
Compression and injection moulds — Components for gating systems

*Moulage par compression et moules d'injection — Composants pour
systèmes d'injection*



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Components for gating systems	3
4.1 Conventional gating	3
4.2 Hot side.....	4
4.2.1 Externally heated gating system	6
4.2.2 Internally heated gating system.....	11
4.3 Component for cold runner gating system.....	12

Foreword

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ISO 28238 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

Compression and injection moulds — Components for gating systems

1 Scope

This International Standard specifies the characteristics of components of gating systems used in injection moulds for the processing of thermoplastics, thermosetting plastics and elastomers. These are gating systems for solidifying sprues for externally heated gating systems, internally heated gating systems and cold runner gating systems.

The purpose of this International Standard is to establish coherent terms for the different gating systems in professional terminology.

NOTE 1 The components and, in part, the examples for the assembly of the various gating systems are shown in Figures 1 to 12. All figures are given as examples only and need not be considered in the design of the tools.

NOTE 2 For terms and symbols related to components of compression and injection moulds and diecasting dies, see ISO 12165.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1580, *Slotted pan head screws — Product grade A*

ISO 4762, *Hexagon socket head cap screws*

ISO 6751, *Tools for moulding — Ejector pins with cylindrical head*

ISO 6753-2, *Tools for pressing and moulding — Machined plates — Part 2: Machined plates for moulds*

ISO 8017, *Tools for moulding — Guide pillars, straight and shouldered, and locating guide pillars, shouldered*

ISO 8734, *Parallel pins, of hardened and martensitic stainless steel (Dowel pins)*

ISO 8735, *Parallel pins with internal thread, of hardened steel and martensitic stainless steel*

ISO 9449, *Tools for moulding — Centring sleeves*

ISO 10072, *Tools for moulding — Sprue bushes — Dimensions*

ISO 10642, *Hexagon socket countersunk head screws*

ISO 10907-1, *Tools for moulding — Locating rings — Part 1: Locating rings for mounting without thermal insulating sheets in small or medium moulds (types A and B)*

ISO 12165, *Tools for moulding — Components of compression and injection moulds and diecasting dies — Terms and symbols*

ISO 15600, *Tools for moulding — Thermal insulating sheets for injection moulds*

ISO 16915, *Tools for moulding — Sprue pullers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12165 and the following apply.

3.1

gating system

functional unit within an injection mould feeding the processed plastic for the parts to be produced from the inlet opening of the mould to the moulding cavity by taking into account the required system temperature

3.2

gating system for solidifying sprues

geometry of the sprue channel, in which the injected plastic solidifies or crosslinks, and which is removed from the mould together with the product within the respective production cycle during or after opening of the parting level of the mould

See Figures 1 and 2.

3.3

hot runner gating system

hot side gating system

functional unit within an injection mould feeding the thermoplastic resin for the parts to be produced from the inlet opening of the mould to the moulding cavity by taking into account the required system temperature

NOTE The components (e.g. distributor bushing, manifold block and nozzle) forming the sprue channel are provided with heat energy generators (cartridge heaters, bores for liquid tempering media, etc.) and appropriate control elements (thermocouples, etc.). Maintenance of the necessary processing temperature allows for distribution of the molten thermoplastic resin through the sprue channel for producing sprueless parts.

3.3.1

hot side

functional unit comprising all hot runner components for the gating system, which is complemented by a mould clamping plate fixed half (FH), frame plate FH, nozzle retainer plate FH, as well as guide elements and locating elements

3.3.2

externally heated gating system

functional unit analogous to the hot runner gating system and the hot side gating system, in which the molten plastic flows through the components required to supply the supplementary heat energy

3.3.3

internally heated gating system

functional unit analogous to the hot runner gating system and the hot side gating system, in which the molten plastic is conducted externally past the components supplying the required supplementary heat energy

