

Precision Series® II Hot Runner Nozzles



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).



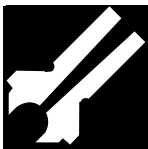
Sprue Tips –

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 nozzle. 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



Flat Style –

Provides a seal of mating surfaces while allowing for lateral expansion between the manifold and nozzle.



O'Ring Style –

When retrofitting a Tutco Precision Series II nozzle to an existing manifold, the O'Ring style provides an optimal means of sealing mating surfaces.

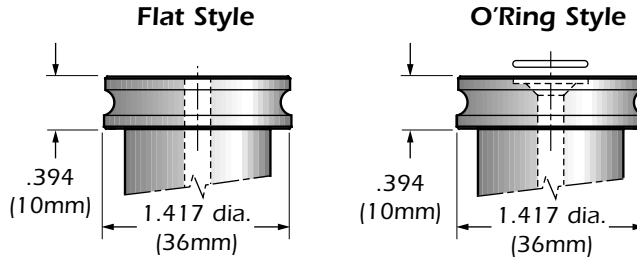
Note: O'Ring must be replaced each time the system is disassembled.

Precision II Technical Specifications

Nozzle Dimensions

All specifications are subject to change without notification.

Head Options



Gating Options / Nozzle Dimensions

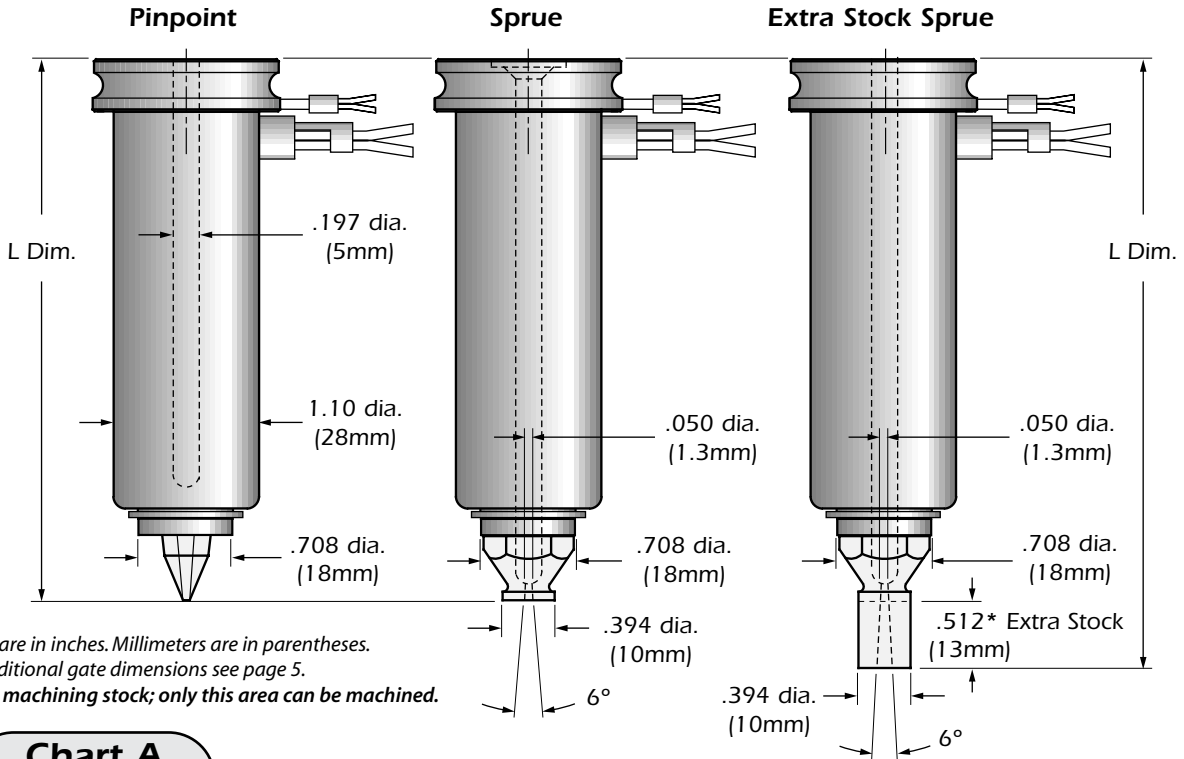


Chart A

Complete Nozzle (Includes subassembly & tip)	w/Pinpoint Tips		w/Sprue Tips		w/Extra Stock Sprue Tips	
	L Dimension		L Dim – Minimum		L Dim – Maximum	
Flat	in	mm	in	mm	in	mm
SV050002 + TIP	2.205	56	2.205	56	2.717	69
SV050006 + TIP	2.913	74	2.913	74	3.425	87
SV050010 + TIP	3.465	88	3.465	88	3.977	101
SV050014 + TIP	4.173	106	4.173	106	4.685	119
SV050018 + TIP	4.882	124	4.882	124	5.394	137
O'Ring	in	mm	in	mm	in	mm
SV050003 + TIP	2.205	56	2.205	56	2.717	69
SV050007 + TIP	2.913	74	2.913	74	3.425	87
SV050011 + TIP	3.465	88	3.465	88	3.977	101
SV050015 + TIP	4.173	106	4.173	106	4.685	119
SV050019 + TIP	4.882	124	4.882	124	5.394	137

MANIFOLD APPLICATIONS

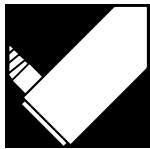
Precision II Technical Specifications

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 Nozzles

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 Nozzles are capable of handling up to 150 grams of resin per drop. (See chart 3 page 5 for more details.)

