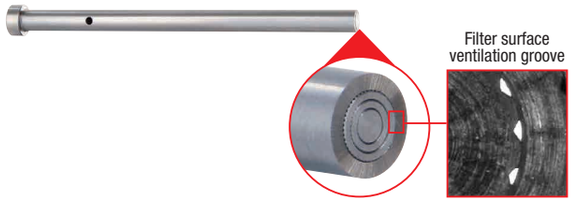
Overview of Pin with Gas Release Filter

■ Features

- This pin features a press-fit gas release filter in its tip. An ejector pin (P.1249) and core pin (P.1250) are available.
- Gas inside the mold is released via ventilation grooves in the filter part. Because the ventilation groove is triangular in shape, surface tension reduces the chance of flash on the molded product, enabling it to demonstrate excellent gas release effects.
- Because filter ventilation grooves are laid out in a concentric shape, gases can easily be released in any direction, reducing the effects of defective molding due to pin orientation at the time of installation.



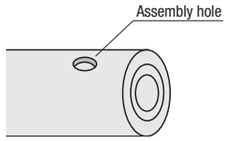


Fig. 1: Pin side surface

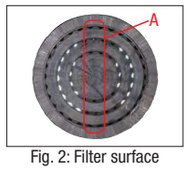


Fig. 2: Filter surface

■ Filter Details

- There may be a hole for assembly on the side surface approx. 1.5 mm from the pin tip created during assembly of this product (Fig. 1).
- Fig. 2 shows a view of when light passes through the filter surface. All parts other than "A" in the figure are ventilation parts, even parts not subject to light penetration.

■ Tip Details and Installation Example

The pin tip (Fig. 3) has a filter that protrudes approx. 0.1 mm beyond the total length of the body ($L\ ^{+0.02}_{0}$). Also, due to product variations, a C plane of approx. 0.1 mm is attached to each of the tip surface of the filter.

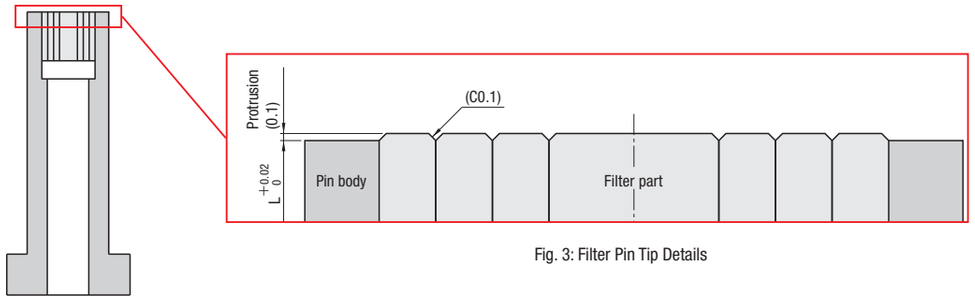


Fig. 3: Filter Pin Tip Details

1) Example of installation where the pin tip surface is set to the same height as the molded product surface

• No application of TK alterations

In products where the filter only protrudes slightly, there is a possibility the molded product surface to be affected. Resin will project out from the molded product surface on the C plane ("B" in Fig. 4).

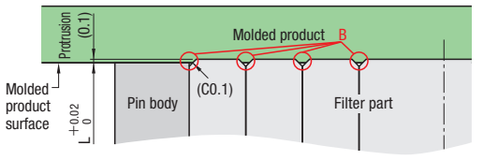


Fig. 4: When protruding from molded product surface

• Application of TK alterations

When TK alterations are applied, the filter protrusion and step caused by the C plane are eliminated by wire cutting (Fig. 6).

Resin flow performance and molding conditions can lead to burring in molded products caused by slight amounts of resin material getting into the filter ventilation grooves.

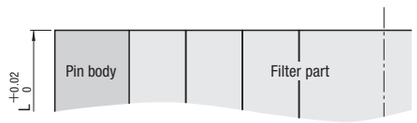


Fig. 6: Tip details when TK alterations are applied

2) Example of installation where the pin tip surface is embedded into the molded product surface

• No application of TK alterations

The total pin length (L) is embedded into the molded product surface by a value "α", resulting in the part protruding out from the molded product surface disappearing as shown in Fig. 4 (Fig. 5).

Value "α" should be set by considering the resin flow performance, etc. (Reference value $\alpha \geq 0.05$ mm)

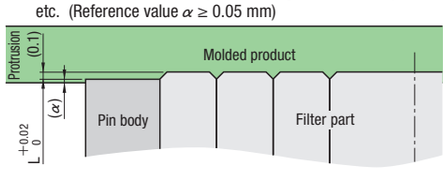


Fig. 5: When total length (L) embedded

• Application of TK alterations

The total pin length (L) is embedded into the molded product by a value β, preventing burrs from protruding out from the molded product surface (Fig. 7).

