Hot Sprue Bushings
Products/Technical Guide

Synventive
molding solutions

SB15 Hot Sprue Bushings

Notes

1. Cold bushing length must allow for thermal expansion to fit specified mold length. Allow .003 x ("A") for thermal expansion of bushing.
2. All dimensions are in mm.
3. 420 SS bushings are available on special order for processing PVC or other corrosive materials.

Ideal for High Capacity Molding

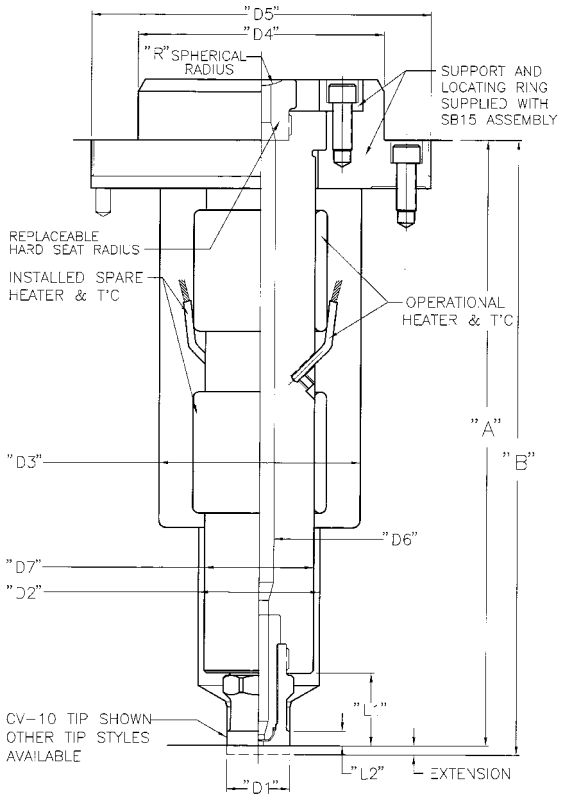
Synventive SB15 hot sprue bushings are specifically designed for use where high capacity, high quality melt transfer is necessary. These bushings are ideally suitable for all combinations of large shot and/or viscous materials.

Each SB15 bushing features a flush mounted design for longer lengths and heater band protection. Only one heater band is required for operation. A spare heater band and thermocouple are installed for models with an “A” length > 200mm for protection against heater burnout or wire failure.

All bushings come complete with mineral insulated heater bands, thermocouples and support ring assembly. A .500, .750 or metric radius is provided per your specification.

Specifications

Max. Operating Pressure: 20,000 psi (1400 bar)
Max. Operating Temperature: 650°F (345°C)
Mode of Operation: Horizontal
Heater: 44.5 mm I.D. x 50mm
750 W, 120 or 240 V
Heater Clearance Diameter: 82.5mm



	MM
“A” min.	106
“A” max.	380
“D1”	26^{h6}
“D2”	50
“D3”	82
“D4”	101.4
“D5”	140
“D6”	15
“D7”	45
“R”	To Suit
“L1”	30
“L2”	6

SB15

50 mm Mold Diameter
26 mm Tip Diameter
15 mm Flow Bore Diameter

Ordering Information – See Worksheet Page 21

To Order:

1. Choose bushing based on mold depth ("A" dimension on drawing).
   Each Synventive SB15 hot sprue bushing is custom built to suit your exact mold depth. Specify the "A" dimension when ordering from 106mm min. — 380mm max.
2. Specify desired tip style (see p. 6 for tip descriptions)
3. Specify additional required information (based on tip style).

a. Please specify if material is glass filled. An abrasion-resistant insert will be supplied.

b. CV-10 tip has multiple insert orifice diameters. For optimum gate control, it is necessary to specify the required orifice diameter or specify the material, shot size and fill time for Synventive to determine what orifice diameter will best suit the application.

c. CV-11 tip requires that the exact tip orifice be specified on the order.

d. Specify 420 SS bushing if required.

e. See Technical Guide “Section D” for tip reduction/modification instructions.

Tip Style	Description
CV-10	Gate/Full Flow
CV-11	Gate/Cone
CV-20	Open/Full Flow
CV-21	Open/Cone

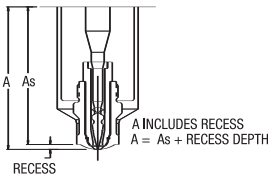
Tip Style[a]	Spherical Radius .500 or.750 (12.7 or 19mm)	Tip Extension (8mm)	Tip Runner Radius (0-4.7mm)	Tip Orifice
CV-10	Yes	Yes	Yes	No[b]
CV-11	Yes	Yes	No	Yes[c]
CV-20	Yes	No	No	No
CV-21	Yes	No	No	No

SB15 Cad Library Drawings

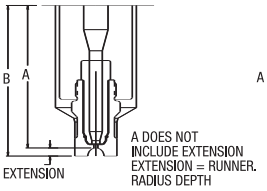
Tip Style	Drawing
CV-10	SB15CV10 (section)
CV-11	SB15CV11 (section)
CV-20	SB15CV20 (section)
CV-21	SB15CV21 (section)

Nozzle Style	Drawing
A = 106-200	SB15200S (section) SB15T (top)
A = 201-330	SB15330S (section) SB15T (top)
A = 331-380	SB15380S (section) SB15T (top)

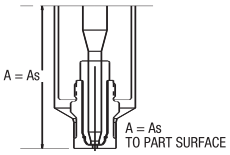
GATING INTO A RECESSED SURFACE



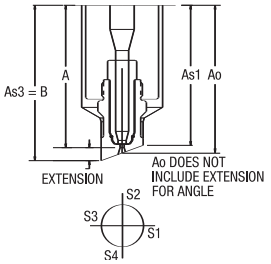
GATING INTO A RUNNER



GATING ONTO A FLAT SURFACE



GATING ONTO AN ANGLED SURFACE



“A” Dimension (Mold Depth)

When gating into a runner CV-20 or -21 tip styles are recommended. If using a CV-10 or CV-11 tip, tip should be "moved back" 1mm hot from parting line, so a thin wafer is molded.

If Synventive is to machine runner radius, provide exact dowel hole location on support ring.

