

Precision Series® II Hot Runner Bushings



The Precision Series II Hot Runner system is an exclusive medium pitch, flat gate system with the ability to process engineering and glass-filled resins without deteriorating the tips. Acceptable for crystalline and amorphous materials, this system utilizes gate diameter, gate area cooling and temperature control at the tip to optimize the part quality.

Precision Series II "flat gating"™ leaves a small mark on the molded part surface (gate vestige). The gate can be sunk into a round depression (referred to as a "recessed gate") so that the mark does not protrude above the part surface. The Precision Series II is available with two different head styles and five gating options to suit a broad range of applications.

Gating Options for the Precision Series® II



Standard Pinpoint Tips – Patent Pending

Exclusive tip design exceeds minimum vestige requirements and tip life expectations. Color change capabilities are enhanced. Ideal for non-erosive commodity resins, these tips are available in 0.015" (0.40 mm), 0.030" (0.75 mm), and 0.050" (1.25 mm) tip flat diameters, to better maintain minimum vestige in parts up to 150 grams (see engineering charts 1, 2 & 3 on page 5).



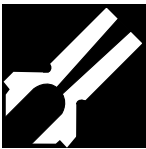
Wear Resistant Pinpoint Tips – Patent Pending

Recommended for glass-filled and other aggressive engineering grade materials, these tips have an excellent heat profile and high wear resistance characteristics. The innovative design orients molecular flow of the material, glass fibers and fillers in a linear direction. This linear orientation reduces shear, which translates to longer tip and gate life. Available in 0.015" (0.40 mm), 0.030" (0.75 mm), and 0.050" (1.25 mm) tip flat diameters, to better maintain minimum vestige in parts up to 150 grams (see engineering charts 1, 2 & 3 on page 5).



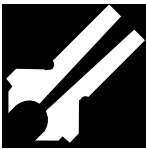
Sprue Tips –

Tips can process all types of resins, from commodity to engineering grades, while maintaining optimal performance with minimal vestige. Ideal for retrofitting into existing molds that may have larger gates. Available in standard and wear resistant alloys, these tips are capable of processing up to 150 grams of low viscosity resin (see engineering charts 1, 2 & 3 on page 5).



Extra Stock Sprue Tips –

Identical to the Standard Sprue tip, except with .512" (13mm) of extra stock at the tip, which can be machined to meet customer specific requirements. Ideal for difficult access areas in the part, or for secondary runner applications. Available in standard and wear resistant alloys, these tips are capable of processing up to 150 grams of low viscosity resin and 75 grams of high viscosity resin (see engineering charts 1, 2 & 3 on page 5).



Extra Stock Sprue (Nylon) Tips –

Specially developed to process resins with narrow melt flow parameters, this tip design provides optimum control within the high temperature zones of the bushing. Ideal for materials such as nylon and acetal, where vestige is not critical. These wear resistant tips can process 75 grams of high viscosity resin (see engineering charts 1, 2 or 3 & page 5).

Head Options for the Precision Series® II



.500" Radius* –

Provided with a 0.500" radius to mate in 0.500" radius machine bushings. Improved contact area for optimum strength and heat transfer.



.750" Radius* –

Provided with a 0.750" radius to mate in 0.750" radius machine bushings. Improved contact area for optimum strength and heat transfer.

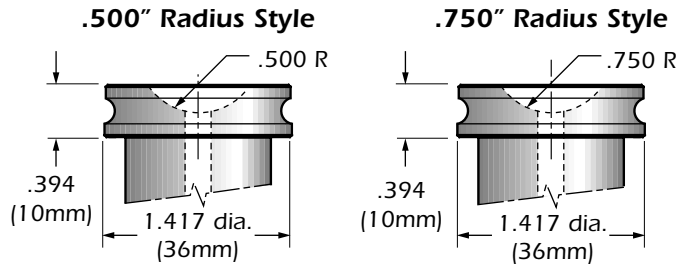
*Different radius sizes are available by special request.

