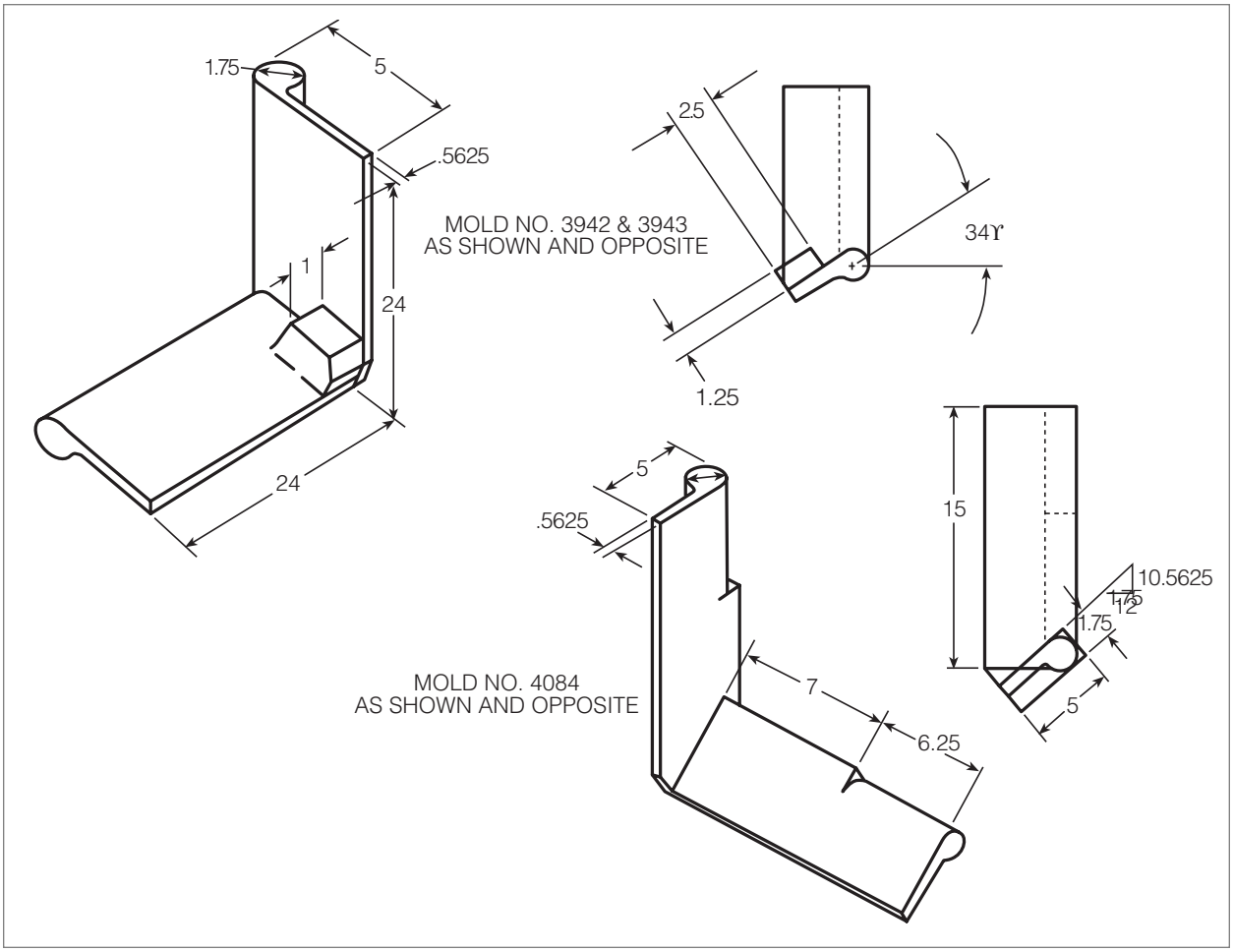
MOLD NO. 5801
AS SHOWN AND OPPOSITE

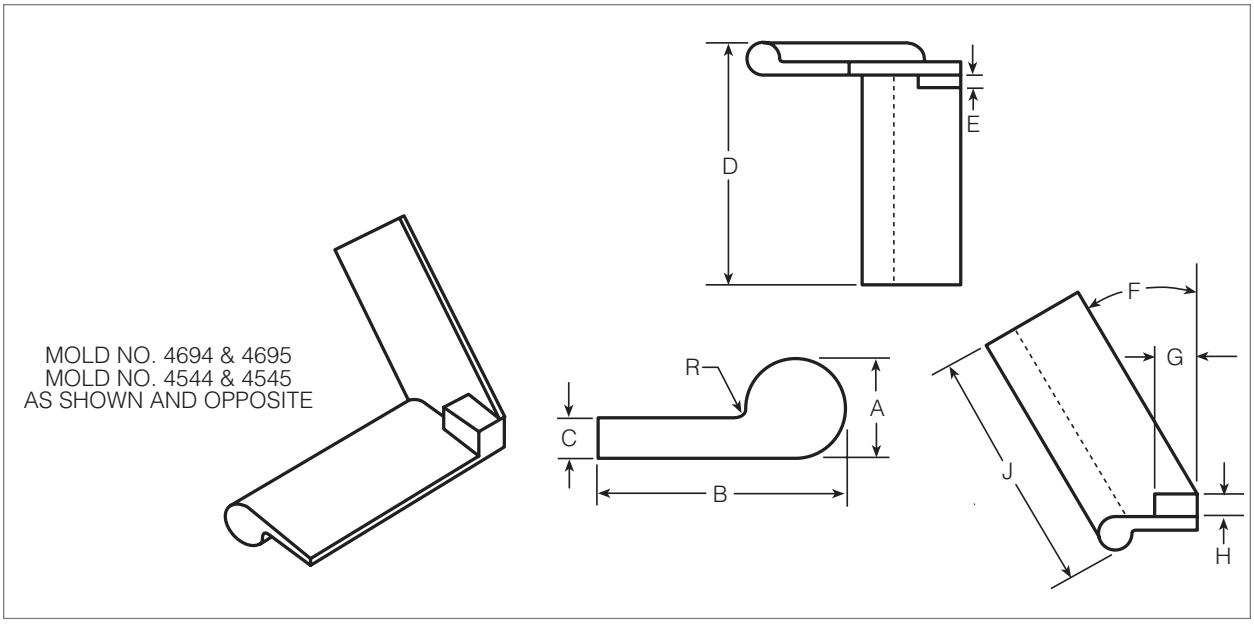


MOLD NO. 4867 & 4868
MOLD NO. 4736 & 4737
AS SHOWN AND OPPOSITE

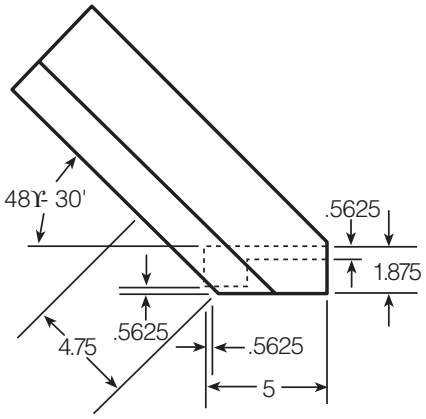


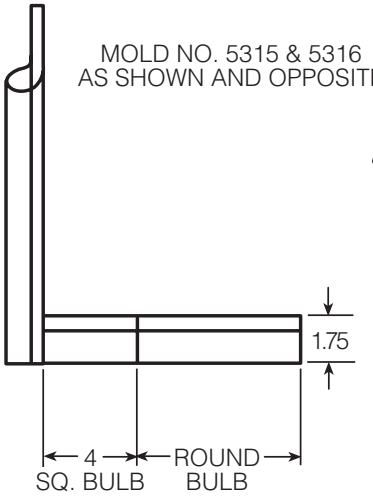
NO.	A	B	C
4867 & 4868	16	42°	1.875
4736 & 4737	12	34.50°	1.375



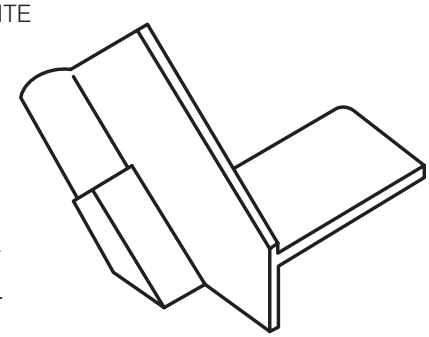


NO.	A	B	C	D	E	F	G	H	J	R
4694 & 4695	2.25	6	.75	15	.50	59°	2.75	1.375	15	.312 R
4544 & 4545	1.75	5	.562	15	.875	53°	2.50	1.25	15	.312 R

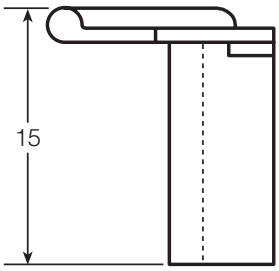




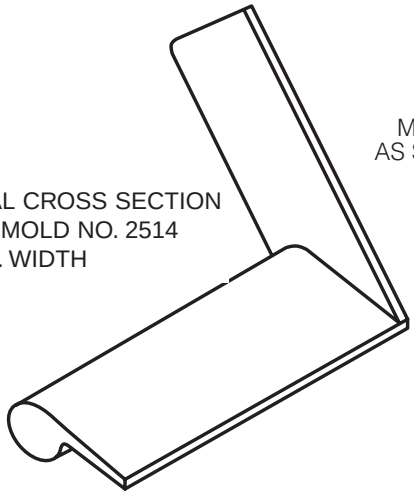
MOLD NO. 5315 & 5316
AS SHOWN AND OPPOSITE



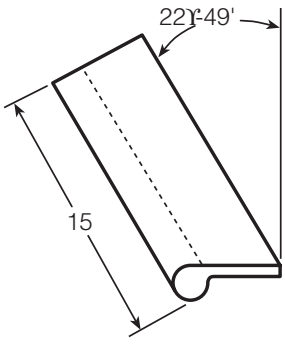
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2514
5" MAX. WIDTH

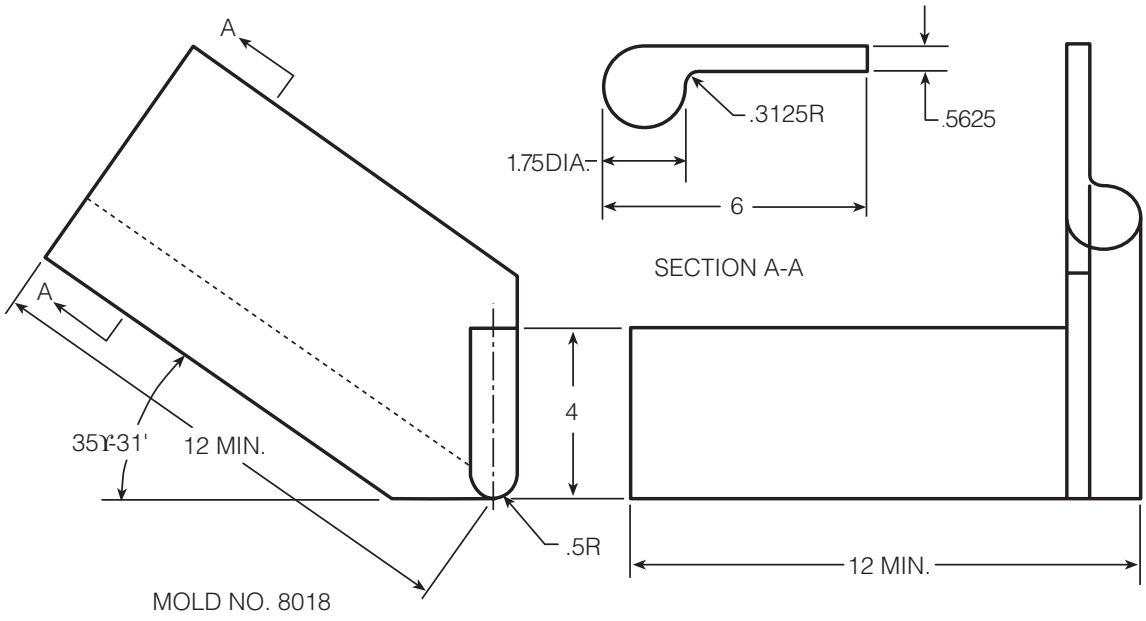


TYPICAL CROSS SECTION
PGA 1, MOLD NO. 2514
6" MAX. WIDTH

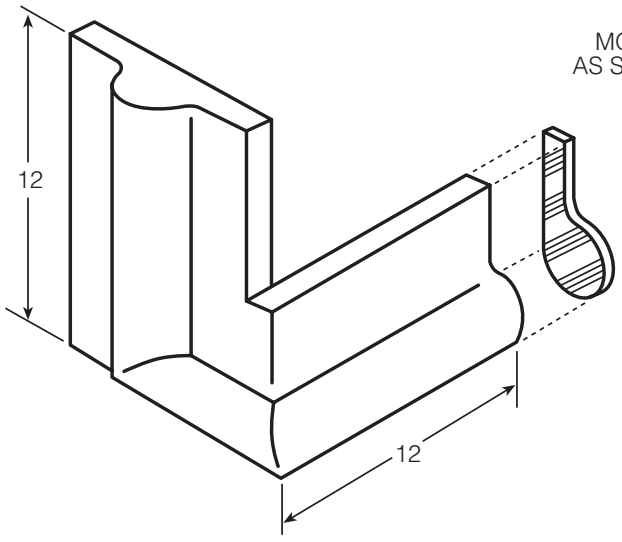


MOLD NO. 4592 & 4593
AS SHOWN AND OPPOSITE





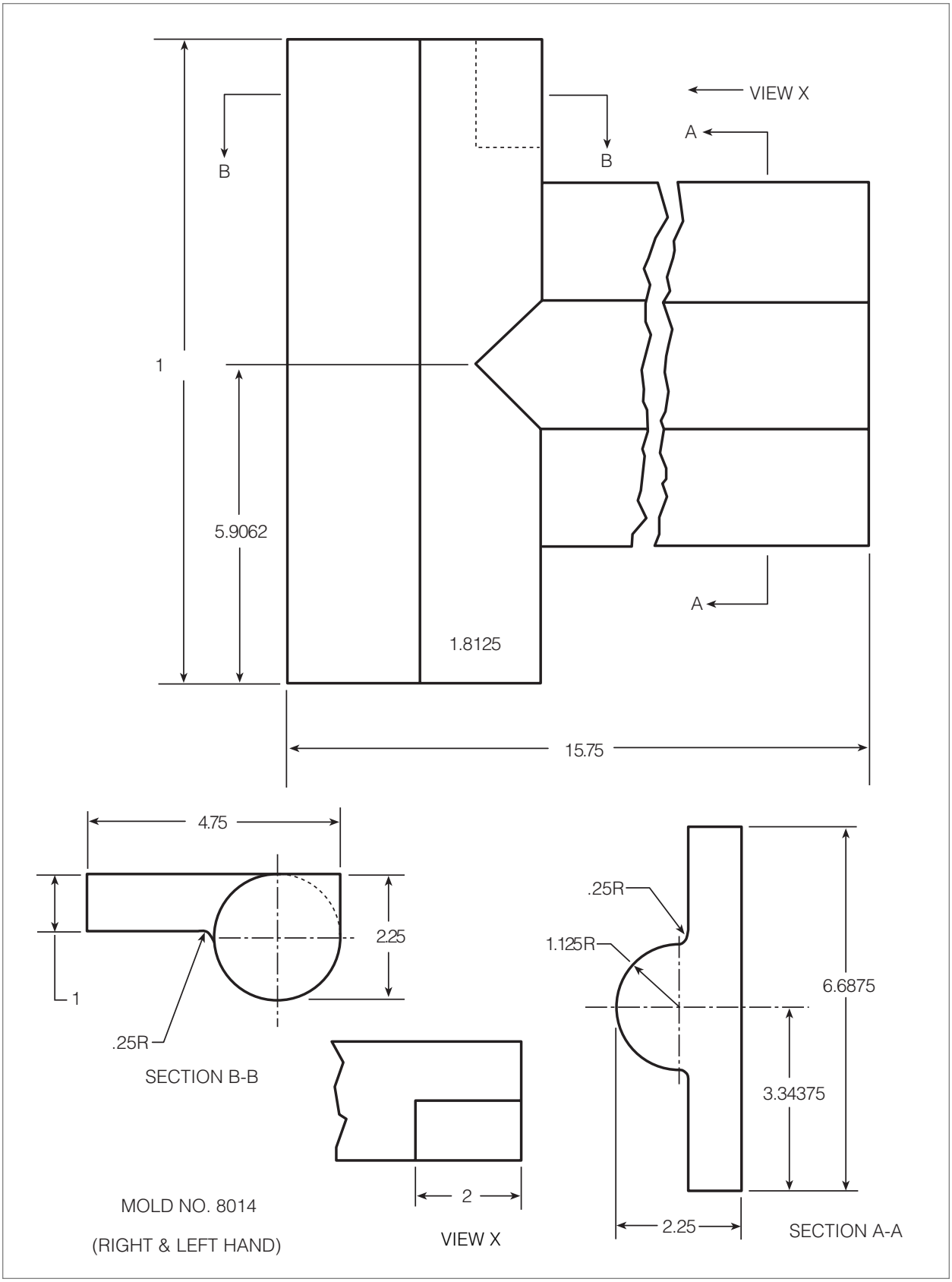
MOLD NO. 8018

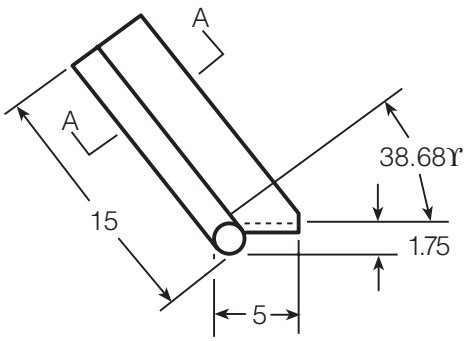


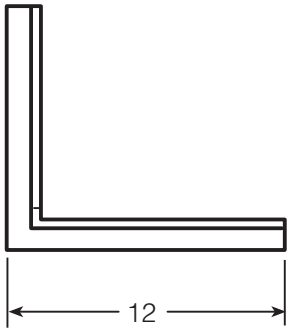
MOLD NO. 4862 & 4863
AS SHOWN AND OPPOSITE

TYPICAL'J' SEAL CROSS SECTION
PG. A-1
MOLD NO. 2514 MAX. WIDTH 5"

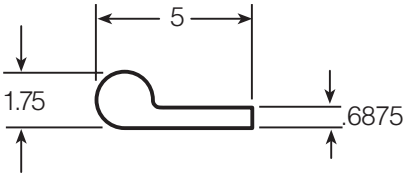
TYPICAL CENTER BULB CROSS
SECTION PG. H-6, MOLD NO. 4767
MAX. WIDTH 6.25"


VIEW X
A
B
B
1
5.9062
A
1.8125
15.75
4.75
2.25
1
.25R
SECTION B-B
2
VIEW X
.25R
1.125R
6.6875
3.34375
2.25
SECTION A-A
MOLD NO. 8014
(RIGHT & LEFT HAND)

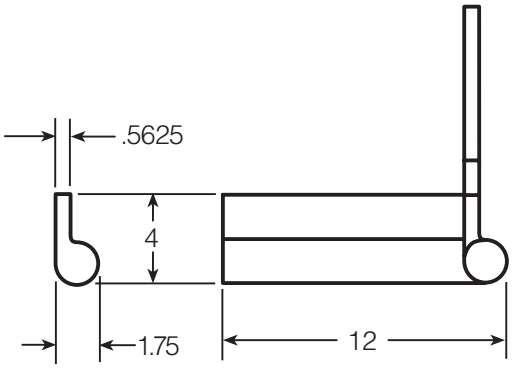




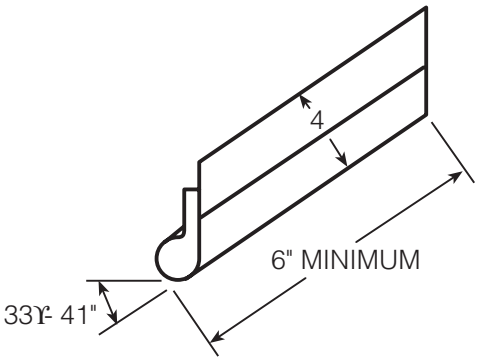
MOLD NO. 8292 & 8293
AS SHOWN AND OPPOSITE



SECTION A-A



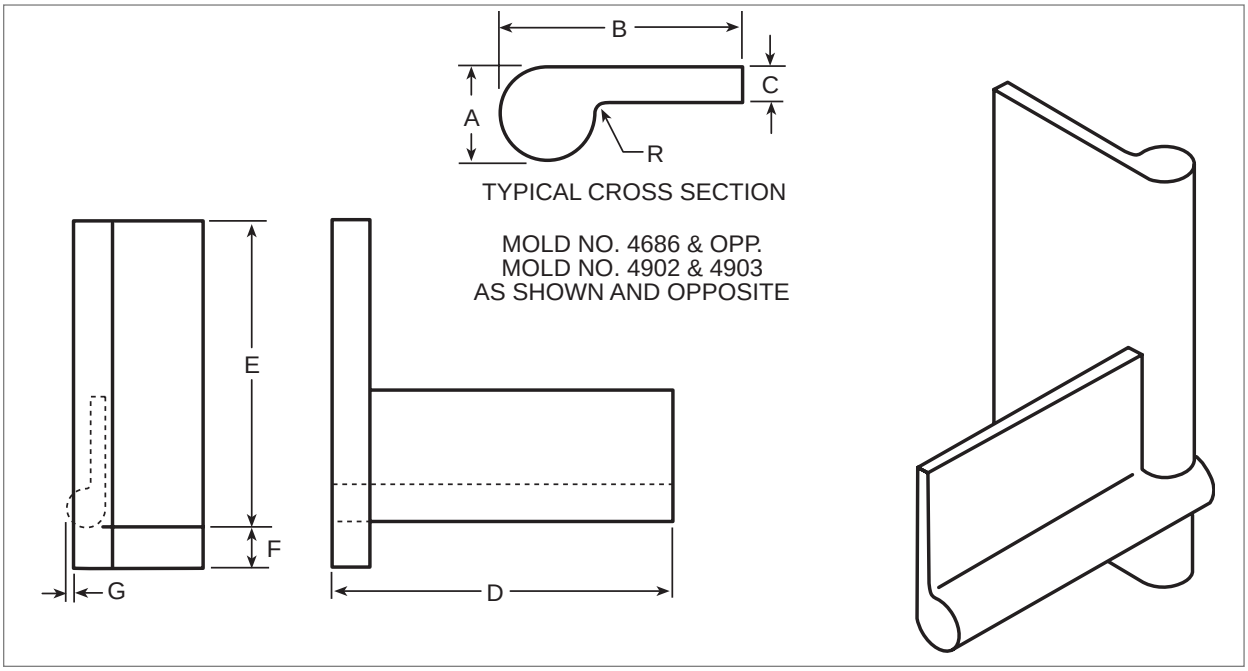
AS SHOWN AND OPP. HAND
HOLLOW BULB, OPTIONAL



MOLD NO'S AT ANGLE SHOWN: 8362 & 8363

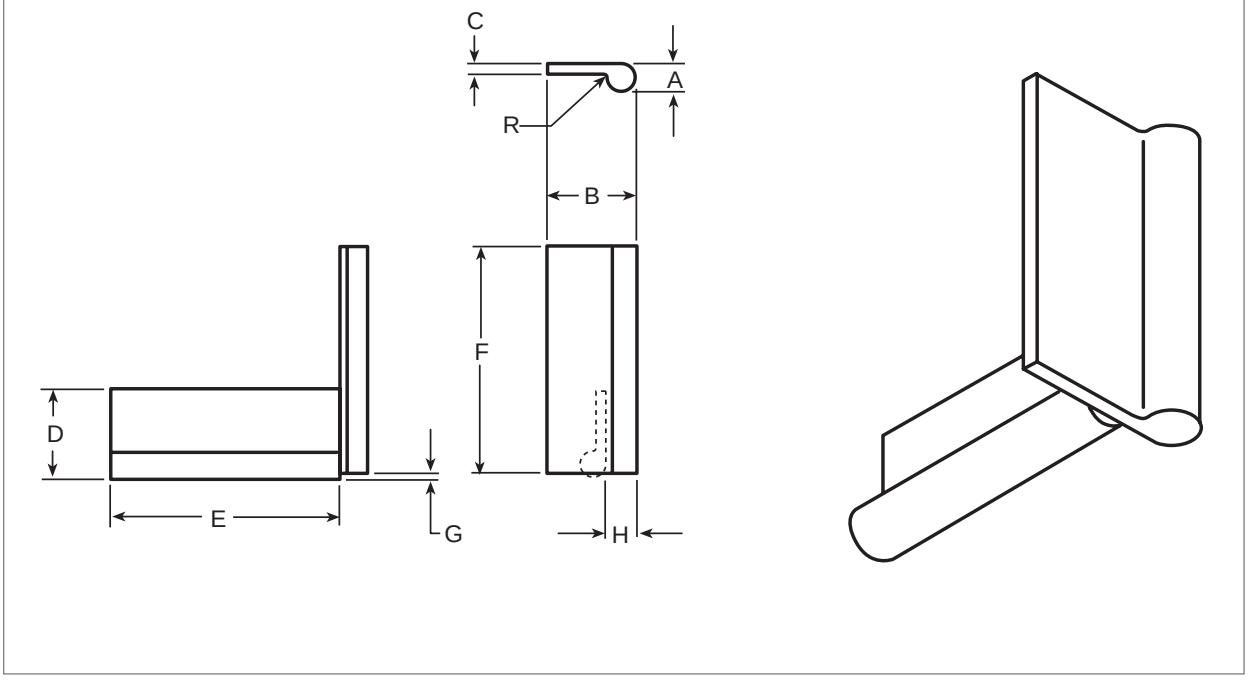
MOLD NO'S AT ANGLE OF 22°-22': 8364 & 8365

"J" Seal Corners, Bulb to Bulb Transition



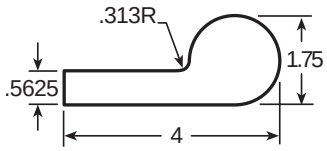
NO.	A	B	C	D	E	F	G	R
4686 & Opp.	1.75	6**	.56	16	16	2	.38	.31R
4903	1.75	5	.88	12*	***	***	.50	.31R

***As required **Max. *Min.

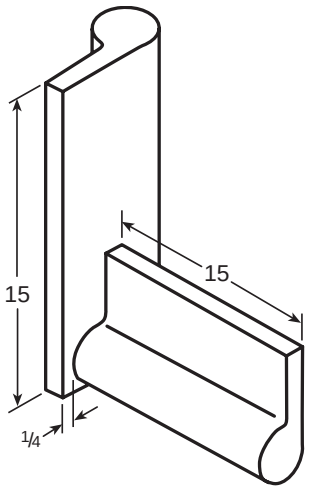


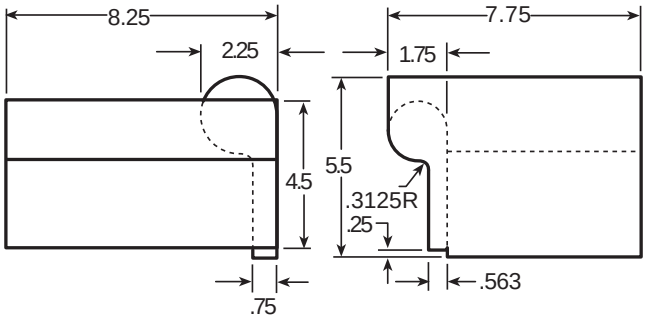
NO.	A	B	C	D	E	F	G	H	R
5746 & Opp.	1.75	6**	.56	4.50	***	***	.25	1.75	.31R

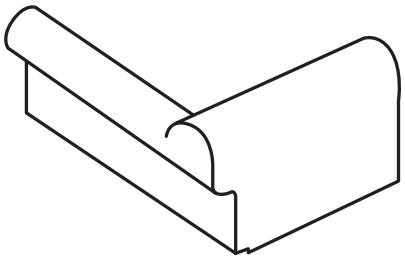
***As Required **Max.



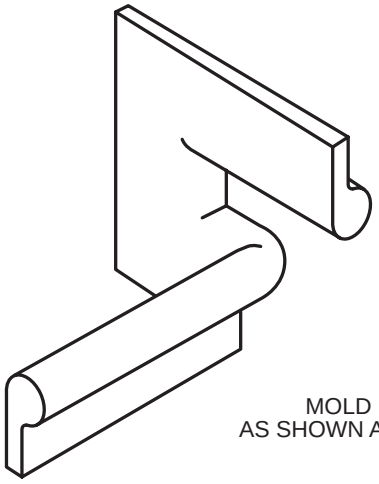
MOLD NO. 5556
AS SHOWN AND OPPOSITE

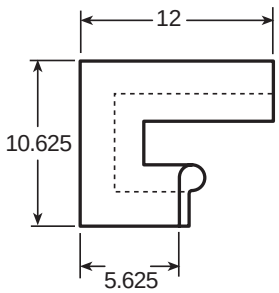


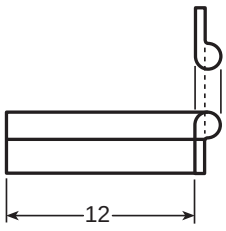




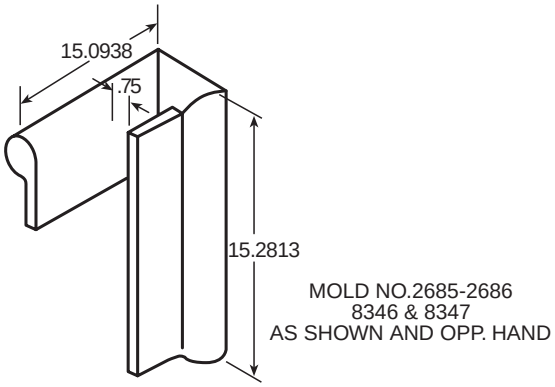
MOLD NO. 4810 & 4811
AS SHOWN AND OPPOSITE



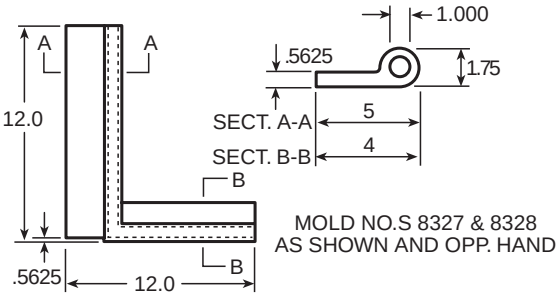




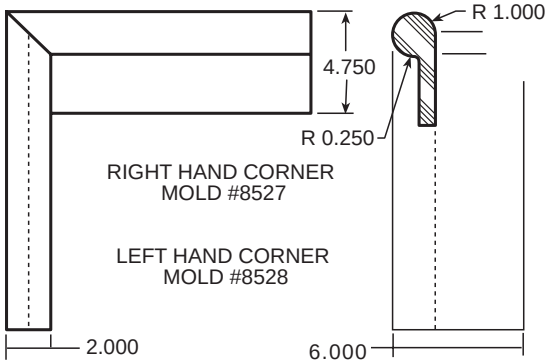
MOLD NO. 4703
AS SHOWN AND OPPOSITE



MOLD NO.2685-2686
8346 & 8347
AS SHOWN AND OPP. HAND

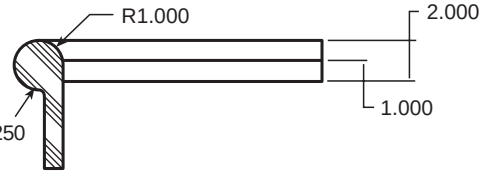


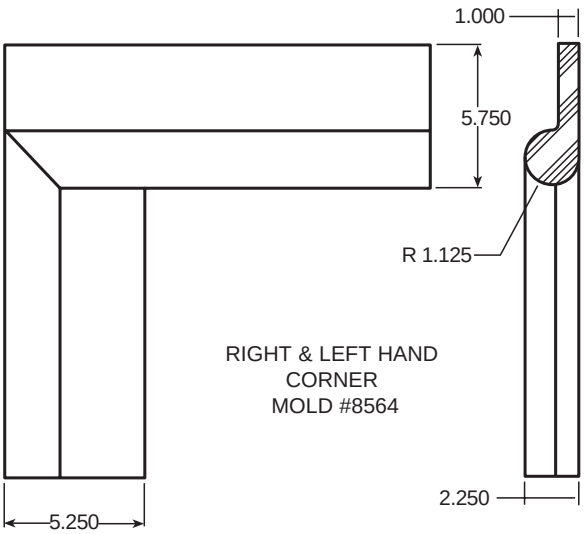
MOLD NO.S 8327 & 8328
AS SHOWN AND OPP. HAND



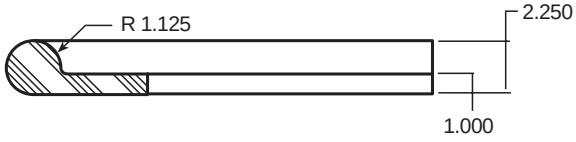
RIGHT HAND CORNER
MOLD #8527

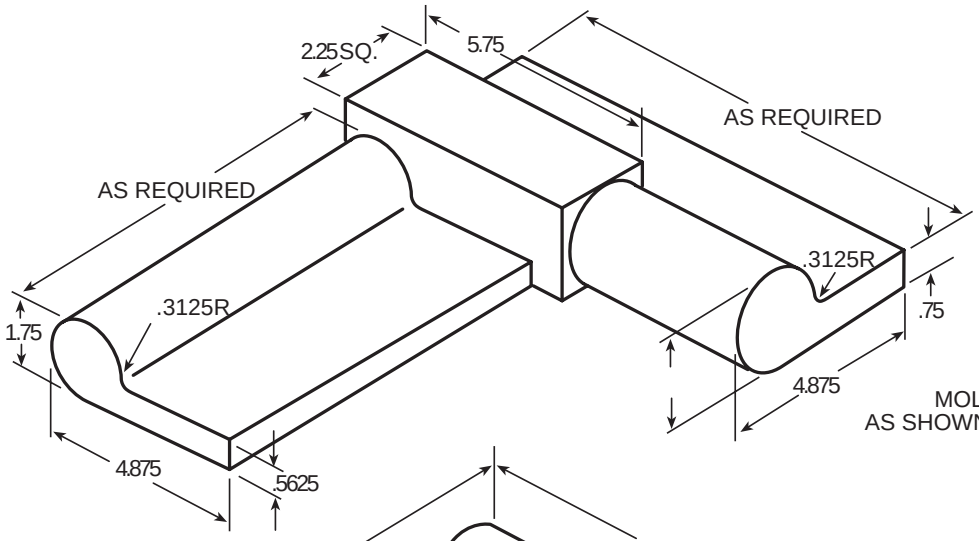
LEFT HAND CORNER
MOLD #8528



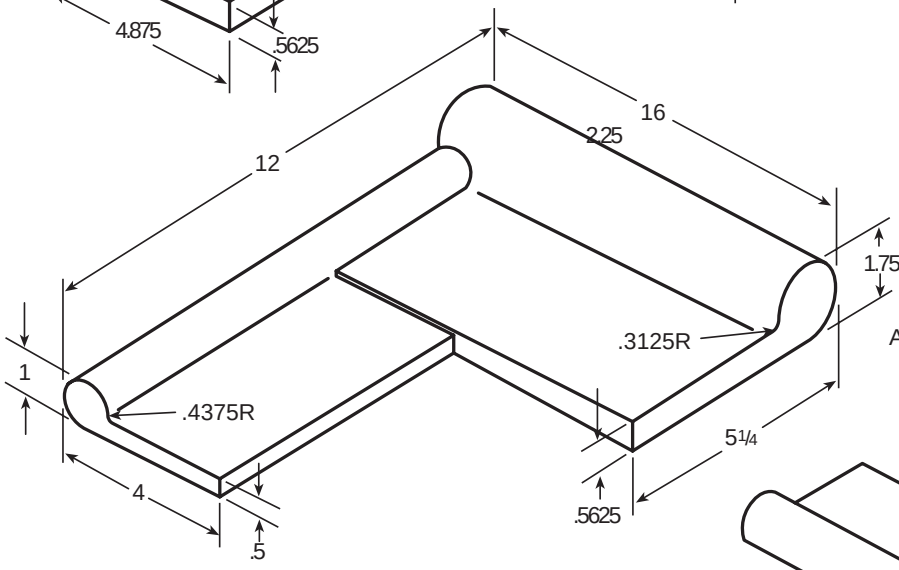


RIGHT & LEFT HAND
CORNER
MOLD #8564

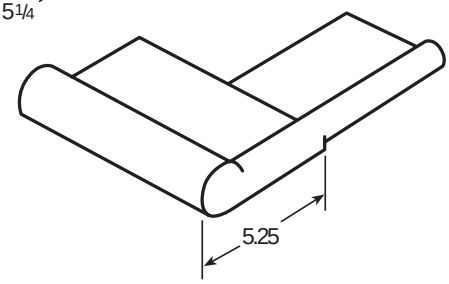


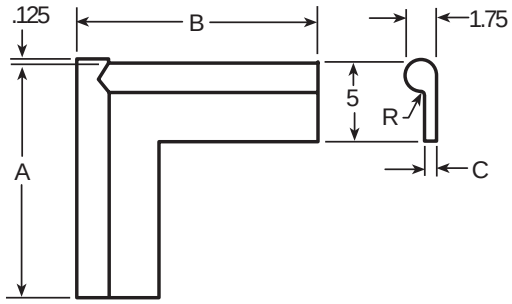


MOLD NO.6091
AS SHOWN AND OPPOSITE

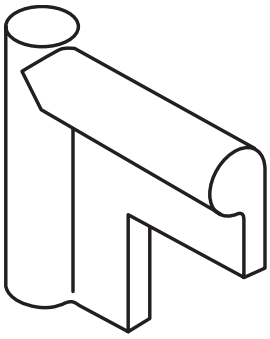


MOLD NO.6239
AS SHOWN AND OPPOSITE

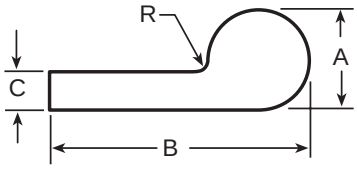


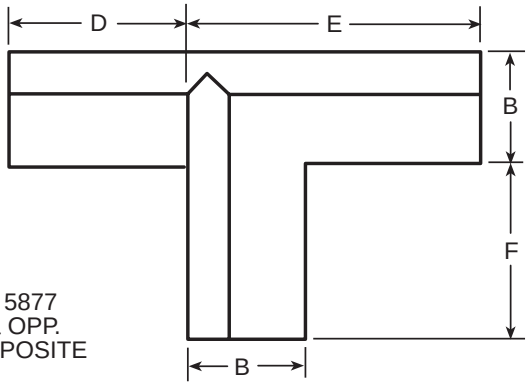


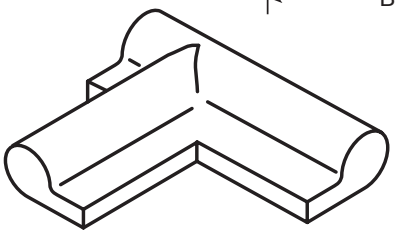
MOLD NO.4231A & OPP.
MOLD NO. 3001 & OPP.



NO.	A	B	C	R
4231A & Opp.	16.50	17.75	.56	.31
3001 & Opp.	15	15	.69	.25



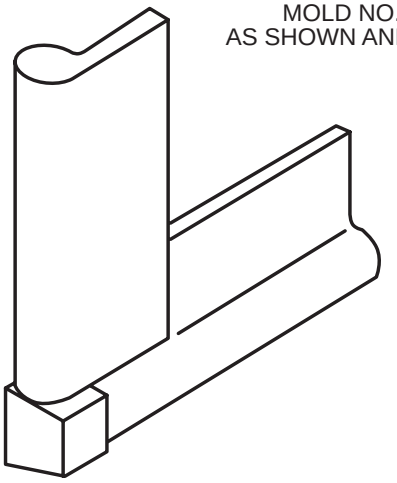


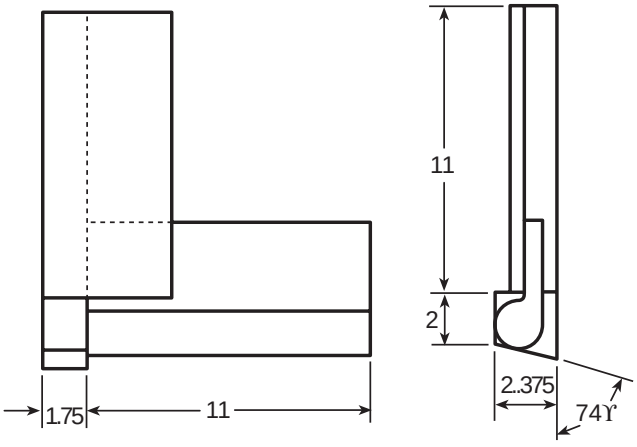


MOLD NO.5876 & 5877
MOLD NO. 4231 & OPP.
AS SHOWN AND OPPOSITE

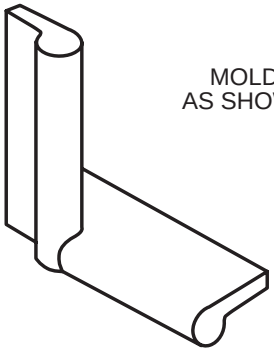
NO.	A	B	C	D	E	F	R
5876 & 5877	2.25	6**	.75	9	15	9	.31
4231 & Opp.	1.75	5	.56	9**	16.50	12.75	.31
8478 & Opp.	1	3	.50	9	9	9	.44

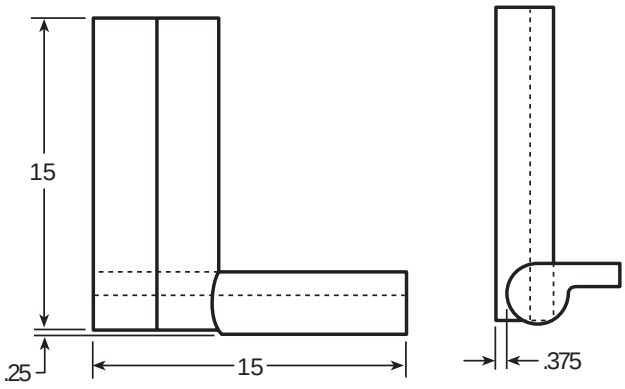
MOLD NO. 2247-C
AS SHOWN AND OPPOSITE





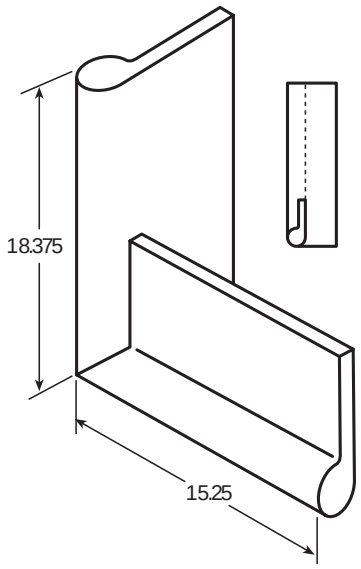
MOLD NO. 3703 & 3704
AS SHOWN AND OPPOSITE

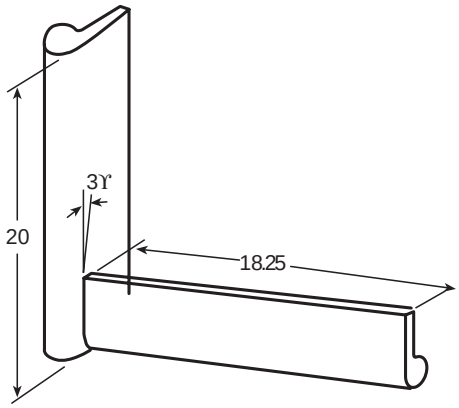




MOLD NO. 3220 & 3221
AS SHOWN AND OPPOSITE

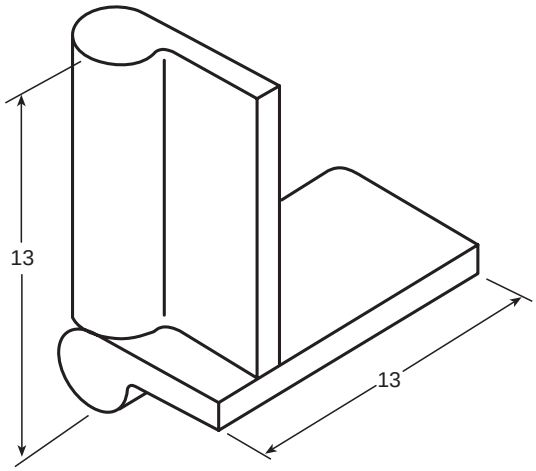
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2514 6'' MAX.





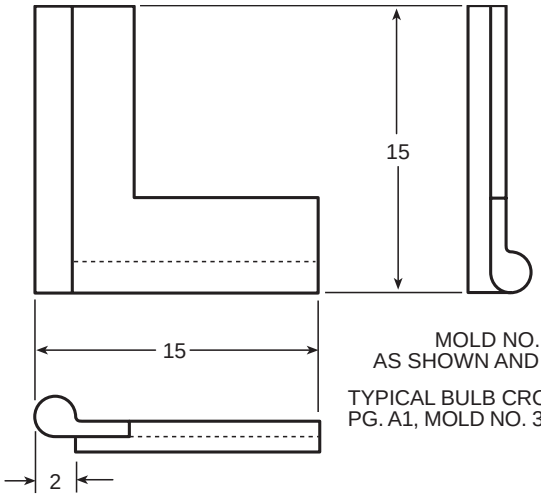
MOLD NO. 4407
AS SHOWN AND OPPOSITE

TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2514 5'' MAX. WIDTH



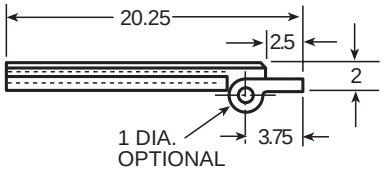
MOLD NO. 5997 & 5998
AS SHOWN AND OPPOSITE

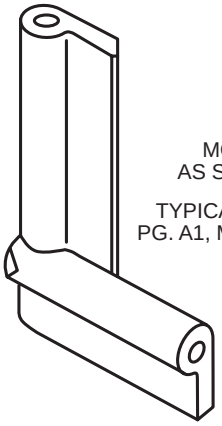
TYPICAL CROSS SECTION
2.5 x 6 x .875 PG. A1,
MOLD NO. 3602



MOLD NO. 4218
AS SHOWN AND OPPOSITE

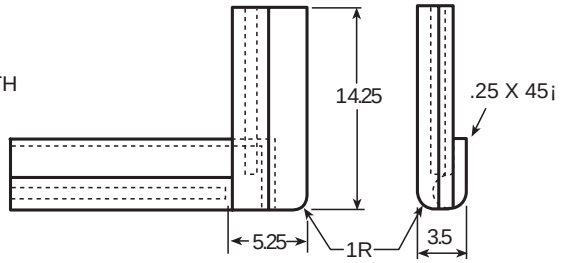
TYPICAL BULB CROSS SECTION
PG. A1, MOLD NO. 3073 5" WIDTH

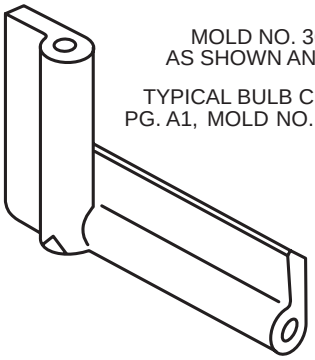




MOLD NO. 2589 & 2590
AS SHOWN AND OPPOSITE

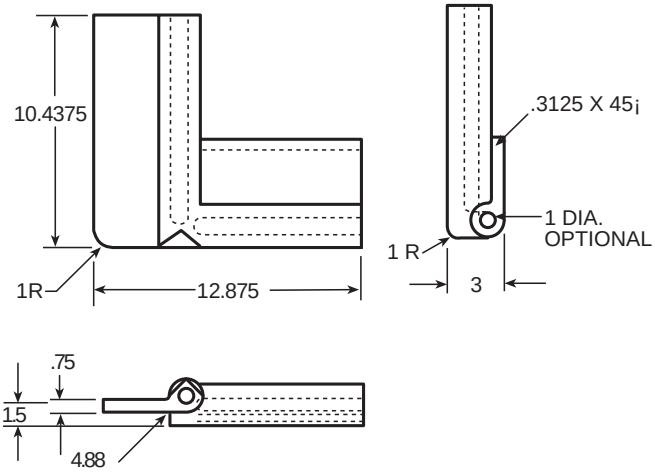
TYPICAL BULB CROSS SECTION
PG. A1, MOLD NO. 3658 4.88" WIDTH

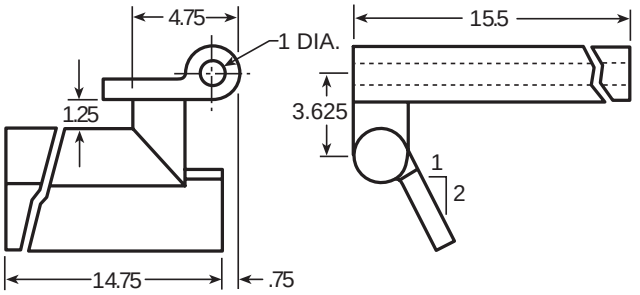




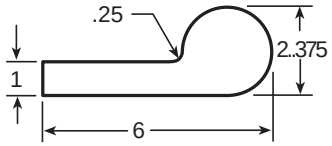
MOLD NO. 3696 & 3697
AS SHOWN AND OPPOSITE

TYPICAL BULB CROSS SECTION
PG. A1, MOLD NO. 3658 4.88" WIDTH

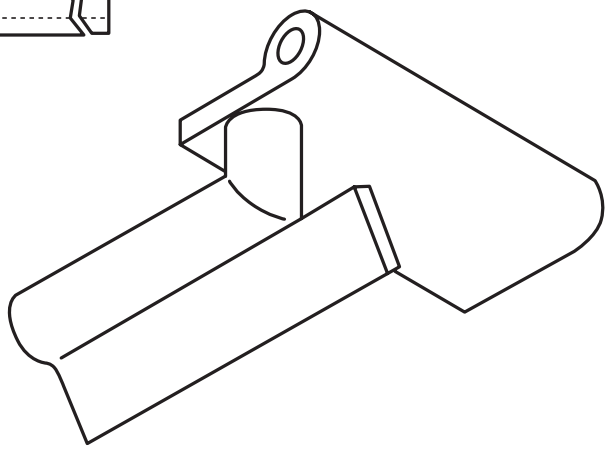


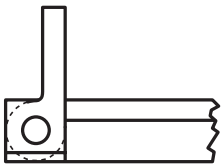


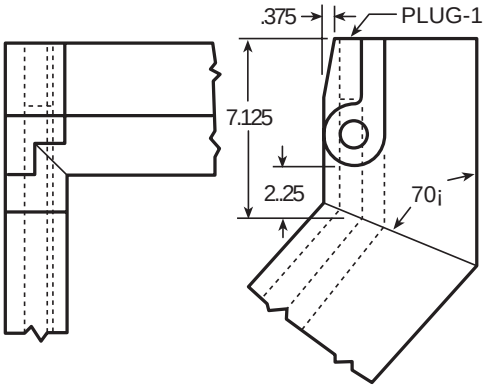
MOLD NO. 2682 & 2683
AS SHOWN AND OPOSITE



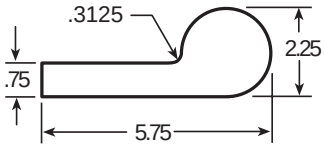
TYPICAL CROSS SECTION



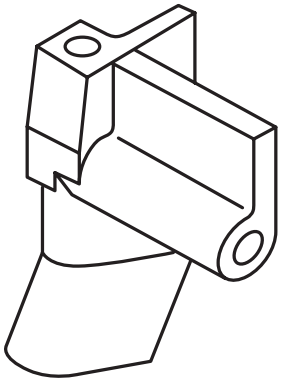


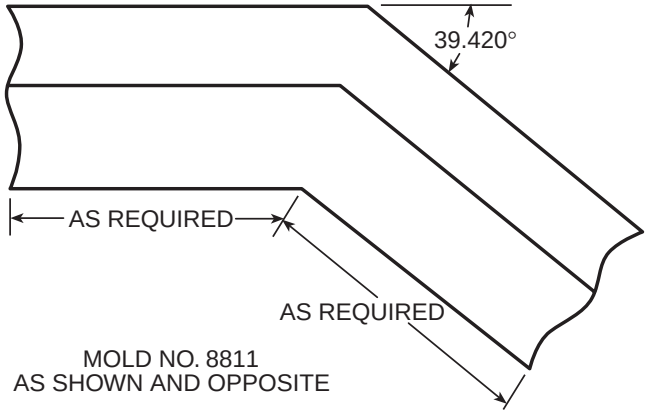


MOLD NO. 4234 & 4235
AS SHOWN AND OPOSITE

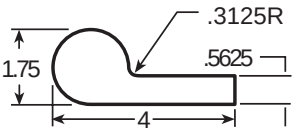


TYPICAL CROSS SECTION

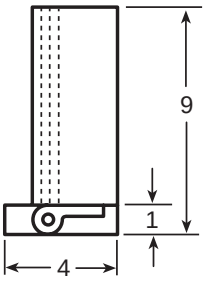




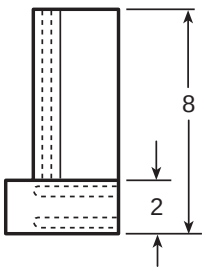
MOLD NO. 8811
AS SHOWN AND OPPOSITE

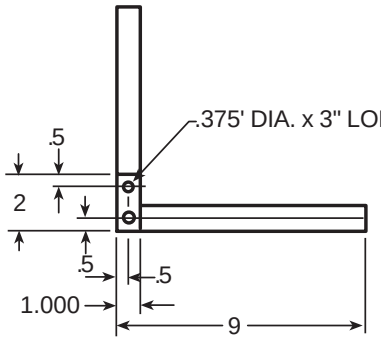


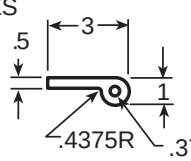
TYPICAL CROSS SECTION



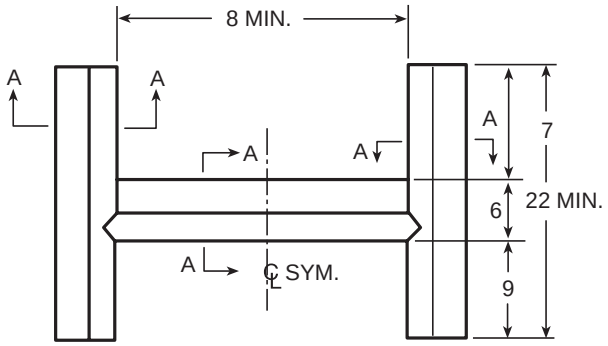
MOLD NO. 7113
AS SHOWN AND OPPOSITE

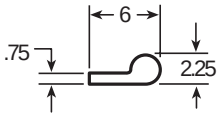




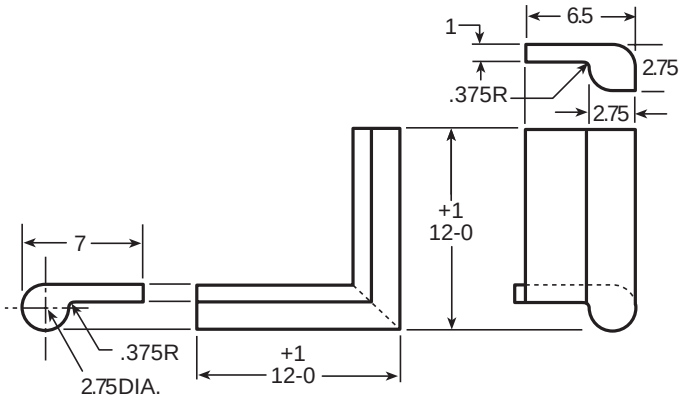


.375 DIA. HOLE OPTIONAL

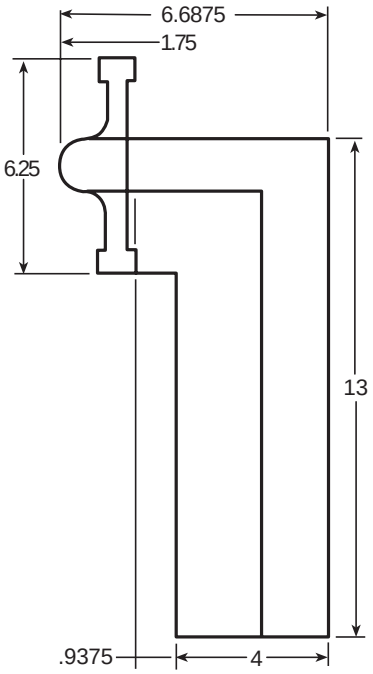


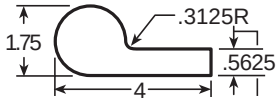


MOLD NO. 8007
SEAL CORNER COMBINATION
FOR RIGHT AND LEFT HAND

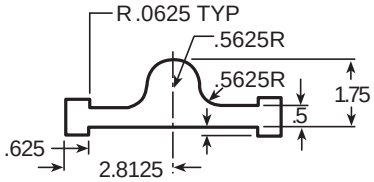


MOLD NO.'S 7430 & 7431
AS SHOWN AND OPPOSITE





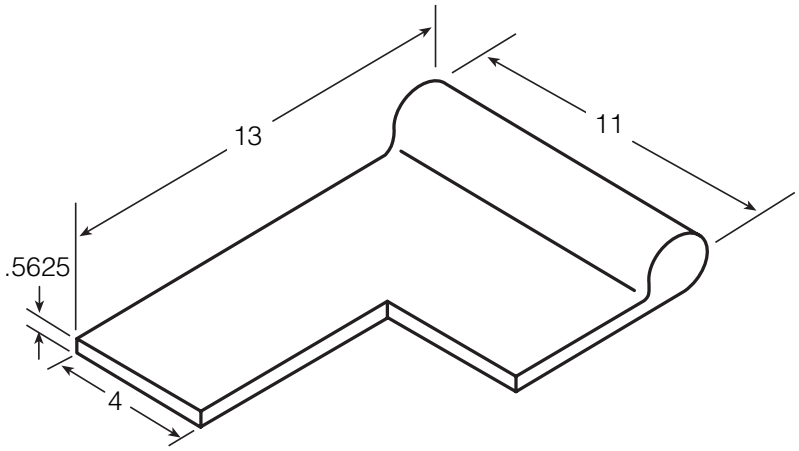
TYPICAL CROSS SECTION



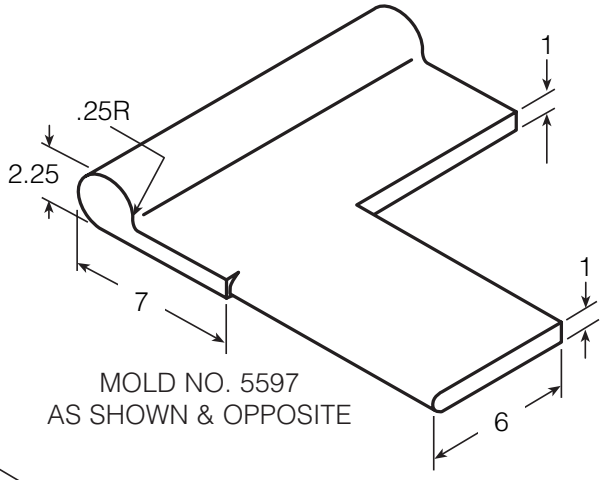
TYPICAL CROSS SECTION

MOLD NO.'S 8809 & 8810
AS SHOWN AND OPPOSITE

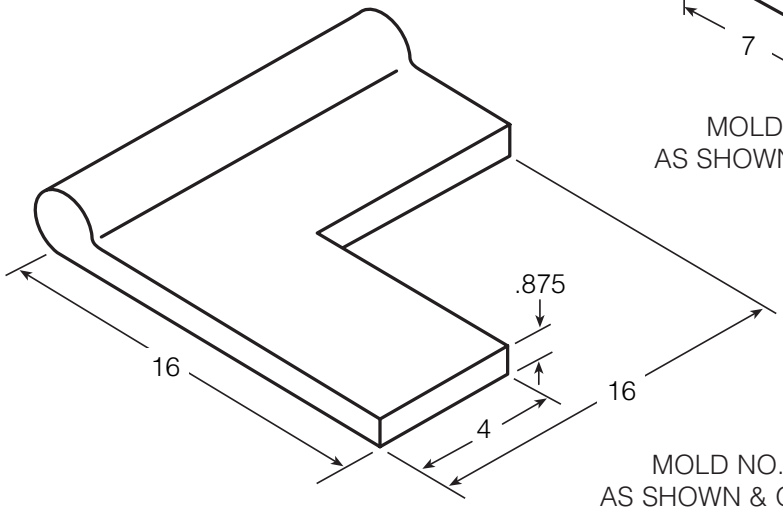
"J" Seal to Wedge Seal Transition Corners