Synventive molding solutions

Attn: _____
Fax: _____

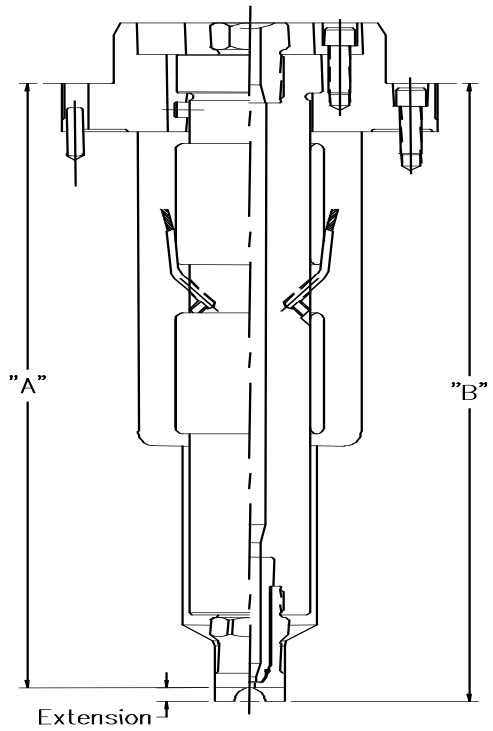
SB15/SBP15 Hot Sprue Bushing Worksheet

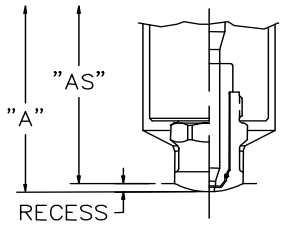
This worksheet needs to be filled out completely. Information not applicable, please fill in N/A.

Customer Information

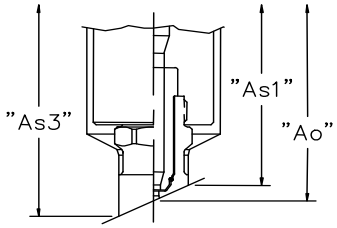
Company: _____
Address: _____
End User: _____

Contact: _____
Tel: _____
Fax: _____
Email: _____
Job #: _____
PO#: _____





Gating into a recessed surface



Gating onto an angled surface

Bushing Style: ☐ SB15 ☐ SBP15 (Tip Heated)

Tip Style: ☐ CV-10 ☐ CV-20 ☐ CV-11 ☐ CV-21

Mold "A" Length **"A"**: **"B":** (If applicable)

Tip Extension: (If no extension is required, specify "0")

Tip Orifice Diameter:

Tip Diameter: ☐ Metric Fit 26mm ☐ English Fit 25.4mm

Dual Dimension: ☐ No ☐ Yes

Molding Material:

Manufacture/Grade:

Filler: ☐ None ☐ Glass ☐ Other: ____ % of Filler

Flame Retardant: ☐ No ☐ Yes

Part Weight: Or Shot Size:

Number of Cavities:

Part; Average Wall Thickness:

Runner: ☐ No ☐ Yes, Runner Diameter:

Recess: ☐ No ☐ Yes, Recess Depth:

Angled Surface: ☐ No ☐ Yes "Ao":
"As1":
"As3":

Gating Opposite Cosmetic Surface: ☐ No ☐ Yes

Color Change: ☐ No ☐ Yes

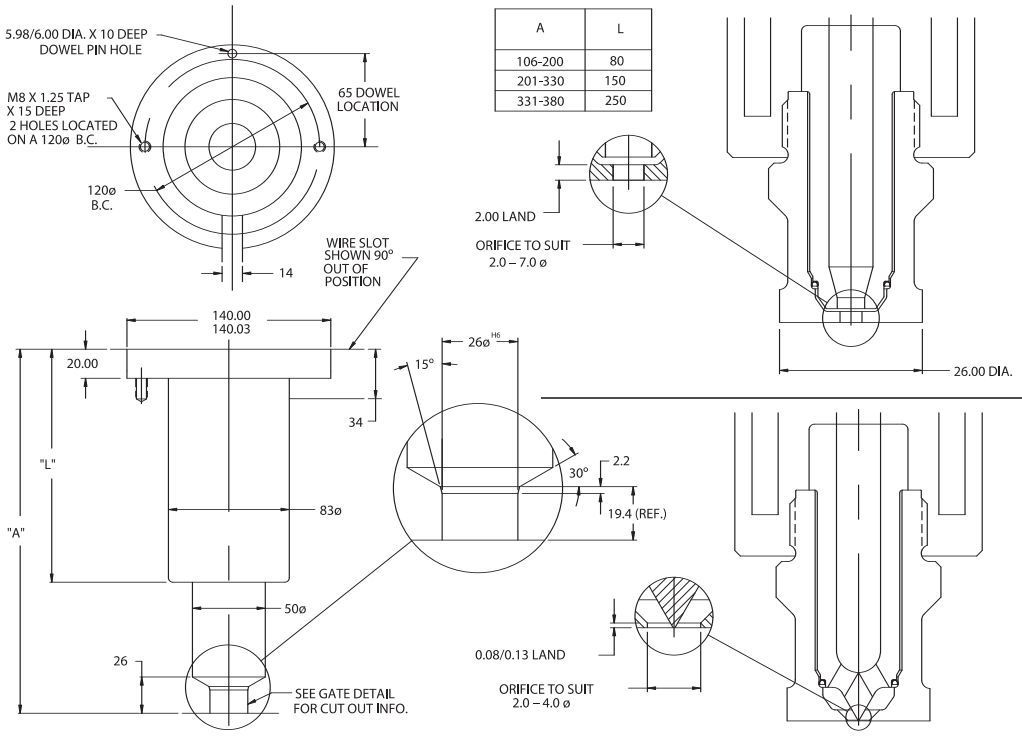
Spherical Radius: (mates with machine nozzle tip)

☐ 12.7 [.500] ☐ 19.05 [.750] ☐ Other:

Voltage: ☐ 120 ☐ 240

Special Requirements (if any):

SB15 Bushing (metric)



