

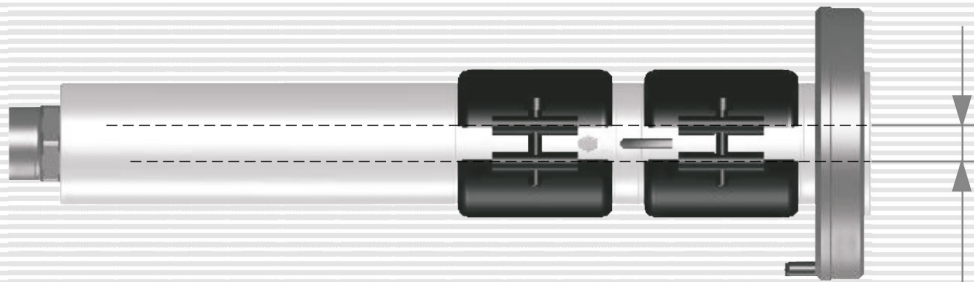


BARNES™
MOLDING SOLUTIONS

HOT RUNNER TECHNOLOGY

SR24 Hot Runner Nozzle Manifold Nozzle Sliding Fit

Products / Technical Guide



Ø13-25

Product type

Hot runner nozzle, SR (support ring)

- Manifold nozzle sliding fit
- Utilizes heat pipe technology to ensure uniform temperature
- Patented seal technology
- Replaceable threaded tips
- Designed for high flow applications

Available with six Controlled Vestige (CV) tip options including valve gates for zero vestige applications. See table at right.

Available gating types

- Full flow
- Valve gate:
 - VG12 & VG23 tapered gate
 - VG12S & VG23S Straight gate

Major Dimensions (mm)

J Nozzle length band heaters	120-380
J Nozzle length helical heaters	175-625
J Nozzle length tubular heaters	220-900
Nozzle flow bore	Ø25
Dt	Ø32
Z	6
L1	See pages 2 and 3

Heating

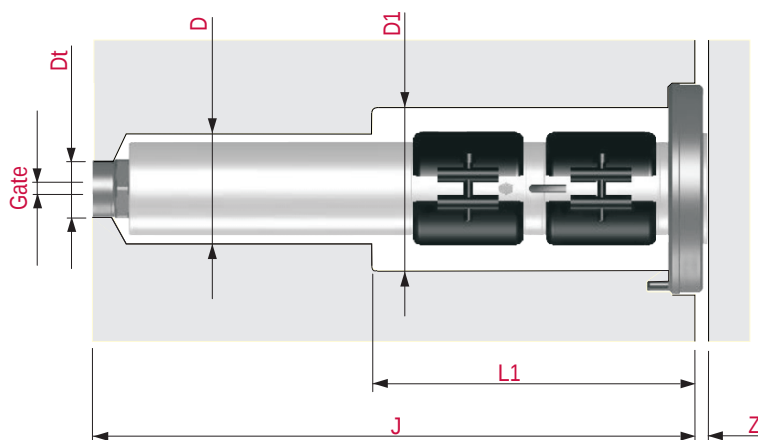
- Available with replaceable band, helical or tubular heaters and thermocouples. If band heated, one band heater is required for operation but an installed spare may be provided if space allows.

Application

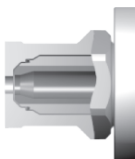
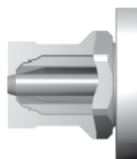
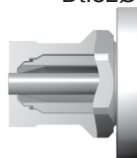
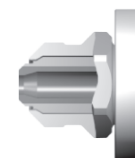
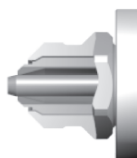
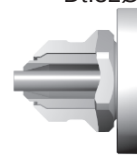
- Suitable for all filled and unfilled materials

☐ page no. of related data sheets

Illustrations simplified, schematically drawn and not to scale.

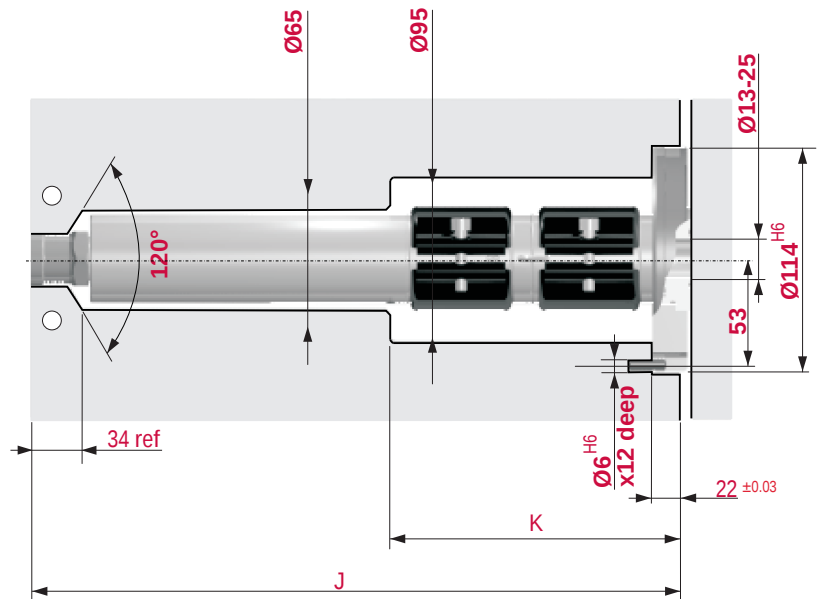


Available tip styles for SR24 Nozzles
Gating of nozzle tip

	Full flow thermal gate	Cone point thermal gate	Valve Gate
Witness Mark	CV-10 Gate: 3.0-8.0Ø Dt: 32Ø 		VG-12 Gate: 6.4Ø Dt: 32Ø 
			VG-12S Gate: 8Ø Dt: 32Ø 
No Witness Mark	CV-20 Gate: 3.0-8.0Ø Dt: 32Ø 		VG-23 Gate: 6.4Ø Dt: 32Ø 
			VG-23S Gate: 8Ø Dt: 32Ø 