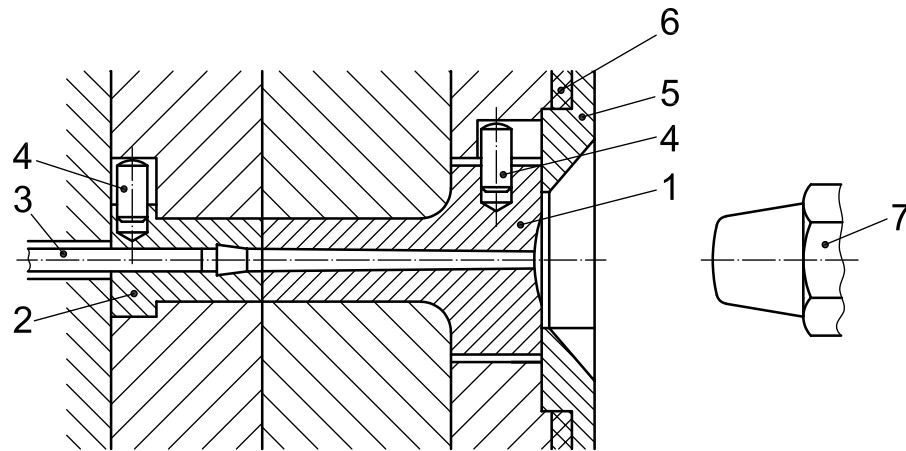
3.4

cold runner gating system

functional unit within an injection mould feeding the processed non-crosslinked elastomers for the parts to be produced from the inlet opening of the mould to the moulding cavity by taking into account the required system temperature

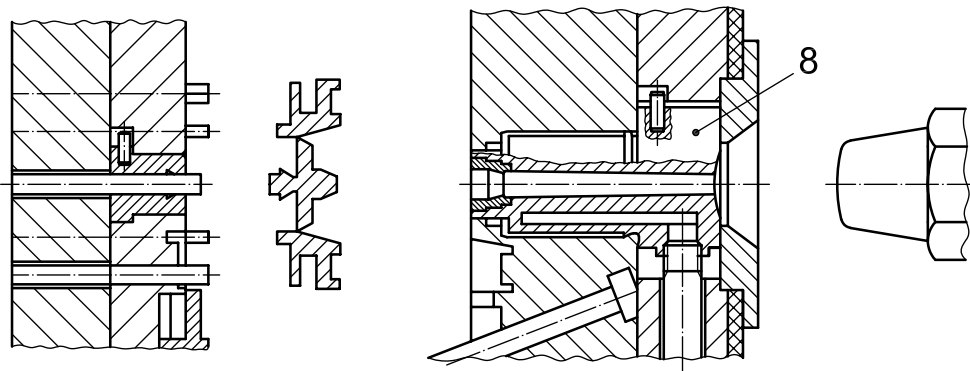
4 Components for gating systems

4.1 Conventional gating



For numbered items, see Table 1.

Figure 1 — Direct or indirect injection by means of a sprue bush in an injection mould for processing of thermoplastic or elastomer



For numbered item, see Table 1.

Figure 2 — Direct or indirect injection by means of a temperable sprue bush in an injection mould for processing of thermosetting plastic