Chart B

Subassembly						
Flat	Body	Sleeve Heater	Watts	Thermocouple	Retaining Ring	
SV050002	MB050002	DS010000	285	MTO20032	100101	
SV050006	MB050006	DS010001	370	MTO20033	100101	
SV050010	MB050010	DS010002	435	MTO20034	100101	
SV050014	MB050014	DS010003	520	MTO20035	100101	
SV050018	MB050018	DS010004	605	MTO20036	100101	
O'Ring	Body	Sleeve Heater	Watts	Thermocouple	Retaining Ring	O'Ring
SV050003	MB050003	DS010000	285	MTO20032	100101	MR010000
SV050007	MB050007	DS010001	370	MTO20033	100101	MR010000
SV050011	MB050011	DS010002	435	MTO20034	100101	MR010000
SV050015	MB050015	DS010003	520	MTO20035	100101	MR010000
SV050019	MB050019	DS010004	605	MTO20036	100101	MR010000

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 Fast Heat.

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	

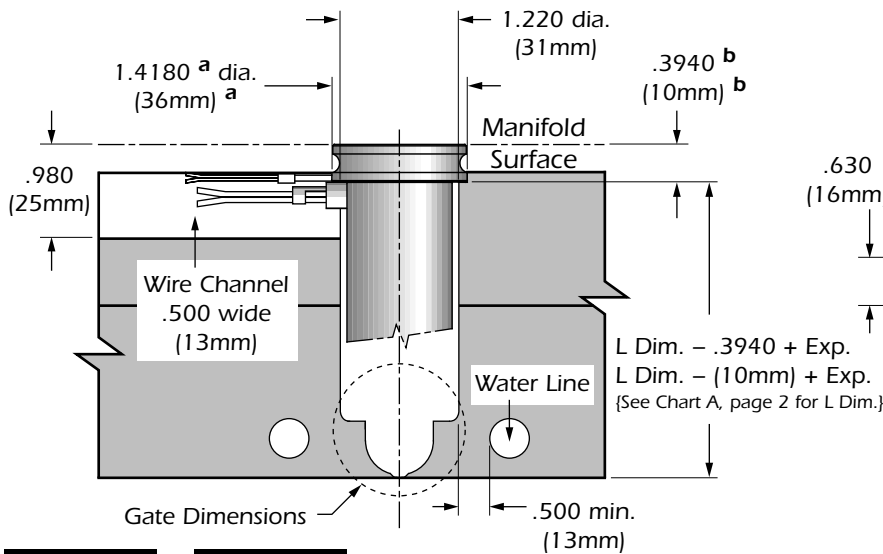
Tip Alloy Reference: STD = Standard, WR = Wear Resistant

Precision II Technical Specifications

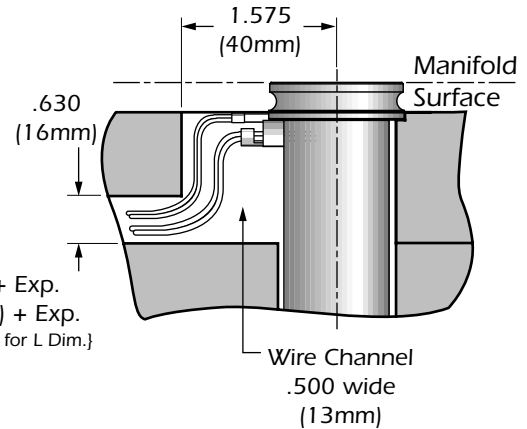
Bore & Gate Dimensions

All specifications are subject to change without notification.