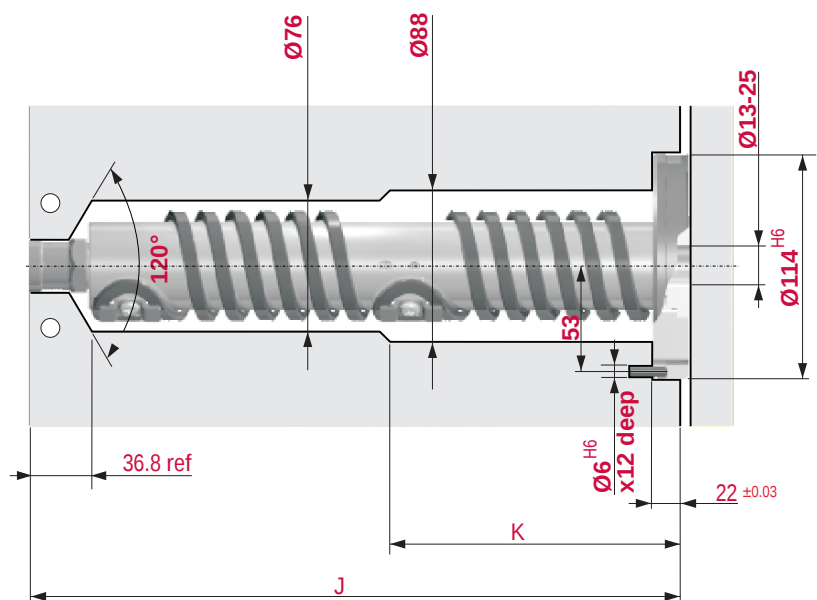
Band Heater

- One heater required for operation. If mould thickness allows a spare band heater will be installed.
- J Minimum = 120
- J Maximum = 380
- K = 90 for single Heater
- K = 155 for installed spare heater



Helical Heater

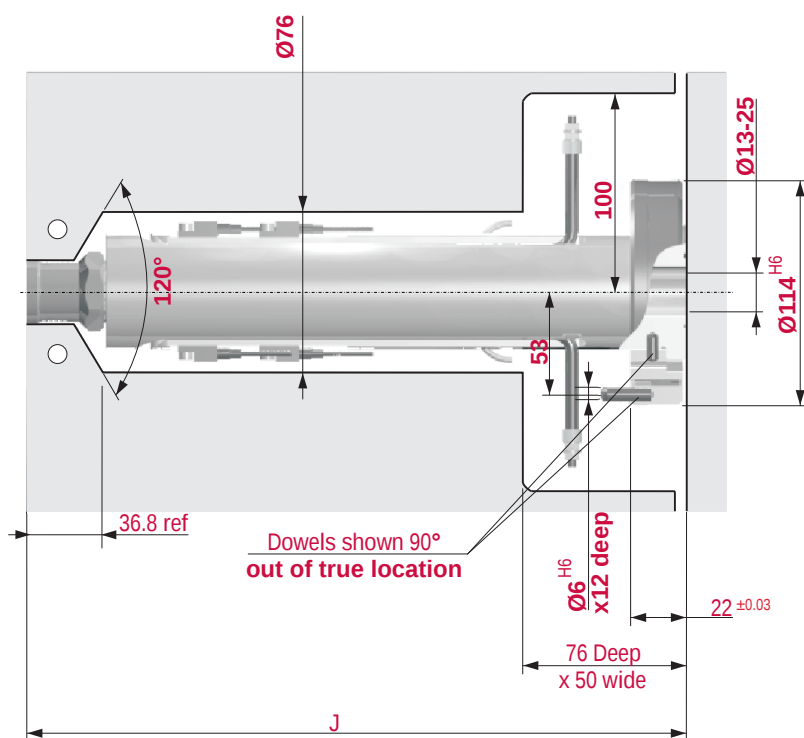
- When J is greater than 300 two heaters are required for operation.
- J Minimum = 175
- J Maximum = 625
- J 175-300, K = 0
- J 300-625, K = J/2



Illustrations simplified, schematically drawn and not to scale.

Tubular Heater

- Each nozzle requires 2 heaters wired in parallel to create one zone.
- J Minimum = 220
- J Maximum = 900



1. Cut out for the nozzle

J Length from back of cavity plate to Gate location

General tolerances: DIN ISO 2768-mK

Surfaces: $\nabla \frac{3.2}{\left(\frac{1.6}{\frac{0.8}{\nabla}} \right)}$

Values of the dimension J can be found in the data sheet for the selected nozzle type.

2. Cut out for connections

→ electrical power
→ thermocouple

3. Alignment pin

The alignment pin prevents the nozzle from rotating.

4. Cut out for the nozzle tip

- A) Through bore nozzle tip (CV10, VG12 and VG12S)
 b) Blind bore nozzle tip (CV20, VG23 & VG23S)

Dt Tip Ø

H Hot runner gate Ø

Depending on the selected nozzle type, different cut outs are required for the nozzle tip.

