Shut-off Nozzles

**Shut-off Nozzle**

**External Spring**
External spring activates shut-off pin. During injection, material flow caused by injecting force overcomes spring tension, thereby pushing shut-off pin away from seat. During screw recovery and idle, the spring tension forces the pin forward, restricting material flow.

**Shut-Off Pin**
Externally activated shut-off pin permits unrestricted material flow during injection. Completely seals off flow at point of removable tip seat during screw recovery and idle. Eliminates drool and stringing.

**Replaceable Tip**
Special hardened tool steel tip can be changed in seconds. Reverse taper nylon design. Available with choice of radius and orifice 3, 4, 5 and 6mm. Be sure to specify when ordering.

Shut-off body uses 50 X 25mm heater (e.g. NB2010)

**Dimensions:**

- Completely mechanical, automatic operation.
- No internal springs.
- Eliminates cold slugs.
- Controllable back flow during injection.
- Reduces flashing.
- Precise pressure control during cure.
- Positive shut-off prevents drooling.
- Increase production up to 34%

**Extension Tips**
to reach recessed sprues

- 22mm
- 57mm
- 82mm

Nickerson PMS
24 Brunel Road, Corby, Northants NN17 4JW
www.nickersoneurope.co.uk

01536 206653
01536 403886
Shut-off Nozzles

**NOTE:** Pressures are in lbs. per sq. inch of plastic melt. In most cases the hydraulic pressure of the machine will be one tenth of the above values. It should be noted however, that the hydraulic oil to plastic ratio is not always one-to-ten.

**Pressure to fully open**

<table>
<thead>
<tr>
<th>Orifice</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3mm</td>
<td>1900</td>
</tr>
<tr>
<td>4mm</td>
<td>2000</td>
</tr>
<tr>
<td>5mm</td>
<td>2100</td>
</tr>
<tr>
<td>6mm</td>
<td>2200</td>
</tr>
</tbody>
</table>

**CRACKING PRESSURE:** 1800 psi
(Max. screw back pressure)

**Automatic Operation**
Operation is fully automatic and mechanical, with activating force derived from natural machine action. During injection, the material flow and pressure force shut-off pin backwards, thereby overcoming spring tension through pin extension. Material flows unrestricted into mould. As soon as injection pressure is released, the tension of spring forces pin extension and thereby also shut-off pin forward, restricting material flow. Tip is of reverse taper design; hence, residue material is ejected with the finished article, eliminating the possibility of cold slugs and strings.

**How to Order**
1. Specify make and model of machine.
2. Specify length or style (A, B, C or D).
3. Specify radius and orifice of tip.
4. Please identify and advise thread and rear opening of your machine.

**Heaters**

<table>
<thead>
<tr>
<th>Heater For:</th>
<th>Heater Size dia x width</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAIN BODY</td>
<td>50 x 25</td>
</tr>
<tr>
<td>SOT1</td>
<td>N/A</td>
</tr>
<tr>
<td>SOT2</td>
<td>25 x 25</td>
</tr>
<tr>
<td>SOT3</td>
<td>25 x 50</td>
</tr>
</tbody>
</table>

**Heater For:**
- Main Body
- SOT1
- SOT2
- SOT3

**Complete Assembly**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLETE ASSEMBLY:</td>
<td></td>
</tr>
<tr>
<td>Style A (Length L = 113mm)</td>
<td>SONZ1</td>
</tr>
<tr>
<td>Style B (Length L = 148mm)</td>
<td>SONZ2</td>
</tr>
<tr>
<td>Style C (Length L = 173mm)</td>
<td>SONZ3</td>
</tr>
</tbody>
</table>

Assembly includes complete unit: Body, tip, external spring, CPM9V shut-off pin and CPM9V pin insert, pin extension and adaptor to suit your machine.