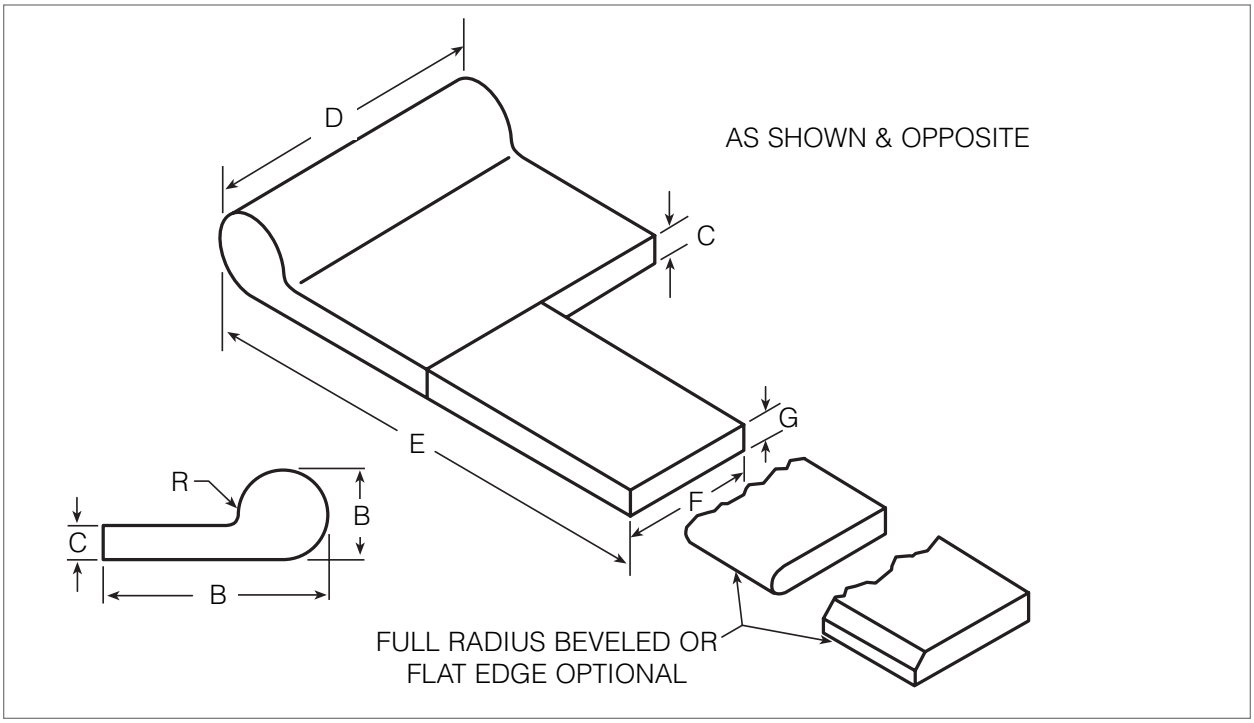
MOLD NO. 3725 & 3726
AS SHOWN & OPPOSITE
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2514
5'' MAX. WIDTH



MOLD NO. 5597
AS SHOWN & OPPOSITE

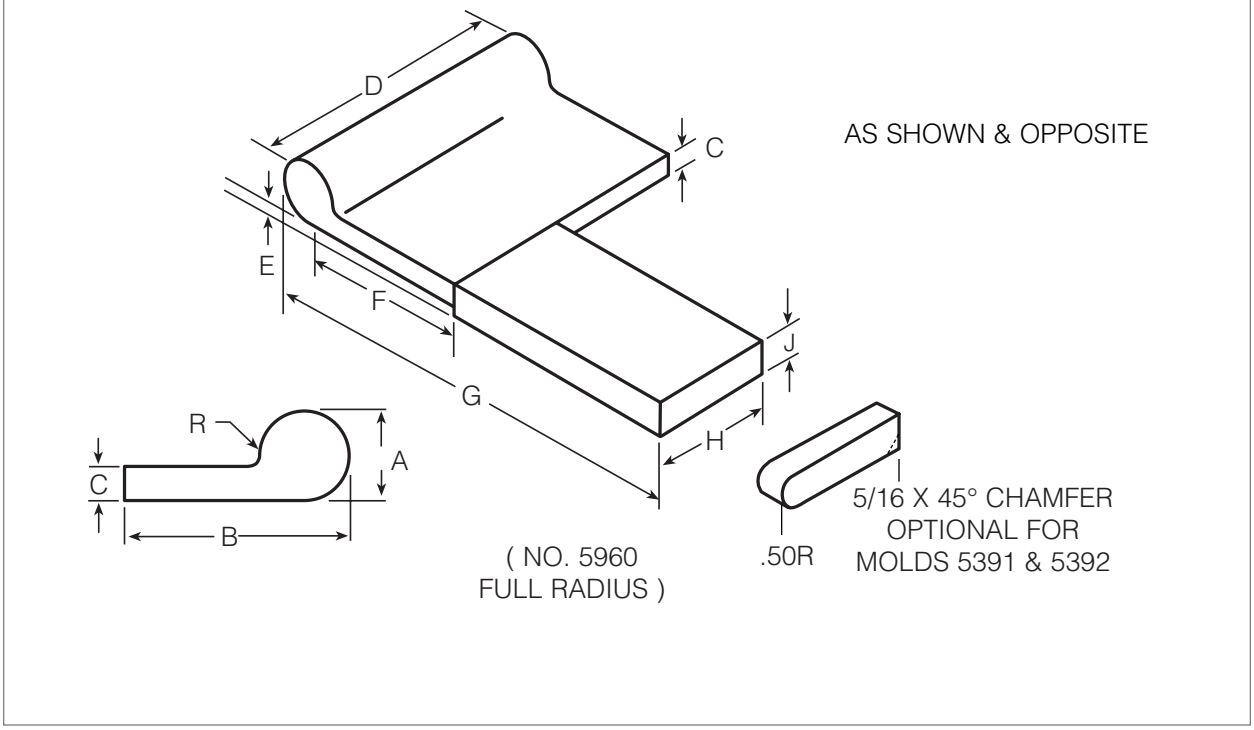


MOLD NO. 6184
AS SHOWN & OPPOSITE
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2575



NO.	A	B	C	D	E	F	G	R
3829	2.25	9••	.75	•••	•••	4••	.63 or .75	.31R
5831	1.75	5••	.69	•••	•••	4••	.69	.25R

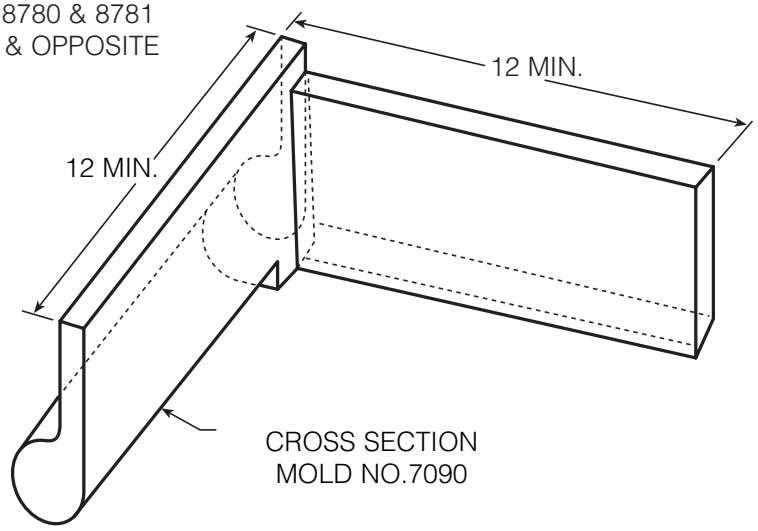
•••AS REQUIRED ••MAX.

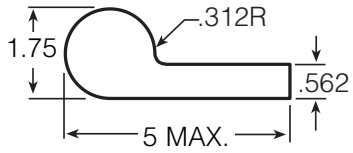


NO.	A	B	C	D	E	F	G	R	J	R
5391 & 5392	1.75	5	.56	•••	.44	4.125	•••	3.50	1	.31R

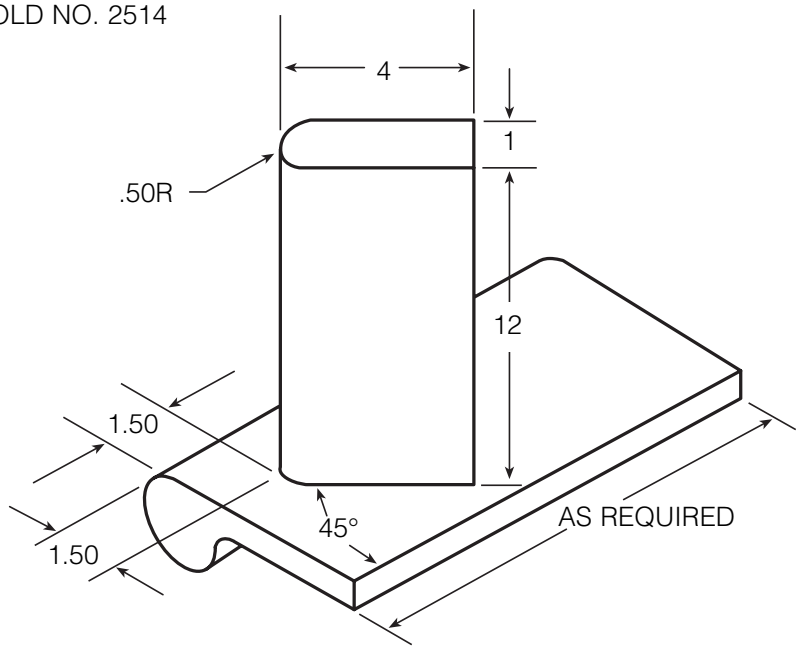
•••AS REQUIRED ••MAX.

MOLD NO. 8780 & 8781
AS SHOWN & OPPOSITE

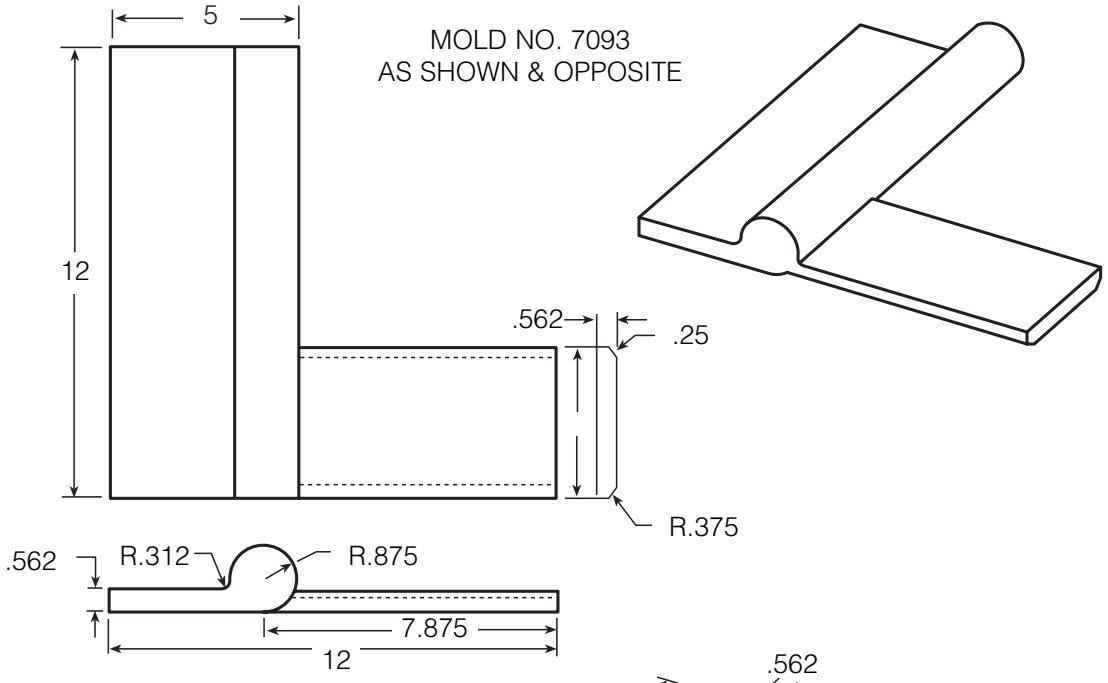




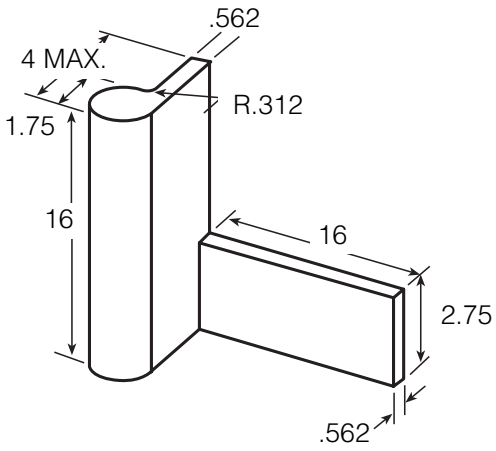
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
PER MOLD NO. 2514



MOLD NO. 6443
AS SHOWN & OPPOSITE

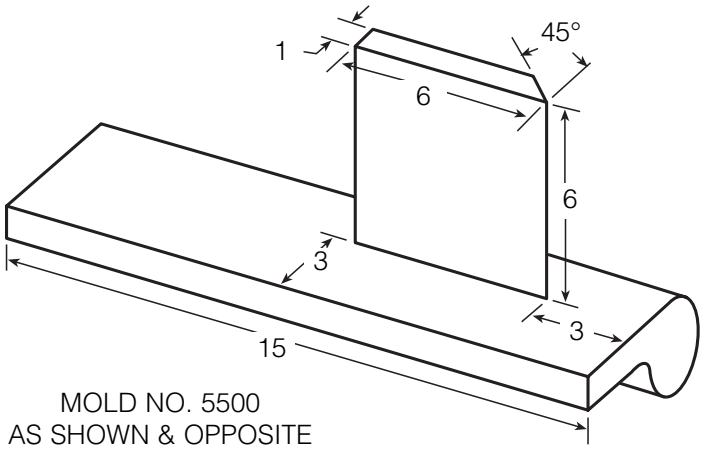


MOLD NO. 7093
AS SHOWN & OPPOSITE

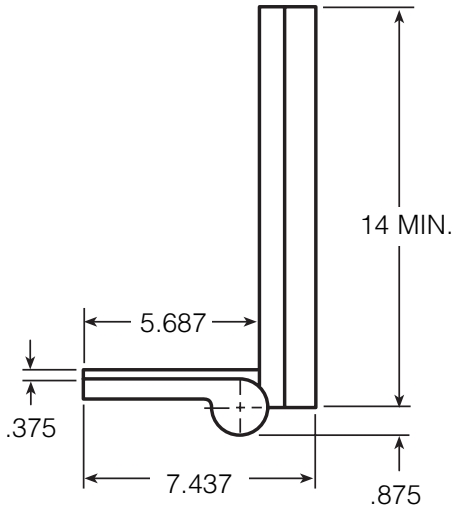


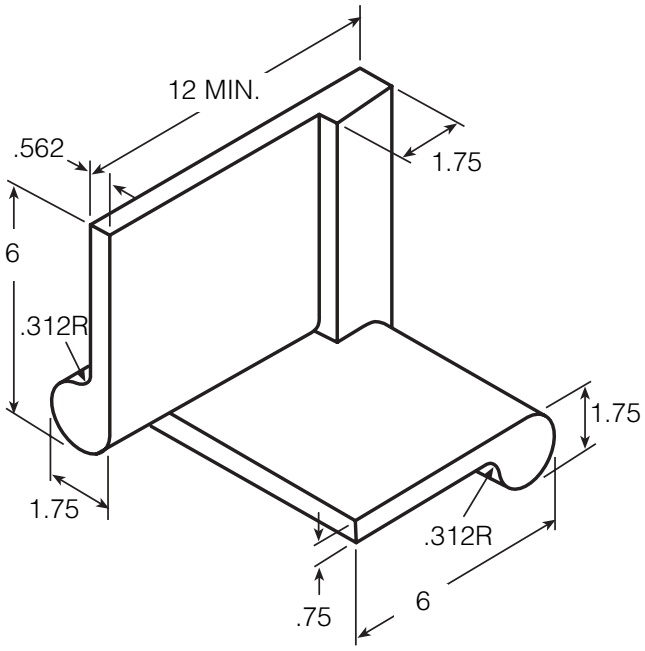
CROSS SECTION TYPICAL TO PG. A1
MOLD NO. 2950
6'' MAX. WIDTH

MOLD NO. 4710
AS SHOWN & OPPOSITE



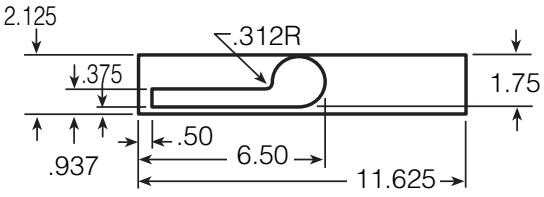
MOLD NO. 5500
AS SHOWN & OPPOSITE

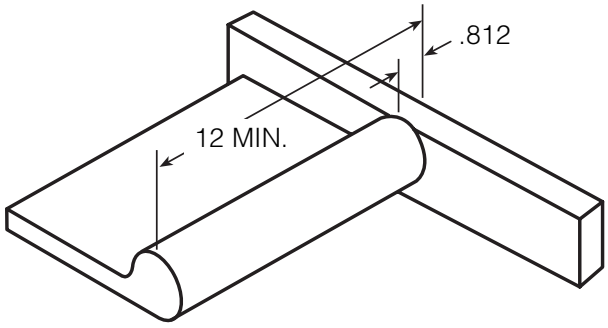


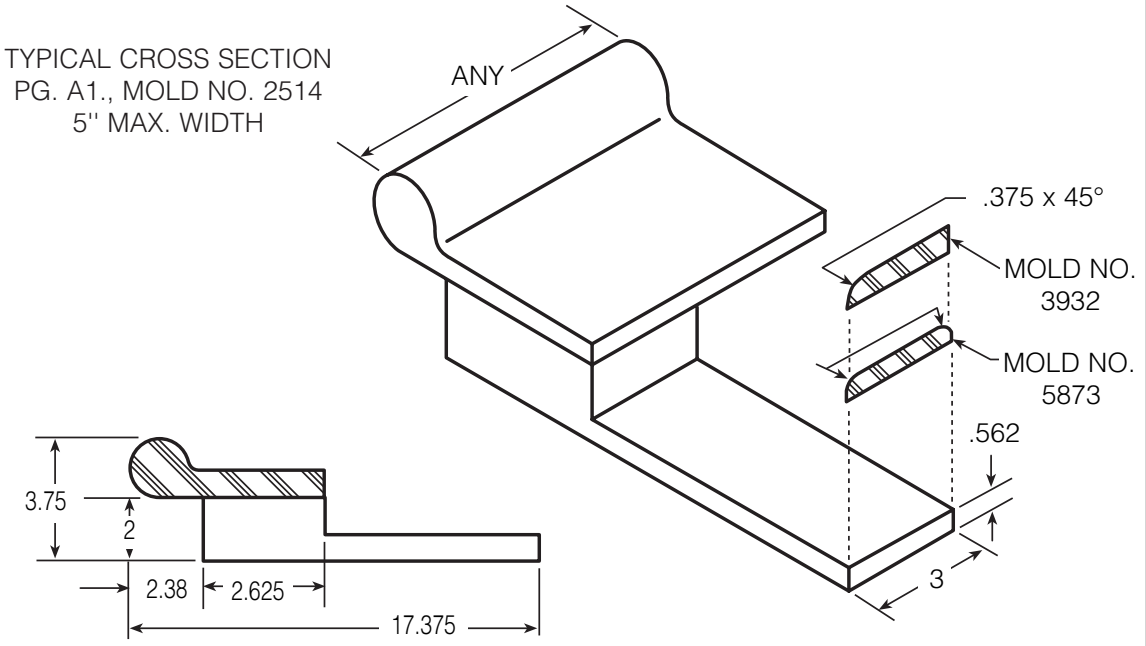


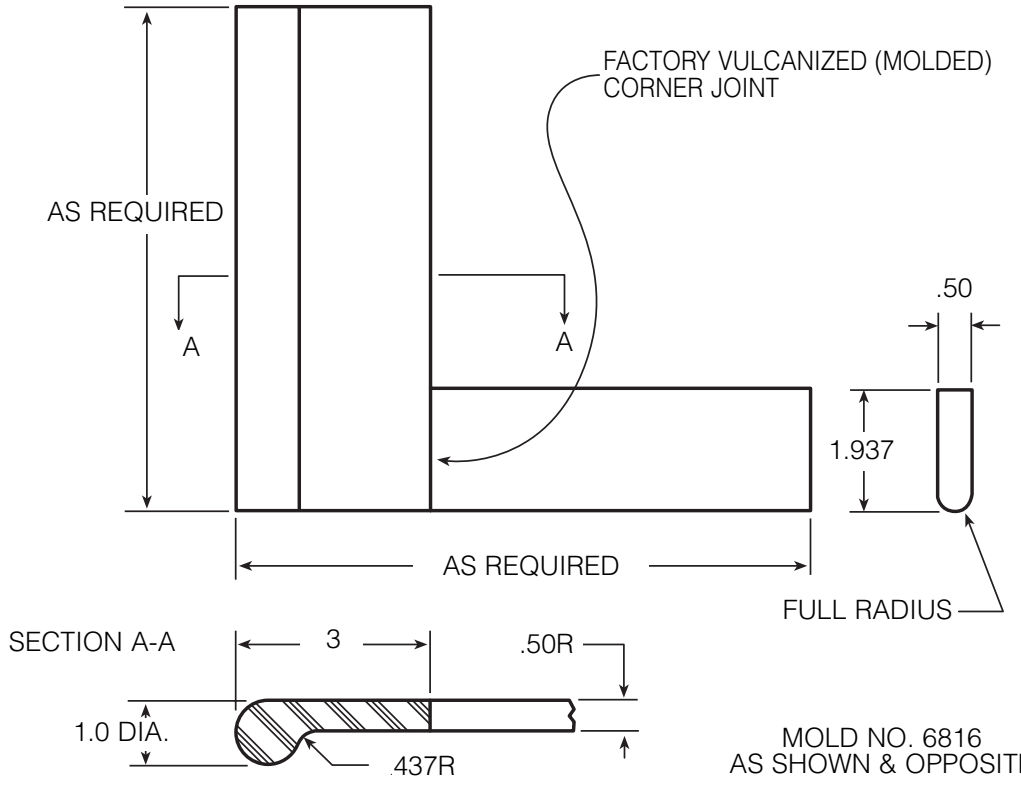
MOLD NO. 6884
AS SHOWN & OPPOSITE

MOLD NO. 6885
AS SHOWN & OPPOSITE
SPECIAL MOLDED RUBBER END PIECE SEAL



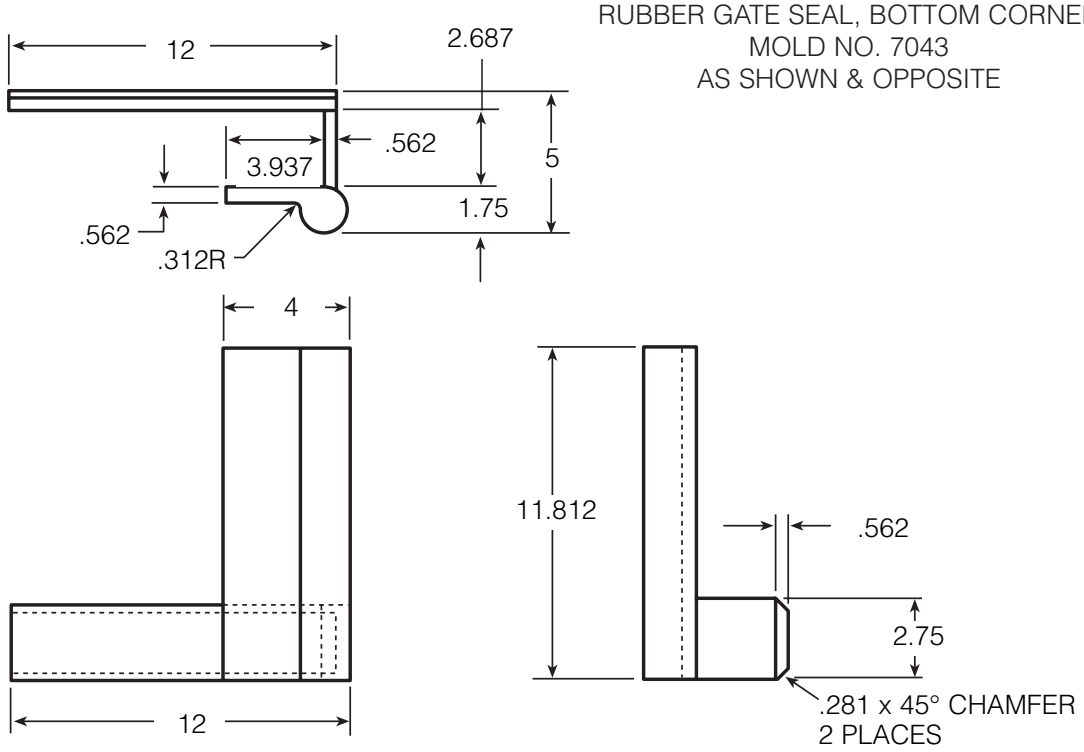


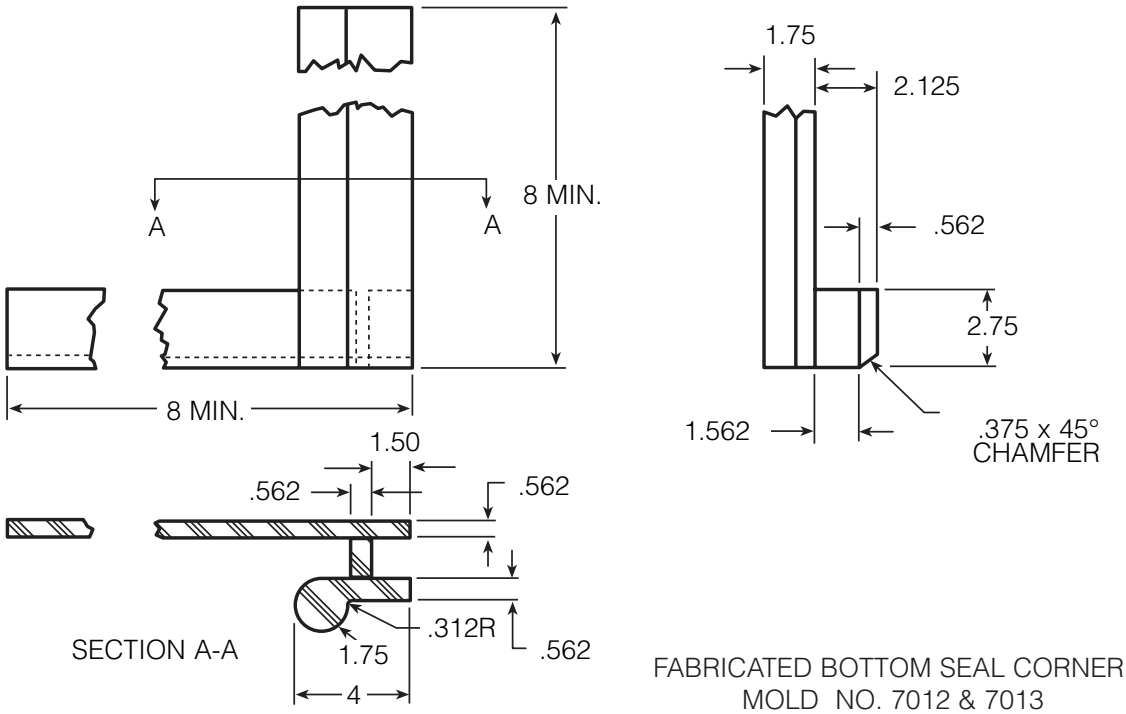




MOLD NO. 6816
AS SHOWN & OPPOSITE

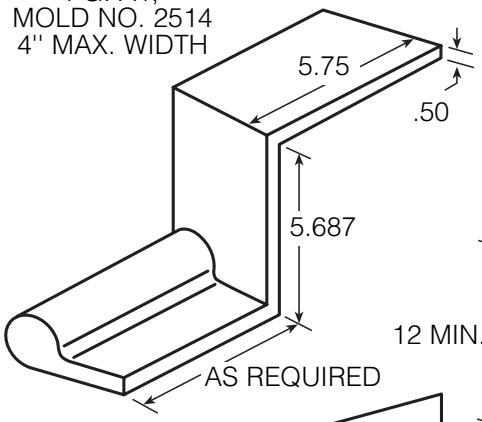
RUBBER GATE SEAL, BOTTOM CORNER
MOLD NO. 7043
AS SHOWN & OPPOSITE



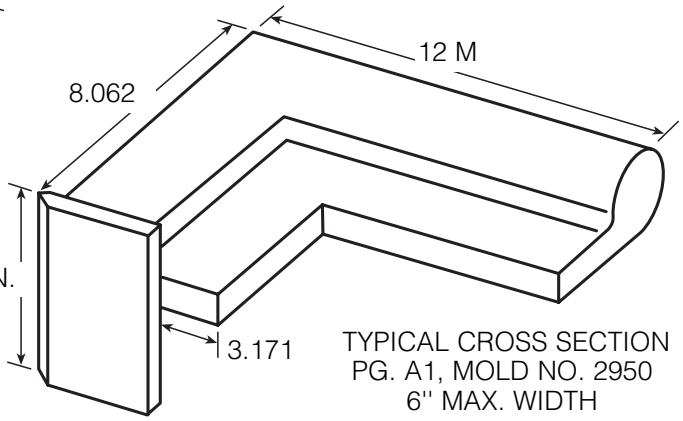


FABRICATED BOTTOM SEAL CORNER
MOLD NO. 7012 & 7013
AS SHOWN & OPPOSITE

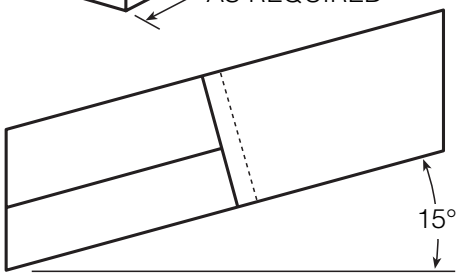
TYPICAL CROSS SECTION
PG. A1,
MOLD NO. 2514
4'' MAX. WIDTH



MOLD NO. 4708 & 4709
AS SHOWN & OPPOSITE

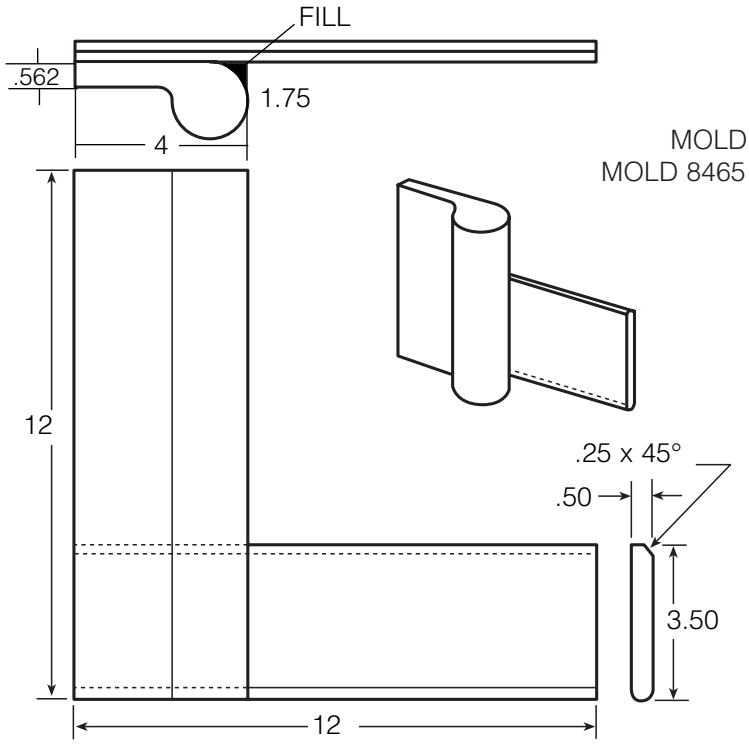


TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2950
6'' MAX. WIDTH

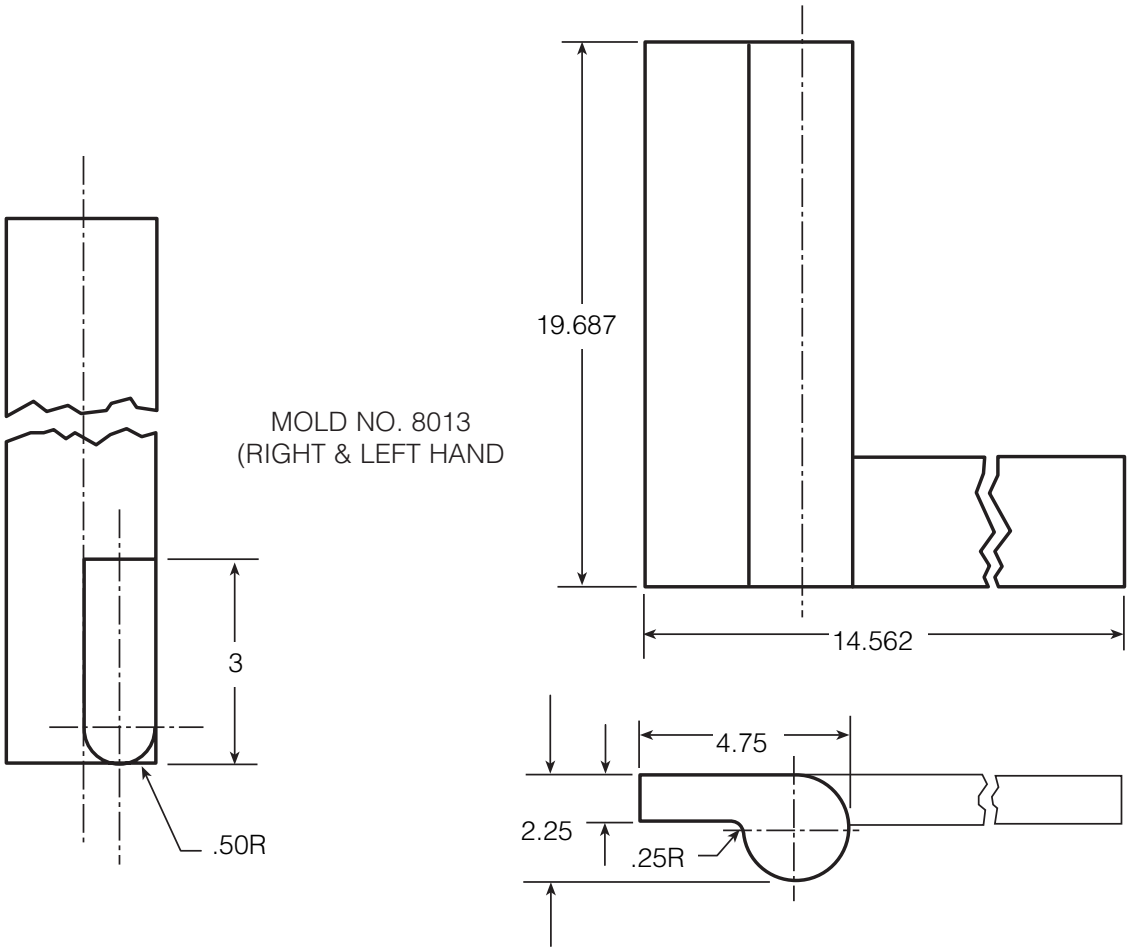


TYPICAL CROSS SECTION
PG. K2, MOLD NO. 5135
4'' WIDTH SHOWN

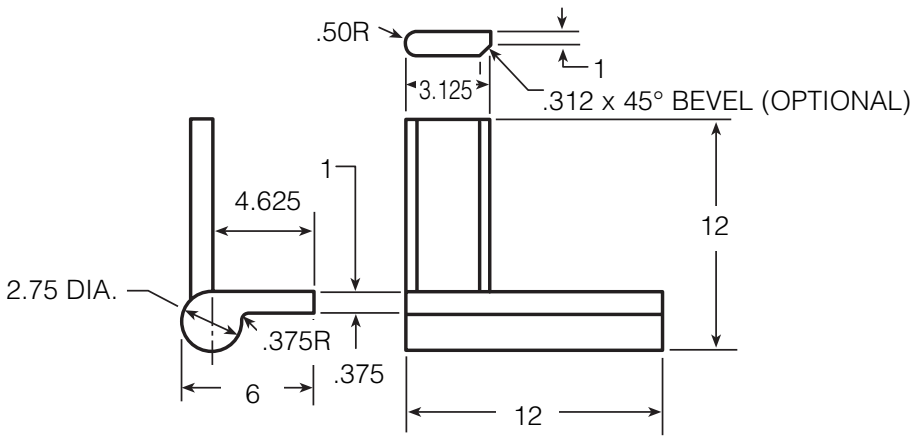
MOLD NO. 5120 & 5121
AS SHOWN & OPPOSITE



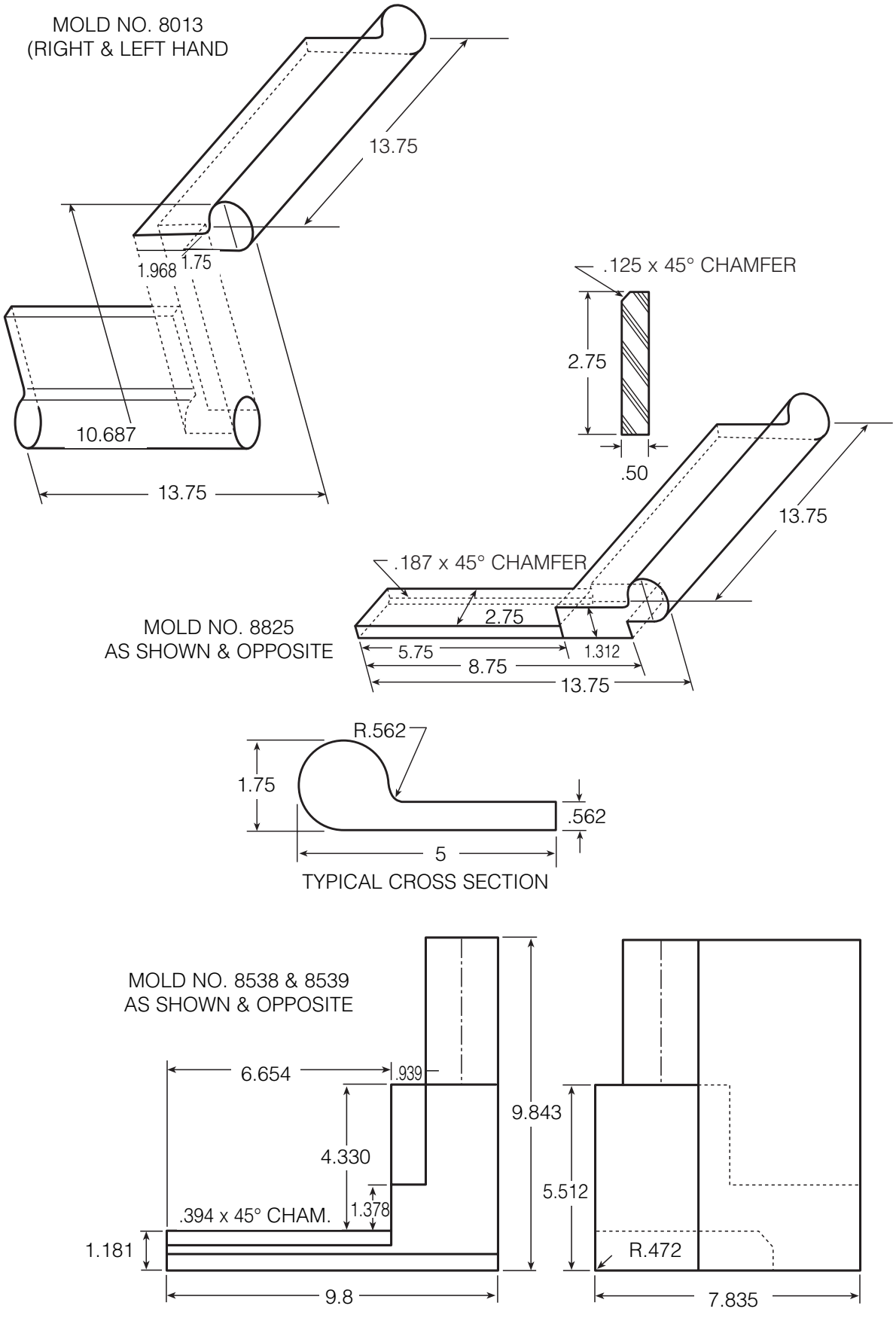
MOLD 8464 AS SHOWN
MOLD 8465 OPPOSITE OF SHOWN



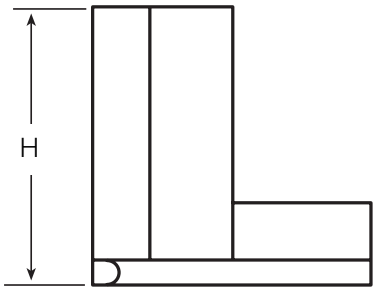
MOLD NO. 8013
(RIGHT & LEFT HAND

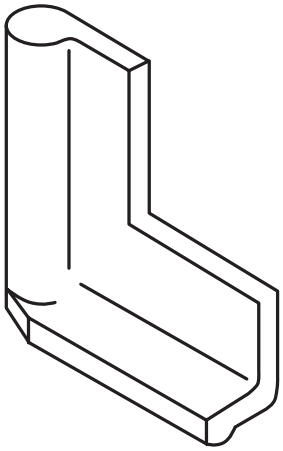


MOLD NO. 7175
AS SHOWN & OPPOSITE


MOLD NO. 8013
(RIGHT & LEFT HAND
13.75
1.968
1.75
10.687
13.75
.125 x 45° CHAMFER
2.75
.50
13.75
.187 x 45° CHAMFER
2.75
MOLD NO. 8825
AS SHOWN & OPPOSITE
5.75
1.312
8.75
13.75
R.562
1.75
.562
5
TYPICAL CROSS SECTION
MOLD NO. 8538 & 8539
AS SHOWN & OPPOSITE
6.654
.939
9.843
4.330
1.378
.394 x 45° CHAM.
1.181
5.512
R.472
9.8
7.835

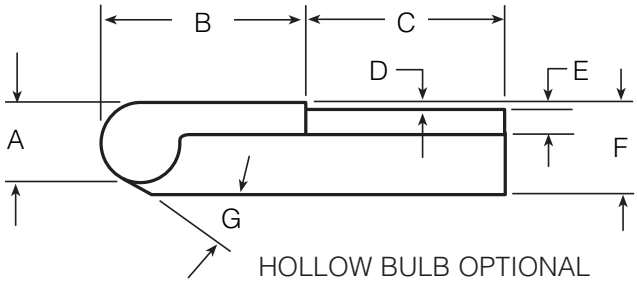
Special 90° Flat Corners

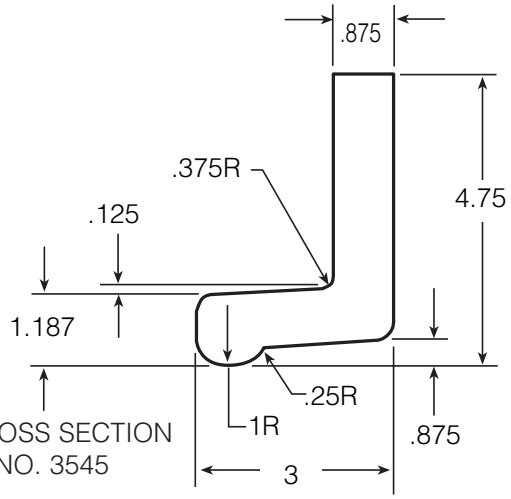




MOLD NO. 4527
MOLD NO. 4349 & 4350
MOLD NO. 5567 & 5568

AS SHOWN & OPPOSITE

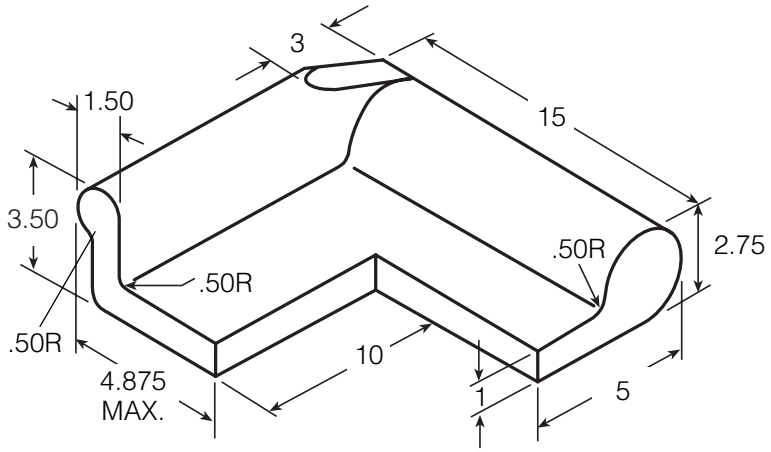


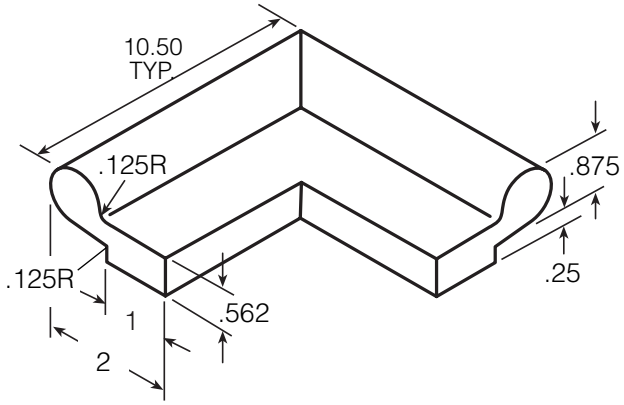


TYPICAL CROSS SECTION
MOLD NO. 3545

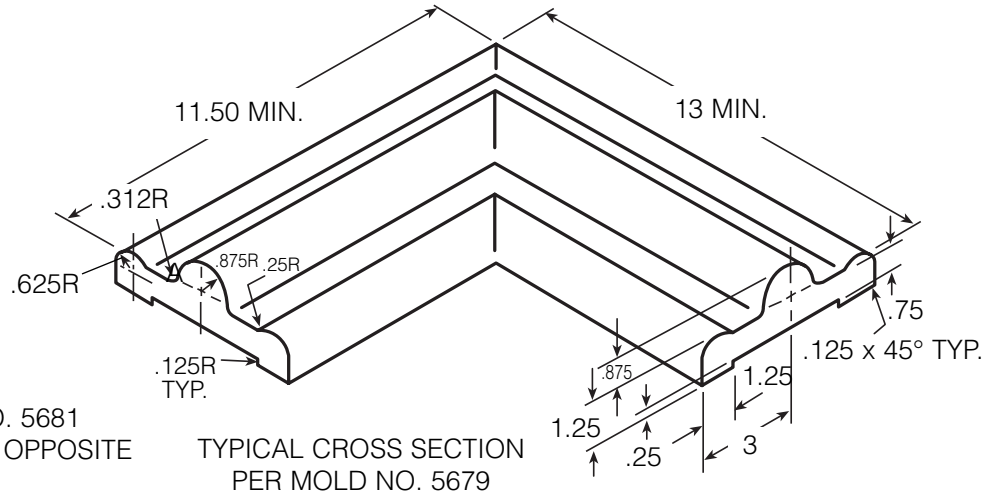
MOLD NO.	A	B	C	D	E	F	G	H
4349 & 4350	2	4.75	10.50	.125	.875	3	37°	15
4527	2.75	5.50	9.50	.125	.875	4.3125	30°	15
5567 & 5568	2.75	7	8	.125	.875	3	30°	15

MOLD NO. 4724 & 4725
AS SHOWN & OPPOSITE





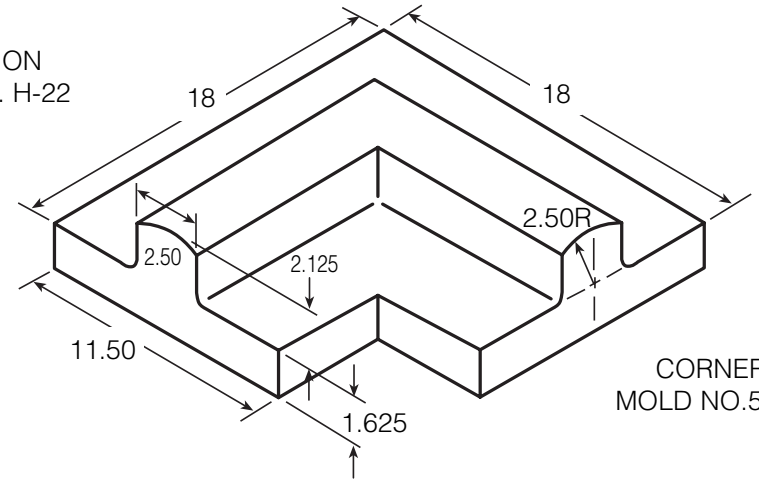
CORNER MOLD NO. 3761-1



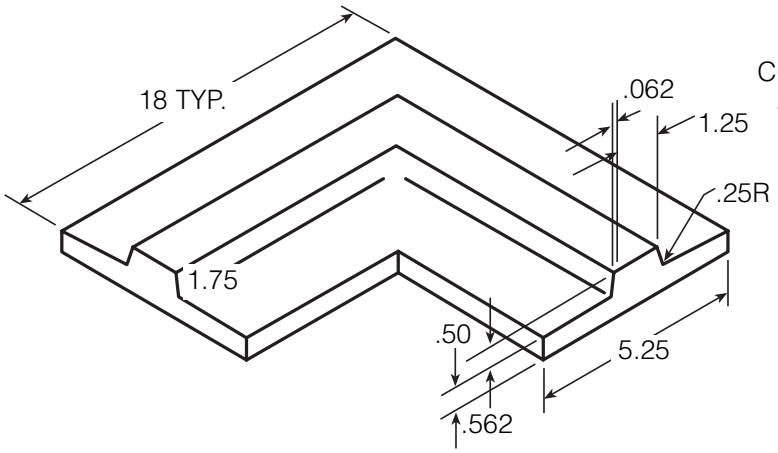
MOLD NO. 5681
AS SHOWN & OPPOSITE

TYPICAL CROSS SECTION
PER MOLD NO. 5679

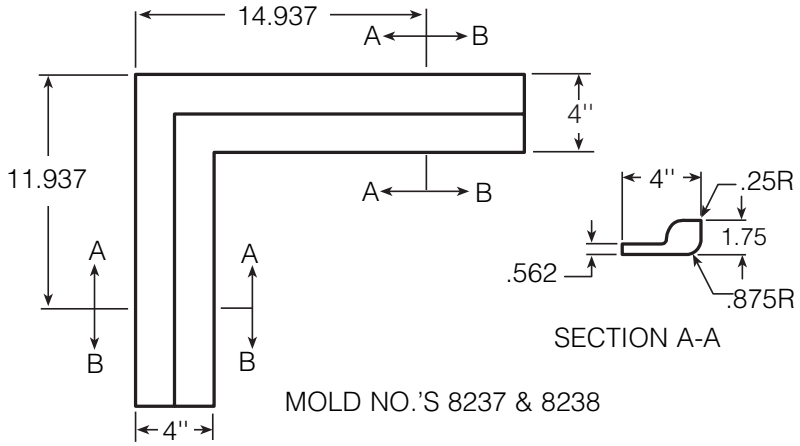
TYPICAL CROSS SECTION
PER MOLD NO. 5691, PG. H-22