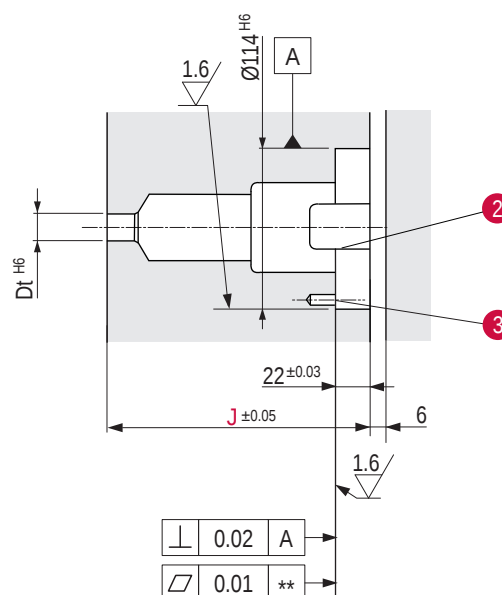
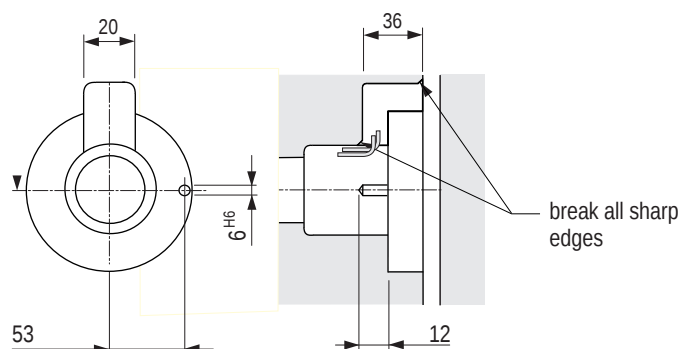
The dimensions of the cut out for the nozzle tip used can be found in the nozzle data sheet.

1) Applies to valve gate nozzles.

1

* drawn offset

** to all other pocket surfaces

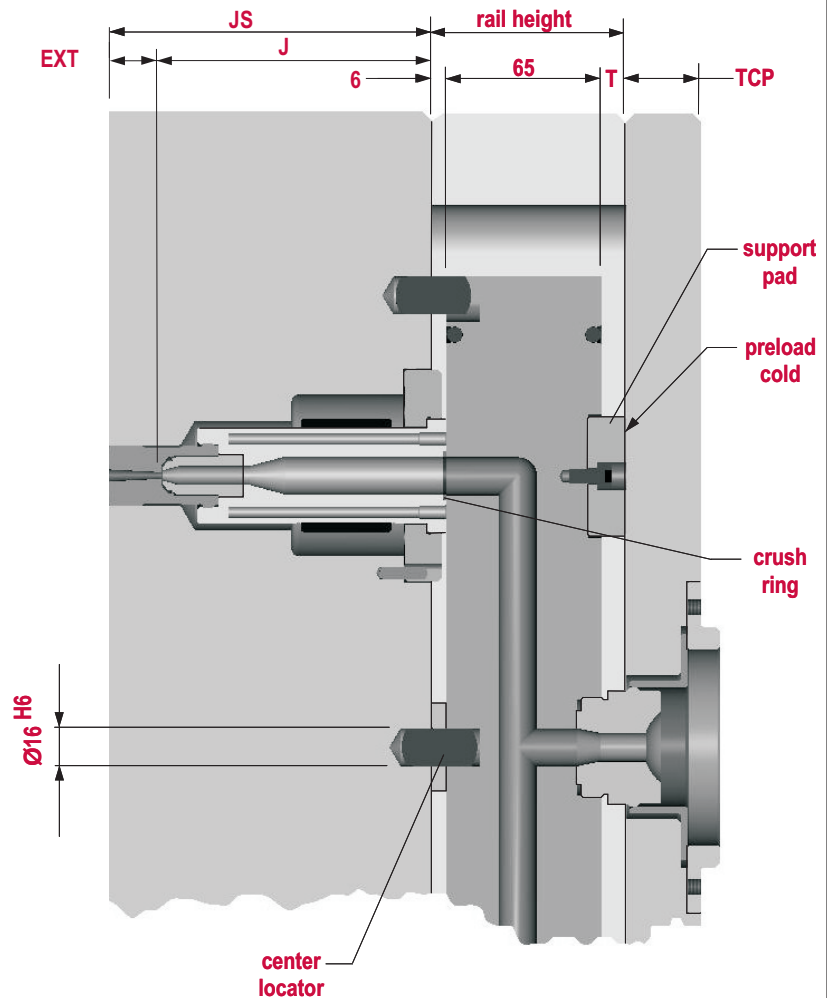
**2****3**

SR24 Series

SR24 manifold criteria:

- SR24 hot runner systems are designed with preload between the thrust pads and the mold plates in the cold condition. As the manifold heats an additional sealing force is created
- Thrust pads are made of a low conductivity material and should only be replaced with an equivalent Synventive part
- Excessive contact with the mold will cause heat sinks and affect system performance. Contact with the mold must be limited to specified areas.
- Support ring nozzles do not line up with sub-runners in the manifold in the cold condition. As the manifold heats up the manifold sub-runner locations expand to the correct location.
- Minimum rail height:
 - 81 (thermal gates)
 - 93 (valve gates)
- T :
 - = Rail height - 6 - 65 (thermal Gate)
 - = 22 (Valve Gate)
- Minimum T (thermal gates) = 10

Illustrations simplified, schematically drawn and not to scale.