**Replacement Parts**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTERNAL SPRING</td>
<td>SPG2A</td>
</tr>
<tr>
<td>PIN EXTENSION</td>
<td>OPEXT</td>
</tr>
<tr>
<td>CPM9V Shut Off Pin for SOT1</td>
<td>OPSOPN1</td>
</tr>
<tr>
<td>CPM9V Shut Off Pin for SOT2</td>
<td>OPSOPN2</td>
</tr>
<tr>
<td>CPM9V Shut Off Pin for SOT3</td>
<td>OPSOPN3</td>
</tr>
<tr>
<td>CPM9V INSERT</td>
<td>OPSOI</td>
</tr>
<tr>
<td>ADAPTOR TO SUIT YOUR MACHINE NOZZLE TIPS:</td>
<td>SOAD</td>
</tr>
<tr>
<td>STYLE A (22mm extension)</td>
<td>SOT1</td>
</tr>
<tr>
<td>STYLE B (57mm extension)</td>
<td>SOT2</td>
</tr>
<tr>
<td>STYLE C (82mm extension)</td>
<td>SOT3</td>
</tr>
</tbody>
</table>

**Assembly includes complete assembly: Body, tip, external spring, CPM9V shut-off pin and CPM9V pin insert, pin extension and adaptor to suit your machine.**

**WARNING**
This Shut-Off Nozzle uses wear-resistant Particle Metallurgy materials in the critical wear areas of the pin and insert and will provide long life when moulding regular polyamides, acrylics and similar relatively normal non-abrasive materials. For moulding extremely abrasive materials such as glass filled Ryton, we recommend a Shut-Off Nozzle of similar design made of exclusively of wear resistant CPM9V. Contact factory for price and delivery.

Now available with larger orifice sizes up to 9.5mm, using oversize Shut-off. Call for details.
High performance Shut-off Nozzle

Type L:
- Single hole technology
- The melt is led centrally by the nozzle needle
- Minimal pressure drop
- Optimised heat transport
- No shearing of melt

Advanced construction
Substantial advantages in handling
- Easy assembly
- Quick and easy cleaning
- Trouble free production

Advantages of the shut-off nozzle NSO
- Single hole technology
- The melt is led centrally by the nozzle needle
- Minimal pressure drop
- Optimised heat transport
- No shearing of melt

Shut-off in the nozzle tip
- No sprue, no drooling
- Controlled, clean shut-off of the melt stream
- Reduced cycle times
Compact design less space

Modular system
Specific adapter designed for your application
- Standard nozzle available from stock.
- Quick change of nozzle
- Shortest delivery time
- Most economic solution

Flexible system
For a fast changeover to various tools and machines
- Different tip lengths from stock
- Different nozzle tip length

Integrated actuator
The integrated actuator is located directly at the lever. This compact design is suitable for all types of injection units. The power source can be either hydraulic or pneumatic. The operating pressure of 6 to 10 bar pneumatic or 50 to 70 bar hydraulic must not be exceeded. When using compressed air, make sure that the air is clean and dry.

Following dimensions describe the space required by the nozzle. The correct length of the nozzle tip ensures that the nozzle fits within the opening in the stationary mold platen. Extended tip lengths may require additional tip heater bands.

Machine-based actuator
If a machine-based actuation is to be utilized, attention has to be paid fitting the linkage or cable (stroke, force and alignment) to the nozzle. The cable or linkage should be installed according to instructions provided in order to achieve proper operation and avoid damage to the nozzle.
High performance Shut-off Nozzle

**Technical description**

NSO nozzles SYSTEM ENG are available in two types: spring operated type S, and power operated type L.

**Type S:**
- Internal Spring Operation

**Function of spring operated NSO nozzle**

The needle moves axially in the nozzle and is held in the closed position by the force of the spring. The melt pressure from the injection unit pushes back the needle and opens the hole for injection at 180 bar. After the injection process and pressure decrease, the nozzle is closed again, due to spring pressure. The spring is made from heat resistant steel. Good to 500°C.