Value "β" should be set by considering the resin flow performance, etc. (Reference value $\beta \geq 0.02$ mm)

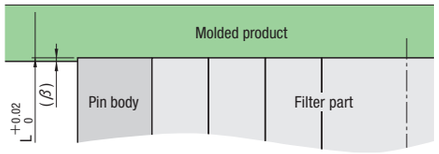


Fig. 7: When TK alterations are applied and total length (L) is embedded

■ Filter Strength

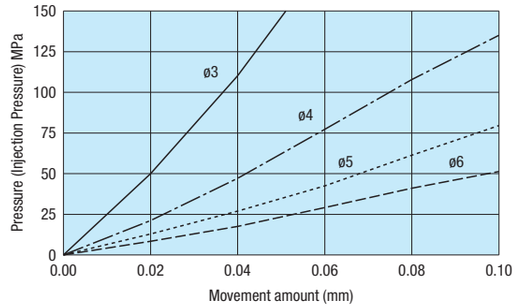


Fig. 8: Injection Pressure on Filter Pin and Filter Surface Movement Amount (GVFCM)

- The filter part may move (sink) due to pressure applied to the pin tip surface. See Fig. 8 for the relationship between pressure and the amount of movement before checking the usage location and performing installation.
- If too much injection pressure is applied, the pin could be damaged in a way to make removal, installation, sliding difficult. Caution when installing to under or near the sprue.

Note, the injection pressure is the value seen at the filter pin tip and not the maximum pressure of the injection press.

The data in Fig. 8 is the reference value (guideline) demonstrated when using GVFCM. Quality and values are not guaranteed.

■ Differences in Filter Tip Surface External Appearance and Ventilation Amounts

- As shown in Fig. 9 (top), the external appearances of filter tip surfaces can vary depending on differences between the medium-flow and large-flow types, as well as whether TK alterations were applied or not.
- As shown in Fig. 9 (bottom), ventilation amounts can vary depending on product type.
  - Ejector pin and core pin: Differences in ventilation amount will occur due to variations in filter shape.
  - Medium flow rate type and large flow rate type: Differences in ventilation amount will occur due to variations in ventilation groove size.

When TK alterations are applied, ventilation grooves may undergo slight crushing due to the wire cutting, which could in turn result a lower flow rate than before TK alterations were applied.

The data in Fig. 9 is the demonstrated reference value (guideline). Quality and values are not guaranteed.

Fig. 9: Differences in Filter Tip Surface External Appearance and Ventilation Amounts

		Medium Flow Rate Type		Large Flow Rate Type	
		Without TK Alterations	With TK alterations	Without TK Alterations	With TK alterations
Filter Tip Surface External Appearance					
Flow Rate (L/min)	Ejector Pin	GVFE		GVFEM	
		2.6～2.8		3.6～6.6	
	Core Pin	GVFC		GVFCM	
		3.2～6.2		7.3～11.3	