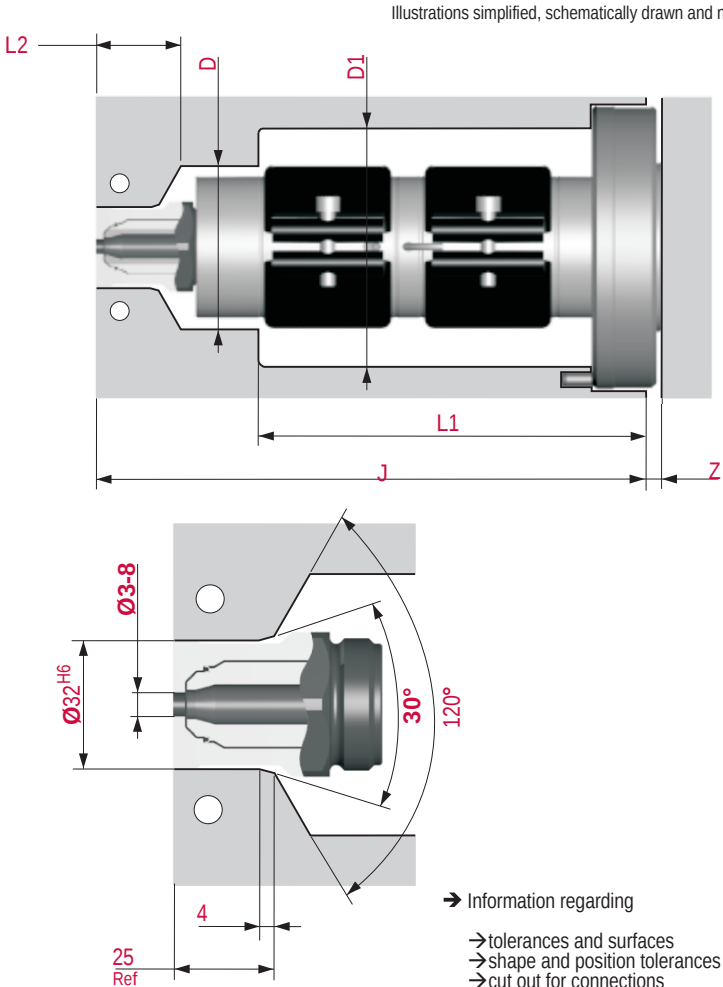
Variable	Description
T	Top Air Gap
J	Depth to Zero Extension
TCP	Top Clamp Plate
JS	Depth to Parting Line
EXT	Extension

SR24 CV10

- General:
- Filled and unfilled materials
 - Easy orifice changes by straight reaming
 - Heat pipes for isothermal operation

- Nozzle Criteria:
- Orificec Ø3-8
 - J length See Chart
 - Open flow bore
 - Patented seal

L2= 34 band heater
 37.2 helical heater
 36.8 tubular heater



- Information regarding
 - tolerances and surfaces
 - shape and position tolerances
 - cut out for connections
 - groove/bore for locking pin
- please see page 4
- "Cut out in mould plate for nozzle and connections"
- Cooling required
 - around the nozzle tip
 - opposite to the nozzle tip
- The front of the nozzle tip must always be against plastic.
- General tolerances according to DIN ISO 2768-mK

Heater Style	J Min	J Max	Heater Qty	Watts/Volts
Band	120	380	1	750W/240V
Helical	175	220	1	750W/240V
Helical	220	300	1	1000W/240V
Helical	300	450	2	750W/240V (each)
Helical	450	625	2	1000W/240V (each)
Tubular	220	900	2	Varies/240V

Illustrations simplified, schematically drawn and not to scale.

SR24 CV10

SR24 angled mould contour criteria:

- When gating onto an angled mold contour the vestige height may be increased depending on the angle.
- K is the increase in land required to maintain a 1.6 wall and/or 3 minimum contact

$$\theta \leq 14^\circ;$$

$$K=0$$

$$E=16TAN\theta$$

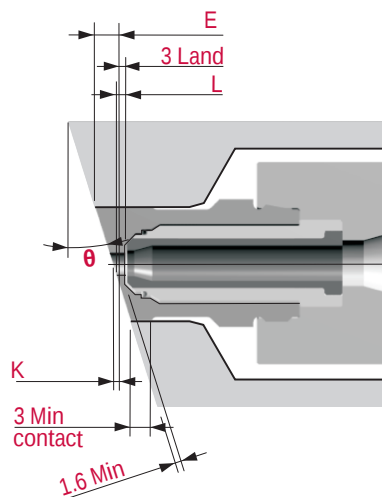
$$L=3-(\varnothing \text{ Orifice}/2)*TAN\theta$$

$$\theta > 26^\circ;$$

$$K=5.7TAN\theta+1.6/COS\theta-3$$

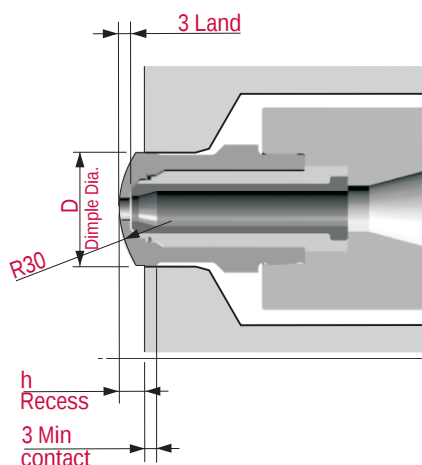
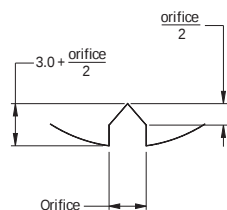
$$E=K+16TAN\theta$$

$$L=3+K-(\varnothing \text{ Orifice}/2)*TAN\theta$$


Angled Mold Contour

SR24 recessed mold contour criteria:

- Values in tables are for materials not having glass fibers. Consult Synventive for vestige height when using glass fillers.
- Recessed gates are used to reduce the vestige height above the part surface or keep the vestige below the part surface.
- For most materials CV10 vestige height is equal to $3.0 + \text{orifice}/2$


Spherical Recess

h (recess depth)	3.0	3.5	4.0	4.5	5.0	5.5	6.0
D	26.2	28.1	29.9	31.6	32.0	32.0	32.0

SR24 CV20

- General:
- Filled and unfilled materials
 - Easy orifice size changes by straight reaming
 - Heat pipes for isothermal operation
 - No witness mark on part
 - Easier removal of frozen material around tip for color change.