Precision II Technical Specifications

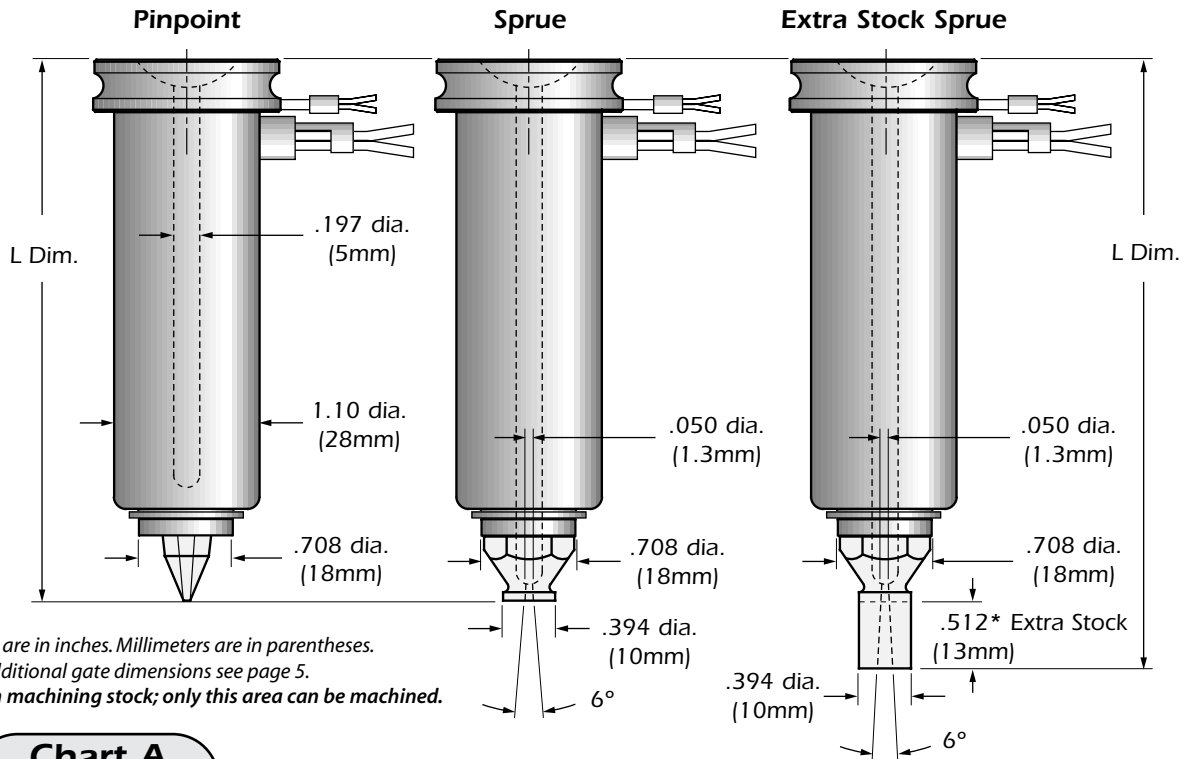
Bushing Dimensions

All specifications are subject to change without notification.

Head Options



Gating Options / Bushing Dimensions



Dimensions are in inches. Millimeters are in parentheses.
 Note: For additional gate dimensions see page 5.
 * Maximum machining stock; only this area can be machined.

Chart A

Complete Bushing (Includes subassembly & tip)	w/Pinpoint Tips		w/Sprue Tips		w/Extra Stock Sprue Tips	
	L Dimension		L Dim – Minimum		L Dim – Maximum	
.500 Radius	in	mm	in	mm	in	mm
SV050000 + TIP	2.205	56	2.205	56	2.717	69
SV050004 + TIP	2.913	74	2.913	74	3.425	87
SV050008 + TIP	3.465	88	3.465	88	3.977	101
SV050012 + TIP	4.173	106	4.173	106	4.685	119
SV050016 + TIP	4.882	124	4.882	124	5.394	137
.750 Radius	in	mm	in	mm	in	mm
SV050001 + TIP	2.205	56	2.205	56	2.717	69
SV050005 + TIP	2.913	74	2.913	74	3.425	87
SV050009 + TIP	3.465	88	3.465	88	3.977	101
SV050013 + TIP	4.173	106	4.173	106	4.685	119
SV050017 + TIP	4.882	124	4.882	124	5.394	137

DIRECT FEED APPLICATIONS

Precision II Technical Specifications

Subassembly Ordering Numbers

All specifications are subject to change without notification.

