



COMPONENT GUYS INC.

Tunnel Gate Inserts



Ringelflow®



About us

1998 Development of the EXAflow[®] tunnel gate insert for injection moulding applications.

1998 EXAflow[®] inserts (Standardflow) are produced by mechanical machining and erosion processes.

2000 Market interest in EXAflow[®] gate inserts becomes so keen that an alternative production method is required. MIM tooling is built for the manufacture of EXAflow[®] inserts.

2001 The new EXAflow[®] inserts are produced by the metal injection moulding (MIM) process. Concurrently, a new product (Miniflow[®]) is being developed.

2003 An additional insert variant (Konturflow[®]) is introduced to supplement the product portfolio.

2004 Slide locks are included in the product range.

2005 To permit the design of new insert geometries, EXAflow[®] develops a special production method. Two new insert types, Ringelflow[®] and Maxiflow[®], are launched.

2013 New insert types, Midiflow: GMK-1, GMK-2, GMK-3 are launched.



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The benefits



Benefit from our product advantages:

- Perfect surface quality and concealed gate marks through tunnel gating, even on rear molding wall thanks to innovative Ringelflow[®] technology
- Variable gate diameters from 0,5 to 3,5 mm
- Clearly defined separating edge for precise degating
- Save time and cost through fast & easy interchangeability
- High wear resistance
- Compact dimensions due to single-part design
- Enhances molding process reliability
- Unsurpassed balance in multiple gating applications

Injected by:



Material / Material: PC

Weight: 45 g Firma /

Company:

Rapp Kunststofftechnik GmbH Pfinztal-Söllingen Deutschland / Germany



EXAflow[®] - Das Original EXAflow[®] - The Original

Innovation is a key success driver at EXAflow[®]. Our ambition is to create innovative products and solutions for the injection moulding industry, and to provide our customers with a decisive head start in a highly competitive environment, now and in the future.

- EXAflow[®] products are designed to help you build moulds reliably and at favourable cost.
- We are determined to provide you with just the right gate insert for your application.
- Our aim is to amaze you, both with innovative products and with our extensise after-sales support.

As a specialist for gate insert technology, we develop and produce sophisticated solutions for plastic injection moulders and support them with a maximum of service.



Injected by:



Material: ABS

Weight: 10 g

Firma / Company:

Benthin Technology GmbH Bremerhaven Deutschland / Germany



Miniflow® Geschlossener Anschnitt

Injected by:

Standardflow GTE

Material: ABS

Weight: 200 g Firma /

Company:

Maschinen & Formenbau Leinetal GmbH Neustadt Deutschland / Germany



GTM





Injected by:

Konturflow[®] - GTK Material: PA66 GF25

Weight: 14 g

Firma / Company:

Kindtner Werkzeugbau GmbH Künzelsau Deutschland / Germany

Standardflow GTR





Größenstempel (Ø d2)

Size stamp (Ø d2)



								AIV /	
Size Table GTR 12									
						Visc	osity (Rhec	ology)	
Article No.	d1	d2	d3	d4	м	high	regular	poor	
						flowability	flowability	flowability	
GTR 12-08		0,8	2,1			8	7	5	
GTR 12-10		1	2,3			14	12	9	
GTR 12-12		1,2	2,5				20	16	10
GTR 12-14	12	1,4	2,7	5	5	30	23	15	
GTR 12-16		1,6	2,9				40	30	20
GTR 12-18		1,8	3,1			54 40	40	27	
GTR 12-20		2	3,3			68	52	34	
						И	Veight in gra	ams	
Size Table GTR 14									

Viscosity (Rheology)

regular

flowability flowability flowability

7

12

16

23

30

Weight in grams

poor

5

9

10

15

20

high

8

14

20

30

40

Size Table GTR 10

d1

Article No.

GTR 10-08

GTR 10-10

GTR 10-14

GTR 10-16

GTR 10-12 10

d2 d3

0,8 2,1

1 2,3

1,4 2,7

1,6 2,9

1,2 2,5 4

d4 М

4

						Visc	osity (Rhec	ology)
Article No.	d1	d2	d3	d4	м	high flowability	regular flowability	poor flowability
GTR 14-12		1,2	2,5			20	16	10
GTR 14-14		1,4	2,7			30	23	15
GTR 14-16		1,6	2,9			40	30	20
GTR 14-18	14	1,8	3,1	6	6	54	40	27
GTR 14-20		2	3,3			68	52	34
GTR 14-22		2,2	3,5			85	65	43
GTR 14-24		2,4	3,7			100	80	50
-						И	/eight in gra	ams

Technical information

For tunnel gating of small to mediumsized moldings along a flat separating plane. The projecting calotte ensures concealed degating.