- Nozzle Criteria:
- Orifice Ø3-8
 - J length (see chart)
 - Open flow bore
 - Patented seal

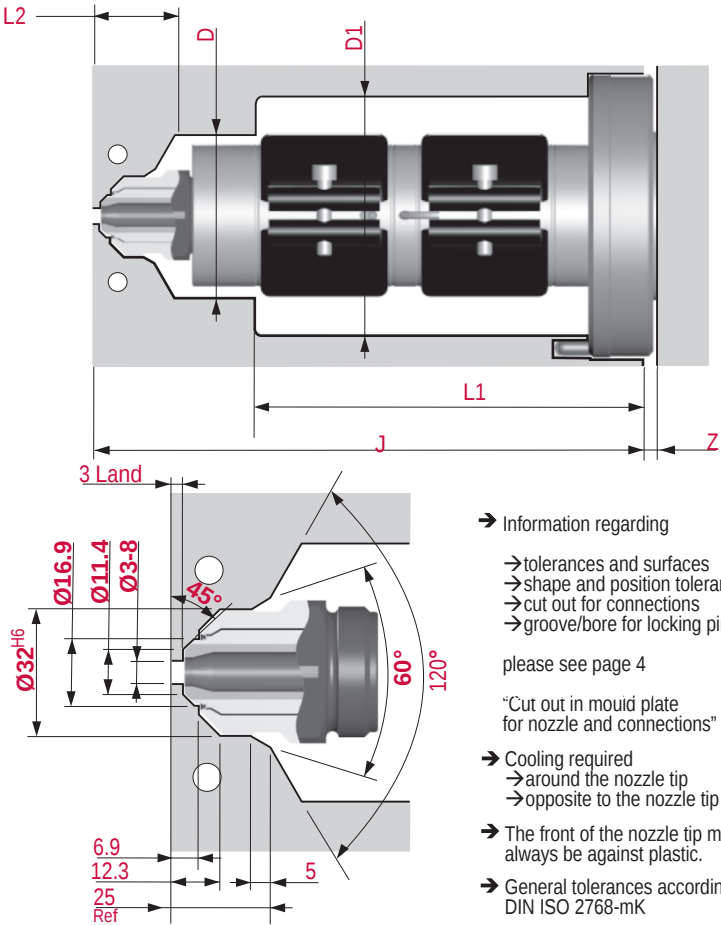
L2= 34 band heater
 37.2 helical heater
 36.8 tubular heater

- SR24 angled mould contour criteria:
- When gating on an angled mold contour, the vestige height may be increased depending on the angle.
 - K is the increase in vestige height required to maintain a 1.6 minimum wall thickness.

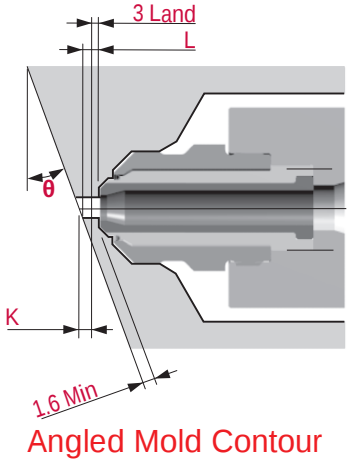
$\theta \leq 8^\circ;$ $K=0$
 $L=3-(\varnothing \text{ Orifice}/2)*\text{TAN}\theta$

$\theta > 8^\circ;$ $K=4.75\text{TAN}\theta+1.6/\text{COS}\theta-3$
 $L=3+K-(\varnothing \text{ Orifice}/2)*\text{TAN}\theta$

Illustrations simplified, schematically drawn and not to scale.



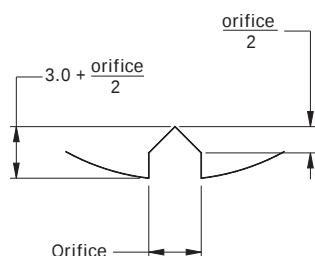
Heater Style	J Min	J Max	Heater Qty	Watts/Volts
Band	120	380	1	750W/240V
Helical	175	220	1	750W/240V
Helical	220	300	1	1000W/240V
Helical	300	450	2	750W/240V (each)
Helical	450	625	2	1000W/240V (each)
Tubular	220	900	2	Varies/240V



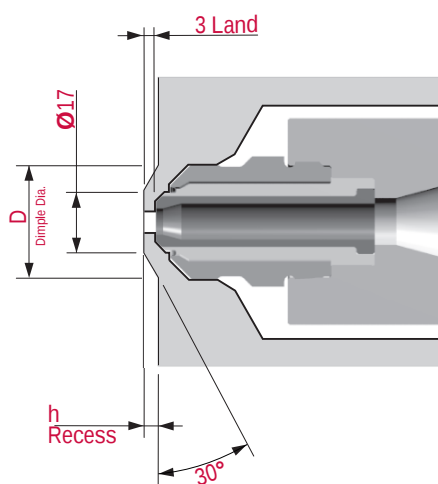
SR24 CV20

SR24 recessed mould contour criteria:

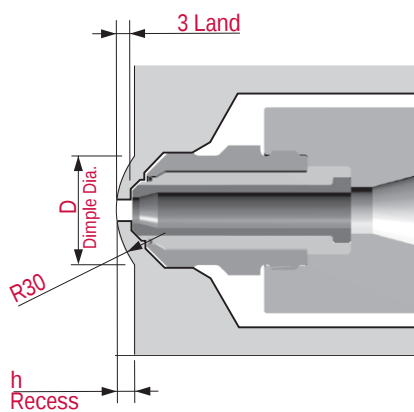
- Values in tables are for materials not having glass fibers. Consult Synventive for vestige height when using glass fillers
- Recessed gates are used to reduce vestige height above the part surface or keep the vestige below the part surface
- For most materials CV20 vestige height is equal to $3 + (\text{Ø orifice} / 2)$.