Standard Bore



Optional Wire Channel



Tol. "a" Chart

in:	+ 0.0003
	- 0.0007
mm:	+ 0.02
	- 0

Tol. "b" Chart

in:	+ 0.0003
	- 0.0003
mm:	+ 0.02
	- 0

Thermal Expansion (Exp.) Formulas

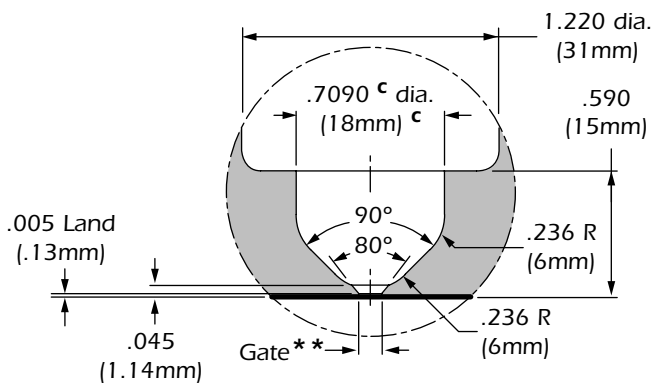
$$\text{Exp. in} = (\text{L Dim.} - .3940) \times 7.5 \times 10^{-6} \times (\text{Processing Temp.} - 70^\circ\text{F})$$

$$\text{Exp. mm} = (\text{L Dim.} - 10) \times 13.5 \times 10^{-6} \times (\text{Processing Temp.} - 21^\circ\text{C})$$

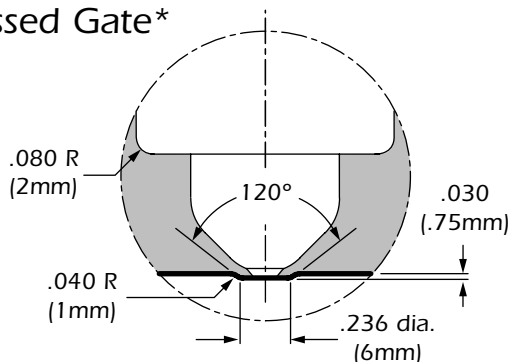
$$\text{Ref: } 10^{-6} = 0.000001$$

Pinpoint Gate

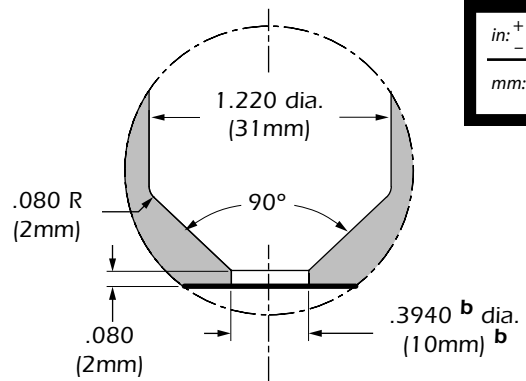
Non-Recessed Gate*



Recessed Gate*



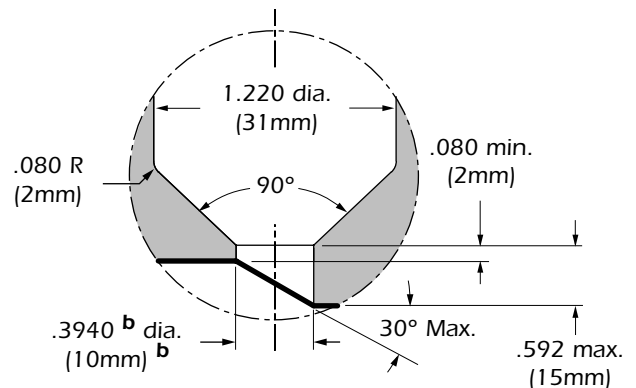
Sprue Gate



Tol. "c" Chart

in:	+ 0.0005
	- 0.0003
mm:	+ 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.

MANIFOLD APPLICATIONS

Precision II Technical Specifications

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			

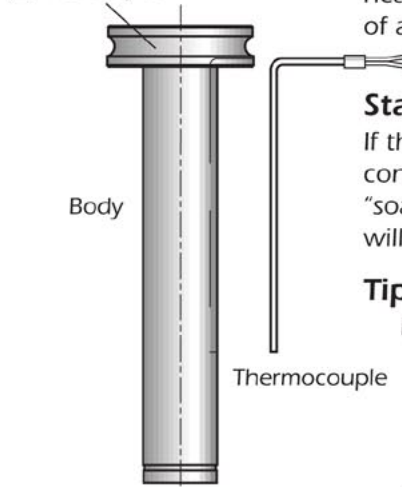
Consult Tutco Hot Runner Dept. when exceeding max. shot weight in Spruce style tips.

Precision II Technical Specifications

Operating/Service Instructions

All specifications are subject to change without notification.

(2) Head styles



Body

Thermocouple

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 nozzle 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 nozzle in "V" block and secure it firmly at the nozzle 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 nozzle in "V" block and secure it firmly at the nozzle 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

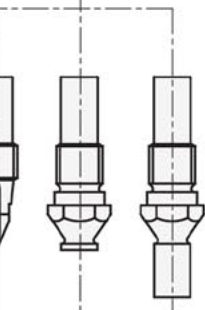
- 240 Volts AC – 15 amp fuse
- Grounding – Tutco nozzles do not require any additional grounding wire. The nozzles are grounded through the bodies of the components.

WARNING

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

Sleeve Heater

Retaining Ring



(11) Tip Styles

MANIFOLD APPLICATIONS