CORNER
MOLD NO.5694

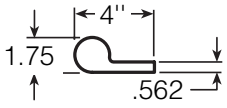


CORNER MOLD NO. 5068
STRIP MOLD NO. 3171



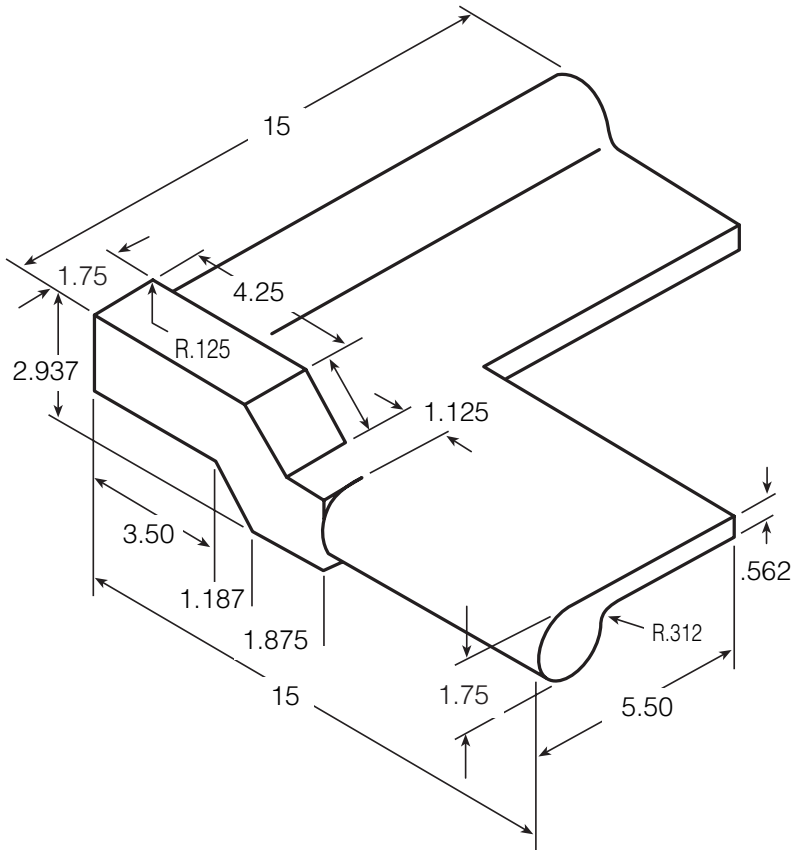
MOLD NO.'S 8237 & 8238

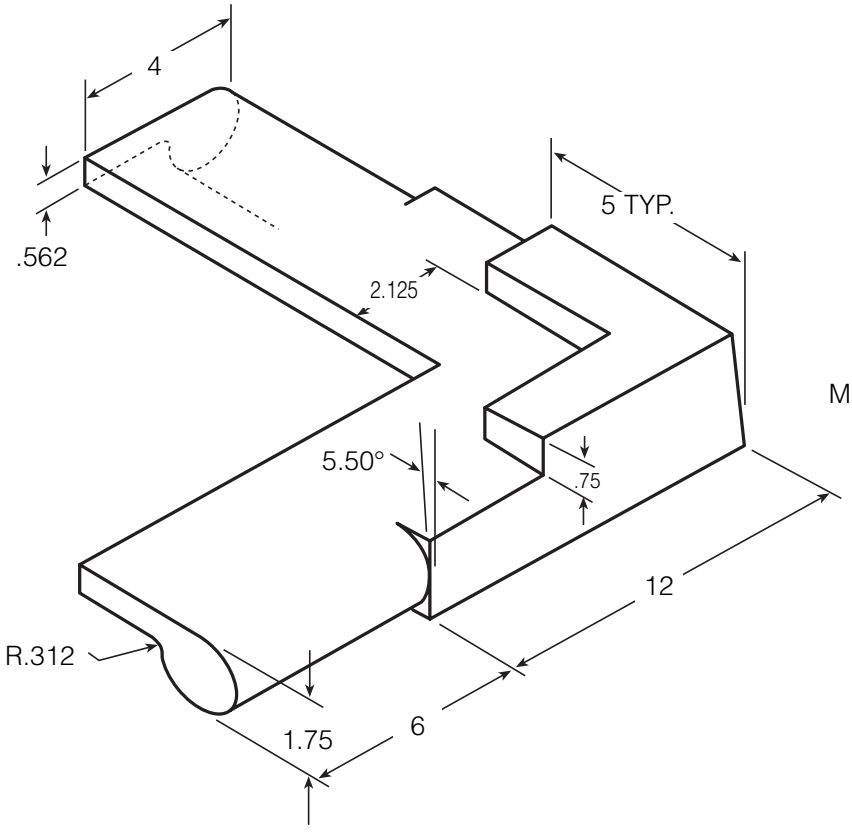
SECTION A-A



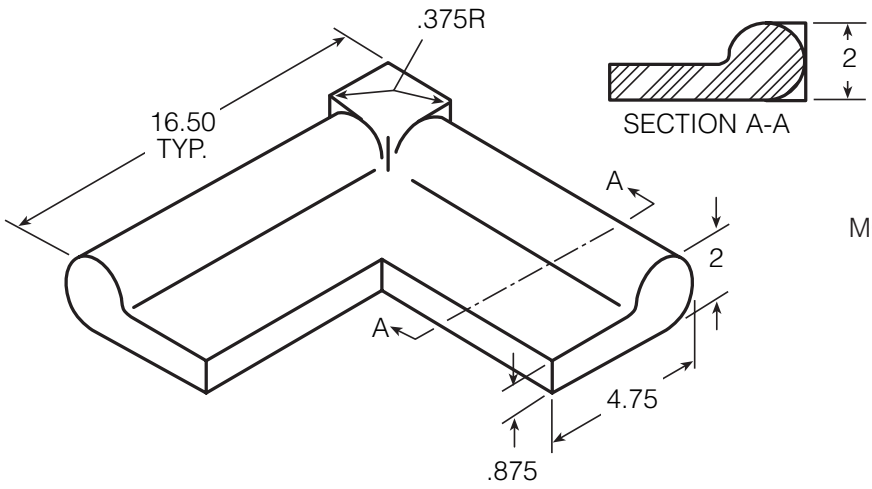
SECTION B-B

MOLD NO. 3506 & 3507
AS SHOWN & OPPOSITE



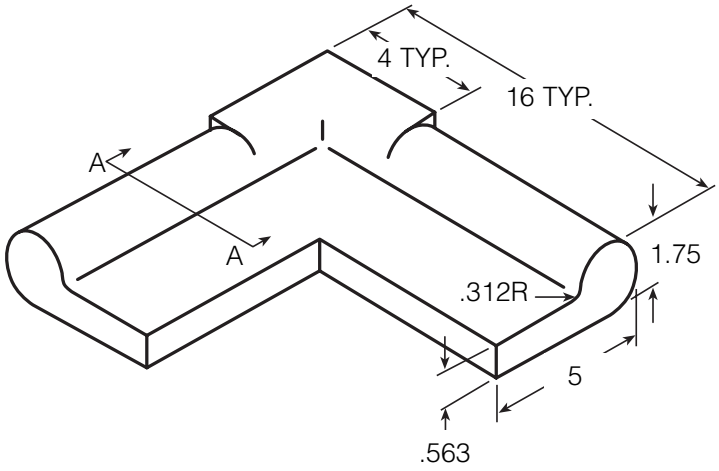


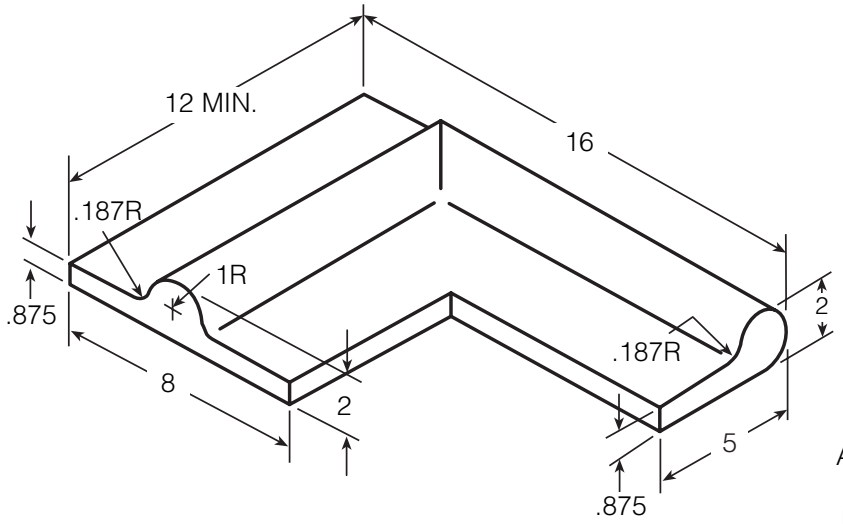
MOLD NO. 4543



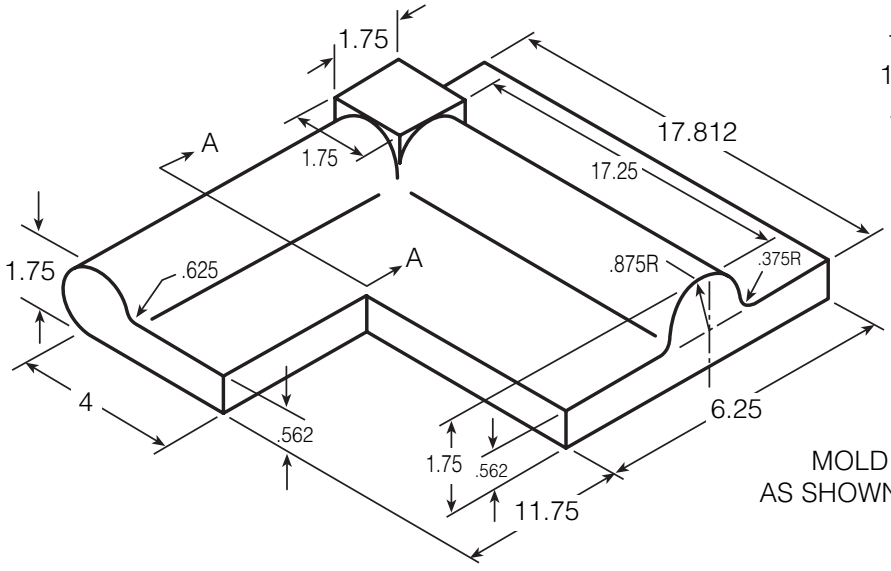
MOLD NO. 3375

MOLD NO. 4097



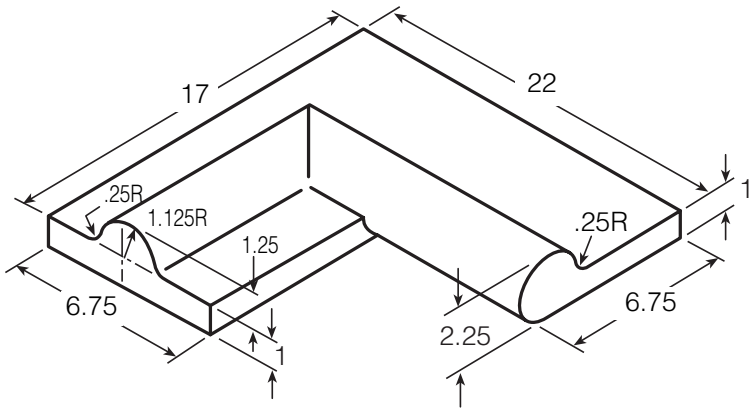


MOLD NO. 6801
AS SHOWN & OPPOSITE
FOR USE WITH STRIP
MOLD NO. 6800 & 3073
& 3073 PG. A-1

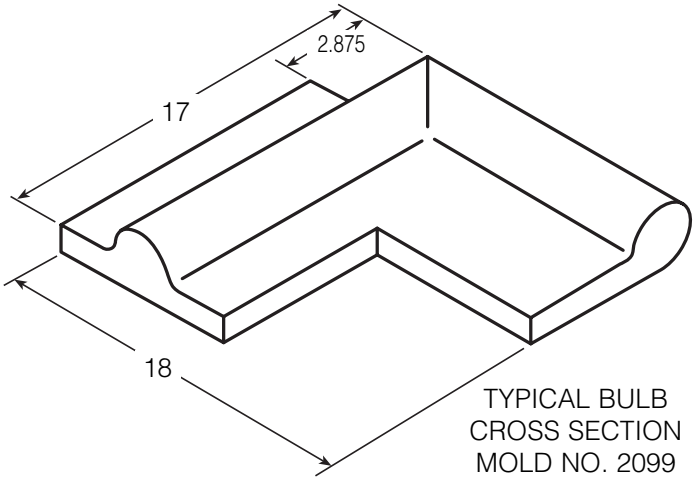


SECTION A-A

MOLD NO. 5416
AS SHOWN & OPPOSITE



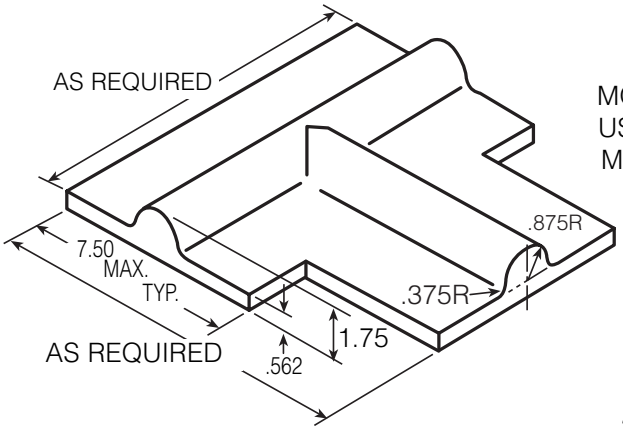
MOLD NO. 5596
AS SHOWN & OPPOSITE



MOLD NO. 5595
AS SHOWN & OPPOSITE

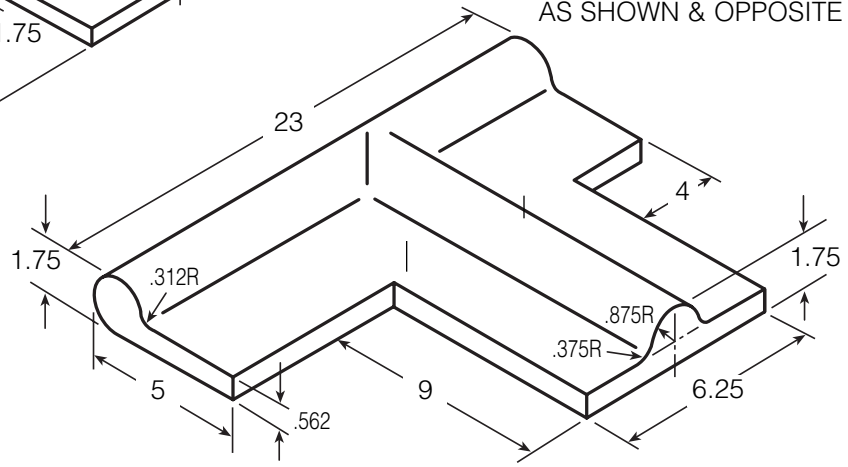
TYPICAL CROSS SECTION
PER STRIP MOLD NO. 5569
PG. H-21

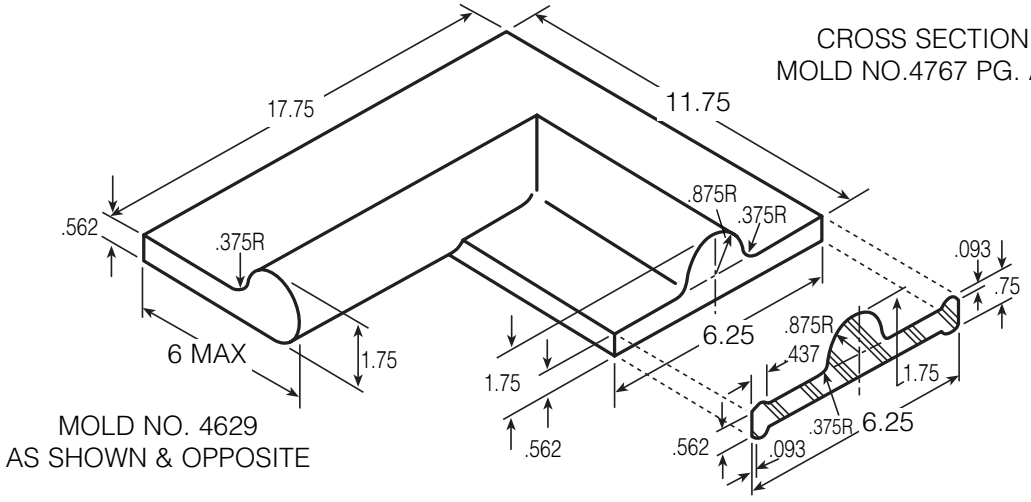
TYPICAL BULB
CROSS SECTION
MOLD NO. 2099
PG.A-1
6.75'' MAX. WIDTH



MOLD NO. 5583
USE WITH STRIP
MOLD NO. 4767
PG. A-3

MOLD NO. 4861
AS SHOWN & OPPOSITE

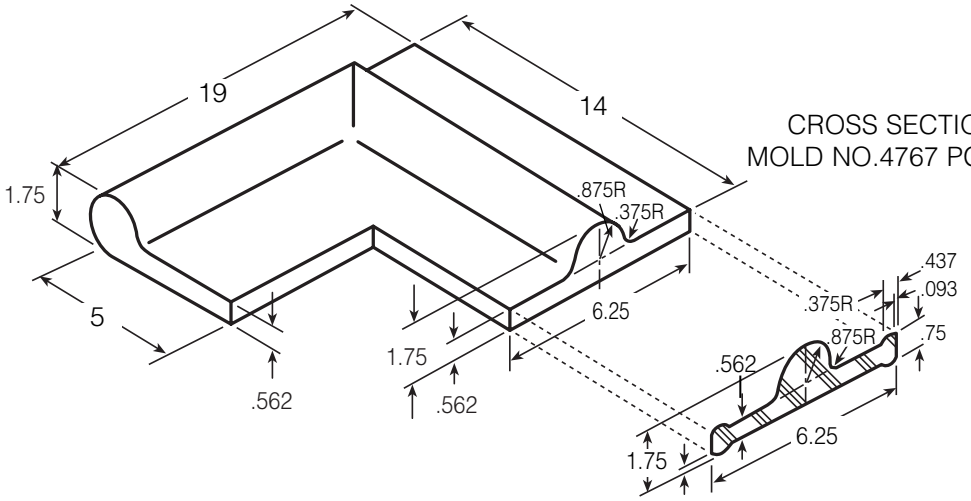




CROSS SECTION
MOLD NO.4767 PG. A-3

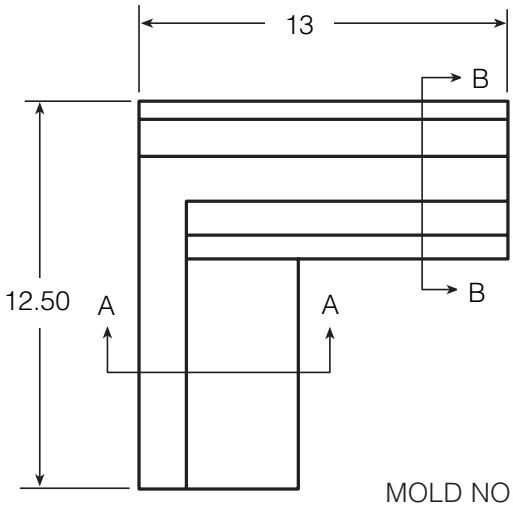
MOLD NO. 4629
AS SHOWN & OPPOSITE

OPTIONAL CROSS SECTION
PER MOLD NO. 2284 PG. H-8



CROSS SECTION
MOLD NO.4767 PG. A-3

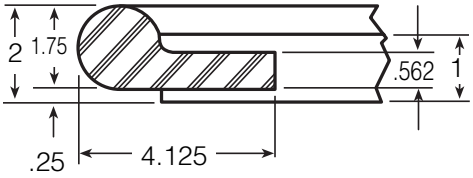
OPTIONAL CROSS SECTION
PER MOLD NO. 2284 PG. H-8



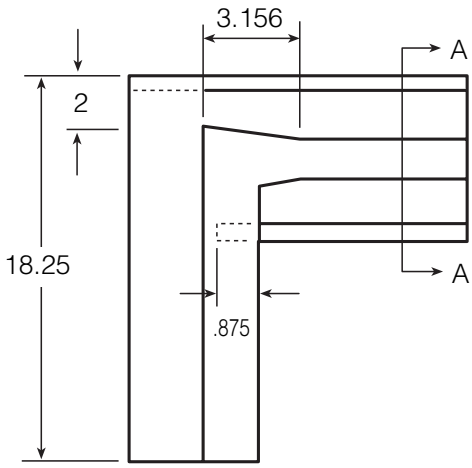
MOLD NO. 6978
AS SHOWN & OPPOSITE

TYPICAL CROSS SECTION
MOLD 4499 PG. H-12

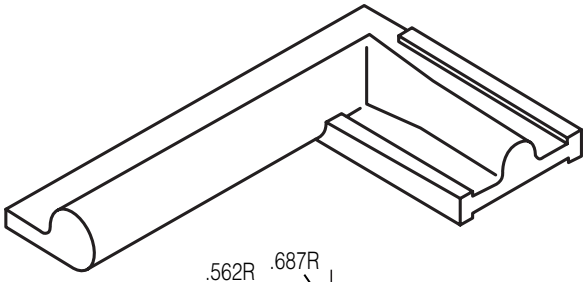
SECTION B-B

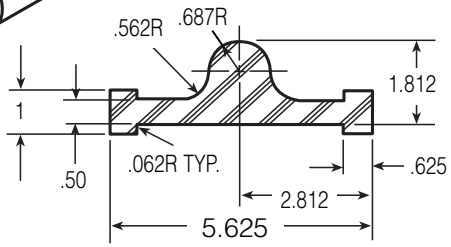


SECTION A-A

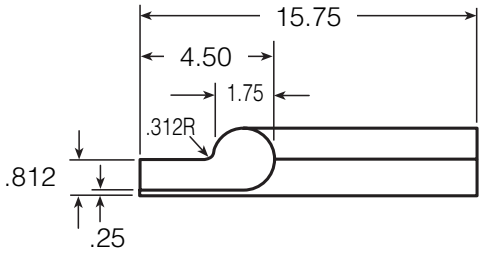


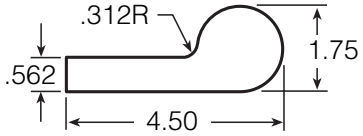
MOLD NO. 6809
(AS SHOWN & OPPOSITE)



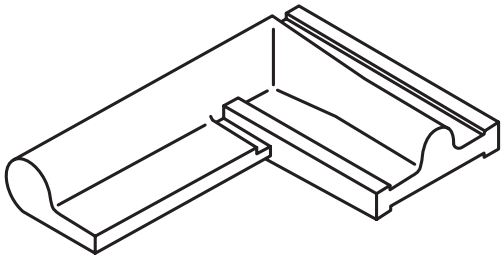


SECTION A-A

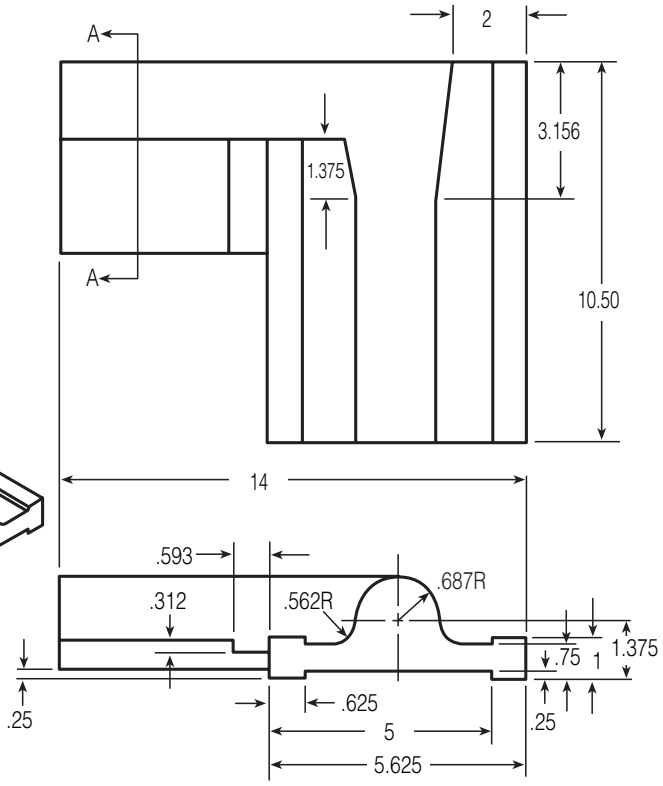


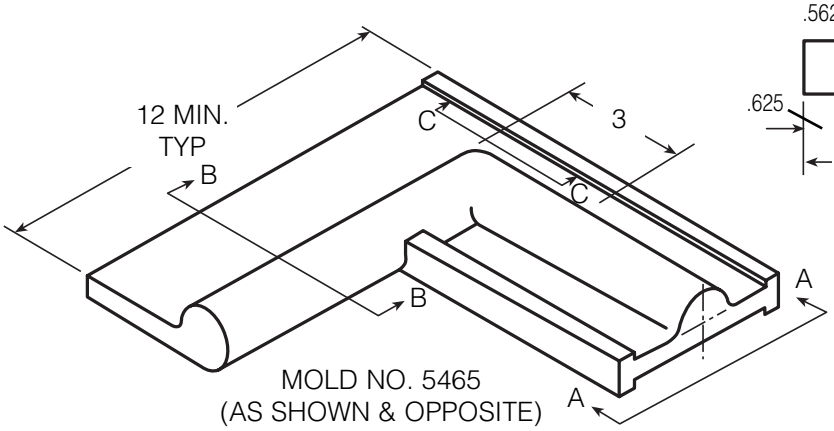


SECTION A-A

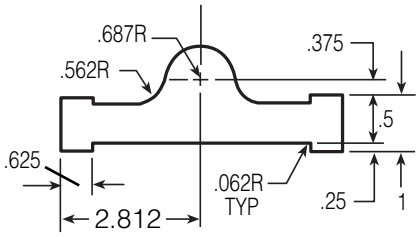


MOLD NO. 6810
(AS SHOWN & OPPOSITE)





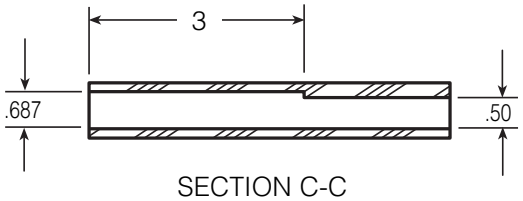
MOLD NO. 5465
(AS SHOWN & OPPOSITE)



SECTION A-A
TYPICAL CROSS SECTION
PG. H-12, MOLD NO. 4499

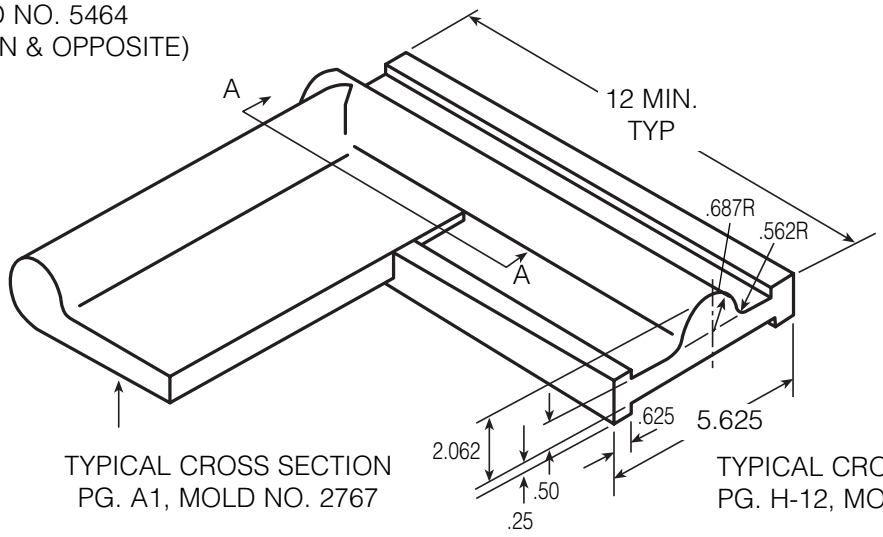
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2767

SECTION B-B



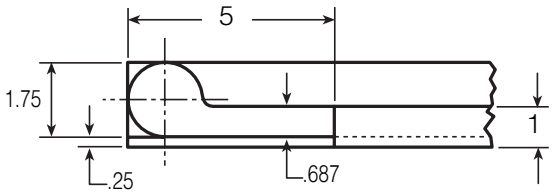
SECTION C-C

MOLD NO. 5464
(AS SHOWN & OPPOSITE)

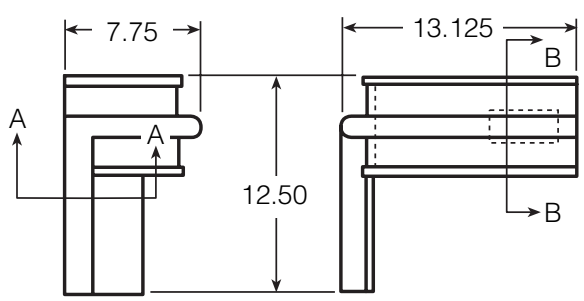


TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2767

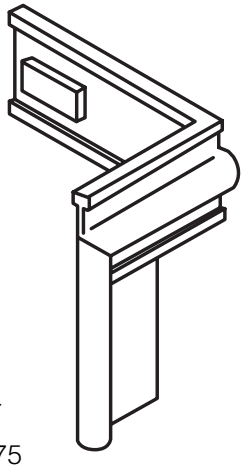
TYPICAL CROSS SECTION
PG. H-12, MOLD NO. 4499

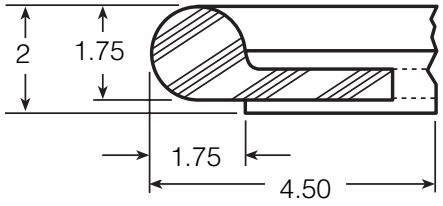


SECTION A-A

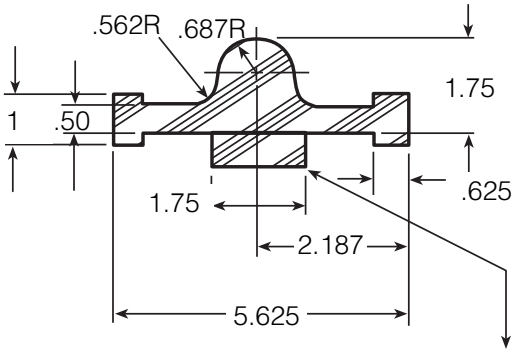


MOLD NO. 6979 & 6980
(AS SHOWN & OPPOSITE)
USE WITH
MOLD NO. 4499 PG. H-12



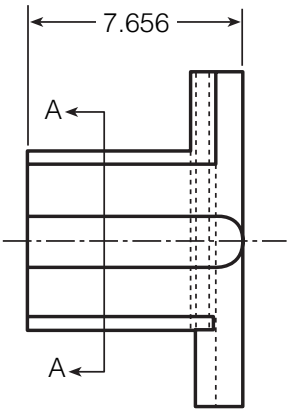


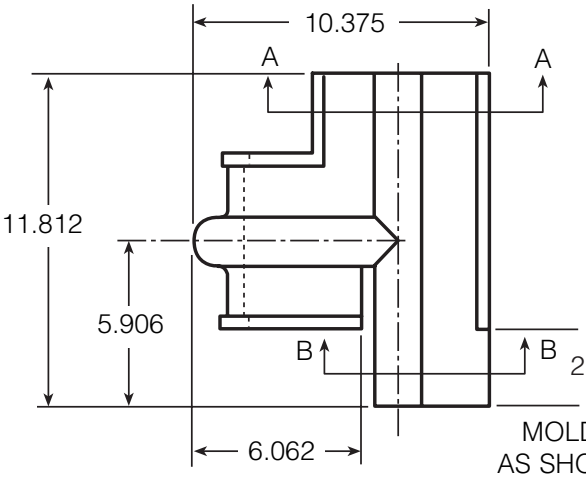
SECTION A-A

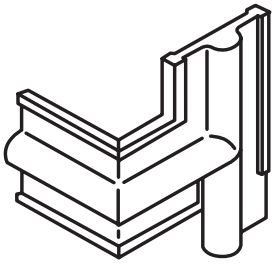


SECTION B-B

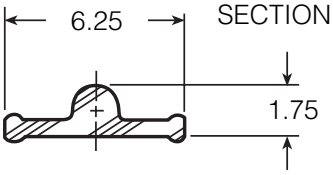
RUBBER BLOCK .75 THICK AND 1.75X3.75
VULCANIZED TO BACK OF TOP SEAL





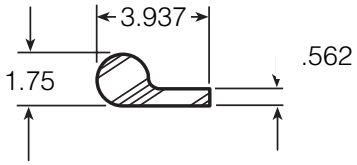


MOLD NO. 7001 & 7002
AS SHOWN AND OPPOSITE



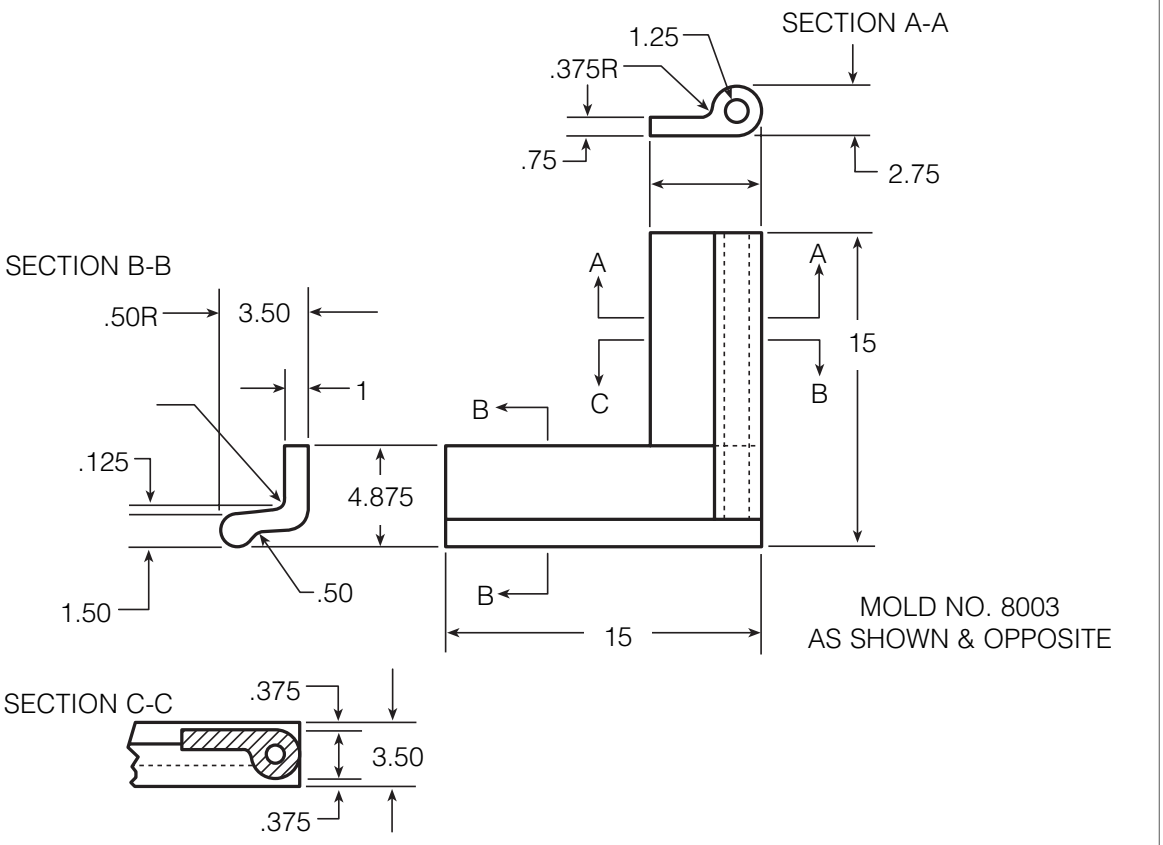
SECTION A-A

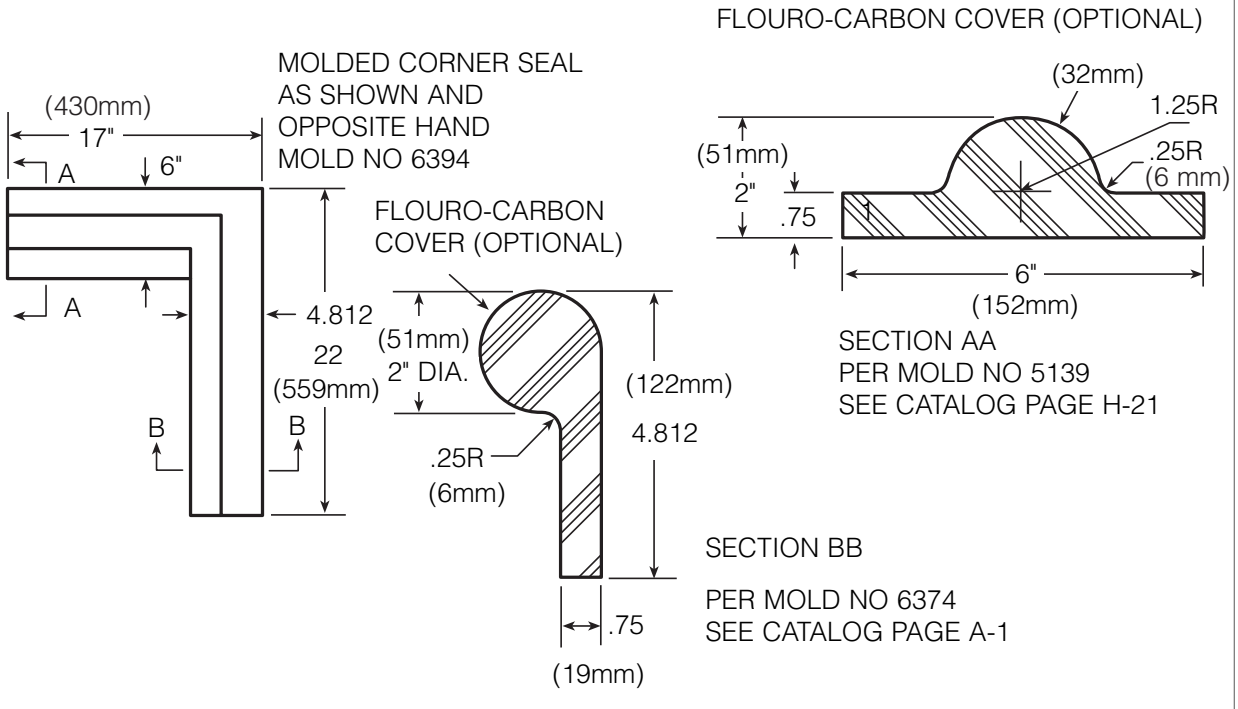
TYPICAL CROSS SECTION
SEE MOLD NO. 2284, PAGE H-8

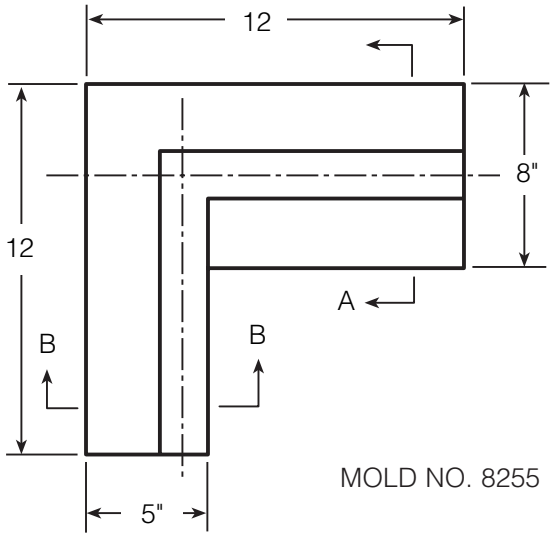


SECTION B-B

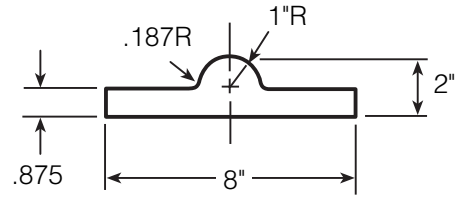
TYPICAL CROSS SECTION
PG. A1, MOLD NO. 2514


SECTION A-A
1.25
.375R
.75
2.75
SECTION B-B
.50R
3.50
1
.125
4.875
1.50
.50
A
B
C
15
MOLD NO. 8003
AS SHOWN & OPPOSITE
SECTION C-C
.375
3.50
.375

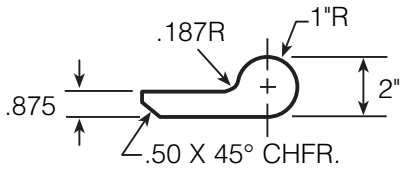

MOLDED CORNER SEAL
AS SHOWN AND
OPPOSITE HAND
MOLD NO 6394
(430mm)
17"
6"
A
4.812
22
(559mm)
B
FLOURO-CARBON
COVER (OPTIONAL)
(51mm)
2" DIA.
.25R
(6mm)
(122mm)
4.812
.75
(19mm)
SECTION BB
PER MOLD NO 6374
SEE CATALOG PAGE A-1
FLOURO-CARBON COVER (OPTIONAL)
(32mm)
1.25R
.25R
(6 mm)
(51mm)
2"
.75
6"
(152mm)
SECTION AA
PER MOLD NO 5139
SEE CATALOG PAGE H-21



MOLD NO. 8255

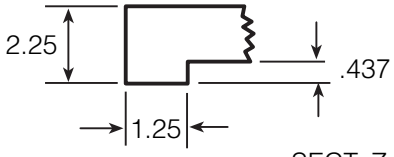


SECT. A-A

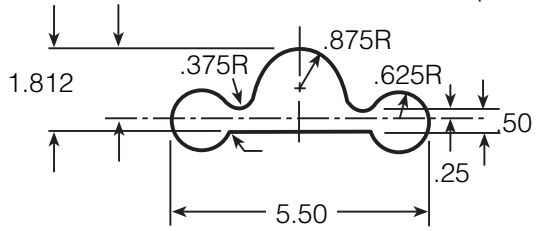


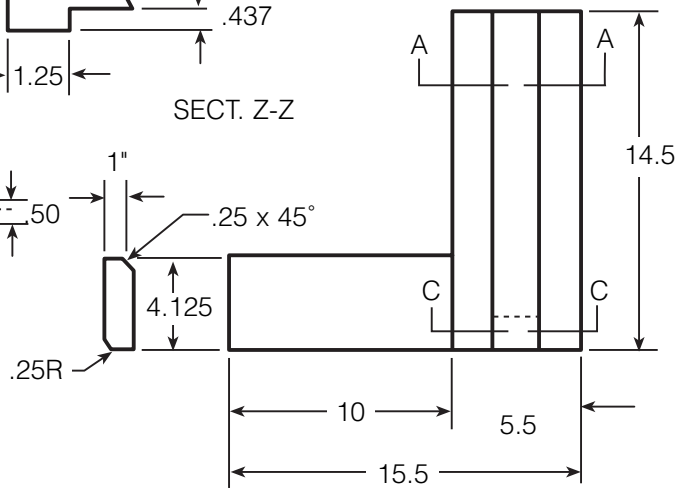
SECT. B-B

AS SHOWN & OPPOSITE

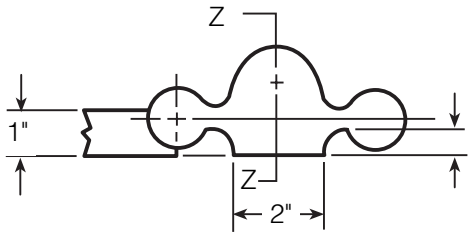


SECT. Z-Z

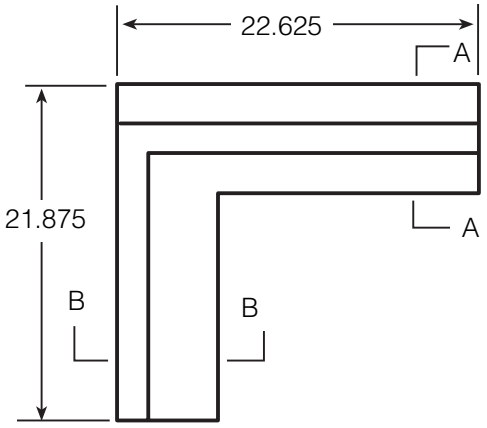


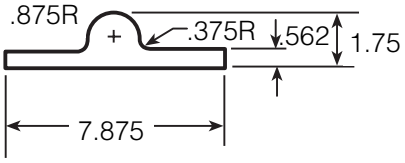


AS SHOWN & OPPOSITE HAND

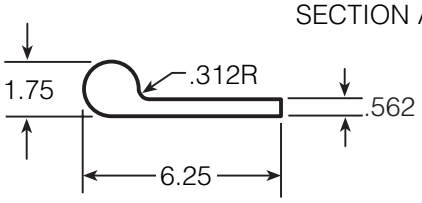


MOLD NO'S 8202 & 8203



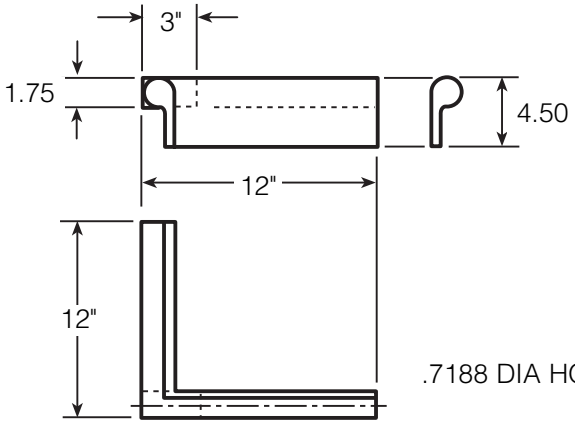


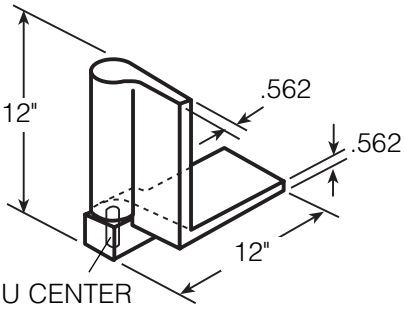
SECTION A-A



MOLD NO. 8331
AS SHOWN & OPPOSITE HAND

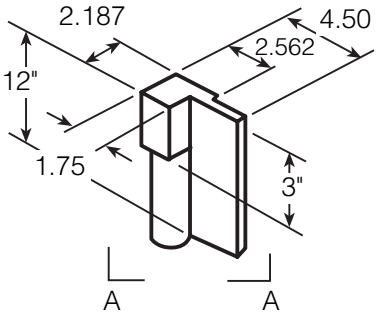
SECTION B-B

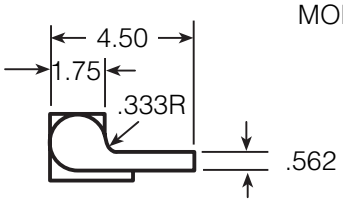




.7188 DIA HOLE THRU CENTER

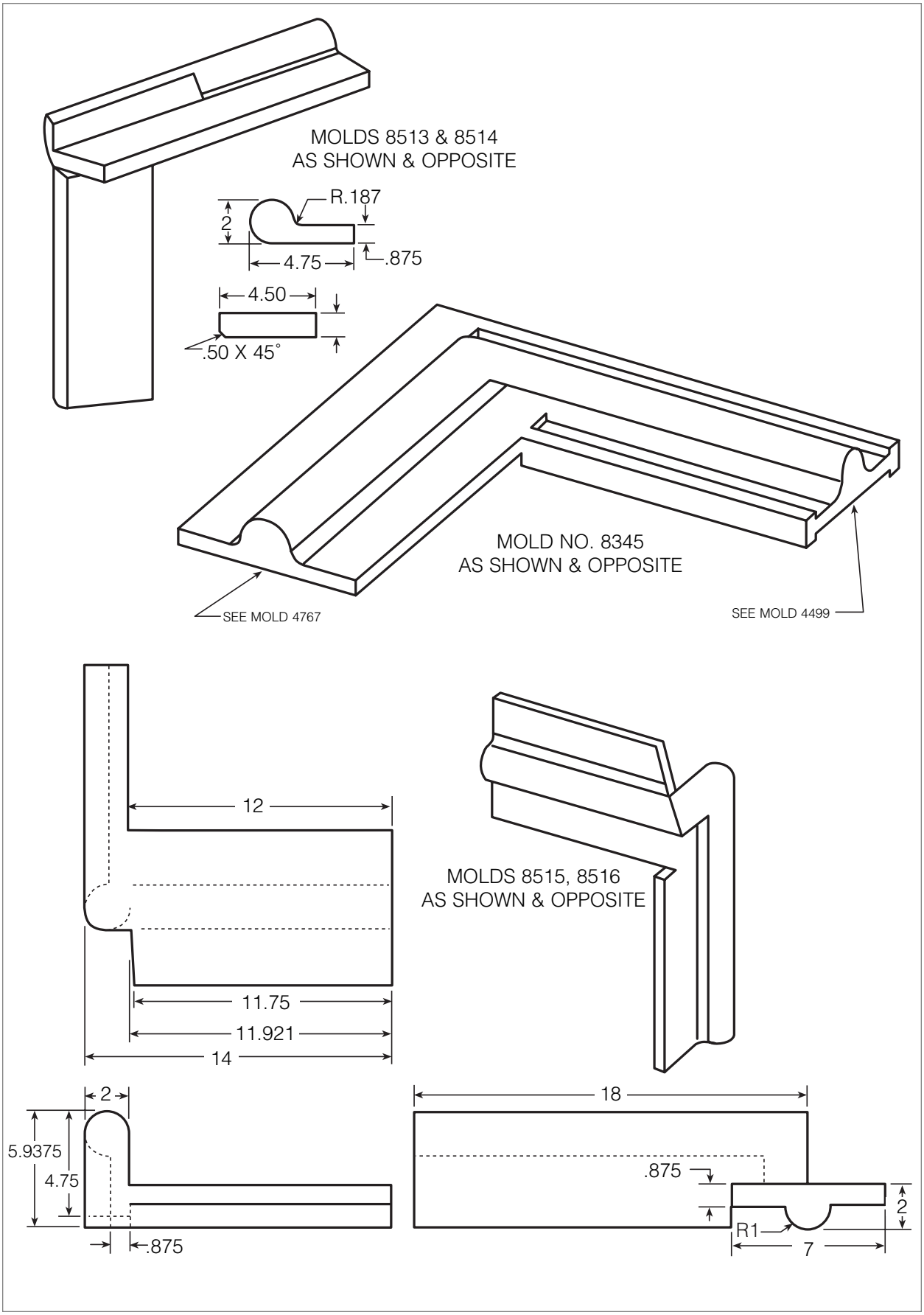
MOLD NO. 8081



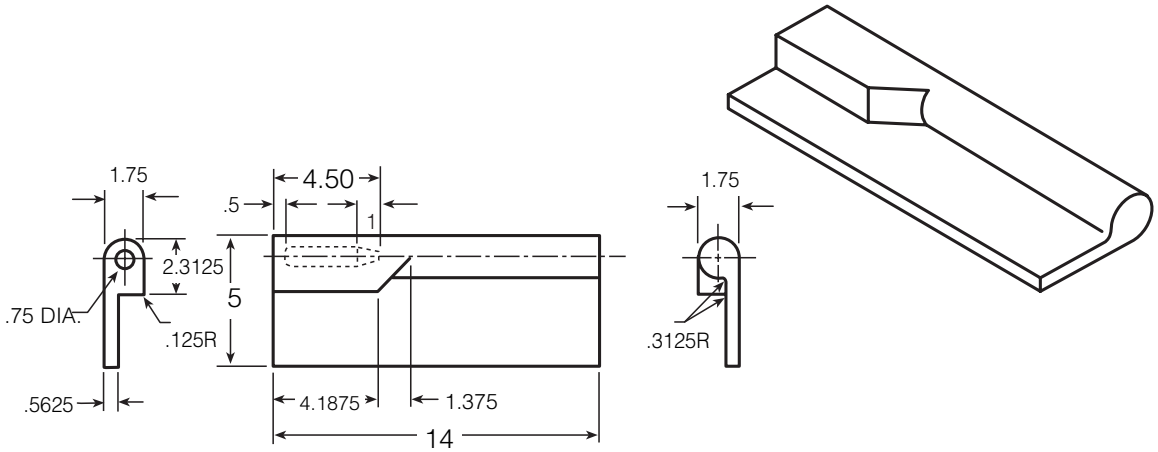


VIEW A-A
MOLD NO. 8082

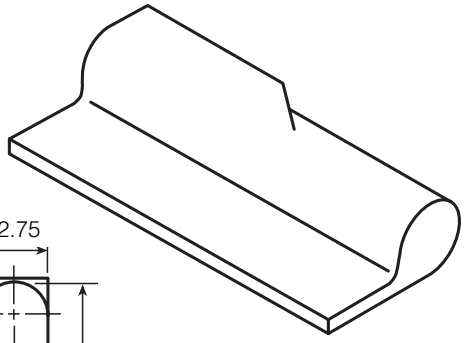
MOLDS MAKE PARTS AS SHOWN
AND OPPOSITE HAND

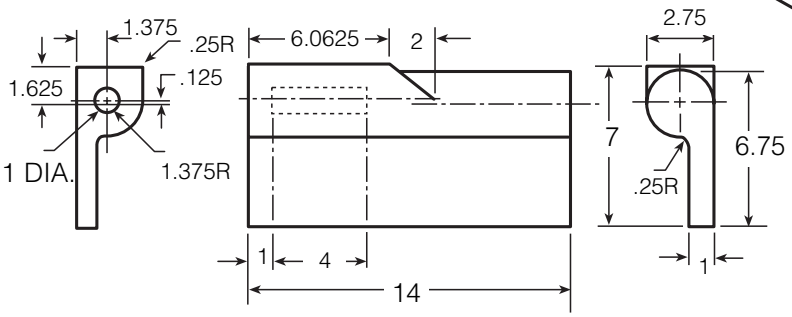

MOLDS 8513 & 8514
AS SHOWN & OPPOSITE
R.187
2
4.75
.875
4.50
.50 X 45°
MOLD NO. 8345
AS SHOWN & OPPOSITE
SEE MOLD 4767
SEE MOLD 4499
12
11.75
11.921
14
MOLDS 8515, 8516
AS SHOWN & OPPOSITE
2
5.9375
4.75
.875
18
.875
2
R1
7

Molded Ends for Straight Strip Seals

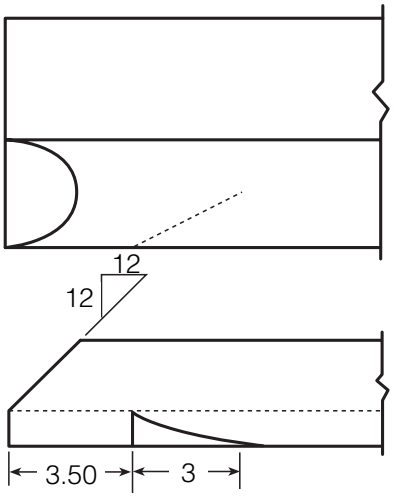


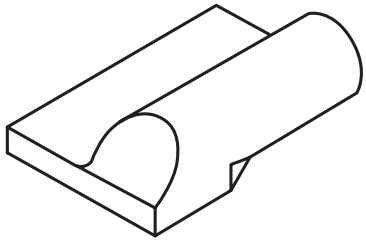
MOLD NO. 4487
AS SHOWN & OPPOSITE



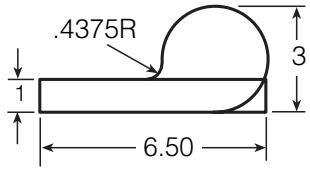


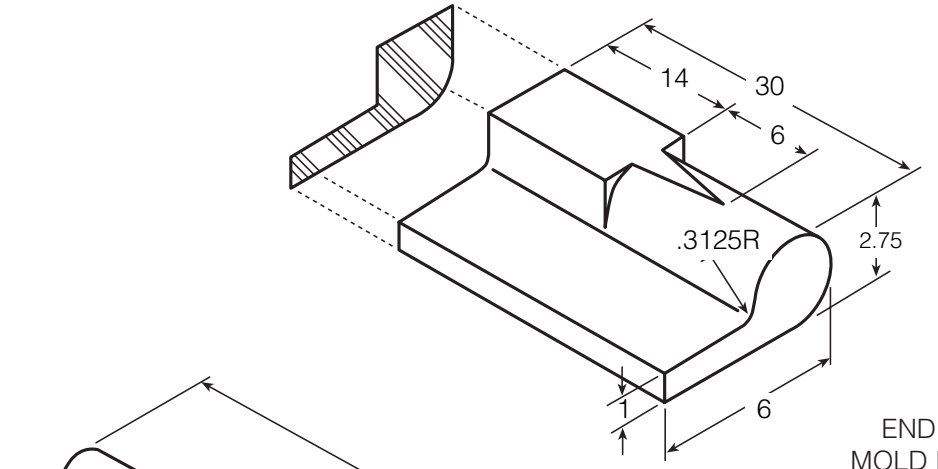
MOLD NO. 4488
AS SHOWN & OPPOSITE



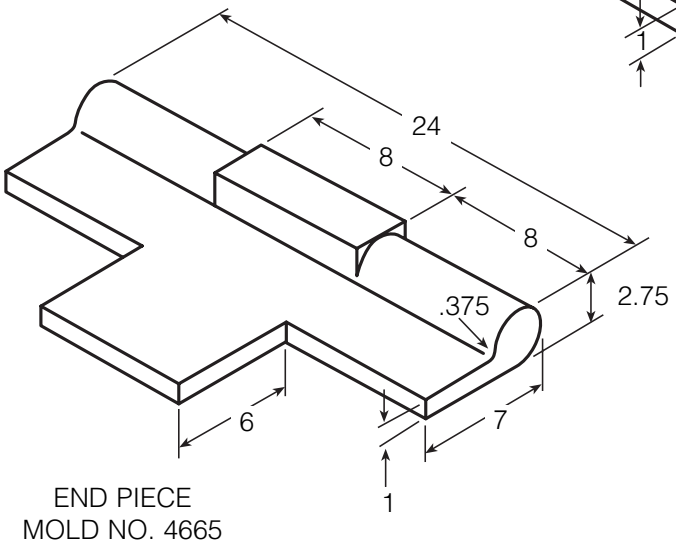


SPECIAL END PIECE
FOR ATTACHMENT TO MOLD NO. 3074 PAGE A-1

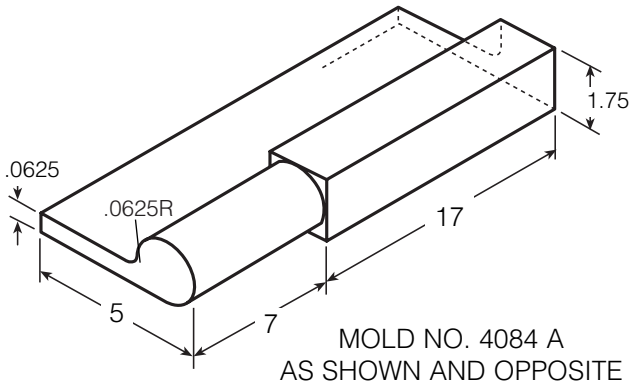




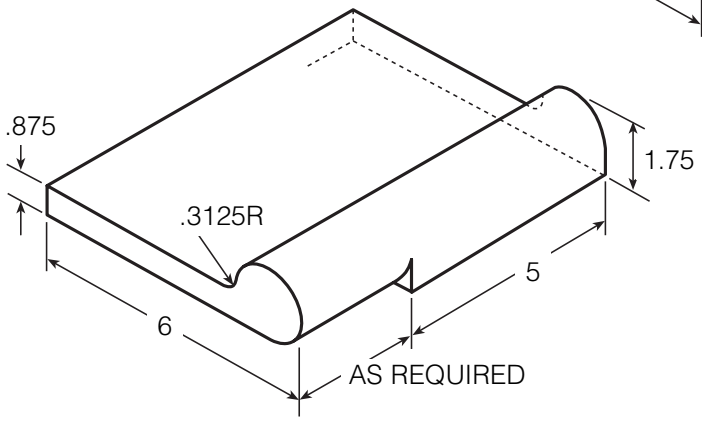
END PIECE
MOLD NO. 4992
AS SHOWN AND OPPOSITE

