

# Mechanical seals

## Magnetic couplings

### Pump seals



### Agitator seals



### Compressor seals



### Magnetic couplings





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## Magnetic couplings

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## EagleBurgmann – Your System Supplier

Separately available brochures offer information about additional product lines as well as notes on the technology and selection of mechanical seals.

All products can be retrieved interactively from eagleburgmann.com. Among others, you will find current data sheets in PDF format available for download here.

## Seal supply systems

**Brochure 84 Pages** (Code: DMS\_SSE)

The entire product portfolio of systems and components for the cooling, flushing, pressurization and supplying of liquid and gas-lubricated mechanical seals, e.g. quench and thermosiphon systems, heat exchangers, buffer pressure systems, leakage monitoring and API682-compliant supply systems.

## Important note

All the technical specifications are based on extensive tests and our many years of experience. However, the diversity of possible applications means that they can serve as guide values only.

It should be noted that the extremal values of each operating parameter cannot be applied at the same time because of their interaction. Furthermore, the operating range of each specific product depends on the respective shaft diameter, materials used, mode of operation and on the medium to be sealed.

A guarantee can only be given in the individual case if the exact conditions of application are known and these are confirmed in a special agreement. When critical conditions of operation are involved, we recommend consulting with our specialist engineers.

Subject to change.

## Mechanical seal technology and selection

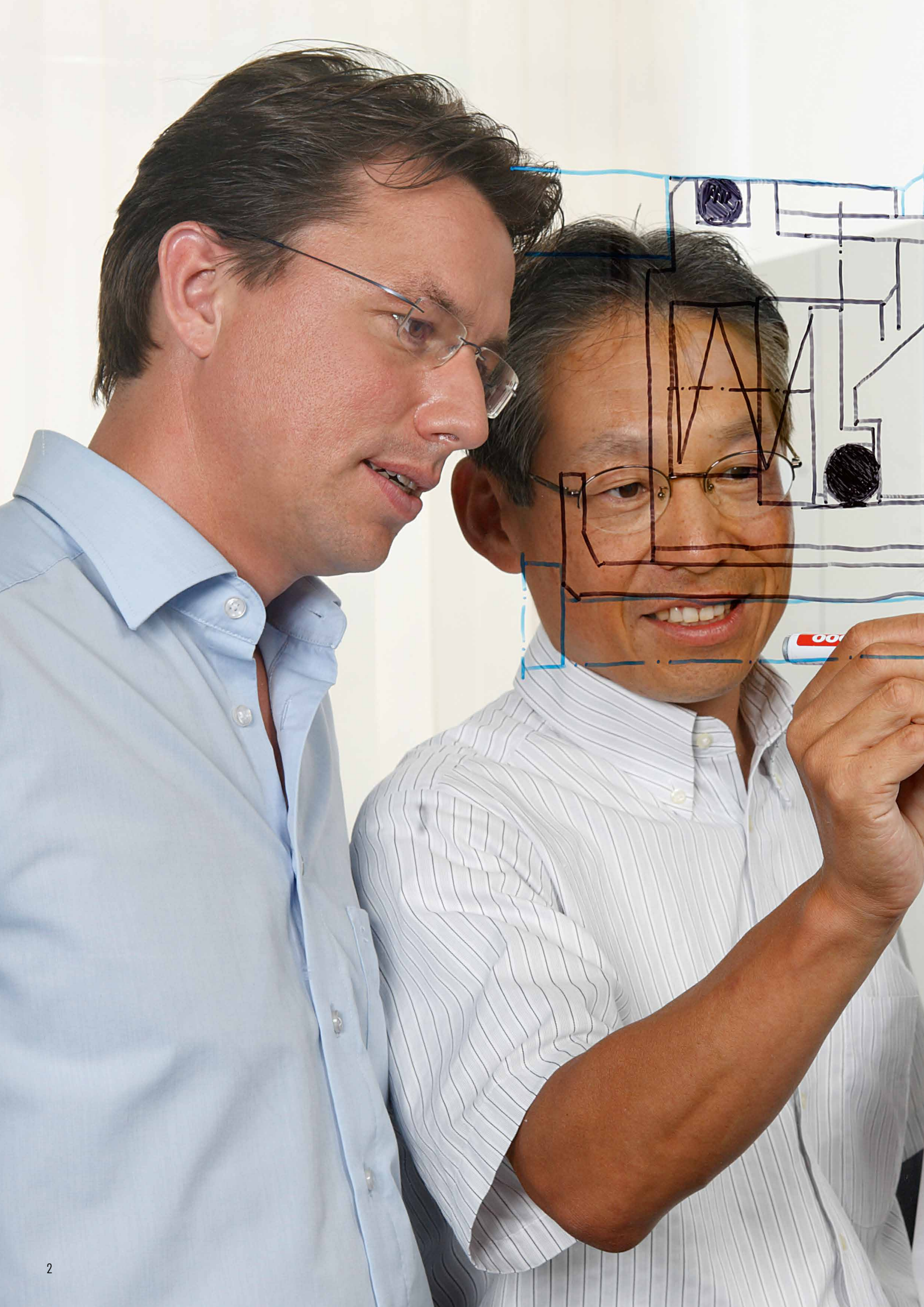
**Brochure 58 pages** (Code: DMS\_TSE)

Technical principles, designation codes, API plans, notes on installation and operation and articles covering theory and practice are summarized in the first part. The second part concerns choosing a seal according to media. Recommendations for arrangement, operation, type and materials of the required mechanical seal for over 900 media. With extensive additional information.

## Carbon floating ring seals

**Brochure 32 Pages** (Code: EBES)

Maintenance-free, compact cartridge labyrinth seals with long service life and best performance from EagleBurgmann-Espey. For the sealing of gases, dust and vapors in turbines, fans, compressors, centrifuges and mills.



## Our products – as varied as our customers



EagleBurgmann products deliver safe, reliable sealing performance in any application including oil pumping and cracking, gas compression, process gas containment, phase separation or synthesis of chemical substances, pipeline sealing, dairy product filling or compensation of temperature expansion in flue gas systems.

Our challenge is to design seals that are able to withstand a wide range of media, different aggregate states and varying pressure and temperature and to provide special solutions for small installation up to seal contact areas of several meters. Every application has its own special requirements profile, and our job is to provide the best sealing solution.

### **The EagleBurgmann portfolio: A product range with an unlimited horizon.**

EagleBurgmann is one of the world's leading manufacturer of industrial sealing solutions. Our extensive portfolio includes everything from standard seals to one-off application-specific designs:

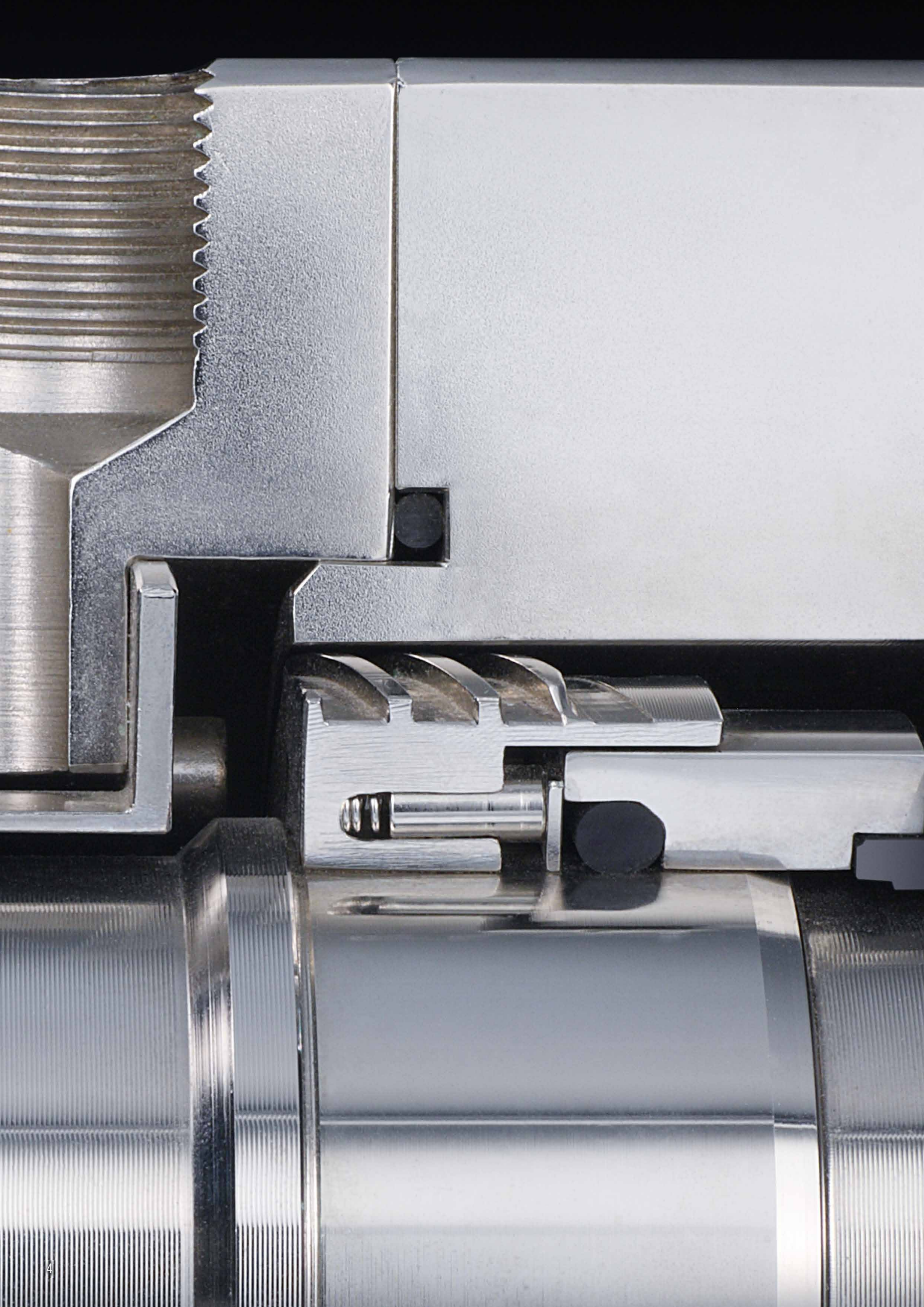
- Mechanical seals
- Magnetic couplings
- Seal supply systems
- Carbon floating ring seals
- Compression packings
- Gaskets
- Expansion joints
- Special products
- TotalSealCare Services

### **Total commitment to quality excellence.**

Outstanding quality is the top priority at EagleBurgmann. Our products are designed for user-friendly installation, optimal functionality and long service life. Our R&D activities, advanced quality management system, in-house test facilities and in-depth engineering expertise ensure that our seals meet the most demanding customer expectations. Starting right back in the development phase, our employees continually verify the quality of our products, and we carry out systematic inspection and testing to guarantee that customers are getting top quality.

### **Proud of the trust which our customers place in us.**

EagleBurgmann is a dependable, competent partner. Our customers are always in total control of the media in their pumps, agitators, compressors, blowers, turbines, valves and pipeline systems even when operating conditions are extremely harsh. There is good reason why customers in the oil & gas, refinery, chemical, energy, food processing, paper, water, marine, aerospace, mining and other industries choose EagleBurgmann as their sealing solutions supplier.



# Mechanical seals

# 1

## Mechanical seals for pumps

EagleBurgmann offers a complete range of liquid and gaslubricated pump shaft seals including standard and engineered seals in single and multi-seal versions. We also offer a complete range of solutions for all API 682 4th edition\* categories and arrangements. The portfolio includes a broad selection of material and surface technologies such as DiamondFace coatings.

## Mechanical seals for agitators

Sealing solutions for normal and sterile applications. The design and selection of materials ensure that the seals are rugged enough to deliver outstanding cost and engineering performance in everyday applications.

## Mechanical seals for compressors

A complete range of products for process gas compressors from a single source. Single, double and tandem versions and tandem seals with intermedia labyrinths. Rugged, non-wearing, non-contact seals designed to deliver outstanding performance and long service life.

\* Request our separately available API 682 printed publication series. Additional comprehensive documents and information are available at [eagleburgmann.com/api682](http://eagleburgmann.com/api682).

## Mechanical seals for pumps

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### Agitator seals

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#### Compressor seals

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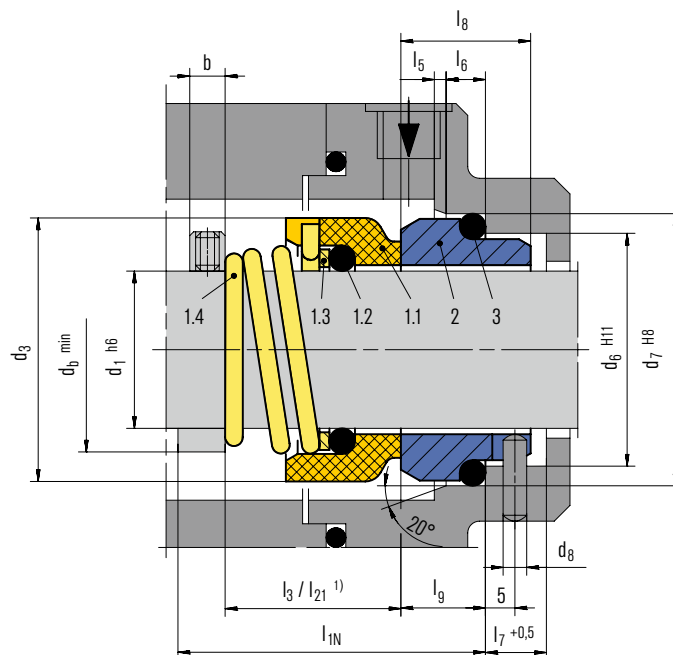
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# M2N



### Features

- For plain shafts
- Single seal
- Unbalanced
- Conical spring rotating
- Dependent on direction of rotation

### Advantages

- Economical seal solution
- No damage of the shaft by set screws
- Short installation length possible (G16)

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 6 \dots 38 \text{ mm}$  (0.25" ... 1.5")  
 Pressure:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +140 \text{ }^\circ\text{C}$  (-4 °F ... +355 °F)  
 Sliding velocity:  $v_g = 15 \text{ m/s}$  (50 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

### Materials

Seal face: Carbon graphite resin impregnated (B)  
 Seat G9: Silicon carbide (Q1, Q2),  
 Special cast CrMo steel (S), Aluminium oxide (V)

### Standards and approvals

- EN 12756

### Recommended applications

- Water and waste water technology
- Building services industry

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	412.1	O-Ring
1.3	474	Thrust ring
1.4	478	Righthand spring
1.4	479	Lefthand spring
2	475	Seat (G9)
3	412.2	O-Ring

### Product variants

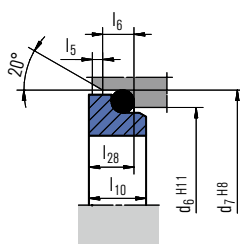
#### M2

Rotating unit M2 with seat G4 or G16 (shorter installation length)  
 Seal face: Carbon graphite resin impregnated (B)  
 Seat G4: Silicon carbide (Q1), Special cast CrMo steel (S)  
 Seat G16: Silicon carbide (Q1, Q2), Special cast CrMo steel (S), Aluminium oxide (V)

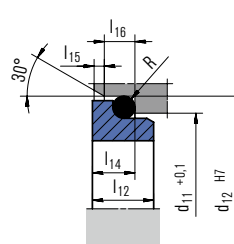
#### M2N4

Rotating unit M2 with seat G6  
 Seal face: Carbon graphite resin impregnated (B)  
 Seat G6: Silicon carbide (Q1), Special cast CrMo steel (S)

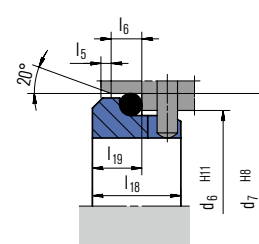
### Seat alternatives



**G6** (EN 12756)



**G4**



**G16** (EN 12756)

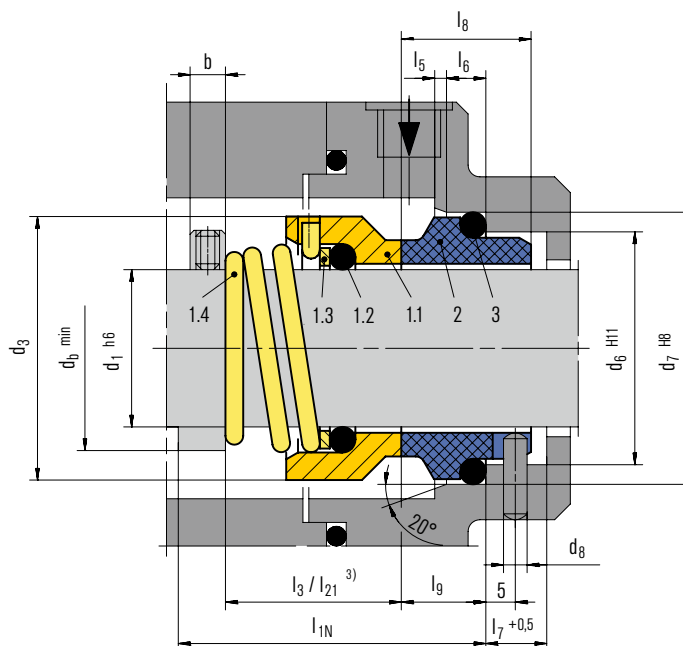


**Dimensions in mm**

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>b</sub>	l <sub>1N</sub>	l <sub>3</sub> <sup>1)</sup>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>10</sub>	l <sub>12</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>18</sub>	l <sub>19</sub>	l <sub>21</sub> <sup>1)</sup>	l <sub>28</sub>	b	R
6	15	-	-	-	11.8	16	8	-	-	-	-	-	-	-	6.5	5.6	1.2	3.8	-	-	10.9	-	-	1.2
8	18	-	-	-	15.5	19.2	11	-	-	-	-	-	-	-	8	7	1.2	3.8	-	-	15.5	-	-	1.2
10	20	17	21	3	15.5	19.2	13	40	17.5	1.5	4	8.5	17.5	7.5	7.5	6.6	1.2	3.8	-	-	15.9	6.6	8	1.2
12	22	19	23	3	17.5	21.6	16	40	17.5	1.5	4	8.5	17.5	7.5	8	7	1.2	3.8	-	-	16	6.6	8	1.2
14	25	21	25	3	20.5	24.6	18	40	17.5	1.5	4	8.5	17.5	7.5	8	7	1.2	3.8	-	-	16	6.6	8	1.2
15	27	-	-	-	20.5	24.6	19	-	-	-	-	-	-	-	7.5	6.6	1.2	3.8	-	-	17.4	-	-	1.2
16	27	23	27	3	22	28	21	40	19.5	1.5	4	8.5	17.5	7.5	8.5	7.5	1.5	5	-	-	19	6.6	8	1.5
18	30	27	33	3	24	30	23	45	20.5	2	5	9	19.5	8.5	9	8	1.5	5	15	7	20.5	7.5	8	1.5
20	32	29	35	3	29.5	35	26	45	22	2	5	9	19.5	8.5	8.5	7.5	1.5	5	15	7	22	7.5	8	1.5
22	35	31	37	3	29.5	35	28	45	23.5	2	5	9	19.5	8.5	8.5	7.5	1.5	5	15	7	23.5	7.5	8	1.5
24	38	33	39	3	32	38	30	50	25	2	5	9	19.5	8.5	8.5	7.5	1.5	5	15	7	25	7.5	8	1.5
25	40	34	40	3	32	38	31	50	26.5	2	5	9	19.5	8.5	8.5	7.5	1.5	5	15	7	26.5	7.5	8	1.5
26	41	-	-	-	34	40	32	-	-	-	-	-	-	-	9	8	1.5	5	-	-	26.5	-	-	1.5
28	43	37	43	3	36	42	35	50	26.5	2	5	9	19.5	8.5	10	9	1.5	5	15	7	26.5	7.5	8	1.5
30	47	-	-	-	39.2	45	37	-	-	-	-	-	-	-	11.5	10.5	1.5	5	15	7	25	-	-	1.5
32	48	-	-	-	42.2	48	39	-	-	-	-	-	-	-	13	10.5	1.5	5	15	7	28.5	-	-	1.5
35	53	-	-	-	46.2	52	43	-	-	-	-	-	-	-	13.5	11	1.5	5	15	7	28.5	-	-	1.5
38	56	-	-	-	49.2	55	47	-	-	-	-	-	-	-	13	10.3	1.5	5	16	8	32	-	-	1.5

 1) l<sub>3</sub> valid for M2N, l<sub>21</sub> valid for M2

# M3N



## Features

- For plain shafts
- Single seal
- Unbalanced
- Rotating conical spring
- Dependent on direction of rotation

## Advantages

- Universal application opportunities
- Insensitive to low solids content
- No damage of the shaft by set screws
- Large choice of materials
- Short installation lengths possible (G16)
- Variants with shrink-fitted seal face available

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 6 \dots 80 \text{ mm}$  (0.24" ... 3.15")  
 Pressure:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +140 \text{ }^\circ\text{C}$  (-4 °F ... +355 °F)  
 Sliding velocity:  $v_g = 15 \text{ m/s}$  (50 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

## Materials

Seal face: CrMo special cast steel (S)  
 Seat G9: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)

## Standards and approvals

- EN 12756

## Recommended applications

- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Building services industry
- Food and beverage industry
- Sugar industry
- Low solids content media
- Water and sewage water pumps
- Submersible pumps
- Chemical standard pumps
- Eccentric screw pumps
- Cooling water pumps
- Basic sterile applications

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	412.1	O-Ring
1.3	474	Thrust ring
1.4	478	Righthand spring
1.4	479	Lefthand spring
2	475	Seat (G9)
3	412.2	O-Ring

## Product variants

### M3

Items and description as M3N.  
 Seal face: Special cast CrMo steel (S)  
 Seat G13: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)

### M32

Items and descriptions as for type M3N, but with carbon graphite seal face shrink-fitted into the seal face carrier (Item no. 1.1).