When measured at a pressure of 0.15 MPa Pin shaft diameter P=6

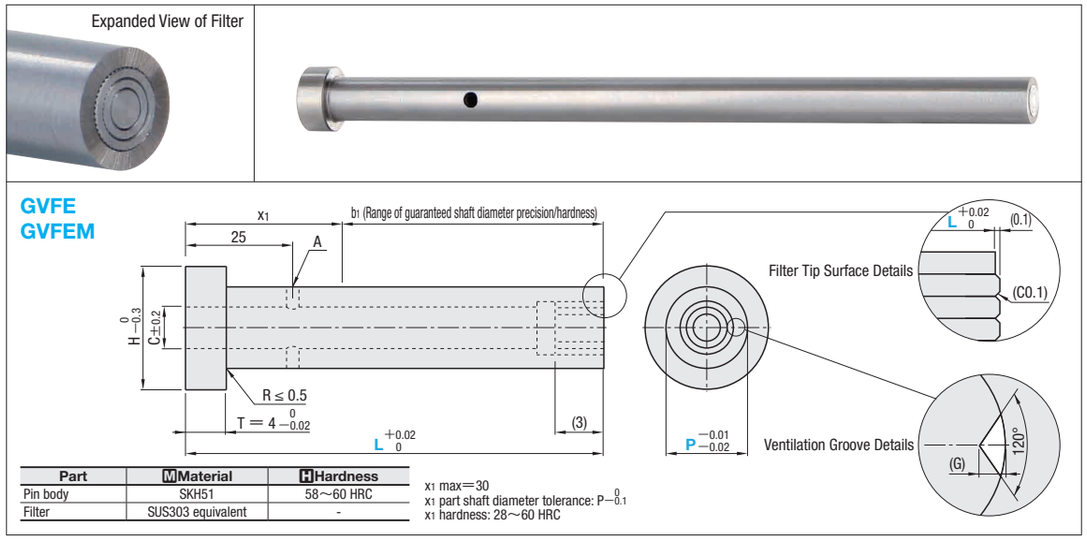
■ When Using

- Select a type suitable for the application as ventilation groove hole sizes can vary depending on the flow rate type, as well as due to the fact that gas release amounts or flash created during molding process can also vary.
- Ventilation grooves may be blocked as the product is coated with an anti-rust agent before shipping. Blow the products off with air to remove before use.
- Since tip processing risks damaging the filter part, implement processing within a range of 0.5 mm from the tip surface. Use of electric discharge machining or wire cutting is recommended as ventilation grooves may become deformed during cutting, grinding, or other machining, possibly resulting in reduced gas release performance.
- Perform periodic maintenance such as ultrasonic cleaning to prevent resin clogging.
- Be careful to avoid applying excessive pressure to the filter surface as it may cause filter sinking or buckling.
- The pin tip has a filter that protrudes about 0.1 mm. Keep this in mind when performing design.
- Specify TK alteration to align the shaft tip surface by eliminating filter protrusions.

New

High Speed Steel SKH51

Ejector Pin with Gas Release Filter



Part	Material	Hardness
Pin body	SKH51	58～60 HRC
Filter	SUS303 equivalent	-

x1 max=30
x1 part shaft diameter tolerance: P 0 −0.1
x1 hardness: 28～60 HRC

Filter part		H	C	A	G	Part Number		L
Outer Diameter	No. of Rings			(Reference value)	(Reference value)	Type	P	0.01 mm increments
2	1	7	1.0	1	0.03	GVFE (Medium Flow Rate Type)	4	40.00～150.00
3	2	8	2.5				5	40.00～250.00
4	3	9	3.5	2			6	40.00～300.00
2	1	7	1.0	1	0.06	GVFEM (Large Flow Rate Type)	4	40.00～150.00
3	2	8	2.5				5	40.00～250.00
4	3	9	3.5	2			6	40.00～300.00

Order — Part Number - L: GVFE5 - 245.98

Days to Ship: Quotation

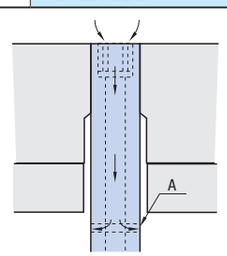
Alterations — Part Number - L - (KC/WKC, etc.): GVFE6 - 300.00 - KC3.0

Alterations	Code	Spec.
KC 0 −0.1	KC	Single flat cutting P/2 ≤ KC < H/2
WKC 0 −0.1	WKC	Dual flat cutting P/2 ≤ WKC < H/2
KAC 0 −0.1 KBC 0 −0.1	KAC KBC	Cutting of flats with different dim P/2 ≤ KAC < H/2 KAC<KBC < H/2
RKC RKC 0 −0.1	RKC	Dual flat (right angle) cutting P/2 ≤ RKC < H/2
DKC DKC DKC 0 −0.1	DKC	Triple flat cutting P/2 ≤ DKC < H/2
SKC SKC 0 −0.1	SKC	Quadruple flat cutting P/2 ≤ SKC < H/2
AG°±0.5 0° KGC KGC 0 −0.1	KGC	Dual flat cutting (angle) P/2 ≤ KGC < H/2 AG = 1° increments 0<AG < 360
120° 120° 120° KTC 0 −0.1	KTC	Triple flat cutting 120° separation P/2 ≤ KTC < H/2

Specified increment 0.1mm

Alterations	Code	Spec.
H HC 0 −0.3	HC	HC = 0.1 mm increments P+1 ≤ HC < H
TC T	TC	TC = 0.1 mm increments 2 ≤ TC < 4 (Dimension L remains unchanged) 4−TC ≤ Lmax−L
	TK	Shaft tip surface alignment Filter protrusions on the shaft tip surface are eliminated by wire cutting. (Dimension L remains unchanged) For changes that occur to external appearance, see P.1248