Notes

Gate Full Flow CV-10

Gate Orifice

2.0 – 7.0

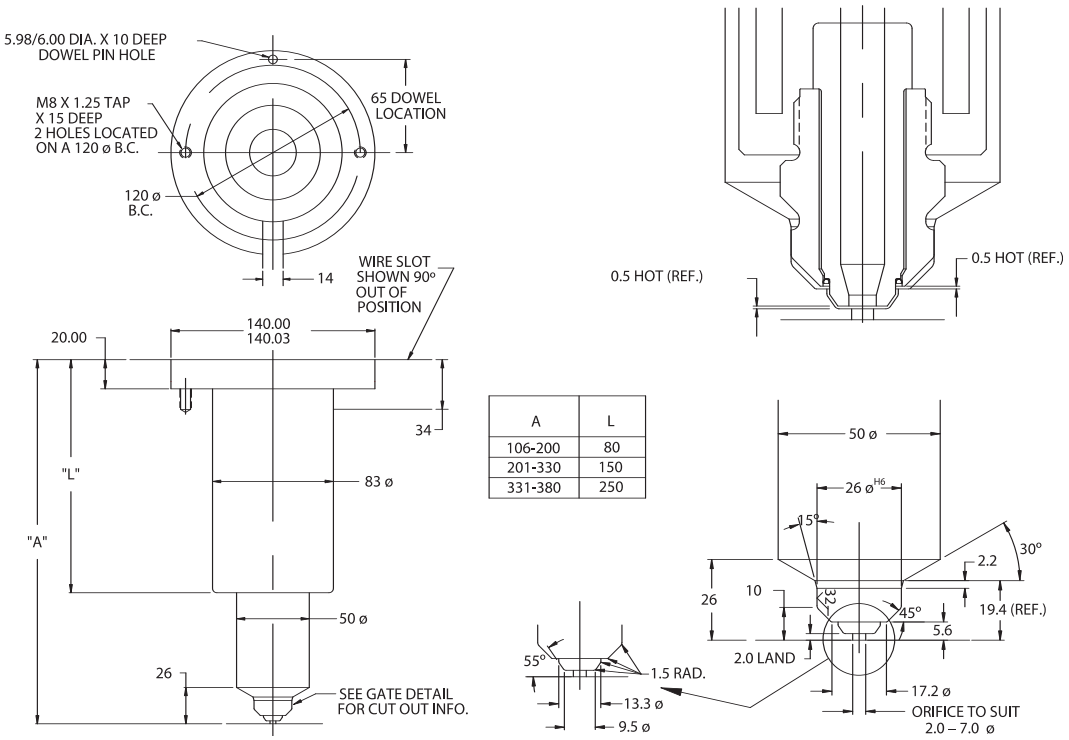
(.080" – .275")

Gate Cone CV-11

Gate Orifice

2.0 – 4.0

(.079" – .157")



Open Full Flow CV-20

Gate Orifice

2.0 – 7.0

(.080" – .275")

Bushing Cavity Requirements By Tip Style

Notes

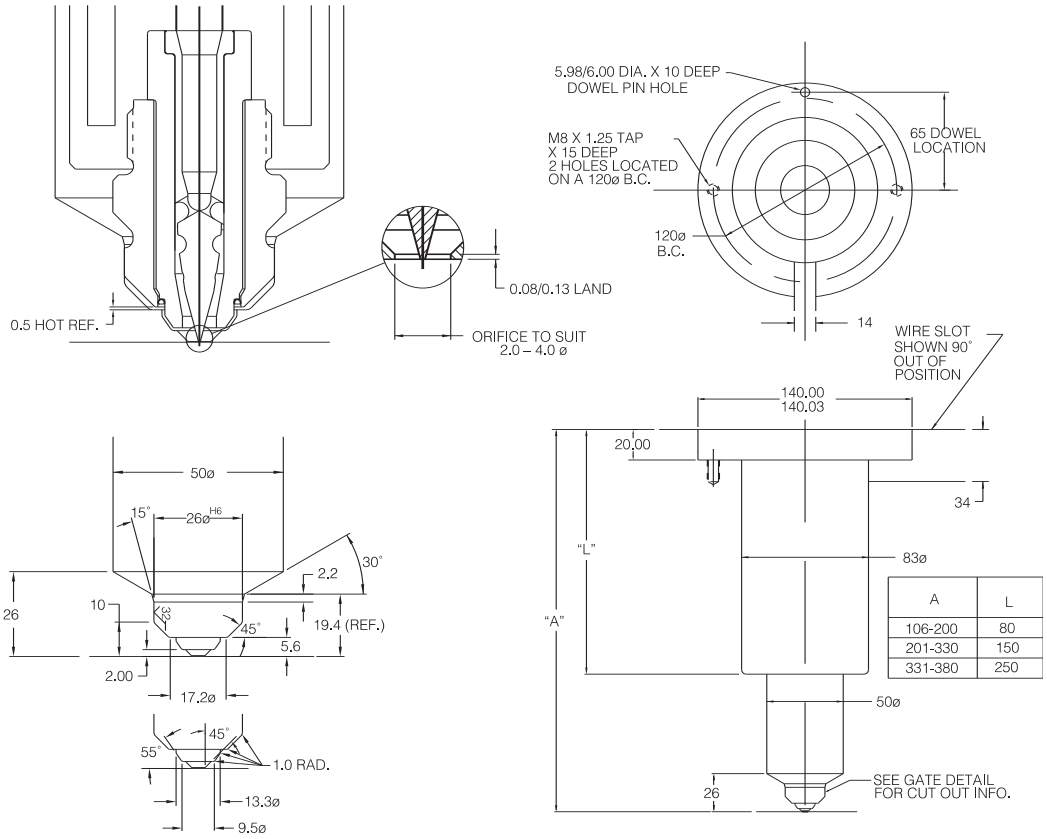
Open Cone CV-21

Gate Orifice

2.0 – 4.0

(.079" – .157")

SB15 Bushing (metric)

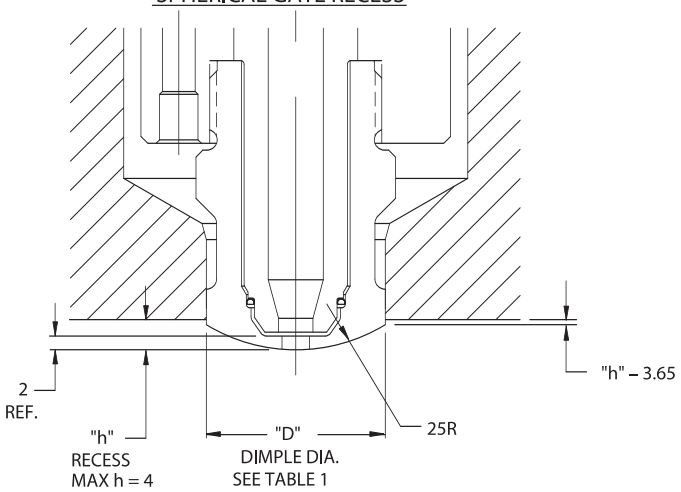


A	L
106-200	80
201-330	150
331-380	250

Gate Machining Limits For Field Modifications

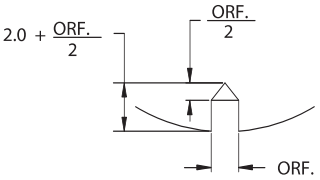
SB15 Bushing (metric) With CV-10 Tip

SPHERICAL GATE RECESS



NOTE:

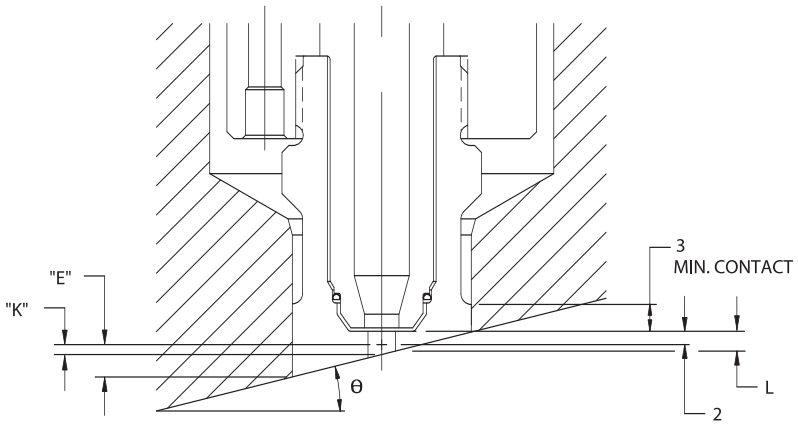
FOR MOST MATERIALS, CV-10 VESTIGE HEIGHT IS EQUAL TO (2.0mm + ORF/2).
IF VESTIGE HEIGHT RELATIVE TO THE POSSIBLE GATE RECESS DEPTH IS TOO GREAT, USE OF A CV-11 TIP IS RECOMMENDED TO PRODUCE A SHORTER VESTIGE HEIGHT.



$"D"=2\sqrt{"h"(50-"h")}$

TABLE 1	
RECESS "h"	D
2.0	19.6
2.5	21.8
3.0	23.7
3.5	25.5
4.0	26.0

ANGLED MOLD CONTOUR



NOTE:

"K" IS THE INCREASE IN ORIFICE LAND NECESSARY TO MAINTAIN 3 MINIMUM CONTACT.

$\theta \leq 8°$; $"K" = 0$

$"E" = 13 \tan \theta$

$"L" = 2 - \left(\frac{\text{ORIFICE DIA.}}{2}\right)\tan\theta$

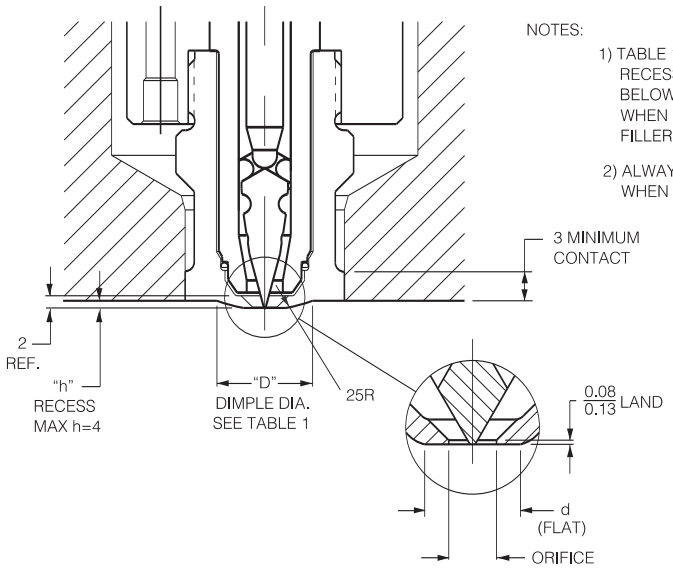
$\theta > 8°$; $"K" = 4.75 \tan\theta + \frac{1.3}{\cos\theta} - 2$

$"E" = "K" + 13 \tan\theta$

$"L" = 2 + "K" - \left(\frac{\text{ORIFICE DIA.}}{2}\right)\tan\theta$

SB15 Bushing (metric) With CV-11 Tip

SPHERICAL GATE RECESS



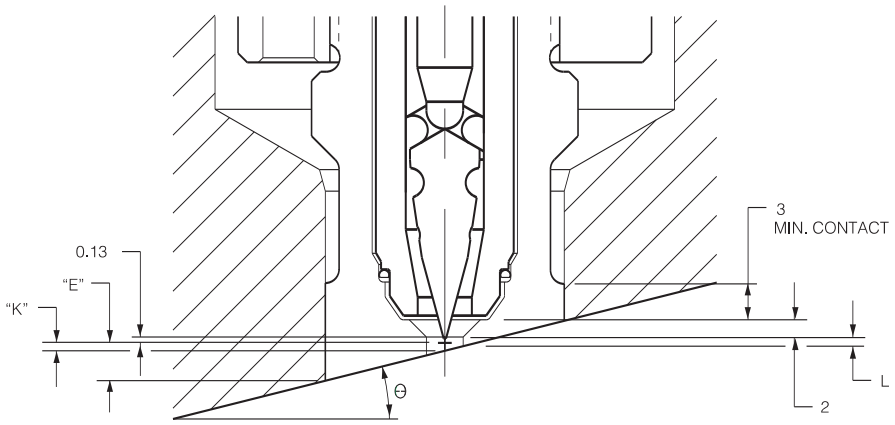
NOTES:

1) TABLE 1 SHOWS THE RECOMMENDED RECESS REQUIRED TO KEEP THE VESTIGE BELOW THE PART SURFACE. CONSULT KONA WHEN USING GLASS FIBERS OR OTHER FILLERS.

2) ALWAYS MAINTAIN .13 LAND LENGTH WHEN MACHINING TIP CONTOUR.

TABLE 1			
ORIFICE DIA.	RECESS h	d	D
2.00-2.20	1.00	2.45	14.20
2.20-2.40	1.06	2.65	14.64
2.40-2.60	1.12	2.85	15.06
2.60-2.80	1.18	3.05	15.47
2.80-3.00	1.26	3.25	15.99
3.00-3.20	1.32	3.45	16.38
3.20-3.40	1.40	3.65	16.87
3.40-3.60	1.46	3.85	17.25
3.60-3.80	1.52	4.05	17.61
3.80-4.00	1.60	4.25	18.07

ANGLED MOLD CONTOUR



$\Theta \leq 9^\circ$; "K" = $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TAN Θ

"E" = $\left(\frac{26 + \text{ORIFICE DIA.}}{2}\right)$ TAN Θ

"L" = 0.13

$9^\circ \leq 13^\circ$; "K" = 4.75 TAN Θ + $\frac{1.3}{\text{COS } \Theta}$ + $\left(\frac{\text{ORIFICE} - 2}{2}\right)$ TAN Θ - 2

"E" = K + 13 TAN Θ

"L" = 0.13 + "K" - $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TANΘ

$\Theta > 13^\circ$; "K" = 4.75 TAN Θ + $\frac{1.3}{\text{COS } \Theta}$ - 2

"E" = K + 13 TAN Θ

"L" = 0.13 + "K" - $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TANΘ

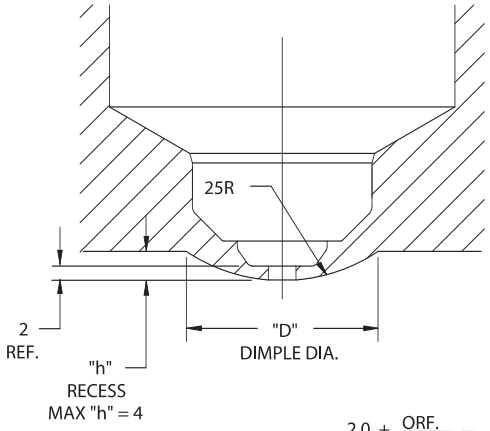
NOTE:

"K" IS THE INCREASE IN ORIFICE LAND NECESSARY TO MAINTAIN 0.13 LAND AND/OR 3 MINIMUM CONTACT.