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Seat G4: Special cast CrMo steel (S),  
 Silicon carbide (Q1, Q2)  
 Seat G6 (M32N4): Special cast CrMo steel (S),  
 Silicon carbide (Q1, Q2)  
 Seat G9 (M32N): Silicon carbide (Q1, Q2)

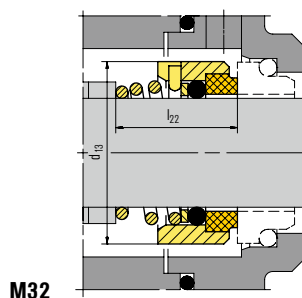
Seat G6 also available in A, B = G30 (longer installation length than G6)

### M37G

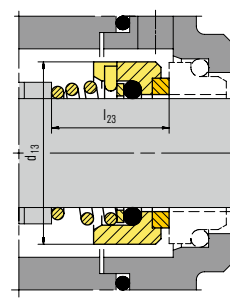
Items and descriptions as for type M3N, but with shrink fitted silicon carbide seal face to the seal face carrier (Item no. 1.1)  
 Shaft diameter:  $d_1 = 16 \dots 80 \text{ mm}$  (0.63" ... 3.15")  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +180 \text{ }^\circ\text{C}$  (-4 °F ... +355 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)

Seal face: Silicon carbide (Q12, Q22),  
 Tungsten carbide (U22)  
 Seat G4: Silicon carbide (Q1, Q2)  
 Seat G13: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Seat G6 (M37GN4): Silicon carbide (Q1, Q2)  
 Seat G9 (M37GN): Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1, Q2)

Seat G6 also available in A, B = G30 (longer installation length than G6)

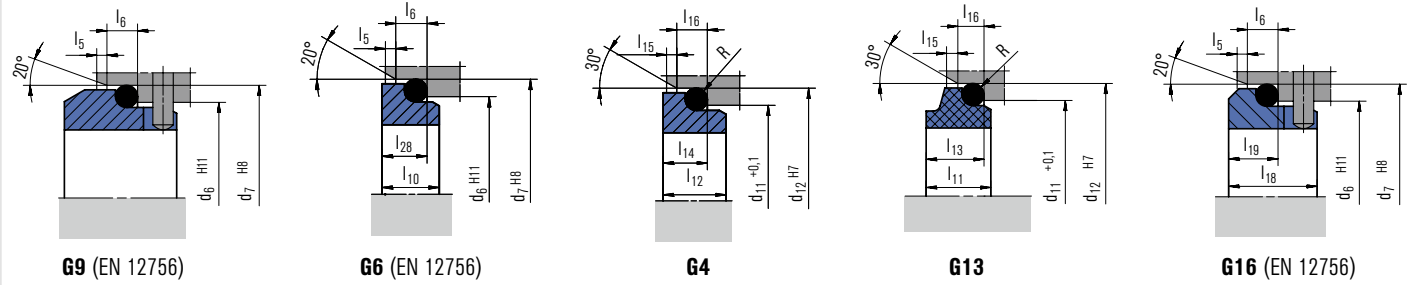


M32



M37G

## Seat alternatives



## Dimensions in mm

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>11</sub> <sup>1)</sup>	d <sub>12</sub> <sup>1)</sup>	d <sub>13</sub>	db	l <sub>1N</sub>	l <sub>3</sub> <sup>3)</sup>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>	l <sub>11</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>18</sub>	l <sub>19</sub>	l <sub>21</sub> <sup>3)</sup>	l <sub>22</sub>	l <sub>23</sub>	l <sub>28</sub>	b <sup>2)</sup>	R
6	14	-	-	-	11.5	16	16	8	-	-	-	-	-	-	-	-	9	6.5	7.1	5.6	1.2	3.8	-	-	10.5	11.9	-	-	-	1.2
8	18	-	-	-	15.5	19.2	18	11	-	-	-	-	-	-	-	-	9	8	7.1	7	1.2	3.8	-	-	15.5	16.9	-	-	-	1.2
10*	19	17	21	3	15.5	19.2	20	13	40	15.5	1.5	4	8.5	17.5	10	7.5	9	7.5	7.1	6.6	1.2	3.8	-	-	15.5	16.9	-	6.6	(8)	1.2
12*	21	19	23	3	17.5	21.6	22	16	40	16	1.5	4	8.5	17.5	10	7.5	10	6.5	7.6	5.6	1.2	3.8	-	-	15.5	17.4	-	6.6	(8)	1.2
14*	23	21	25	3	20.5	24.6	24	18	40	16.5	1.5	4	8.5	17.5	10	7.5	10	6.5	7.6	5.6	1.2	3.8	-	-	15.5	17.4	16.5	6.6	(8)	1.2
15	24	-	-	-	20.5	24.6	25	19	-	-	-	-	-	-	-	-	11	7.5	8.6	6.6	1.2	3.8	-	-	15.5	17.4	-	-	-	1.2
16*	26	23	27	3	22	28	26	21	40	18	1.5	4	8.5	17.5	10	7.5	11.5	8.5	9	7.5	1.5	5	-	-	17.5	19.5	16.5	6.6	(8)	1.5
18*	29	27	33	3	24	30	31	23	45	19.5	2	5	9	19.5	11.5	8.5	12.5	9	10	8	1.5	5	15	7	18.5	20.5	18	7.5	(8)	1.5
20*	31	29	35	3	29.5	35	34	26	45	22	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	20	22	19	7.5	(8)	1.5
22*	33	31	37	3	29.5	35	36	28	45	21.5	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	21.5	23.5	20.5	7.5	(8)	1.5
24*	35	33	39	3	32	38	38	30	50	23.5	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	23	25	22	7.5	(8)	1.5
25*	36	34	40	3	32	38	39	31	50	26.5	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	24.5	26.5	23.5	7.5	(8)	1.5
26	37	-	-	-	34	40	40	32	-	-	-	-	9	-	-	-	13	9	10	8	1.5	5	-	-	24.5	26.5	23.5	-	-	1.5
28*	40	37	43	3	36	42	42	35	50	26.5	2	5	9	19.5	11.5	8.5	14	10	11	9	1.5	5	15	7	24.5	26.5	24.5	7.5	(8)	1.5
30*	43	39	45	3	39.2	45	44	37	50	26.5	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	15	7	24.5	25	24.5	7.5	(8)	1.5
32*	46	42	48	3	42.2	48	46	39	55	28.5	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	15	7	28	28.5	28	7.5	(8)	1.5
33*	47	42	48	3	-	47	40	55	28.5	2	5	9	19.5	11.5	8.5	-	12	-	-	-	-	-	15	7	-	-	-	7.5	(8)	1.5
35*	49	44	50	3	46.2	52	49	43	55	28.5	2	5	9	19.5	11.5	8.5	14.5	12	11.5	11	1.5	5	15	7	28	28.5	28	7.5	(8)	1.5
38*	53	49	56	4	49.2	55	54	45	55	33.5	2	6	9	22	14	10	14.5	11.3	11.5	10.3	1.5	5	16	8	31	32.2	31	9	7.5	1.5
40*	56	51	58	4	52.2	58	56	49	55	36	2	6	9	22	14	10	14.5	11.8	11.5	10.8	1.5	5	16	8	34	34.7	34	9	(8)	1.5
42	59	-	-	-	53.3	62	58	52	-	-	-	-	9	-	-	-	17	13.2	14.3	12	2	6	-	-	35	37.3	35	-	-	2.5
43*	59	54	61	4	-	-	59	52	60	38.5	2	6	9	22	14	10	-	13.2	-	-	2	-	16	8	-	-	-	9	7.5	2.5
45*	61	56	63	4	55.3	64	61	55	60	39.5	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	16	8	36.5	39.2	36.5	9	(8)	2.5
48*	64	59	66	4	59.7	68.4	64	58	60	46	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	16	8	42	44.7	42	9	(8)	2.5
50*	66	62	70	4	60.8	69.3	66	61	60	45	2.5	6	9	23	15	10.5	17	12.8	14.3	11.6	2	6	17	9.5	43	45.7	43	9.5	(8)	2.5
53*	69	65	73	4	-	-	69	64	70	47	2.5	6	9	23	15	12	-	13.5	-	-	-	-	17	9.5	-	-	-	11	8	2.5
55*	71	67	75	4	66.5	75.4	71	66	70	49	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	17	9.5	47	49	47	11	(8)	2.5
58*	76	70	78	4	69.5	78.4	78	69	70	55	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	18	10.5	50	52	50	11	(8)	2.5
60*	78	72	80	4	71.5	80.4	79	71	70	55	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	18	10.5	51	53	51	11	(8)	2.5
63*	83	75	83	4	-	-	83	74	70	55	2.5	6	9	23	15	12	-	14.2	-	-	-	-	18	10.5	-	-	-	11	(8)	2.5
65*	84	77	85	4	76.5	85.4	85	77	80	55	2.5	6	9	23	15	12	18	14.2	15.3	13	2	6	18	10.5	52	54.3	52	11	(8)	2.5
68*	88	81	90	4	82.7	91.5	88	80	80	55	2.5	7	9	26	18	12.5	19	14.9	16	13.7	2	6	18.5	11	53	55.3	52.7	11.3	(8)	2.5
70*	90	83	92	4	83	92	90	83	80	57	2.5	7	9	26	18	12.5	18	14.2	15.3	13	2	6	19	11.5	54	56.3	54	11.3	(10)	2.5
75*	98	88	97	4	90.2	99	98	88	80	62	2.5	7	9	26	18	12.5	18	15.2	15.3	14	2	6	19	11.5	55	56.3	54	11.3	(10)	2.5
80*	100	95	105	4	95.2	104	103	93	90	61.8	3	7	9	26.2	18.2	13	19	16.2	16.3	15	2	6	19	11.5	58	59.3	58	12	10	2.5

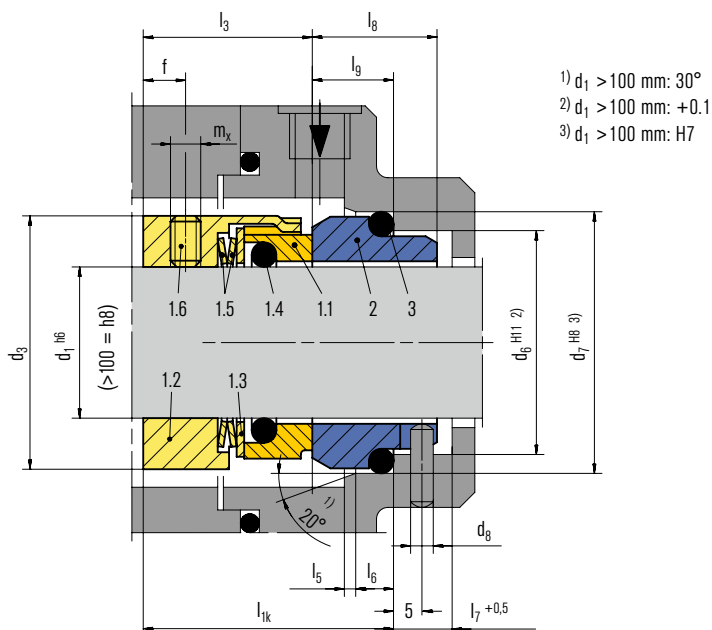
<sup>1)</sup> Fitting dimensions d<sub>11</sub> and d<sub>12</sub> only apply to type M37G with d<sub>1</sub> > 16 mm

<sup>2)</sup> Dimensions in brackets lie either above or below l<sub>1N</sub>

<sup>3)</sup> l<sub>3</sub> valid for M3...N, l<sub>21</sub> valid for M3

\* in accordance with EN 12756

# M7N



## Features

- For plain shafts
- Single seal
- Unbalanced
- Super-Sinus-spring or multiple springs rotating
- Independent of direction of rotation
- Pumping screw for media with higher viscosity (M7..F)
- Variant with PTFE secondary seals for high chemical resistance (M78N)

## Advantages

- Universal application opportunities
- Efficient stock keeping
- due to easily interchangeable faces
- Extended selection of materials
- Insensitive to low solids contents
- Flexibility in torque transmissions
- Self cleaning effect
- Short installation length possible (G16)

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 14 \dots 100 \text{ mm}$  (0.55" ... 3.94")  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t = -50 \text{ °C} \dots +220 \text{ °C}$   
 (-58 °F ... +428 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)  
 Axial movement:  
 $d_1 = \dots 25 \text{ mm}$ : ±1 mm  
 $d_1 = 28 \dots 63 \text{ mm}$ : ±1.5 mm  
 $d_1 = \text{from } 65 \text{ mm}$ : ±2 mm

## Materials

Seal face: Special cast CrMo steel (S), Silicon carbide (Q1, Q2), Aluminium Oxide (V)  
 Seat G9: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Silicon carbide (Q1\*, Q2\*)  
 Seat G4: Silicon carbide (Q1\*, Q2\*)  
 Seat G6: Silicon carbide (Q1\*, Q2\*)  
 Seat G13: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B)

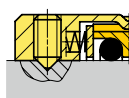
Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)  
 Springs: CrNiMo steel (G)  
 Metal parts: CrNiMo steel (G), Duplex (G1)

\* Cannot be combined with seal face in S

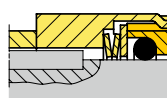
## Standards and approvals

• EN 12756

## Torque transmissions



$d_1 > 100 \text{ mm}$  (3,94")  
 Torque transmission by  
 4 set screws with cone  
 point. Offset: 90°



Drive key  
 (M7S2 / M74S2)

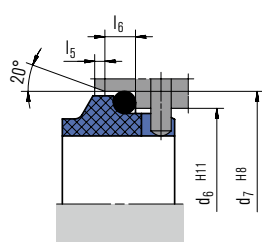
## Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	485	Drive collar
1.3	474	Thrust ring
1.4	412.1	O-Ring
1.5	477	Spring
1.6	904	Set screw
2	475	Seat (G9)
3	412.2	O-Ring

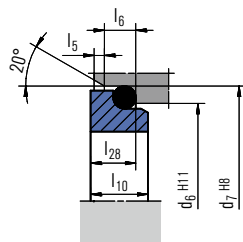
## Recommended applications

- Process industry
- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Shipbuilding
- Food and beverage industry
- Lube oils
- Low solids content media
- Water / sewage water pumps
- Chemical standard pumps
- Vertical screw pumps
- Gear wheel feed pumps
- Multistage pumps (drive side)
- Circulation of printing colors with viscosity
- 500 ... 15,000 mm<sup>2</sup>/s

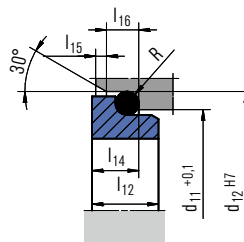
## Seat alternatives



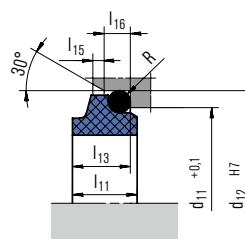
G9 (EN 12756)



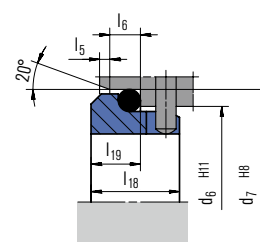
G6 (EN 12756)



G4



G13



G16 (EN 12756, but  $l_{1k}$  is shorter than specified)

**Product variants**

**M74**

Dimensions, items and descriptions as for M7N, but with multiple springs (Item no. 1.5). Preferably for  $d_1 > 100$  mm (3.94").

**M7F**

Shaft diameter:  $d_1 = \text{max. } 100$  mm (3.94")  
Dimensions, items and descriptions as for type M7N, but with pumping screw. Dependent on direction of rotation! (Viscosity  $\leq$  ISO VG10).

**M74F**

Shaft diameter:  $d_1 = 14 \dots 200$  mm (0.55" ... 7.87")  
Dimensions, items and descriptions as for type M7N, but with multiple springs and pumping screw. Dependent on direction of rotation! (Viscosity  $\leq$  ISO VG10).

**M7S2**

Shaft diameter:  $d_1 = \text{max. } 100$  mm (3.94")  
Dimensions, items and descriptions as for type M7N, but with drive key. (without item no. 1.6).

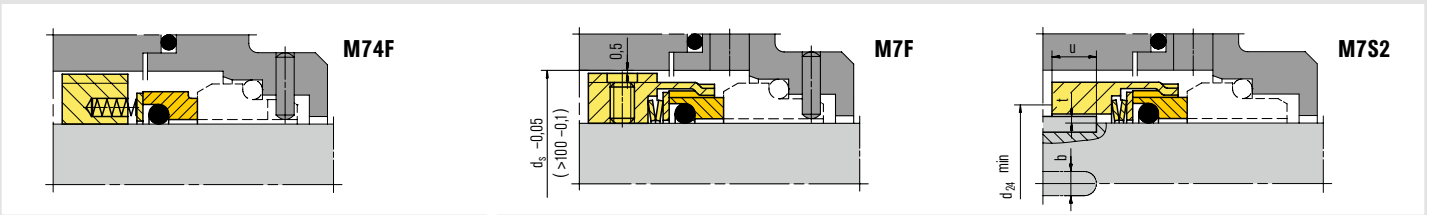
**M74S2**

Shaft diameter:  $d_1 = 28 \dots 200$  mm (1.10" ... 7.87")  
Dimensions, items and descriptions as for type M7N, but with multiple springs and drive key. (without item no. 1.6).

**M78N**

Shaft diameter:  $d_1 = 18 \dots 100$  mm (0.71" ... 3.94")  
Temperature:  $t = \text{max. } 180$  °C (356 °F)  
Dimensions, items and description as for M7N. Design of the seal face especially for secondary sealing element made of PTFE (T).  
Seal face: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Silicon carbide (Q1)\*  
Seat G9: Special cast CrMo steel (S)\*, Silicon carbide (Q1)

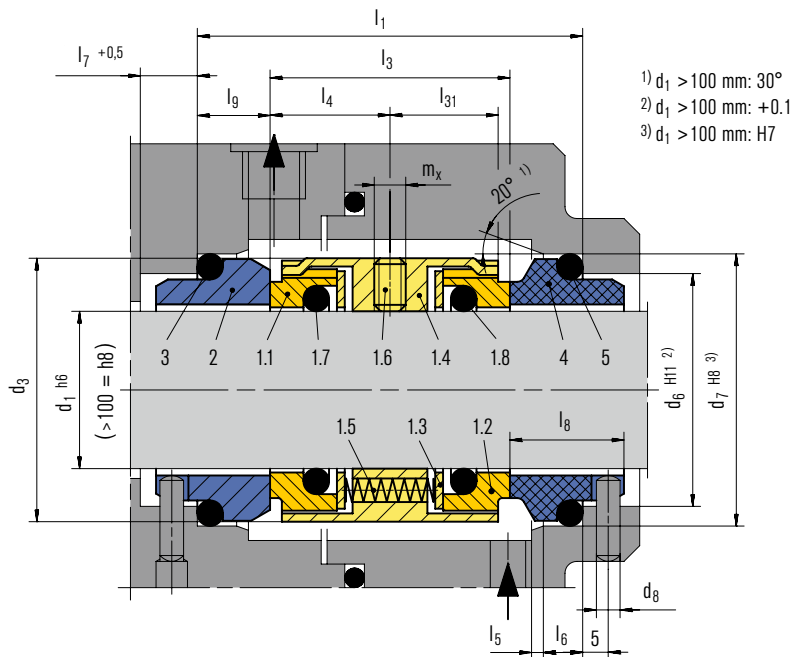
\* Cannot be combined with seal face made of silicon carbide (Q1)