Precision Series® II Body

Thermocouple



Integral Sleeve Heater

Exclusive swaged construction provides a higher heat density and an ideal heat profile.

Retaining Ring

Precision Series® II Hot Runner Bushings

The Precision Series II has an all metric body style and a .197" (5mm) flow channel with replaceable sleeve heater and thermocouple. Made from pre-hardened steel for maximum high pressure resistance, the Precision Series II has an optimum heat profile for a uniform flow.

Designed for medium pitches of 1.50" (38 mm), the Precision Series II has minimal contact areas, reducing heat loss. It is available in 5 different nozzle lengths and 2 head styles.

The Precision Series II Bushings are capable of handling up to 150 grams of resin per drop. (See chart 3 page 5 for more details.)

Chart B

Subassembly					
0.500" Radius	Body	Sleeve Heater	Watts	Thermocouple	Retaining Ring
SV050000	MB050000	DS010000	285	MTO20032	100101
SV050004	MB050004	DS010001	370	MTO20033	100101
SV050008	MB050008	DS010002	435	MTO20034	100101
SV050012	MB050012	DS010003	520	MTO20035	100101
SV050016	MB050016	DS010004	605	MTO20036	100101
0.750" Radius	Body	Sleeve Heater	Watts	Thermocouple	Retaining Ring
SV050001	MB050001	DS010000	285	MTO20032	100101
SV050005	MB050005	DS010001	370	MTO20033	100101
SV050009	MB050009	DS010002	435	MTO20034	100101
SV050013	MB050013	DS010003	520	MTO20035	100101
SV050017	MB050017	DS010004	605	MTO20036	100101

Tip Ordering Numbers

Precision Series® II Tip Options

The Precision Series II has 11 interchangeable tip styles to accommodate most applications. Wear Resistant tips are constructed from a special tip alloy, exclusive to Tutco.

Chart C

Alloy	Pinpoint .015"	Pinpoint .030"	Pinpoint .050"	Sprue	Extra Stock Sprue	Extra Stock Sprue Nylon
WR	TP050000	TP050002	TP050004	TP050101	TP050201	TP050300
STD	TP050001	TP050003	TP050005	TP050100	TP050200	