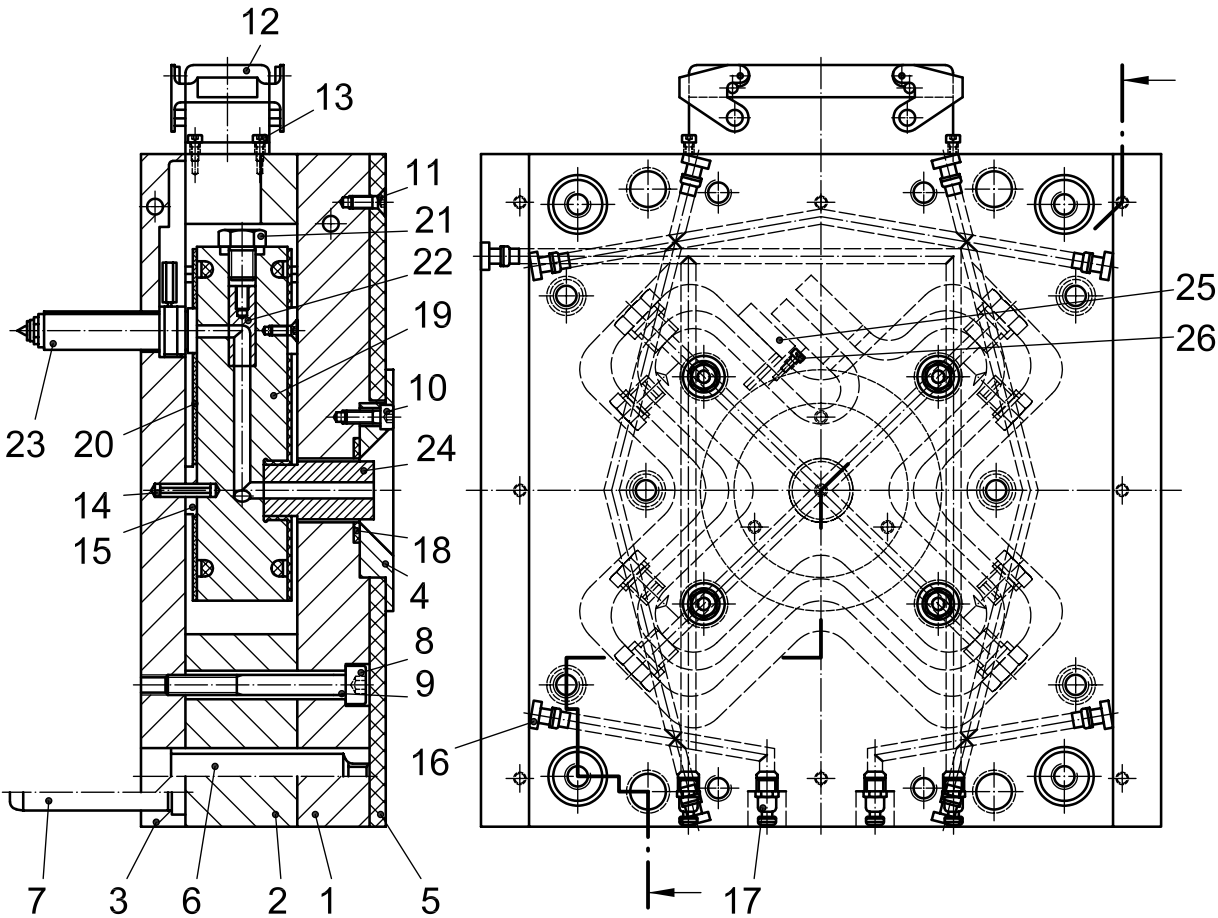
Table 1 — Conventional gating

Figure	Item no.	Term/component ^a	International Standard
1	1 ^b	Sprue bush	ISO 10072
1	2 ^b	Sprue puller insert	ISO 16915
1	3 ^b	Ejector pin	ISO 6751
1	4 ^b	Dowel pin	ISO 8734
1	5 ^b	Locating ring	ISO 10907-1
1	6 ^b	Thermal insulating sheet	ISO 15600
1	7	Machine nozzle	
2	8	Sprue bush, temperable	

^a See Figures 1 and 2.

^b Terms are in accordance with ISO 12165.

4.2 Hot side



For numbered items, see Table 2.

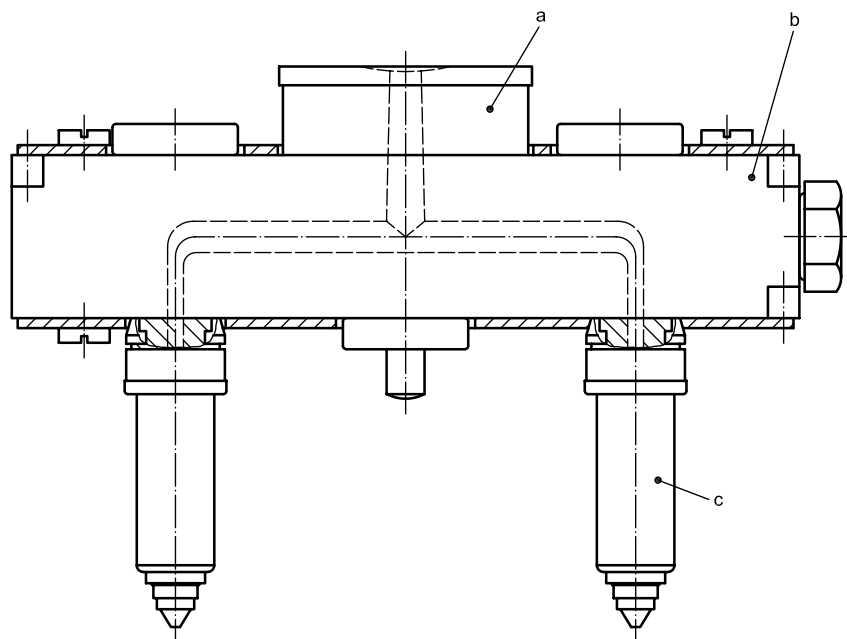
Figure 3 — Hot side for quadruple hot runner mould