**Dimensions in mm**

$d_1$	$d_3$	$d_6$	$d_7$	$d_8$	$d_{11}$	$d_{12}$	$d_{24}$	$d_s$	$l_{1k}$	$l_3$	$l_5$	$l_6$	$l_7$	$l_8$	$l_9$	$l_{10}$	$l_{11}$	$l_{12}$	$l_{13}$	$l_{14}$	$l_{15}$	$l_{16}$	$l_{18}$	$l_{19}$	$l_{28}$	b	f	mx	$u_{max.}$	t	R	
14*	25	21	25	3	20.5	24.6	16	34	35	25	1.5	4	8.5	17.5	10	7.5	10	6.5	7.6	5.6	1.2	3.8	-	-	6.6	4	6	M5	10	1.5	1.2	
16*	27	23	27	3	22	28	18	36	35	25	1.5	4	8.5	17.5	10	7.5	11.5	8.5	9	7.5	1.2	3.8	-	-	6.6	4	6	M5	10	1.5	1.5	
18*	33	27	33	3	24	30	20	38	37.5	26	2	5	9	19.5	11.5	8.5	12.5	9	10	8	1.5	5	15	7	7.5	5	7	M5	12	1.1	1.5	
20*	35	29	35	3	29.5	35	22	40	37.5	26	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	7.5	5	7	M5	12	1.1	1.5	
22*	37	31	37	3	29.5	35	24	42	37.5	26	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	7.5	6	7	M5	12	1.5	1.5	
24*	39	33	39	3	32	38	26	44	40	28.5	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	7.5	6	8	M5	12	1.5	1.5	
25*	40	34	40	3	32	38	27	45	40	28.5	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	15	7	7.5	6	8	M5	12	1.5	1.5	
28*	43	37	43	3	36	42	30	47	42.5	31	2	5	9	19.5	11.5	8.5	14	10	11	9	1.5	5	15	7	7.5	6	8	M6	13	1.5	1.5	
30*	45	39	45	3	39.2	45	32	49	42.5	31	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	15	7	7.5	6	8	M6	13	1.5	1.5	
32*	47	42	48	3	42.2	48	34	51	42.5	31	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	15	7	7.5	6	8	M6	13	1.5	1.5	
33*	48	42	48	3	44.2	50	35	51	42.5	31	2	5	9	19.5	11.5	8.5	14.5	12	11.5	10.5	1.5	5	15	7	7.5	6	8	M6	13	1.5	1.5	
35*	50	44	50	3	46.2	52	37	54	42.5	31	2	5	9	19.5	11.5	8.5	14.5	12	11.5	11	1.5	5	15	7	7.5	6	8	M6	13	1.5	1.5	
38*	55	49	56	4	49.2	55	40	59	45	31	2	6	9	22	14	10	14.5	11.3	11.5	10.3	1.5	5	16	8	9	6	8	M6	13	1.5	1.5	
40*	57	51	58	4	52.2	58	42	61	45	31	2	6	9	22	14	10	14.5	11.8	11.5	10.8	1.5	5	16	8	9	6	8	M6	13	1.5	1.5	
43*	60	54	61	4	53.3	62	45	65	45	31	2	6	9	22	14	10	17	13.2	14.3	12	2	6	16	8	9	6	8	M6	13	1.5	2.5	
45*	62	56	63	4	55.3	64	47	66	45	31	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	16	8	9	6	8	M6	13	1.5	2.5	
48*	65	59	66	4	59.7	68.4	50	69	45	31	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	16	8	9	6	8	M6	13	1.5	2.5	
50*	67	62	70	4	60.8	69.3	52	71	47.5	32.5	2.5	6	9	23	15	10.5	17	12.8	14.3	11.6	2	6	17	9.5	9.5	6	8	M6	13	1.5	2.5	
53*	70	65	73	4	63.8	72.3	55	75	47.5	32.5	2.5	6	9	23	15	12	17	13.5	14.3	12.3	2	6	17	9.5	11	6	8	M6	13	1.5	2.5	
55*	72	67	75	4	66.5	75.4	57	76	47.5	32.5	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	17	9.5	11	6	8	M6	13	1.5	2.5	
58*	79	70	78	4	69.5	78.4	60	83	52.5	37.5	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	18	10.5	11	8	9	M8	13	1.9	2.5	
60*	81	72	80	4	71.5	80.4	62	85	52.5	37.5	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	18	10.5	11	8	9	M8	13	1.9	2.5	
63*	84	75	83	4	74.5	83.4	65	88	52.5	37.5	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	18	10.5	11	8	9	M8	13	1.9	2.5	
65*	86	77	85	4	76.5	85.4	67	95	52.5	37.5	2.5	6	9	23	15	12	18	14.2	15.3	13	2	6	18	10.5	11	8	9	M8	13	1.9	2.5	
68*	89	81	90	4	82.7	91.5	70	93	52.5	34.5	2.5	7	9	26	18	12.5	19	14.9	16	13.7	2	6	18.5	11	11.3	8	9	M8	13	1.9	2.5	
70*	91	83	92	4	83	92	72	95	60	42	2.5	7	9	26	18	12.5	18	14.2	15.3	13	2	6	19	11.5	11.3	8	9	M8	16	1.9	2.5	
75*	99	88	97	4	90.2	99	77	105	60	42	2.5	7	9	26	18	12.5	18	15.2	15.3	14	2	6	19	11.5	11.3	8	10	M8	16	1.9	2.5	
80*	104	95	105	4	95.2	104	82	109	60	41.8	3	7	9	26.2	18.2	13	19	16.2	16.3	15	2	6	19	11.5	12	8	10	M8	16	1.9	2.5	
85*	109	100	110	4	100.2	109	87	114	60	41.8	3	7	9	26.2	18.2	15	19	16	16.3	14.8	2	6	19	11.5	14	8	10	M8	16	1.9	2.5	
90*	114	105	115	4	105.2	114	92	119	65	46.8	3	7	9	26.2	18.2	15	19	16	16.3	14.8	2	6	20.5	13	14	10	10	M8	20	2.3	2.5	
95*	119	110	120	4	111.6	120.3	97	124	65	47.8	3	7	9	25.2	17.2	15	20	17	17.3	15.8	2	6	20.5	13	14	10	10	M8	20	2.3	2.5	
100*	124	115	125	4	114.5	123.3	102	129	65	47.8	3	7	9	25.2	17.2	15	20	17	17.3	15.8	2	6	20.5	13	14	10	10	M8	20	2.3	2.5	
105	138	122.2	134.3	5	-	-	108	143	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
110	143	128.2	140.3	5	-	-	113	148	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
115	148	136.2	148.3	5	-	-	118	153	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
120	153	138.2	150.3	5	-	-	123	158	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
125	158	142.2	154.3	5	-	-	128	163	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
130	163	146.2	158.3	5	-	-	133	168	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
135	168	152.2	164.3	5	-	-	138	173	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
140	173	156.2	168.3	5	-	-	143	178	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
145	178	161.2	173.3	5	-	-	148	183	67	47	2	10	12	30	20	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
150	183	168.2	180.3	5	-	-	153	188	69	47	2	10	12	32	22	-	-	-	-	-	-	-	-	-	-	-	10	10	M8	20	2.3	-
155	191	173.2	185.3	5	-	-	158	196	80	56	2	12	12	34	24	-	-	-	-	-	-	-	-	-	-	-	12	12	M8	24	2.1	-
160	196	178.2	190.3	5	-	-	163	201	80	56	2	12	12	34	24	-	-	-	-	-	-	-	-	-	-	-	12	12	M8	24	2.1	-
165	201	183.2	195.3	5	-	-	168	206	80	56	2	12	12	34	24	-	-	-	-	-	-	-	-	-	-	-	12	12	M8	24	2.1	-
170	206	188.2	200.3	5	-	-	173	211	80	56	2	12	12	34	24	-	-	-	-	-	-	-	-	-	-	-	12	12	M8	24	2.1	-
175	211	193.2	205.3	5	-	-	178	216	80	56	2	1																				

# M74-D



### Features

- For plain shafts
- Dual seal
- Unbalanced
- Rotating multiple springs
- Independent of direction of rotation
- Seal concept based on the M7 range
- Variant with pumping screw available (M74F-D)

### Advantages

- Efficient stock keeping due to easily interchangeable faces
- Extended selection of materials
- Flexibility in torque transmissions
- EN 12756 (for connection dimensions d1 up to 100 mm (3.94"))

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 18 \dots 200 \text{ mm}$  (0.71" ... 7.87")  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t = -50 \text{ }^\circ\text{C} \dots +220 \text{ }^\circ\text{C}$   
 (-58 °F ... +428 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)  
 Axial movement:  
 $d_1$  up to 100 mm:  $\pm 0.5 \text{ mm}$   
 $d_1$  from 100 mm:  $\pm 2.0 \text{ mm}$

### Materials

Seal face: Special cast CrMo steel (S), Silicon carbide (Q1, Q2)  
 Seat G9: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Silicon carbide (Q1\*, Q2\*)  
 Seat G4: Silicon carbide (Q1\*, Q2\*)  
 Seat G6: Silicon carbide (Q1\*, Q2\*)  
 Seat G13: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B)

\* Cannot be combined with seal face in S

### Standards and approvals

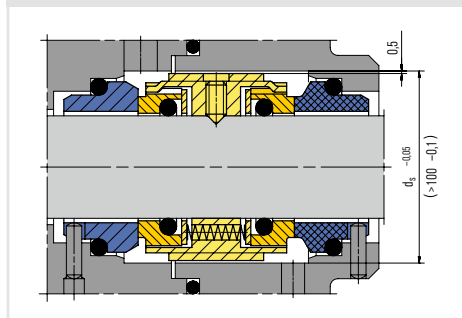
- EN 12756

### Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472.1	Seal face
1.2	472.2	Seal face
1.3	474	Thrust ring
1.4	485	Drive collar
1.5	477	Spring
1.6	904	Set screw
1.7	412.1	O-Ring
1.8	412.2	O-Ring
2	475.1	Seat (G9)
3	412.3	O-Ring
4	75.2	Seat (G9)
5	12.4	O-Ring

### Product variant

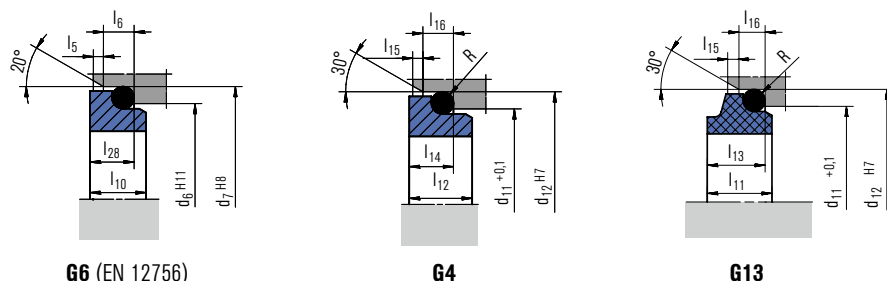
**M74F-D**  
 Dimensions, items and descriptions as for M74-D, but with pumping screw. (Viscosity  $\leq$  ISO VG10).  
 Dependent on direction of rotation.



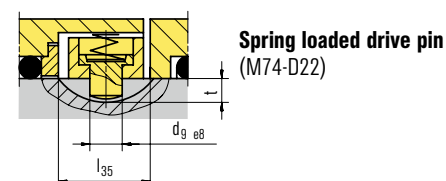
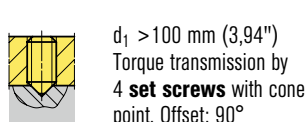
### Recommended applications

- Process industry
- Chemical industry
- Pulp and paper industry
- Low solids content and low abrasive media
- Toxic and hazardous media
- Media with poor lubrication properties
- Adhesives
- Chemical standard pumps

### Seat alternatives



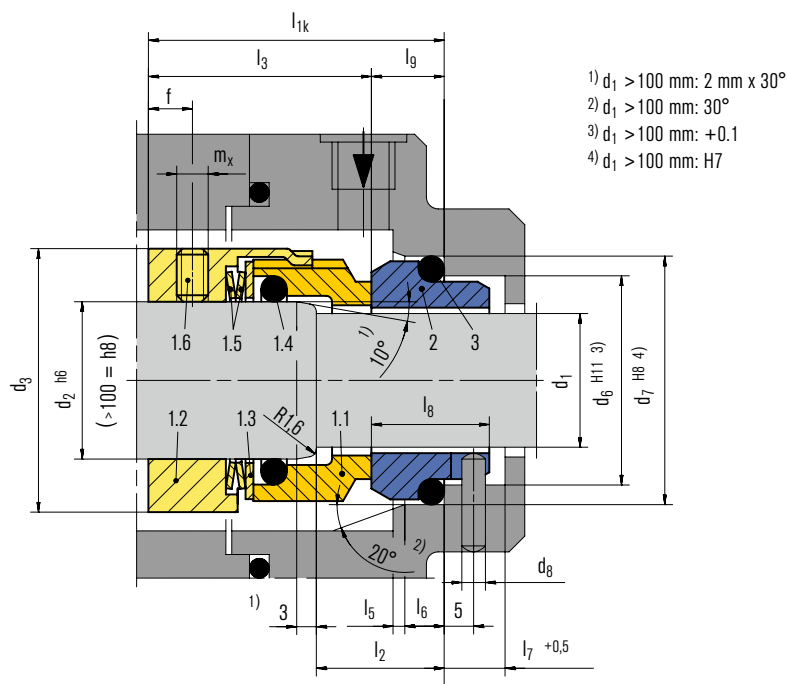
### Torque transmissions



**Dimensions in mm**

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>s</sub>	l <sub>1</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>	l <sub>11</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>28</sub>	l <sub>31</sub>	l <sub>35</sub>	m <sub>x</sub>	t	R	
18	33	27	33	3	4	24	30	-	61	38	19	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	7.5	17	15	M5	3.5	1.5	
20	35	29	35	3	4	29.5	35	-	61	38	19	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	7.5	17	15	M5	3.5	1.5	
22	37	31	37	3	4	29.5	35	42	61	38	19	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	7.5	17	15	M5	3.5	1.5	
24	39	33	39	3	4	32	38	44	61	38	19	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	7.5	17	15	M5	3.5	1.5	
25	40	34	40	3	4	32	38	45	61	38	19	2	5	9	19.5	11.5	8.5	12.5	8.5	9.5	7.5	1.5	5	7.5	17	15	M5	3.5	1.5	
28	43	37	43	3	4	36	42	47	62	39	19.5	2	5	9	19.5	11.5	8.5	14	10	11	9	1.5	5	7.5	17.5	15	M6	3.5	1.5	
30	45	39	45	3	4	39.2	45	49	62	39	19.5	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	7.5	17.5	15	M6	3.5	1.5	
32	47	42	48	3	4	42.2	48	51	62	39	19.5	2	5	9	19.5	11.5	8.5	14	11.5	11	10.5	1.5	5	7.5	17.5	15	M6	3.5	1.5	
33	48	42	48	3	4	44.2	50	51	62	39	19.5	2	5	9	19.5	11.5	8.5	14.5	12	11.5	10.5	1.5	5	7.5	17.5	15	M6	3.5	1.5	
35	50	44	50	3	4	46.2	52	54	62	39	19.5	2	5	9	19.5	11.5	8.5	14.5	12	11.5	11	1.5	5	7.5	17.5	15	M6	3.5	1.5	
38	55	49	56	4	4	49.2	55	59	69	41	20.5	2	6	9	22	14	10	14.5	11.3	11.5	10.3	1.5	5	9	18.5	15	M6	3.5	1.5	
40	57	51	58	4	4	52.2	58	61	70	42	21	2	6	9	22	14	10	14.5	11.8	11.5	10.8	1.5	5	9	19	15	M6	3.5	1.5	
43	60	54	61	4	4	53.3	62	65	70	42	21	2	6	9	22	14	10	17	13.2	14.3	12	2	6	9	19	15	M6	3.5	2.5	
45	62	56	63	4	4	55.3	64	66	70	42	21	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	9	19	15	M6	3.5	2.5	
48	65	59	66	4	4	59.7	68.4	69	70	42	21	2	6	9	22	14	10	17	12.8	14.3	11.6	2	6	9	19	15	M6	3.5	2.5	
50	67	62	70	4	4	60.8	69.3	71	73	43	21.5	2.5	6	9	23	15	10.5	17	12.8	14.3	11.6	2	6	9.5	19.5	15	M6	3.5	2.5	
53	70	65	73	4	4	63.8	72.3	75	73	43	21.5	2.5	6	9	23	15	12	17	13.5	14.3	12.3	2	6	11	19.5	15	M6	3.5	2.5	
55	72	67	75	4	4	66.5	75.4	76	73	43	21.5	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	11	19.5	15	M8	3.5	2.5	
58	79	70	78	4	5	69.5	78.4	83	86	56	28	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	11	23.5	19	M8	3.5	2.5	
60	81	72	80	4	5	71.5	80.4	85	86	56	28	2.5	6	9	23	15	12	18	14.5	15.3	13.3	2	6	11	23.5	19	M8	3.5	2.5	
63	84	75	83	4	5	74.5	83.4	88	85	55	27.5	2.5	6	9	23	15	12	18	14.2	15.3	13.3	2	6	11	24.5	19	M8	3.5	2.5	
65	86	77	85	4	5	76.5	85.4	95	85	55	27.5	2.5	6	9	23	15	12	18	14.2	15.3	13	2	6	11	24.5	19	M8	3.5	2.5	
68	89	81	90	4	5	82.7	91.5	93	91	55	27.5	2.5	7	9	26	18	12.5	19	14.9	16	13.7	2	6	11.3	24.5	19	M8	3.5	2.5	
70	91	83	92	4	5	83	92	95	92	56	28	2.5	7	9	26	18	12.5	18	14.2	15.3	13	2	6	11.3	23.5	19	M8	3.5	2.5	
75	99	88	97	4	5	90.2	99	105	92	56	28	2.5	7	9	26	18	12.5	18	15.2	15.3	14	2	6	11.3	25.5	19	M8	3.5	2.5	
80	104	95	105	4	5	95.2	104	109	92.5	56	28	3	7	9	26.2	18.2	13	19	16.2	16.3	15	2	6	12	25.5	19	M8	3.5	2.5	
85	109	100	110	4	5	100.2	109	114	92.5	56	28	3	7	9	26.2	18.2	15	19	16	16.3	14.8	2	6	14	25	19	M8	3.5	2.5	
90	114	105	115	4	5	105.2	114	119	92.5	56	28	3	7	9	26.2	18.2	15	19	16	16.3	14.8	2	6	14	25.5	19	M8	3.5	2.5	
95	119	110	120	4	5	111.6	120.3	124	90.5	56	28	3	7	9	25.2	17.2	15	20	17	17.3	15.8	2	6	14	25	19	M8	3.5	2.5	
100	124	115	125	4	5	114.5	123.3	129	90.5	56	28	3	7	9	25.2	17.2	15	20	17	17.3	15.8	2	6	14	25	19	M8	3.5	2.5	
105	138	122.2	134.3	5	7	-	-	143	108	68	34	2	10	-	30	20	-	-	-	-	-	-	-	-	-	30.5	22	M8	3.5	-
110	143	128.2	140.3	5	7	-	-	148	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
115	148	136.2	148.3	5	7	-	-	153	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
120	153	138.2	150.3	5	7	-	-	158	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
125	158	142.2	154.3	5	7	-	-	163	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
130	163	146.2	158.3	5	7	-	-	168	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
135	168	152.2	164.3	5	7	-	-	173	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
140	173	156.2	168.3	5	7	-	-	178	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
145	178	161.2	173.3	5	7	-	-	183	110	70	35	2	10	-	30	20	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
150	183	168.2	180.3	5	7	-	-	188	114	70	35	2	10	-	32	22	-	-	-	-	-	-	-	-	-	31.5	22	M8	3.5	-
155	191	173.2	185.3	5	7	-	-	196	127	79	39.5	2	12	-	34	24	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
160	196	178.2	190.3	5	7	-	-	201	127	79	39.5	2	12	-	34	24	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
165	201	183.2	195.3	5	7	-	-	206	127	79	39.5	2	12	-	34	24	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
170	206	188.2	200.3	5	7	-	-	211	127	79	39.5	2	12	-	34	24	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
175	211	193.2	205.3	5	7	-	-	216	127	79	39.5	2	12	-	34	24	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
180	216	207.5	219.3	5	7	-	-	221	135	79	39.5	2	12	-	38	28	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
185	221	212.5	224.3	5	7	-	-	226	135	79	39.5	2	12	-	38	28	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
190	226	217.5	229.3	5	7	-	-	231	135	79	39.5	2	12	-	38	28	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
195	231	222.5	234.3	5	7	-	-	236	135	79	39.5	2	12	-	38	28	-	-	-	-	-	-	-	-	-	35.5	22	M8	3.5	-
200	236	227.5	239.3	5	7	-	-	241	135	79	39.5	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

# H7N



## Features

- For stepped shafts
- Single seal
- Balanced
- Super-Sinus-spring or multiple springs rotating
- Independent of direction of rotation
- Integrated pumping device available (H7F, H75F)
- Variant with seat cooling available (H75G115)

## Advantages

- Universal application opportunities (standardization)
- Efficient stock keeping due to easily interchangeable faces
- Extended selection of materials
- Flexibility in torque transmissions
- Self cleaning effect
- Short Installation length possible (G16)

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 14 \dots 100 \text{ mm}$  (0.55" ... 3.94")  
(Single spring:  $d_1 = \text{max. } 100 \text{ mm}$  (3.94"))

Pressure:

$p_1 = 80 \text{ bar}$  (1.160 PSI) for  $d_1 = 14 \dots 100 \text{ mm}$ ,

$p_1 = 25 \text{ bar}$  (363 PSI) for  $d_1 = 100 \dots 200 \text{ mm}$ ,

$p_1 = 16 \text{ bar}$  (232 PSI) for  $d_1 > 200 \text{ mm}$

Temperature:  $t = -50 \text{ }^\circ\text{C} \dots +220 \text{ }^\circ\text{C}$

( $-58 \text{ }^\circ\text{F} \dots +428 \text{ }^\circ\text{F}$ )

Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

Axial movement:

$d_1 \dots 22 \text{ mm}$ :  $\pm 1.0 \text{ mm}$

$d_1 \dots 24 \dots 58 \text{ mm}$ :  $\pm 1.5 \text{ mm}$

$d_1$  from 60 mm:  $\pm 2.0 \text{ mm}$

## Materials

Seal face: Silicon carbide (Q1, Q2), Carbon graphite antimony impregnated (A), Aluminium oxide (V), Special cast CrMo steel (S)

Seat G9: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Silicon carbide (Q1\*, Q2\*)

Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)

Springs: CrNiMo steel (G)

Metal parts: CrNiMo steel (G), Duplex (G1)

\* Cannot be combined with seal face in S

## Standards and approvals

- EN 12756

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Power plant technology
- Pulp and paper industry
- Food and beverage industry
- Hot water applications
- Light hydrocarbons
- Boiler feed pumps
- Process pumps

## Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	485	Drive collar
1.3	474	Thrust ring
1.4	412.1	O-Ring
1.5	477	Spring
1.6	904	Set screw
2	475	Seat (G9)
3	412.2	O-Ring

## Product variants

### H75

Shaft diameter:  $d_1 = 28 \dots 200 \text{ mm}$  (1.10" ... 7.87")

As H7N, but with multiple springs in sleeves (Item no. 1.5)

Axial movement:  $\pm 2 \dots 4 \text{ mm}$ , dependent on diameter.

### H76

Shaft diameter:  $d_1 = 14 \dots 100 \text{ mm}$  (0.55" ... 3.94")

Dimensions, items and descriptions as for H7N, but with special single spring (Item no. 1.5) for compensating large axial movements ( $\pm 4 \text{ mm}$ ).

### H7F

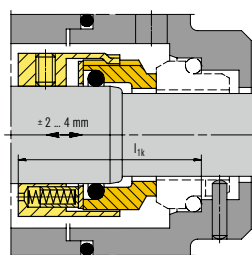
Shaft diameter:  $d_1 = \text{max. } 100 \text{ mm}$  (3.94")

Dimensions, items and descriptions as for H7N, but with single spring and pumping screw. Dependent on direction of rotation! (Viscosity  $\leq$  ISO VG10).

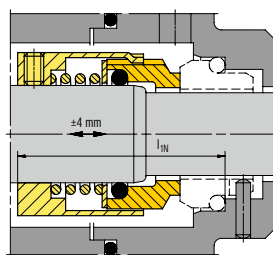
### H75F

Shaft diameter:  $d_1 = 28 \dots 200 \text{ mm}$  (1.10" ... 7.87")

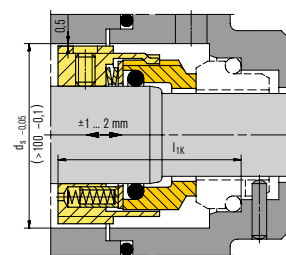
Dimensions, items and descriptions as for H7N, but with multiple springs and pumping screw. Dependent on direction of rotation! (Viscosity  $\leq$  ISO VG10).