Illustrations simplified, schematically drawn and not to scale.


Conical Recess

h (recess depth)	3.0	3.5	4.0	4.5	5.0	5.5	6.0
D	27.4	29.1	30.9	32.6	34.3	36.1	37.8


Spherical Recess

h (recess depth)	3.0	3.5	4.0	4.5	5.0	5.5	6.0
D	26.2	28.1	29.9	31.6	33.2	34.6	36.0



SR24 VG12

- General:
- Filled and unfilled materials
 - Tapered valve pin to eliminate gate flash
 - Heat pipes for isothermal operation

- Nozzle Criteria:
- Orifice Ø6.4
 - J length (see chart)
 - Patented seal

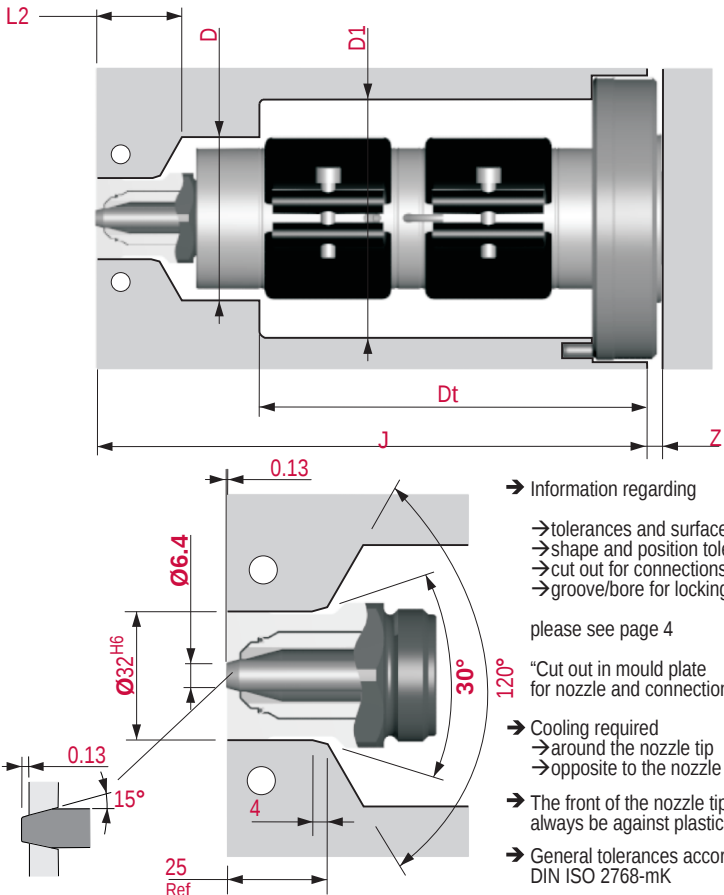
L2= 34 band heater
37.2 helical heater
36.8 tubular heater

- SR24 VG12 angled mold criteria:
- When gating on an angled mold contour the vestige height may be increased depending on the angle
 - K is the increase in land required to maintain a 1.6 minimum wall thickness and/or 3 minimum contact

$\theta \leq 11^\circ$;
K=0
E=16TAN θ

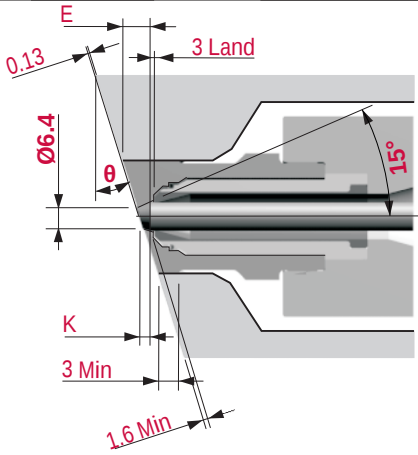
$\theta > 11^\circ$;
K=5.7TAN θ +1.6/COS θ -3
E=K+16TAN θ

Illustrations simplified, schematically drawn and not to scale.



- Information regarding
- tolerances and surfaces
 - shape and position tolerances
 - cut out for connections
 - groove/bore for locking pin
- please see page 4
- “Cut out in mould plate for nozzle and connections”
- Cooling required
 - around the nozzle tip
 - opposite to the nozzle tip
- The front of the nozzle tip must always be against plastic.
- General tolerances according to DIN ISO 2768-mK

Heater Style	J Min	J Max	Heater Qty	Watts/Volts
Band	120	380	1	750W/240V
Helical	175	220	1	750W/240V
Helical	220	300	1	1000W/240V
Helical	300	450	2	750W/240V (each)
Helical	450	625	2	1000W/240V (each)
Tubular	220	900	2	Varies/240V



Angled Mold Contour

Illustrations simplified, schematically drawn and not to scale.