Table 2 — Components for hot side

Figure	Item no.	Term/component	International Standard
3	1	Clamping plate	ISO 6753-2
	2	Frame plate	
	3	Nozzle retainer plate	
	4	Locating ring	ISO 10907-1
	5	Thermal insulating sheet	ISO 15600
	6	Centring sleeve	ISO 9449
	7	Guide pillar	ISO 8017
	8	Head cap screw	ISO 4762
	9	Detent edged ring	
	10	Head cap screw	ISO 4762
	11	Hexagon socket countersunk head screw	ISO 10642
	12	Connection housing	
	13	Head cap screw	ISO 4762
	14	Dowel pin with internal thread	ISO 8735
	15	Spacer disc	
	16	Screw plug	
	17	Connecting nipple	
	18	Sealing ring	
	19	Cross-shaped manifold block	
	20	Reflector plate	
	21	Pipe plug	
	22	Deflecting insert	
	23	Nozzle	
	24	Distributor bushing	
	25	Thermocouple	
	26	Head cap screw	ISO 4762

4.2.1 Externally heated gating system

4.2.1.1 General

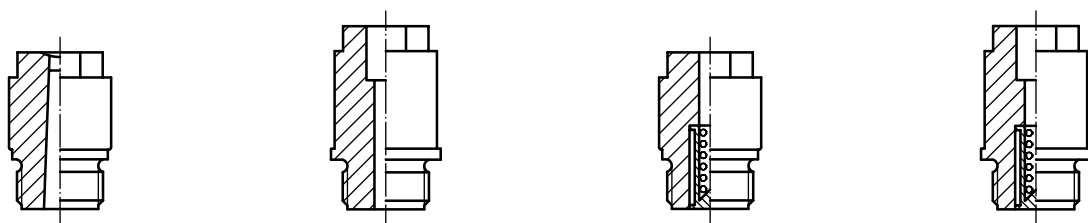


- a For the different types of distributor bushings, see 4.2.1.2.
- b For the different shapes of manifold blocks, see 4.2.1.3.
- c For nozzles for externally heated hot runner gating systems, see 4.2.1.5.