H75



H76

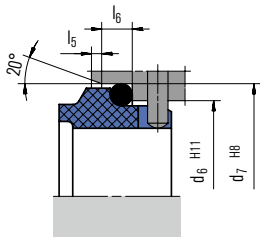


H7F/H75F

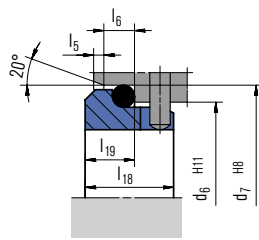


## Seat alternatives

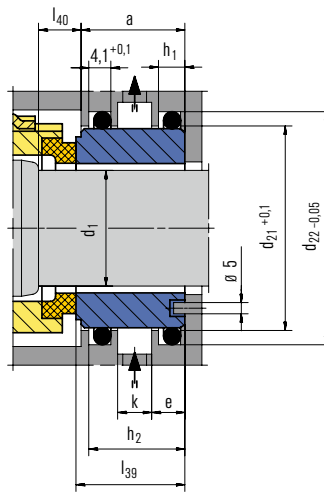
## Torque transmissions



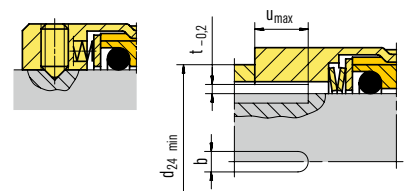
**G9** (EN 12756)



**G16** (EN 12756, but  $l_{1k}$  and  $l_2$  are shorter than specified)



**G115** Cooled seat especially for hot water applications.



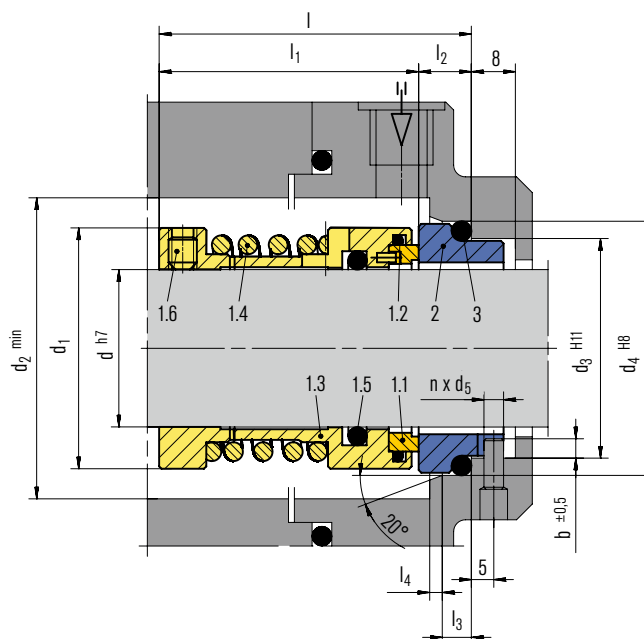
$d_1 > 100$  mm (3.94")  
Torque transmission by  
**4 set screws** with cone  
point. Offset: 90°

**Drive key**  
(H7S2/H7S2)

## Dimensions in mm

$d_1$	$d_2$	$d_3$	$d_6$	$d_7$	$d_8$	$d_{24}$	$d_{21}$	$d_{22}$	$d_s$	$l_{1k}$	$l_{1N}$	$l_2$	$l_3$	$l_5$	$l_6$	$l_7$	$l_8$	$l_9$	$l_{39}$	$l_{40}$	$a$	$b$	$e$	$f$	$h_1$	$h_2$	$k$	$m_x$	$u_{max}$	$t$
14*	18	33	21	25	3	20	-	-	38	42.5	-	18	32.5	1.5	4	8.5	17.5	10	-	-	-	5	-	6	-	-	-	M5	9	1.1
16*	20	35	23	27	3	22	-	-	40	42.5	-	18	32.5	1.5	4	8.5	17.5	10	-	-	-	5	-	6	-	-	-	M5	9	1.1
18*	22	37	27	33	3	24	-	-	42	45	55	20	33.5	2	5	9	19.5	11.5	-	-	-	6	-	7	-	-	-	M5	9	1.5
20*	24	39	29	35	3	26	-	-	44	45	60	20	33.5	2	5	9	19.5	11.5	-	-	-	6	-	5.5	-	-	-	M5	9	1.5
22*	26	41	31	37	3	28	-	-	45	45	60	20	33.5	2	5	9	19.5	11.5	-	-	-	6	-	8	-	-	-	M5	9	1.5
24*	28	43	33	39	3	30	-	-	47	47.5	60	20	36	2	5	9	19.5	11.5	-	-	-	6	-	5.5	-	-	-	M6	9	1.5
25*	30	45	34	40	3	32	-	-	49	47.5	60	20	36	2	5	9	19.5	11.5	-	-	-	6	-	5.5	-	-	-	M6	9	1.5
28*	33	48	37	43	3	35	44.65	50.57	51	50	65	20	38.5	2	5	9	19.5	11.5	24	8.5	24	6	8	8	6.6	22.6	9	M6	12	1.5
30*	35	50	39	45	3	37	47.83	53.75	54	50	65	20	38.5	2	5	9	19.5	11.5	24.5	9	24	6	8	8	6.6	22.6	9	M6	12	1.5
32*	38	55	42	48	3	40	47.83	53.75	59	50	65	20	38.5	2	5	9	19.5	11.5	24.5	9	24	6	8	8	6.6	22.6	9	M6	12	1.5
33*	38	55	42	48	3	40	47.83	53.75	59	50	65	20	38.5	2	5	9	19.5	11.5	24.5	9	24	6	8	8	6.6	22.6	9	M6	12	1.5
35*	40	57	44	50	3	42	51	56.92	61	50	65	20	38.5	2	5	9	19.5	11.5	24.5	9	24	6	8	8	6.6	22.6	9	M6	12	1.5
38*	43	60	49	56	4	45	54.18	60.1	65	52.5	75	23	38.5	2	6	9	22	14	26	11	24	6	8	8	6.6	22.6	9	M6	12	1.5
40*	45	62	51	58	4	47	60.53	66.45	66	52.5	75	23	38.5	2	6	9	22	14	26	11	24	6	8	8	6.6	22.6	9	M6	12	1.5
43*	48	65	54	61	4	50	63.7	69.62	69	52.5	75	23	38.5	2	6	9	22	14	26	11	24	6	8	8	6.6	22.6	9	M6	12	1.5
45*	50	67	56	63	4	52	63.7	69.62	71	52.5	75	23	38.5	2	6	9	22	14	26	11	24	6	8	8	6.6	22.6	9	M6	12	1.5
48*	53	70	59	66	4	55	66.88	72.8	75	52.5	85	23	38.5	2	6	9	22	14	26	11	24	6	8	8	6.6	22.6	9	M6	12	1.5
50*	55	72	62	70	4	57	70.05	75.97	76	57.5	85	25	42.5	2.5	6	9	23	15	26.5	12.5	24	6	8	8	6.6	22.6	9	M6	12	1.5
53*	58	79	65	73	4	60	76.4	82.32	83	57.5	85	25	42.5	2.5	6	9	23	15	26.5	12.5	24	8	8	9	6.6	22.6	9	M8	12	1.9
55*	60	81	67	75	4	62	76.4	82.32	85	57.5	85	25	42.5	2.5	6	9	23	15	28.5	12.5	26	8	8	9	6.6	24.6	11	M8	12	1.9
58*	63	84	70	78	4	65	79.58	85.5	88	62.5	85	25	47.5	2.5	6	9	23	15	28.5	12.5	26	8	8	9	6.6	24.6	11	M8	15	1.9
60*	65	86	72	80	4	67	82.75	88.67	95	62.5	95	25	47.5	2.5	6	9	23	15	28.5	12.5	26	8	8	9	6.6	24.6	11	M8	15	1.9
63*	68	89	75	83	4	70	85.93	91.85	93	62.5	95	25	47.5	2.5	6	9	23	15	28.5	12.5	26	8	8	9	6.6	24.6	11	M8	14	1.9
65*	70	91	77	85	4	72	85.93	91.85	95	62.5	95	25	47.5	2.5	6	9	23	15	28.5	12.5	26	8	8	9	6.6	24.6	11	M8	15	1.9
70*	75	99	83	92	4	77	89.1	95.02	105	70	95	28	52	2.5	7	9	26	18	30.5	14.5	26	8	8	10	6.6	24.6	11	M8	15	1.9
75*	80	104	88	97	4	82	98.63	104.55	109	70	105	28	52	2.5	7	9	26	18	30.5	14.5	26	8	8	10	6.6	24.6	11	M8	15	1.9
80*	85	109	95	105	4	87	101.8	107.72	114	70	105	28	51.8	3	7	9	26.2	18.2	30.2	14	26	8	8	10	6.6	24.6	11	M8	15	1.9
85*	90	114	100	110	4	92	108.15	114.07	119	75	105	28	56.8	3	7	9	26.2	18.2	30.2	14	26	10	8	10	6.6	24.6	11	M8	18	2.3
90*	95	119	105	115	4	97	114.5	120.42	124	75	105	28	56.8	3	7	9	26.2	18.2	30.2	14	26	10	8	10	6.6	24.6	11	M8	18	2.3
95*	100	124	110	120	4	102	117.68	123.6	129	75	105	28	57.8	3	7	9	25.2	17.2	29.2	14	26	10	8	10	6.6	24.6	11	M8	18	2.3
100*	105	129	115	125	4	107	124.03	129.95	134	75	105	28	57.8	3	7	9	25.2	17.2	29.2	14	26	10	8	10	6.6	24.6	11	M8	18	2.3
105*	115	148	122.2	134.3	5	118	128.98	134.9	153	73	-	32	53	2	10	-	30	20	29.2	15.2	26	10	8	10	6.6	24.6	11	M8	18	2.3
110*	120	153	128.2	140.3	5	123	135.3	141.2	158	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
115*	125	158	136.2	148.3	5	128	140.3	146.2	163	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
120*	130	163	138.2	150.3	5	133	145.3	151.2	168	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
125*	135	168	142.2	154.3	5	138	150.3	156.2	173	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
130*	140	173	146.2	158.3	5	143	155.3	161.2	178	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
135*	145	178	152.2	164.3	5	148	160.3	166.2	183	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
140*	150	183	156.2	168.3	5	153	165.3	171.2	188	73	-	32	53	2	10	-	30	20	32.5	14.5	30	10	9.5	10	6.6	28.6	13	M8	18	2.3
145*	155	191	161.2	173.3	5	158	172.3	178.2	196	83	-	34	63	2	10	-	30	20	34.5	16.5	32	12	10	12	7.1	30.1	14	M8	22	2.1
150*	160	196	168.2	180.3	5	163	177.3	183.2	201	85	-	36	63	2	10	-	32	22	34.5	16.5	32	12	10	12	7.1	30.1	14	M8	22	2.1
155*	165	201	173.2	185.3	5	168	182.3	188.2	206	87	-	38	63	2	12	-	34	24	34.5	16.5	32	12	10	12	7.1	30.1	14	M8	22	2.1
160*	170	206	178.2	190.3	5	173	187.3	193.2	211	87	-	38	63	2	12	-	34	24	34.5	16.5	32	12	10	12	7.1	30.1	14	M8	22	2.1
165*	175	211	183.2	195.3	5	178	192.3	198.2	216	87	-	38	63	2	12	-	34	24	34.5	16.5	32	12	10	12	7.1	30.1	14	M8	22	2.1
170*	180	216	188.2	200.3	5	183	197.3	203.2	221	87	-	38	63	2	12	-	34	24	37	16.5	34.5	12	10	12	7.1	32.1	16	M8	22	2.1
175*	185	221	193.2	205.3	5	188	202.3	208.2	226	87	-	38	63	2	12	-	34	24	37	16.5	34.5	12	10	12	7.1	32.1	16	M8	22	2.1
180*	190	226	207.5	219.3	5	193	207.3	213.2	231	91	-	42	63	2	12	-	38	28	37	16.5	34.5	12	10	12	7.1	32.1	16	M8	22	2.1
185*	195	231	212.5	224.3	5	198	212.3	218.2	236	91	-	42	63	2	12	-	38	28	37	16.5	34.5	12	10	12	7.1	32.1	16	M8	22	2.1
190*	200	236	217.5	229.3	5	203	217.3	223.2	241																					

# HA211



## Features

- Single seal
- Unbalanced
- Independent of direction of rotation
- Positive torque transmission due to bayonet drive between seal head and drive collar
- O-Ring groove for ventilation prevents solids build-up and enhances flexibility

## Operating range (see note on page 1)

Pressure:  $p = 12$  bar (174 PSI)  
 Temperature:  $t = -20$  °C ...  $+160$  °C ( $-4$  °F ...  $+320$  °F)  
 Sliding velocity: ... 20 m/s (66 ft/s)  
 Viscosity: ... 300 Pa·s  
 Solids content: ... 7 %

## Materials

Seal face: Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: EPDM (E), FKM (V)  
 Metal parts: CrNiMo steel (G)

## Recommended applications

- Pulp and paper industry
- Water and waste water technology
- High-viscosity liquids
- Pulp suspensions
- Process pumps
- Pulp pumps

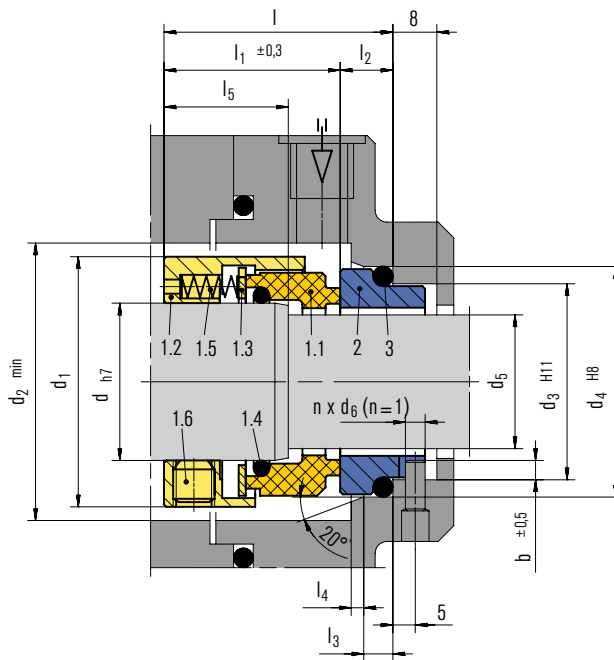
## Item Description

Item	Description
1.1	Seal face
1.2, 1.5, 3	O-Ring
1.3	Drive collar
1.4	Spring
1.6	Set screw
2	Seat

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	B
20	34	36	29	35	3	51	41	10	5.5	2	3.5
24	38	40	33	39	3	53	43	10	5.5	2	3.5
25	39	41	34	40	3	53	43	10	5.5	2	3.5
28	42	44	37	43	3	55	45	10	5.5	2	3.5
30	44	46	39	45	3	55	45	10	5.5	2	3.5
32	46	48	42	48	3	55	45	10	5.5	2	3.5
33	47	49	42	48	3	55	45	10	5.5	2	3.5
35	49	51	44	50	3	59	49	10	5.5	2	3.5
38	54	58	49	56	4	64	53	11	6	2	4
40	56	60	51	58	4	66	55	11	6	2	4
43	59	63	54	61	4	66	55	11	6	2	4
45	61	65	56	63	4	66	55	11	6	2	4.5
48	64	68	59	66	4	66	55	11	6	2	4.5
50	66	70	62	70	4	73	60	13	6	2.5	4.5
53	69	73	65	73	4	74	61	13	6	2.5	5
55	71	75	67	75	4	74	61	13	6	2.5	5
60	78	85	72	80	4	76	63	13	6	2.5	5
63	81	88	75	83	4	76	63	13	6	2.5	5
65	84	90	77	85	4	80	67	13	6	2.5	5
70	90	95	83	92	4	83	68	15	7	2.5	5
75	95	104	88	97	4	87	72	15	7	2.5	5
80	100	109	95	105	4	87.5	72	15.5	7	3	6
85	107	114	100	110	4	92.5	77	15.5	7	3	6
90	112	119	105	115	4	92.5	77	15.5	7	3	6
95	119	124	110	120	4	97.5	82	15.5	7	3	6
100	124	129	115	125	4	97.5	82	15.5	7	3	6

# LB500



### Features

- Single seal
- Balanced
- Independent of direction of rotation
- Rotating multiple springs

### Advantages

- API 682 (Type A) compliant
- Fits to EN and ANSI seal chambers
- Optimized, narrow width seal face design

### Operating range (see note on page 1)

Pressure:  $p = \text{vacuum} \dots 35 \text{ bar (508 PSI)}$   
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +200 \text{ }^\circ\text{C} (-4 \text{ }^\circ\text{F} \dots +392 \text{ }^\circ\text{F})$   
 Sliding velocity:  $v_g = \dots 20 \text{ m/s (66 ft/s)}$   
 Viscosity:  $\dots 500 \text{ mPa}\cdot\text{s}$   
 Solids content:  $\dots 0.5 \%$

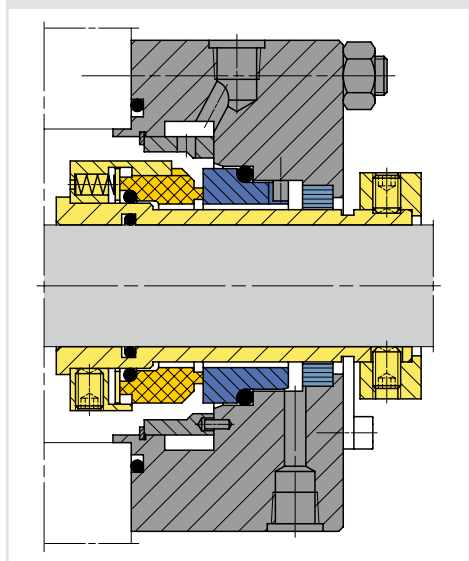
### Materials

Seal face: Carbon graphite resin impregnated (B),  
 High density carbon graphite  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V)  
 Metal parts: CrNiMo steel (G)

### Product variant

#### Configuration sample

in acc. with API 682 (1CW-FX)



### Standards and approvals

- API 682/ISO 21049
- ANSI

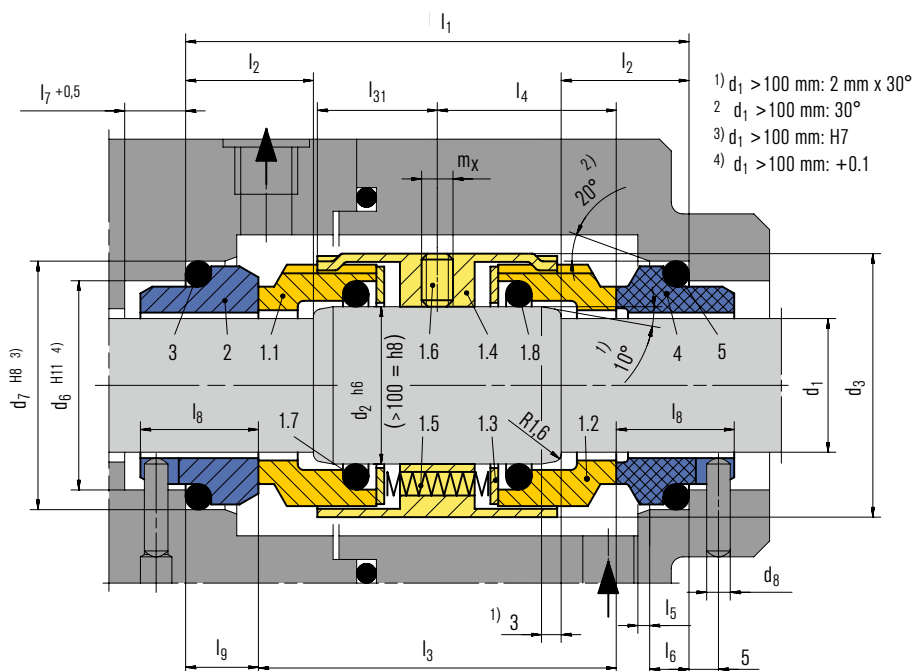
### Recommended applications

- Chemical industry
- Process industry
- Acids
- Alkaline solutions
- Salt solutions
- Low viscosity oils
- Monomers
- Hydrocarbons
- Water
- Seawater
- Process pumps

### Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	b
25	39	41	29	35	20	44	34	10	5.5	2	24	3	3.5
28	42	44	33	39	24	44	34	10	5.5	2	24	3	3.5
30	44	46	34	40	25	44	34	10	5.5	2	24	3	3.5
32	46	48	37	43	27	44	34	10	5.5	2	24	3	3.5
33	47	49	37	43	28	44	34	10	5.5	2	24	3	3.5
35	49	51	39	45	30	44	34	10	5.5	2	24	3	3.5
38	55	58	42	48	33	45	35	10	5	2	25	3	3.5
40	57	60	44	50	35	45	35	10	5	2	25	3	3.5
42	59	62	49	56	37	48	37	11	5	2	25	4	4
43	60	63	49	56	38	48	37	11	5	2	25	4	4
45	62	65	51	58	40	48	37	11	5	2	25	4	4.5
48	65	68	54	61	43	48	37	11	5	2	25	4	4.5
50	67	70	56	63	45	48	37	11	6	2	25	4	4.5
53	70	73	59	66	48	48	37	11	6	2	25	4	4.5
55	72	75	62	70	50	50	37	13	6	2.5	25	4	4.5
60	77	85	67	75	55	50	37	13	6	2.5	25	4	5
63	80	88	70	78	58	50	37	13	6	2.5	25	4	5
65	82	90	72	80	60	50	37	13	6	2.5	25	4	5
70	87	95	77	85	65	50	37	13	6	2.5	25	4	5
75	92	104	83	92	70	53	38	15	7	2.5	25	4	5
80	97	109	88	97	75	53	38	15	7	2.5	25	4	5
85	102	114	95	105	80	53	37.5	15.5	7	3	25	4	6
90	107	119	100	110	85	53	37.5	15.5	7	3	25	4	6
95	112	124	105	115	90	53	37.5	15.5	7	3	25	4	6
100	117	129	110	120	95	53	37.5	15.5	7	3	25	4	6
105	122	134	115	125	100	4	53	37.5	15.5	7	3	25	6
110	127	139	120	130	105	4	53	37.5	15.5	7	3	25	6