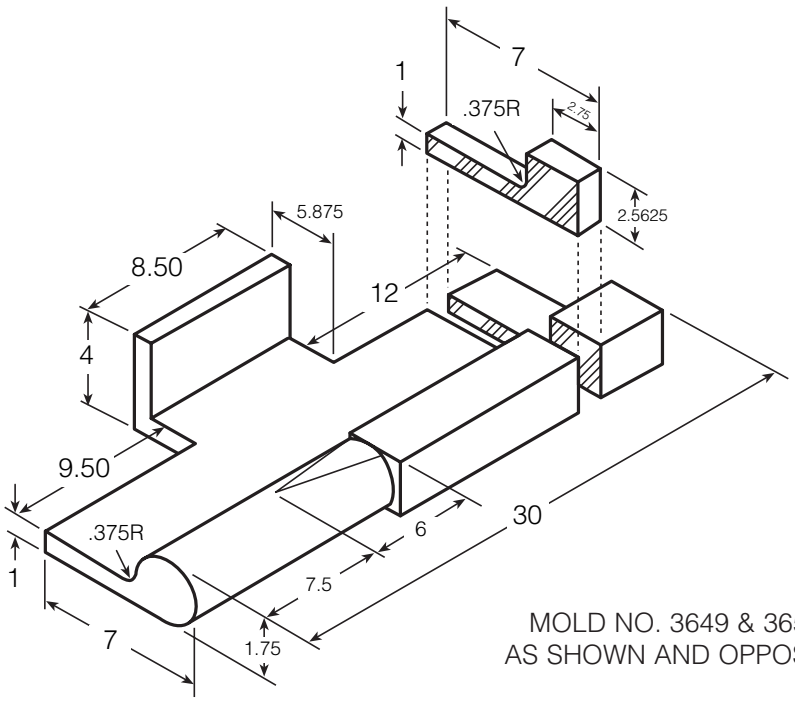


END PIECE
MOLD NO. 4665

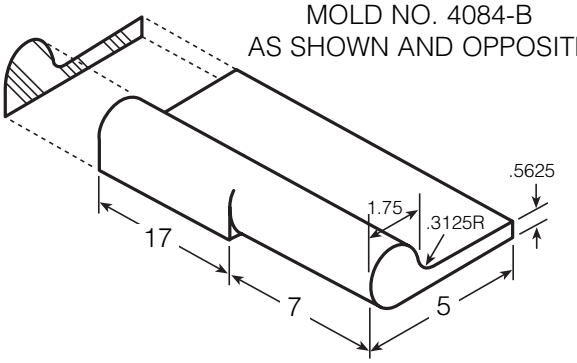


MOLD NO. 4084 A
AS SHOWN AND OPPOSITE

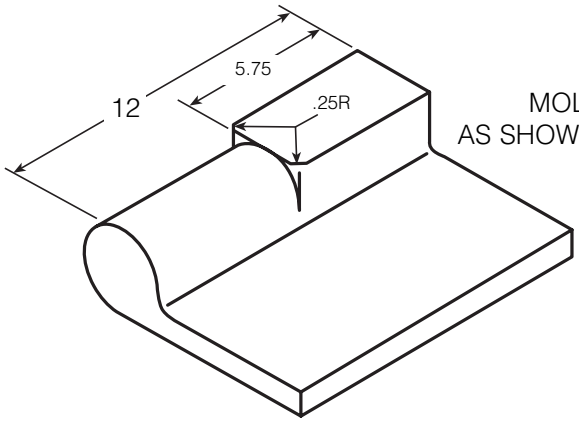




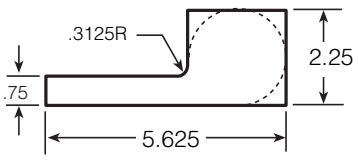
MOLD NO. 3649 & 3650
AS SHOWN AND OPPOSITE



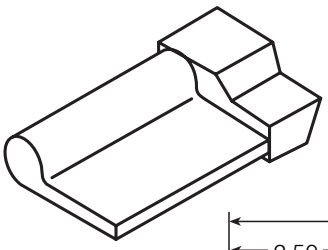
MOLD NO. 4084-B
AS SHOWN AND OPPOSITE



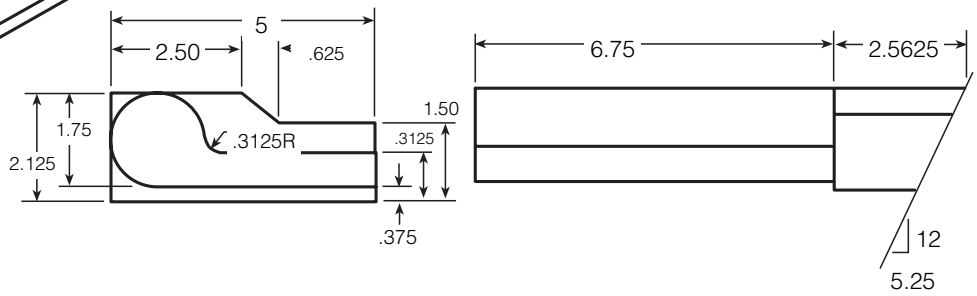
MOLD NO. 3441
AS SHOWN AND OPPOSITE

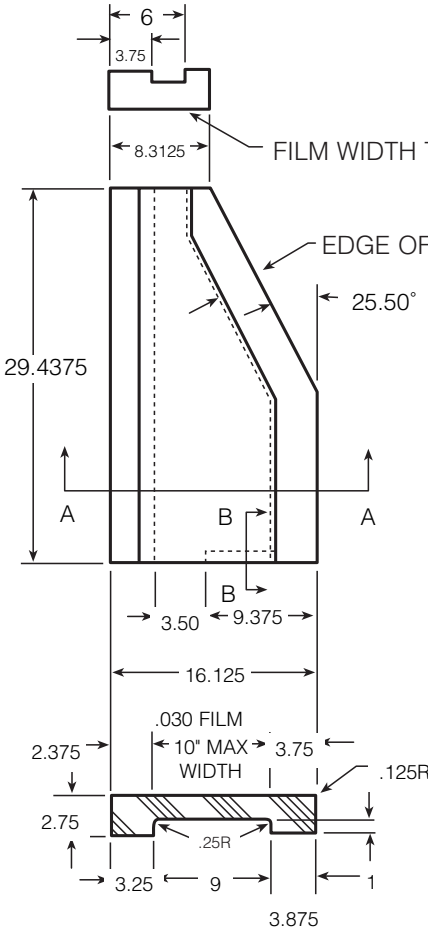


TYPICAL CROSS SECTION

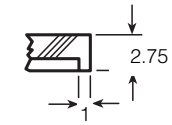


END PIECE
MOLD NO. 6475
AS SHOWN AND OPPOSITE





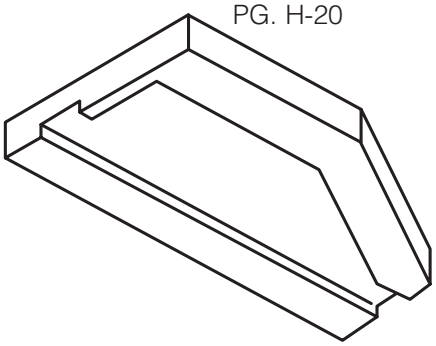
SECTION A-A

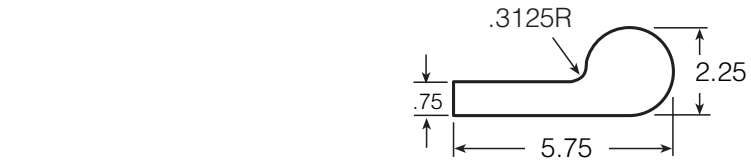


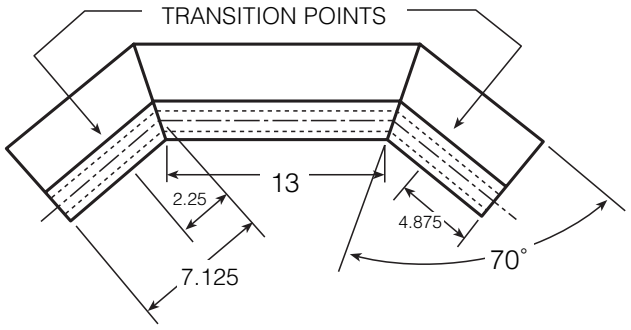
SECTION B-B

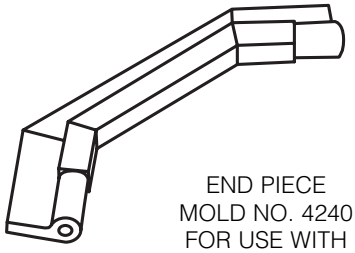
MOLD NO. 5298 & 5299
AS SHOWN AND OPPOSITE

FLUORO-CARBON FILM
COVER (OPTIONAL)
USED WITH MOLD NO. 3677-A
PG. H-20

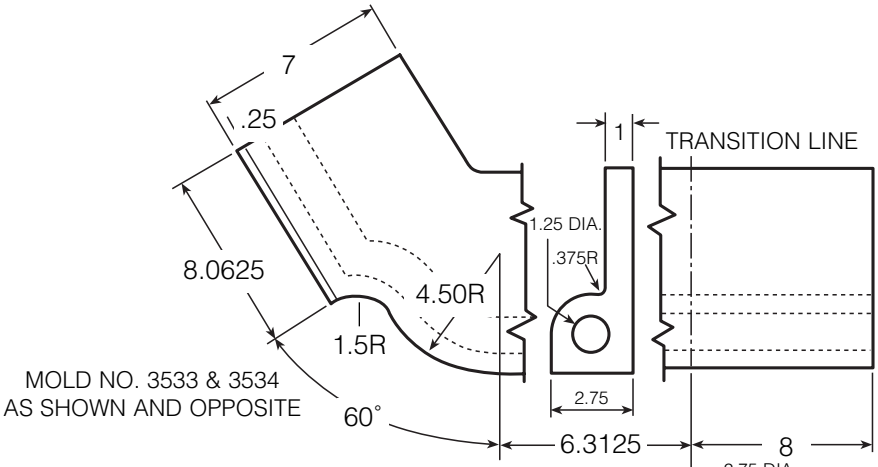




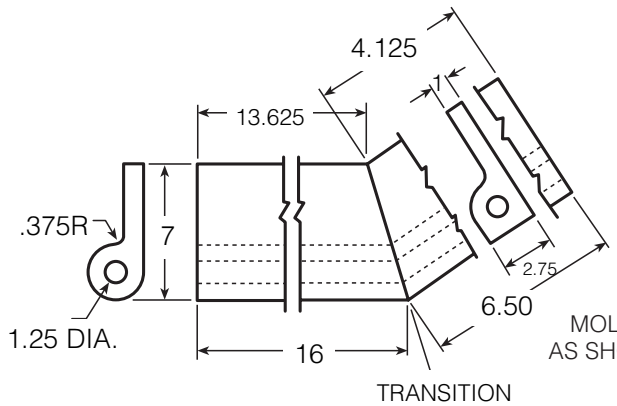


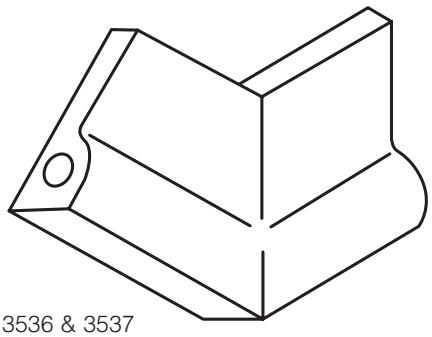


END PIECE
MOLD NO. 4240
FOR USE WITH
MOLD NO. 4234 & 4235
PG. C-9

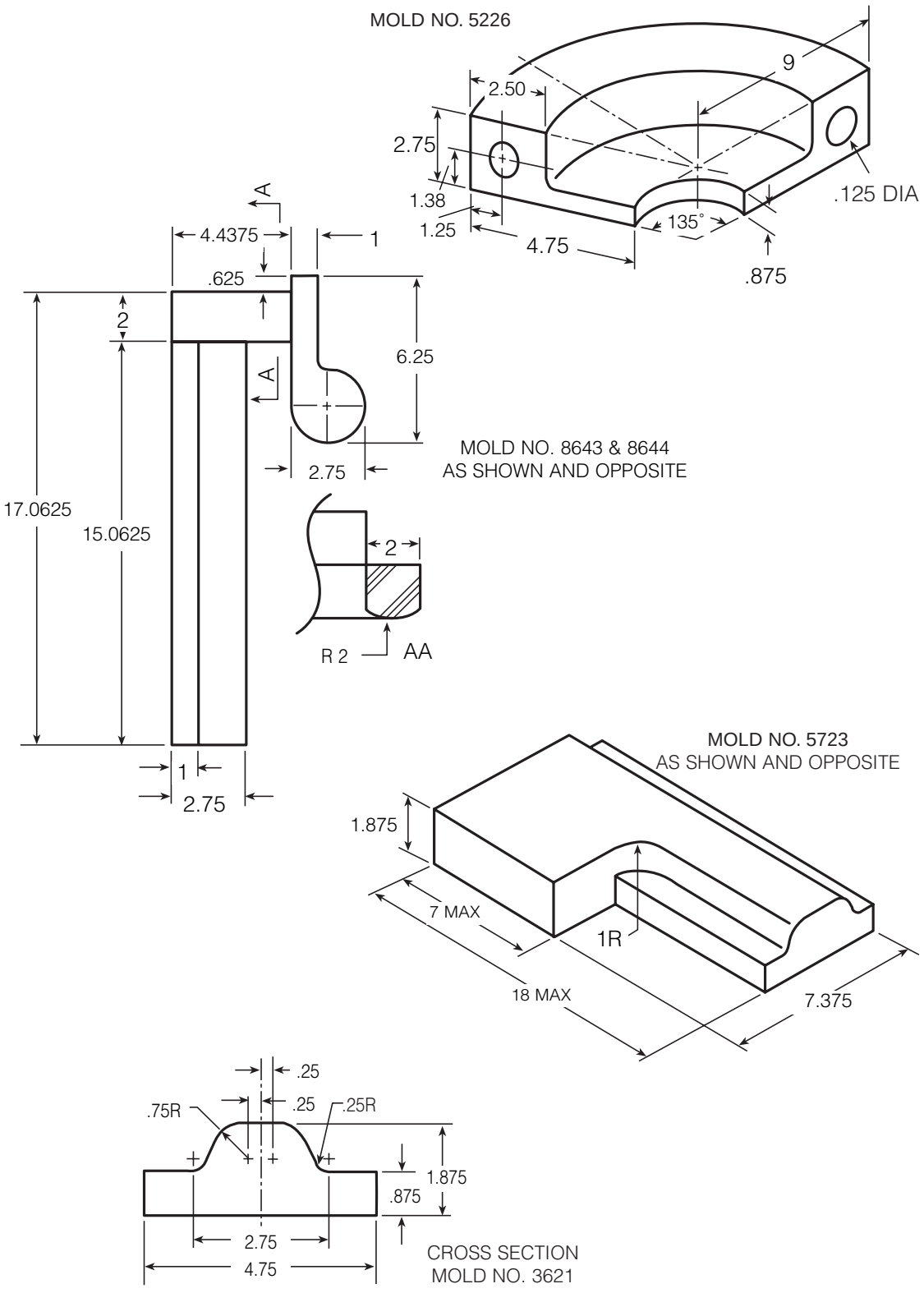


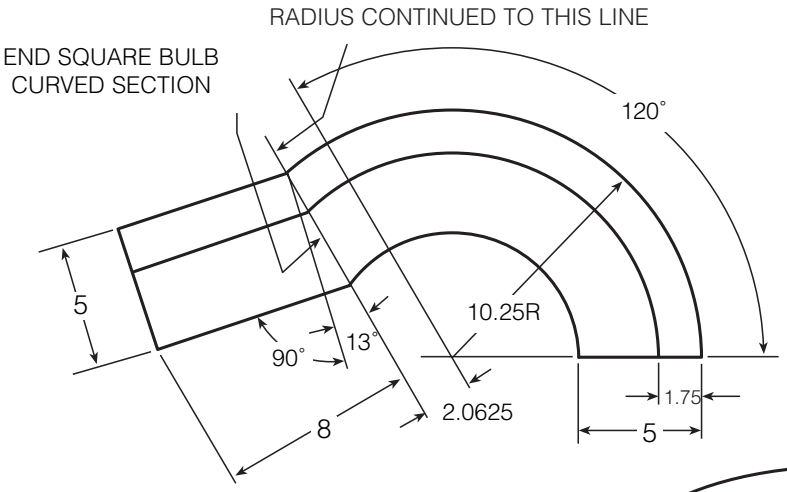
MOLD NO. 3533 & 3534
AS SHOWN AND OPPOSITE



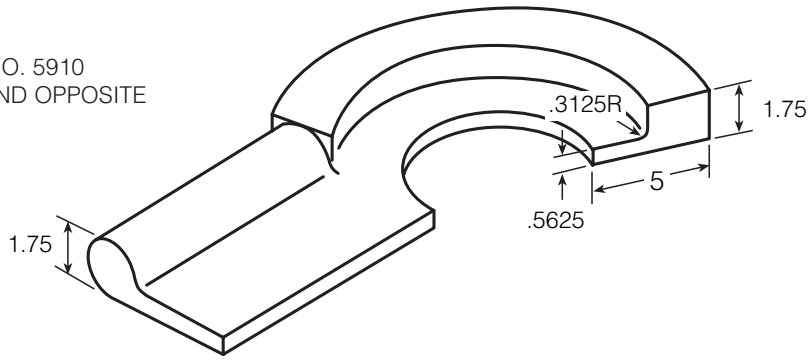


MOLD NO. 3536 & 3537
AS SHOWN AND OPPOSITE

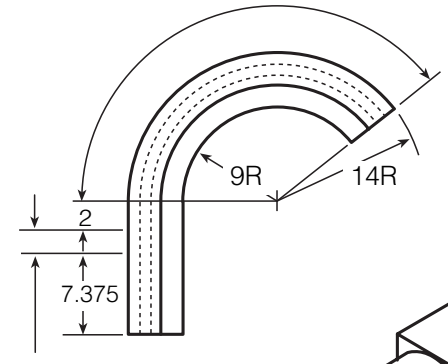

MOLD NO. 5226
9
2.50
2.75
1.38
1.25
4.75
135°
.125 DIA
.875
A
4.4375
1
.625
2
6.25
A
2.75
17.0625
15.0625
MOLD NO. 8643 & 8644
AS SHOWN AND OPPOSITE
2
R 2
AA
1
2.75
MOLD NO. 5723
AS SHOWN AND OPPOSITE
1.875
7 MAX
1R
18 MAX
7.375
.25
.25
.25R
.75R
1.875
.875
2.75
4.75
CROSS SECTION
MOLD NO. 3621



MOLD NO. 5910
AS SHOWN AND OPPOSITE

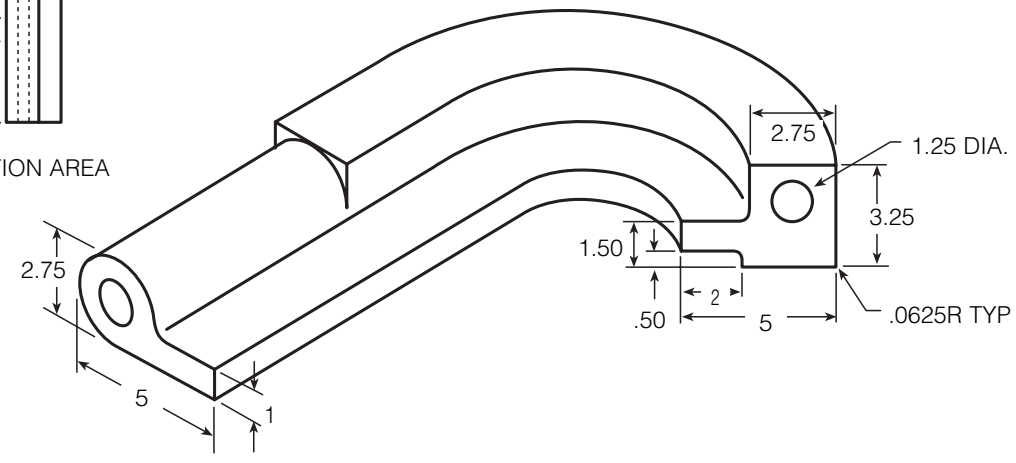


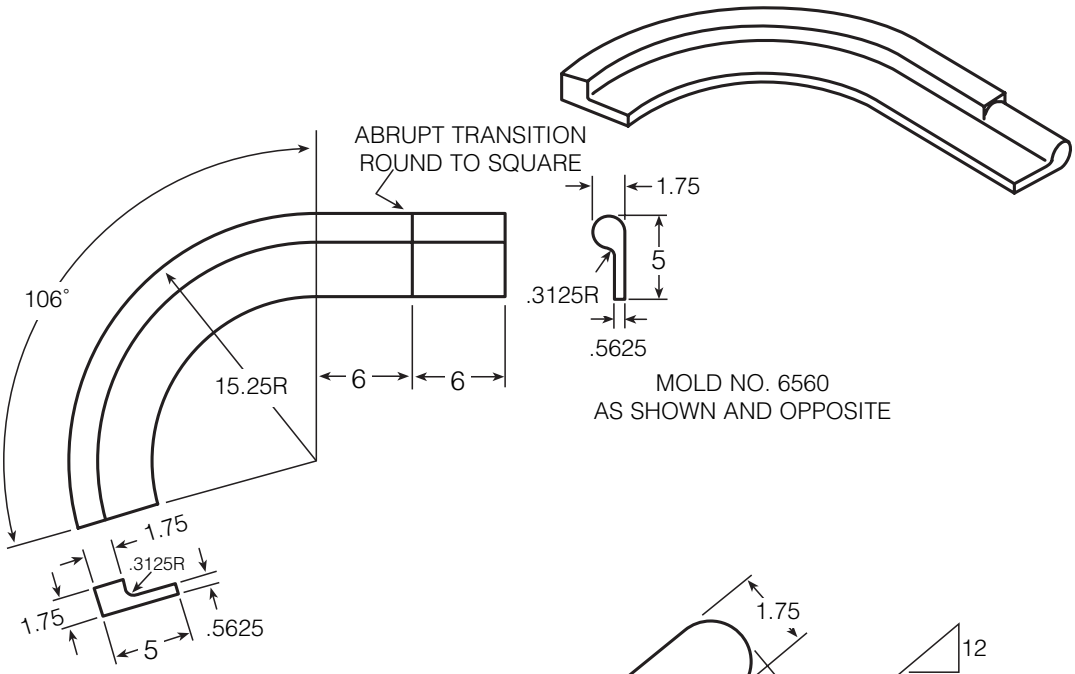
24.5625 on 10" RADIUS BOLT CIRCLE (WITHOUT BOLT HOLES–BOLT HOLES TO BE DRILLED WHEN FITTING SEAL TO GATE.)



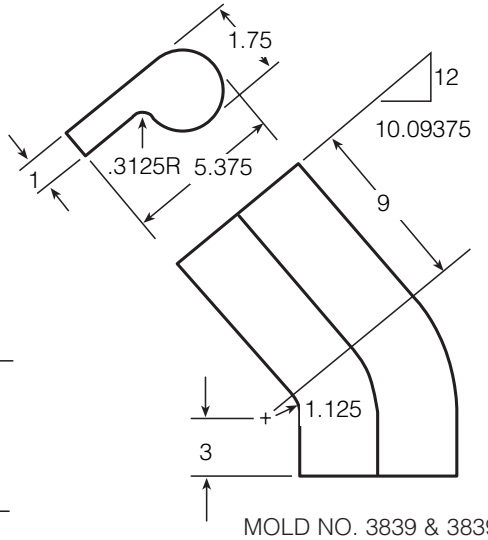
2" TRANSITION AREA

MOLD NO. 4308
AS SHOWN AND OPPOSITE

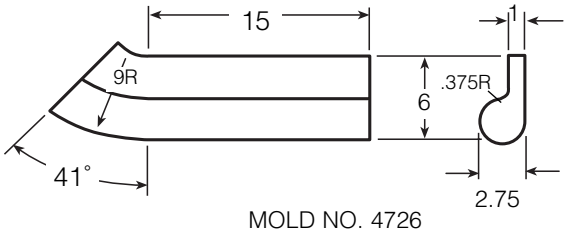




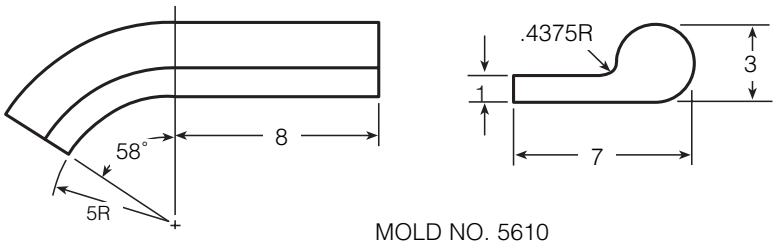
MOLD NO. 6560
AS SHOWN AND OPPOSITE



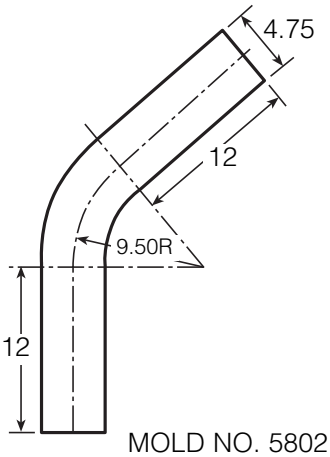
MOLD NO. 3839 & 3839L
AS SHOWN AND OPPOSITE



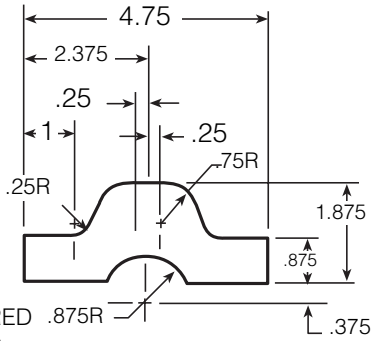
MOLD NO. 4726
AS SHOWN AND OPPOSITE



MOLD NO. 5610
AS SHOWN AND OPPOSITE

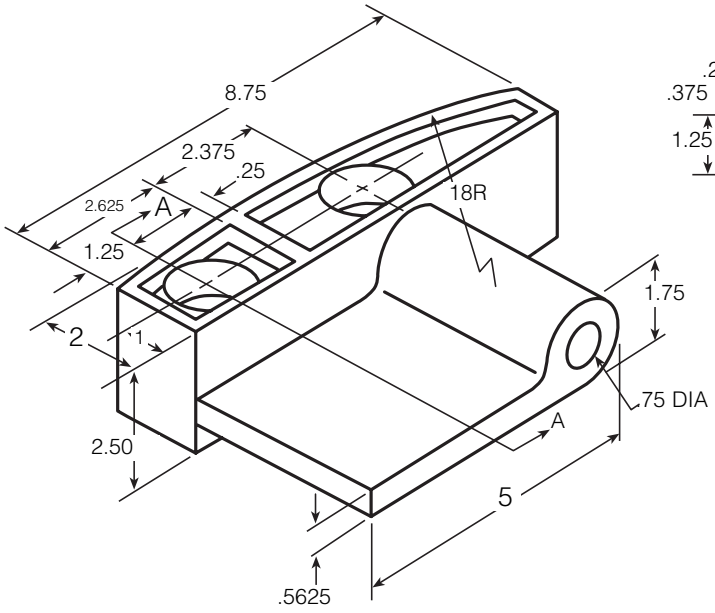


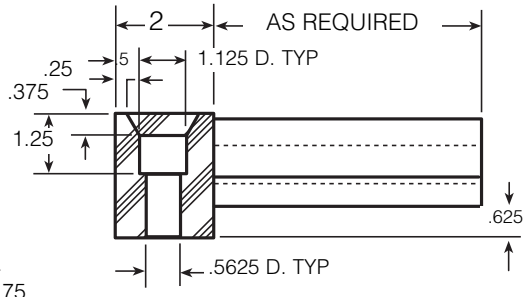
TYPICAL CROSS SECTION
PER MOLD NO. 3621-A PG. H-17



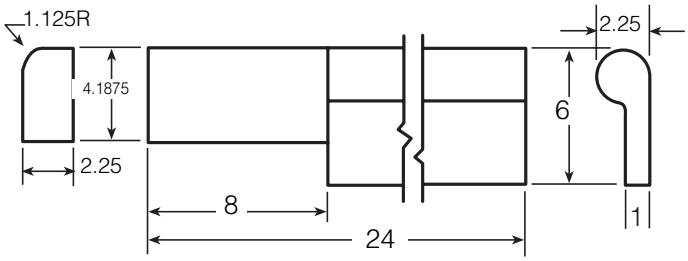
MOLD NO. 5802
TRIM EITHER END AS REQUIRED
FOR RIGHT OR LEFT HAND

MOLD NO. 3992 & 3993
AS SHOW AND OPPOSITE



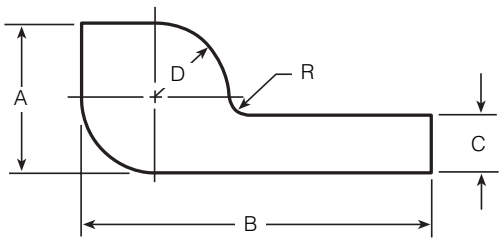


SECTION A-A

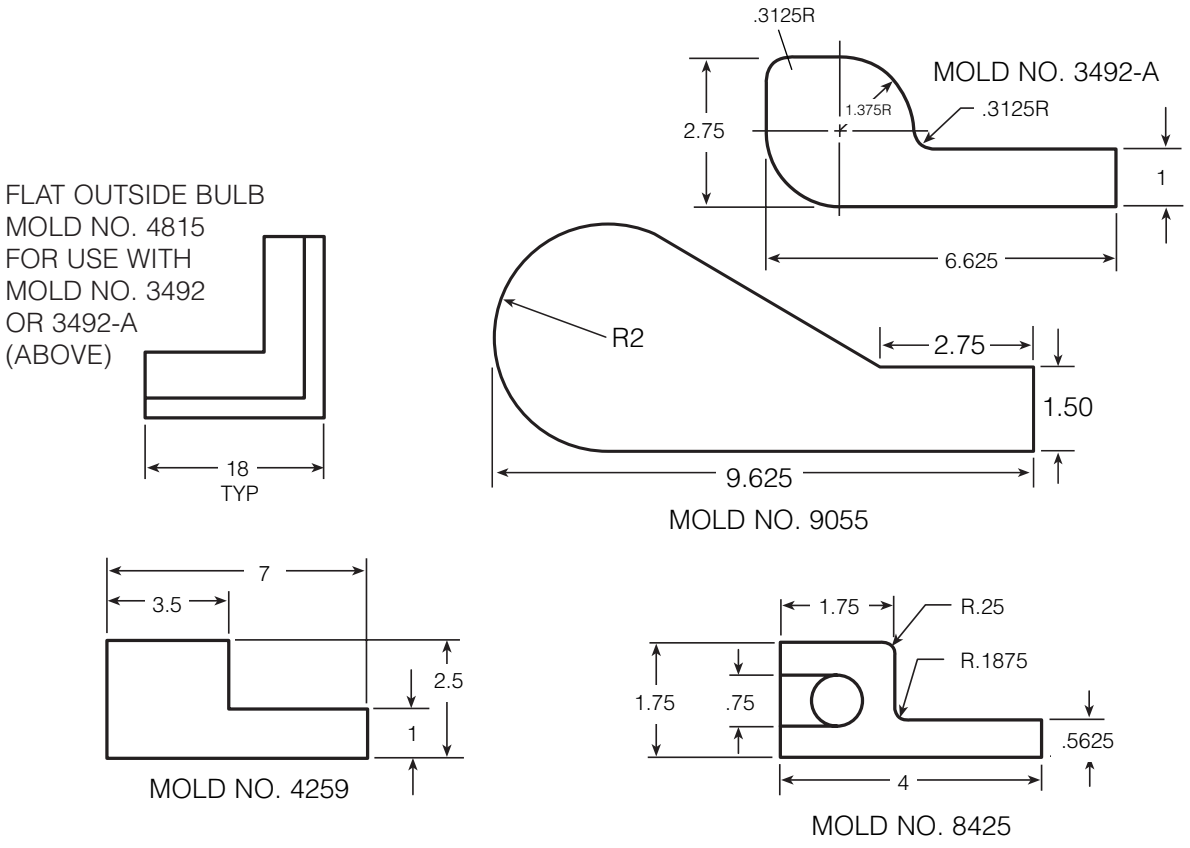


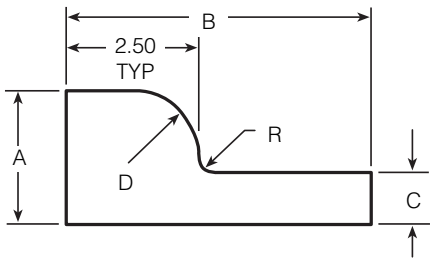
MOLD NO. 5603
AS SHOWN AND OPPOSITE

Edge - Bulb Seals

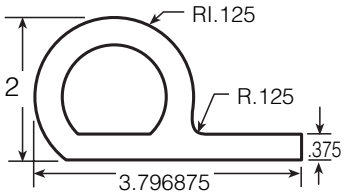


NO.	A	B	C	D	R
3492	2.75	6.625	1	1.375	.3125
6258	2.75	7.625	1	1.375	.375

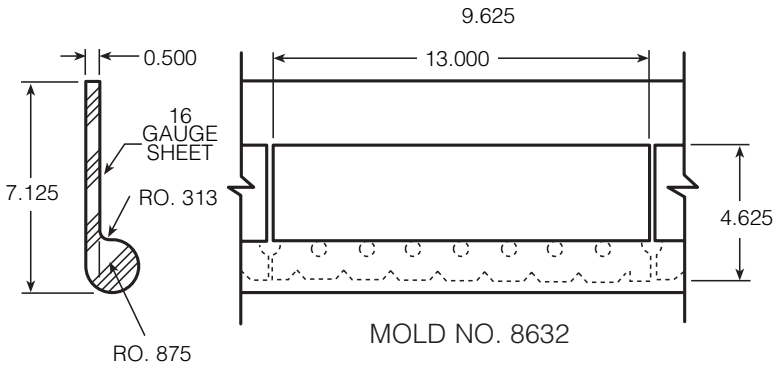




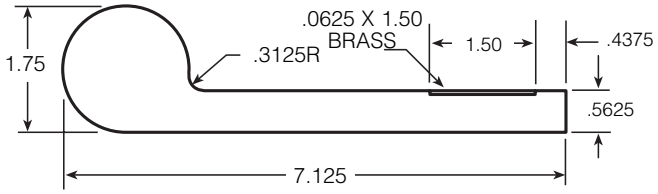
NO.	A	B	C	D	R
4446	2.50	5.75	1	1.25	.1875
4804	2.50	7.25	1	1.25	.25
4735	2.50	6.625	1	1.25	.25
4802	2.375	7.625	1	1.1875	.1875



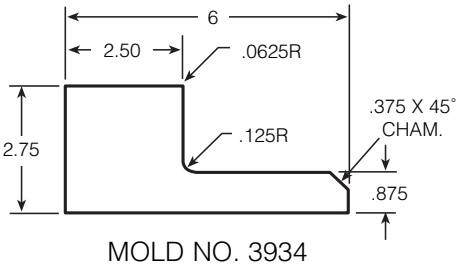
MOLD NO. 5775



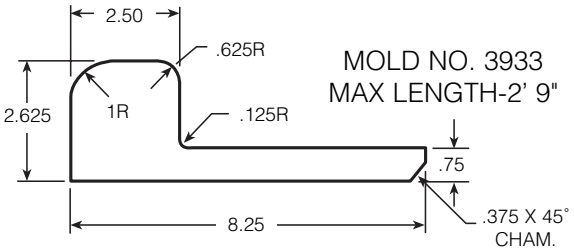
MOLD NO. 8632



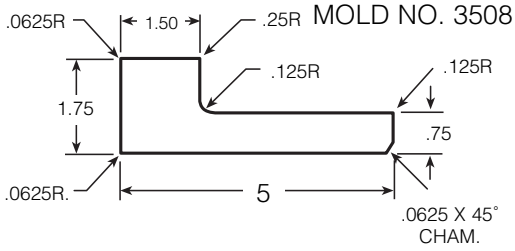
MOLD NO. 4287
MAX LENGTH 3' 5"



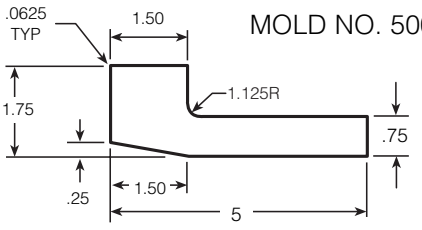
MOLD NO. 3934
MAX. LENGTH 3'5"



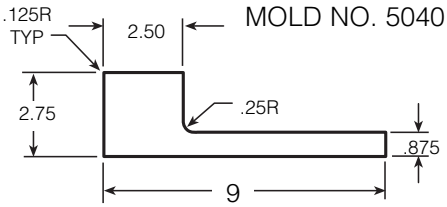
MOLD NO. 3933
MAX LENGTH-2' 9"



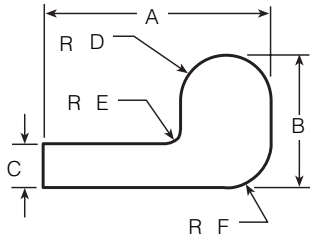
MOLD NO. 3508



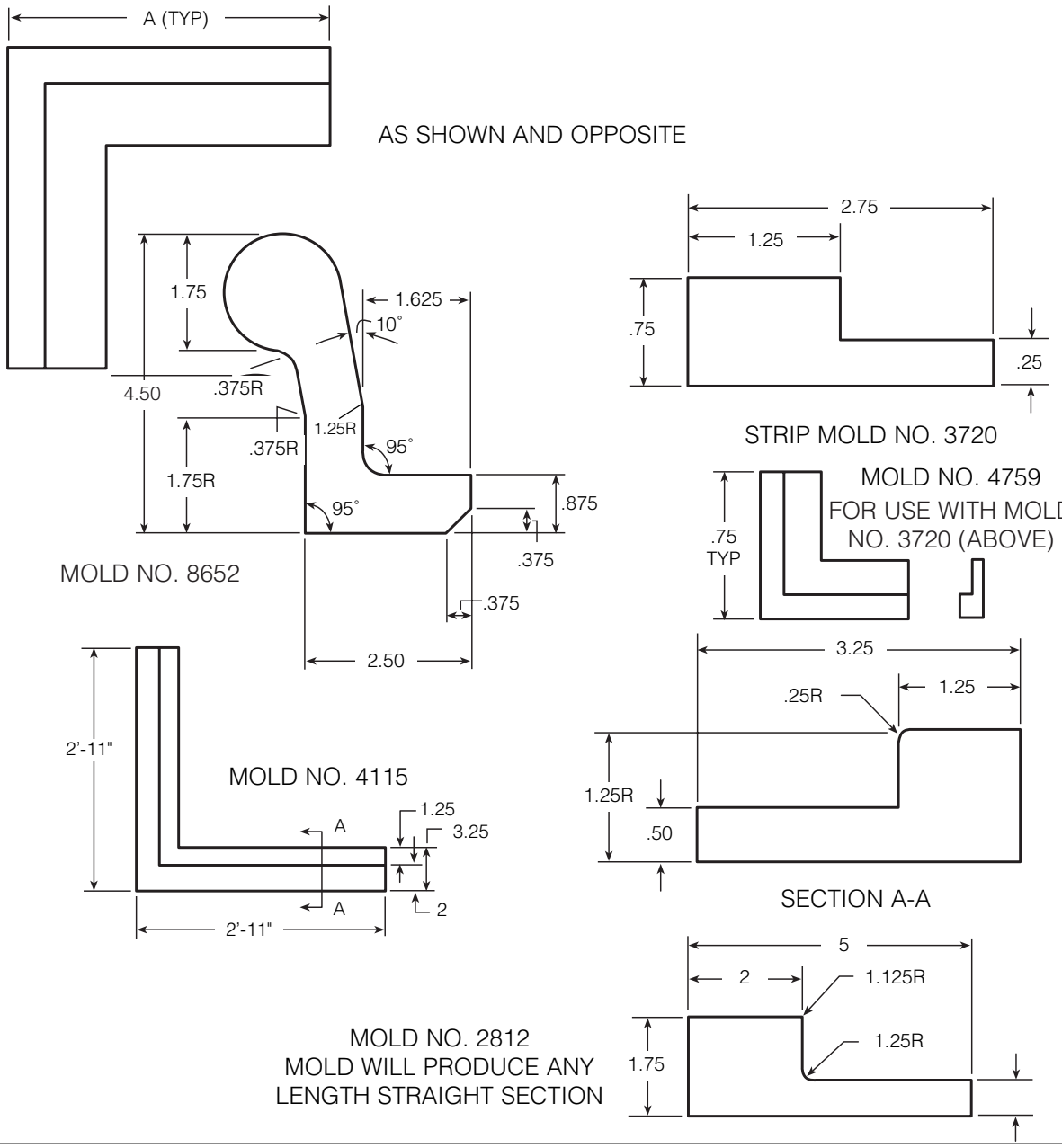
MOLD NO. 5008



MOLD NO. 5040

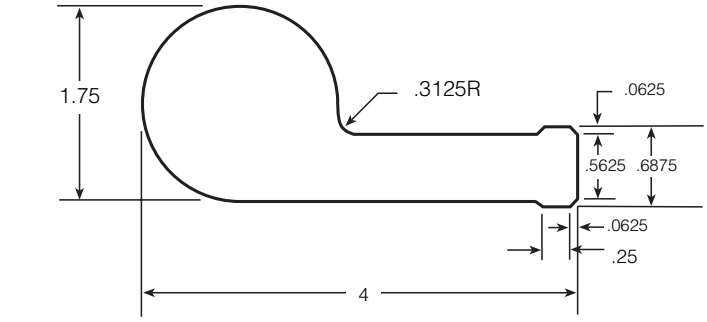


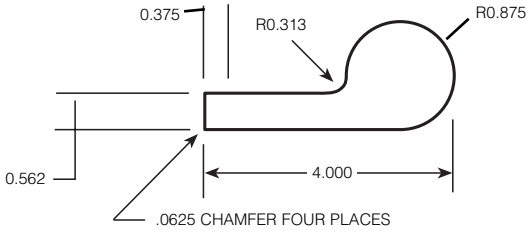
NO.	A	B	C	D	E	F
8839	4.75	3	1	1	.25	1
8768	3.75	2.25	.75	.75	.1875	.75
3792	3.50	2.125	.50	.75	.75	.75



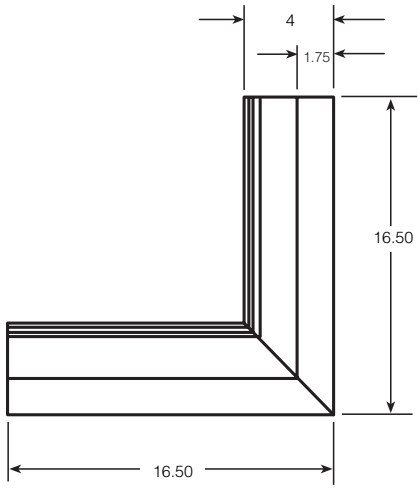
MOLD NO.	CROSS SECT.	A
8770	8768	12
3794	3792	21

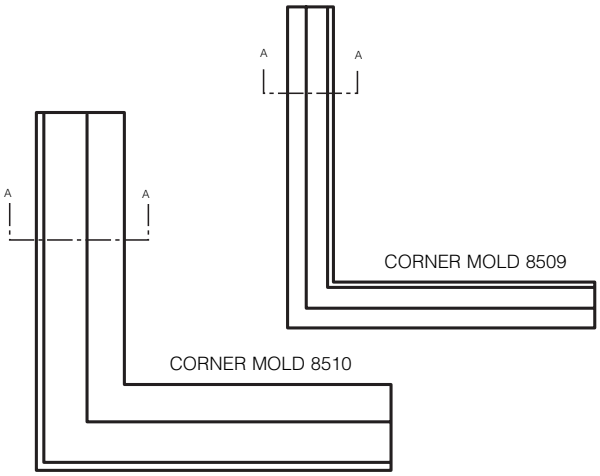
STRIP MOLD NO. 2329

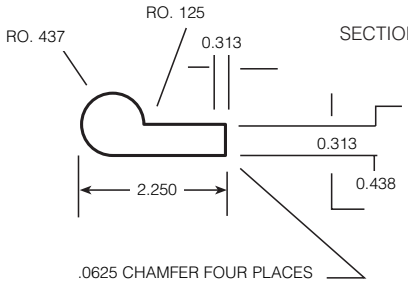


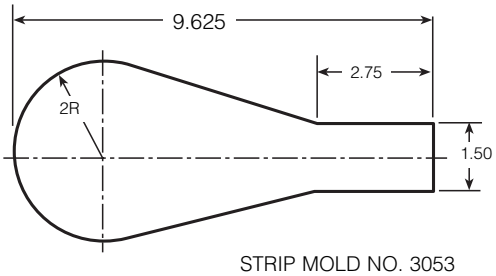


MOLD NO. 2330
TYPICAL CROSS SECTION
MOLD NO. 2329



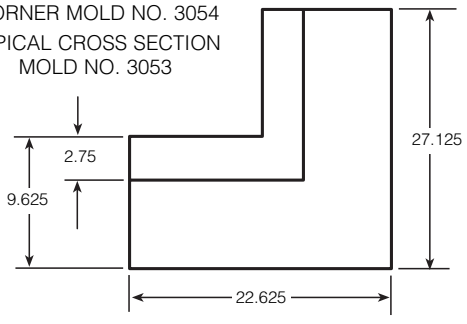


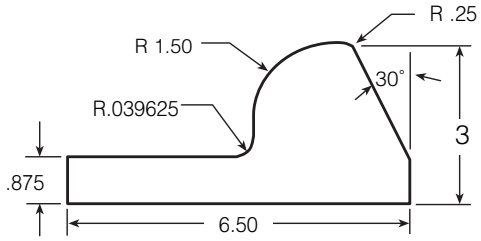




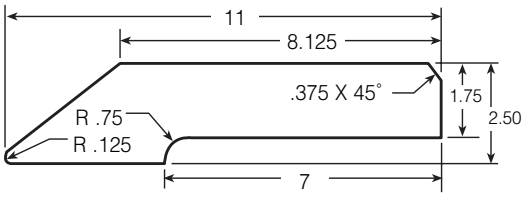
STRIP MOLD NO. 3053

CORNER MOLD NO. 3054
TYPICAL CROSS SECTION
MOLD NO. 3053

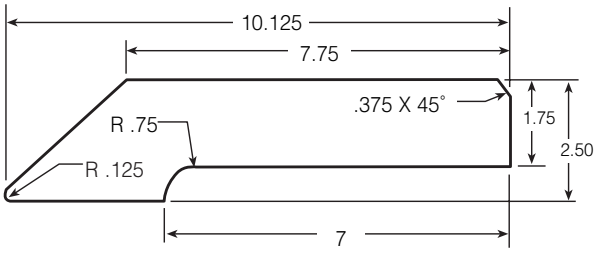




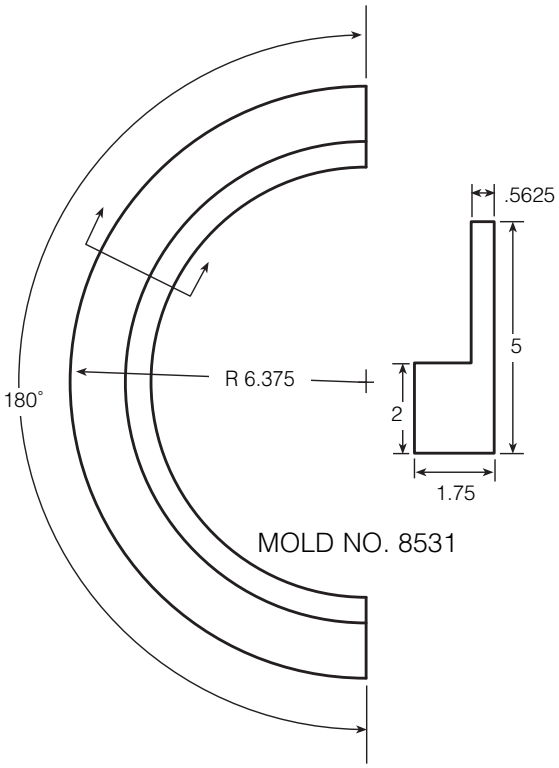
MOLD NO. 8559
TYPICAL CROSS SECTION



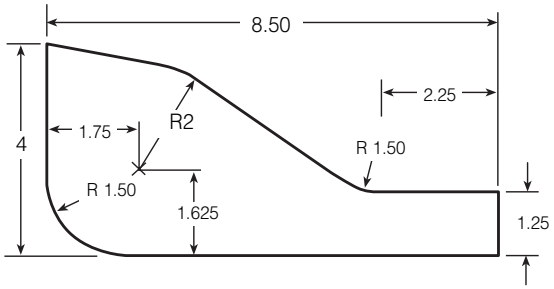
MOLD NO. 8537M
TYPICAL CROSS SECTION



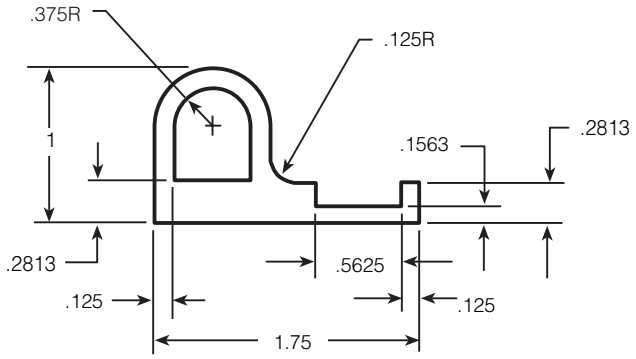
MOLD NO. 8537
TYPICAL CROSS SECTION



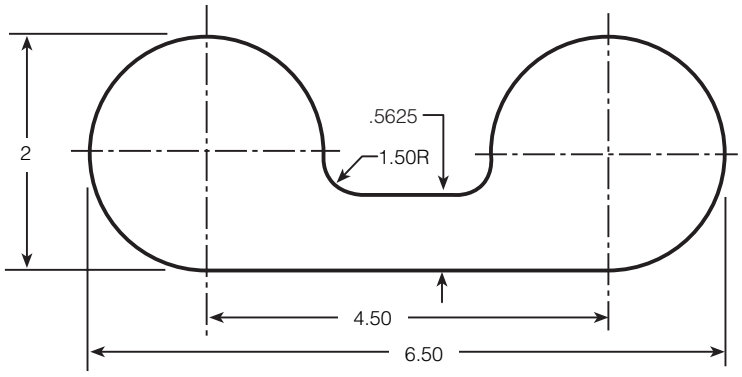
MOLD NO. 8531



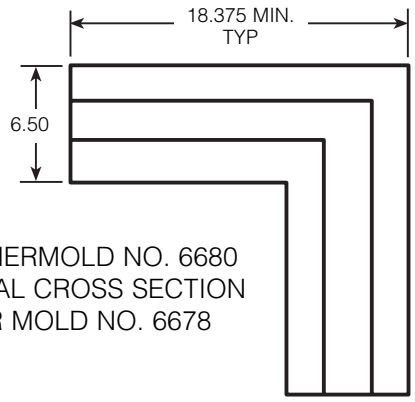
MOLD NO. 2990
TYPICAL CROSS SECTION



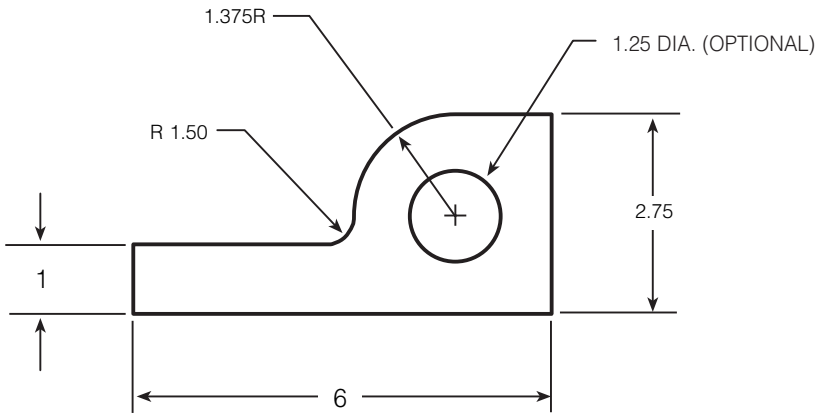
STRIP MOLD NO. 6493



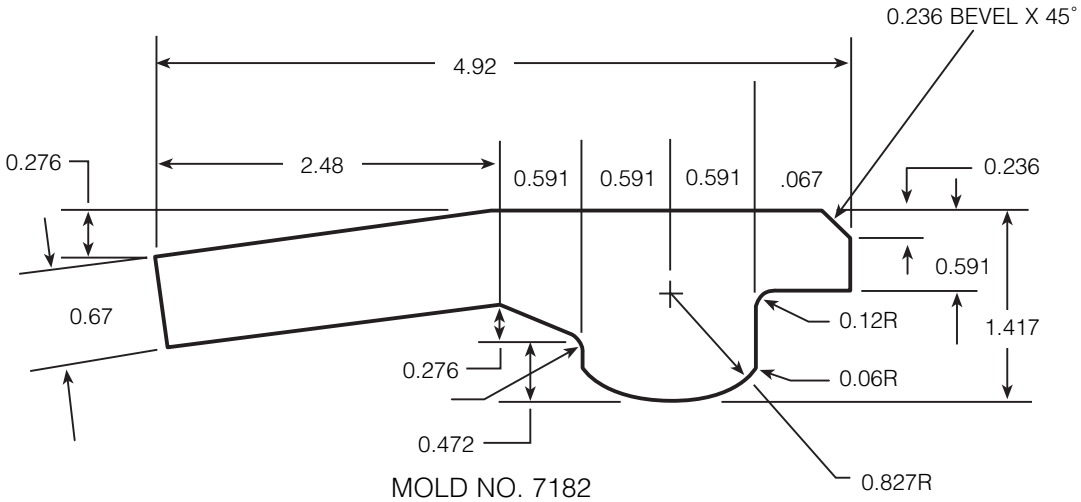
DOUBLE BULB SEAL
STRIP MOLD NO. 6678
SPLICE MOLD NO. 6679
ALTERNATE MOLD NO. 9333
1.75 X 6.0 X .56



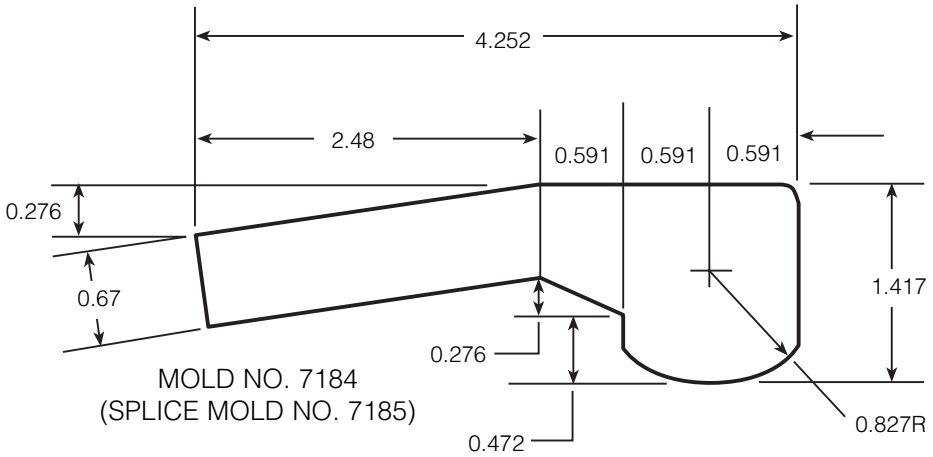
CORNERMOLD NO. 6680
TYPICAL CROSS SECTION
PER MOLD NO. 6678



MOLD NO. 6900
(MOLD LID OR HALF FOR MOLD NO. 6258)

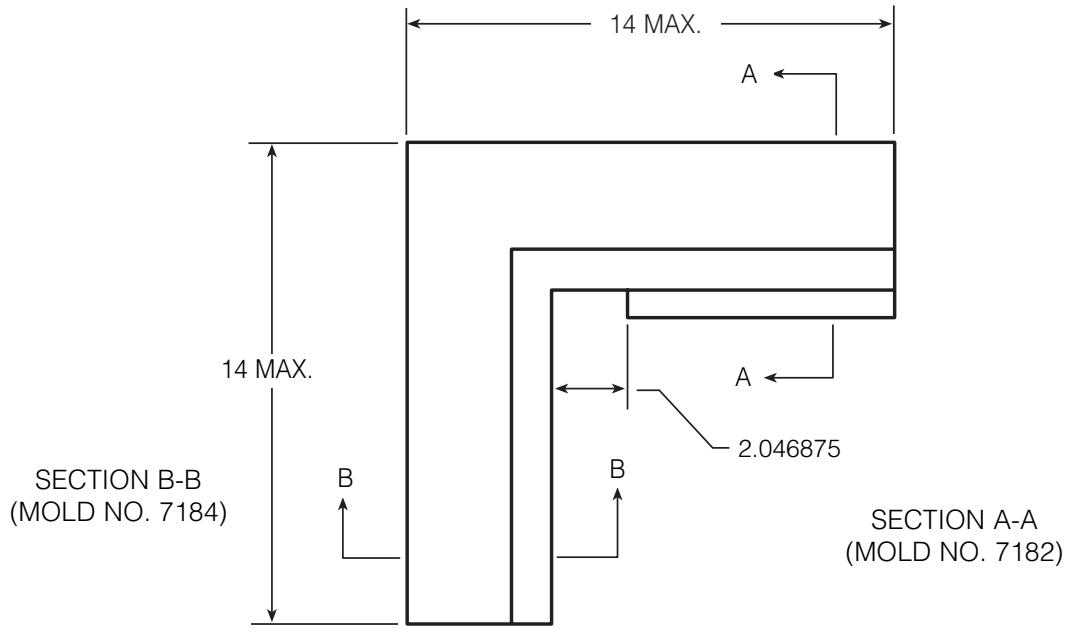


MOLD NO. 7182
(SPLICE MOLD NO. 7183)

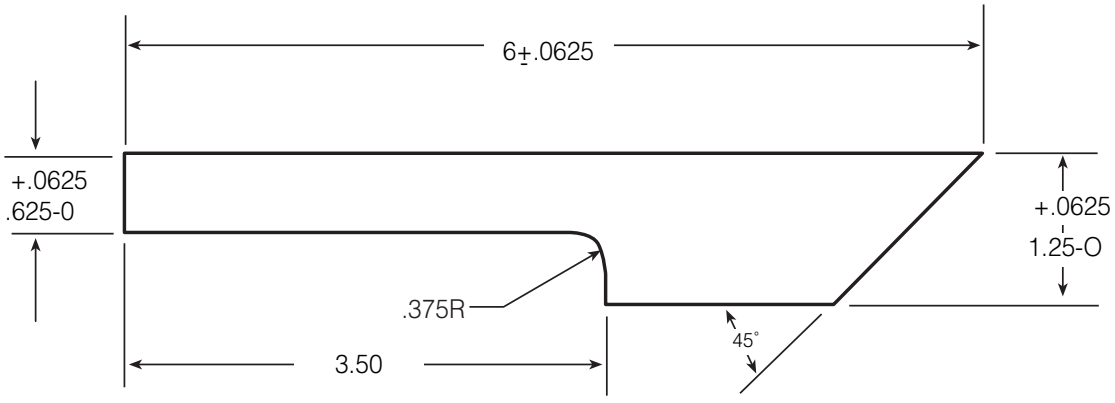


MOLD NO. 7184
(SPLICE MOLD NO. 7185)

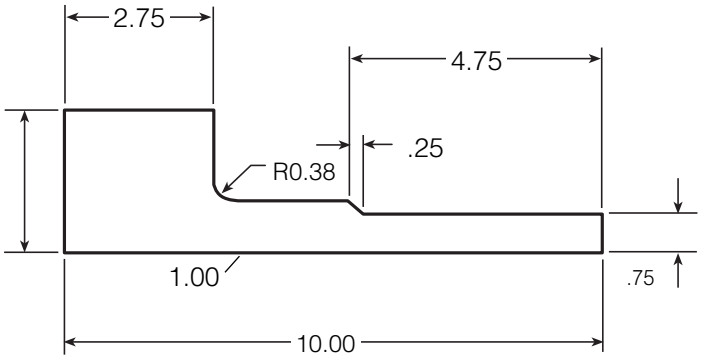
SEE PAGE G-8 FOR CORNER MOLD FOR THESE TWO SECTIONS



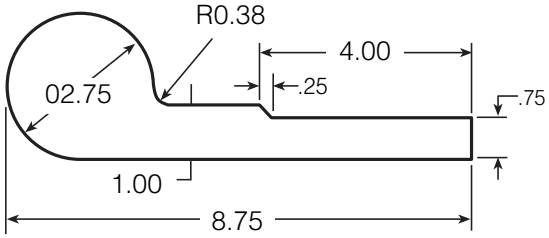
MOLD NO. 7186
AS SHOWN AND OPPOSITE



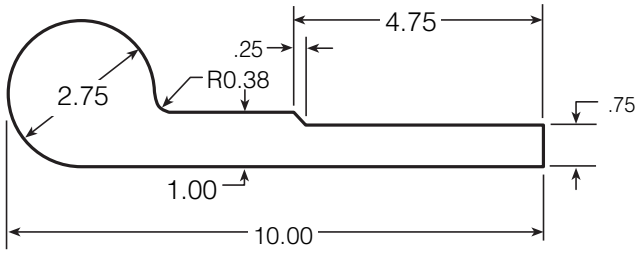
MOLD NO. 8063



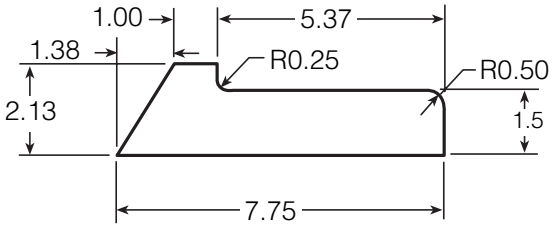
MOLD NO. 8067
4 FT. MAXIMUM TRANSITION TYPE
TO MOLD NO. 80678B END PC.