SR24 VG12S

General:

- Filled and unfilled materials
- Straight valve pin for non-adjustable actuators and glass filled materials
- Heat pipes for isothermal operation

Nozzle Criteria:

- Orifice Ø8
- J length (see chart)
- Patented seal

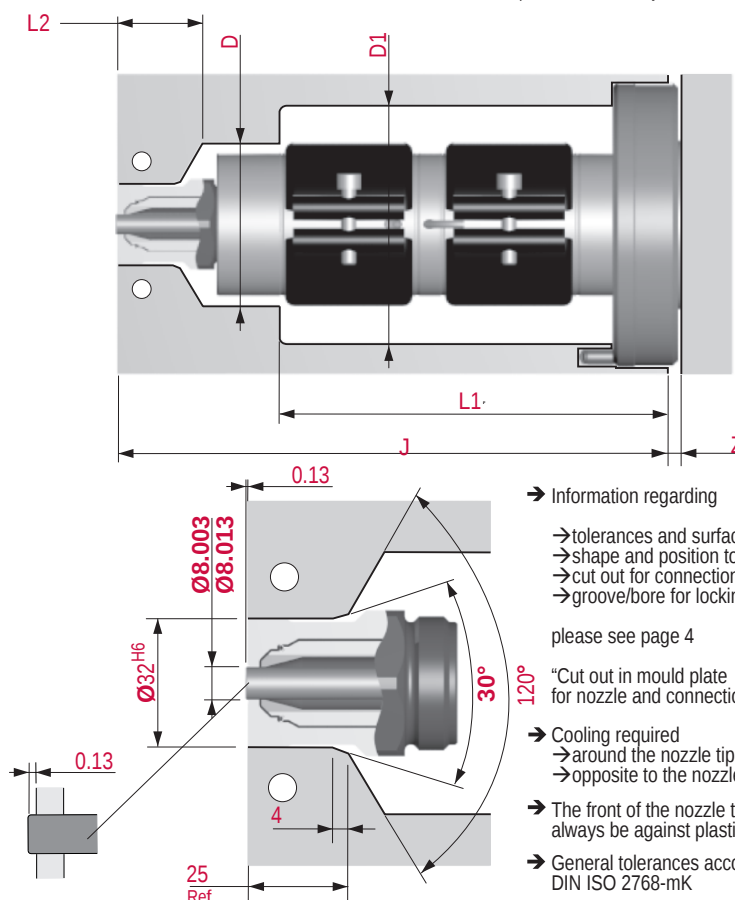
L2= 34 band heater
 37.2 helical heater
 36.8 tubular heater

SR24 VG12S angled mold criteria:

- When gating on an angled mold contour the vestige height may be increased depending on the angle
- K is the increase in land required to maintain a 1.6 minimum wall thickness and/or 3 minimum contact.

 $\theta \leq 11^\circ$;

 $K=0$
 $E=16TAN\theta$
 $\theta > 11^\circ$;

 $K=5.7TAN\theta+1.6/COS\theta-3$
 $E=K+16TAN\theta$


Information regarding

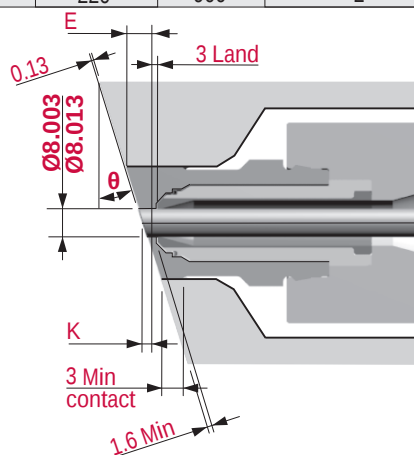
- tolerances and surfaces
- shape and position tolerances
- cut out for connections
- groove/bore for locking pin

please see page 4

"Cut out in mould plate for nozzle and connections"

- Cooling required
 - around the nozzle tip
 - opposite to the nozzle tip
- The front of the nozzle tip must always be against plastic.
- General tolerances according to DIN ISO 2768-mK

Heater Style	J Min	J Max	Heater Qty	Watts/Volts
Band	120	380	1	750W/240V
Helical	175	220	1	750W/240V
Helical	220	300	1	1000W/240V
Helical	300	450	2	750W/240V (each)
Helical	450	625	2	1000W/240V (each)
Tubular	220	900	2	Varies/240V


Angled Mold Contour



SR24 VG23

- General:
- Filled and unfilled materials
 - Tapered valve pin to eliminate gate flash
 - Heat pipes for isothermal operation
 - No witness mark on part

- Nozzle Criteria:
- Orifice Ø6.4
 - J length (see chart)
 - Patented seal

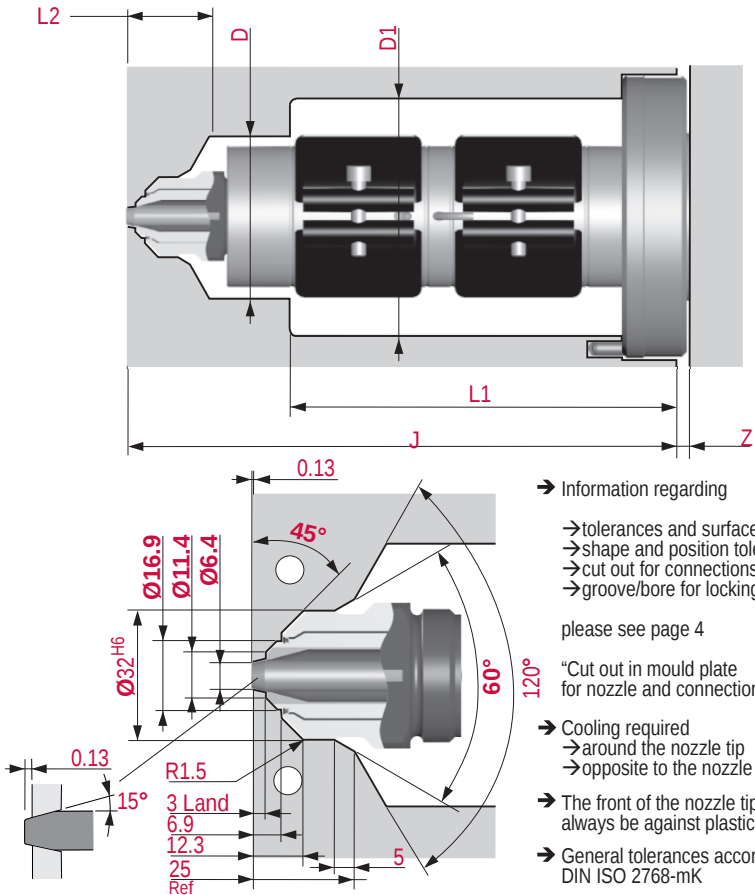
L2= 34 band heater
37.2 helical heater
36.8 tubular heater

- SR24 VG23 angled mold criteria:
- When gating on an angled mold contour the vestige height may be increased depending on the angle
 - K is the increase in land required to maintain a 1.6 minimum wall thickness.