# H74-D



## Features

- For stepped shafts
- Dual seal
- Balanced
- Rotating multiple springs
- Independent of direction of rotation
- Seal concept based on the H7 range
- Variant with pumping screw available (H74F-D)

## Advantages

- Efficient stock keeping due to easily interchangeable faces
- Extended selection of materials
- Flexibility in torque transmissions
- Insensitive to low solids contents
- EN 12756  
(For connection dimensions  $d_1$  up to 100 mm (3.94"))

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 14 \dots 200$  mm (0.55" ... 7.87")

Pressure:

$p_1 = 80$  bar (1.160 PSI) for  $d_1 = 14 \dots 100$  mm,

$p_1 = 25$  bar (363 PSI) for  $d_1 = 100 \dots 200$  mm,

$p_1 = 16$  bar (232 PSI) for  $d_1 > 200$  mm

Temperature:  $t = -50$  °C ... +220 °C

(-58 °F ... +428 °F)

Sliding velocity:  $v_0 = 20$  m/s (66 ft/s)

Axial movement:

$d_1$  up to 100 mm:  $\pm 0.5$  mm

$d_1$  from 100 mm:  $\pm 2.0$  mm

## Materials

Seal face: Silicon carbide (Q1, Q2), Carbon graphite antimony impregnated (A), Aluminium oxide (V), Special cast CrMo steel (S)

Seat G9: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Silicon carbide (Q1\*, Q2\*)

Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)

Springs: CrNiMo steel (G)

Metal parts: CrNiMo steel (G), Duplex (G1)

\* Cannot be combined with seal face in S

## Standards and approvals

- EN 12756

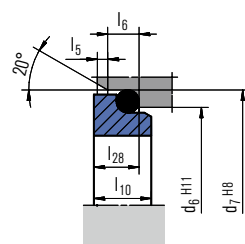
## Item Part no. to DIN 24250 Description

1.1	472.1	Seal face
1.2	472.2	Seal face
1.3	474	Thrust ring
1.4	485	Drive collar
1.5	477	Spring
1.6	904	Set screw
1.7	412.1	O-Ring
1.8	412.2	O-Ring
2	475.1	Seat (G9)
3	412.3	O-Ring
4	475.2	Seat (G9)
5	412.4	O-Ring

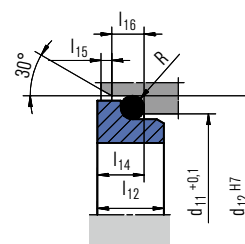
## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Pulp and paper industry
- Power plant technology
- Low solids content and low abrasive media
- Toxic and hazardous media
- Media with poor lubrication properties
- Adhesives
- Chemical standard pumps

## Seat alternatives



G6 (EN 12756)



G4

## Torque transmission

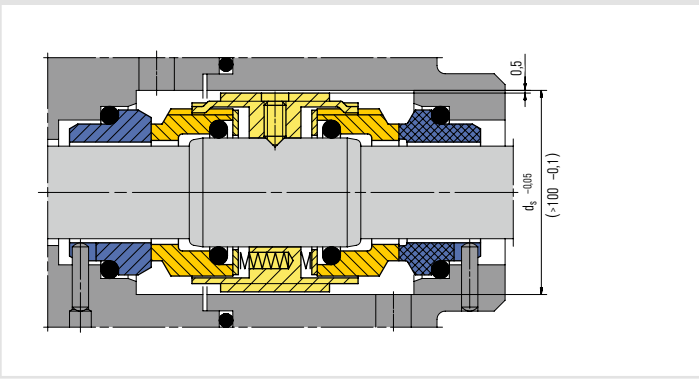


$d_{12} \geq 105$  mm Torque transmission by 4 set screws with cone point. Offset: 90°

**Product variant**

**H74F-D**

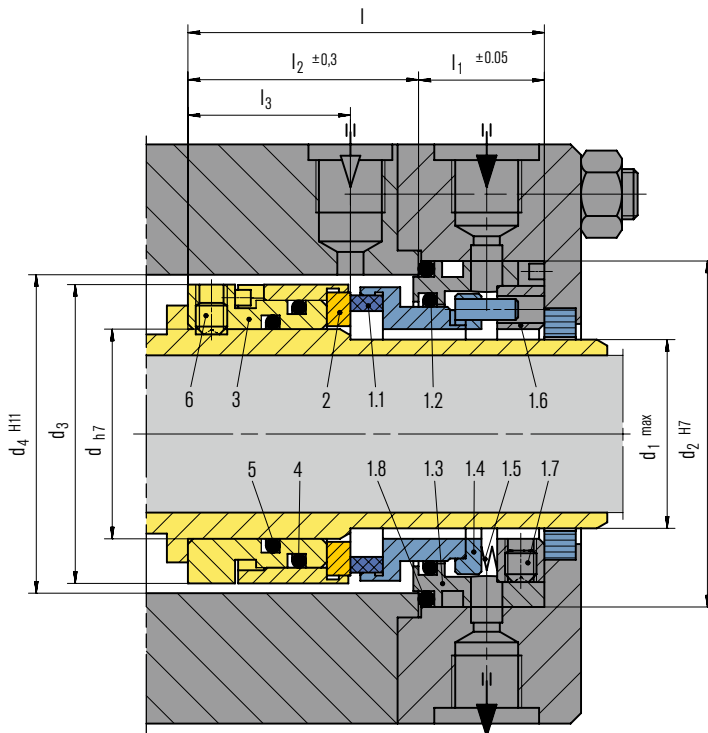
Dimensions, items and descriptions as for H74-D, but with pumping screw.  
Dependent on direction of rotation.



**Dimensions in mm**

d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>s</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>	l <sub>12</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>28</sub>	l <sub>31</sub>	m <sub>x</sub>	R	
14	18	33	21.0	25.0	3	24.0	30.0	-	73.0	18	53.0	26.5	1.5	4	8.5	17.5	10.0	7.5	6.5	5.6	1.5	5	6.6	17.0	M5	1.2	
16	20	35	23.0	27.0	3	29.5	35.0	-	73.0	18	53.0	26.5	1.5	4	8.5	17.5	10.0	7.5	8.5	7.5	1.5	5	6.6	17.0	M5	1.5	
18	22	37	27.0	33.0	3	29.5	35.0	42	76.0	20	53.0	26.5	2.0	5	9.0	19.5	11.5	8.5	9.0	8.0	1.5	5	7.5	17.0	M5	1.5	
20	24	39	29.0	35.0	3	32.0	38.0	44	76.0	20	53.0	26.5	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5	7.5	17.0	M5	1.5	
22	26	41	31.0	37.0	3	32.0	38.0	45	76.0	20	53.0	26.5	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5	7.5	17.0	M5	1.5	
24	28	43	33.0	39.0	3	36.0	42.0	47	77.0	20	54.0	27.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5	7.5	17.5	M6	1.5	
25	30	45	34.0	40.0	3	39.2	45.0	49	77.0	20	54.0	27.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5	7.5	17.5	M6	1.5	
28	33	48	37.0	43.0	3	42.2	48.0	51	77.0	20	54.0	27.0	2.0	5	9.0	19.5	11.5	8.5	10.0	9.0	1.5	5	7.5	17.5	M6	1.5	
30	35	50	39.0	45.0	3	44.2	50.0	54	77.0	20	54.0	27.0	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5	7.5	17.5	M6	1.5	
32	38	55	42.0	48.0	3	46.2	52.0	59	79.0	20	56.0	28.0	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5	7.5	18.5	M6	1.5	
33	38	55	42.0	48.0	3	49.2	55.0	59	79.0	20	56.0	28.0	2.0	5	9.0	19.5	11.5	8.5	12.0	10.5	1.5	5	7.5	18.5	M6	1.5	
35	40	57	44.0	50.0	3	52.2	58.0	61	80.0	20	57.0	28.5	2.0	5	9.0	19.5	11.5	8.5	12.0	11.0	1.5	5	7.5	19.0	M6	1.5	
38	43	60	49.0	56.0	4	53.3	62.0	65	85.0	23	57.0	28.5	2.0	6	9.0	22.0	14.0	10.0	11.3	10.3	2.0	6	9.0	19.0	M6	1.5	
40	45	62	51.0	58.0	4	55.3	64.0	66	85.0	23	57.0	28.5	2.0	6	9.0	22.0	14.0	10.0	11.8	10.8	2.0	6	9.0	19.0	M6	1.5	
43	48	65	54.0	61.0	4	59.7	68.4	69	85.0	23	57.0	28.5	2.0	6	9.0	22.0	14.0	10.0	13.2	12.0	2.0	6	9.0	19.0	M6	2.5	
45	50	67	56.0	63.0	4	60.8	69.3	71	84.0	23	56.0	28.0	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6	9.0	19.5	M6	2.5	
48	53	70	59.0	66.0	4	63.8	72.3	75	84.0	23	56.0	28.0	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6	9.0	19.5	M6	2.5	
50	55	72	62.0	70.0	4	66.5	75.4	76	93.0	25	63.0	31.5	2.5	6	9.0	23.0	15.0	10.5	12.8	11.6	2.0	6	9.5	19.5	M6	2.5	
53	58	79	65.0	73.0	4	69.5	78.4	83	97.0	25	67.0	33.5	2.5	6	9.0	23.0	15.0	12.0	13.5	12.3	2.0	6	11.0	23.5	M8	2.5	
55	60	81	67.0	75.0	4	71.5	80.4	85	97.0	25	67.0	33.5	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6	11.0	23.5	M8	2.5	
58	63	84	70.0	78.0	4	74.5	83.4	88	104.0	25	74.0	37.0	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6	11.0	24.5	M8	2.5	
60	65	86	72.0	80.0	4	76.5	85.4	95	104.0	25	74.0	37.0	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6	11.0	24.5	M8	2.5	
63	68	89	75.0	83.0	4	82.7	91.5	93	109.0	25	79.0	39.5	2.5	6	9.0	23.0	15.0	12.0	14.2	13.3	2.0	6	11.0	24.5	M8	2.5	
65	70	91	77.0	85.0	4	83.0	92.0	95	98.0	25	68.0	34.0	2.5	6	9.0	23.0	15.0	12.0	14.2	13.0	2.0	6	11.0	23.5	M8	2.5	
70	75	99	83.0	92.0	4	90.2	99.0	105	112.5	28	76.4	38.2	2.5	7	9.0	26.0	18.0	12.5	14.9	13.7	2.0	6	11.3	25.5	M8	2.5	
75	80	104	88.0	97.0	4	95.2	104.0	109	112.5	28	76.4	38.2	2.5	7	9.0	26.0	18.0	12.5	14.2	13.0	2.0	6	11.3	25.5	M8	2.5	
80	85	109	95.0	105.0	4	100.2	109.0	114	112.5	28	76.0	38.0	3.0	7	9.0	26.2	18.2	12.5	15.2	14.0	2.0	6	11.3	25.0	M8	2.5	
85	90	114	100.0	110.0	4	105.2	114.0	119	112.5	28	76.0	38.0	3.0	7	9.0	26.2	18.2	13.0	16.2	15.0	2.0	6	12.0	25.5	M8	2.5	
90	95	119	105.0	115.0	4	111.6	120.3	124	112.5	28	76.0	38.0	3.0	7	9.0	26.2	18.2	15.0	16.0	14.8	2.0	6	14.0	25.0	M8	2.5	
95	100	124	110.0	120.0	4	114.5	123.3	129	110.5	28	76.0	38.0	3.0	7	9.0	25.2	17.2	15.0	16.0	14.8	2.0	6	14.0	25.0	M8	2.5	
100	105	129	115.0	125.0	4	-	-	134	110.5	28	76.0	38.0	3.0	7	9.0	25.2	17.2	15.0	17.0	15.8	-	-	14.0	25.5	M8	2.5	
105	115	148	122.2	134.3	5	-	-	153	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	15.0	17.0	15.8	-	-	14.0	31.5	M8	2.5	
110	120	153	128.2	140.3	5	-	-	158	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
115	125	158	136.2	148.3	5	-	-	163	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
120	130	163	138.2	150.3	5	-	-	168	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
125	135	168	142.2	154.3	5	-	-	173	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
130	140	173	146.2	158.3	5	-	-	178	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
135	145	178	152.2	164.3	5	-	-	183	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
140	150	183	156.2	168.3	5	-	-	188	122.0	32	82.0	41.0	2.0	10	-	30.0	20.0	-	-	-	-	-	-	31.5	M8	-	
145	155	191	161.2	173.3	5	-	-	196	133.0	34	93.0	46.5	2.0	10	-	30.0	20.0	-	-	-	-	-	-	35.5	M8	-	
150	160	196	168.2	180.3	5	-	-	201	137.0	36	93.0	46.5	2.0	10	-	32.0	22.0	-	-	-	-	-	-	35.5	M8	-	
155	165	201	173.2	185.3	5	-	-	206	141.0	38	93.0	46.5	2.0	12	-	34.0	24.0	-	-	-	-	-	-	35.5	M8	-	
160	170	206	178.2	190.3	5	-	-	211	141.0	38	93.0	46.5	2.0	12	-	34.0	24.0	-	-	-	-	-	-	35.5	M8	-	
165	175	211	183.2	195.3	5	-	-	216	141.0	38	93.0	46.5	2.0	12	-	34.0	24.0	-	-	-	-	-	-	35.5	M8	-	
170	180	216	188.2	200.3	5	-	-	221	141.0	38	93.0	46.5	2.0	12	-	34.0	24.0	-	-	-	-	-	-	35.5	M8	-	
175	185	221	193.2	205.3	5	-	-	226	141.0	38	93.0	46.5	2.0	12	-	34.0	24.0	-	-	-	-	-	-	35.5	M8	-	
180	190	226	207.5	219.3	5	-	-	231	149.0	42	93.0	46.5	2.0	12	-	38.0	28.0	-	-	-	-	-	-	35.5	M8	-	
185	195	231	212.5	224.3	5	-	-	236	149.0	42	93.0	46.5	2.0	12	-	38.0	28.0	-	-	-	-	-	-	35.5	M8	-	
190	200	236	217.5	229.3	5	-	-	241	149.0	42	93.0	46.5	2.0	12	-	38.0	28.0	-	-	-	-	-	-	35.5	M8	-	
195	205	245	222.5	234.3	5	-	-	250	151.0	43	95.0	47.5	2.0	12	-	38.0	28.0	-	-	-	-	-	-	-	M10	-	
200	210	250	227.5	239.3	5	-	-	255	151.0	43	95.0	47.5	2.0	12	-	38.0	28.0	-	-	-	-	-	-	-	-	M10	-

# EK700



## Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary multiple springs

## Advantages

- Unitized construction allows easy conversion
- Springs located on the atmospheric side, no clogging
- High precision rotating assembly reduces "swashing" of seal head

## Operating range (see note on page 1)

Pressure:  $p = \dots 35 \text{ bar}$  (... 508 PSI)  
 Temperature:  $t = 160 \text{ }^\circ\text{C}$  (320  $^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 30 \text{ m/s}$  (98 ft/s)  
 Viscosity: ... 0.5 Pa-s  
 Solids content: ... 0.5 %

## Materials

Seal face: High density carbon graphite  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V)  
 Metal parts: CrNiMo steel (G)

## Recommended applications

- Chemical industry
- Refining technology
- Petrochemical industry
- Lubrication oil
- Light oil
- Gasoline
- Naphtha
- Water
- Process pumps

## Item

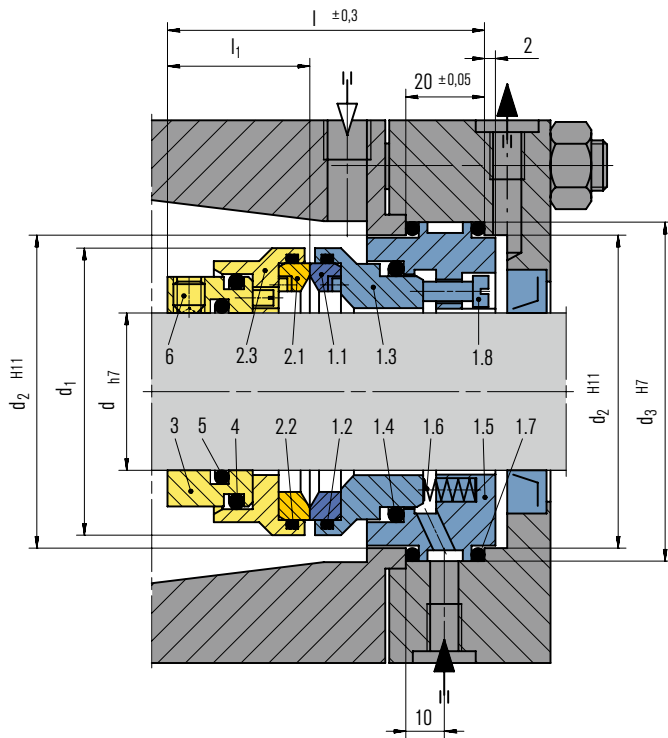
## Description

Item	Description
1.1	Seal face
1.2, 1.8, 4, 5	O-Ring
1.3	Housing
1.4	Thrust ring
1.5	Spring
1.6	Thrust ring
1.7, 6	Set screw
2	Seat
3	Drive collar

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
20	18	42	33	36	63	23	40	30
25	23	47	39	41	65	24	41	30
30	28	53	44	46	66	24	42	30
35	33	58	49	51	66	24	42	30
40	38	66	57	60	68	24	44	31
45	43	71	60	65	68	24	44	31
50	48	76	67	70	68	24	44	31
55	53	81	72	75	69	25	44	31
60	58	91	79	85	72.5	27.5	45	31
65	63	96	86	90	77	29	48	31
70	68	101	92	95	79.5	28.5	51	32
75	73	110	99	104	79.5	28.5	51	32
80	78	115	102	109	79.5	28.5	51	32
85	83	120	108	114	80.5	28.5	52	33
90	88	125	115	119	81.5	29.5	52	33
95	93	130	118	124	81.5	29.5	52	33
100	98	135	124	129	81.5	29.5	52	33
110	110	145	134	139	84.5	29.5	55	36
120	120	160	147	150	91	34	57	38
130	130	170	157	160	96	37	59	40
140	140	185	172	175	98	38	60	40
150	150	200	184	190	100	38	62	42

# Pulace



## Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary multiple springs
- Springs and pins not in contact with the medium

## Advantages

- Stationary seat and/or seal face replaceable
- Can be adopted under positive pressure or under back pressure
- Operation in vacuum without additional seat locking possible

## Operating range (see note on page 1)

Pressure:  $p = 10 \text{ bar (145 PSI)}$   
 Temperature:  $t = -20 \text{ °C ... } +200 \text{ °C (-4 °F ... } +392 \text{ °F)}$   
 Sliding velocity:  $v_g = 20 \text{ m/s (66 ft/s)}$   
 Viscosity: ... 100 Pa·s  
 Solids content: ... 20 %

## Materials

Seal face and seat: Silicon carbide (Q1),  
 Tungsten carbide (U7)  
 Metal parts: 1.4401 (G)  
 Secondary seals: EPDM (E)

## Recommended applications

- Sugar industry
- Pulp and paper industry
- Highly concentrated black water
- Green water
- White water
- Pulp suspensions
- Chemical solutions
- Alkaline solutions
- Slurries
- Highly viscous liquids
- Raw sludge pumps
- Thick juice pumps
- Conveying and bottling of dairy products

## Item

- 1.1
- 1.2, 1.4, 1.7, 2.2, 4, 5
- 1.3
- 1.5
- 1.6
- 1.8
- 2.1
- 2.3
- 3
- 6

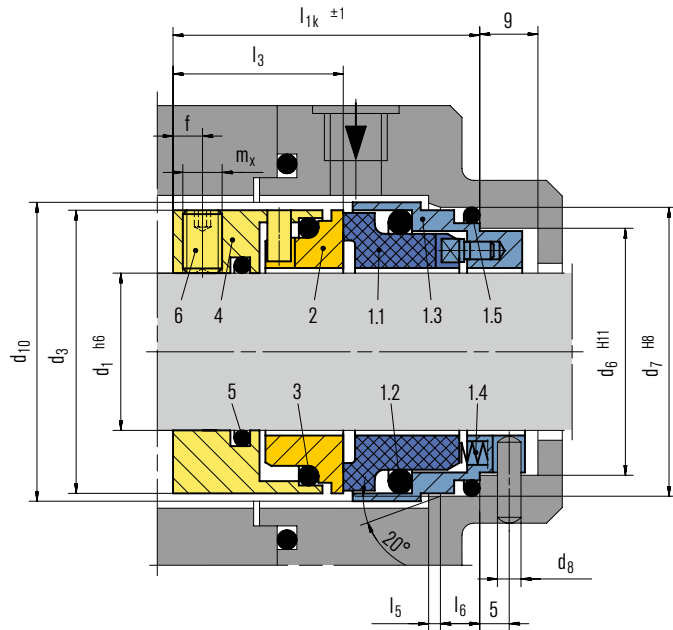
## Description

- Seal face
- O-Ring
- Retainer
- Adapter
- Spring
- Drive screw
- Seat
- Retainer
- Drive collar
- Set screw

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	l	l <sub>1</sub>
20	46	51	57	71	34
25	51	58	64	71	34
30	56	63	69	71	34
35	62	68	74	75	37
40	69	76	82	80	38
45	78	83	89	80	38
50	78	86	92	80	38
55	86	92	98	80	38
60	91	98	104	78	37
65	97	102	108	81	38
70	102	109	115	80	38
75	107	114	120	82	39
80	112	119	125	82	40
85	118	124	130	85	40
90	128	137	143	85	42
95	128	137	143	85	42
100	135	144	150	85	42

# HRN



## Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary springs
- Dual seals in tandem as well as back-to-back arrangements (also in combination with H10 seal)

## Advantages

- Spring unit averted from the product so no sticking and clogging of the springs
- Safe operation (no fractures) because of seal face locking by square pin
- Suitable for pressure reversals
- Operation in vacuum without additional seat locking possible
- No damage of the shaft by a dynamically loaded O-Ring
- Small installation sizes
- Best suitable for conversions, no adaptations of the pump
- Insensitive to solid containing and abrasive media
- Advantages of a balanced seal even with plain shafts
- Insensitive to shaft movements because of the stationary design

## Operating range (see note on page 1)

Shaft diameter:  $d = 18 \dots 100 \text{ mm}$  (0.71" ... 3.94")  
 Pressure:  $p_1^* = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$   
 (-40 °F ... +428 °F)  
 Sliding velocity:  $v_0 = 20 \text{ m/s}$  (66 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

\* Additional seat locking is not needed in vacuum operation.  
 For operation under vacuum it is necessary to arrange for quenching on the atmosphere side.