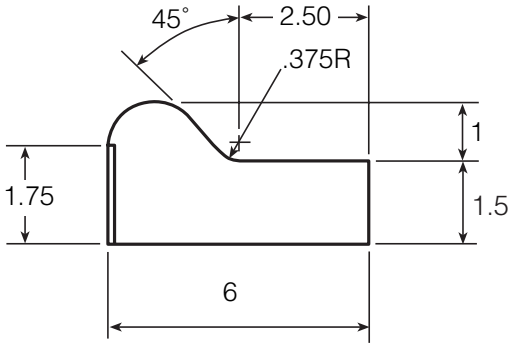
MOLD NO. 8068C



MOLD NO. 8068B

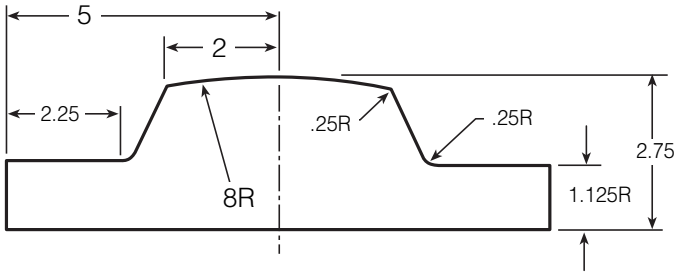


MOLD NO. 8070



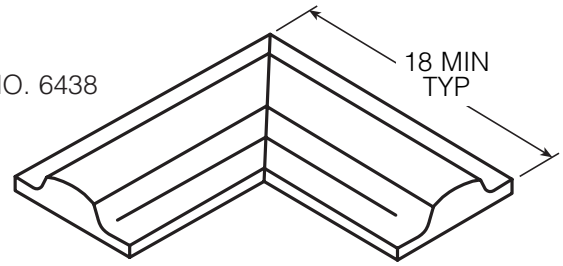
MOLD NO. 8069
.060 THICK FLUORO-CARBON

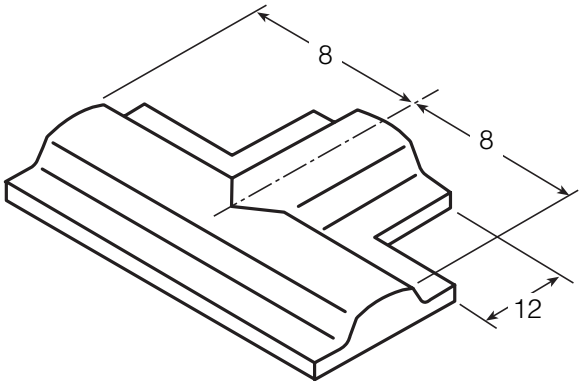
Center Bulb Seals



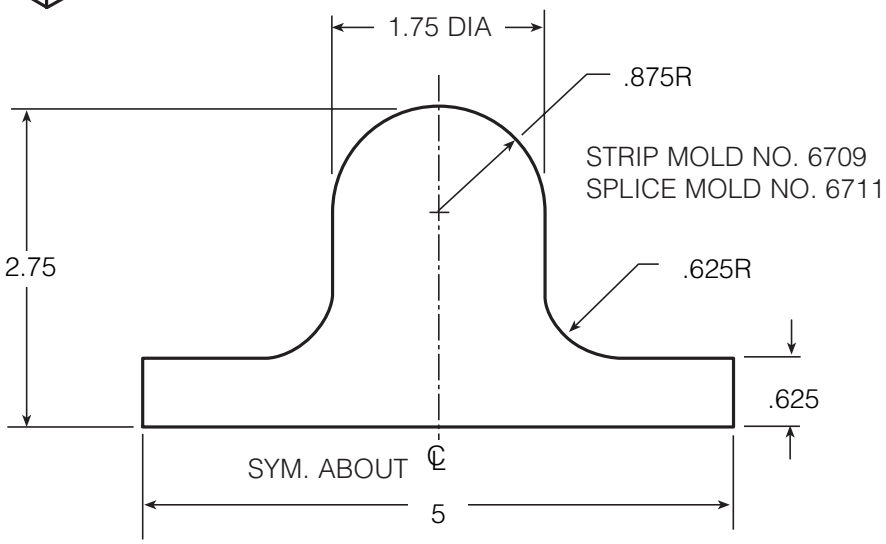
MOLD NO. 3677
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE

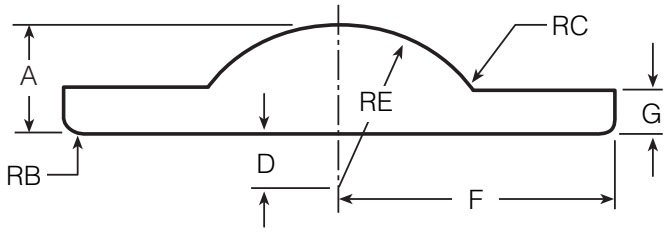
MOLD NO. 6438



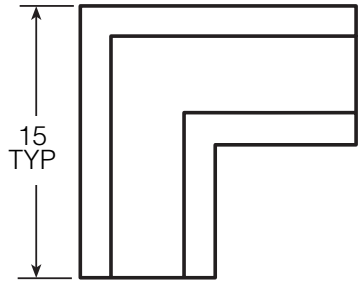


MOLD NO. 6435

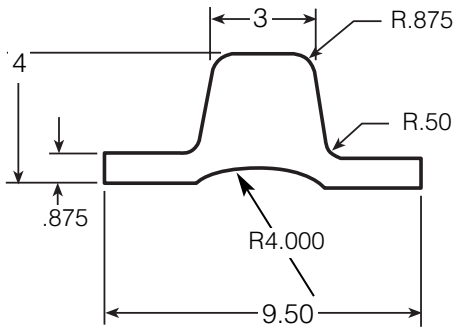




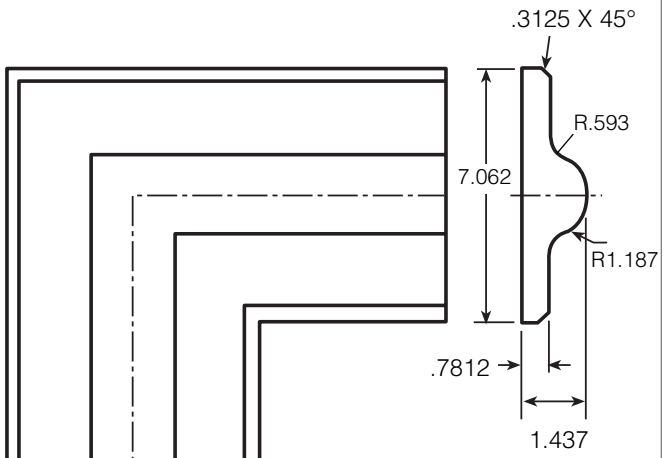
No.	A	B	C	D	E	F	G
1905	1.5	.25R	.25R	.75	2.25	3.75	.63
1905-A	1.38	.25R	.25R	.88	2.25	3.75	.50



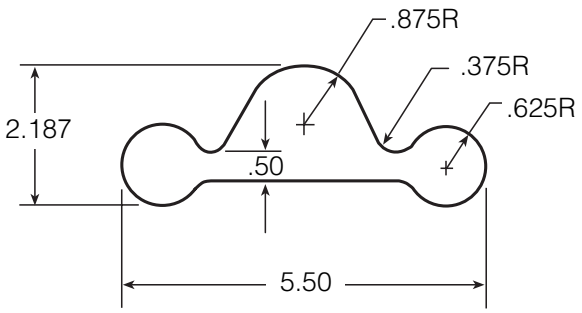
MOLD NO. 1906
CROSS SECTION TYPICAL
TO MOLD NO. 1905



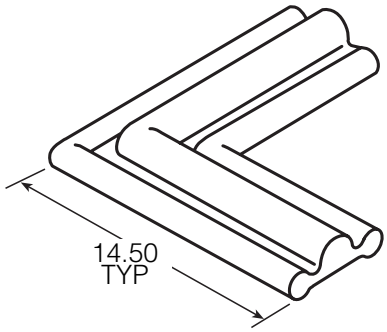
MOLD NO. 8542



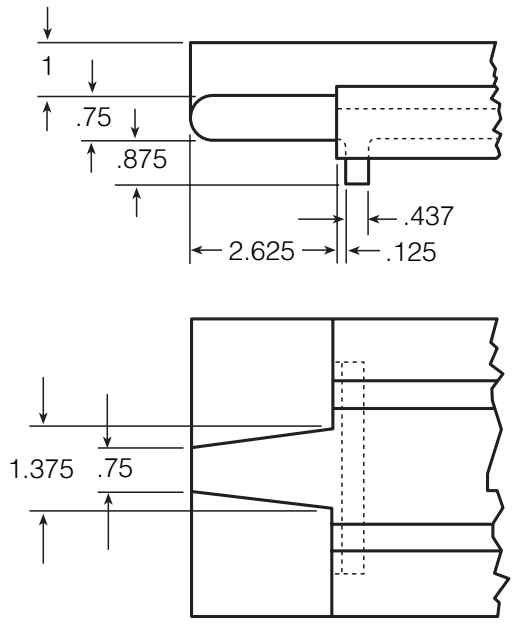
MOLD NO. 8929
CROSS SECTION IS
STRIP MOLD NO. 8928

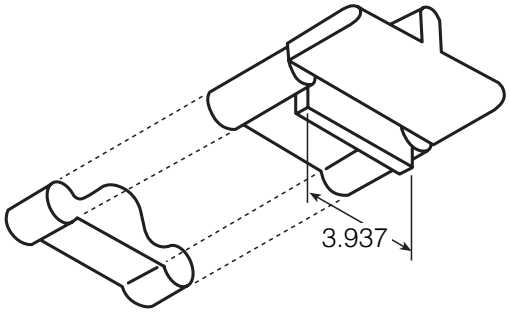


STRIP MOLD NO. 2933

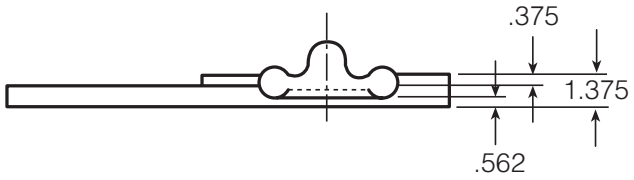


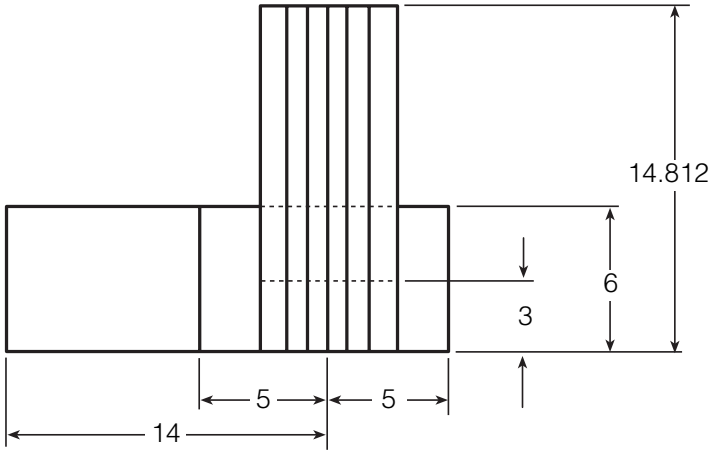
MOLD NO. 2918
TYPICAL CROSS SECTION
SEE MOLD NO. 2933





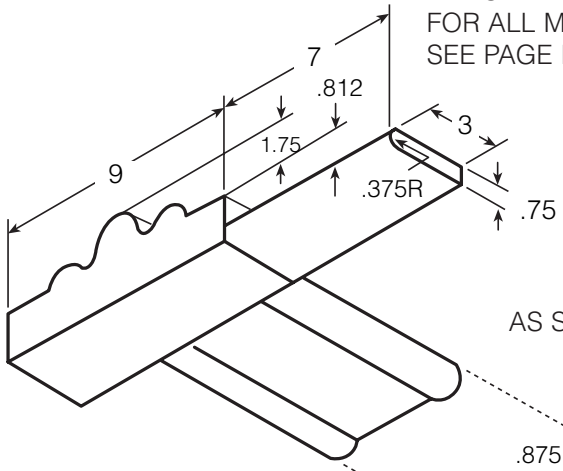
SPECIAL END SECTION FOR MOLD NO. 2933
(SHOWN ABOVE)



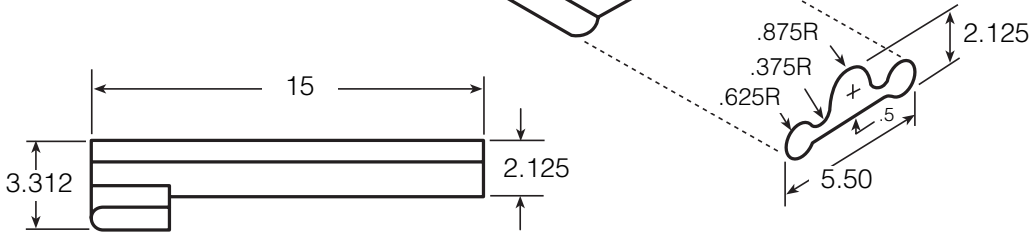


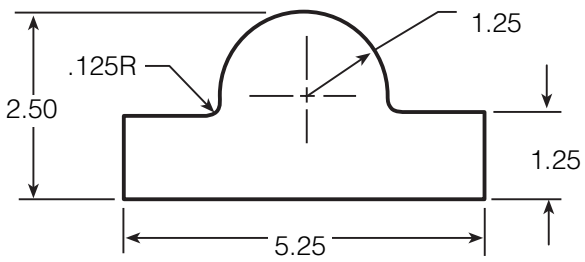
MOLD NO. 4282
AS SHOWN AND OPPOSITE

TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE PAGE H-3 MOLD NO. 2933



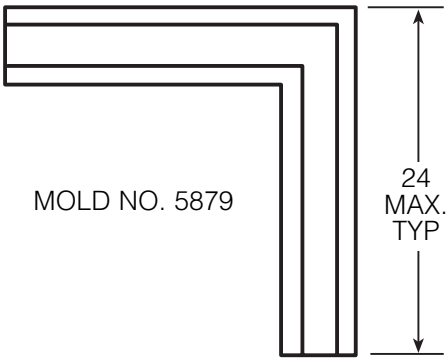
MOLD NO. 5292
AS SHOWN AND OPPOSITE





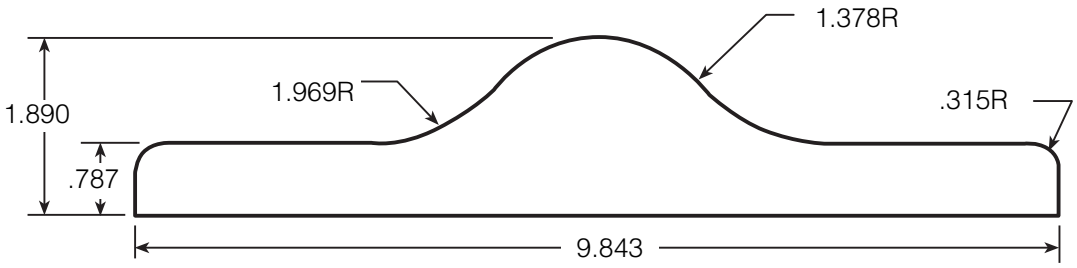
MOLD NO. 4258

TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE

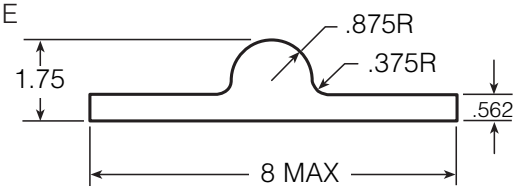


MOLD NO. 5879

MOLD NO. 9037

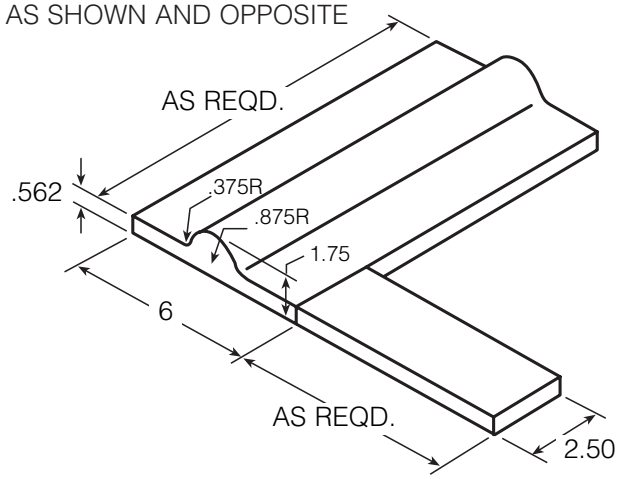


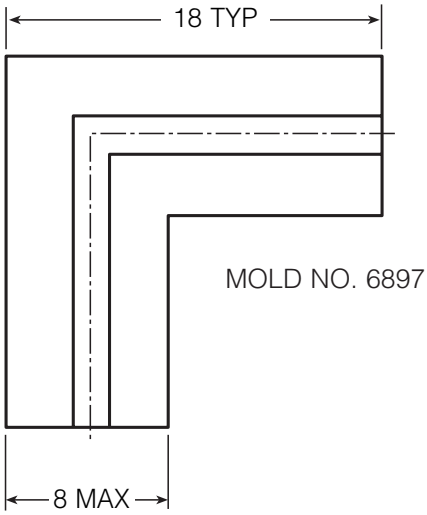
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
– WIDTHS AS SHOWN



MOLD NO. 4767

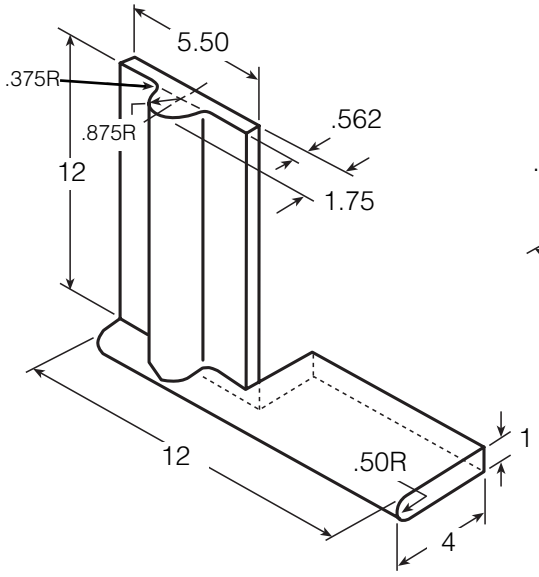
MOLD NO. 6275
AS SHOWN AND OPPOSITE

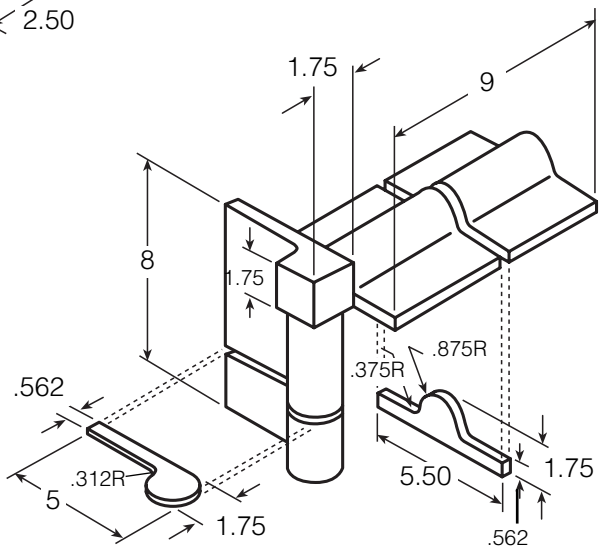




MOLD NO. 6897

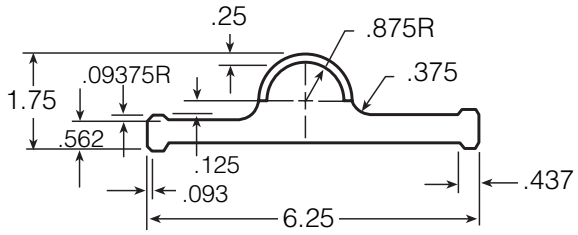
MOLD NO. 5006
AS SHOWN AND OPPOSITE





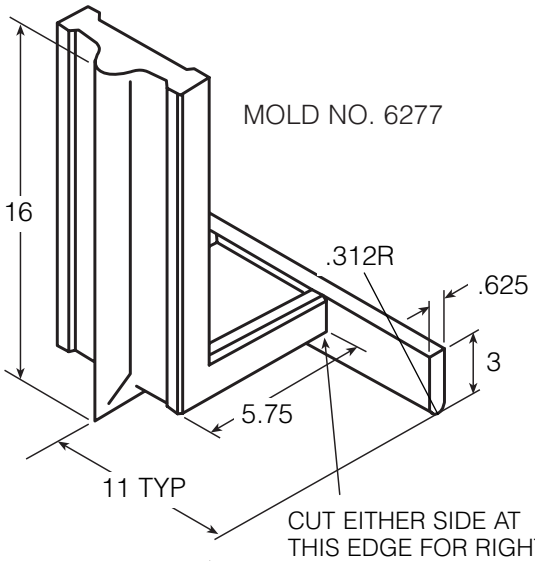
MOLD NO. 4788 AND 4789
AS SHOWN AND OPPOSITE

SIDE VIEW MOLD NO. 5006

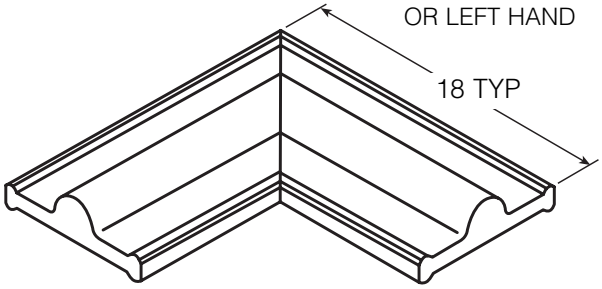


STRIP MOLD NO. 2284

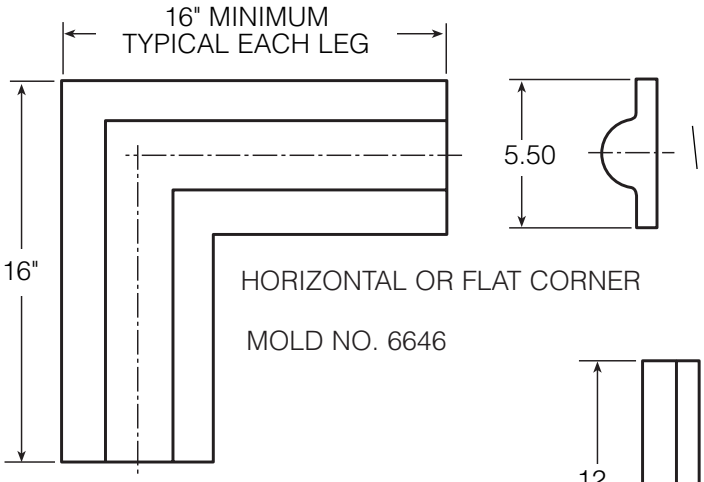
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE



CORNER MOLD NO. 2440
IF BRASS CLAD MAXIMUM
LEG LENGTH IS 14"

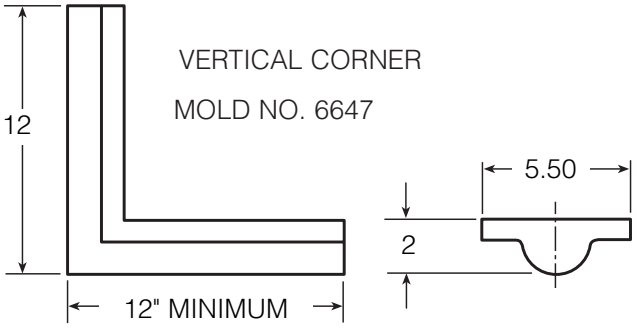


ALL RUBBER USE WITH
MOLD 2284 PAGE H-8



HORIZONTAL OR FLAT CORNER

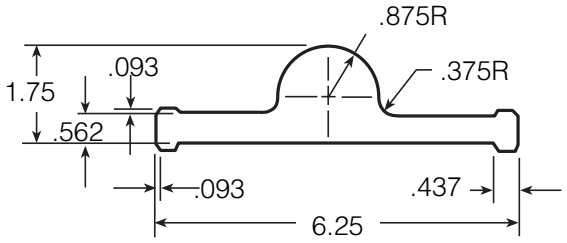
MOLD NO. 6646



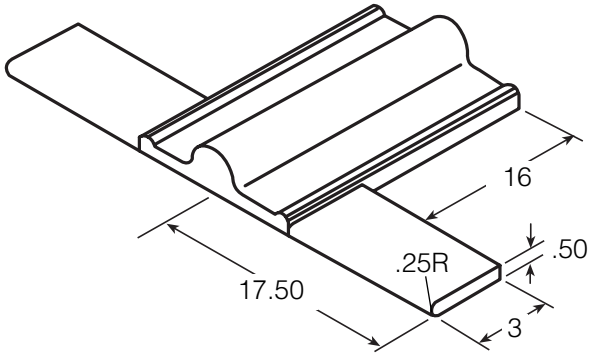
VERTICAL CORNER

MOLD NO. 6647

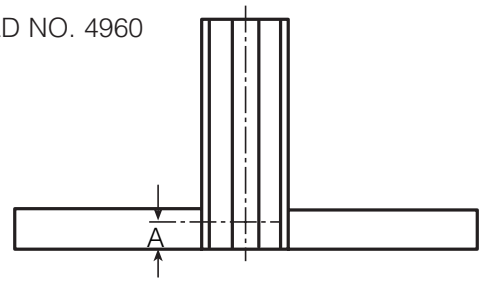
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE



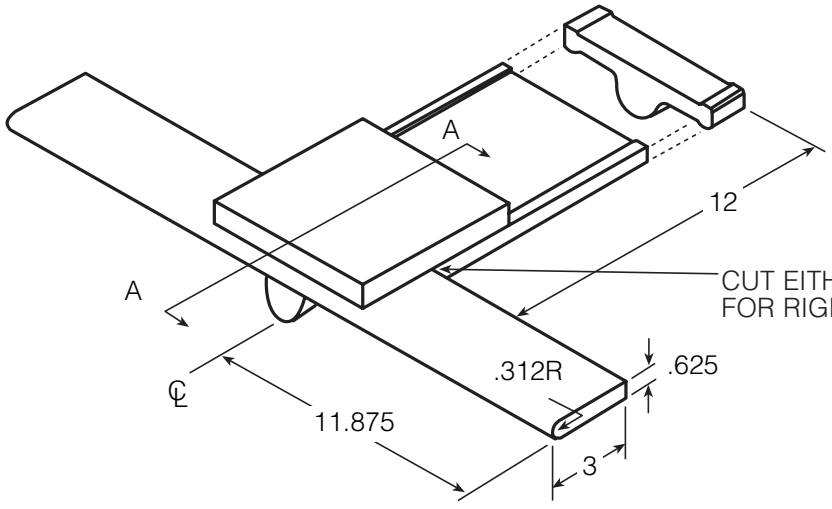
MOLD NO. 2284



MOLD NO. 4960



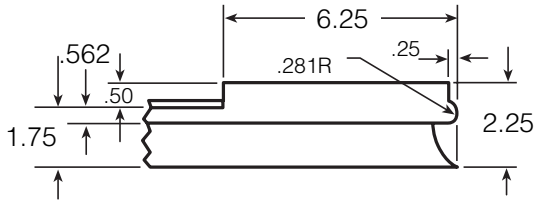
"A" DIM.– 2 & 2.125
MOLD TO PROVIDE BOTH



MOLD NO. 3589

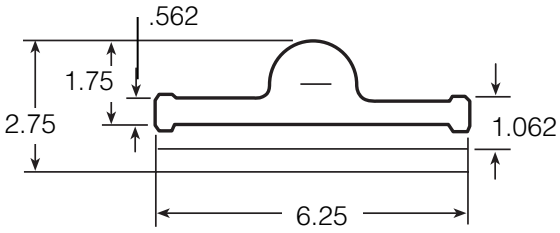
CUT EITHER SIDE AT THIS EDGE
FOR RIGHT OR LEFT HAND

SECTION A-A

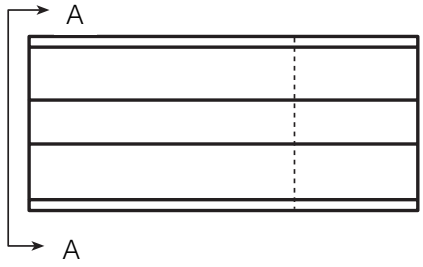


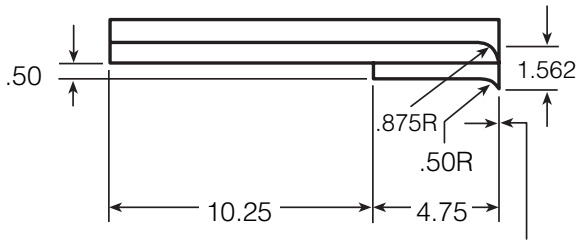
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE MOLD NO. 2284 PAGE H-8

MOLD NO. 5911

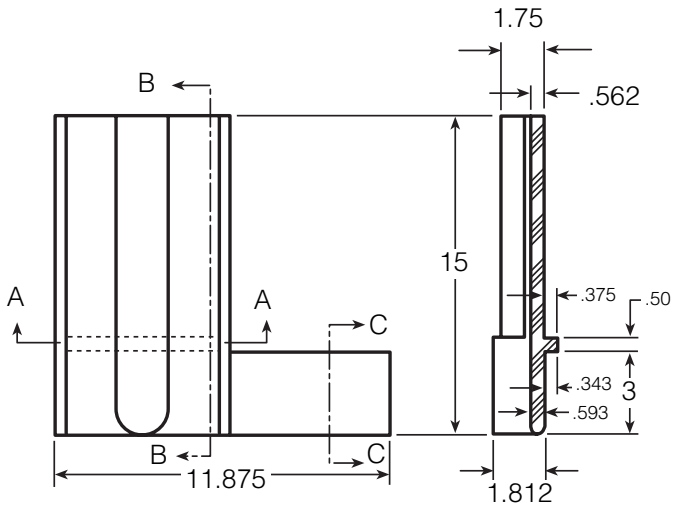


SECTION A-A

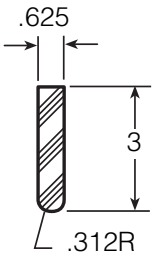




.0625 TO FEATHERED EDGE



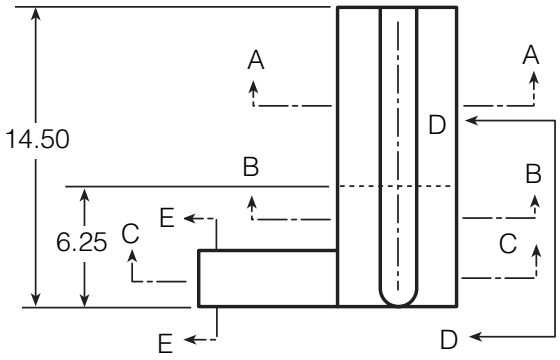
SECTION B-B



SECTION C-C

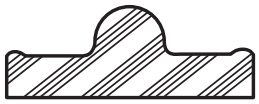
SECTION A-A

MOLD NO. 3589- MODIFIED
AS SHOWN AND OPPOSITE

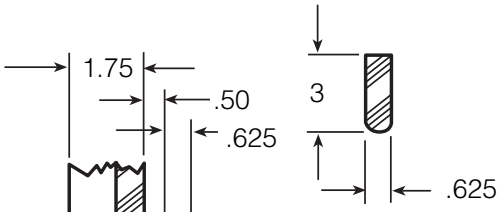


SECTION A-A

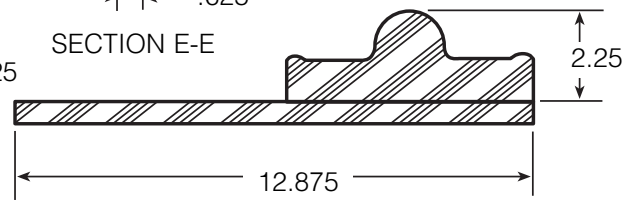
MOLD NO. 3331
AS SHOWN AND OPPOSITE



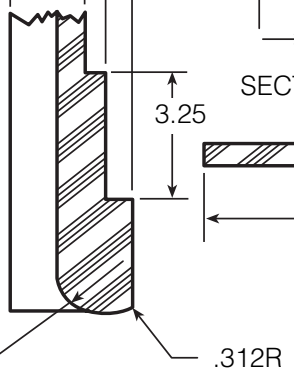
SECTION B-B



SECTION E-E

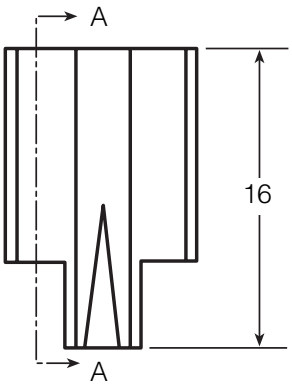


SECTION C-C



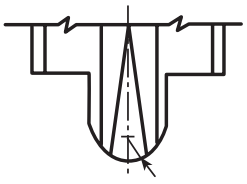
SECTION D-D

TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE MOLD NO. 2284 PAGE H-8

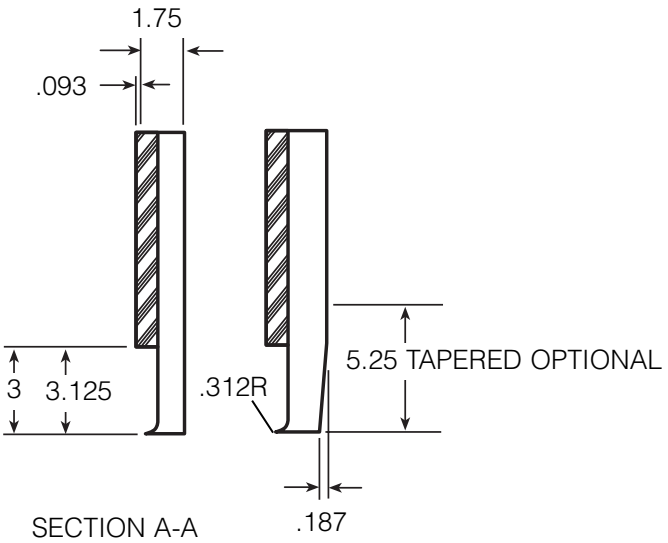


OPTIONAL END

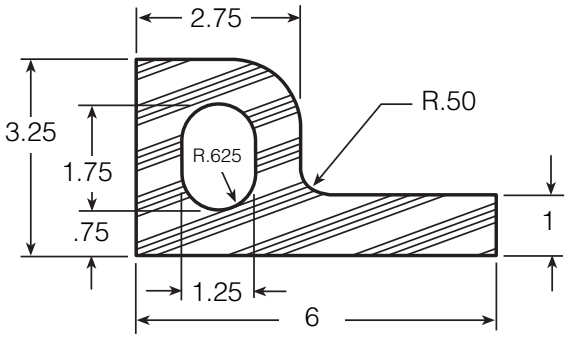
MOLD NO. 5056



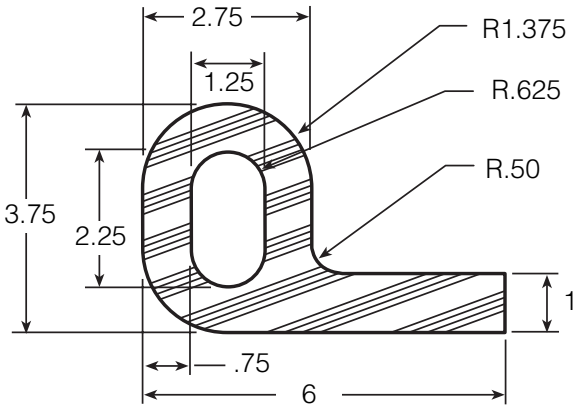
OPTIONAL END



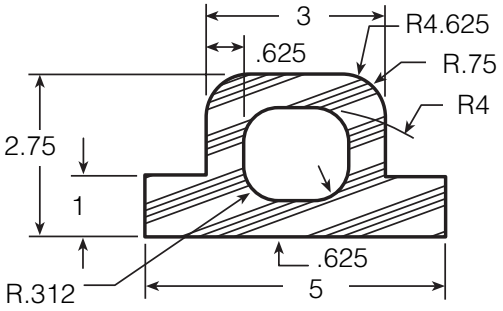
SECTION A-A



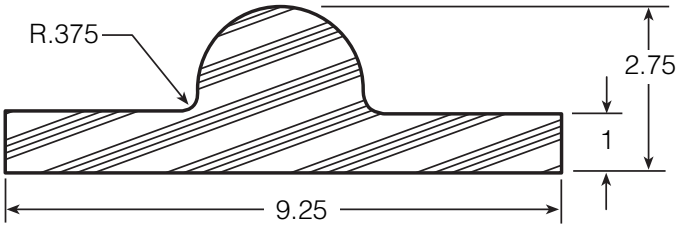
MOLD NO. 8905
TYPICAL CROSS SECTION



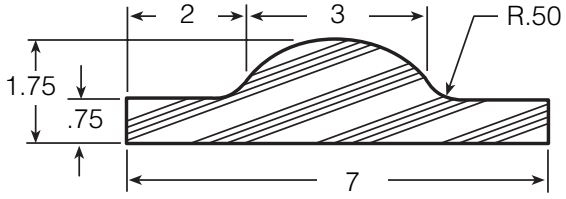
MOLD NO. 8906
TYPICAL CROSS SECTION



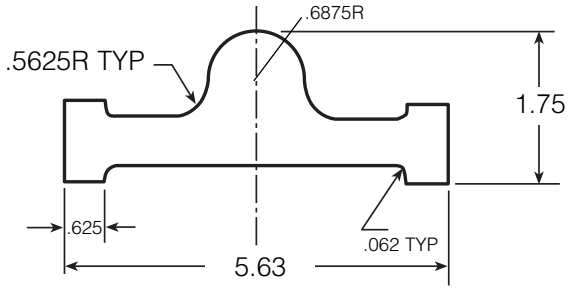
MOLD NO. 8907
TYPICAL CROSS SECTION



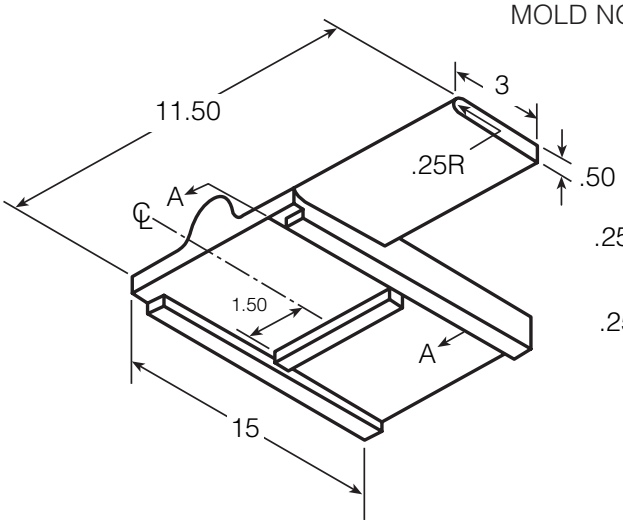
MOLD NO. 8712
TYPICAL CROSS SECTION



MOLD NO. 8641
TYPICAL CROSS SECTION

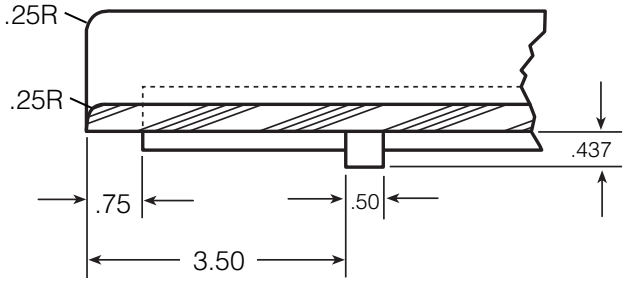


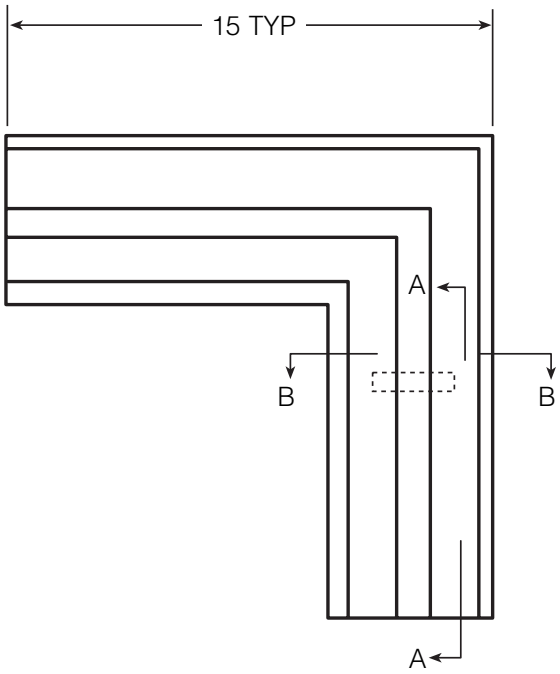
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
MOLD NO. 4499



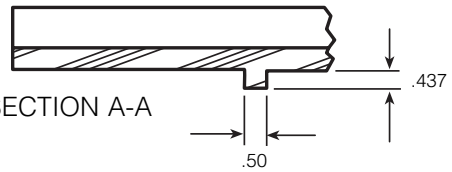
MOLD NO. 5169
AS SHOWN AND OPPOSITE

SECTION A-A

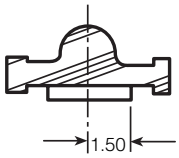




RADIAL GATE SEAL CORNER
MOLD NO. 4504
AS SHOWN AND OPPOSITE

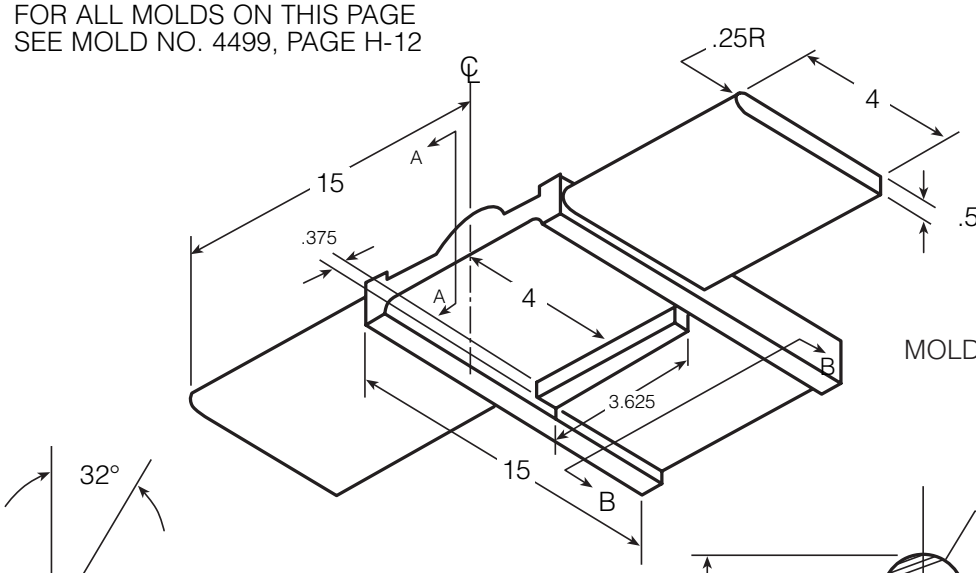


SECTION A-A

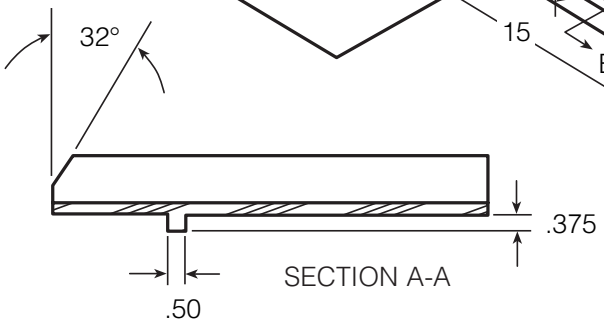


SECTION B-B

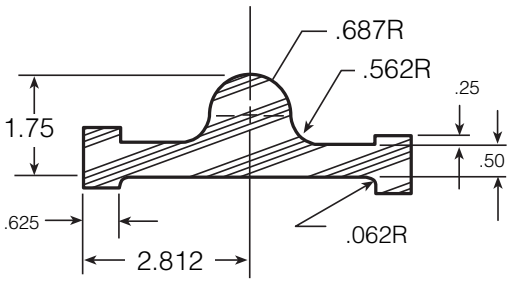
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE MOLD NO. 4499, PAGE H-12



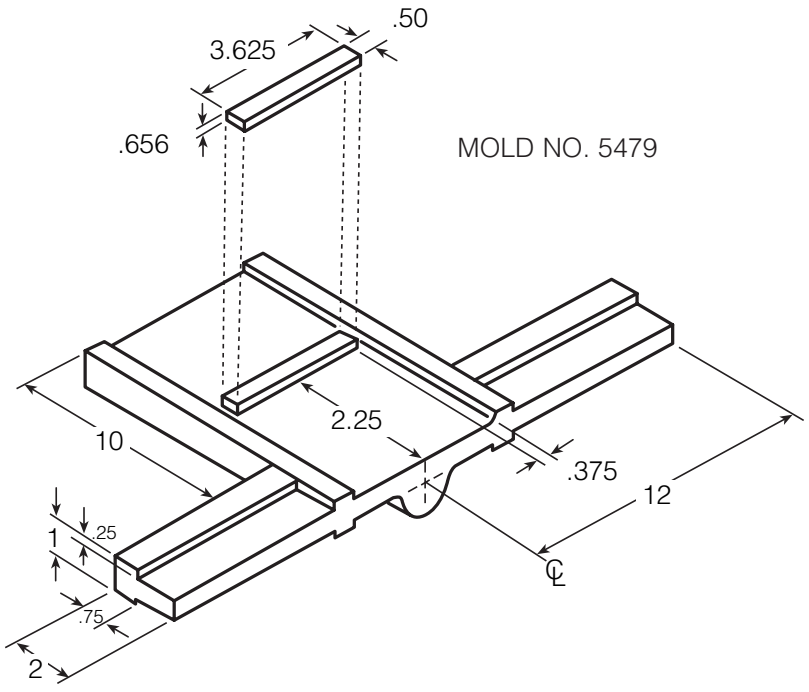
MOLD NO. 5019



SECTION A-A



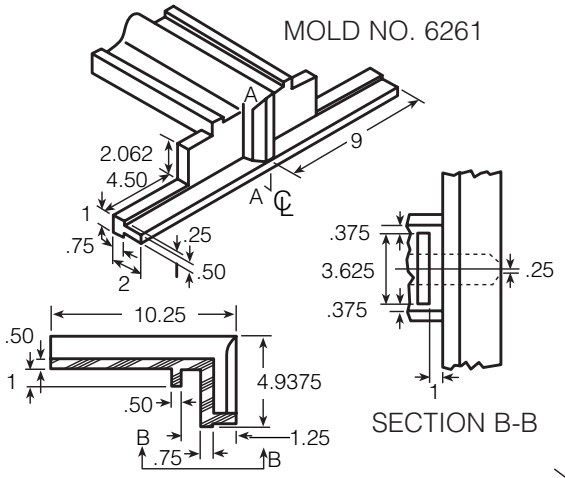
SECTION B-B



MOLD NO. 5479

TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE MOLD NO. 4499, PAGE H-12

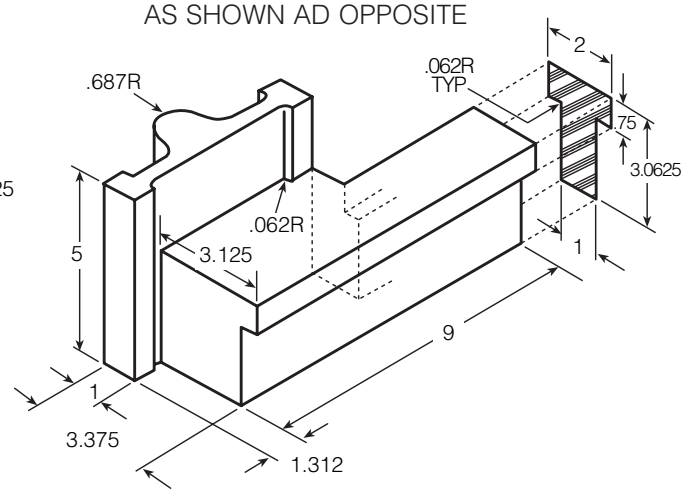
MOLD NO. 6261

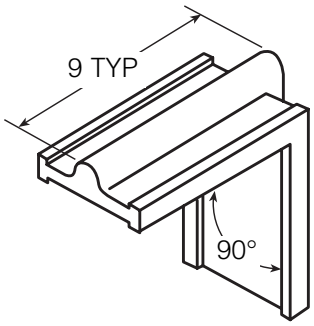


SECTION B-B

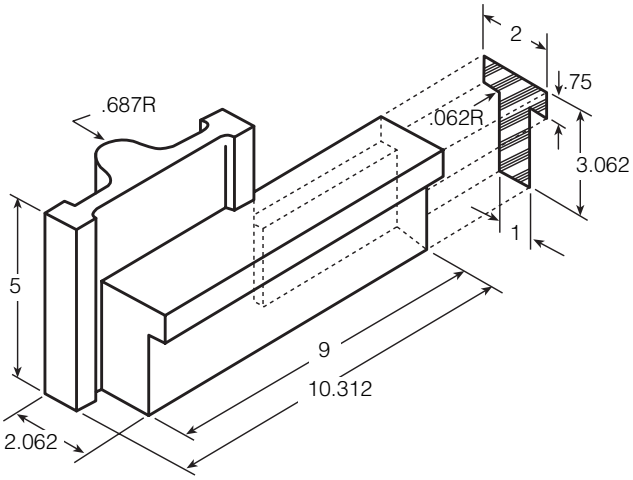
SECTION A-A

MOLD NO. 5753
AS SHOWN AD OPPOSITE



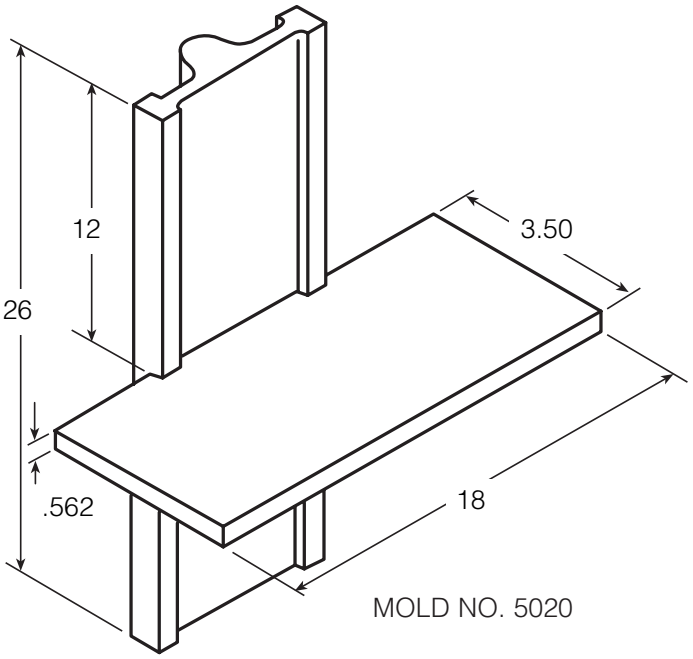


VERTICAL CORNOR SEAL
MOLD NO. 6609

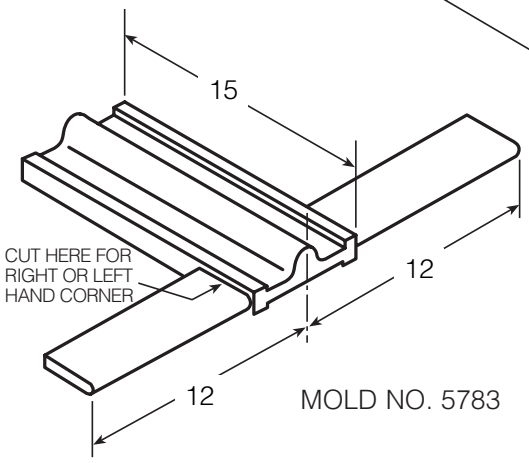


MOLD NO. 5404
AS SHOWN AD OPPOSITE

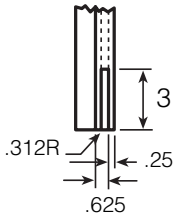
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE
SEE MOLD NO. 4499, PAGE H-12

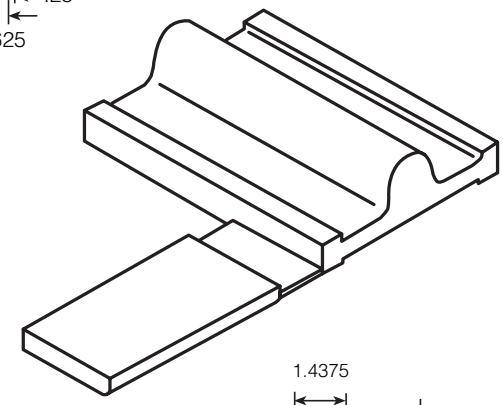


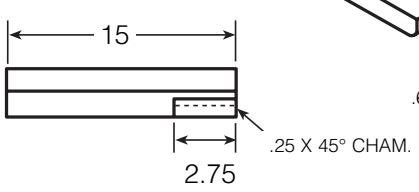
MOLD NO. 5020

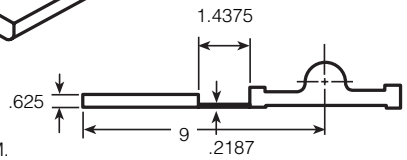


MOLD NO. 5783

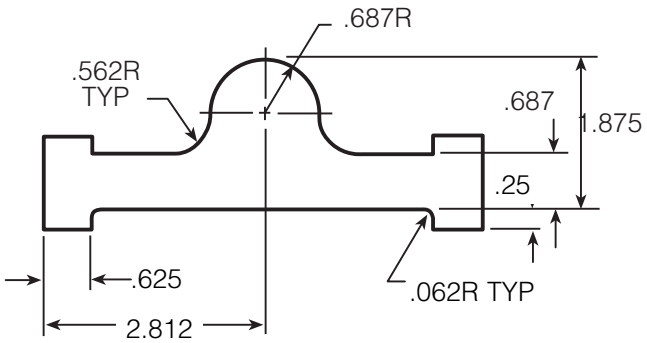




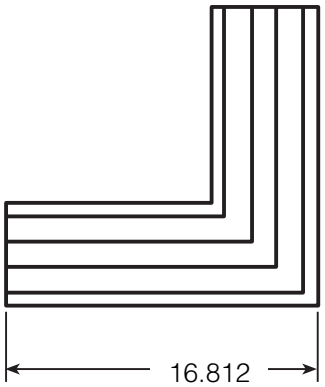




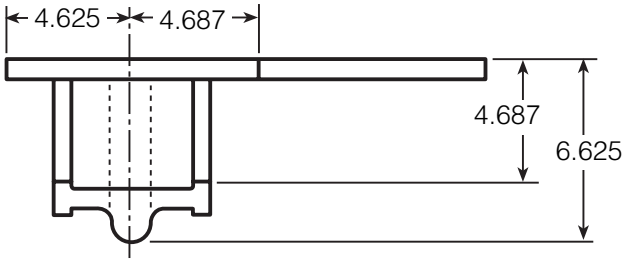
MOLD NO. 6541
AS SHOWN AND OPPOSITE



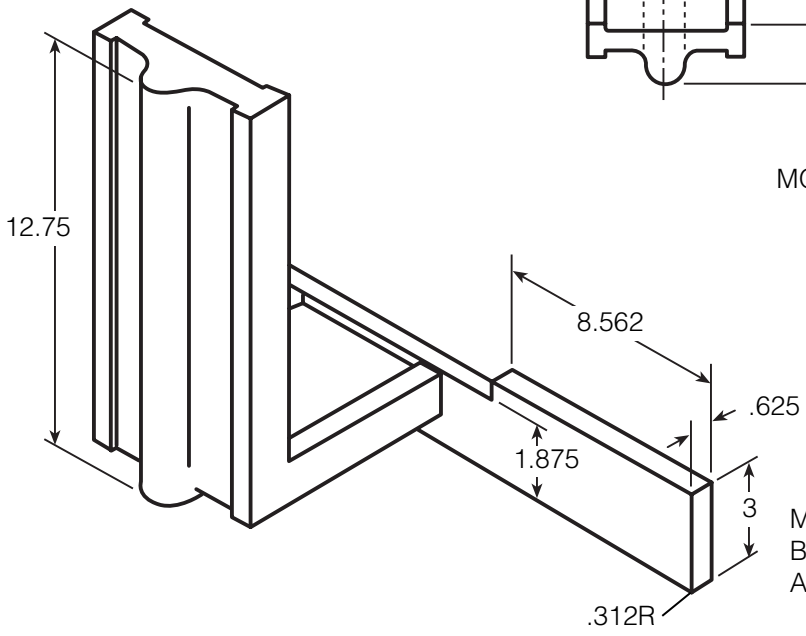
MOLD NO. 6360
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE



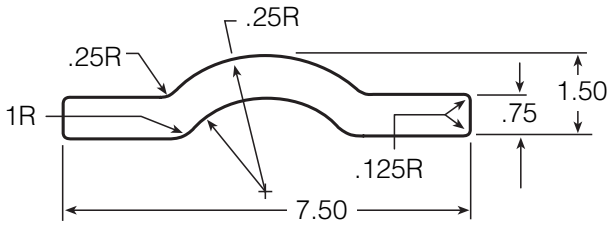
CORNER MOLD NO. 6361



TOP VIEW
MOLD NO. 6362

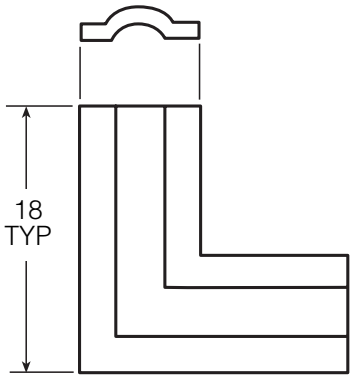


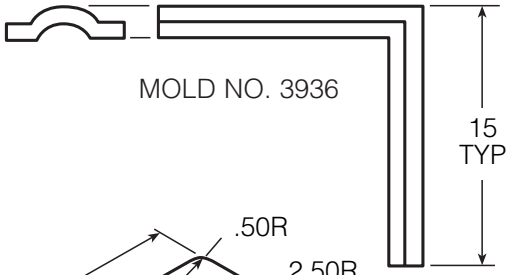
MOLD NO. 6362
BOTTOM CORNER SEAL
AS SHOWN AND OPPOSITE



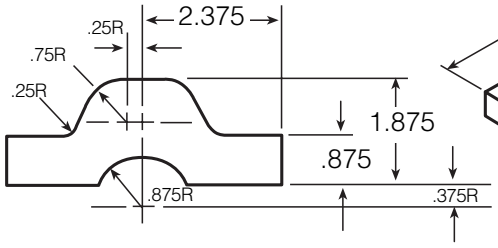
STRIP MOLD NO. 3885
TYPICAL CROSS SECTION FOR
MOLDS 3935 & 3936

MOLD NO. 3935

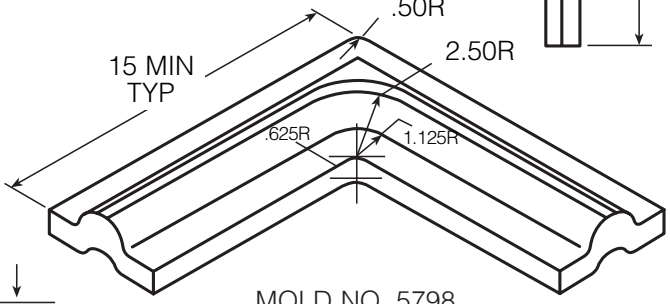




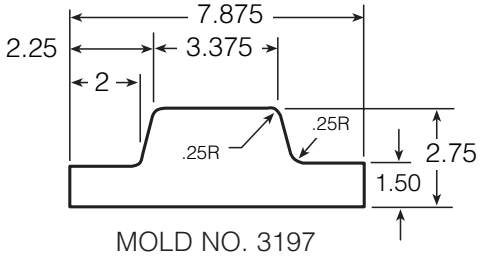
MOLD NO. 3936



STRIP MOLD NO. 3621-A

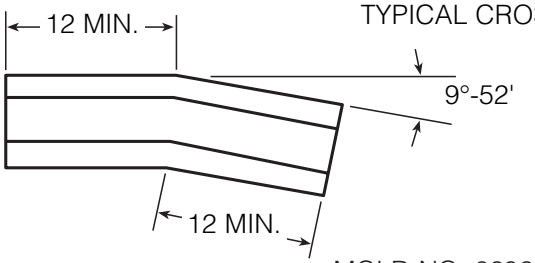


MOLD NO. 5798

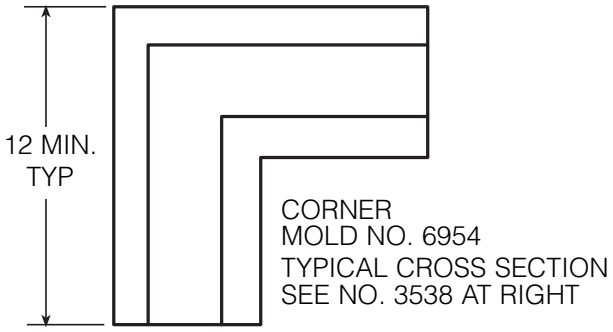


MOLD NO. 3197

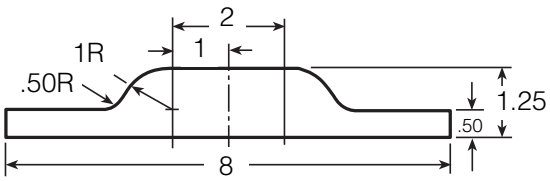
TYPICAL CROSS SECTION FOR MOLD BELOW



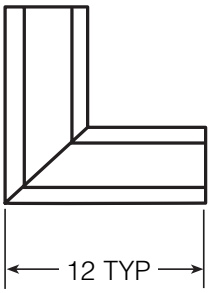
MOLD NO. 6292



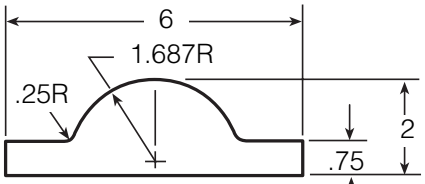
CORNER
MOLD NO. 6954
TYPICAL CROSS SECTION
SEE NO. 3538 AT RIGHT



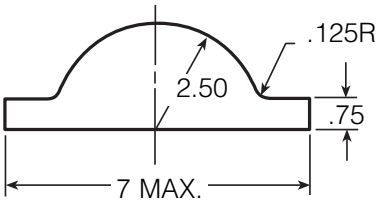
STRIP MOLD NO. 3538



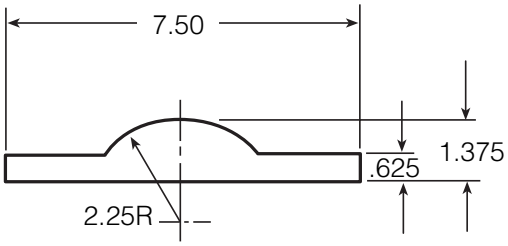
CORNER MOLD NO. 6251
TYPICAL CROSS SECTION
SEE NO. 5131 AT RIGHT



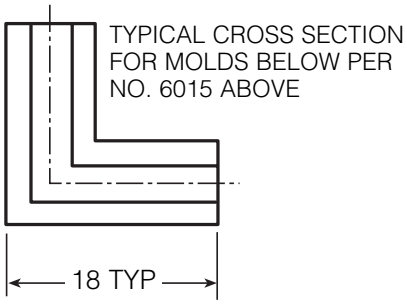
STRIP MOLD NO. 5131



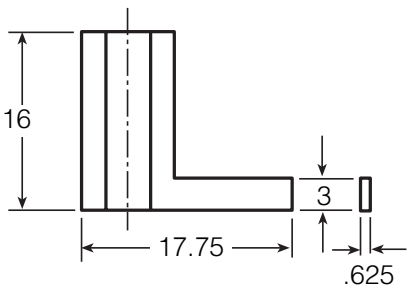
STRIP MOLD NO. 5832



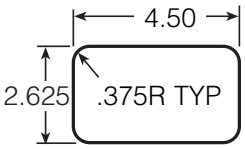
STRIP MOLD NO. 6015



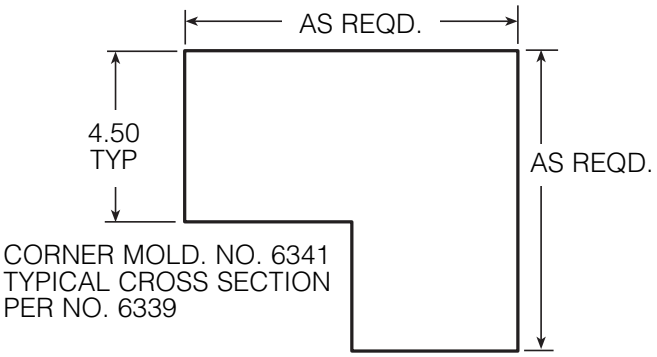
TOP CORNER MOLD NO. 6016



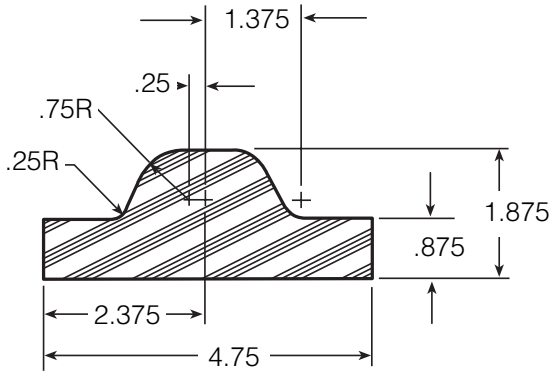
BOTTOM CORNER MOLD NO. 6017
AS SHOWN AND OPPOSITE



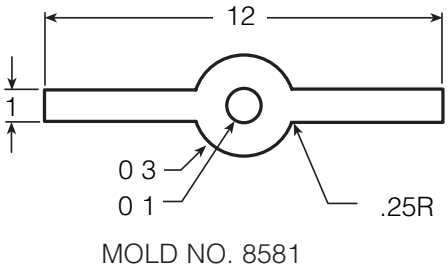
STRIP MOLD NO. 6339



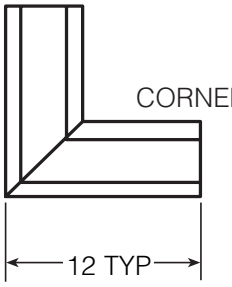
CORNER MOLD. NO. 6341
TYPICAL CROSS SECTION
PER NO. 6339



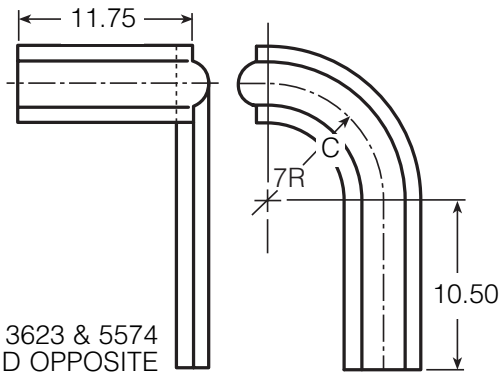
STRIP MOLD. NO. 3621
TYPICAL BULB CROSS SECTION
FOR ALL MOLD BELOW



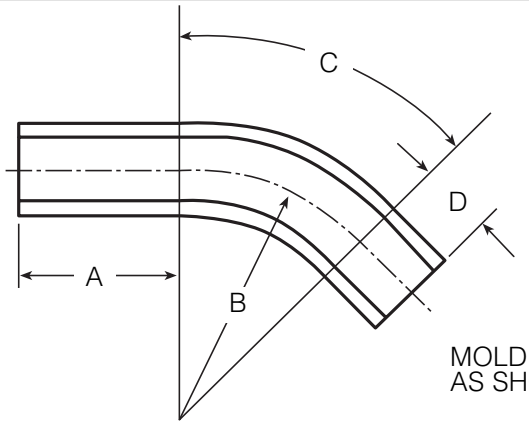
MOLD NO. 8581



CORNER MOLD NO. 4561



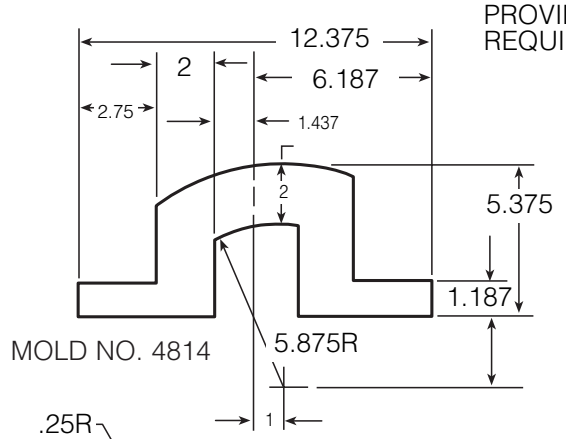
MOLD NO. 3623 & 5574
AS SHOWN AND OPPOSITE



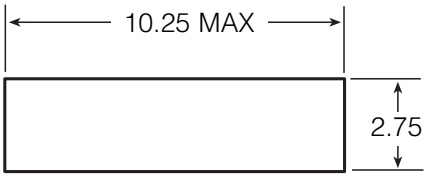
MOLD NO. 3634 & 3635
AS SHOWN AND OPPOSITE

Mold No.	A	B	C	D
3623	7.5	13R	45°	3.13
5574	8	7.5R	45°	3

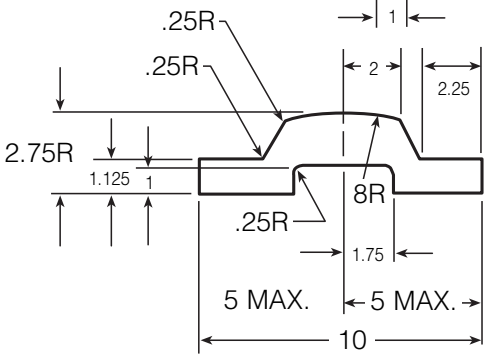
ALL MOLDS ON THIS PAGE WILL PROVIDE STRIP LENGTHS AS REQUIRED, EXCEPT AS NOTED.



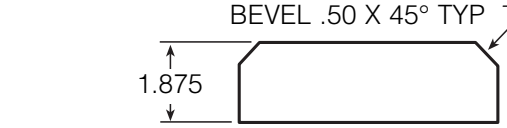
MOLD NO. 4814



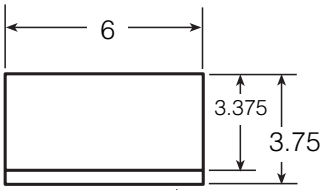
MOLD NO. 5859



MOLD NO. 3677-A

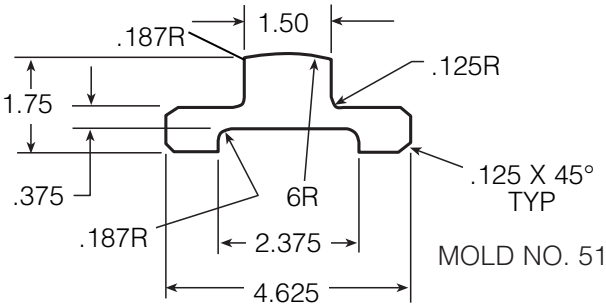


MOLD NO. 3238-E

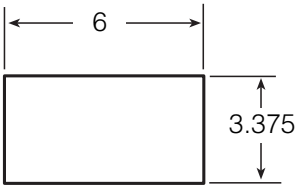


MOLD NO. 3238-C
MAX. LENGTH 10'

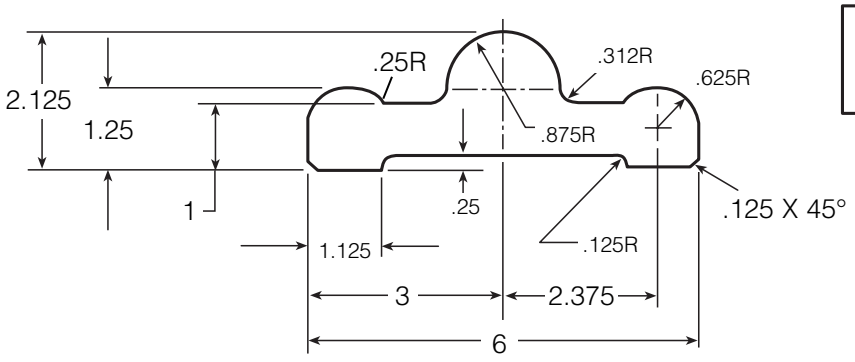
.375 THICK X 6 WIDE
MILD STEEL FLAT BAR



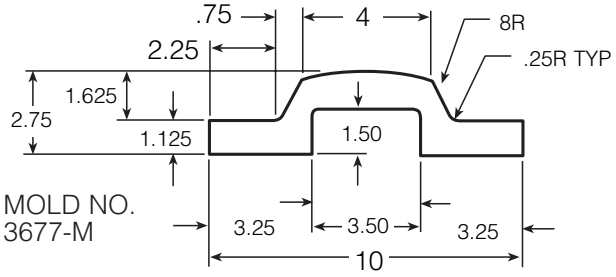
MOLD NO. 5150



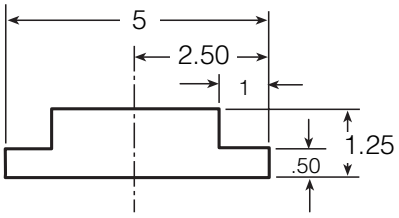
MOLD NO. 3238-D



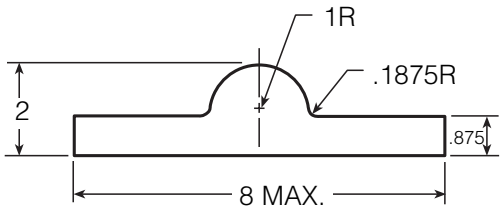
MOLD NO. 5679



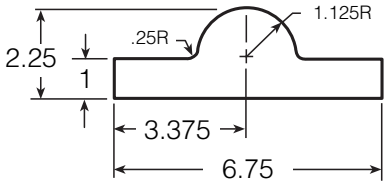
MOLD NO. 3677-M



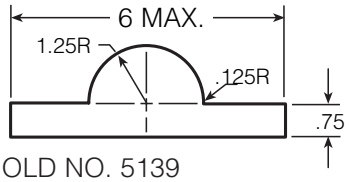
MOLD NO. 4414



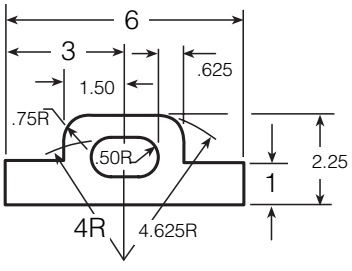
MOLD NO. 6800



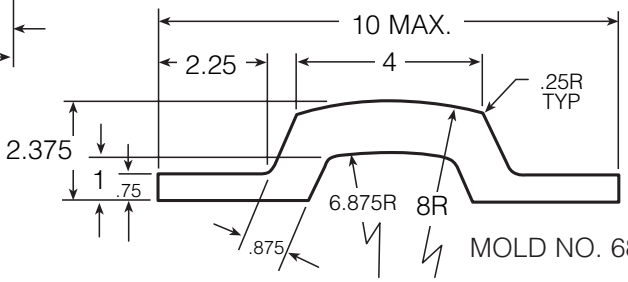
MOLD NO. 5569



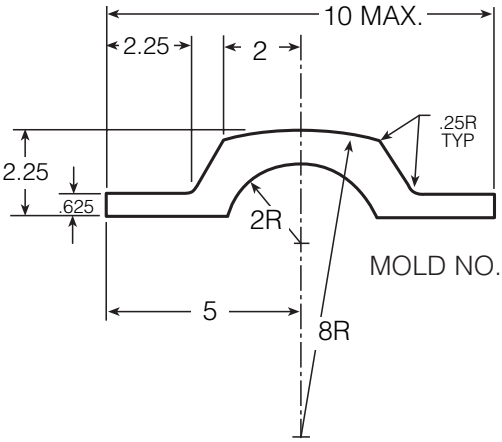
MOLD NO. 5139



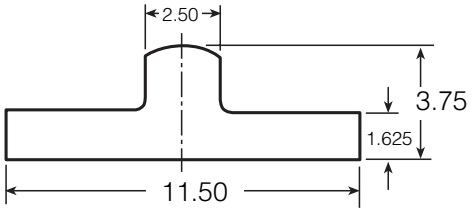
MOLD NO. 5616



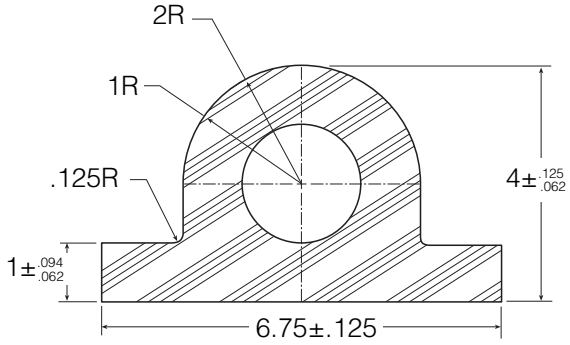
MOLD NO. 6835



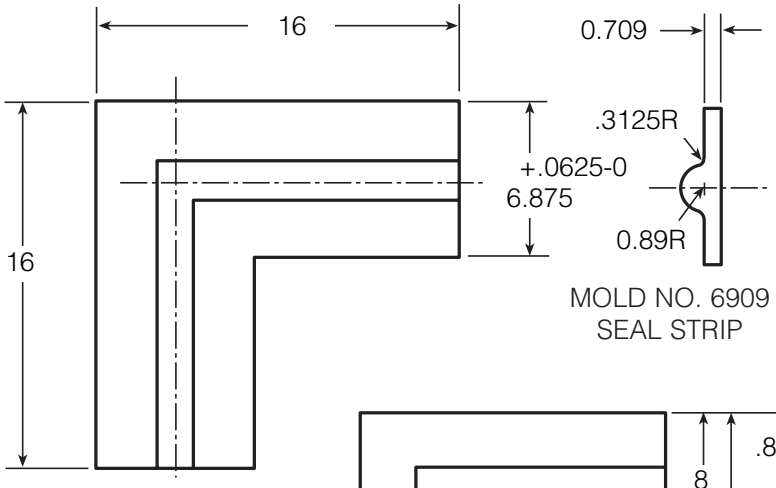
MOLD NO. 6790



MOLD NO. 5691

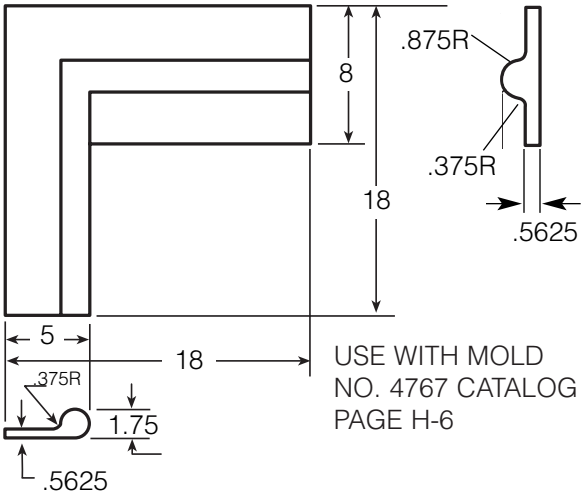


MOLD NO. 8978



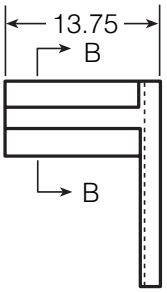
MOLD NO. 6909
SEAL STRIP

MOLD NO. 6919
CORNER

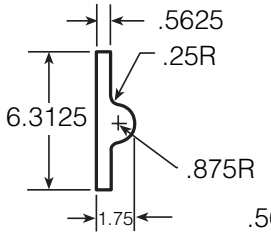


USE WITH MOLD
NO. 4767 CATALOG
PAGE H-6

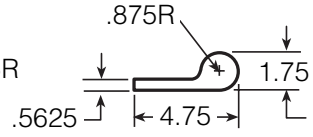
MOLD NO.'S 6270 & 6271
AS SHOWN AD OPPOSITE



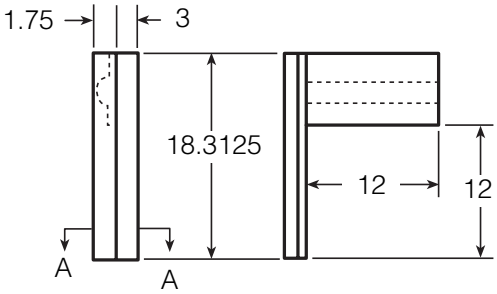
USE WITH MOLD NO. 2514
CATALOG PAGE A-1



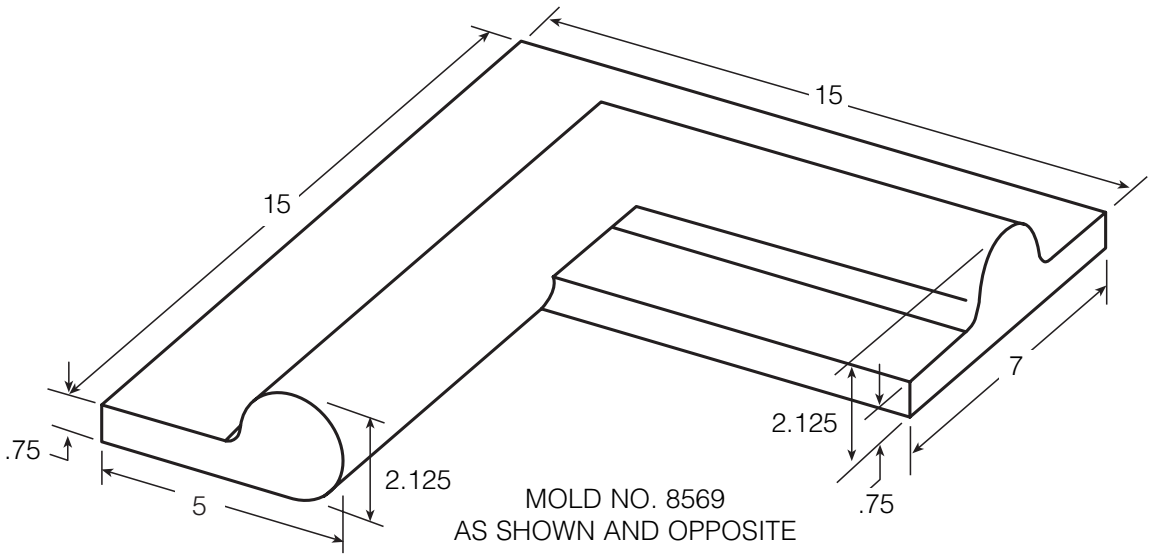
SECTION B-B



SECTION A-A

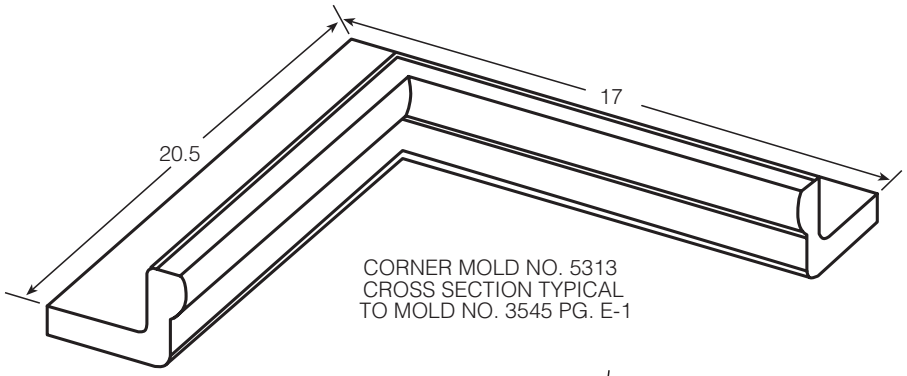


MOLD NO.S' 7442 & 7443
AS SHOWN & OPPOSITE

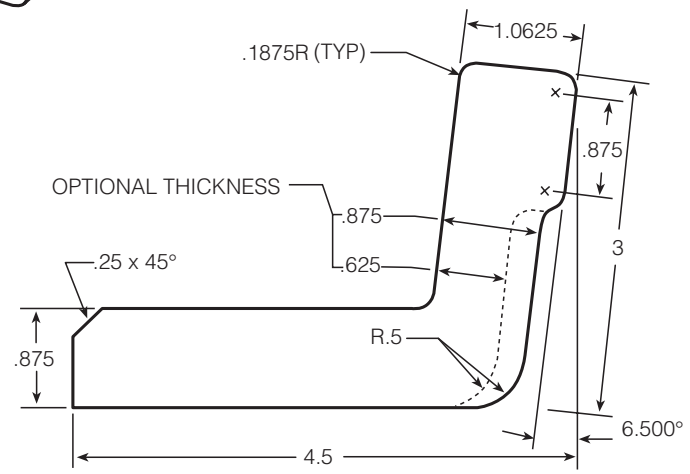


MOLD NO. 8569
AS SHOWN AND OPPOSITE

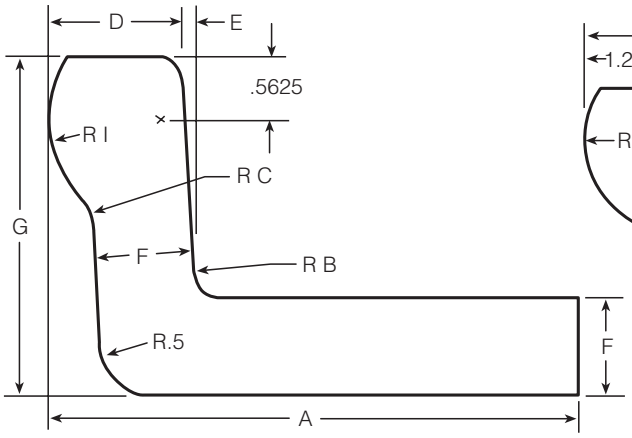
Special Shaped Seals

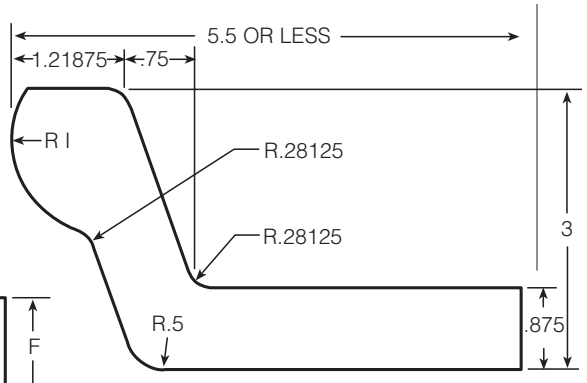


CORNER MOLD NO. 5313
CROSS SECTION TYPICAL
TO MOLD NO. 3545 PG. E-1



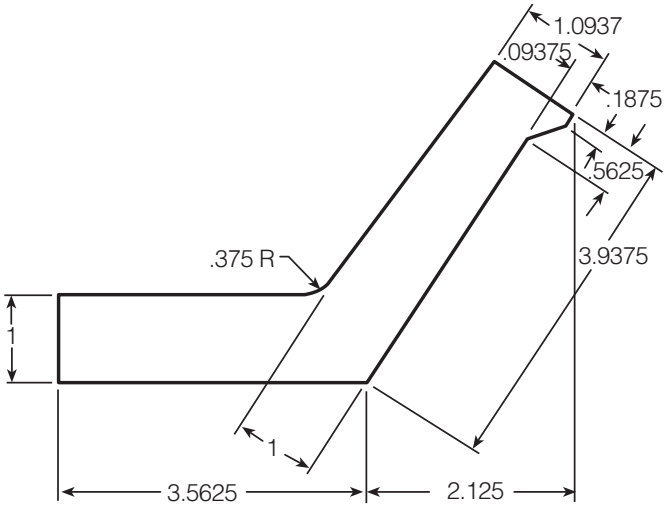
RADIAL GATE SEAL
MOLD NO. 4447



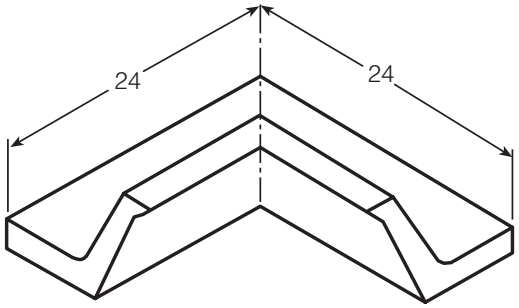


MOLD NO. 6404
TYPICAL CROSS SECTION

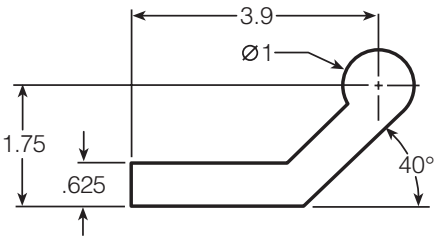
No.	A	B	C	D	E	F	G
5254	4.75	.25R	.25R	1.19	.06	.875	3
3545	4.31	.25R	.25R	1.19	.13	.875	3
6404	5.50	.28R	.28R	1.22	.75	.875	3
8694	4	.25R	.25R	1	.13	.625	2



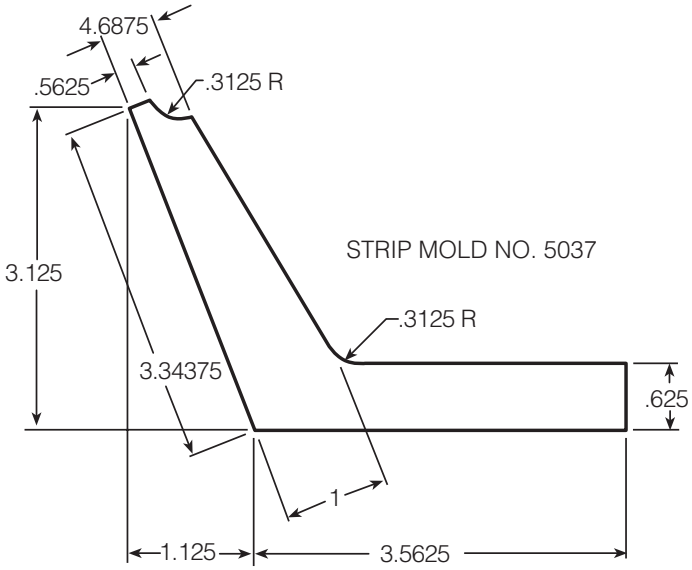
STRIP MOLD NO. 5039



CORNER MOLD NO. 5051
TYPICAL CROSS SECTION
MOLD NO. 5039

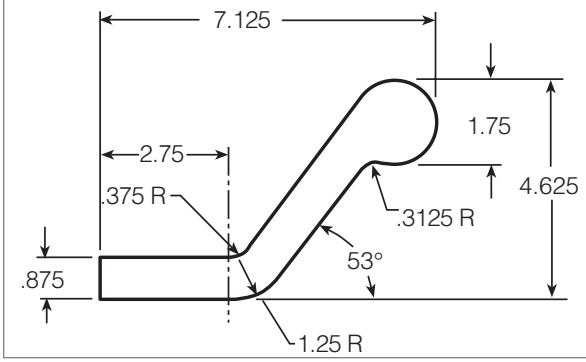


STRIP MOLD NO. 8755

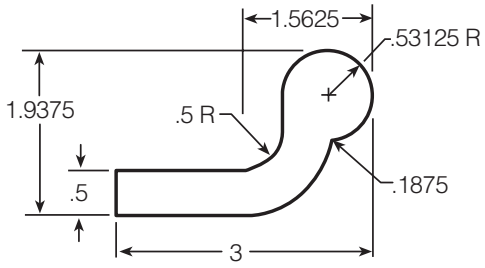


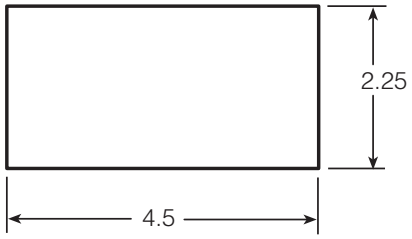
STRIP MOLD NO. 5037

STRIP MOLD NO. 6151



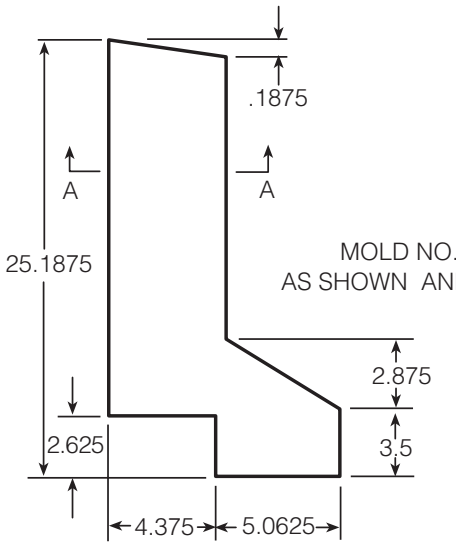
STRIP MOLD NO. 4474



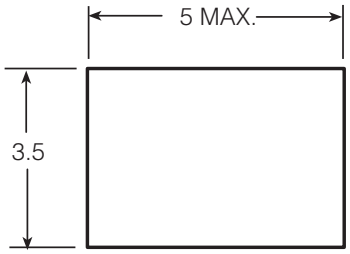


SECTION A-A

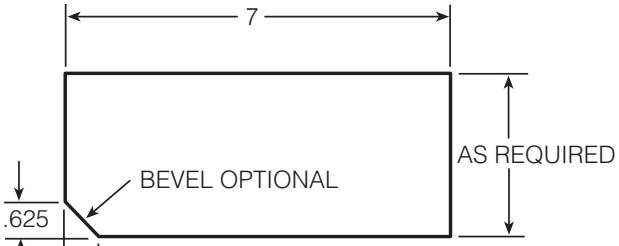
STRIP MOLD NO. 3519



MOLD NO. 3592
AS SHOWN AND OPPOSITE

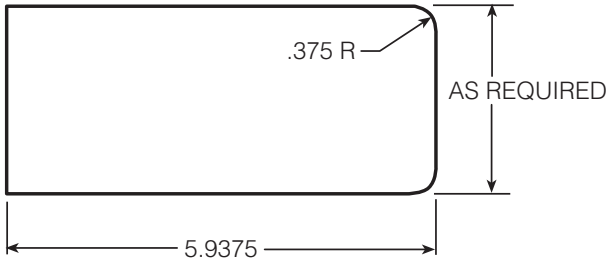


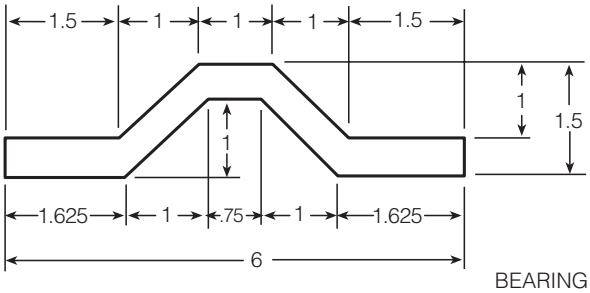
BOTTOM SEAL
STRIP MOLD NO. 3238-B



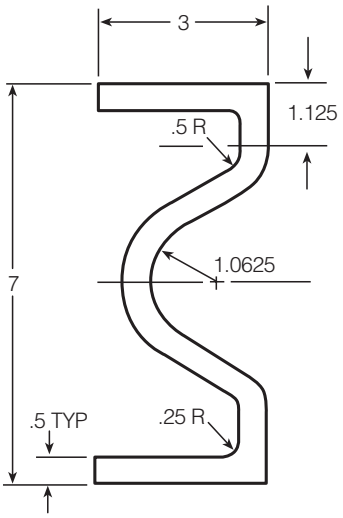
BOTTOM SEAL
STRIP MOLD NO. 3238

STRIP MOLD NO. 3238-A

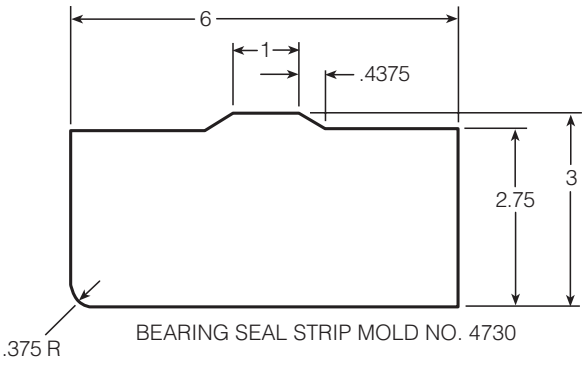




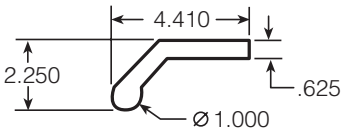
BEARING SEAL
STRIP MOLD NO. 5422

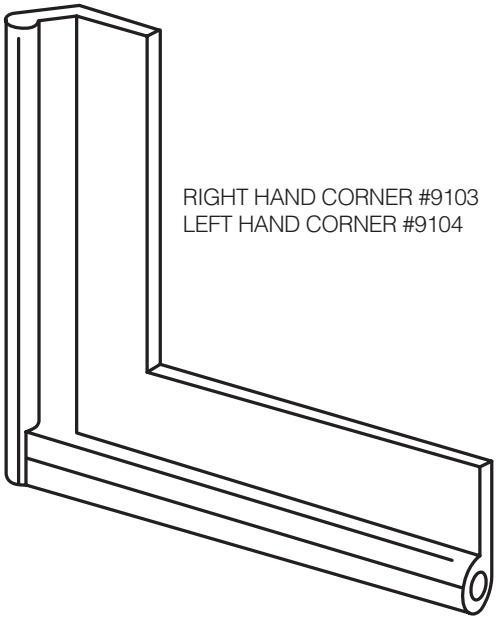


STRIP MOLD NO. 5695
CROSS SECTION FOR CORNER
MOLD NO. 5697

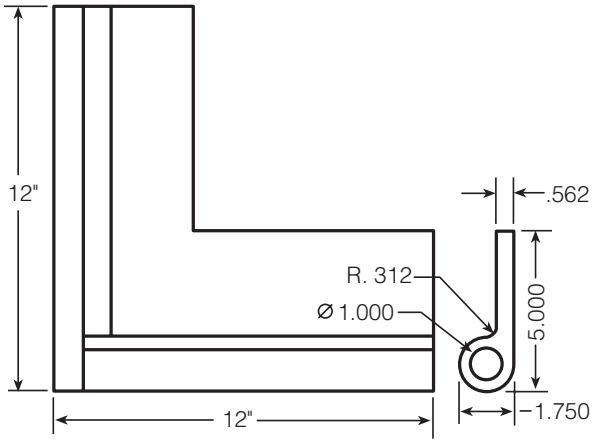


BEARING SEAL STRIP MOLD NO. 4730

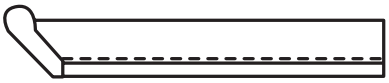




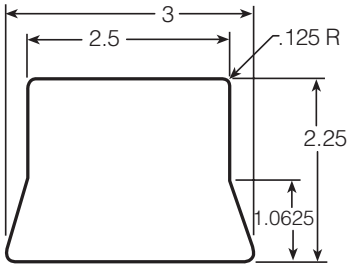
RIGHT HAND CORNER #9103
LEFT HAND CORNER #9104



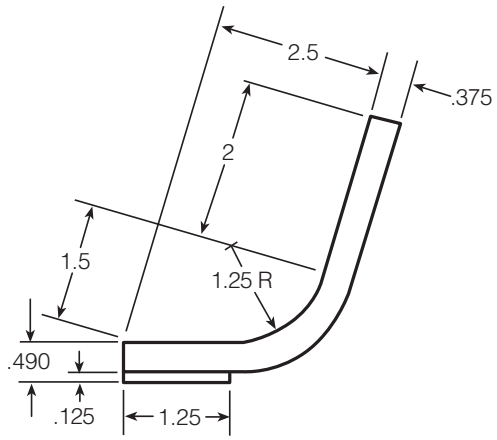
FRONT ELEVATION



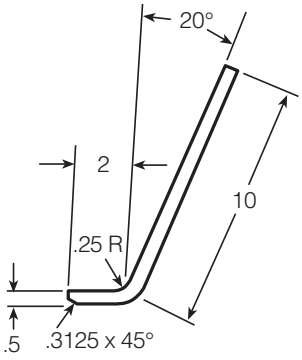
BOTTOM VIEW



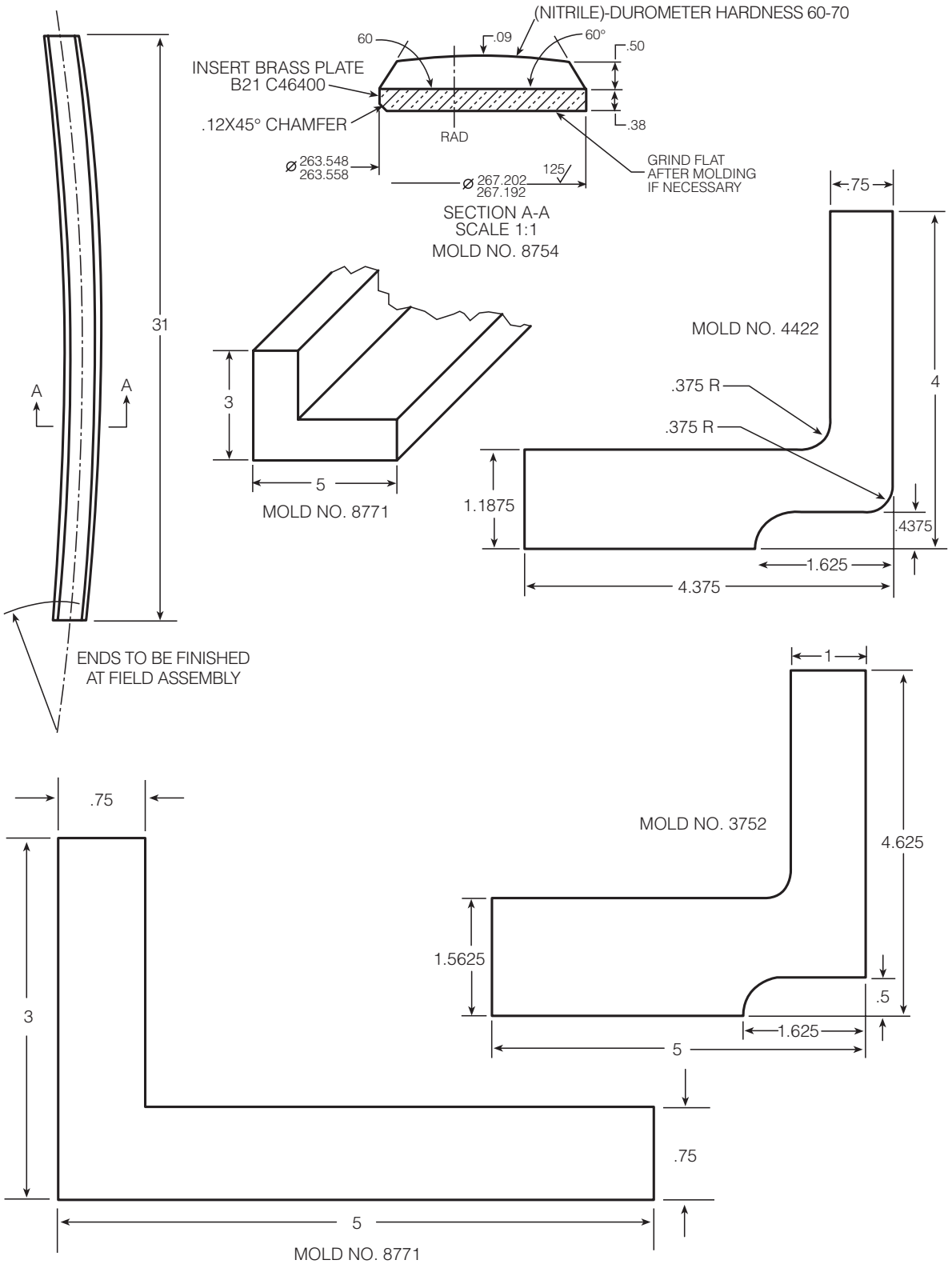
STRIP MOLD NO. 6775

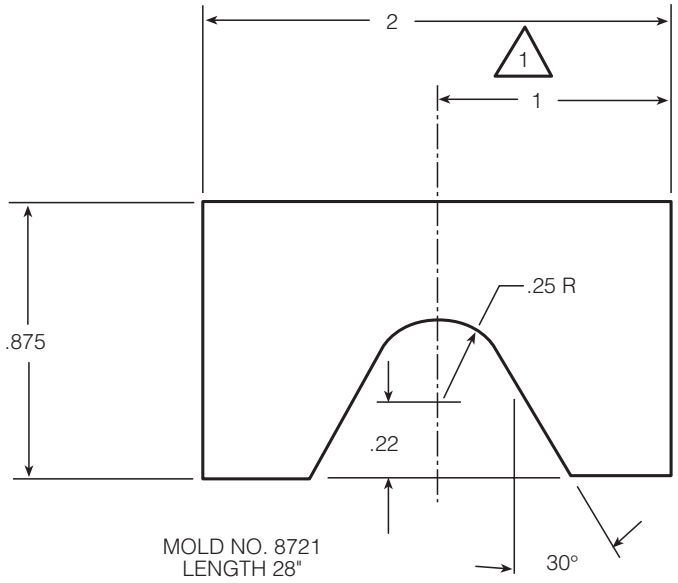


SEAL MOLD NO. 4591 BRASS CLAD
ALL RUBBER-FLUORO-CARBON OPTIONAL

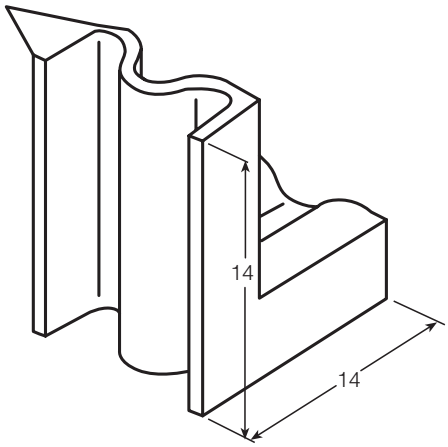


MOLD NO. 5826

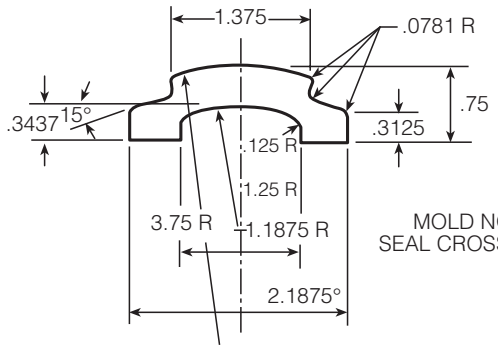

(NITRILE)-DUROMETER HARDNESS 60-70
60
.09
60°
.50
INSERT BRASS PLATE
B21 C46400
.12X45° CHAMFER
RAD
.38
Ø 263.548
263.558
125
Ø 267.202
267.192
GRIND FLAT
AFTER MOLDING
IF NECESSARY
SECTION A-A
SCALE 1:1
MOLD NO. 8754
31
A
A
3
5
MOLD NO. 8771
.75
MOLD NO. 4422
.375 R
.375 R
4
1.1875
.4375
1.625
4.375
ENDS TO BE FINISHED
AT FIELD ASSEMBLY
1
.75
MOLD NO. 3752
4.625
1.5625
.5
1.625
5
3
.75
5
MOLD NO. 8771



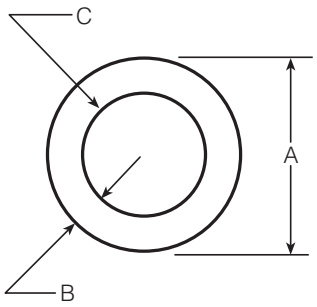
MOLD NO. 8721
LENGTH 28"

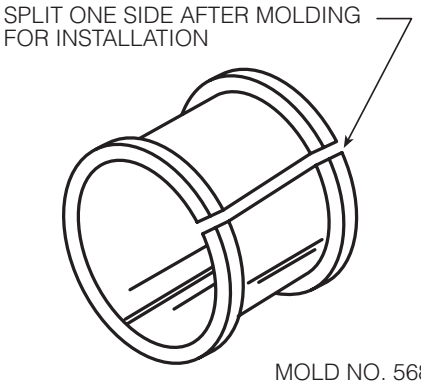


CORNER MOLD NO. 5697
TYPICAL CROSS SECTION
SEE PG. J-4, MOLD NO. 5695

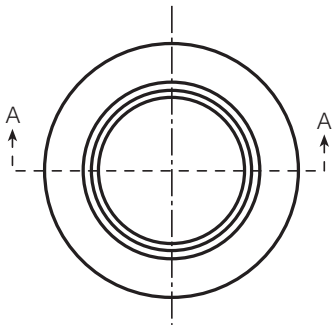


MOLD NO. 8302
SEAL CROSS SECTION

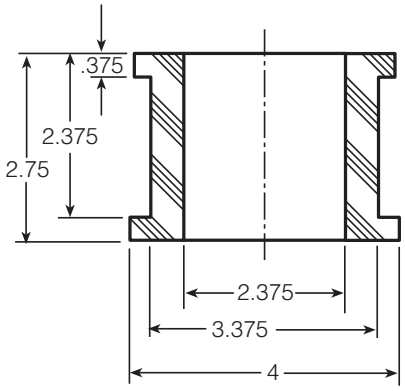


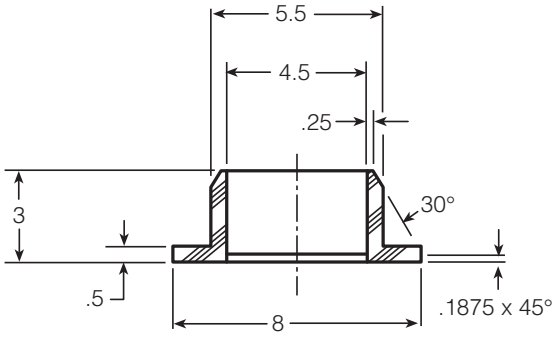


MOLD NO. 5688



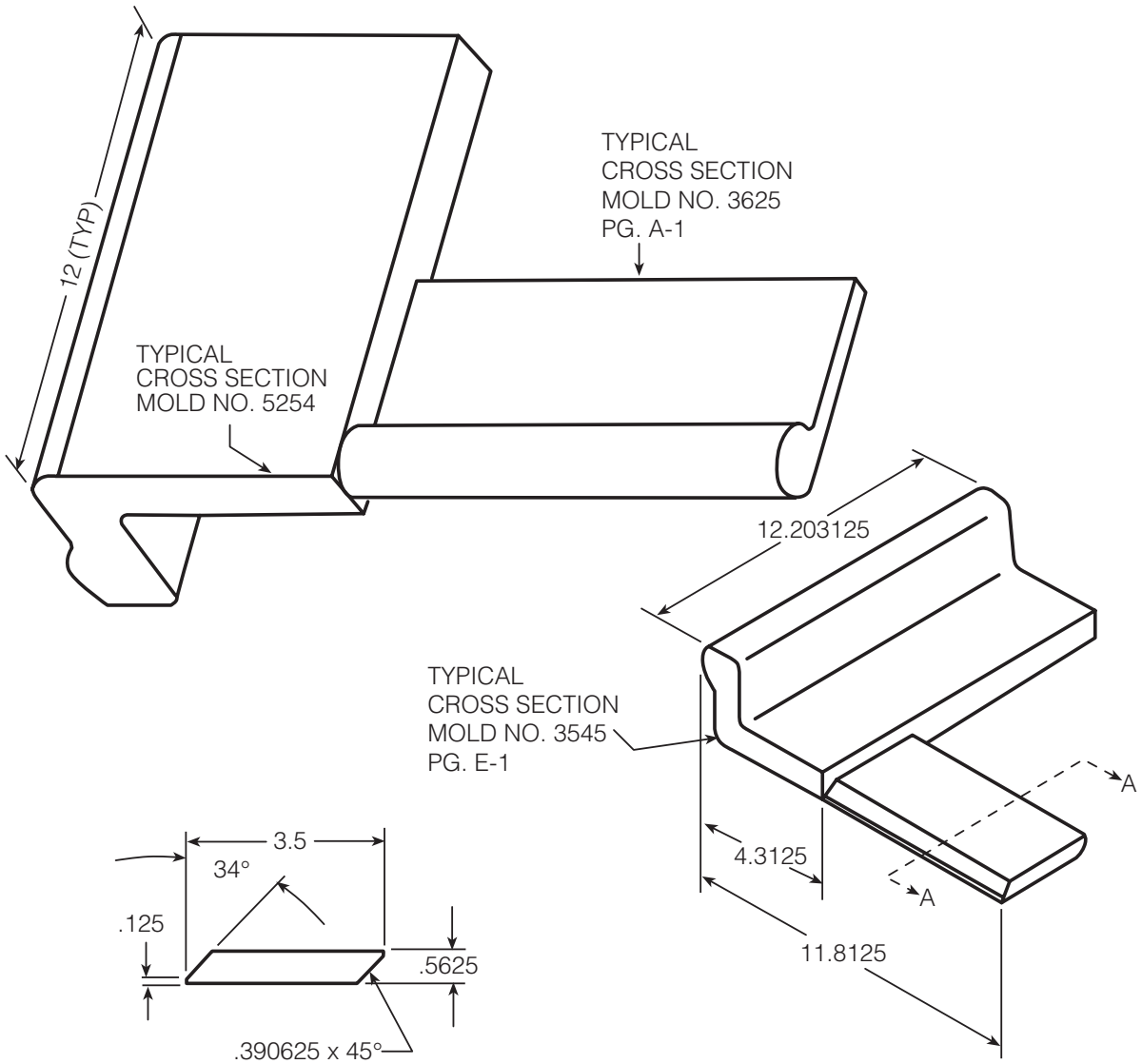
MOLD NO. 5566





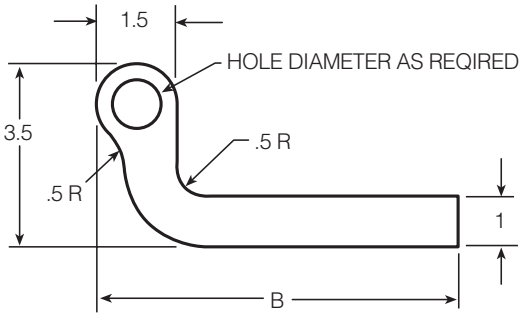
MOLD		A	B	C
8766	Strip Mold	10mm	-	-
4275	90° Corner, 6" legs	.75	-	-
3599	90° Corner, 18" legs	1.13	-	-
3207	Strip & Splicing Mold	.906	-	-
3600	Strip & Splicing Mold	1.13	-	-
4276	Strip Mold	.75	-	-
5894	Strip Mold	1	-	-
4094	Strip Mold	4	.88•	2••
4605	Strip Mold	3.50	.63	2••
5748	Strip Mold	3.75	.75•	2••
6285	Strip Mold	1.75	.31	1••
4704	Strip Mold	2.85	.33•	2••
8784	Strip Mold	2.50	-	1.50

••Max •Min.