Tip Alloy Reference: STD = Standard, WR = Wear Resistant

Precision II Technical Specifications

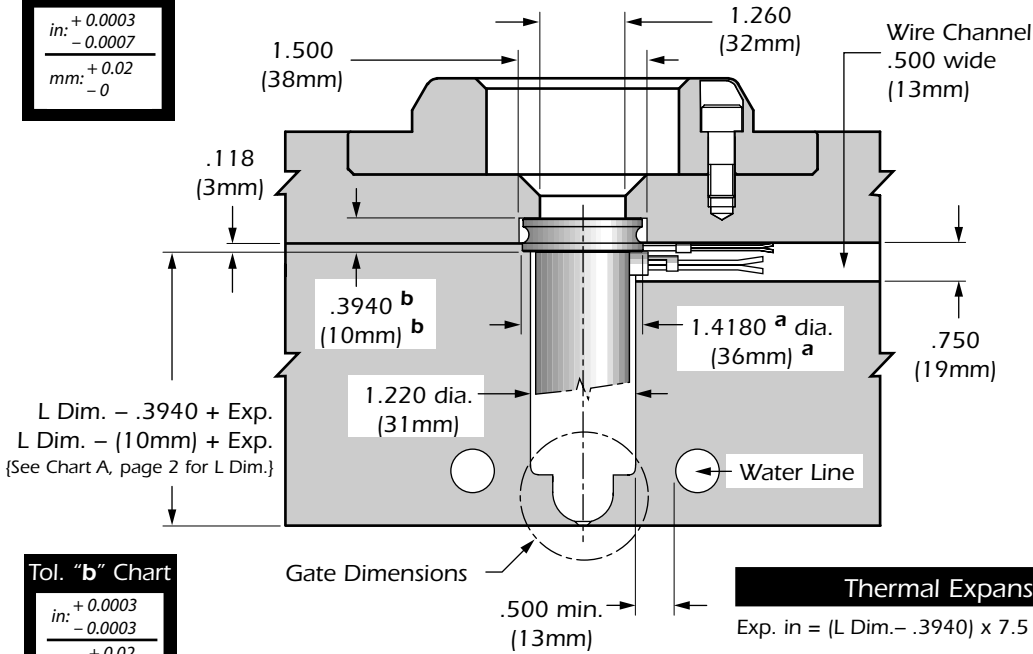
Bore & Gate Dimensions

All specifications are subject to change without notification.

Tol. "a" Chart

in: $\frac{+0.0003}{-0.0007}$
mm: $\frac{+0.02}{-0}$

Standard Bore



Tol. "b" Chart

in: $\frac{+0.0003}{-0.0003}$
mm: $\frac{+0.02}{-0}$

Thermal Expansion (Exp.) Formulas

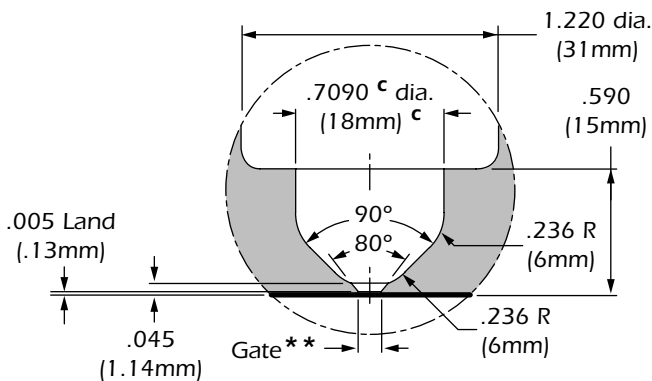
Exp. in = (L Dim. - .3940) x 7.5 x 10⁻⁶ x (Processing Temp. - 70°F)

Exp. mm = (L Dim. - 10) x 13.5 x 10⁻⁶ x (Processing Temp. - 21°C)