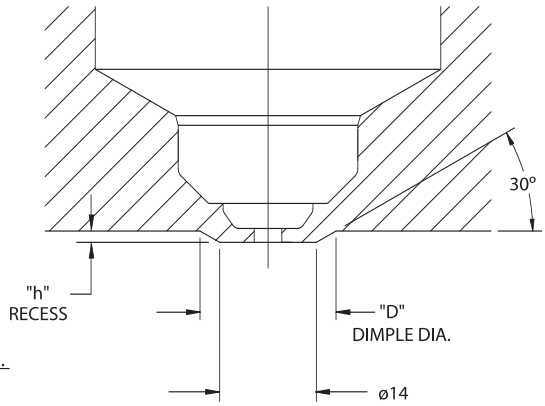
Gate Machining Limits For Field Modifications

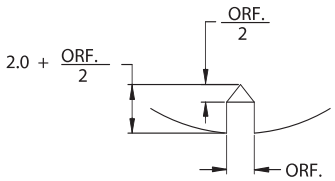
SB15 Bushing (metric) With CV-20 Tip

SPHERICAL GATE RECESS



CONICAL GATE RECESS





$"D"=2\sqrt{"h"(50-"h")}$

TABLE 1	
RECESS "h"	"D"
2.0	19.6
2.5	21.8
3.0	23.7
3.5	25.5
4.0	27.1

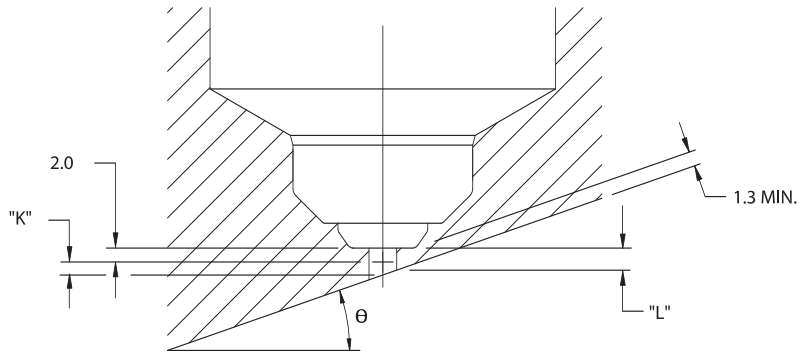
NOTE:

FOR MOST MATERIALS, CV-20 VESTIGE HEIGHT IS EQUAL TO (2.0mm + ORF/2). IF VESTIGE HEIGHT RELATIVE TO THE POSSIBLE GATE RECESS DEPTH IS TOO GREAT, USE OF A CV-21 TIP IS RECOMMENDED TO PRODUCE A SHORTER VESTIGE HEIGHT.

"D"= 14 + 3.5 "h"

TABLE 2	
RECESS "h"	"D"
2.0	21.0
2.5	22.8
3.0	24.5
3.5	26.3
4.0	28.0

ANGLED MOLD CONTOUR



NOTE:

"K" IS THE INCREASE IN ORIFICE LAND NECESSARY TO MAINTAIN 1.3 MINIMUM WALL THICKNESS.

$\theta \leq 8°$; "K" = 0

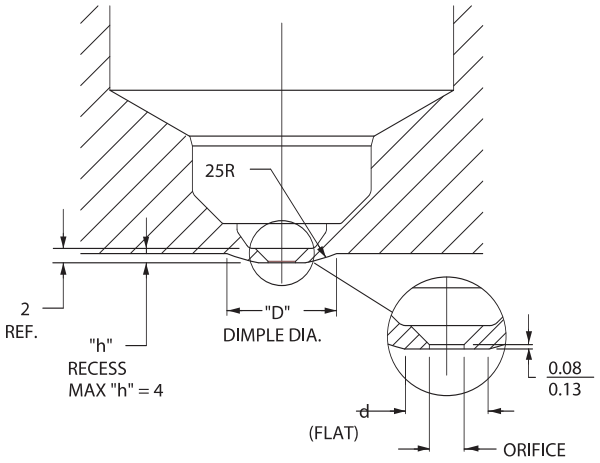
$$"L" = 2 - \left(\frac{\text{ORIFICE DIA.}}{2}\right)\text{TAN}\,\theta$$

$\theta > 8°$; $"K" = 4.75\,\text{TAN}\,\theta + \frac{1.3}{\text{COS}\,\theta} - 2$

$$"L" = 2 + "K" - \left(\frac{\text{ORIFICE DIA.}}{2}\right)\text{TAN}\,\theta$$

SB15 Bushing (metric) With CV-21 Tip

SPHERICAL GATE RECESS



CONICAL GATE RECESS

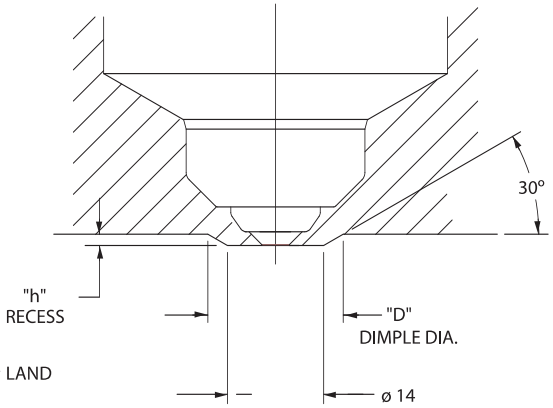


TABLE 1			
ORIFICE DIA.	RECESS h	d	D
2.00-2.20	1.00	2.45	14.20
2.20-2.40	1.06	2.65	14.64
2.40-2.60	1.12	2.85	15.06
2.60-2.80	1.18	3.05	15.47
2.80-3.00	1.26	3.25	15.99
3.00-3.20	1.32	3.45	16.38
3.20-3.40	1.40	3.65	16.87
3.40-3.60	1.46	3.85	17.25
3.60-3.80	1.52	4.05	17.61
3.80-4.00	1.60	4.25	18.07