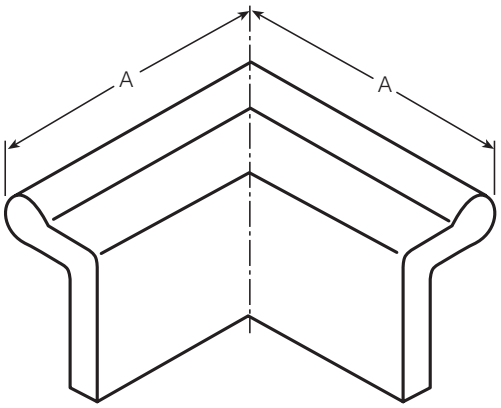


SECTION A-A

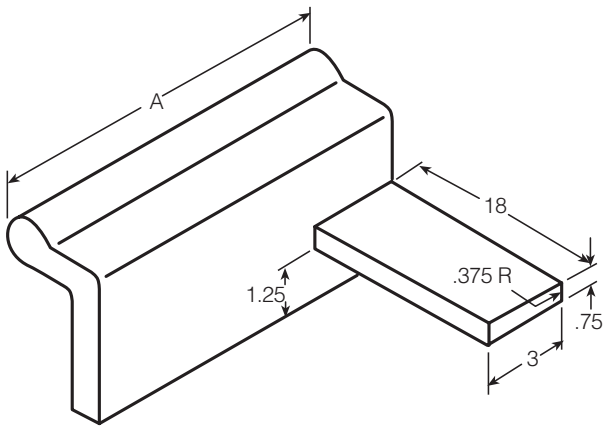
MOLD NO. 7044
AS SHOWN AND OPPOSITE



STRIP MOLD NO. 3493
TYPICAL BULB CROSS SECTION
FOR ALL MOLDS ON THIS PAGE



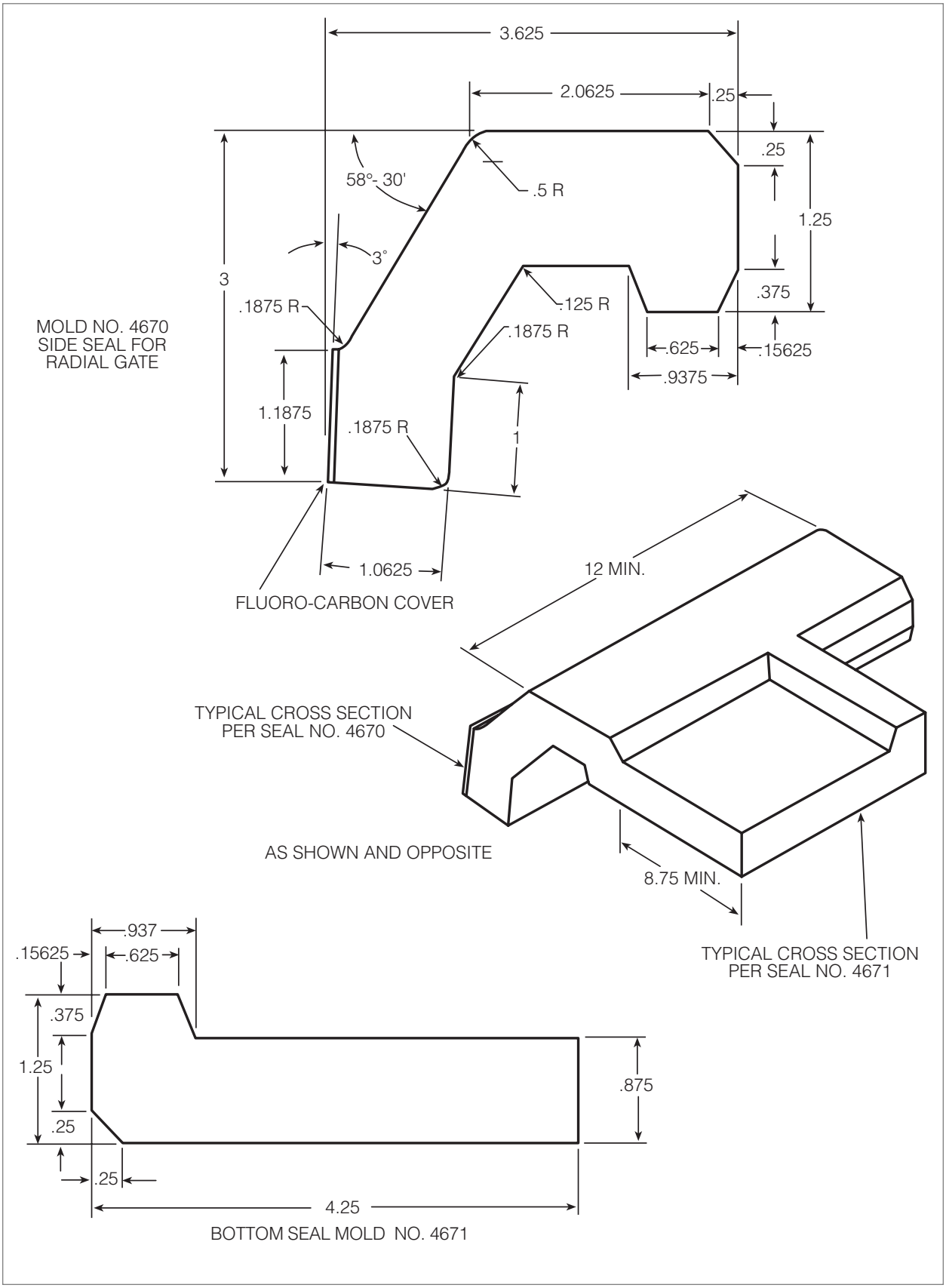
CORNER MOLD NO. 5757

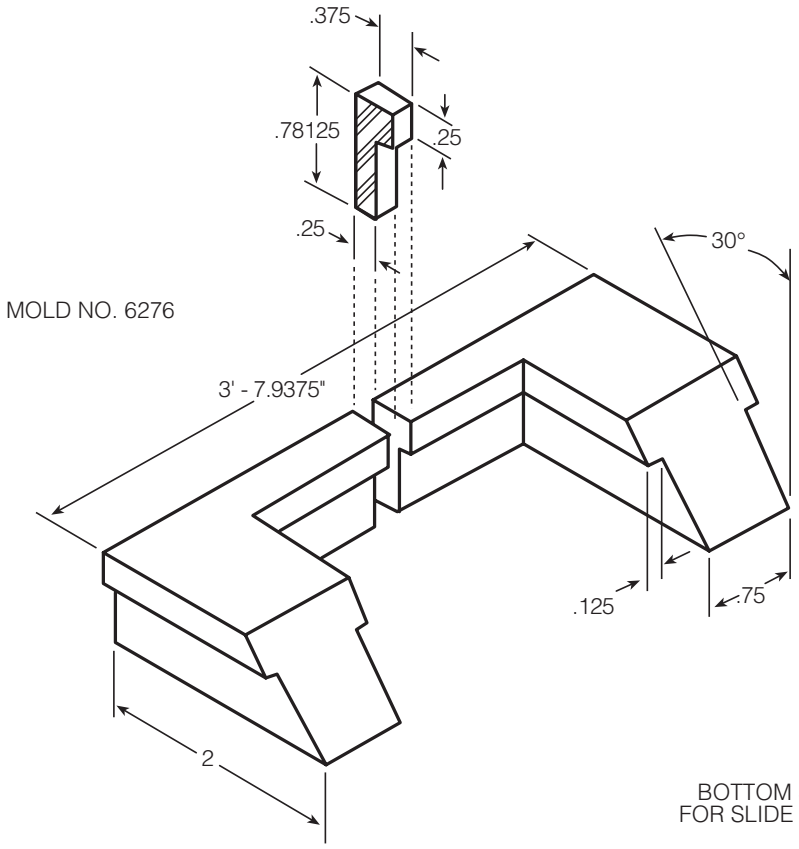


CORNER MOLD NO. 5755 & 5756

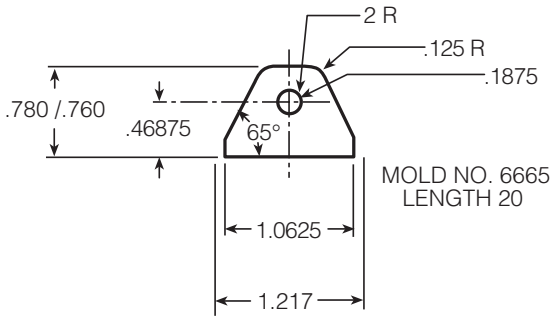
MOLD NO.	A	B
3493	–	7••
5757	•••	4¾
5755 & 5756	19 ¾	4 ¾

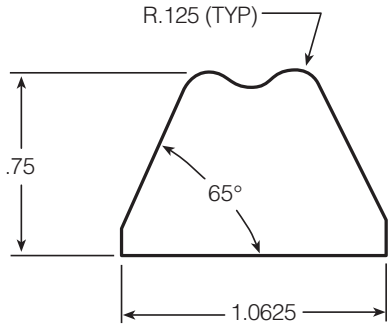
••• AS REQUIRED •• MAX


3.625
2.0625
.25
.25
1.25
.375
.15625
.625
.9375
58°- 30'
.5 R
3°
3
.1875 R
.125 R
.1875 R
1.1875
.1875 R
1
1.0625
MOLD NO. 4670
SIDE SEAL FOR
RADIAL GATE
FLUORO-CARBON COVER
12 MIN.
TYPICAL CROSS SECTION
PER SEAL NO. 4670
AS SHOWN AND OPPOSITE
8.75 MIN.
TYPICAL CROSS SECTION
PER SEAL NO. 4671
.937
.15625
.625
.375
1.25
.25
.875
.25
4.25
BOTTOM SEAL MOLD NO. 4671

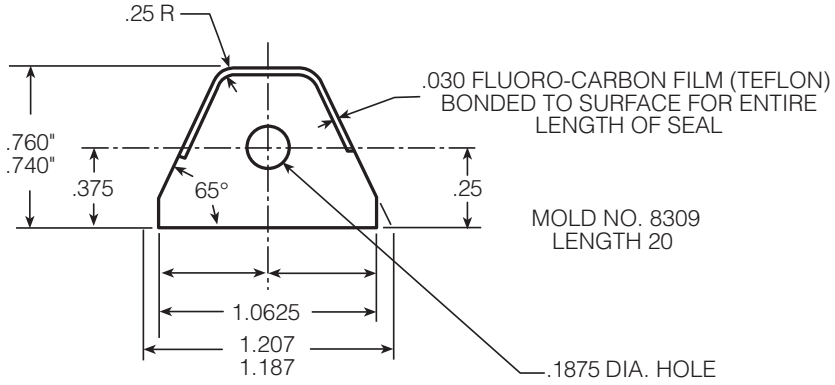


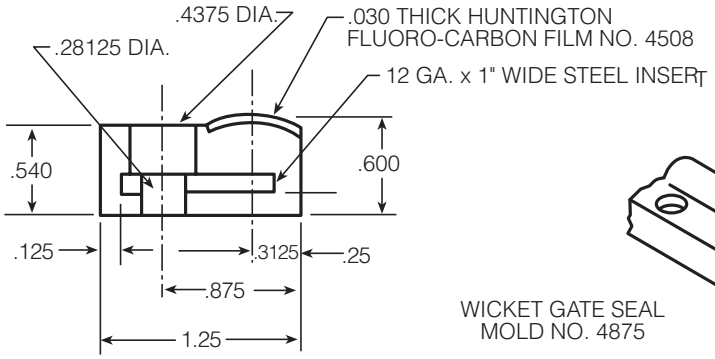
BOTTOM SEALS
FOR SLIDE GRATES

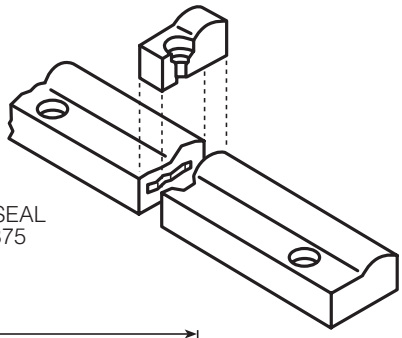




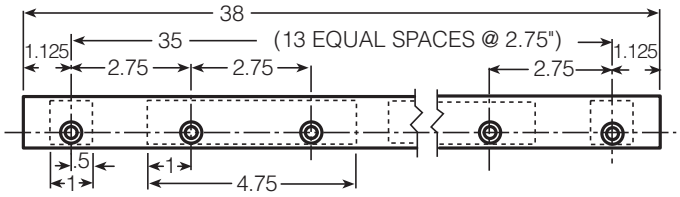
MOLD NO. 8456
L=20

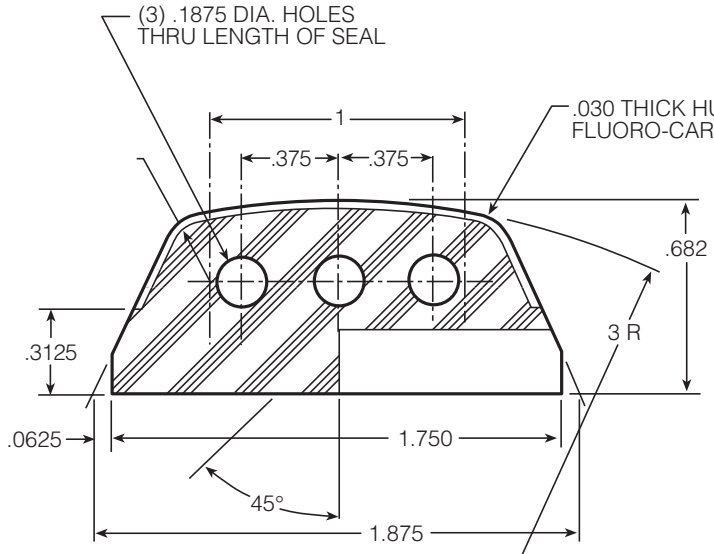






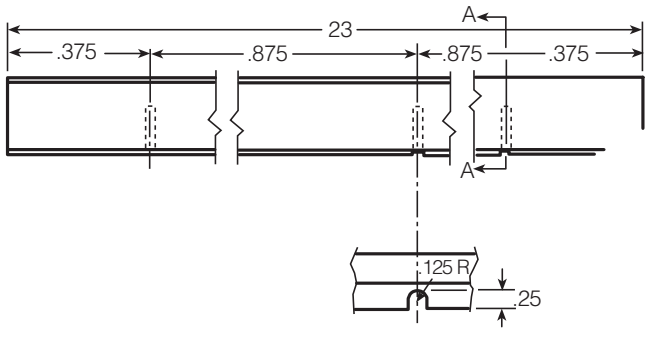
WICKET GATE SEAL
MOLD NO. 4875

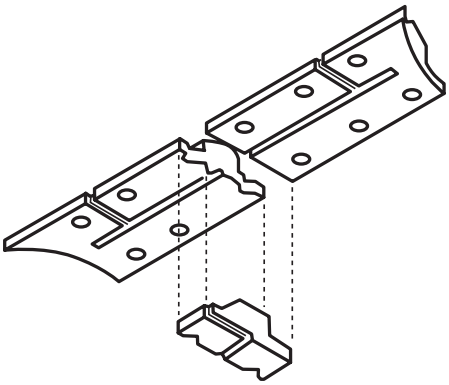




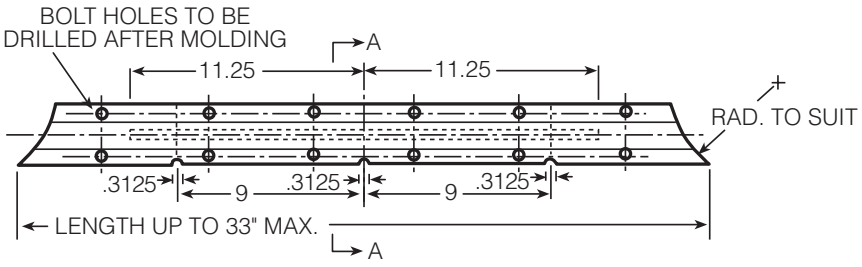
SECTION A-A

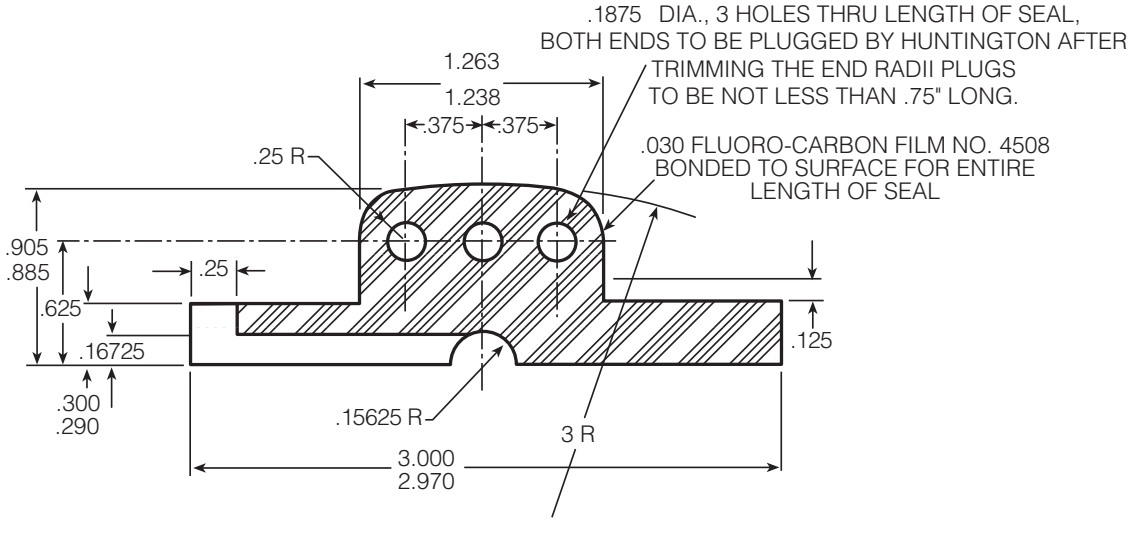
WICKET GATE SEAL
MOLD NO. 4712



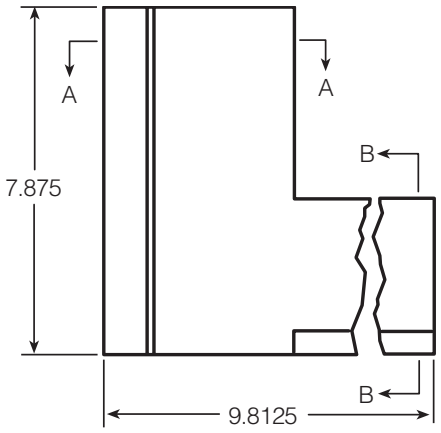


MOLD NO. 5149

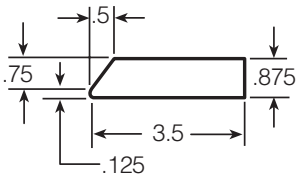




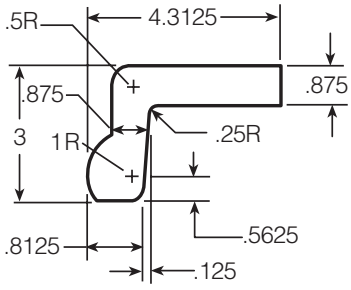
SECTION A-A



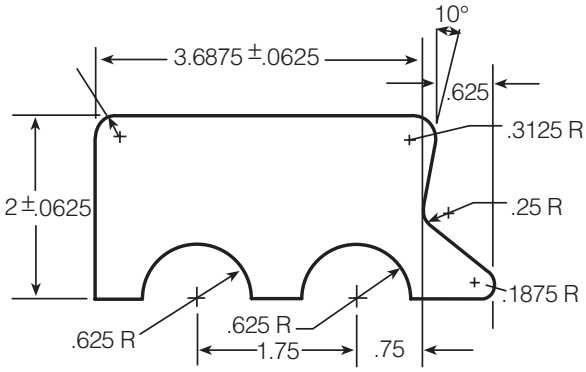
MOLD NO. 7293
AS SHOWN & OPPOSITE



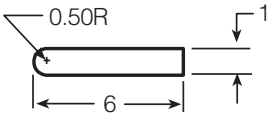
SECTION B-B



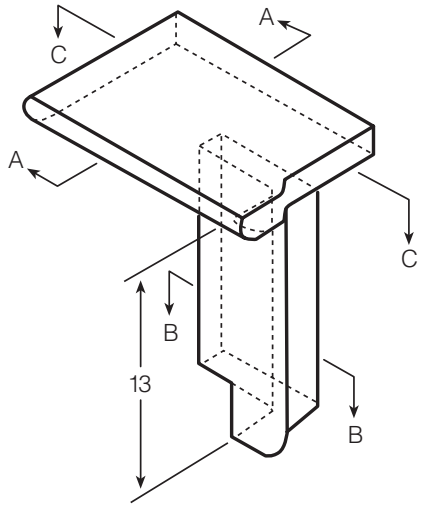
SECTION A-A
(MOLD NO. 3545)



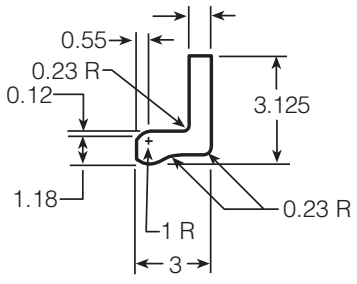
MOLD NO. 8037



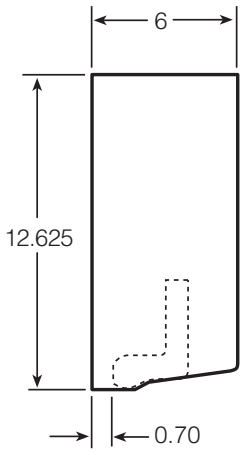
SECTION A-A



MOLD NO.'S 7501 & 7502
AS SHOWN AND OPPOSITE

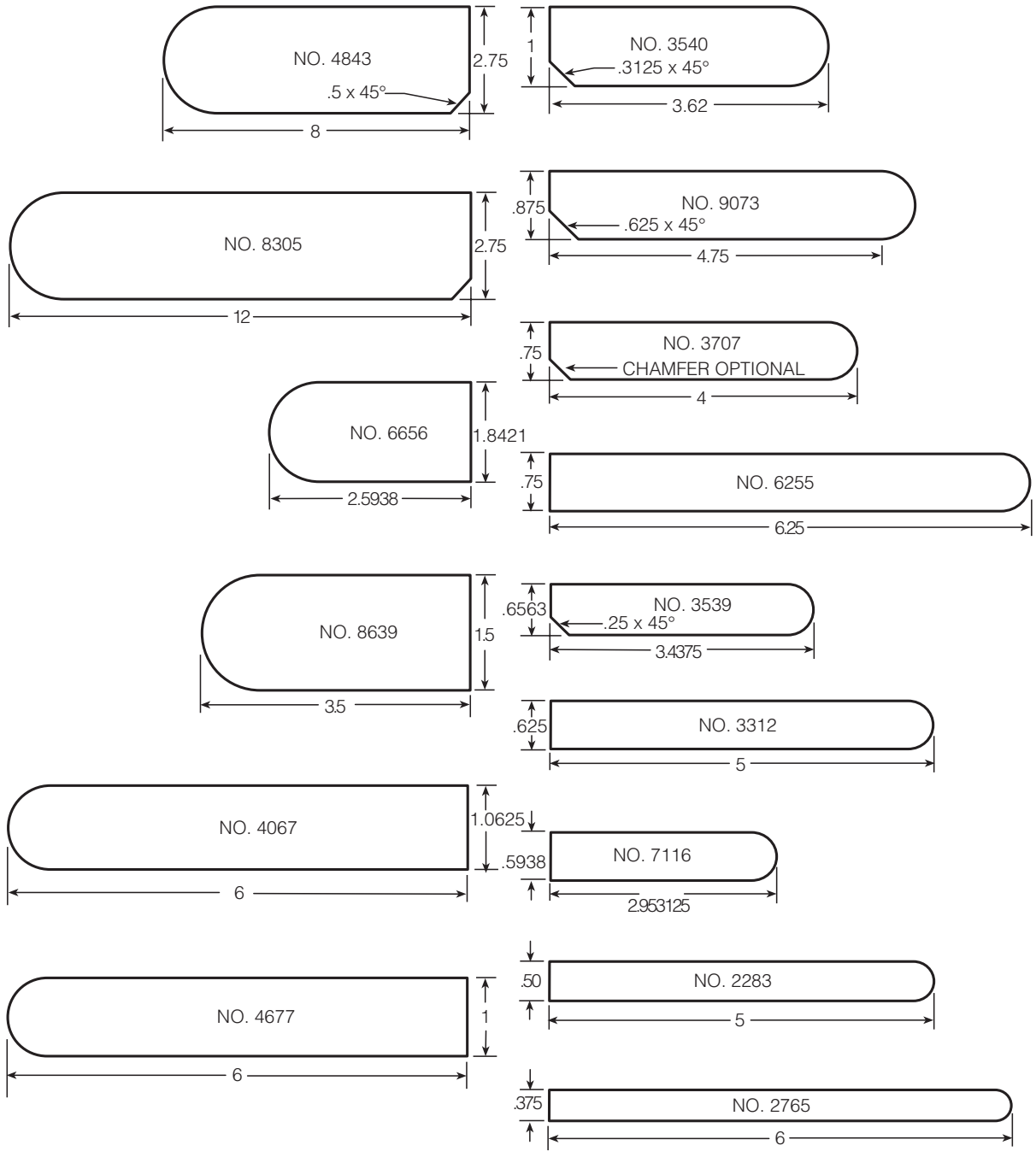


SECTION B-B

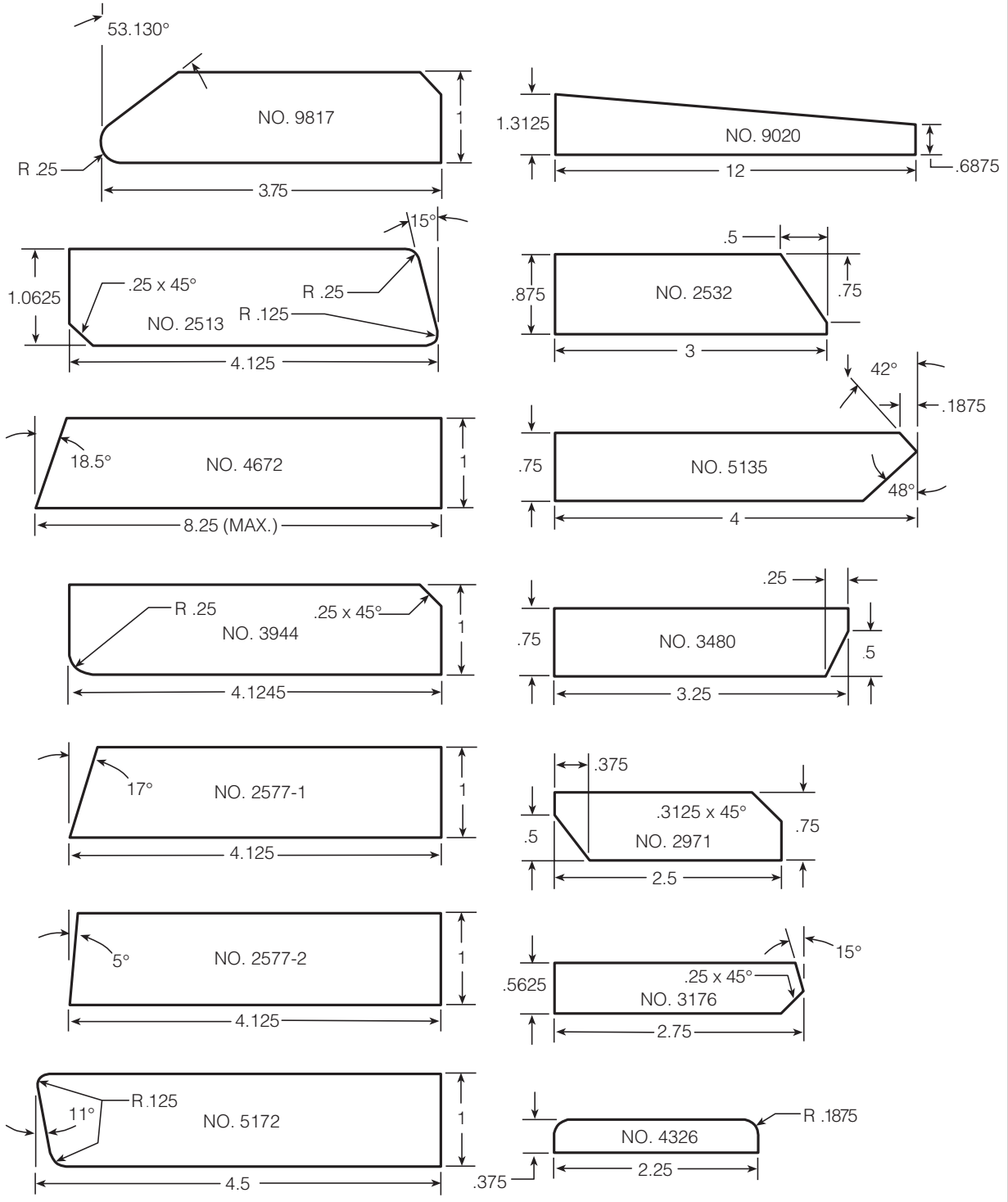


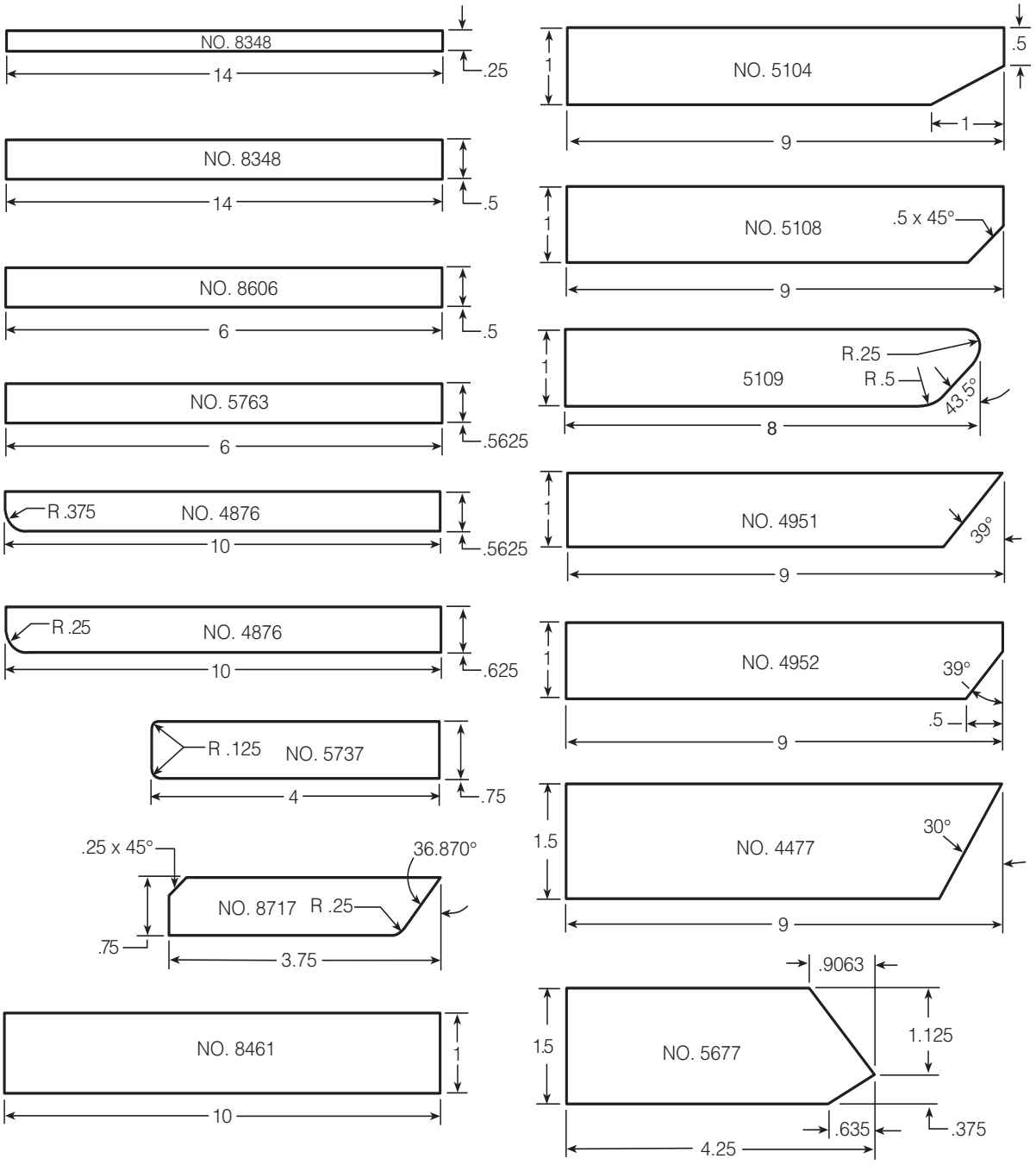
VIEW C-C

Wedge & Bottom Seals



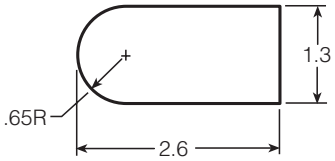
ALL MOLDS ON THIS PAGE WILL PROVIDE
STRIP LENGTHS AS REQUIRED.


53.130°
NO. 9817
1
R .25
3.75
1.3125
NO. 9020
.6875
12
15°
1.0625
.25 x 45°
R .25
NO. 2513
R .125
4.125
.5
.875
NO. 2532
.75
3
42°
.1875
18.5°
NO. 4672
1
8.25 (MAX.)
.75
NO. 5135
48°
4
R .25
.25 x 45°
NO. 3944
1
4.1245
.25
.75
NO. 3480
.5
3.25
17°
NO. 2577-1
1
4.125
.375
.3125 x 45°
.5
NO. 2971
.75
2.5
5°
NO. 2577-2
1
4.125
15°
.5625
.25 x 45°
NO. 3176
2.75
R.125
11°
NO. 5172
1
4.5
R .1875
NO. 4326
.375
2.25

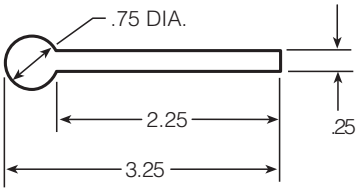


ALL MOLDS ON THIS PAGE WILL PROVIDE
STRIP LENGTHS AS REQUIRED.
WIDTHS SHOWN ARE MAX.

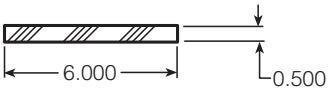
ALL MOLDS ON THIS PAGE WILL PROVIDE STRIP LENGTHS AS REQUIRED, EXCEPT AS NOTED.



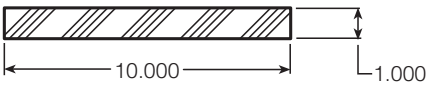
MOLD NO. 6656



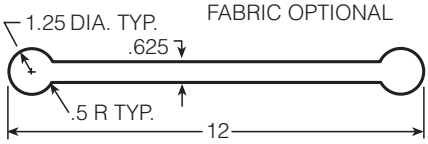
MOLD NO. 3251



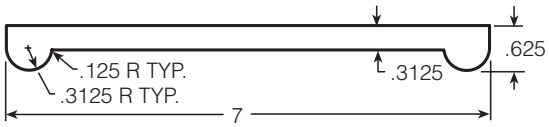
STRIP MOLD NO. 8606



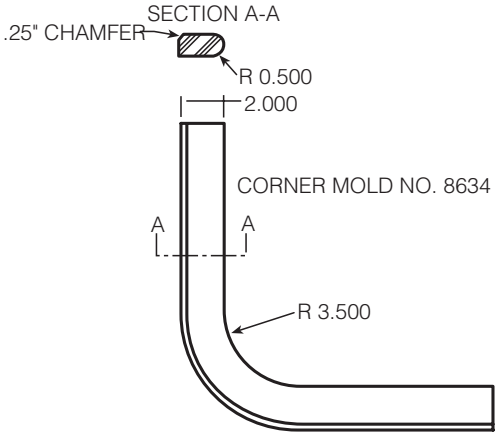
NOTE: REINFORCEMENT WITH FABRIC OPTIONAL

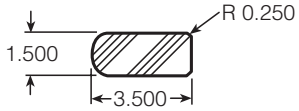


MOLD NO. 6190



MOLD NO. 6486

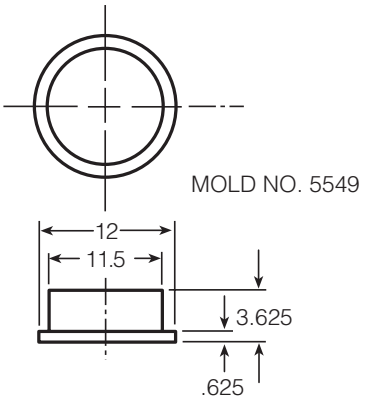


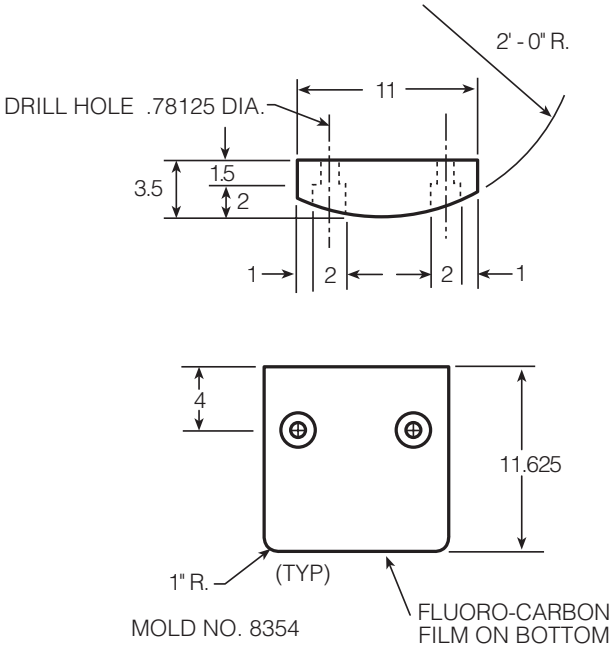


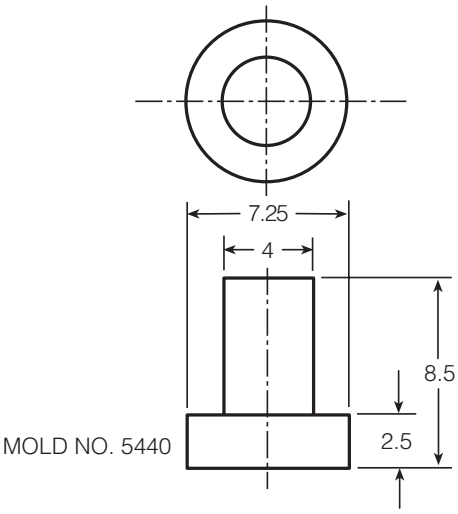
STRIP MOLD NO. 8639

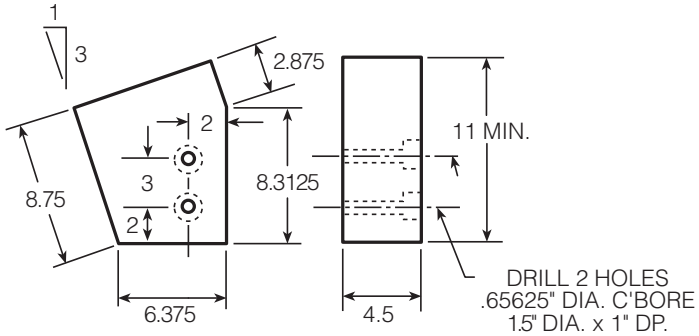
MOLD NO. 6097

Blocks

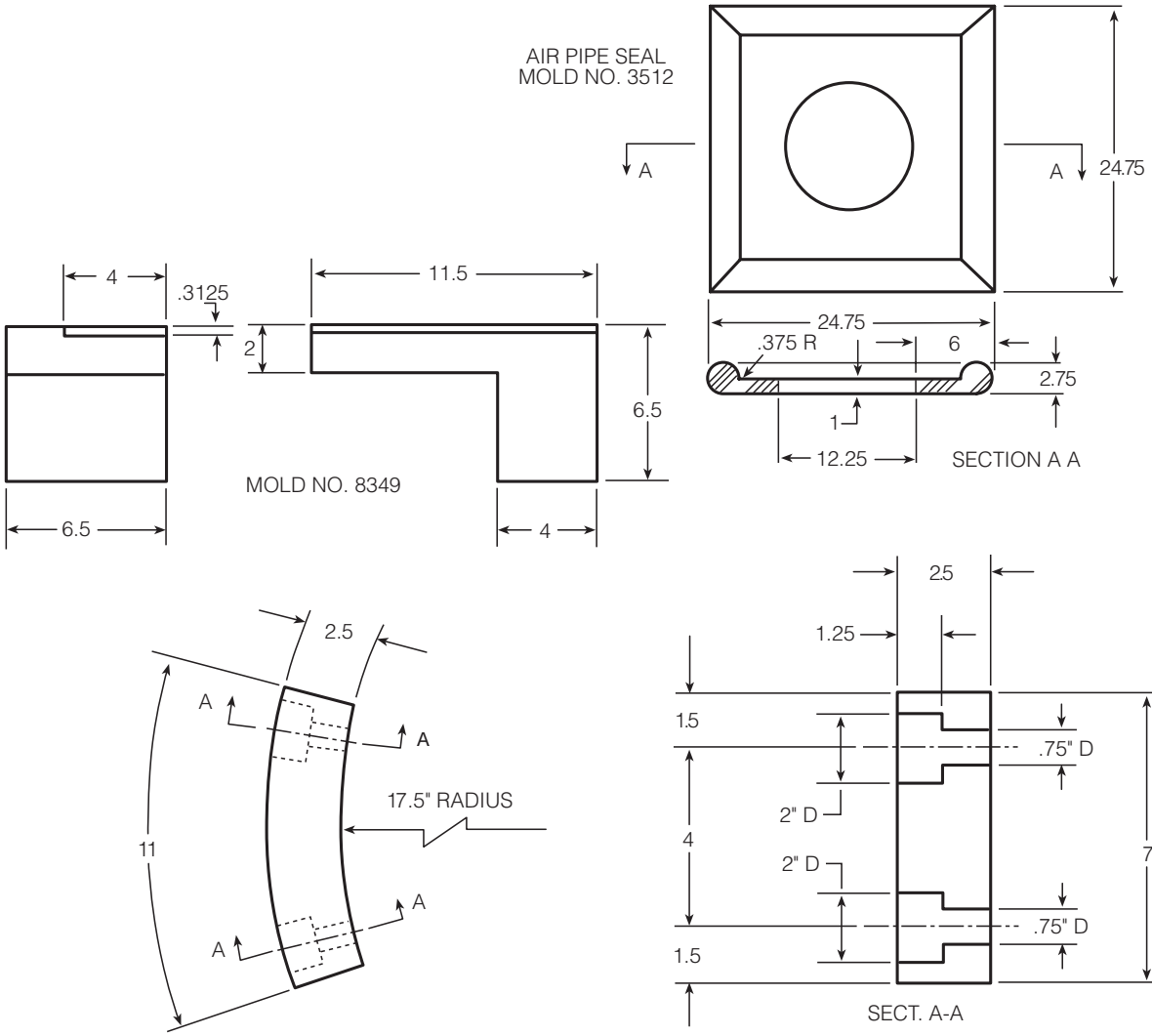

MOLD NO. 5549
12
11.5
3.625
.625


2' - 0" R.
DRILL HOLE .78125 DIA.
11
3.5
1.5
2
1
2
2
1
4
11.625
1" R.
(TYP)
FLUORO-CARBON
FILM ON BOTTOM
MOLD NO. 8354

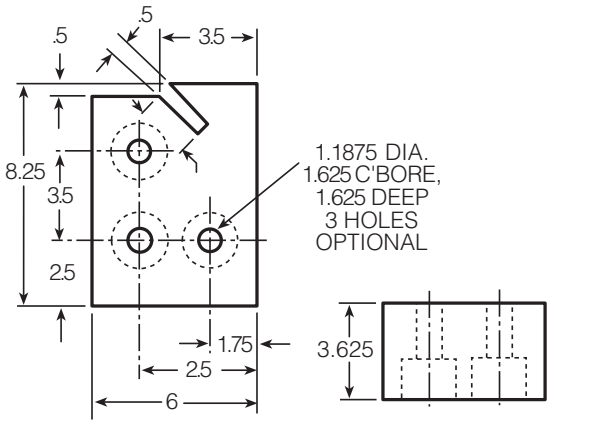

7.25
4
8.5
2.5
MOLD NO. 5440


1
3
2.875
2
11 MIN.
3
8.3125
8.75
2
6.375
4.5
DRILL 2 HOLES
.65625" DIA. C'BORE
1.5" DIA. x 1" DP.

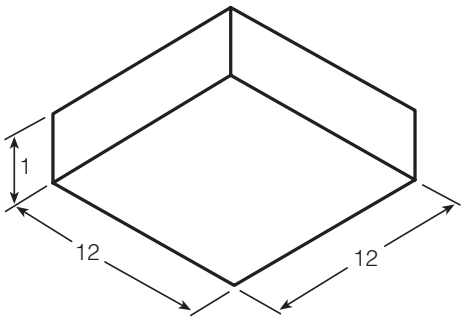
MOLD NO. 8353


AIR PIPE SEAL
MOLD NO. 3512
A
A
24.75
4
.3125
11.5
2
6.5
MOLD NO. 8349
6.5
4
24.75
.375 R
6
2.75
1
12.25
SECTION A A
2.5
A
A
17.5" RADIUS
11
A
A
2.5
1.25
1.5
.75" D
2" D
4
2" D
7
.75" D
1.5
SECT. A-A

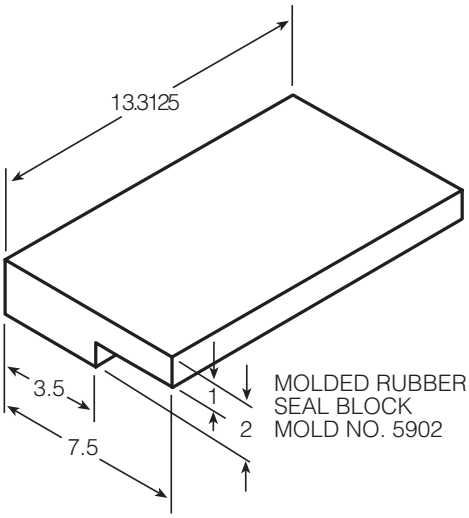
MOLD NO. 6832



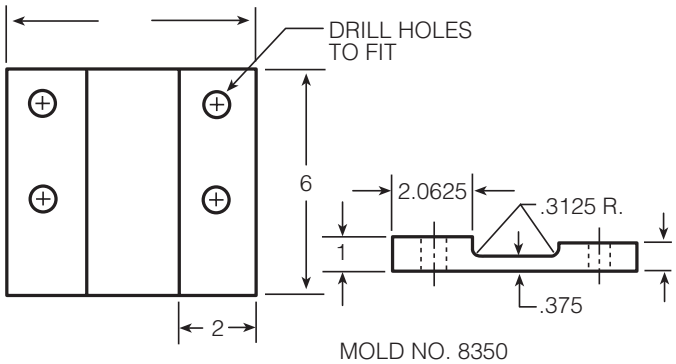
MOLD NO. 6424
AS SHOWN AND OPPOSITE



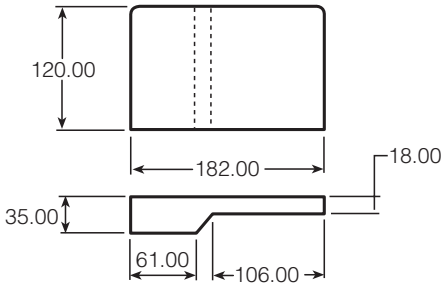
RUBBER BLOCK
MOLD NO. 6561



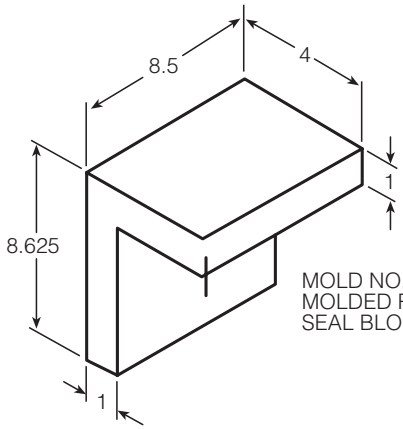
MOLDED RUBBER
SEAL BLOCK
MOLD NO. 5902



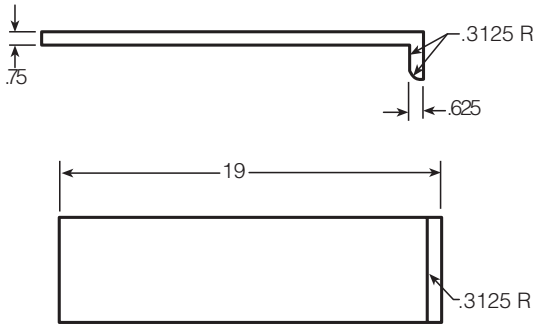
MOLD NO. 8350

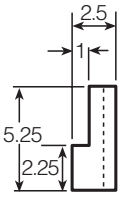


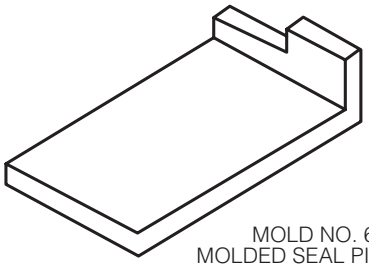
BLOCK MOLD NO. 8500



MOLD NO. 5903
MOLDED RUBBER
SEAL BLOCK

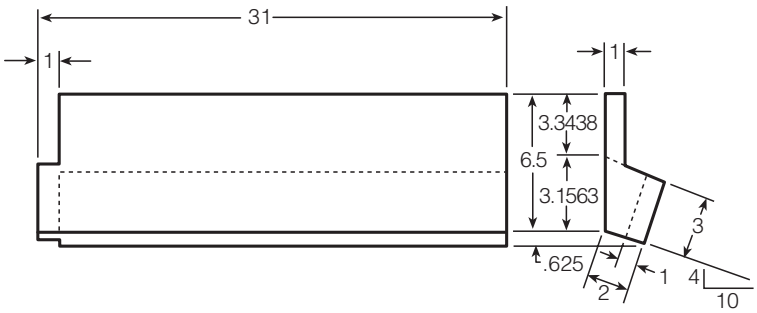


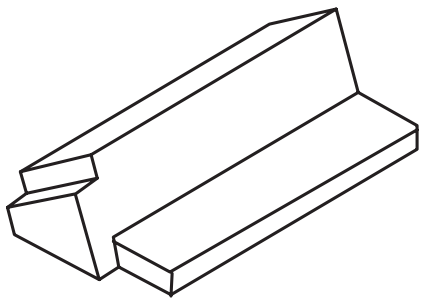


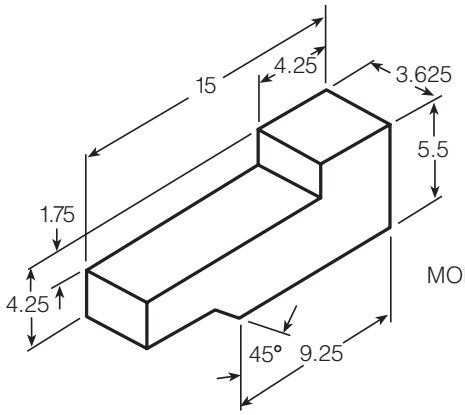


MOLD NO. 6896
MOLDED SEAL PIECE
AS SHOWN AND OPPOSITE

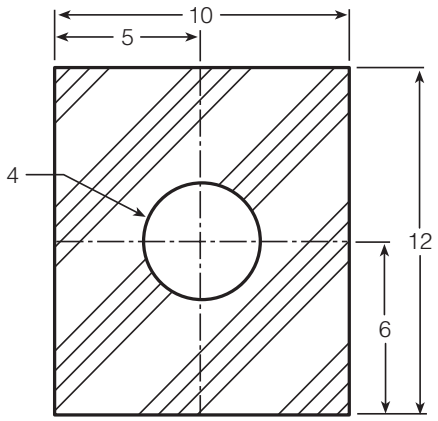
MOLD NO. 6846
SPECIAL MOLDED
RUBBER SEAL FOR
MITER GATE



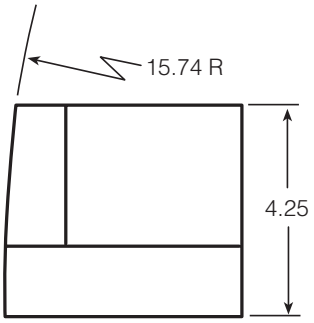




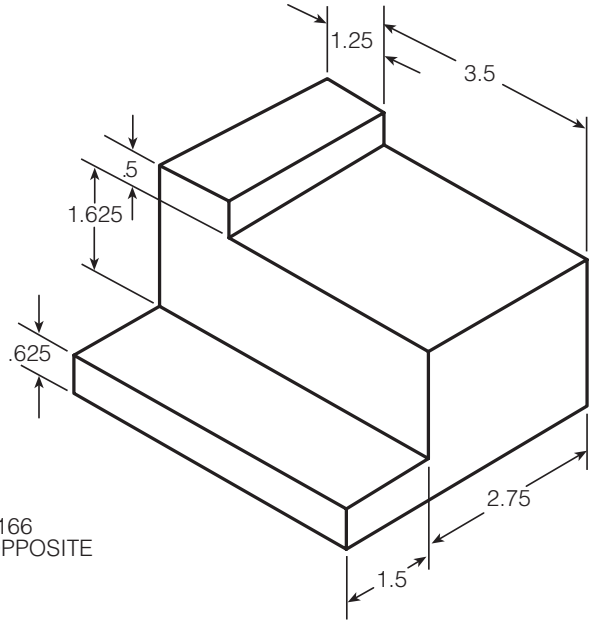
MOLD NO. 6298



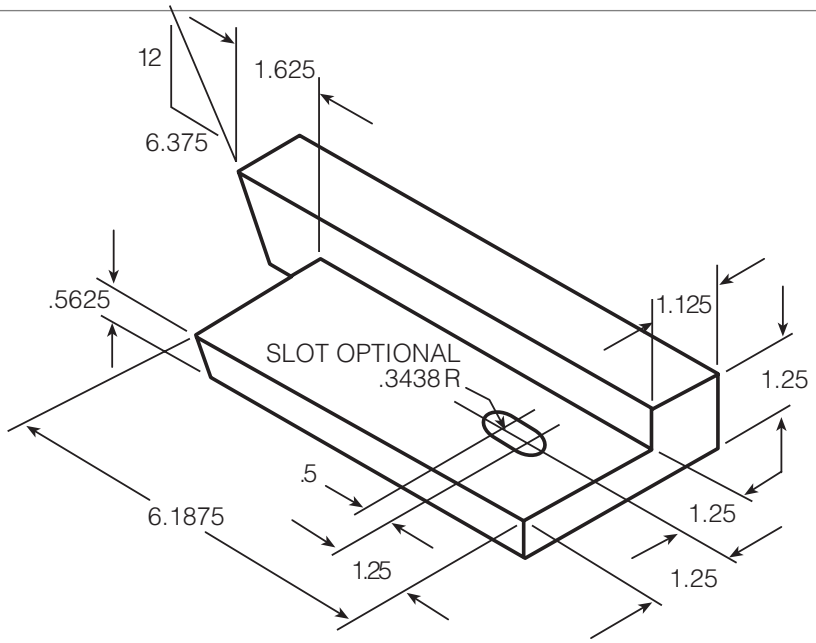
MOLD NO. 8502 x 33"