Figure 4 — Schematic arrangement of a hot runner gating system

4.2.1.2 Distributor bushings, types

4.2.1.2.1 Unheated



a) Distributor bushing — Type A

b) Distributor bushing for immersion nozzle — Type B

c) Distributor bushing with filter cartridge — Type C

d) Distributor bushing for immersion nozzle with cartridge — Type D

Figure 5 — Unheated distributor bushings

4.2.1.2.2 Heated

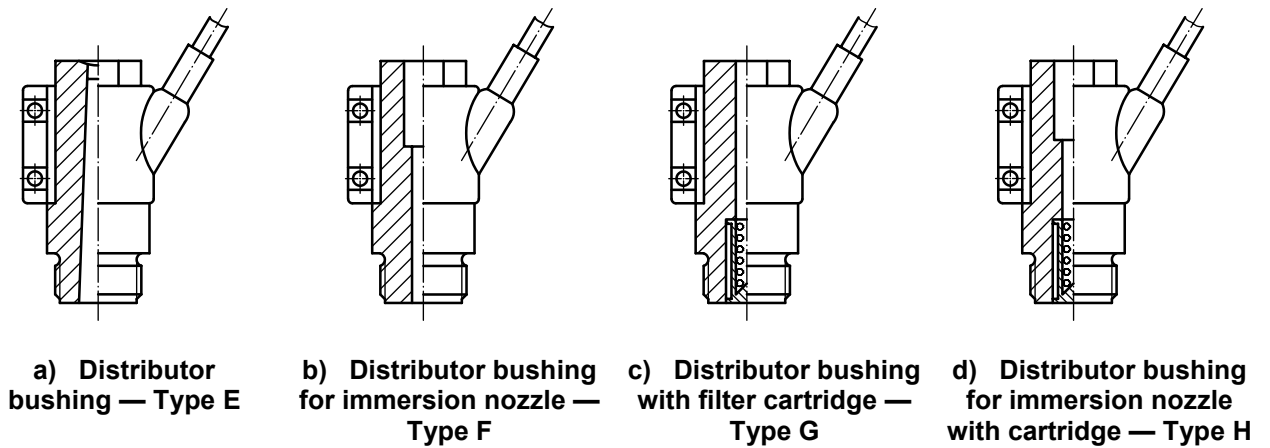


Figure 6 — Heated distributor bushings

4.2.1.3 Manifold blocks, shapes

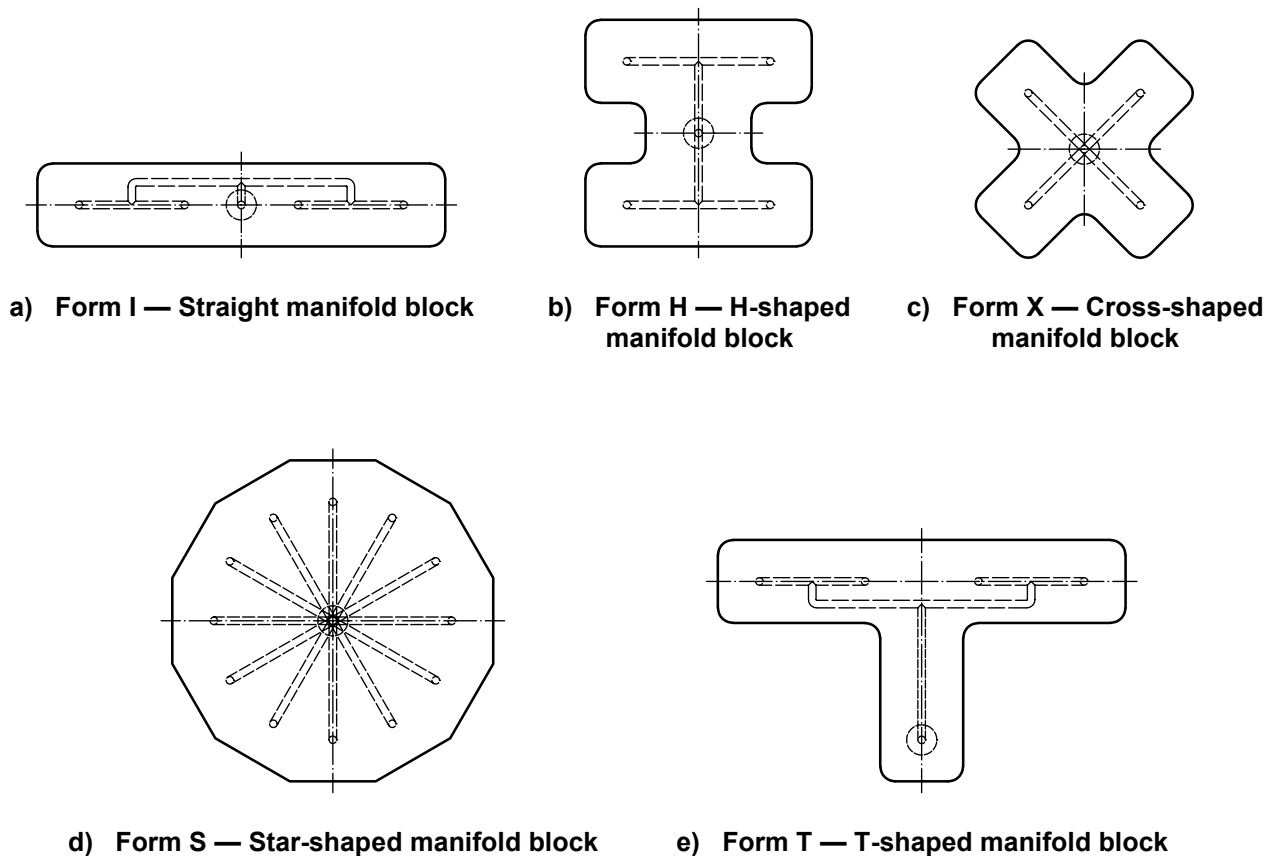


Figure 7 — Manifold blocks — shapes (continued)