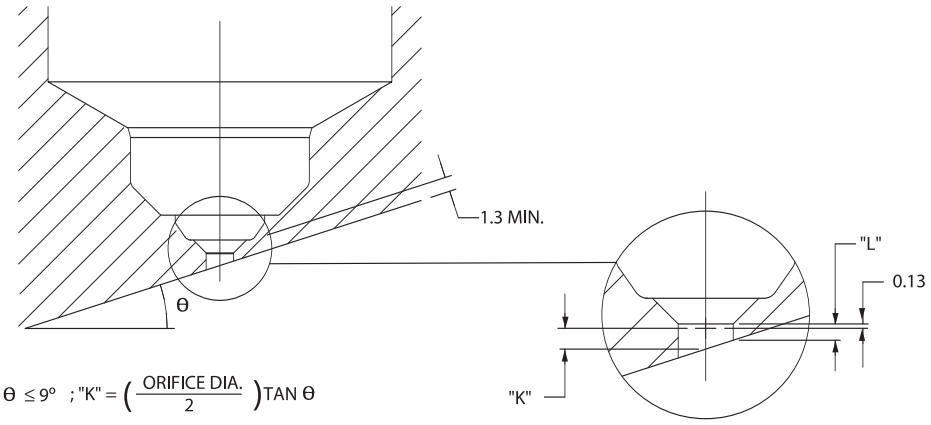
NOTE:

1) TABLES 1 & 2 SHOW THE RECOMMENDED RECESS REQUIRED TO KEEP THE VESTIGE BELOW THE PART SURFACE. CONSULT SYNVENTIVE WHEN USING GLASS FIBERS OR OTHER FILLERS.
2) ALWAYS MAINTAIN .13 LAND LENGTH WHEN WHEN MACHINING GATE CONTOUR.

"D"= 14 + 3.5 "h"

TABLE 2		
ORIFICE	RECESS "h"	"D"
2.0	0.93	17.3
2.5	1.09	17.8
3.0	1.26	18.4
3.5	1.43	19.0
4.0	1.59	19.6

ANGLED MOLD CONTOUR



$\theta \leq 9°$; "K" = $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TAN θ

"L" = .13

θ ; $9° \leq 13°$; "K" = 4.75 TAN θ + $\frac{1.3}{\text{COS } \theta}$ + $\left(\frac{\text{ORIFICE DIA.} - 2}{2}\right)$ TAN − 2

"L" = .13 + "K" − $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TAN θ

$\theta > 13°$; "K" = 4.75 TAN θ + $\frac{1.3}{\text{COS } \theta}$ − 2

"L" = .13 + "K" − $\left(\frac{\text{ORIFICE DIA.}}{2}\right)$ TAN θ

NOTE:

"K" IS THE INCREASE IN ORIFICE LAND NECESSARY TO MAINTAIN 0.13 LAND AND/OR 1.3 MINIMUM WALL THICKNESS.

Orifice Diameter Guidelines

This table lists the normal gate orifice required to fill an average cavity of the listed wall thickness and surface area.

WALL THICKNESS inch/(mm)										
Part Area	**.030**	**.040**	**.050**	**.060**	**.070**	**.080**	**.090**	**.100**	**.125**	**.156**
inch^2/(mm^2)*	**(.75)**	**(1.0)**	**(1.25)**	**(1.50)**	**(1.75)**	**(2.0)**	**(2.25)**	**(2.50)**	**(3.0)**	**(4.0)**
1.0 (600)	.035 (0.90)	.035 (0.90)	.035 (0.90)	.035 (0.90)	.035 (0.90)	.035 (0.90)	.037 (0.95)	.039 (2.00)	.044 (1.12)	.050 (1.27)
2.0 (1200)	.035 (0.90)	.035 (0.90)	.035 (0.90)	.036 (0.92)	.039 (1.00)	.041 (1.05)	.044 (1.12)	.046 (1.17)	.052 (1.32)	.059 (1.50)
3.0 (1800)	.035 (0.90)	.035 (0.90)	.037 (0.95)	.040 (1.02)	.043 (1.10)	.046 (1.17)	.049 (1.25)	.051 (1.30)	.058 (1.47)	.066 (1.68)
4.0 (2400)	.035 (0.90)	.035 (0.90)	.040 (1.02)	.043 (1.10)	.047 (1.20)	.049 (1.25)	.053 (1.35)	.055 (1.40)	.062 (1.58)	.070 (1.78)
5.0 (3000)	.035 (0.90)	.037 (0.95)	.042 (1.07)	.046 (1.17)	.049 (1.25)	.052 (1.32)	.056 (1.42)	.058 (1.47)	.065 (1.65)	.074 (1.88)
10.0 (6000)	.038 (1.00)	.044 (1.12)	.050 (1.27)	.054 (1.37)	.059 (1.50)	.062 (1.58)	.066 (1.68)	.069 (1.76)	.078 (1.98)	.089 (2.26)
20.0 (12,000)	.046 (1.17)	.052 (1.32)	.060 (1.53)	.065 (1.65)	.070 (1.78)	.074 (1.88)	.079 (2.00)	.082 (2.08)	.093 (2.36)	.105 (2.67)
30.0 (18,000)	.051 (1.30)	.058 (1.47)	.066 (1.68)	.072 (1.83)	.077 (1.96)	.081 (2.06)	.087 (2.21)	.091 (2.31)	.103 (2.62)	.117 (2.97)
40.0 (24,000)	.054 (1.37)	.062 (1.58)	.071 (1.80)	.077 (1.96)	.083 (2.10)	.088 (2.24)	.094 (2.39)	.098 (2.49)	.110 (2.80)	.125 (3.18)
50.0 (30,000)	.057 (1.45)	.065 (1.65)	.075 (1.90)	.081 (2.06)	.088 (2.24)	.093 (2.36)	.099 (2.51)	.104 (2.64)	.116 (2.95)	.132 (3.35)
60.0 (36,000)	.060 (1.53)	.068 (1.73)	.078 (1.98)	.085 (2.16)	.092 (2.34)	.097 (2.46)	.104 (2.64)	.109 (2.77)	.122 (3.10)	.139 (3.53)
70.0 (42,000)	.062 (1.58)	.071 (1.80)	.082 (2.08)	.089 (2.26)	.095 (2.41)	.101 (2.57)	.108 (2.75)	.113 (2.87)	.127 (3.23)	.144 (3.66)
80.0 (48,000)	.065 (1.65)	.074 (1.88)	.084 (2.13)	.092 (2.34)	.099 (2.51)	.104 (2.64)	.111 (2.82)	.117 (2.97)	.131 (3.33)	.149 (3.79)
90.0 (54,000)	.067 (1.70)	.076 (1.93)	.087 (2.21)	.094 (2.39)	.102 (2.60)	.107 (2.72)	.115 (2.92)	.120 (3.05)	.135 (3.43)	.153 (3.89)
100.0 (60,000)	.068 (1.73)	.078 (1.98)	.089 (2.26)	.097 (2.46)	.104 (2.64)	.110 (2.80)	.118 (3.00)	.123 (3.12)	.139 (3.53)	.157 (3.99)
150.0 (90,000)	.076 (1.93)	.086 (2.18)	.099 (2.51)	.107 (2.72)	.115 (2.92)	.122 (3.10)	.130 (3.30)	.136 (3.45)	.153 (3.89)	.174 (4.42)
200.0 (120,000)	-	.093 (2.36)	.106 (2.70)	.115 (2.92)	.124 (3.1)	.131 (3.33)	.140 (3.56)	.147 (3.73)	.165 (4.20)	.187 (4.75)
300.0 (180,000)	-	-	.117 (2.97)	.127 (3.23)	.137 (3.48)	.145 (3.68)	.155 (3.94)	.162 (4.15)	.182 (4.62)	.207 (5.26)
400.0 (240,000)	-	-	-	.137 (3.48)	.148 (3.76)	.156 (3.98)	.166 (4.22)	.174 (4.42)	.196 (4.98)	.218 (5.54)