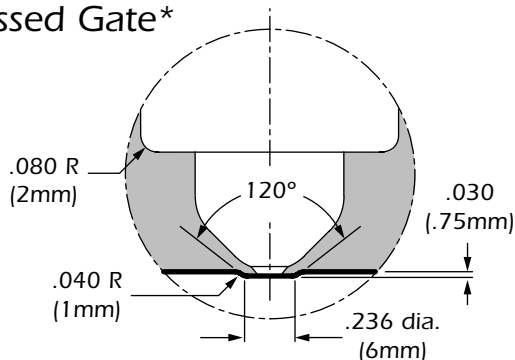
Ref: 10⁻⁶ = 0.000001

Pinpoint Gate

Non-Recessed Gate*



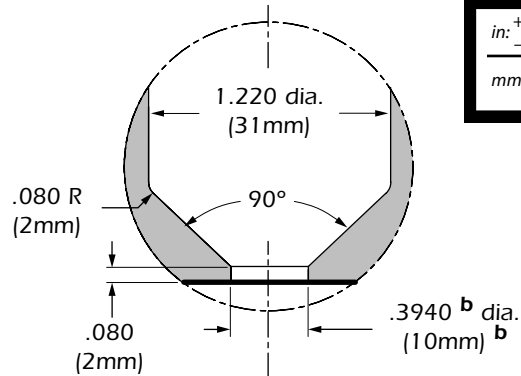
Recessed Gate*



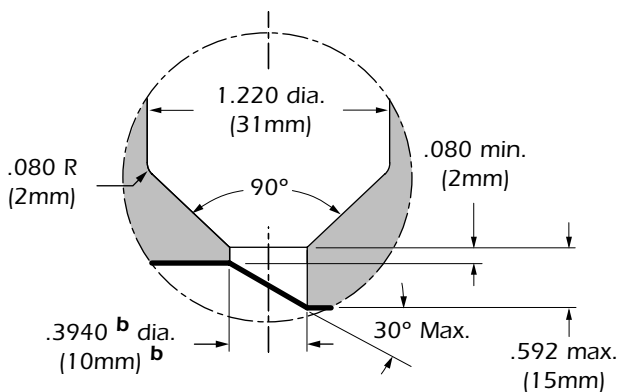
Sprue Gate

Tol. "c" Chart

in: $\frac{+0.0005}{-0.0003}$
mm: $\frac{+0.02}{-0}$



Extra Stock Sprue Gate



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*Dimensions are identical except in gate areas.
**See Chart 2, page 5 for gate diameters.

DIRECT FEED APPLICATIONS

Engineering Charts

All specifications are subject to change without notification.

Chart 1

Tip Alloy Reference: STD = Standard, WR = Wear Resistant

Resin Compatibility Chart					
Tip Style	Part No.	Alloy	Commodity Resin	Engineering Resin	Glass-Filled Resin
Pinpoint 0.015"	TP050000	WR	○	○	○
	TP050001	STD	○	○	○
Pinpoint 0.030"	TP050002	WR	○	○	○
	TP050003	STD	○	○	○
Pinpoint 0.050"	TP050004	WR	○	○	○
	TP050005	STD	○	○	○
Std. Sprue	TP050101	WR	○	○	○
	TP050100	STD	○	○	○
Extra Stock Sprue	TP050201	WR	○	○	○
	TP050200	STD	○	○	○
Extra Stock Sprue (Nylon)	TP050300	WR	○	○	○

Reference: ○ = Recommended

Chart 2

Gate Diameters				
Part No. Pinpoint tips	Alloy	Resin Viscosity		
		High	Medium	Low
TP050000	WR	.077" to .109" (1.90mm to 2.80mm)	.055" to .077" (1.40mm to 1.90mm)	.035" to .055" (0.90mm to 1.40mm)
TP050001	STD			
TP050002	WR	.092" to .124" (2.30mm to 3.10mm)	.070" to .092" (1.80mm to 2.30mm)	.050" to .070" (1.30mm to 1.80mm)
TP050003	STD			
TP050004	WR	.132" to .164" (3.40mm to 4.20mm)	.110" to .132" (2.80mm to 3.40mm)	.090" to .110" (2.30mm to 2.80mm)
TP050005	STD			
Sprue tips	Alloy	High	Medium	Low
All Sprue Part Numbers	WR & STD	.050" to .080"* (1.30mm to 2.00mm)	.050" to .080"* (1.30mm to 2.00mm)	.050" to .080"* (1.30mm to 2.00mm)

Reference: High Viscosity = Melt Flow (0.02 – 6); Medium Viscosity = Melt Flow (7 – 16); Low Viscosity = Melt Flow (16 – up).
The values expressed in grams are for reference purposes only. Part dimensions, wall thickness, mold condition, and molding parameters must also be considered.

*Re-machine gate diameter if necessary for larger shot weights.