- Available gate diameters from 0,8 to 2,4 mm.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.







Ød1-0.02 Χ-

Standardflow GTR

Anti-rotation locking system

Anti-rotation locking system dimensions						
Abstand Zyl.Stift X	Abstand Passfeder Y					
Parallel pin distance X	Key distance Y					
4,5 mm	3,0 mm					
5,2 mm	3,8 mm					
6,0 mm	4,5 mm					
	Cking system dimensi Abstand Zyl.Stift X Parallel pin distance X 4,5 mm 5,2 mm 6,0 mm					



Installation instruction -Anti-rotation locking system

The insert can be secured against inadvertent rotation by a parallel pin and key system. In most cases the gate insert is adequately secured by the bolt.

Standardflow GTE





d4

Größenstempel (Ø d2)



Size stamp (Ø d2)



OIL IU-IU				2,3			14	12	3
GTE 10-12	10	8	1,2	2,5	4	4	20	16	10
GTE 10-14			1,4	2,7			30	23	15
GTE 10-16			1,6	2,9			40	30	20
							W	eight in gra	ms
								A	
Size Ta	ble	GTE	12						
							Visc	osity (Rheo	ology)
Article No.	b1	b2	d2	d3	d4	М	L L	rogulor	noor
							nign	regular	poor
							flowability	flowability	flowability
GTE 12-08			0,8	2,1			8	7	5
GTE 12-10			1	2,3			14	12	9
GTE 12-12			1,2	2,5			20	16	10
GTE 12-14	12	10	1,4	2,7	5	5	30	23	15
GTE 12-16			1,6	2,9			40	30	20
GTE 12-18			1,8	3,1			54	40	27
GTE 12-20			2	3,3			68	52	34
						W	'eight in gra	ams	
Size Ta	Size Table GTE 14								

Viscosity (Rheology)

regular

flowability flowability flowability

7

poor

5

hiqh

8

Size Table GTE 10

Article No.

GTE 10-08

b1 b2 d2 d3 d4 M

0,8 2,1

							Visc	osity (Rheo	ology)
Article No.	b1	b2	d2	d3	d4	м	high flowability	regular flowability	poor flowability
GTE 14-12			1,2	2,5			20	16	10
GTE 14-14			1,4	2,7			30	23	15
GTE 14-16			1,6	2,9			40	30	20
GTE 14-18	14	12	1,8	3,1	6	6	54	40	27
GTE 14-20			2	3,3			68	52	34
GTE 14-22			2,2	3,5			85	65	43
GTE 14-24			2,4	3,7			100	80	50
-							W	eight in gra	ams

Technical information

For tunnel gating of small to mediumsized moldings along a flat separating plane. The projecting calotte ensures concealed degating.

- Available gate diameters from 0,8 to 2,4 mm.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.





Miniflow[®] - GTM







Größenstempel (Ø d2)







Technical information

For tunnel gating of small, thin-walled moldings. This gate insert possesses no calotte and is therefore suitable for very thin-walled moldings.

- Available gate diameters from 0,5 to 1,1 mm.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.

Miniflow[®] - GTM





Detail X

Detail X







Technical information

For tunnel gating of small, thin-walled moldings. This gate insert has a closed gate diameter and is therefore suitable for the use of low article weight and for very thin-walled moldings.

- ■the closed surface enables the creation of individual gate diameter.
- ■usable for all thermoplastics including fillers up to 50 % glass fibre.







Technical information

The front of the gate insert is sealed Off by the mould cavity.

- to reduce pressure loss.
 to avoid jetting.



Technical information

The front of the gate insert is fully sealed off by a companion calotte (baffle) on the cavity or by an auxiliary insert.

- to reduce pressure loss.
- to minimize shear.

Installation example: Thin-walled parts Standardflow





Technical information

The calotte height can be reduced to a minimum of 0,4 mm. This is the height defined by the cutting edge. The front of the gate insert is sealed off by the cavity to the height of the parting line.