$\theta \leq 11^\circ;$
K=0

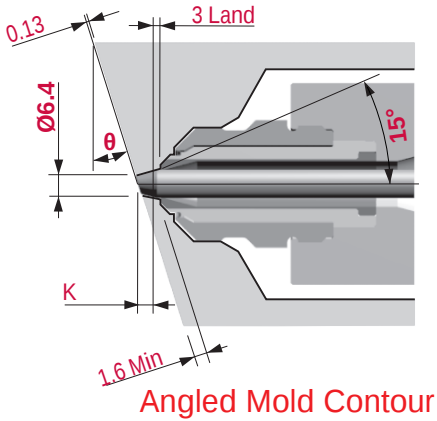
$\theta > 11^\circ;$
 $K = 5.7 \tan \theta + 1.6 / \cos \theta - 3$

Illustrations simplified, schematically drawn and not to scale.



- Information regarding
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- please see page 4
- “Cut out in mould plate for nozzle and connections”
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Helical	450	625	2	1000W/240V (each)
Tubular	220	900	2	Varies/240V



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SR24 VG23S
General:

- Filled and unfilled materials
- No tip witness mark part
- Straight valve pin in gate for non-adjustable actuators and glass filled materials.
- Heat pipes for isothermal operation
- Cooling is required in the gate area.

Nozzle Criteria:

- Orifice Ø8
- J length (see chart)
- Patented seal

L2= 34 band heater
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 36.8 tubular heater

SR24 VG23S angled mold criteria:

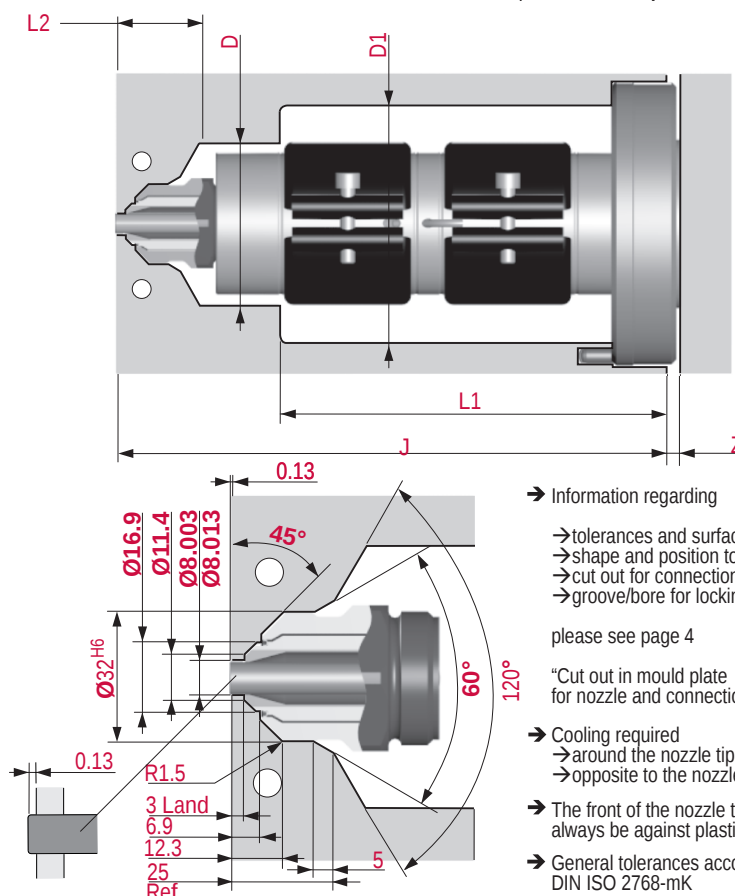
- When gating on an angled mold contour the vestige height may be increased depending on the angle
- K is the increase in land required to maintain a 1.6 minimum wall thickness.

$$\theta \leq 11^\circ;$$

$$K=0$$

$$\theta > 11^\circ;$$

$$K=5.7 \tan \theta + 1.6 / \cos \theta - 3$$


Information regarding

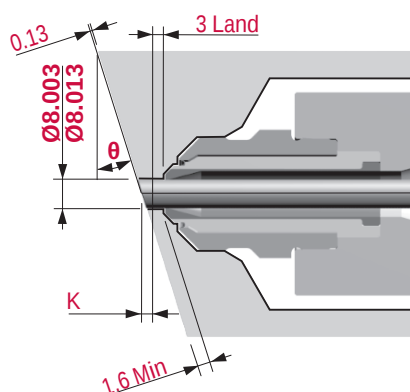
- tolerances and surfaces
- shape and position tolerances
- cut out for connections
- groove/bore for locking pin

please see page 4

"Cut out in mould plate for nozzle and connections"

- Cooling required
 - around the nozzle tip
 - opposite to the nozzle tip
- The front of the nozzle tip must always be against plastic.
- General tolerances according to DIN ISO 2768-mK

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Tubular	220	900	2	Varies/240V


Angled Mold Contour



BARNES™
MOLDING SOLUTIONS



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