## Materials

Seal face: Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V), NBR (P), FFKM (K), PTFE (T)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G)

## Standards and approvals

- EN 12756

## Recommended applications

- Pulp and paper industry
- Water and waste water technology
- Dirty, abrasive and solid containing media
- Fugitive hydrocarbons (no API seal!)
- Sticky and stringy media
- Chemical standard pumps
- Sewage pumps

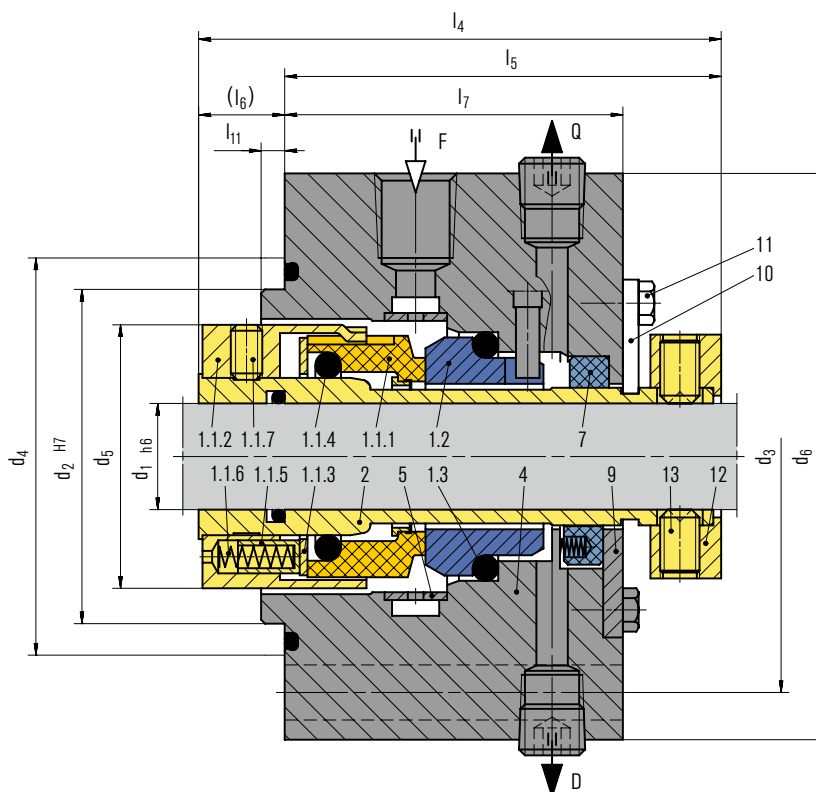
Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	412.1	O-Ring
1.3	485	Retainer
1.4	477	Spring
1.5	412.2	O-Ring
2	475	Seat
3	412.3	O-Ring
4	485	Drive collar
5	412.4	O-Ring
6	904	Set screw



## Dimensions in mm

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>10</sub>	l <sub>1k</sub>	l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>	f	m <sub>x</sub>
18	33	27	33	3	34.7	37.5	19.5	2	5	3	4
20	35	29	35	3	36.7	37.5	19.5	2	5	3	4
22	37	31	37	3	38.7	37.5	19.5	2	5	3	4
24	39	33	39	3	40.7	40	20.5	2	5	3.5	5
25	40	34	40	3	41.7	40	20.5	2	5	3.5	5
28	43	37	43	3	44.7	42.5	21.5	2	5	3.5	5
30	45	39	45	3	46.7	42.5	21.5	2	5	3.5	5
32	48	42	48	3	49.7	42.5	21.5	2	5	3.5	5
33	48	42	48	3	49.7	42.5	21.5	2	5	3.5	5
35	50	44	50	3	51.7	42.5	21.5	2	5	3.5	5
38	56	49	56	4	57.7	45	24	2	6	4	6
40	58	51	58	4	59.7	45	24	2	6	4	6
43	61	54	61	4	62.7	45	24	2	6	4	6
45	63	56	63	4	64.7	45	24	2	6	4	6
48	66	59	66	4	67.7	45	24	2	6	4	6
50	70	62	70	4	71.7	47.5	25	2.5	6	4	6
53	73	65	73	4	74.7	47.5	25	2.5	6	4	6
55	75	67	75	4	76.7	47.5	25	2.5	6	4	6
58	78	70	78	4	80.5	52.5	28	2.5	6	4	6
60	80	72	80	4	82.5	52.5	28	2.5	6	4	6
63	83	75	83	4	85.5	52.5	28	2.5	6	4	6
65	85	77	85	4	87.5	52.5	28	2.5	6	4	6
68	90	81	90	4	92.5	52.5	28	2.5	7	4	6
70	92	83	92	4	94.5	60	34	2.5	7	6	8
75	97	88	97	4	100.5	60	34	2.5	7	6	8
80	105	95	105	4	108.5	60	34	3	7	6	8
85	110	100	110	4	113.5	60	34	3	7	6	8
90	115	105	115	4	118.5	65	39	3	7	10	8
95	120	110	120	4	123.5	65	39	3	7	10	8
100	125	115	125	4	128.5	65	39	3	7	10	8

# H75VN



## Features

- Single seal
- Cartridge unit available
- Design acc. to API 682/ISO 21049
- Category 2 and 3, Type A, Arrangement 1
- Independent of direction of rotation
- Rotating multiple springs
- Integrated pumping device available (H75VP)

## Advantages

- "Low-Emission-Seal" acc. to the American STLE-limits
- Universally applicable both for retrofits or original equipment
- Efficient stock-keeping due to standardized components
- Extended selection of materials
- Extended field of operation in terms of temperature and pressure
- Metal parts also in special materials available

## Operating range (see note on page 1)

Shaft diameter:  $d = 20 \dots 110 \text{ mm}$  (0.79" ... 4.33")\*

Pressure:  $p_1 = 40 \text{ bar}$  (580 PSI)

Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$

(-40 °F ... +428 °F)

Sliding velocity:  $v_g = 23 \text{ m/s}$  (75 ft/s)

Axial movement:  $\pm 2.0 \dots 4.0 \text{ mm}$  depending on diameter and installation situation

\* Other sizes on request

## Materials

Seal face: Carbon graphite antimony impregnated (A)  
 Seat: Silicon carbide (Q1, Q2)  
 Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Duplex (G1)  
 Hastelloy® C-4 (M)

## Standards and approvals

- API 682/ISO 21049

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Power plant technology
- Hot water
- Light hydrocarbons
- API 610/ISO 13709 pumps
- Process pumps

## Item Description

Item	Description
1.1.1	Seal face
1.1.2	Drive collar
1.1.3	Thrust ring
1.1.4, 1.3	O-Ring
1.1.5	Sleeve
1.1.6	Spring
1.1.7, 1.3	Set screw
1.2	Seat
2	Shaft sleeve
4	Housing
5	Insert
7	Throttle ring
9	Washer
10	Assembly fixture
11	Hexagon bolt
12	Set ring

## Product variants

### H75VP

Dimensions, items and descriptions as H75VN, but with pumping ring. Shorter installation length possible.

### H75N

Dimensions, items and descriptions as H75VN.  
 Seal face: Silicon carbide (Q1, Q2)  
 Seat: Silicon carbide (Q1, Q2)

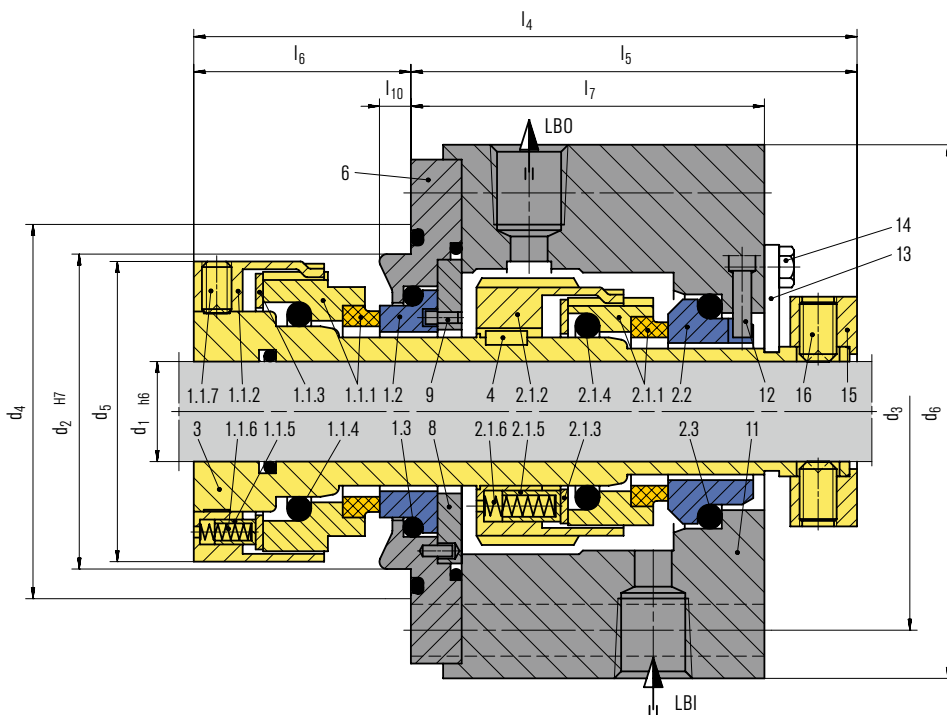
### Dimensions in mm

API/d <sub>1</sub>	API/d <sub>2</sub>	API/d <sub>3</sub>	API/d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>(6)</sub>	l <sub>7</sub>	l <sub>11</sub>	Overall length
<b>20</b>	70	105	85	50	138	95	94	1	76	6	<b>100</b>
<b>30</b>	80	115	95	62	148	100.5	98	2.5	77	6	<b>104</b>
<b>40</b>	90	125	105	72	158	105.5	98.5	7	77.5	6	<b>125</b>
<b>50</b>	100	140	115	86	168	111.5	99.5	12	78.5	6	<b>140</b>
<b>60</b>	120	160	135	99	188	120.5	102	18.5	81	6	<b>160</b>
<b>70</b>	130	170	145	109	198	124.5	106	18	81	6	<b>170</b>
<b>80</b>	140	180	155	119	208	129	106	23	81	6	<b>180</b>
<b>90</b>	160	205	175	129	238	129	106	23	81	6	<b>205</b>
<b>100</b>	170	215	185	153	248	133	109	24	81	6	<b>215</b>
<b>110</b>	180	225	195	168	258	133	109	24	81	6	<b>225</b>

### Dimensions in inch

API/d <sub>1</sub>	API/d <sub>2</sub>	API/d <sub>3</sub>	API/d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>(6)</sub>	l <sub>7</sub>	l <sub>11</sub>	Overall length
<b>0.787</b>	2.756	4.134	3.346	1.969	5.433	3.74	3.701	0.039	2.992	0.236	<b>3.937</b>
<b>1.181</b>	3.15	4.528	3.74	2.441	5.827	3.957	3.858	0.098	3.031	0.236	<b>4.094</b>
<b>1.575</b>	3.543	4.921	4.134	2.835	6.22	4.154	3.878	0.276	3.051	0.236	<b>4.921</b>
<b>1.969</b>	3.937	5.512	4.528	3.386	6.614	4.39	3.917	0.472	3.091	0.236	<b>5.512</b>
<b>2.362</b>	4.724	6.299	5.315	3.898	7.402	4.744	4.016	0.728	3.189	0.236	<b>6.299</b>
<b>2.756</b>	5.118	6.693	5.709	4.291	7.795	4.902	4.173	0.709	3.189	0.236	<b>6.693</b>
<b>3.15</b>	5.512	7.087	6.102	4.685	8.189	5.079	4.173	0.906	3.189	0.236	<b>7.087</b>
<b>3.543</b>	6.299	8.071	6.89	5.079	9.37	5.079	4.173	0.906	3.189	0.236	<b>8.071</b>
<b>3.937</b>	6.693	8.465	7.283	6.024	9.764	5.236	4.291	0.945	3.189	0.236	<b>8.465</b>
<b>4.331</b>	7.087	8.858	7.677	6.614	10.157	5.236	4.291	0.945	3.189	0.236	<b>8.858</b>

# H75VK



## Features

- Dual seal
- Cartridge unit
- Design acc. to API 682/ISO 21049
- Category 2 and 3, Type A, Arrangement 2 or 3
- Bi-directional design available
- Rotating multiple springs
- Integrated pumping device
- Suitable for pressure reversals

## Advantages

- Universally applicable both for retrofits or original equipment
- Efficient stock-keeping due to standardized components
- Extended selection of materials
- Extended field of operation in terms of temperature and pressure
- Metal parts also in special materials available
- Safe operation due to metal torque transmission at the rotating seal face

## Operating range (see note on page 1)

Shaft diameter:  $d = 20 \dots 110 \text{ mm} (0.79" \dots 4.33")^*$   
 Pressure:  $p_1 = 40 \text{ bar} (580 \text{ PSI})$   
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$   
 ( $-40 \text{ °F} \dots +428 \text{ °F}$ )  
 Sliding velocity:  $v_0 = 23 \text{ m/s} (75 \text{ ft/s})$   
 Axial movement:  $\pm 2.0 \dots 4.0 \text{ mm}$  depending on diameter and installation situation

\* Other sizes on request

## Materials

Seal face: Carbon graphite antimony impregnated (A), Silicon carbide (Q1, Q2)  
 Seat: Silicon carbide (Q1, Q2)  
 Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Duplex (G1)  
 Hastelloy® C-4 (M)

## Standards and approvals

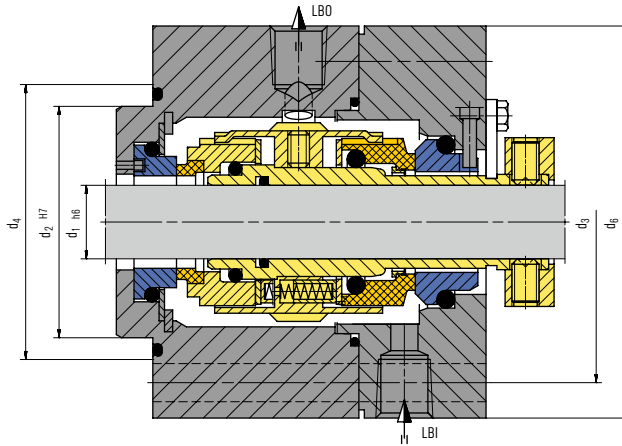
- API 682/ISO 21049

Item	Description	Recommended applications
1.1.1, 2.1.1	Seal face	<ul style="list-style-type: none"> <li>• Oil and gas industry</li> <li>• Refining technology</li> <li>• Petrochemical industry</li> <li>• Power plant technology</li> <li>• Light volatile and highly viscous hydrocarbons</li> <li>• API 610/ISO 13709 pumps</li> <li>• Process pumps</li> </ul>
1.1.2, 2.1.2	Drive collar	
1.1.3, 2.1.3	Thrust ring	
1.1.4, 2.1.4, 1.3, 2.3	O-Ring	
1.1.5, 2.1.5	Sleeve	
1.1.6, 2.1.6	Spring	
1.1.7, 16	Set screw	
1.2, 2.2	Seat	
3	Shaft sleeve	
4	Key	
6	Retainer	
8	Washer	
9	Pin	
11	Housing	
12	HSH Cap screw	
13	Assembly fixture	
14	Hexagon bolt	
15	Set ring	

## Product variant

### H75VKP-D

Dual seal in back-to-back arrangement. Suitable for API 610 table 6 seal chambers.



## Dimensions in mm

API/d <sub>1</sub>	API/d <sub>2</sub>	API/d <sub>3</sub>	API/d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>10</sub>	Axial movement
20	70	105	85	60	129	144	97	47	81	6	±2.00
30	80	115	95	70	139	145.5	96	49.5	77.5	8	±2.00
40	90	125	105	82	149	146.5	96.5	50	78	8	±2.00
50	100	140	115	94	168	158	106.5	51.5	88	10.5	±2.00*
60	120	160	135	114	188	165	107.5	57.5	90.2	4.5	±2.00*
70	130	170	145	124	198	170	107.5	62.5	85	10	±2.00*
80	140	180	155	134	208	175	107.5	67.5	85	12.5	±2.00*
90	160	205	175	146	238	178.8	116.9	61.9	94.4	6.9	±3.00
100	170	215	185	163	248	185	117.5	67.5	92	11.5	±2.00*
110	180	225	195	173	258	188	116.5	71.5	91	15.5	±3.00

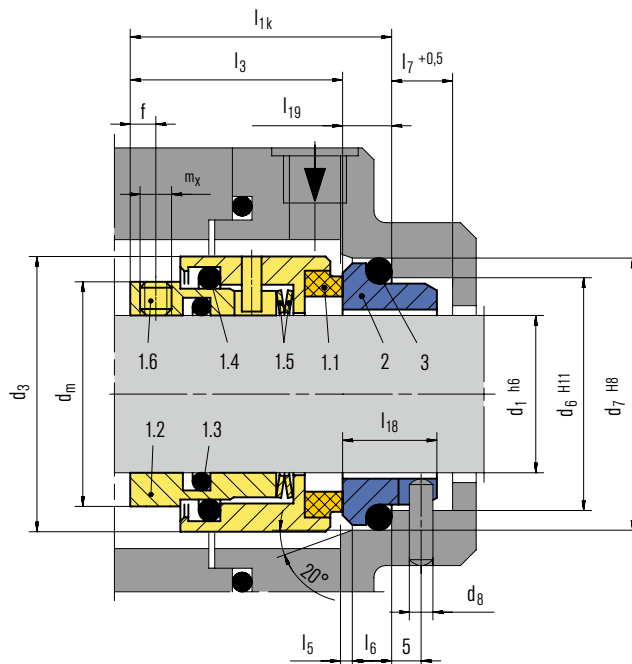
\* For larger installation space an axial movement of ±3.0 mm is possible

## Dimensions in inch

API/d <sub>1</sub>	API/d <sub>2</sub>	API/d <sub>3</sub>	API/d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>10</sub>	Axial movement
0.787	2.756	4.134	3.346	2.362	5.079	5.669	3.819	1.85	3.189	0.236	±0.079
1.181	3.15	4.528	3.74	2.756	5.472	5.728	3.780	1.949	3.051	0.315	±0.079
1.575	3.543	4.921	4.134	3.228	5.866	5.768	3.799	1.969	3.071	0.315	±0.079
1.969	3.937	5.512	4.528	3.701	6.614	6.22	4.193	2.028	3.465	0.413	±0.079*
2.362	4.724	6.299	5.315	4.488	7.402	6.496	4.232	2.264	3.551	0.177	±0.079*
2.756	5.118	6.693	5.709	4.882	7.795	6.693	4.232	2.461	3.346	0.394	±0.079*
3.15	5.512	7.087	6.102	5.276	8.189	6.89	4.232	2.657	3.346	0.492	±0.079*
3.543	6.299	8.071	6.89	5.748	9.37	7.039	4.602	2.437	3.717	0.272	±0.118
3.937	6.693	8.465	7.283	6.417	9.764	7.283	4.626	2.657	3.622	0.453	±0.079*
4.331	7.087	8.858	7.677	6.811	10.157	7.402	4.587	2.815	3.583	0.61	±0.118

\* For larger installation space an axial movement of 0.118" is possible

# HJ92N



## Features

- For unstepped shafts
- Single seal
- Balanced
- Independent of direction of rotation
- Encapsulated rotating spring

## Advantages

- Especially designed for solids containing and highly viscous media
- Springs are protected from the product
- Rugged and reliable design
- No damage of the shaft by dynamically loaded O-Ring
- Universal application
- Variant for operation under vacuum available
- Variant for sterile operation available

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 18 \dots 100 \text{ mm}$  (0.71" ... 4")  
 Pressure:  $p_1^* = 0.8 \text{ abs} \dots 25 \text{ bar}$  (12 abs. ... 363 PSI)  
 Temperature:  $t = -50 \text{ °C} \dots +220 \text{ °C}$   
 (-58 °F ... +430 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)  
 Axial movement:  $\pm 0.5 \text{ mm}$ .

\* An integral stationary seat lock is not needed within the permissible low pressure range. For prolonged operation under vacuum it is necessary to arrange for quenching on the atmospheric side.

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Seat G16: Silicon carbide (Q1)

## Standards and approvals

- EN 12756

## Recommended applications

- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Food and beverage industry
- Sugar industry
- Contaminated, abrasive and solids containing media
- Thick juice (70 ... 75 % sugar content)
- Raw sludge, sewage slurries
- Raw sludge pumps
- Thick juice pumps
- Conveying and bottling of dairy products

## Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472/473	Seal face
1.2	485	Drive collar
1.3	412.2	O-Ring
1.4	412.1	O-Ring
1.5	477	Spring
1.6	904	Set screw
2	475	Seat (G16)
3	412.3	O-Ring

## Product variants

### HJ927GN

Items and description as HJ92N.  
 Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Seat G46: Silicon carbide (Q12)  
 Installations length  $l_{11}$  ( $= l_3 + l_{39}$ ) is longer than  $l_{1k}$ .

### HJ97GN5

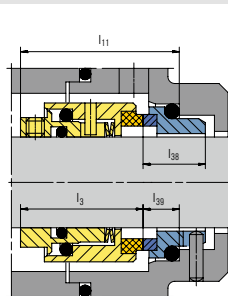
Items and description as HJ92N.  
 Seal face: Silicon carbide (Q12)  
 Seat G16: Silicon carbide (Q1)  
 Installations length  $l_{12}$  ( $= l_{13} + l_{19}$ ) is shorter than  $l_{1k}$ .