* Part area is total outside surface area not projected area (i.e. includes side walls, etc.).

1. Material Factors:
   - Use Tabulated Orifice for PE, PP, PS, SAN, PUR
   - Use Tabulated Orifice x 1.15 for Acetal, PC, PPO, ABS
   - Use Tabulated Orifice x 1.30 for Acrylic, Nylon, PET, PBT (see note 5)
   - Use Tabulated Orifice x 1.50 for PVC

2. This diameter is based on the flow and freeze characteristics of each type of plastic at its normal processing conditions. It is not dependent on the type of nozzle or whether it is fed by a hot or cold runner system.

   - Hot Runner Gates: CV-10, CV-11, CV-11S, CV-20, CV-21, CV-21S, EG-10

   - Cold Runner Gates: Pin, Sub-Gate, Edge-Gate

   This diameter size applies to most gate styles.

3. Some of the listed wall thickness and surface area combinations are not applicable to all plastics because of flow-length-to-wall ratios of each plastic – consult plastic supplier's processing recommendations (e.g. 400 inch^2 surface area of .060 (1.50 mm) wall is possible for some cavities with PE, but is not possible with most other plastics).

4. The gate diameter limitations – minimum and maximum – which apply to each Synventive hot runner nozzle may require the actual gate to be slightly smaller or larger than the tabulated orifice.

5. Due to the crystalline nature of Nylon, PET and PBT, the minimum orifice for non-reinforced grades should be .094 (2.39 mm) and for reinforced grades .156 (3.96 mm).

6. For filled crystalline materials, nylon, PET and PBT when using full flow inserts, the gate orifice should be 1mm smaller than the insert orifice.

Material Compatibility

MATERIAL	Synventive Hot Sprue Bushings USB5*, SB5*, USB8, SB8, SB13, SB15 & SB24** Synventive Tip Styles			
	CV-10	**CV-11**	**CV-20**	**CV-21**
ABS	1	1	1	1
ABS GR ***	1	2	1	2
ACETAL (POM)	NR	1	NR	1
ACETAL GR	1	2	1	2
ACRYLIC	1	1	1	1
LCP	NR	1	NR	1
PPO	1	1	1	1
NYLON 6 ***	NR	1	NR	1
NYLON 6 GR ***	1	2	1	2
NYLON 66 ***	NR	1	NR	1
NYLON 66 GR ***	1	2	1	2
NYLON 66 (MINERAL FILLED) ***	NR	1	NR	1
POLYCARBONATE ***	1	1	1	1
POLYCARBONATE GR	1	2	1	2
PC/ABS BLEND	1	1	1	1
PC/POLYESTER BLEND	1	1	1	1
POLYESTER (PBT) ***	NR	1	NR	1
POLYESTER (PBT) GR ***	1	2	1	2
POLYESTER (PET) BOTTLE GRADE	1	1	1	1
POLYESTER (PET) GR ***	1	2	1	2
POLYETHYLENE	1	1	1	1
POLYPROPYLENE	1	1	1	1
POLYSTYRENE	1	1	1	1
STYRENE-ACRYLONITRILE (SAN)	1	1	1	1
STYRENE BUTADIENE	1	1	1	1
STYRENE MALEIC ANHYDRIDE (SMA)	1	1	1	1
SMA (GR)	1	2	1	2
POLYURETHANE	1	1	1	1
PVC RIGID ***	1	2	1	2
PVC FLEXIBLE ***	2	1	2	1
TPE	NR	1	NR	1
TPR	NR	1	NR	1
TPO	1	1	1	1

Notes

GR-Glass Reinforced

NR-Not Recommended for Most Applications

Recommended Tip/Bushing

1. Most Suitable
2. Suitable with some reservations:
   e.g. Gate Control, etc.
   (Not as good as category 1)
   See page 24 for correct Orifice Sizing

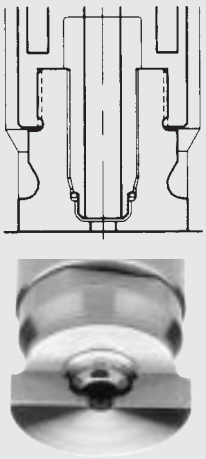
* USB5 & SB5 Bushings are NR-For Glass Filled Materials.

** SB24 Bushings are available with CV-10 & CV-20 tips only.

*** See Orifice Diameter Requirements, page 24.

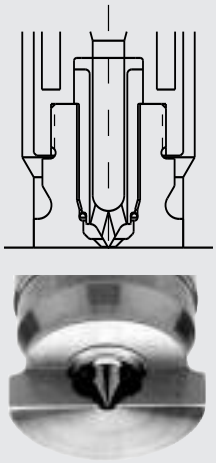
Controlled Vestige (CV) Tips

CV-10 Full-Flow



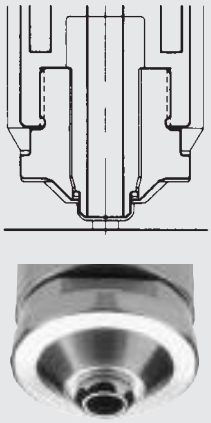
- This is the most widely used tip.
- Vestige height is equal to orifice diameter.
- Provides best gate control for most materials.
- Open flow bore provides low pressure drop.
- Tramp metal can usually flow through tip.
- Orifice is increased by simple straight reaming of diameter.