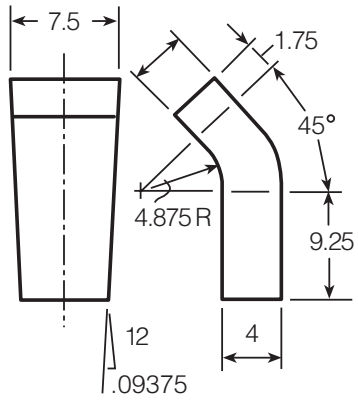
TOP VIEW



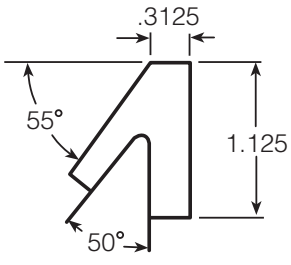
MOLD NO. 5166
AS SHOWN AND OPPOSITE



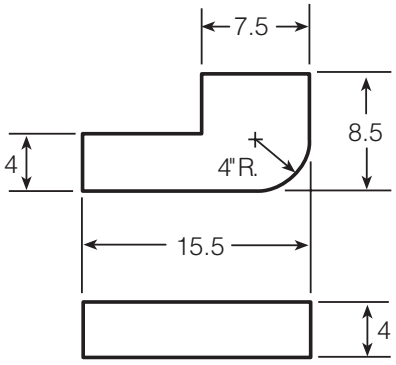
MOLD NO. 4661
AS SHOWN ON OPPOSITE



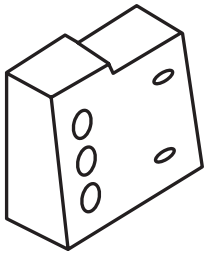
MOLD NO. 8201



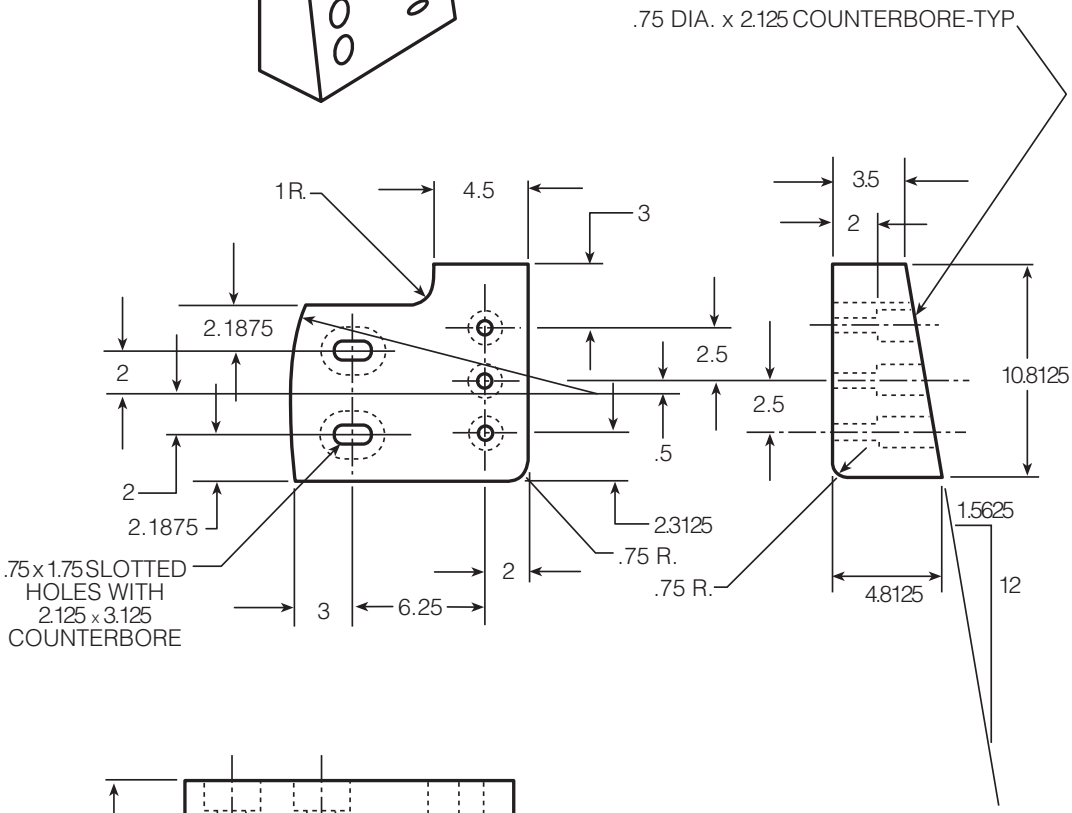
MOLD NO. 8832

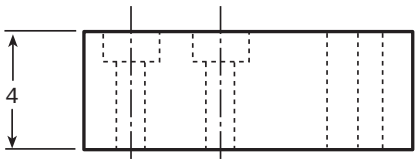


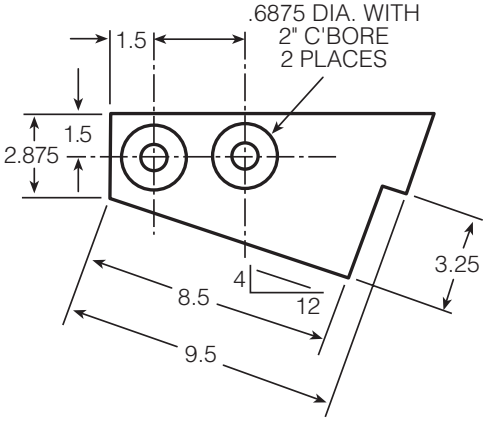
MOLD NO. 8200



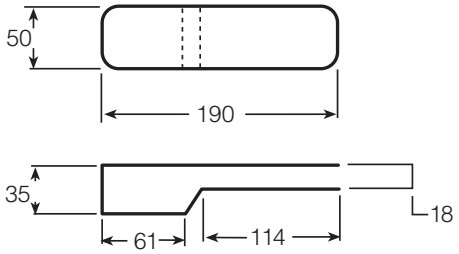
MOLD NO. 4786 & 4787
AS SHOWN ON OPPOSITE



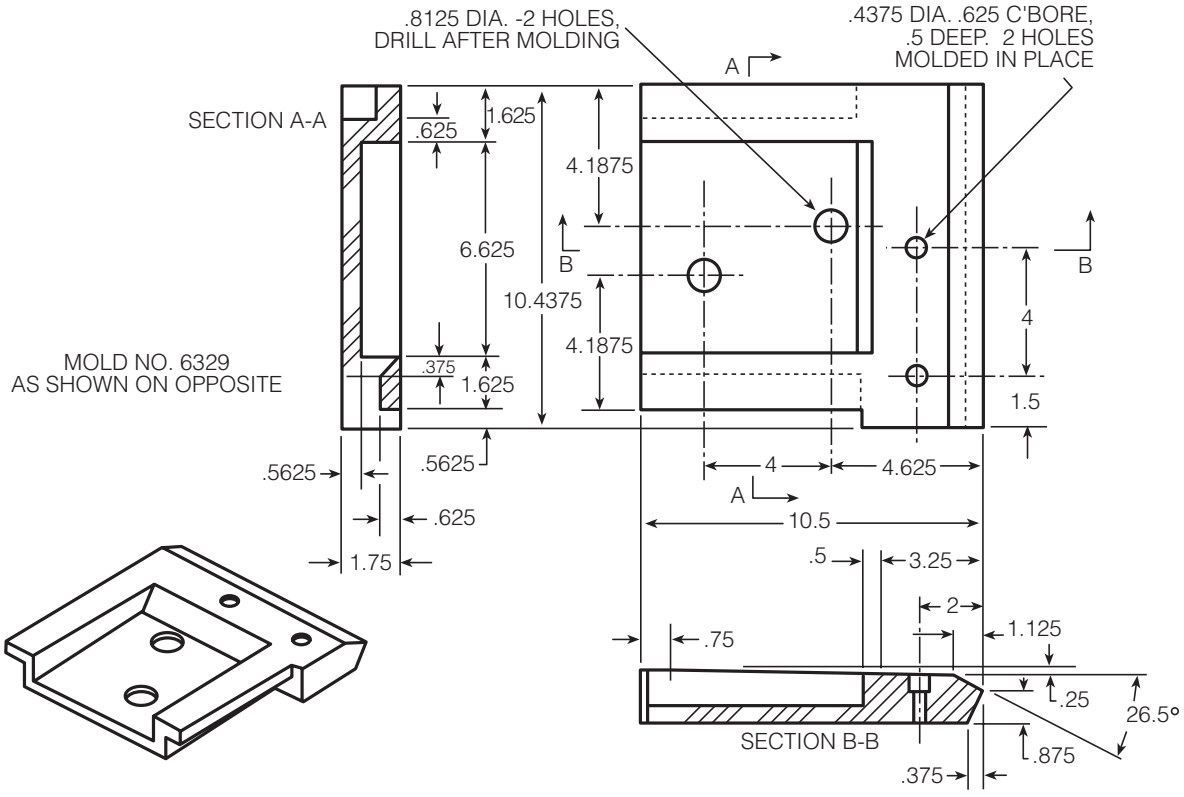


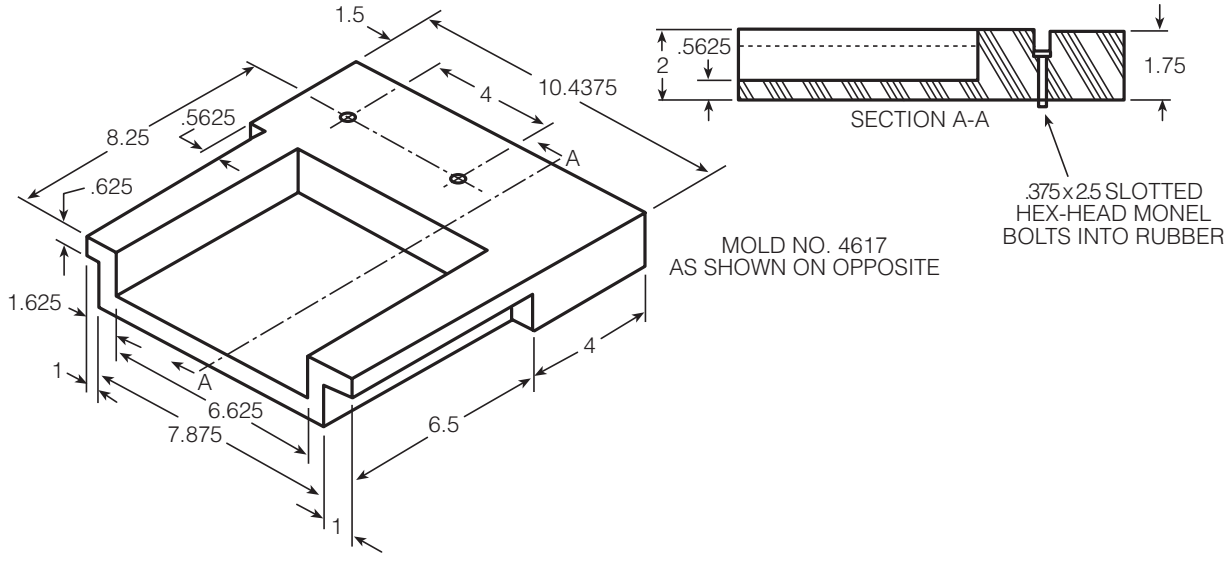


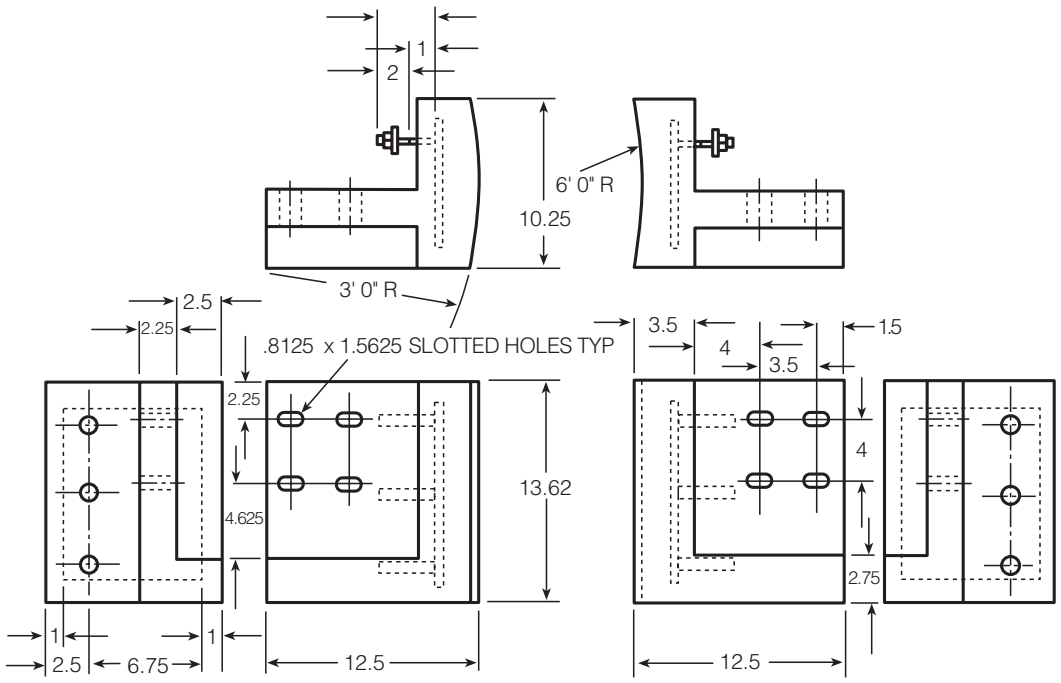
MOLD NO. 6798



BLOCK MOLD NO. 8501

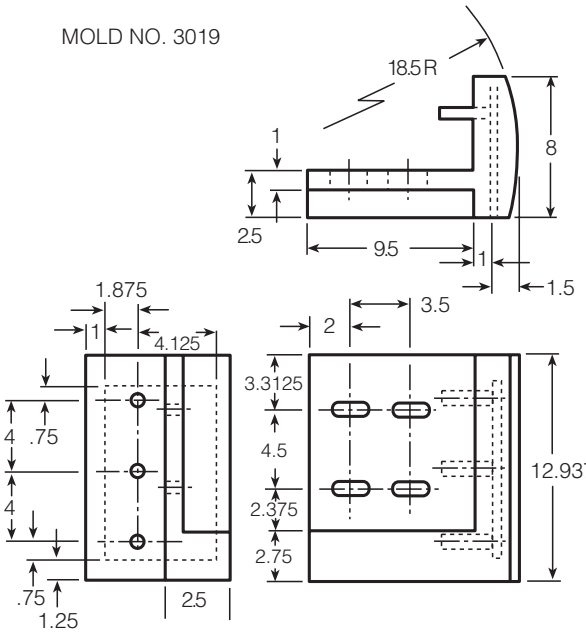

.8125 DIA. -2 HOLES,
DRILL AFTER MOLDING
.4375 DIA. .625 C'BORE,
.5 DEEP. 2 HOLES
MOLDED IN PLACE
A
SECTION A-A
.625
1.625
4.1875
6.625
B
10.4375
4.1875
4
MOLD NO. 6329
AS SHOWN ON OPPOSITE
.375
1.625
1.5
.5625
.5625
4
4.625
A
.625
10.5
1.75
.5
3.25
2
1.125
.75
.25
26.5°
SECTION B-B
.875
.375


1.5
10.4375
4
8.25
.5625
A
.625
1.625
1
A
6.625
7.875
6.5
4
1
.5625
2
1.75
SECTION A-A
.375 x 2.5 SLOTTED
HEX-HEAD MONEL
BOLTS INTO RUBBER
MOLD NO. 4617
AS SHOWN ON OPPOSITE

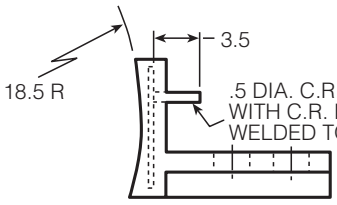


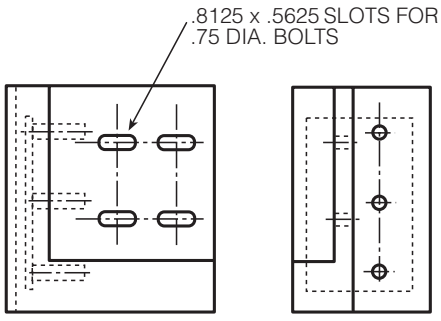
MOLD NO. 4750 & 4751

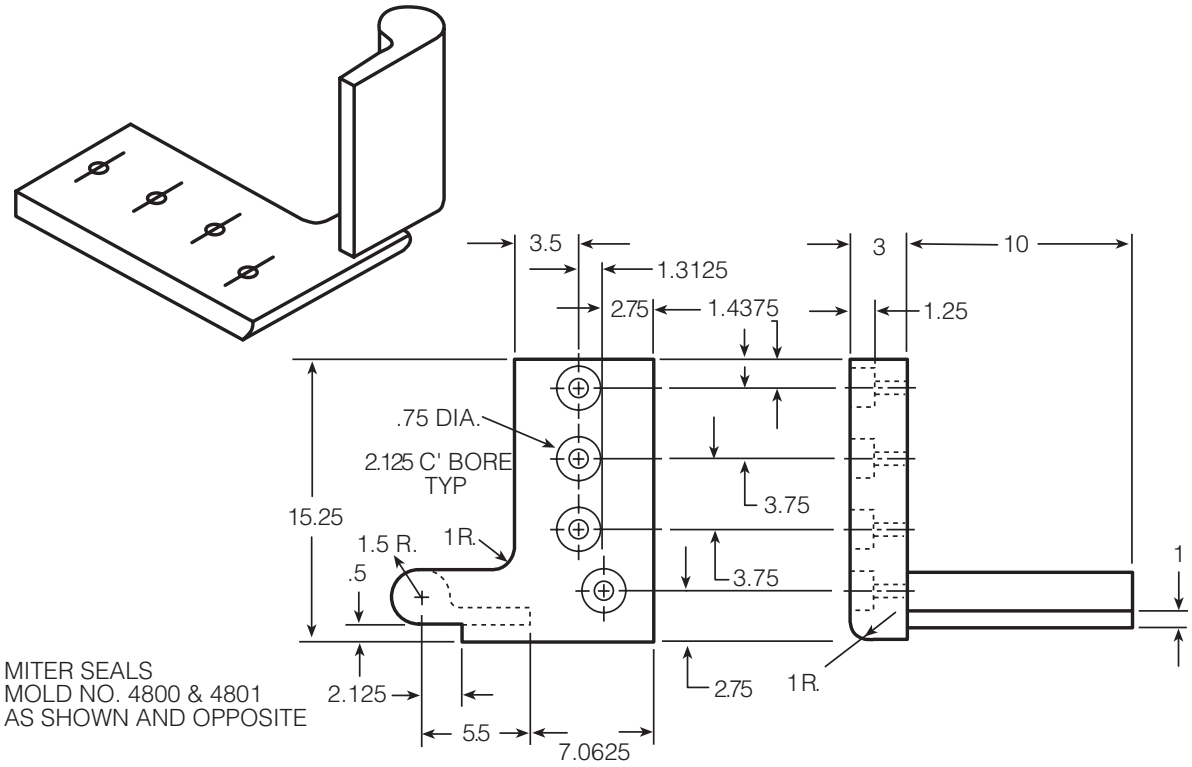
MOLD NO. 3019



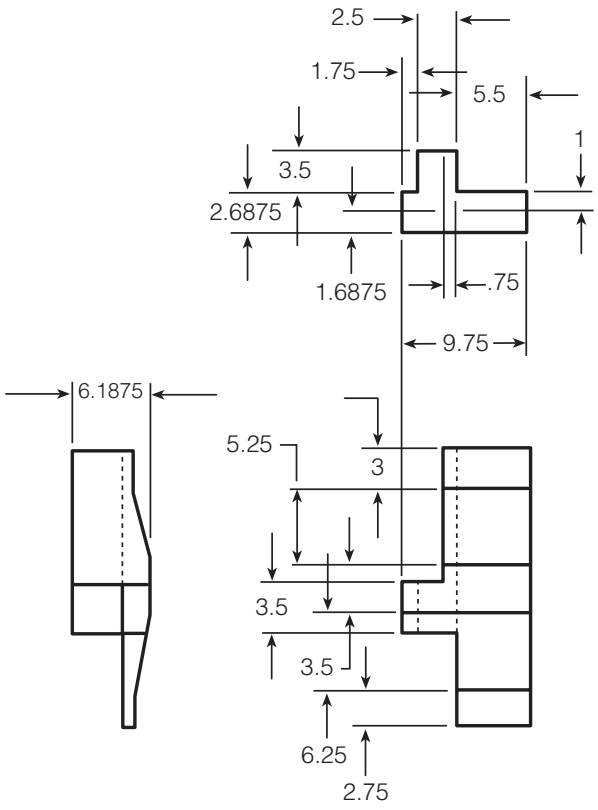
MOLD NO. 3020

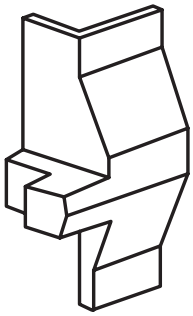




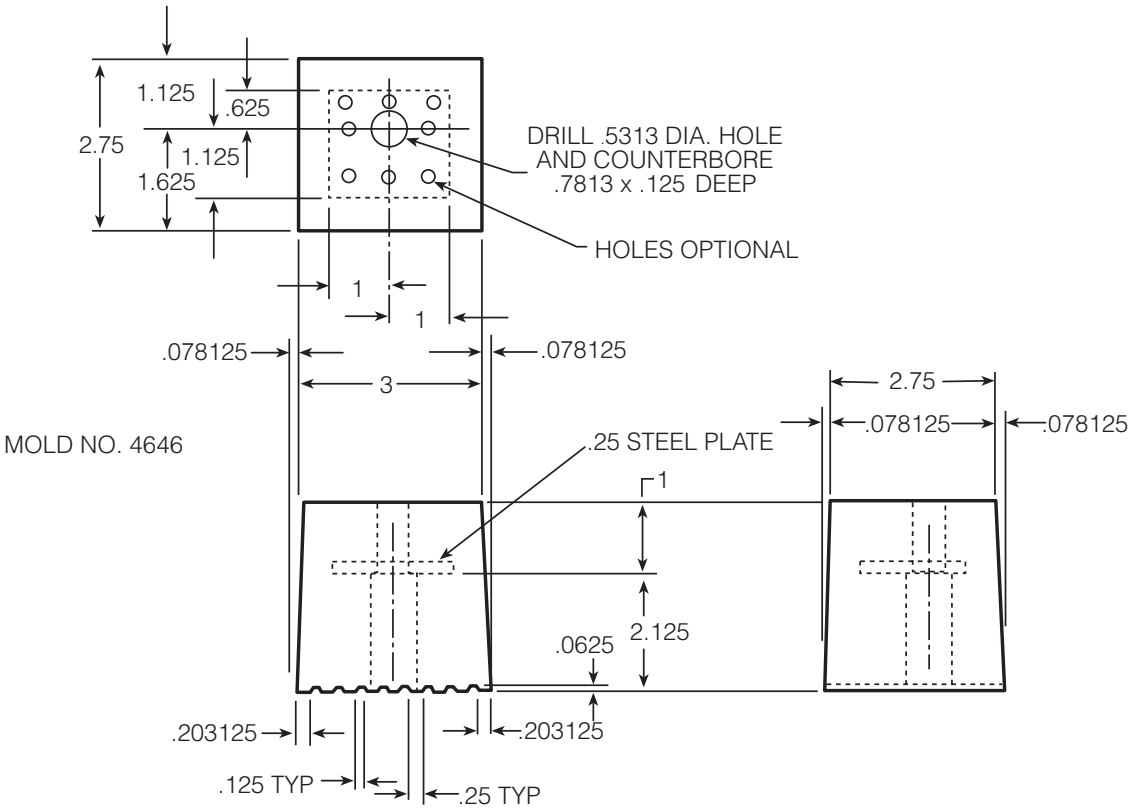


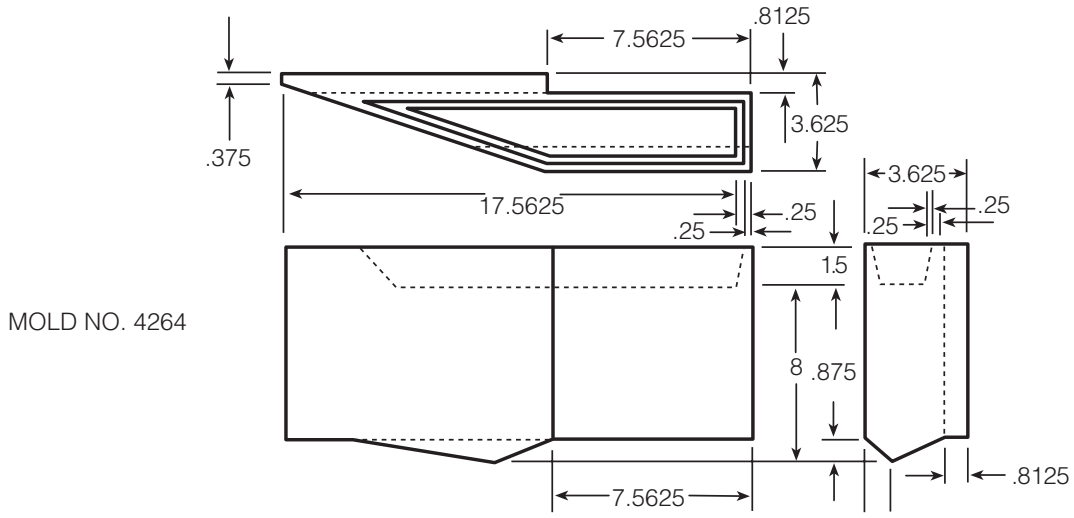
MITER SEALS
MOLD NO. 4800 & 4801
AS SHOWN AND OPPOSITE



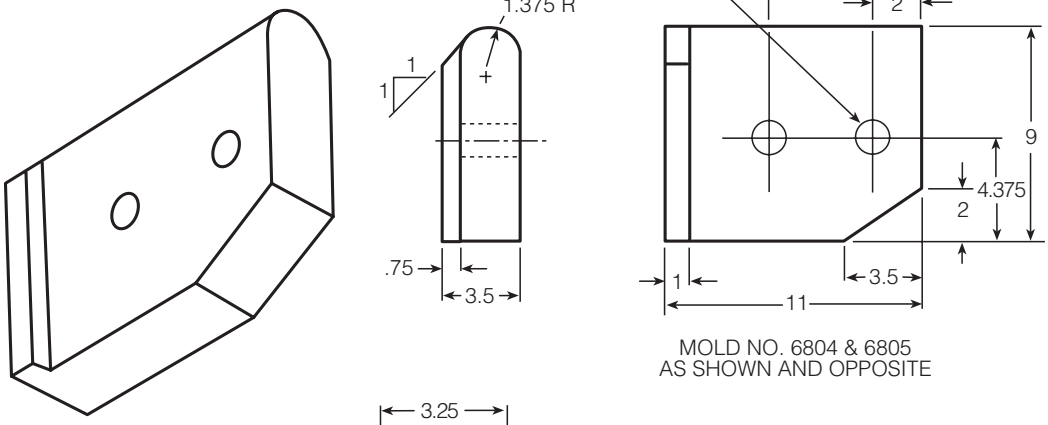


END PIECE
MOLD NO. 4068 & 4069
AS SHOWN AND OPPOSITE

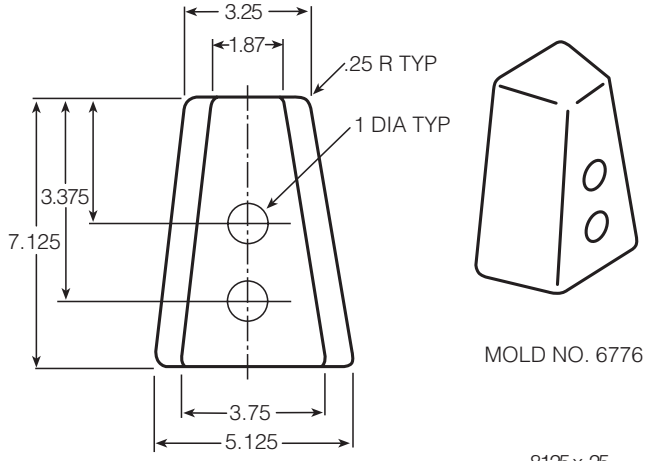

1.125
.625
2.75
1.125
1.625
DRILL .5313 DIA. HOLE
AND COUNTERBORE
.7813 x .125 DEEP
HOLES OPTIONAL
1
1
.078125
.078125
3
2.75
.078125
.078125
MOLD NO. 4646
.25 STEEL PLATE
1
.0625
2.125
.203125
.203125
.125 TYP
.25 TYP


.8125
7.5625
3.625
.375
3.625
17.5625
.25
.25
.25
.25
1.5
MOLD NO. 4264
8
.875
.8125
7.5625

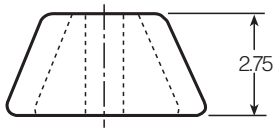
AS SHOWN AND OPPOSITE

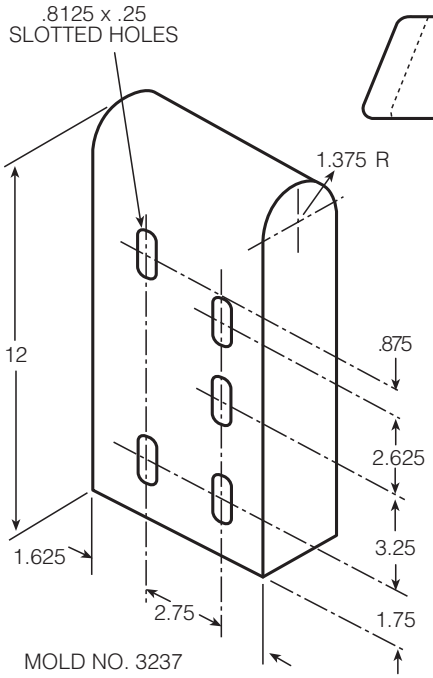


MOLD NO. 6804 & 6805
AS SHOWN AND OPPOSITE

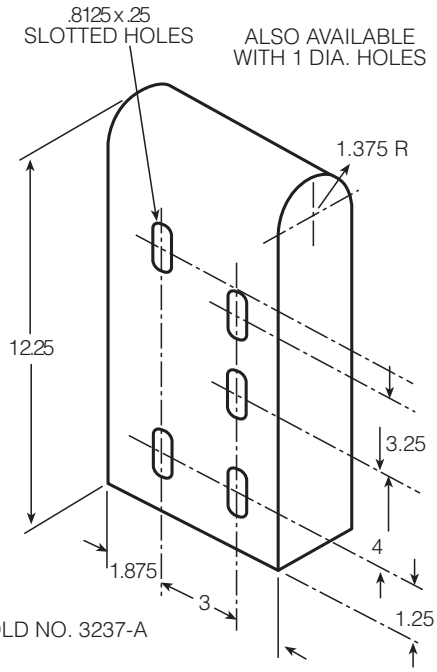


MOLD NO. 6776

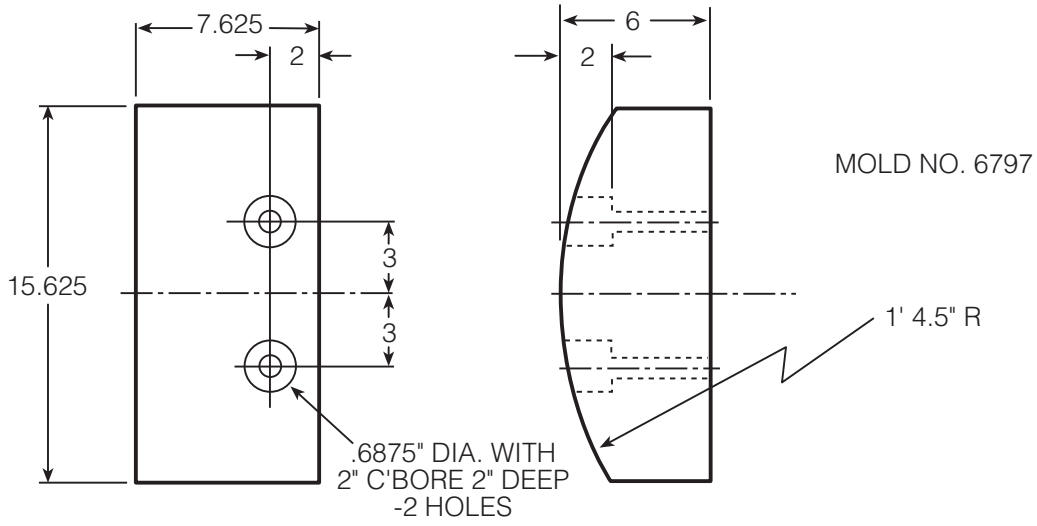




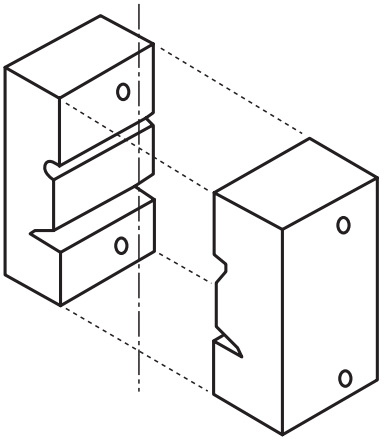
MOLD NO. 3237

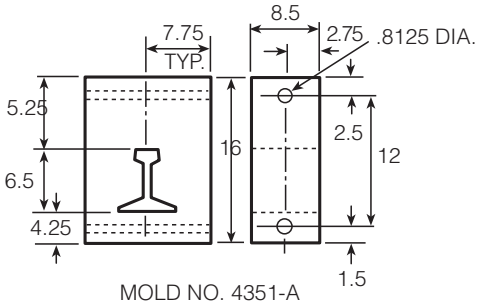


MOLD NO. 3237-A

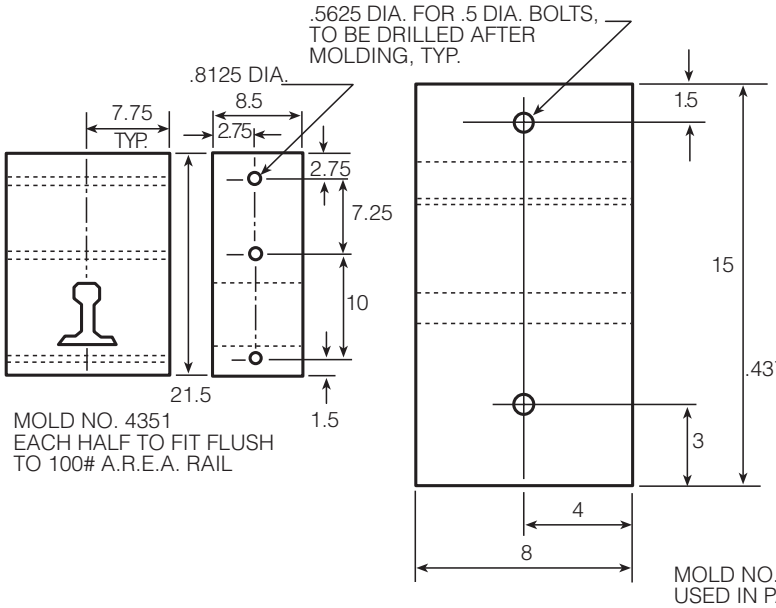

7.625
2
6
2
MOLD NO. 6797
15.625
3
3
1' 4.5" R
.6875" DIA. WITH
2" C'BORE 2" DEEP
-2 HOLES

JOINT LINE - FLUSHFIT (NOT VULCANIZED)

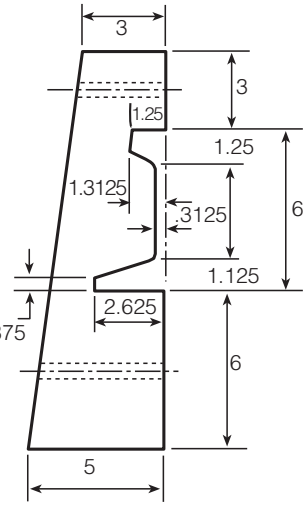




MOLD NO. 4351-A

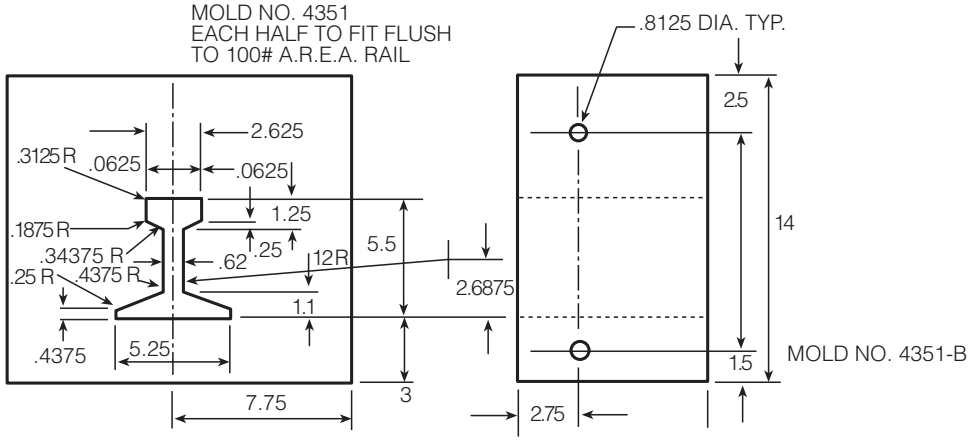


MOLD NO. 4351
EACH HALF TO FIT FLUSH
TO 100# A.R.E.A. RAIL

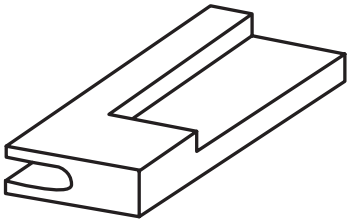


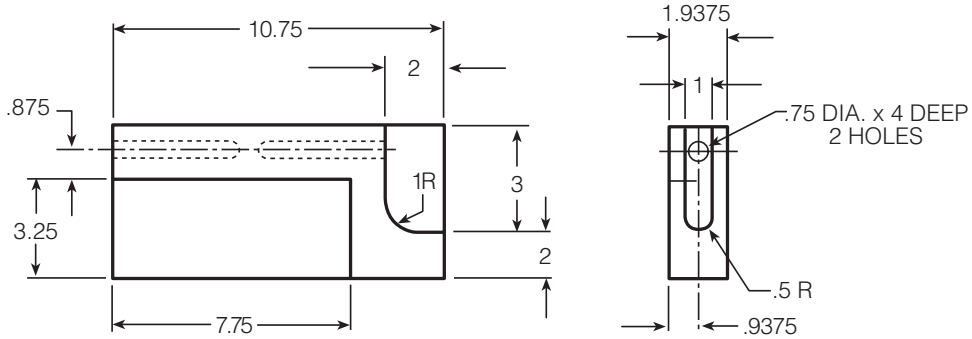
MOLD NO. 4351-C
USED IN PAIRS-ONE
ON EACH SIDE OF RAIL

MOLD NO. 4351
EACH HALF TO FIT FLUSH
TO 100# A.R.E.A. RAIL

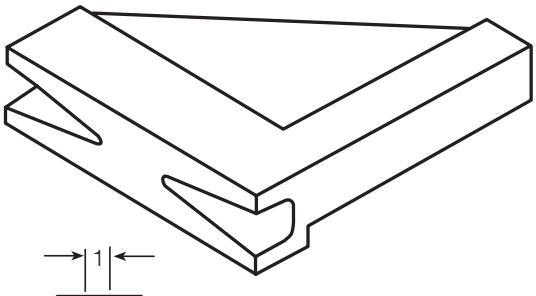


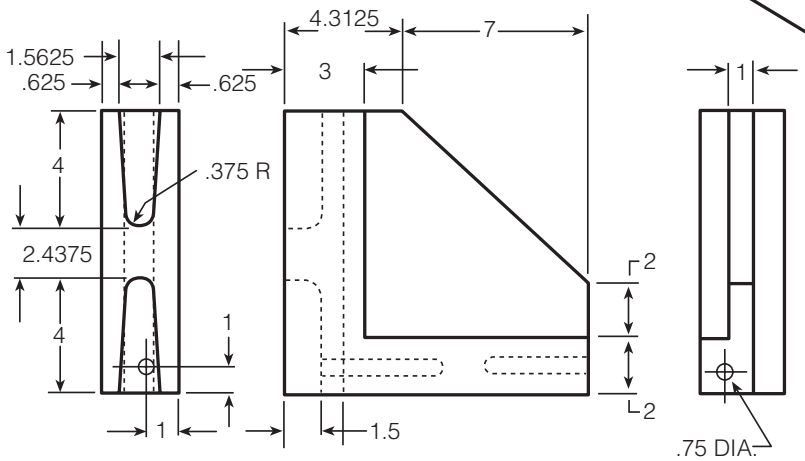
MOLD NO. 4351-B



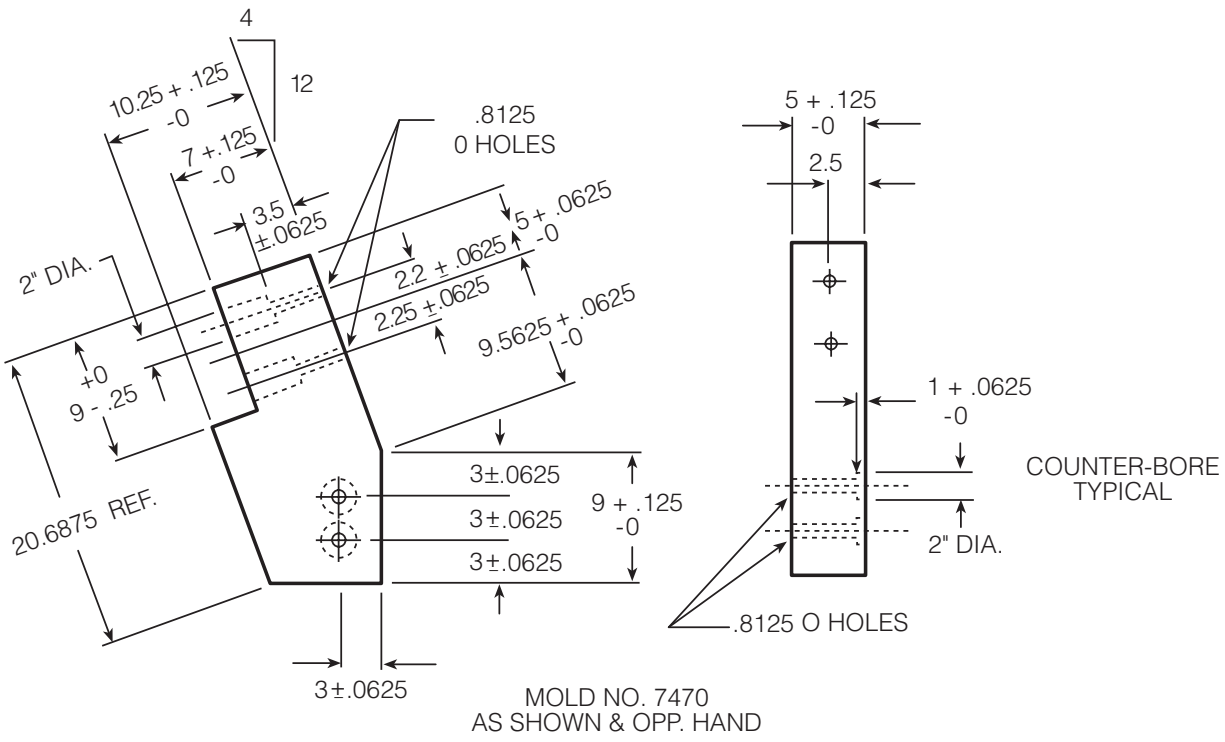


MOLD NO. 4616
AS SHOWN AND OPPOSITE

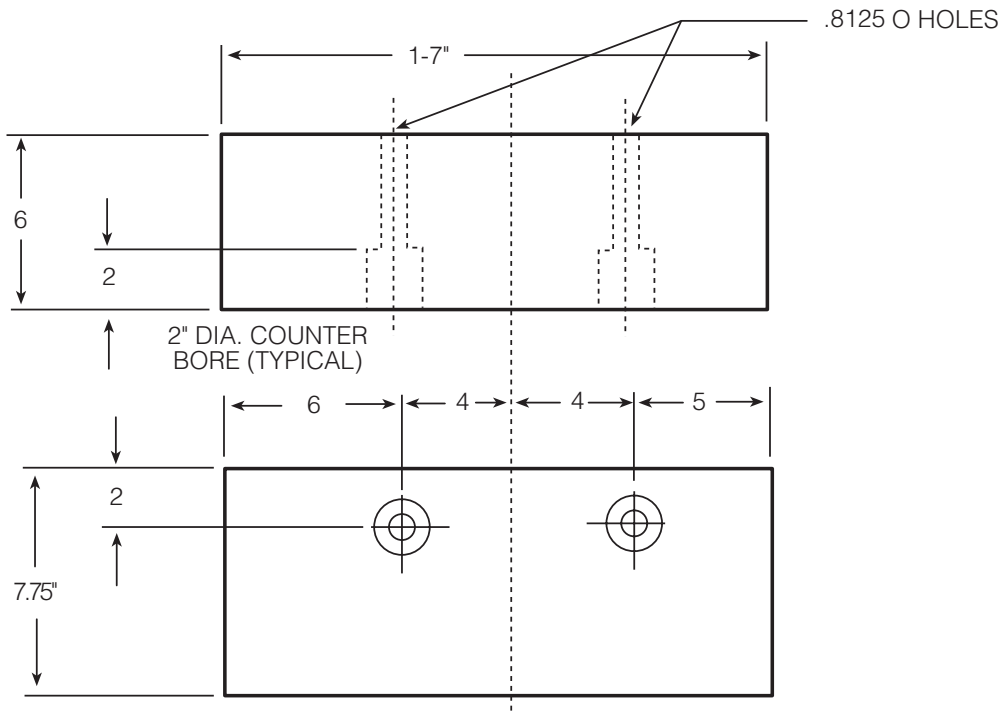




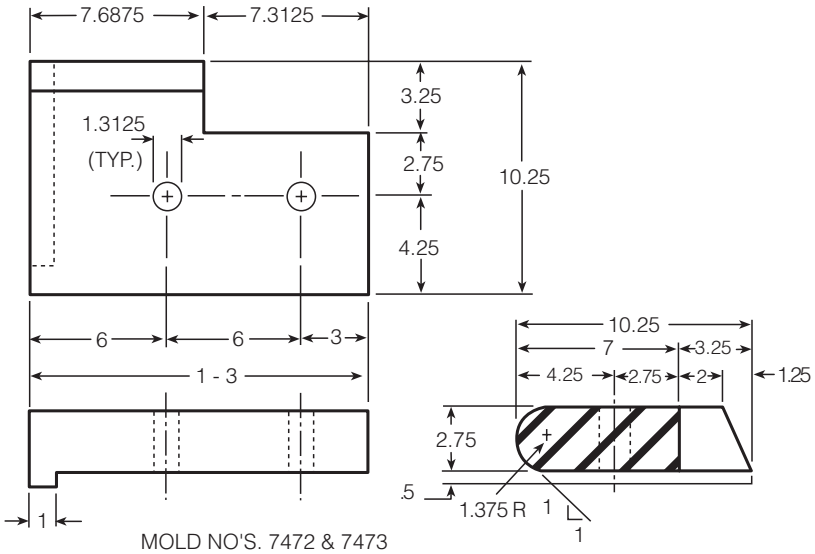
MOLD NO. 4618
AS SHOWN AND OPPOSITE



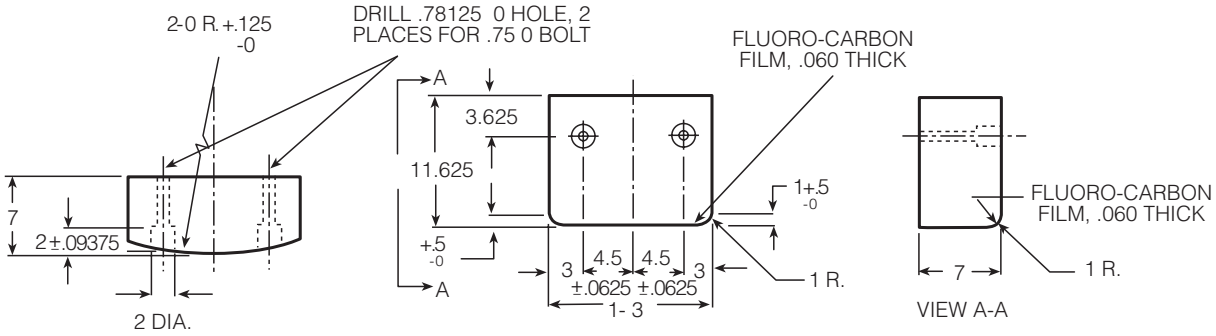
MOLD NO. 7470
AS SHOWN & OPP. HAND



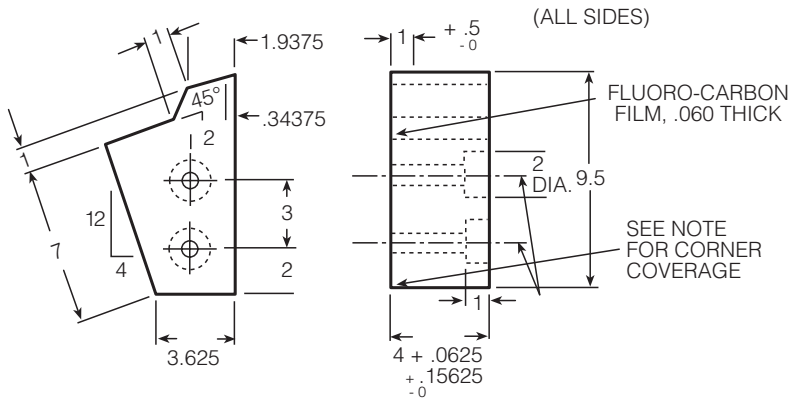
MOLD NO. 7471
AS SHOWN & OPP. HAND



MOLD NO'S. 7472 & 7473
AS SHOWN & OPP. HAND

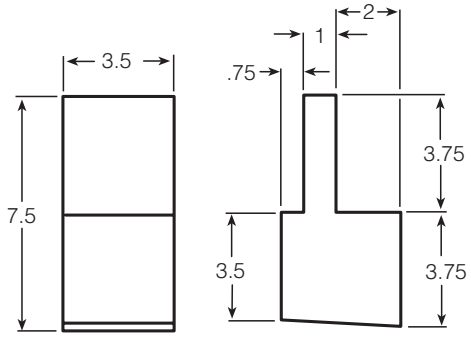


MOLD NO. 7428

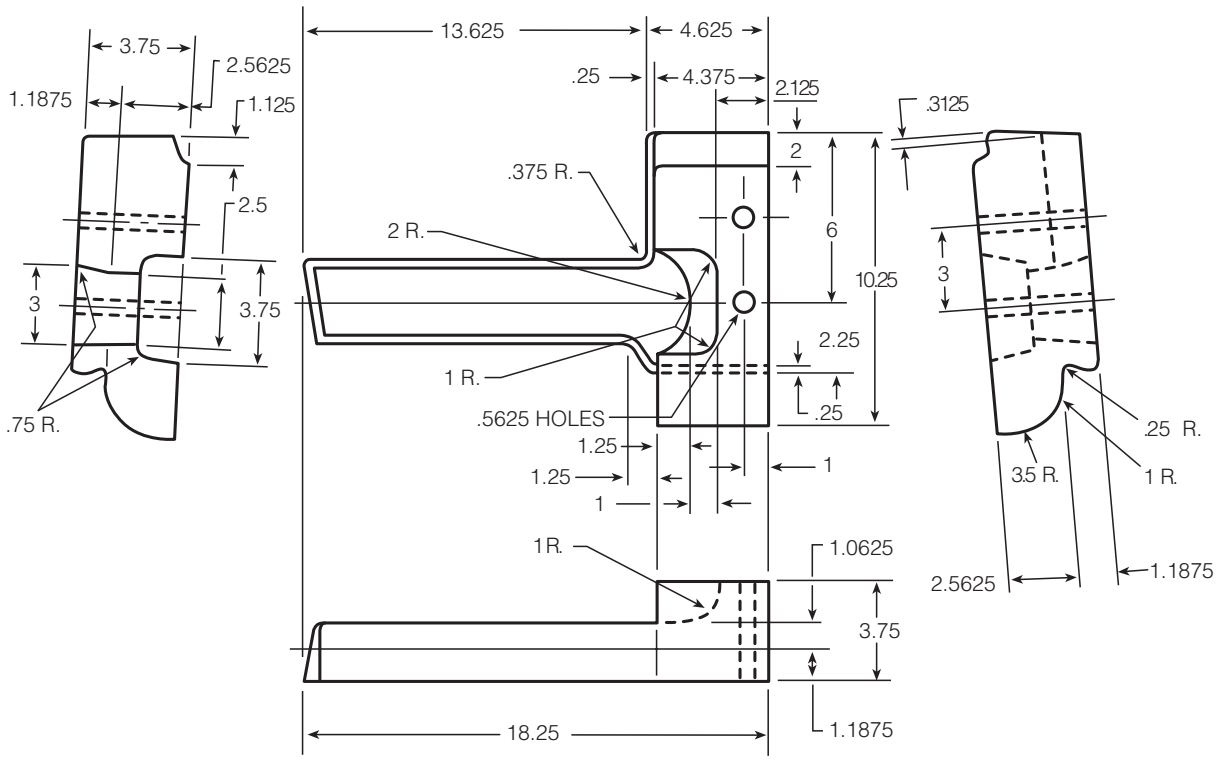


NOTE: FIT F.C. COVER AROUND
ALL EDGES WITH TRIANGULAR
CUT OUR PATTERN AS NECESSARY
TO ENSURE AS NEAR FULL
COVERAGE AS POSSIBLE ON FLAT
SURFACE AVOIDING TEARS IN F.C.

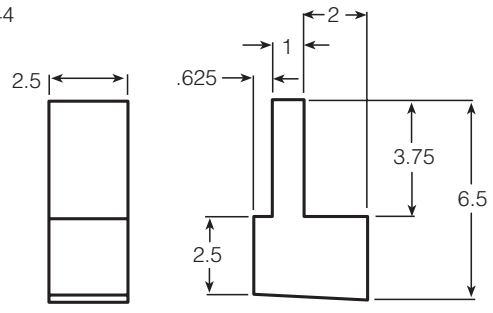
AS SHOWN & OPP. HAND
TOLERANCES ON ALL DIMENSIONS NOT SHOWN
EXCEPT HOLES: PLUS .25 MINUS .03125 A



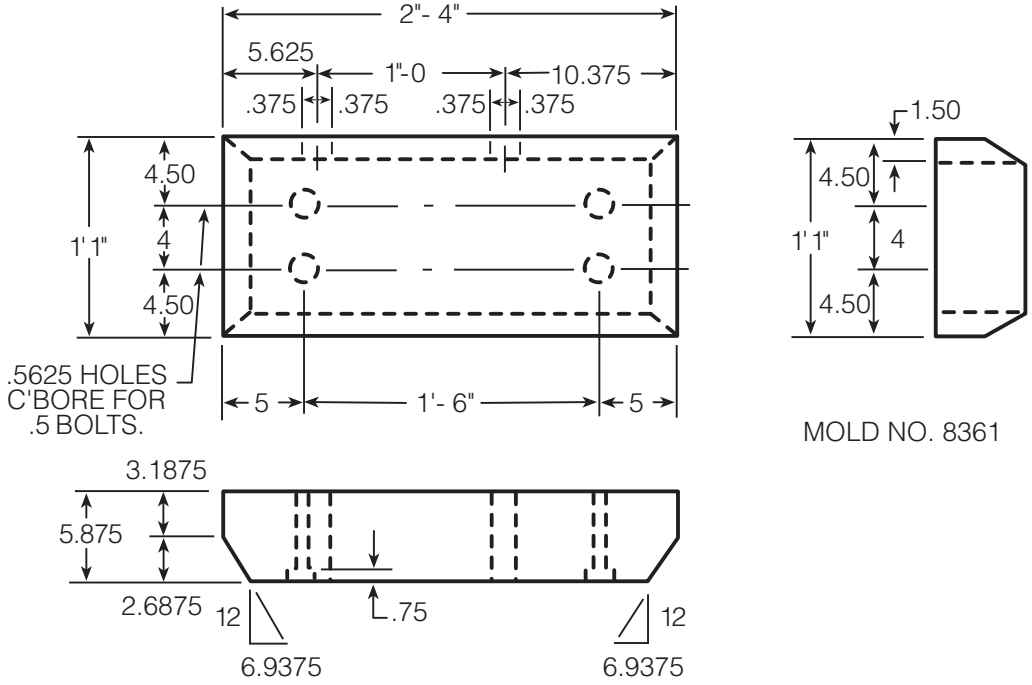
MOLD NO. 8924



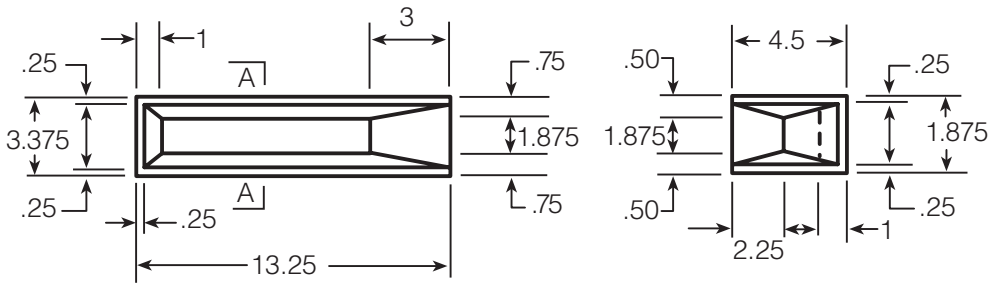
MOLD NO. 8343 & 8344



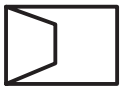
MOLD NO. 8377



MOLD NO. 8361



MOLD NO. 8009



SECT. D-D