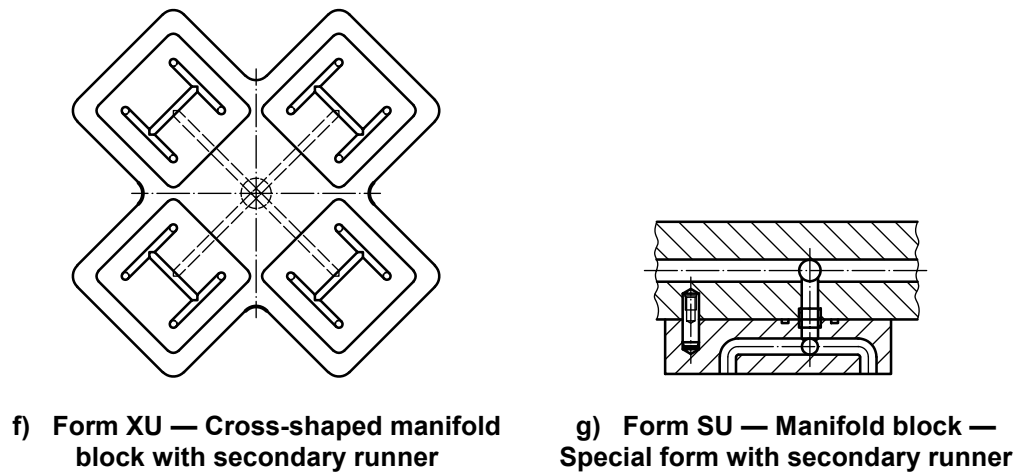
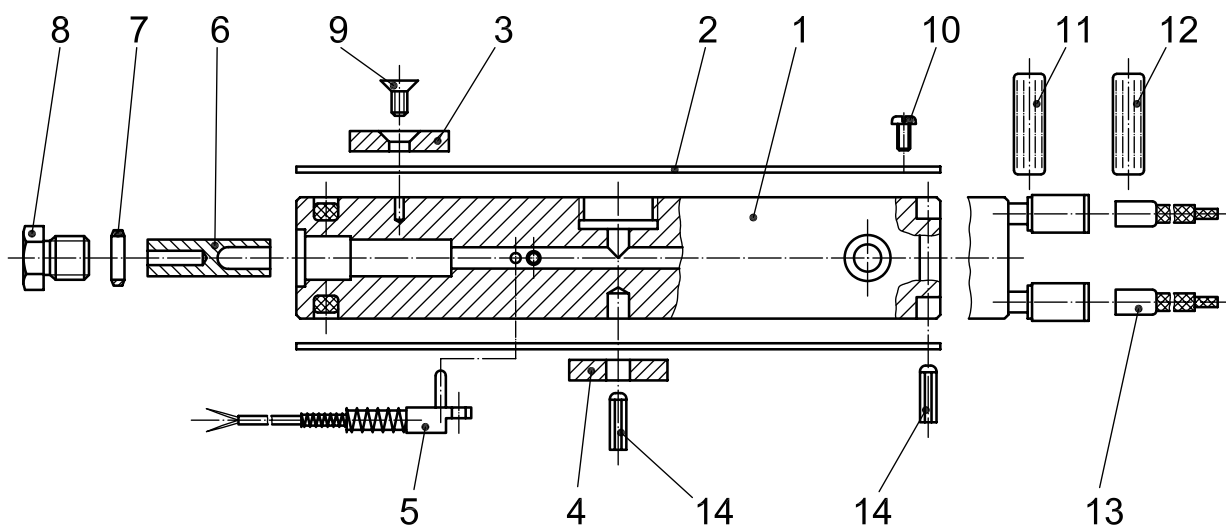


Figure 7 — Manifold blocks — shapes

4.2.1.4 Manifold block and accessories



For numbered items, see Table 3.