CV-11 Cone



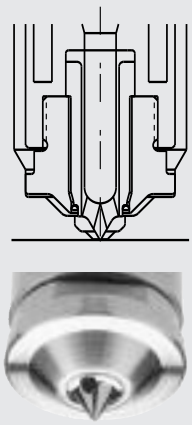
- This tip style is used primarily to provide reduced vestige height, 0.4- 0.9mm high for all materials.
- Cone Point adds heat to center of orifice for nylon, acetal and PBT.
- Orifice adjustment requires added machining to hold land length at 0.08/0.13mm.

CV-20 Full-Flow



- Same as CV-10 except gate orifice is machined into mold plate to eliminate circular witness mark of tip.
- For use in gating into runner or directly onto part surface.

CV-21 Cone



- Same as CV-11 except gate orifice is machined into mold plate to eliminate circular witness mark of tip.
- For use in gating into runner or directly onto part surface.

REPLACEMENT BAND HEATERS

DESCRIPTION	PART NO.
USB5/SB5 and USB8/SB8	
45mm (1.75") I.D. x 35mm (1.38") wide, 450 Watts, 120 Volts	81-16-105
240 Volts	81-16-107
SB13	
50mm I.D. x 50mm wide, 750 Watts, 120 Volts	81-20-114
240 Volts	81-20-116
SB15	
44.5mm I.D. x 50mm wide, 750 Watts, 120 Volts	81-16-112
240 Volts	81-16-113
SB24B	
57mm I.D. x 64mm wide, 1000 Watts, 120 Volts	81-22-124
240 Volts	81-22-125

REPLACEMENT THERMOCOUPLES

DESCRIPTION	PART NO.
T'C for USB5, SB5, USB8, SB8, SB13	83-192-048
T'C for SB15, SB24	83-187-120

TEMPERATURE CONTROLLERS

Single Zone 15 Amp Temperature Controller includes one thermocouple connector (80-M2MJ)

Catalog Number	Amp/Voltage	Input connector Catalog No.*	Output connector Catalog No.*
80-PIM1A15	15A/240V	80-AC1524F (NEMA 6-15)	80-AC1524M (NEMA 6-15)
80-PIM1A151	15A/120V	80-AC1512F (NEMA 5-15)	80-AC1512M (NEMA 5-15)

Synventive offers a complete line of single and multi-zone temperature control systems. For details, see Temperature Control Systems Design Manual.

Tip Removal

1. Place a 27mm 6 point deep socket wrench over split wrench. Torque off tip with wrench assembly. See Figure 1.
2. Tips are usually removed at room temperature. If tip does not break free, heat bushing to operating melt temperature.

Insert Removal

1. The conductive BeCu insert should only be removed if it is to be replaced by a new insert. Reinstallation of the same insert may affect the heat transfer from the steel body to the BeCu insert.
2. Using an 8.9mm dia. drill, machine into the center of the insert for a depth of 15mm, and then thread using a M10 tap.
3. After the insert is tapped, thread in an M10 rod. Place the insert removal tool (Figure 3) over the rod. Using a M10 nut, thread the nut against the removal tool to pull out the insert. See Figure 2.

Tip Replacement

1. Clean any and all plastic from SYNVENTIVE-SEAL and from the inside sealing diameter on tip. Care must be taken not to damage SYNVENTIVE-SEAL.
2. Verify seating between tip and body by the application of blueing to tip seat.
3. Verify that the SYNVENTIVE-SEAL is in place prior to tip installation.
4. Torque tip to the recommended torque of 27.7 kg.M (200 ft.lb) for all tip styles (see tip removal for wrenching information).

Insert Replacement

1. Clean any and all plastic from the insert counter bore, measure the insert counter bore diameter and insert press diameter.
2. The diameter of the insert should be .013-.030mm larger than the diameter of the mating counter bore in the steel body. This is necessary to assure proper heat transfer to the BeCu insert.
3. The insert must be pressed so that the insert shoulder is flush with the tip seat ±.013mm (Figure 4). This is achieved by using the insert installation tool as shown in Figure 5. Use a small arbor press.

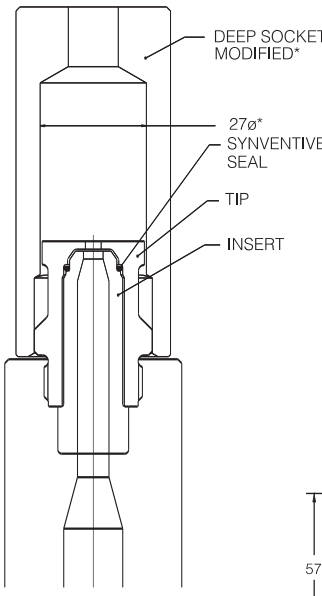


FIGURE 1

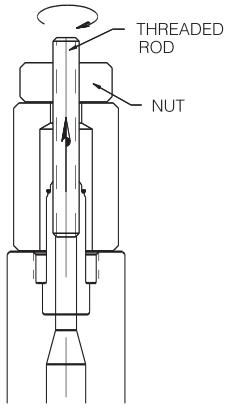


FIGURE 2

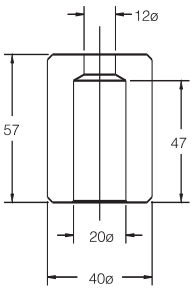
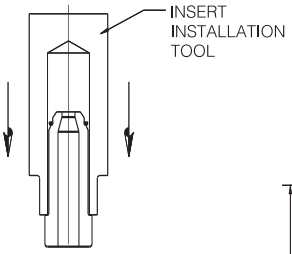


FIGURE 3



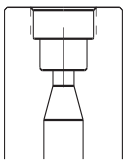


FIGURE 4

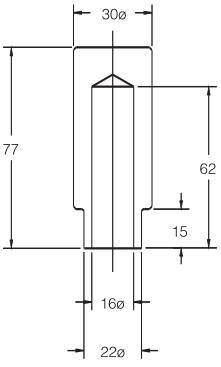


FIGURE 5

SYNVENTIVE-SEAL Replacement

Always inspect the SYNVENTIVE-SEAL when replacing a tip. No plastic should have leaked past the seal, nor should there be scratches or dents in the seal O.D. Thermal operation of the gate will be affected by any damage or plastic leakage.

Remove a damaged SYNVENTIVE-SEAL by using a removal tool to avoid scratching the insert sealing diameter. Replace the SYNVENTIVE-SEAL only onto an insert sealing diameter that is smooth and free of plastic. Use a light arbor press and pressing tool to bottom the SYNVENTIVE-SEAL on the insert shoulder. Do not overpress.