**Type L:**
- Hydraulic or Pneumatic Operation
- Machine based or Integrated Actuator

(see diagrams below)

**Function of power operated NSO nozzle**

The injection orifice of the power operated nozzle can be opened without pressure loss. The nozzle is controlled by hydraulic or pneumatic actuation. The reliable shut-off system separates the melt flow at a predefined point determined by the process. The control of opening and closing is integrated into the unit and is very compact. The position of the lever can be set at any position. If the melt pressure exceeds 600 bar, the nozzle opens automatically. (Safety device) The nozzle can be controlled also by actuation rod or cable.

The NSO nozzle type L utilizes the options of the machine controller and uses either the hydraulic or pneumatic system. Two options are available for the installation of the nozzle:
- Integrated compact actuator
- Machine based actuator
**High performance Shut-off Nozzle**

**Type L External Actuator Operation**

**Integrated actuator**

The integrated actuator is located directly at the lever. This compact design is suitable for all types of injection units. The power source can be either hydraulic or pneumatic. The operating pressure of 6 to 10 bar pneumatic or 50 to 70 bar hydraulic must not be exceeded. When using compressed air, make sure that the air is clean and dry.

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### Standard dimensions in mm

<table>
<thead>
<tr>
<th></th>
<th>L20</th>
<th>L30</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>26</td>
<td>40</td>
</tr>
<tr>
<td>V</td>
<td>35</td>
<td>55</td>
</tr>
<tr>
<td>A</td>
<td>150</td>
<td>250</td>
</tr>
</tbody>
</table>

**Tip length K Options:**

<table>
<thead>
<tr>
<th></th>
<th>L20</th>
<th>L30</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm</td>
<td>35</td>
<td>55</td>
</tr>
<tr>
<td>60 mm</td>
<td>80</td>
<td>120</td>
</tr>
</tbody>
</table>

---

### Operating conditions

The following conditions must be met in order to ensure correct operation of the NSO nozzle:

- Maximum force at the lever: \(L20 = 350 \text{ N}, L30 = 700 \text{ N}\)
- Minimum actuator stroke: \(L20 = 25 \text{ mm}, L30 = 50 \text{ mm}\)
- Check that the lever does not touch the body in the nozzle open position.
- Check also that the nozzle reaches fully open

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>Spring operated</th>
<th>Power operated</th>
<th>Spring operated</th>
<th>Power operated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. injection flow based on PSI</td>
<td>1000 cm³/sec</td>
<td>500 cm³/sec</td>
<td>1000 cm³/sec</td>
<td>500 cm³/sec</td>
</tr>
<tr>
<td>Approximate size (mm)</td>
<td>25 - 40 mm</td>
<td>25 - 50 mm</td>
<td>25 - 40 mm</td>
<td>25 - 50 mm</td>
</tr>
<tr>
<td>Min. operating temperature</td>
<td>40°C</td>
<td>40°C</td>
<td>40°C</td>
<td>40°C</td>
</tr>
<tr>
<td>Min. injection pressure</td>
<td>500 bar</td>
<td>500 bar</td>
<td>500 bar</td>
<td>500 bar</td>
</tr>
<tr>
<td>Max. fluid pressure</td>
<td>300 bar</td>
<td>300 bar</td>
<td>300 bar</td>
<td>300 bar</td>
</tr>
<tr>
<td>Operating type</td>
<td>Spring, pneumatic</td>
<td>Spring</td>
<td>Spring, pneumatic</td>
<td>Spring</td>
</tr>
<tr>
<td>Airflow (range) (cfm)</td>
<td>3 - 60</td>
<td>3 - 60</td>
<td>3 - 60</td>
<td>3 - 60</td>
</tr>
<tr>
<td>Body heater band</td>
<td>200 x 40 mm</td>
<td>250 x 40 mm</td>
<td>200 x 40 mm</td>
<td>250 x 40 mm</td>
</tr>
<tr>
<td>Tip heater band</td>
<td>25 x 60 mm</td>
<td>25 x 60 mm</td>
<td>25 x 60 mm</td>
<td>25 x 60 mm</td>
</tr>
<tr>
<td>Thermocouple</td>
<td>J-Type, Threaded Nut</td>
<td>J-Type, Threaded Nut</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