### HJ977GN

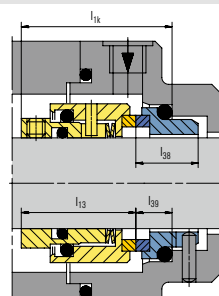
Items and description as HJ92N.  
 Seal face: Silicon carbide (Q12)  
 Seat G46: Silicon carbide (Q12)  
 Installation length  $l_{1k}$   
 Operating range:  
 Temperature:  $t = -20 \text{ °C} \dots +180 \text{ °C}$  (-4 °F ... +356 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)

### HJ4...

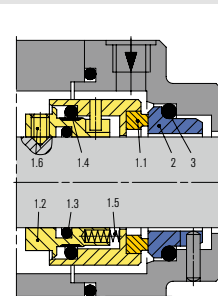
Mechanical seals with product-protected multiple springs, for high pressure applications.  
 Pressure:  $p = \text{max. } 50 \text{ bar}$  (725 PSI)  
 Shaft diameter:  $d_1 > 100 \text{ mm}$  (3,94")  
 Smaller diameters and higher pressure on request.



HJ927GN



HJ977GN

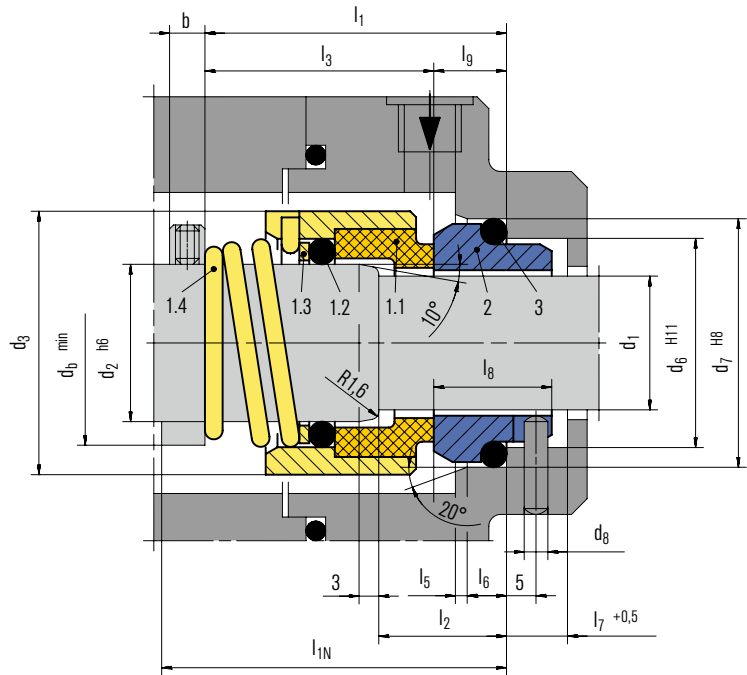


HJ4 ... (example)

**Dimensions in mm**

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>m</sub>	l <sub>1k</sub>	l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>18</sub>	l <sub>19</sub>	l <sub>11</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>38</sub>	l <sub>39</sub>	f	m <sub>x</sub>
18	32	27	33	3	26.0	37.5	30.5	2.0	5	9	15.0	7.0	39.5	35.5	28.5	17.0	9.0	3.0	M4
20	34	29	35	3	28.0	37.5	30.5	2.0	5	9	15.0	7.0	39.5	35.5	28.5	17.0	9.0	3.0	M4
22	36	31	37	3	30.0	37.5	30.5	2.0	5	9	15.0	7.0	39.5	35.5	28.5	17.0	9.0	3.0	M4
24	38	33	39	3	32.5	40.0	33.0	2.0	5	9	15.0	7.0	42.0	38.0	31.0	17.0	9.0	3.5	M5
25	39	34	40	3	33.5	40.0	33.0	2.0	5	9	15.0	7.0	42.0	38.0	31.0	17.0	9.0	3.5	M5
28	42	37	43	3	36.5	42.5	35.5	2.0	5	9	15.0	7.0	45.0	40.0	33.0	17.5	9.5	3.5	M5
30	44	39	45	3	38.5	42.5	35.5	2.0	5	9	15.0	7.0	45.0	40.0	33.0	17.5	9.5	3.5	M5
32	47	42	48	3	41.5	42.5	35.5	2.0	5	9	15.0	7.0	45.0	40.0	33.0	17.5	9.5	3.5	M5
33	47	42	48	3	41.5	42.5	35.5	2.0	5	9	15.0	7.0	45.0	40.0	33.0	17.5	9.5	3.5	M5
35	49	44	50	3	43.5	42.5	35.5	2.0	5	9	15.0	7.0	45.0	40.0	33.0	17.5	9.5	3.5	M5
38	54	49	56	4	47.5	45.0	37.0	2.0	6	9	16.0	8.0	47.5	42.5	34.5	18.5	10.5	4.0	M5
40	56	51	58	4	49.5	45.0	37.0	2.0	6	9	16.0	8.0	47.5	42.5	34.5	18.5	10.5	4.0	M5
43	59	54	61	4	52.5	45.0	37.0	2.0	6	9	16.0	8.0	47.5	42.5	34.5	18.5	10.5	4.0	M5
45	61	56	63	4	54.5	45.0	37.0	2.0	6	9	16.0	8.0	47.5	42.5	34.5	18.5	10.5	4.0	M5
48	64	59	66	4	57.5	45.0	37.0	2.0	6	9	16.0	8.0	47.5	42.5	34.5	18.5	10.5	4.0	M5
50	66	62	70	4	59.5	47.5	38.0	2.5	6	9	17.0	9.5	50.0	45.0	35.5	19.5	12.0	4.5	M6
53	69	65	73	4	62.5	47.5	38.0	2.5	6	9	17.0	9.5	50.0	45.0	35.5	19.5	12.0	4.5	M6
55	71	67	75	4	64.5	47.5	38.0	2.5	6	9	17.0	9.5	50.0	45.0	35.5	19.5	12.0	4.5	M6
58	78	70	78	4	68.5	52.5	42.0	2.5	6	9	18.0	10.5	55.0	50.0	39.5	20.5	13.0	4.5	M6
60	80	72	80	4	70.5	52.5	42.0	2.5	6	9	18.0	10.5	55.0	50.0	39.5	20.5	13.0	4.5	M6
63	83	75	83	4	73.5	52.5	42.0	2.5	6	9	18.0	10.5	55.0	50.0	39.5	20.5	13.0	4.5	M6
65	85	77	85	4	75.5	52.5	42.0	2.5	6	9	18.0	10.5	55.0	50.0	39.5	20.5	13.0	4.5	M6
68	88	81	90	4	78.5	52.5	41.5	2.5	7	9	18.5	11.0	55.0	50.0	39.0	21.0	13.5	4.5	M6
70	90	83	92	4	80.5	60.0	48.5	2.5	7	9	19.0	11.5	62.5	57.5	46.0	21.5	14.0	5.0	M6
75	99	88	97	4	89.0	60.0	48.5	2.5	7	9	19.0	11.5	62.5	57.5	46.0	21.5	14.0	5.5	M8
80	104	95	105	4	94.0	60.0	48.5	3.0	7	9	19.0	11.5	62.5	57.5	46.0	21.5	14.0	5.5	M8
85	109	100	110	4	99.0	60.0	48.5	3.0	7	9	19.0	11.5	62.5	57.5	46.0	21.5	14.0	5.5	M8
90	114	105	115	4	104.0	65.0	52.0	3.0	7	9	20.5	13.0	67.5	62.5	49.5	23.0	15.5	5.5	M8
95	119	110	120	4	109.0	65.0	52.0	3.0	7	9	20.5	13.0	67.5	62.5	49.5	23.0	15.5	5.5	M8
100	124	115	125	4	114.0	65.0	52.0	3.0	7	9	20.5	13.0	67.5	62.5	49.5	23.0	15.5	5.5	M8

# H12N



## Features

- For Stepped shafts
- Single seal
- Balanced
- Dependent of direction of rotation
- Torque transmission via conical spring

## Advantages

- High flexibility due to extended selection of materials
- Insensitive to low solids contents
- Short Installation length possible (G16)
- Economical balanced seal
- Seat cooling for hot water applications available (G115)
- No damage of the shaft by set screws

## Operating range (see note on page 1)

Shaft diameter  $d_1 = 10 \dots 80 \text{ mm}$  (0.4" ... 3.125")  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t = -50 \text{ °C} \dots +220 \text{ °C}$   
 (-58 °F ... +430 °F)  
 Sliding velocity:  $v_g = 15 \text{ m/s}$  (50 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

## Materials

Seal face: Carbon graphite antimony impregnated (A)  
 Seat G9: Silicon carbide (Q1), Special cast CrMo steel (S)

## Standards and approvals

- EN 12756

## Recommended applications

- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Low solids content media (H17GN)
- Hot water
- Chemical standard pumps
- Water and sewage pumps

Item	Part no. to DIN 24250	Description
1.1	472/473	Seal face
1.2	412.1	O-Ring
1.3	474	Thrust ring
1.4	478	Righthand spring
1.4	479	Lefthand spring
2	475	Type G9 stationary seat
3	412.2	O-Ring

## Product variants

### H12

Dimensions, items and descriptions as for H12N, but with seat G16.

Seal face: Carbon graphite antimony impregnated (A)  
 Seat G16: Silicon carbide (Q1), Special cast CrMo steel (S), Aluminium oxide (V)

### H17GN

Dimensions, items and descriptions as for H12N, but with shrink-fitted seal face (Q12) (Item no. 1.1).

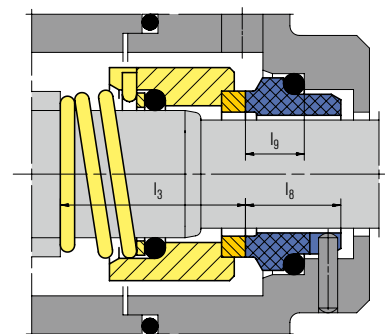
Temperature:  $t = -20 \text{ °C} \dots +180 \text{ °C}$  (-4 °F ... +356 °F)

Seal face: Silicon carbide (Q12)  
 Seat G9: Silicon carbide (Q1, Q2), Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B)

### H17G

Dimensions, items and descriptions as for H12N, but with shrink-fitted seal face (Q12) and seat G16.  
 Temperature:  $t = -20 \text{ °C} \dots +180 \text{ °C}$  (-4 °F ... +356 °F)

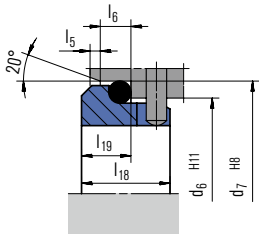
Seal face: Silicon carbide (Q12)  
 Seat G16: Silicon carbide (Q1)



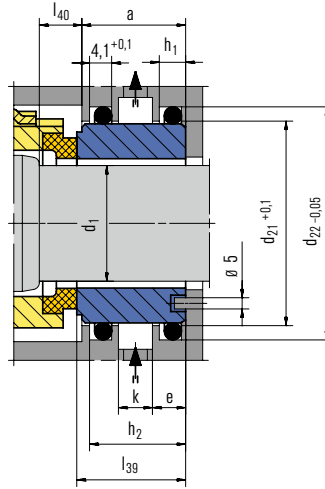
H17GN



## Seat alternatives



**G16** (EN 12756 but  $l_{1k}$  and  $l_2$  are shorter than specified)



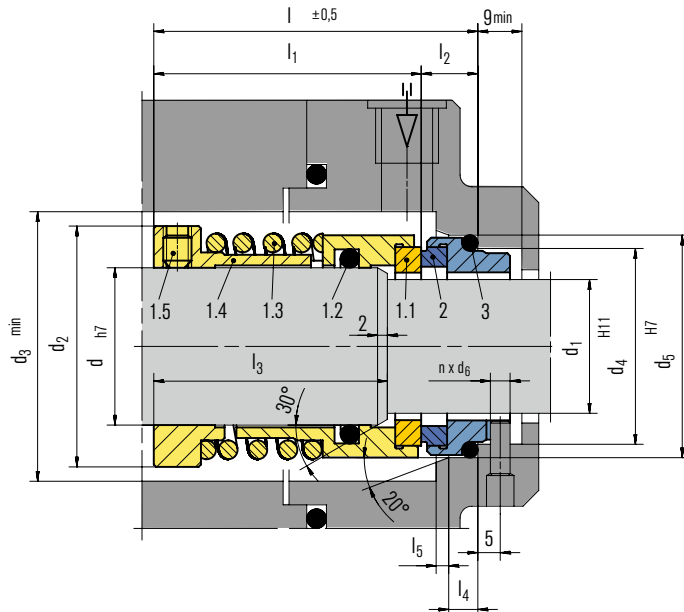
**G115**  
Cooled seat especially for hot water applications. In this case, the dimensions of the H12N rotating unit are modified.  
Seat designation: H127G115.  
Please inquire.

## Dimensions in mm

d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>21</sub>	d <sub>22</sub>	d <sub>b</sub>	l <sub>1N</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>18</sub>	l <sub>19</sub>	l <sub>39</sub>	l <sub>40</sub>	a	b	e	h <sub>1</sub>	h <sub>2</sub>	k	b*	
10	14	24	17	21	3	-	-	18	50	35.5	18	25.5	1.5	4	8.5	17.5	10.0	-	-	-	-	-	5	-	-	-	-	-	8.0
12	16	26	19	23	3	-	-	21	50	36.5	18	26.5	1.5	4	8.5	17.5	10.0	-	-	-	-	-	5	-	-	-	-	-	8.0
14	18	31	21	25	3	-	-	23	55	39.5	18	29.5	1.5	4	8.5	17.5	10.0	-	-	-	-	-	6	-	-	-	-	-	8.0
16	20	34	23	27	3	-	-	26	55	41.0	18	31.0	1.5	4	8.5	17.5	10.0	-	-	-	-	-	6	-	-	-	-	-	8.0
18	22	36	27	33	3	-	-	28	55	44.0	20	32.5	2.0	5	9.0	19.5	11.5	15	7	-	-	-	6	-	-	-	-	-	8.0
20	24	38	29	35	3	-	-	30	60	44.0	20	32.5	2.0	5	9.0	19.5	11.5	15	7	-	-	-	6	-	-	-	-	-	8.0
22	26	40	31	37	3	-	-	31	60	44.0	20	32.5	2.0	5	9.0	19.5	11.5	15	7	-	-	-	6	-	-	-	-	-	8.0
24	28	42	33	39	3	-	-	35	60	44.0	20	32.5	2.0	5	9.0	19.5	11.5	15	7	-	-	-	6	-	-	-	-	-	8.0
25	30	44	34	40	3	-	-	37	60	45.0	20	33.5	2.0	5	9.0	19.5	11.5	15	7	-	-	-	6	-	-	-	-	-	8.0
28	33	47	37	43	3	44.65	50.57	40	65	47.0	20	35.5	2.0	5	9.0	19.5	11.5	15	7	24.0	8.5	24.0	6	8.0	6.6	22.6	9	8.0	
30	35	49	39	45	3	47.83	53.75	43	65	47.0	20	35.5	2.0	5	9.0	19.5	11.5	15	7	24.5	9.0	24.0	6	8.0	6.6	22.6	9	8.0	
32	38	54	42	48	3	47.83	53.75	45	65	51.0	20	39.5	2.0	5	9.0	19.5	11.5	15	7	24.5	9.0	24.0	6	8.0	6.6	22.6	9	7.5	
33	38	54	42	48	3	47.83	53.75	45	65	51.0	20	39.5	2.0	5	9.0	19.5	11.5	15	7	24.5	9.0	24.0	6	8.0	6.6	22.6	9	7.5	
35	40	56	44	50	3	51.00	56.92	49	65	55.0	20	43.5	2.0	5	9.0	19.5	11.5	15	7	24.5	9.0	24.0	6	8.0	6.6	22.6	9	8.0	
38	43	59	49	56	4	54.18	60.10	52	75	60.0	23	46.0	2.0	6	9.0	22.0	14.0	16	8	26.0	11.0	24.0	6	8.0	6.6	22.6	9	7.5	
40	45	61	51	58	4	60.53	66.45	55	75	62.0	23	48.0	2.0	6	9.0	22.0	14.0	16	8	26.0	11.0	24.0	6	8.0	6.6	22.6	9	8.0	
43	48	64	54	61	4	63.70	69.62	58	75	65.0	23	51.0	2.0	6	9.0	22.0	14.0	16	8	26.0	11.0	24.0	6	8.0	6.6	22.6	9	8.0	
45	50	66	56	63	4	63.70	69.62	61	75	69.0	23	55.0	2.0	6	9.0	22.0	14.0	16	8	26.0	11.0	24.0	6	8.0	6.6	22.6	9	(8)	
48	53	69	59	66	4	66.88	72.80	64	85	69.0	23	55.0	2.0	6	9.0	22.0	14.0	16	8	26.0	11.0	24.0	8	8.0	6.6	22.6	9	8.0	
50	55	71	62	70	4	70.05	75.97	66	85	73.0	25	58.0	2.5	6	9.0	23.0	15.0	17	9.5	26.5	12.5	24.0	8	8.0	6.6	22.6	9	8.0	
53	58	78	65	73	4	76.40	82.32	69	85	75.0	25	60.0	2.5	6	9.0	23.0	15.0	17	9.5	26.5	12.5	24.0	8	8.0	6.6	22.6	9	8.0	
55	60	79	67	75	4	76.40	82.32	71	85	75.0	25	60.0	2.5	6	9.0	23.0	15.0	17	9.5	28.5	12.5	26.0	8	8.0	6.6	24.6	11	8.0	
58	63	83	70	78	4	79.58	85.50	74	85	75.0	25	60.0	2.5	6	9.0	23.0	15.0	18	10.5	28.5	12.5	26.0	8	8.0	6.6	24.6	11	8.0	
60	65	85	72	80	4	82.75	88.67	77	95	75.0	25	60.0	2.5	6	9.0	23.0	15.0	18	10.5	28.5	12.5	26.0	8	8.0	6.6	24.6	11	8.0	
63	68	88	75	83	4	85.93	91.85	80	95	75.0	25	60.0	2.5	6	9.0	23.0	15.0	18	10.5	28.5	12.5	26.0	8	8.0	6.6	24.6	11	8.0	
65	70	90	77	85	4	85.93	91.85	83	95	76.0	25	61.0	2.5	6	9.0	23.0	15.0	18	10.5	28.5	12.5	26.0	8	8.0	6.6	24.6	11	10.0	
70	75	98	83	92	4	89.10	95.02	88	95	81.0	28	63.0	2.5	7	9.0	26.0	18.0	19	11.5	30.5	14.5	26.0	8	8.0	6.6	24.6	11	10.0	
75	80	103	88	97	4	98.63	104.55	93	105	86.0	28	68.0	2.5	7	9.0	26.0	18.0	19	11.5	30.5	14.5	26.0	10	8.0	6.6	24.6	11	10.0	
80	85	109	95	105	4	101.80	107.72	98	105	86.0	28	68.0	3.0	7	9.0	26.2	18.2	19	11.5	30.2	14.0	26.0	10	8.0	6.6	24.6	11	10.0	

\*  $l_{1N}$  acc. to EN 12756 is exceeded

# H3B



## Features

- Single seal
- Balanced
- Independent of direction of rotation

## Advantages

- Excellent torque transmission due to clutch drive between seal head and drive collar.

## Operating range (see note on page 1)

Pressure:  $p = 12 \text{ bar (174 PSI)}$   
 Temperature:  $t = -20 \text{ °C ... } +160 \text{ °C (-4 °F ... } +320 \text{ °F)}$   
 Sliding velocity:  $v_g = 20 \text{ m/s (66 ft/s)}$   
 Viscosity: ... 300 mPa·s  
 Solids content: ... 7 %

## Materials

Seal face and seat: Silicon carbide (Q1),  
 Tungsten carbide (U7)  
 Secondary seals: FKM (V)  
 Metal parts: CrNiMo steel (G)

## Standards and approvals

- ISO 3096

## Recommended applications

- Process industry
- Oil and gas industry
- High viscous media (tar, heavy oils)
- Process pumps

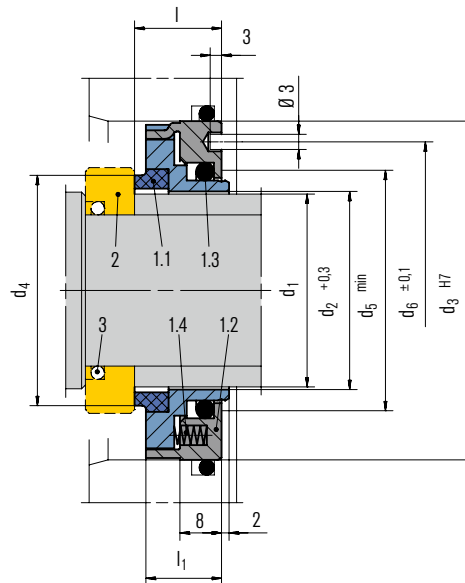
## Item Description

- 1.1 Seal face
- 1.2, 3 O-Ring
- 1.3 Spring
- 1.4 Drive collar
- 1.5 Set screw
- 2 Seat

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>
24	20	38	40	29	35	3	62	49	13	42	5	2
26	22	40	42	31	37	3	62	49	13	42	5	2
28	24	42	44	33	39	3	64	51	13	44	5	2
30	25	44	46	34	40	3	64	51	13	44	5	2
33	28	47	49	37	43	3	64	51	13	44	5	2
35	30	49	51	39	45	3	68	55	13	48	5	2
38	33	54	58	42	48	3	71	58	13	51	5	2
40	35	56	60	44	50	3	73	60	13	53	5	2
43	38	59	63	50	56	4	76	61	15	53	5	2
45	40	61	65	52	58	4	76	61	15	53	5	2
48	43	64	68	55	61	4	76	61	15	53	5	2
50	45	66	70	57	63	4	80	65	15	57	5	2
53	48	69	73	60	66	4	80	65	15	57	5	2
55	50	71	75	62	68	4	82	65	17	57	5	2
58	53	76	83	65	71	4	84	68	16	59	5	2
60	55	78	85	67	73	4	84	68	16	59	5	2
63	58	81	88	70	79	4	84	68	16	59	7	2.5
65	60	84	90	72	81	4	88	72	16	63	7	2.5
68	63	87	93	75	84	4	88	72	16	63	7	2.5
70	65	90	95	77	86	4	89	73	16	64	7	2.5
75	70	95	104	83	92	4	94	75	19	66	7	2.5
80	75	100	109	88	97	4	94	75	19	66	7	2.5
85	80	107	114	96	105	4	100	81	19	72	7	2.5
90	85	112	119	101	110	4	100	82	18	72	7	2.5
95	90	119	124	106	115	4	105	87	18	77	7	2.5
100	95	124	129	111	120	4	105	87	18	77	7	2.5
105	100	129	134	116	125	4	105	87	18	77	7	2.5

# H10/H8



## Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary multiple springs

## Advantages

- Insensitive to solids in the medium
- Very short axial installation length (analog lip seals) combined with high pressure capability
- No damage of the shaft by dynamically loaded O-Ring
- Due to the stationary design insensitive to shaft misalignments
- Compact ready-to-install unit

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 15 \dots 100 \text{ mm}$  (0.6" ... 3.9")  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t = -40 \text{ °C} \dots +180 \text{ °C}$   
 (-40 °F ... +356 °F)  
 Sliding velocity:  $v_g = 35 \text{ m/s}$  (115 ft/s)

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)

## Recommended applications

- Process industry
- Chemical industry
- Water and waste water technology
- Lube oils
- Roller seal
- Bearing seal
- All seal chambers with a very short axial installation length

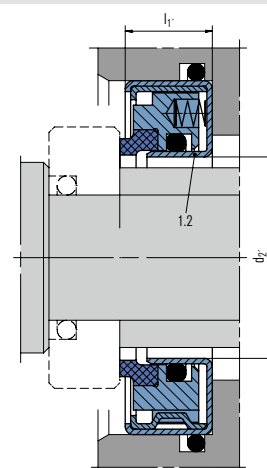
Item	Part no. to DIN 24250	Description
1.1	472	Seal face
	473	Seal face housing
1.2	485	Drive collar
1.3		O-Ring
1.4	477	Spring
2	475	Rotating seat*
3	412.2	O-Ring

\* The stationary seat design is chosen according to the specific requirements and conditions of operation.