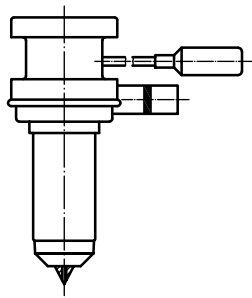
Figure 8 — Manifold block and accessories for externally heated hot runner gating system

Table 3 — Components for externally heated hot runner gating system

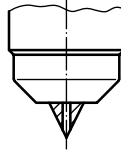
Figure	Item no.	Term/component	International Standard
7 a)	1	Form I Straight manifold block	
7 b)		Form H H-shaped manifold block	
7 c)		Form X Cross-shaped manifold block	
7 d)		Form S Star-shaped manifold block	
7 e)		Form T T-shaped manifold block	
7 f)		Form XU Cross-shaped manifold block with secondary runner	
7 g)		Form SU Manifold block, special form with secondary runner	
8	2	Reflector plate	ISO 15600
	3	Distance disc	
	4	Distance disc	
	5	Thermocouple	
	6	Turn plug	
	7	Sealing disc	
	8	Hexagon head screw	
	9	Countersunk socket head screw	ISO 10642
	10	Slotted pan head screw	ISO 1580
	11	Filter cartridge	
	12	Filter cartridge	
	13	Extension cable	
	14	Dowel pin	ISO 8734

4.2.1.5 Nozzles for externally heated hot runner gating systems

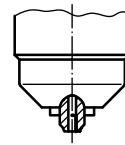
4.2.1.5.1 Thermal seals



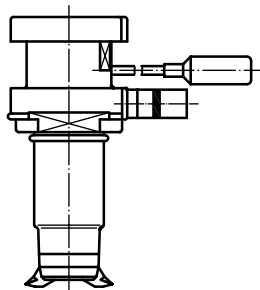
a) Open nozzle



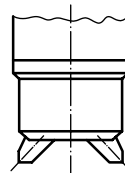
b) Pointed open nozzle



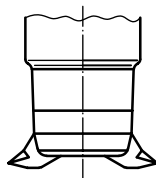
c) Open nozzle with straight opening



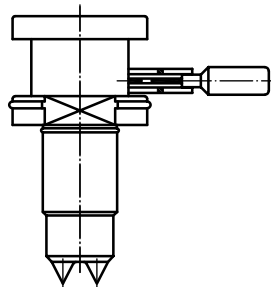
d) Nozzle for lateral injection



e) Nozzle for lateral injection with cold slug



f) Nozzle for lateral injection without cold slug



g) Pointed open multiple nozzle for axial injection

Figure 9 — Thermal seals

4.2.1.5.2 Mechanical seal

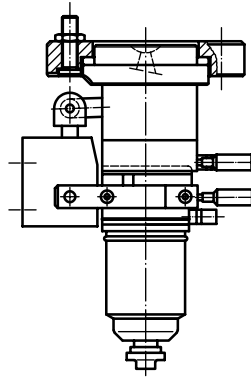
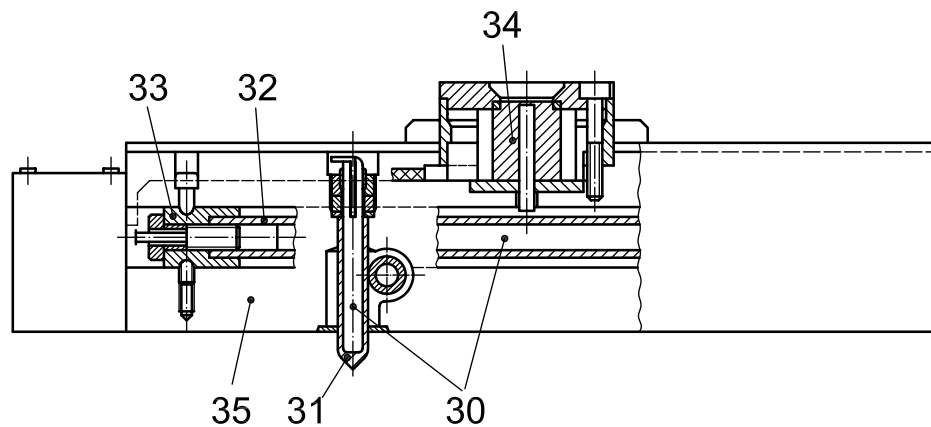