- to reduce pressure loss.
- to minimize shear.





Technical information

Designed for particularly thin-walled Parts (0,5 to 1,2 mm wall thickness). The tunnel gate insert has no calotte. Gating will occur flush with the moulding.

 The gating point will be flush with, or slightly projecting from, the bottom surface depending on plastic used.

Installation example: Nozzle-side installation





Technical information

The gate insert is screwed into the nozzle side of the mould. The front of the gate insert is sealed off by the cavity.

- to reduce pressure loss.
- to minimize shear.

Installation example: Thermoplastic Elastomers





Technical information

When processing thermoplastic elastomers, please observe the following recommendations to ensure reliable demolding:

- The distance "L" should decrease with the Shore hardness value.
- A centering cone should be provided.
- This application instruction applies to elastomers in the medium Shore hardness range up to 100 Shore A.











Ø2.00

The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Technical information

For tunnel gating of small to mediumsized moldings contoured in the gate area.

- Maximum gate diameter (pointed tunnel) up to 1,7 mm.
- Contourable up to 3 mm depth.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.





Injected by:



Material: PA66 GF25

Weight: 7,5 g Firma / Company:

Kindtner Werkzeugbau GmbH Künzelsau Deutschland / Germany





Material: PA66 GF35

Weight: 18,5 g

Company:

EXAflow[®] Versuchswerkzeug Groß-Umstadt Deutschland / Germany



to be machined

Anspritzung / Injected by: Maxiflow[®] - GXK-1 Material / Material: PA66 Artikelgewicht / Weight: 110 g Firma / Company: Hans Vorbach GmbH & Co. KG Kaufbeuren Deutschland / Cermany Deutschland / Germany



Technical information

For rear surface gating of small-to-medium sized mouldings. Supports gate diameters up to 1,8 mm and shot weights up to 100 g per insert. Suitable for all common non-reinforced plastic types.

Ringelflow[®] - GRF-1

Installation example



For best operating results the Ringelflow[®] insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector



Optimum gate geometry, with edges rounded

Ringelflow[®] - GRF-1 benefits

- Optimum solution to prevent jetting.
- No gate marks on visible external surfaces and bottom wall.
- Ideal for fully rounded edges (e.g,. toys, mouldings with sealing edges and joints).
- Permits internal gating of 2-component mouldings.



Ringelflow[®] - GRF-1

Installation example



For best operating results the Ringelflow[®] insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector



Optimum gate geometry, with edges rounded



Ringelflow[®] - GRF-1 benefits

- Optimum solution to prevent jetting.
 No gate marks on visible external
- No gate marks on visible external surfaces and bottom wall.
- Ideal for fully rounded edges (e.g,. toys, mouldings with sealing edges and joints).
- Permits internal gating of 2-component mouldings.



Ringelflow[®] - GRF-1

Anti-rotation locking system







Installation instruction -Anti-rotation locking system

The insert can be secured against inadvertent rotation by a parallel pin and key system. In most cases the gate insert is adequately secured by the bolt.



Technical information

For bottom (submarine) gating of medium components. Supports contouring to a depth of 8 mm. Suitable for gate diameters up to 2 mm and shot weights up to 200 g per insert.

Suitable for all common plastics, including reinforced types.



Midiflow GMK-1

Installation example: below the parting line



Installation example: above the parting line



Midiflow GMK-1 benefits

- Gating point may be located up to 8 mm above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.



- Gating point may be located up to 5 mm below or above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.



Midiflow GMK-3

Installation example: below the parting line



Installation example: above the parting line







Midiflow GMK-3 benefits

- Gating point may be located up to 8 mm below the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.



Technical information

For bottom (submarine) gating of medium to-large components. Supports contouring to a depth of 11,5 mm. Suitable for gate diameters up to 3,5 mm and shot weights up to 1,200 g per insert. Suitable for all common plastics, including reinforced types.