Example



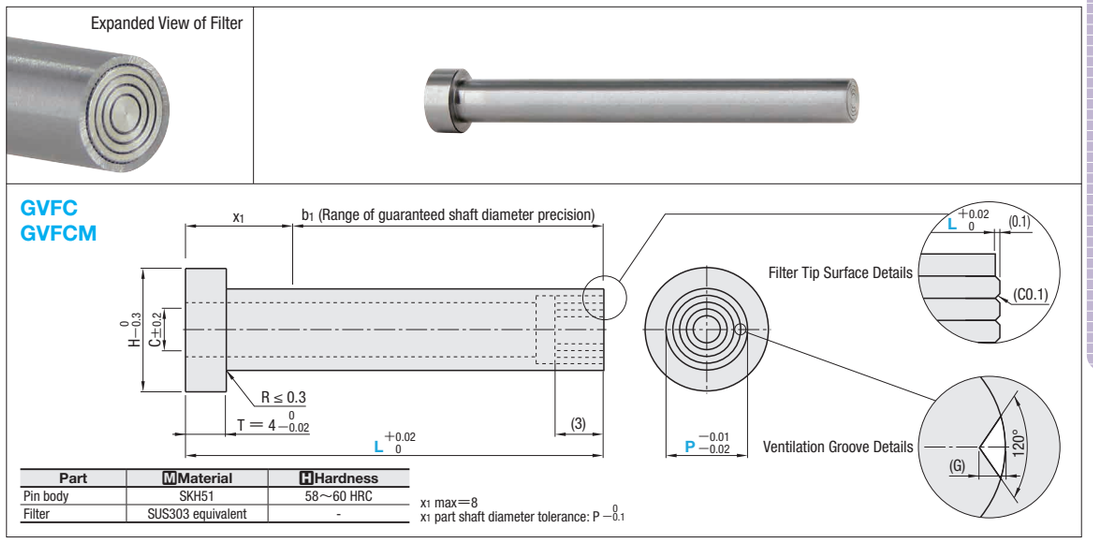
- Release gas by mounting in a locations where gas is likely to pool, such as the final filling section.
- Gas passes through the pin and is released from area "A" in the figure which is installed to the release hole or ejector space.

For the detailed usage methods, see P.1247 "Overview of Pin with Gas Release Filter"

New

High Speed Steel SKH51

Core Pin with Gas Release Filter



Part	Material	Hardness
Pin body	SKH51	58～60 HRC
Filter	SUS303 equivalent	-

x1 max=8
x1 part shaft diameter tolerance: P 0 −0.1

Filter part		H	C	G	Part Number		L
Outer Diameter	No. of Rings			(Reference value)	Type	P	0.01 mm increments
2	1	6	1.0	0.03	GVFC (Medium Flow Rate Type)	3	20.00～100.00
3	2	7	1.5			4	
4	3	8	2.5			5	
5	4	9	3.5			6	
2	1	6	1.0	0.06	GVFCM (Large Flow Rate Type)	3	
3	2	7	1.5			4	
4	3	8	2.5			5	
5	4	9	3.5			6	

Order — Part Number - L: GVFC4 - 20.01

Days to Ship: Quotation

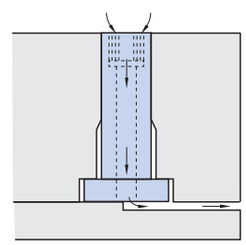
Alterations — Part Number - L - (KC/WKC, etc.): GVFC4 - 98.25 - KC2.5

Alterations	Code	Spec.
KC 0 −0.1	KC	Single flat cutting P/2 ≤ KC < H/2
WKC 0 −0.1	WKC	Dual flat cutting P/2 ≤ WKC < H/2
KAC 0 −0.1 KBC 0 −0.1	KAC KBC	Cutting of flats with different dim P/2 ≤ KAC < H/2 KAC<KBC < H/2
RKC RKC 0 −0.1	RKC	Dual flat (right angle) cutting P/2 ≤ RKC < H/2
DKC DKC DKC 0 −0.1	DKC	Triple flat cutting P/2 ≤ DKC < H/2
SKC SKC 0 −0.1	SKC	Quadruple flat cutting P/2 ≤ SKC < H/2
AG°±0.5 0° KGC KGC 0 −0.1	KGC	Dual flat cutting (angle) P/2 ≤ KGC < H/2 AG = 1° increments 0<AG < 360
120° 120° 120° KTC 0 −0.1	KTC	Triple flat cutting 120° separation P/2 ≤ KTC < H/2

Specified increment 0.1mm

Alterations	Code	Spec.
H HC 0 −0.3	HC	HC = 0.1 mm increments P+1 ≤ HC < H
TC T	TC	TC = 0.1 mm increments 2 ≤ TC < 4 (Dimension L remains unchanged) 4−TC ≤ Lmax−L
	TK	Shaft tip surface alignment Filter protrusions on the shaft tip surface are eliminated by wire cutting. (Dimension L remains unchanged) For changes that occur to external appearance, see P.1248

Example



- Release gas by mounting in a locations where gas is likely to pool, such as the final filling section.
- Provide a release to secure a gas exhaust route.

For the detailed usage methods, see P.1247 "Overview of Pin with Gas Release Filter"