Figure 10 — Nozzle with needle seal

4.2.2 Internally heated gating system



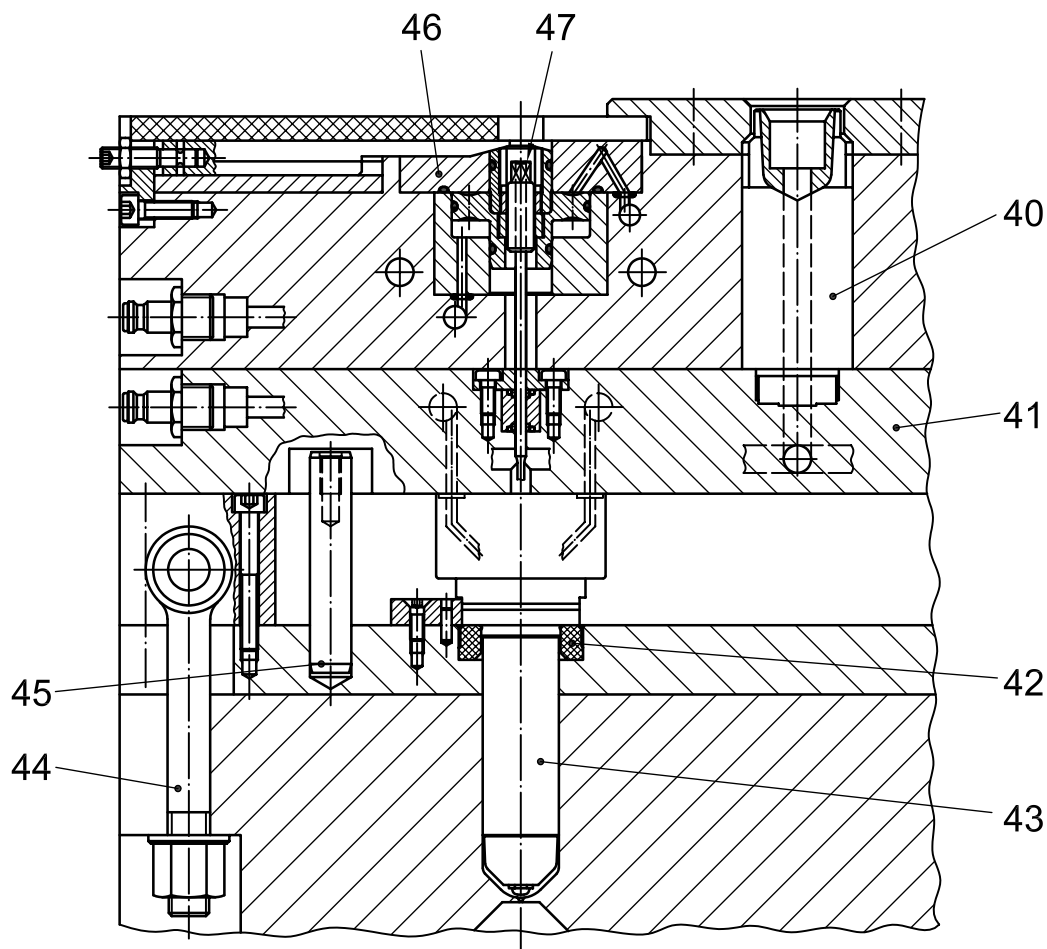
For numbered items, see Table 4.

Figure 11 — Internally heated hot runner gating system

Table 4 — Terms for internally heated gating system

Figure	Item no.	Term/component	International Standard
11	30	Cartridge heater	
	31	Torpedo	
	32	Spreader tube	
	33	Seal cap	
	34	Distributor bushing	
	35	Manifold block	

4.3 Component for cold runner gating system



For numbered items, see Table 5.

Figure 12 — Arrangement of a cold runner gating system

Table 5 — Terms for cold runner gating system

Figure	Item no.	Term/component	International Standard
12	40	Distributor bushing	
	41	Manifold block	
	42	Insulating ring	
	43	Nozzle	
	44	Quick-action clamping for cavity plate	
	45	Dowel pin	ISO 8735
	46	Sealing cylinder	
	47	Sealing needle	