Maxiflow[®] GXK-1

Installation example



For best operating results the Maxiflow[®] insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector



Optimum gate geometry, with edges rounded

Maxiflow[®] - GXK-1 benefits

- Gating point may be located up to 10 mm above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

EXAdow

Maxiflow[®] - GXK-2

EXAglow



Installation example



For best operating results the Maxiflow[®] insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector



Optimum gate geometry, with edges rounded

Maxiflow[®] - GXK-2 benefits

- Gating point may be located up to 5 mm above or below the parting line.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Maxiflow[®] - GXK-3

Installation example



For best operating results the Maxiflow[®] insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector



Optimum gate geometry, with edges rounded

Maxiflow[®] - GXK-3 benefits

- Gating point may be located up to 10 mm below the parting line.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

EXAglow

Runner and supporting ejector





Example of a "Ringelflow[®]" gate configuration

Example of a "Maxiflow[®]" gate configuration

In these examples the contoured supporting ejector is shown displaced towards the bottom for the sake of clarity. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



The supporting ejector, locked against rotation, ends flush with the runner.



Machine the runner contour into the supporting ejector.



Technical information

Ringelflow[®] and Maxiflow[®] inserts must be used in conjunction with a supporting ejector.

The contoured supporting ejector, locked against rotation, should end flush with the runner so that the runner can slide over the ejector's supporting face.

Installation dimensions GTM GTR/GTE GTK

Plastic group	GTM	GTR/GTE	GTK
HD-PE, LD-PE, PET, PP, PA, PC, PVC. (L)	>15	>20	>25
Runner design	rund round	rund round	rund round
Ejector depth (AT)	>11	>16	>20
ABS, M ABS, ASA, PS, PC/ ABS, POM, PBT. (L)	>20	>25	>30
	rund	rund	rund
Runner design	round	round	round
Ejector depth (AT)	>14	>20	>24
Elastomere TPE, TPU, TPP, TPA. (L)	>15	>15	>20
Runner design	arbitrary	arbitrary	arbitrary
Ejector depth (AT)	>11	>11	>16
Brittle plastics	>25	>30	>40
Runner design	half-round	half-round	half-round
Ejector depth (AT)	>18	>24	>32





Technical information

Recommended distances "L" from the injection point to the sprue ejector are given above for the various material groups.

The distance "AT" describes the correlated ejector depth.

Installation dimensions GXK GMK



arbitrary arbitrary arbitrary iector depth (AT) >30 >16 Brittle plastics on request on request Runner design half-round half-round igictor depth (AT) on request on request

GXK

>35

round

>35

>40

round

>40

>30

GMK

>30

round

>30

>35

round

>35

>25

Technical information

Recommended distances "L" from the injection point to the sprue ejector are given above for the various material groups.

The distance "AT" describes the correlated ejector depth.

Installation dimensions Ringelflow[®] - GRF



Rlasticgroup	GRF
HD-PE, LD-PE, PET, PP, PA, PC, PVC. (L)	>30
Kanalausführung <i>Runner design</i>	round
Ejector depth (AT)	>30
ABS, M ABS, ASA, PS, PC/ABS, POM, PBT. (L)	>30
KRunner design	round
Æjector depth (AT)	>30
Elastomere TPE, TPU, TPP, TPA. (L)	>20
KRunner design	arbitrary
Ejector depth (AT)	>20
SBrittle plastics	on request
KRunner design	half-round
Æjector depth (AT)	on request





Technical information

Recommended distances "L" from the injection point to the sprue ejector are given above for the various material groups.

The distance "AT" describes the correlated ejector depth.



Low Viscosity (PA, PE, PC, PP, PET, PVC, PS, SB, TPA, TPE, TPU)

Medium Viscosity (*ABS, ASA, PS, PC/ABS, PBT, SAN*)

High Viscosity

(PČ, PPS, PSU, POM-H, PES, PPO, PEI, PC-ABS, PC-PBT, PMMA, PVC)

Table of viscosity for contourable Inserts

Table of viscosity



Low Viscosity (PA, PE, PC, PP, PET, PVC, PS, SB, TPA, TPE, TPU)

Medium Viscosity (ABS, ASA, PS, PC/ABS, PBT, SAN)

High Viscosity (PC, PPS, PSU, POM-H, PES, PPO, PEI, PC-ABS, PC-PBT, PMMA, PVC)



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Component Guys, Inc. 5345 Outer Drive Unit#3 Windsor, ON. N9A 6J3 Phone: 519-968-3367 email: sales@componentguys.com



EXAflow GmbH & Co. KG Steinschönauer Str. 4c 64823 Groß-Umstadt Deutschland

E-Mail info@exaflow.de Internet www.exaflow.de

COMPONENT GUYS INC.