subject to technical change
High performance Shut-off Nozzle

**Type S** Internal Spring Operation

Function of spring operated NSO nozzle

**Type S30**

- Max. injection flow (PS): 2500 cm³/sec
- Approximate screw: 20 - 60 mm
- Orifice: Ø 3 mm

**Type S20**

- Max. injection flow (PS): 800 cm³/sec
- Approximate screw: 20 - 60 mm
- Orifice: Ø 2 mm
**Plunger Shut-off Nozzle**

Positive Shut-off operation actuated by machine travel

**How it works:**
At the start of the injection cycle, the nozzle tip moves forward and, when making contact with the tool, forces the tip (A) back against the body (B) and, in doing so, allows the material to flow through the plunger (C) to fill the mould.

At the end of the injection cycle, the nozzle retracts and the pressure of the material within the barrel forces the tip into the forward position, thereby shutting off the flow. This nozzle comes complete with a special adaptor to allow you to purge through without the need to offer the nozzle up to the face of the tool.

**Plunger type Nozzle**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete assembly including shut-off unit and tip</td>
<td>PLSON</td>
</tr>
<tr>
<td>Adaptor thread up to 70 mm diameter</td>
<td></td>
</tr>
<tr>
<td>Spare plunger for above unit</td>
<td>PLUNGS</td>
</tr>
<tr>
<td>Spare tip (steel)</td>
<td>PLSTIP</td>
</tr>
<tr>
<td>Spare tip (copper/nickel)</td>
<td>PLCTIP</td>
</tr>
<tr>
<td>Heater band</td>
<td>RS025175C</td>
</tr>
</tbody>
</table>

**Plunger Shut-off Tip**

Fits all existing Standard Removable Tip Nozzle Bodies.

- Change a Standard Nozzle into a Shut Off Nozzle in less than 2 minutes
- Combine a Shut Off Mechanism with a Mixing or Filter Nozzle.
- Significantly reduce material wastage and Heater Band failures caused by nozzle.
- Economical alternative to other types of Shut Off Nozzles
- Retain standardisation of Nozzle Body Diameters and Heater Bands

**Plunger type Tip**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete assembly including 7/8&quot;-14 shut off tip</td>
<td>RSOT1</td>
</tr>
<tr>
<td>(please specify radius and orifice)</td>
<td></td>
</tr>
<tr>
<td>Spare plunger for above unit</td>
<td>PLUNGS</td>
</tr>
<tr>
<td>Spare tip (steel)</td>
<td>RSOTIP</td>
</tr>
<tr>
<td>Spare tip (copper/nickel)</td>
<td>PLCTIP</td>
</tr>
</tbody>
</table>

The shut off tip is supplied complete with a special adaptor to allow you to safely purge through the tip without having to offer the nozzle up to the face of the tool.

**NB:** Requires optional heater band BN1210

---

**Price Promise**
We will not be beaten on price for similar product with the same quality and specification.

**Call Today For Best Prices**

**Nickerson PMS**
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**01536 403886**
**Sales: nickerson@nickerson-europe.com**
**01536 202196**
**Warehouse: sales@pmseurope.com**

---

**Orifice (mm):**
- 1.5
- 2.5
- 3
- 4
- 5
- 6
- 8
- 9.5

**Radius sizes:**
- 35mm (6) (7)
- 3/4" (20mm) (7)
- 15mm (6)

**Part no suffix:**
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

**Note:** 1.5 & 2.5mm orifice only available in GP tip.