Chart 3

Maximum Shot Weights in Grams					
Tip Style	Part No.	Alloy	Resin Viscosity		
			High	Medium	Low
Pinpoint 0.015"	TP050000	WR	20g	25g	35g
	TP050001	STD			
Pinpoint 0.030"	TP050002	WR	70g	90g	110g
	TP050003	STD			
Pinpoint 0.050"	TP050004	WR	125g	150g	185g
	TP050005	STD			
Std. Sprue	TP050101	WR	150g	225g	300g
	TP050100	STD			
Extra Stock Sprue	TP050201	WR	150g	225g	300g
	TP050200	STD			
Extra Stock Sprue (Nylon)	TP050300	WR			

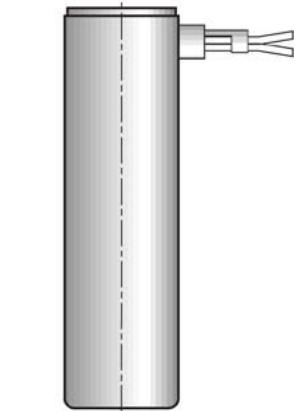
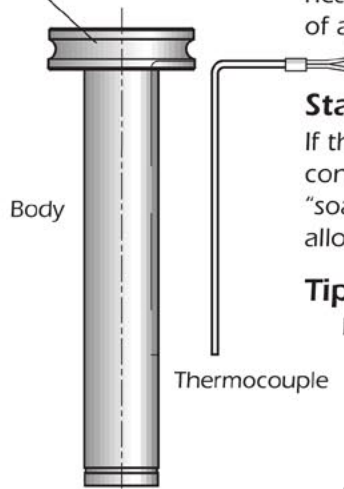
Consult Tutco Hot Runner Dept. when exceeding max. shot weight in Spruce style tips.

Precision II Technical Specifications

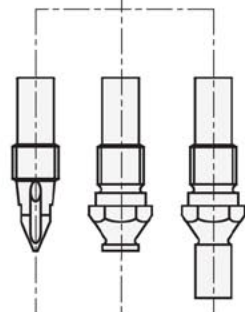
Operating/Service Instructions

All specifications are subject to change without notification.

(2) Head styles



Retaining Ring



(11) Tip Styles

Operating & Servicing Instructions

The Precision Series II body designs are identical in diameter, and differ only in length and head style. The Precision Series II features a replaceable sleeve heater, Type "J" thermocouple, and choice of eleven tip styles for a broad range of applications.

Start-up/Operating Procedures

If the temperature controller does not utilize "soft start" technology, set the controller to 200°F (93.3°C) in automatic or 10% in manual. Allow bushing to "soak" for 15 minutes before increasing to processing temperature. This step will allow the unit to dissipate any moisture and prolong heater life.

Tip Removal/Installation

Removal

- 1) Place bushing in "V" block and secure it firmly at the bushing head.
- 2) Insert Tutco Tip tool **M1002 (Pinpoint)** or **M1003 (Spruce)** provided over/into tip. Use a standard 1/4" Allen socket for Pinpoint tips, or 15mm socket for Sprue tips, and turn counter-clockwise to loosen.

Installation

- 1) Place bushing in "V" block and secure it firmly at the bushing head.
- 2) Insert Tutco Tip tool **M1002 (Pinpoint)** or **M1003 (Spruce)** provided over/into tip.
- 3) Apply anti-seize sparingly onto male threads of tip.
Note: excess anti-seize may contaminate the resin being processed.
- 4) Use a standard 1/4" Allen socket for Pinpoint tips or 15mm socket for Sprue tips and install tip by turning clockwise.
- 5) **Torque to 30 ft./lbs. (41 Newton-Meters)**

Component Disassembly/Assembly

Disassembly

- 1) Remove "Retaining Ring" using Retaining Ring Pliers.
- 2) Remove heater by hand.
- 3) Remove thermocouple by sliding it out of the T/C slot on the body.


Assembly

- 1) Insert pre-bent thermocouple into T/C slot until thermocouple reaches the end of the slot.
- 2) Slide heater over T/C and body by hand, making sure to place heater wires in the same position as the thermocouple wires.
- 3) Install "Retaining Ring" using Retaining Ring Pliers.

Power Requirements

- 240 Volts AC – 15 amp fuse
- Grounding – Tutco brushings do not require any additional grounding wire. The bushings are grounded through the bodies of the components.

WARNING

There must be a ground  present between the Mold "Hot Half" and the temperature control system or damage may occur to the bushing, thermocouple and/or temperature control system.