## Product variant

### H8

Dimensions, items and description as H10. Drive collars and housings for item 1.2 are made of deep-drawn stainless steel sheet.

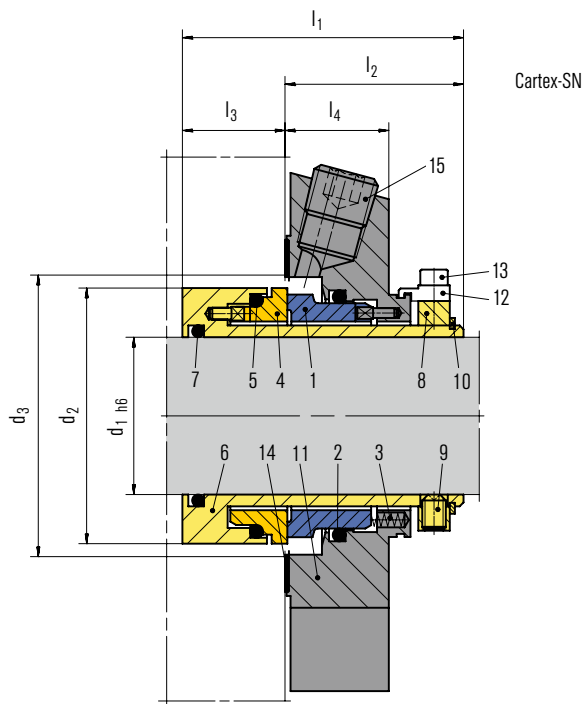


## Dimensions in mm

$d_1$	$d_2$	$d_2'$	$d_3$	$d_4$	$d_5$	$d_6$	$l$	$l_1$	$l_1'$
15	16	17	42	22.6	21	34	17	15	16
18	19	-	45	25.6	24	37	17	15	-
20	21	22	48	27.6	26	40	17	15	16
22	23	24	50	29.6	28	42	17	15	16
25	26	27	52	32.8	31	44	17	15	16
28	29	-	55	35.8	34	47	17	15	-
30	31	32	58	37.8	36	50	17	15	16
32	33	34	60	39.8	38	52	17	15	16
35	36	37	62	42.8	41	54	17	15	16
38	39	40	65	45.9	44	57	17	15	16
40	41	42	68	47.9	46	60	17	15	16
42	43	44	72	49.9	48	64	17	15	16
45	46	47	75	52.9	51	67	17	15	16
48	49	-	80	55.9	54	72	17	15	-
50	51	52	80	58.2	56	72	17	15	16
52	53	-	82	60.2	58	74	17	15	-
55	56	57	85	63.2	61	77	17	15	16
58	59	-	90	66.7	64	82	17	15	-
60	61	62	90	68.7	66	82	17	15	16
65	66	67	95	73.7	71	87	19	16.5	18
68	69	70	100	76.7	74	92	19	16.5	18
70	71	72	100	78.7	76	92	19	16.5	18
75	76	77	108	83.7	81	100	19	16.5	18
80	81	82	112	88.7	86	104	19	16.5	18
85	86	87	118	93.7	91	110	19	16.5	18
90	91	92	122	99.5	96	114	19	16.5	18
95	96	97	128	104.5	101	120	19	16.5	18
100	101	102	132	109.5	106	124	19	16.5	18

Axial tolerances:  $l \pm 0.5 \text{ H10}$ ,  $l_1 \pm 0.2 \text{ H8}$

# Cartex Single seals



## Features

- Single seal
- Cartridge
- Balanced
- Independent of direction of rotation
- Single seals without connections (-SNO), with flush (-SN) and with quench combined with lip seal (-QN) or throttle ring (-TN)
- Additional variants available for ANSI pumps (e. g. -ABPN) and eccentric screw pumps (-Vario)

## Advantages

- Ideal seal for standardizations
- Universal applicable for packings conversions, retrofits or original equipment
- No dimensional modification of the seal chamber (centrifugal pumps) necessary, small radial installation height
- No damage of the shaft by dynamically loaded O-Ring
- Extended service life
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to pre-assembled unit (reduced down-times)
- Individual adaptation to pump design possible
- Customer specific versions available

## Operating range (see note on page 1)

Cartex-SN, -SNO, -QN, -TN, -Vario

Shaft diameter:

$d_1 = 25 \dots 100 \text{ mm (1.000" ... 4.000")}$

Other sizes on request

Temperature:  $t = -40 \text{ °C ... } +220 \text{ °C}$

$(-40 \text{ °F ... } +428 \text{ °F})$

(Check O-Ring resistance)

Sliding face material combination BQ1

Pressure:  $p_1 = 25 \text{ bar (363 PSI)}$

Sliding velocity:  $v_g = 16 \text{ m/s (52 ft/s)}$

Sliding face material combination Q1Q1 or U2Q1

Pressure:  $p_1 = 12 \text{ bar (174 PSI)}$

Sliding velocity:  $v_g = 10 \text{ m/s (33 ft/s)}$

Axial movement:  $\pm 1.0 \text{ mm, } d_1 \geq 75 \pm 1.5 \text{ mm}$

## Item Description

Item	Description
1	Seal face
2, 5, 7	O-Ring
3	Spring
4	Seat
6	Shaft sleeve
8	Drive collar
9	Set screw
10	Snap ring
11	Housing
12	Assembly fixture
13	Screw
14	Gasket
15	Screw plug
16	Lip seal (-QN), throttle ring (-TN)

## Materials

Seal face: Silicon carbide (Q1), Carbon graphite resin impregnated (B), Tungsten carbide (U2)

Seat: Silicon carbide (Q1)

Secondary seals: FKM (V), EPDM (E), FFKM (K),

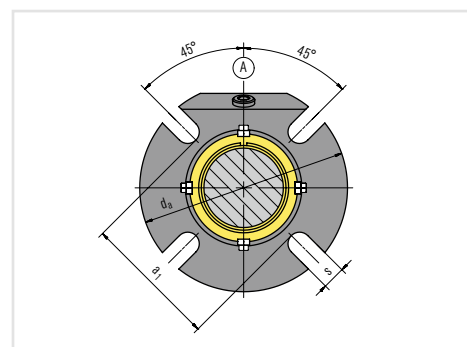
Perfluorocarbon rubber/PTFE (U1)

Springs: Hastelloy® C-4 (M)

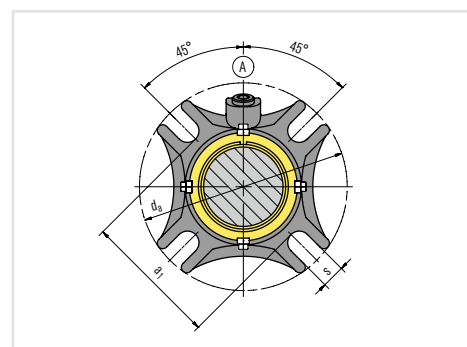
Metal parts: CrNiMo steel (G), CrNiMo cast steel (G)

## Recommended applications

- Process industry
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Food and beverage industry
- Sugar industry
- Universally applicable
- Centrifugal pumps
- Eccentric screw pumps
- Process pumps



Machined cover version



Cast cover version

## Product variants

### Cartex-SNO

Single seal without connections, for dead-end operation.

### Cartex-TN

Single seal, same as Cartex-SN but with throttle ring (item 16). The cover has auxiliary connections for flushing and quench. Throttle ring: PTFE carbon-graphite reinforced.

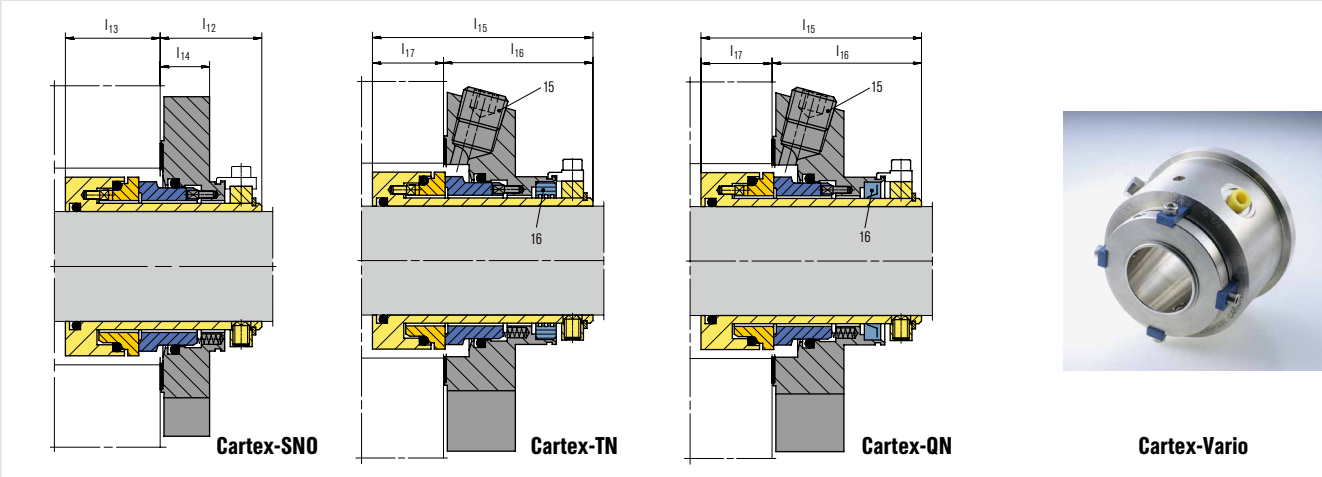
### Cartex-QN

Single seal for operation with unpressurized quench. Same as "SN" version but with outboard lip seal (item 16). The cover has auxiliary connections for flushing and quench. Lip seal: NBR (P), PTFE carbon reinforced (T3)

### Cartex-Vario

Cartridge seals with modified cover for eccentric screw pumps.

For e.g. Seepex BN, Netzsch NM ... S, NM ... B, NE (P), Allweiler AE, AEB, AED, Robbins & Myers/Moyno 2000 CC and Mono E-Range. Please inquire.



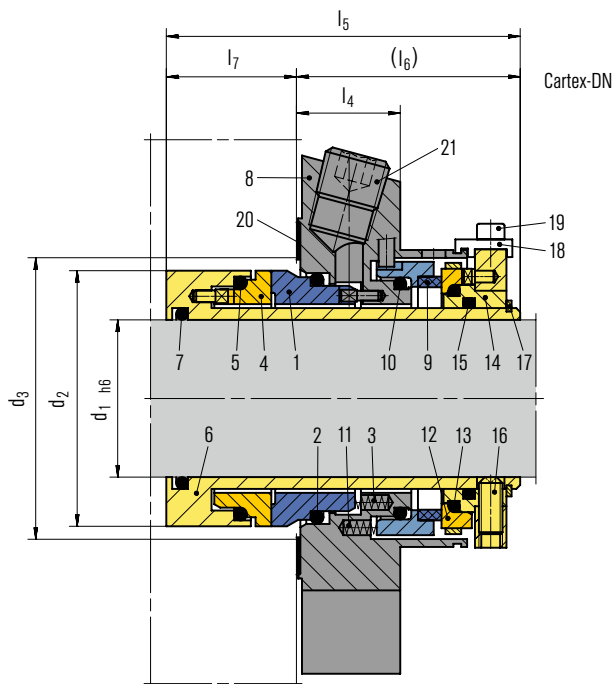
## Dimensions in mm

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>17</sub>	a <sub>1</sub>	d <sub>a</sub>	s
25	43.0	44.0	51.5	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	62	105	13.2
28	46.0	47.0	52.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	62	105	13.2
30	48.0	49.0	56.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	65	105	13.2
32	49.8	51.0	57.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	67	108	13.2
33	49.8	51.0	57.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	67	108	13.2
35	53.0	54.0	61.5	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	70	113	13.2
38	56.0	57.0	66.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	75	123	13.2
40	58.0	59.0	68.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	75	123	14.2
42	60.5	61.5	69.5	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	80	133	14.2
43	60.5	61.5	70.5	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	80	133	14.2
45	62.5	64.0	73.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	81	138	14.2
48	65.6	67.0	75.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	84	138	14.2
50	68.0	69.0	78.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	87	148	14.2
53	72.0	73.0	87.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	97	148	18.0
55	73.0	74.0	83.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	90	148	18.0
60	78.0	79.0	91.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	102	157	18.0
65	84.8	85.7	98.5	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	109	163	18.0
70	93.0	95.0	108.0	67	42.4	24.6	25.4	35.0	32.0	17.5	79.5	53.4	26.1	118	178	18.0
75	100.0	101.6	118.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	129	190	18.0
80	106.4	108.0	124.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	135	195	18.0
85	109.5	111.1	128.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	139	198	22.0
90	115.9	117.5	135.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	145	205	22.0
95	119.1	120.7	138.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	148	208	22.0
100	125.4	127.0	144.0	84	57.4	26.6	28.0	46.1	37.9	22.0	98.0	63.9	34.1	154	218	22.0

## Dimensions in inch

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>17</sub>	a <sub>1</sub>	d <sub>a</sub>	s
1.000	1.693	1.750	2.008	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	2.441	4.134	0.520
1.125	1.811	1.850	2.047	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	2.441	4.134	0.520
1.250	1.969	2.008	2.244	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	2.640	4.252	0.520
1.375	2.087	2.126	2.421	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	2.756	4.449	0.520
1.500	2.205	2.244	2.589	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	2.953	4.843	0.520
1.625	2.344	2.375	2.700	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.031	4.843	0.559
1.750	2.461	2.520	2.874	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.189	5.433	0.559
1.875	2.583	2.638	2.953	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.307	5.433	0.559
2.000	2.677	2.717	3.071	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.425	5.827	0.559
2.125	2.835	2.875	3.425	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.819	5.827	0.709
2.250	2.961	3.000	3.560	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	3.940	6.181	0.709
2.375	3.071	3.110	3.583	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	4.016	6.181	0.709
2.500	3.213	3.250	3.800	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	4.173	6.417	0.709
2.625	3.339	3.338	3.937	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	4.291	6.417	0.709
2.750	3.661	3.740	4.252	2.640	1.669	0.969	1.000	1.378	1.260	0.689	3.130	2.102	1.028	4.646	7.008	0.709
2.875	3.937	4.000	4.646	3.307	2.260	1.047	1.000	1.815	1.492	0.866	-	-	-	5.079	7.480	0.709
3.000	3.937	4.000	4.646	3.307	2.260	1.047	1.100	1.815	1.492	0.866	3.858	2.516	1.343	5.079	7.480	0.709
3.125	4.189	4.252	4.882	3.307	2.260	1.047	1.100	1.815	1.492	0.866	3.858	2.516	1.343	5.315	7.677	0.709
3.250	4.189	4.252	4.882	3.307	2.260	1.047	1.100	1.815	1.492	0.866	3.858	2.516	1.343	5.315	7.677	0.709
3.375	4.311	4.374	5.039	3.307	2.260	1.047	1.100	1.815	1.492	0.866	-	-	-	5.472	7.795	0.866
3.500	4.437	4.500	5.157	3.307	2.260	1.047	1.100	1.815	1.492	0.866	-	-	-	5.591	7.795	0.866
3.625	4.563	4.626	5.315	3.307	2.260	1.047	1.100	1.815	1.492	0.866	-	-	-	5.709	8.071	0.866
3.750	4.689	4.752	5.433	3.307	2.260	1.047	1.100	1.815	1.492	0.866	3.858	2.516	1.343	5.827	8.189	0.866
4.000	4.937	5.000	5.669	3.307	2.260	1.047	1.100	1.815	1.492	0.866	-	-	-	6.063	8.583	0.866

# Cartex Dual seals



## Features

- Dual seal
- Cartridge
- Balanced
- Independent of direction of rotation
- Double pressure balanced
- Integrated pumping device
- Variant for eccentric screw pumps available (-Vario)

## Advantages

- Ideal seal for standardizations
- Universal applicable for packings conversions, retrofits or OEM
- No dimensional modification of the seal chamber (centrifugal pumps) necessary, small radial installation height
- No damage of the shaft by dynamically loaded O-Ring
- Extended service life
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to pre-assembled unit (reduced down-times)
- Individual adaptation to pump design possible
- Customer specific versions available

## Operating range (see note on page 1)

Shaft diameter:  
 $d_1 = 25 \dots 100 \text{ mm (1.000" ... 4.000")}$   
 Other sizes on request  
 Temperature:  $t = -40 \text{ °C ... } +220 \text{ °C}$   
 ( $-40 \text{ °F ... } +428 \text{ °F}$ )  
 (Check O-Ring resistance)

Sliding face material combination BQ1  
 Pressure:  $p_1 = 25 \text{ bar (363 PSI)}$   
 Sliding velocity:  $v_g = 16 \text{ m/s (52 ft/s)}$

Sliding face material combination Q1Q1 or U2Q1  
 Pressure:  $p_1 = 20 \text{ bar (290 PSI)}$   
 Sliding velocity:  $v_g = 10 \text{ m/s (33 ft/s)}$

Barrier fluid circulation system:  
 $p_{3\text{max.}} = 25 \text{ bar (363 PSI)}$   
 $\Delta p (p_3 - p_1)_{\text{ideal}} = 2 \dots 3 \text{ bar (29 ... 44 PSI)}$ ,  
 7 bar (102 PSI) for barrier media with poor lubricating properties

Pump startup:  
 $\Delta p (p_3 - p_1)_{\text{max.}} = 25 \text{ bar (363 PSI)}$  allowed

Recommended supply medium: max. ISO VG 5  
 Axial movement:  $\pm 1.0 \text{ mm, } d_1 = 75 \text{ mm } \pm 1.5 \text{ mm}$

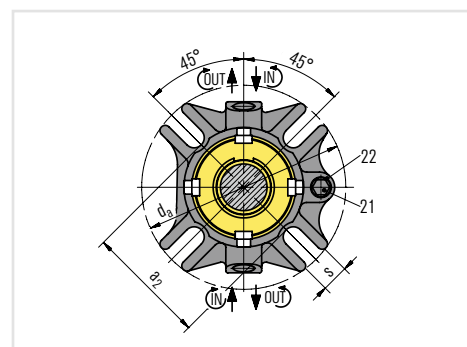
Item	Description
1	Seal face
2, 5, 7, 10, 13, 15	O-Ring
3	Spring
4	Seat
6	Shaft sleeve
8	Cover
9	Seal face
11	Spring
12	Seat
14	Drive collar
16	Set screw
17	Snap ring
18	Assembly fixture (remove after installation)
19	HSH Cap screw
20, 22	Gasket
21	Screw plug

## Materials

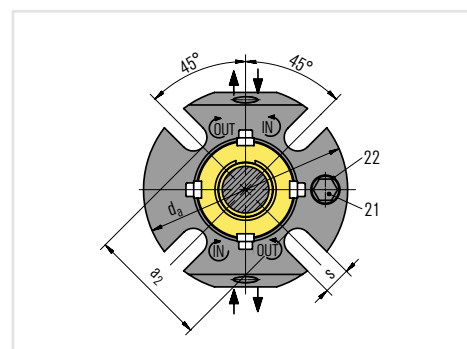
Seal face: Silicon carbide (Q1), Carbon graphite resin impregnated (B), Tungsten carbide (U2)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V), EPDM (E), FFKM (K), Perfluorocarbon rubber/PTFE (U1)  
 Springs: Hastelloy® (M)  
 Metal parts: CrNiMo steel (G), CrNiMo cast steel (G)

## Recommended seal supply

The EagleBurgmann QFT1000 buffer system and QFT2000 vessels are suitable for Cartex-DN in back-to-back arrangement. The EagleBurgmann TS1016 and TS2000 thermosiphon systems support double and back-to-back seal configurations.



Cast cover version



Machined cover version

## Recommended applications

- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Mining industry
- Food and beverage industry
- Sugar industry
- Centrifugal pumps
- Eccentric screw pumps
- Universally applicable

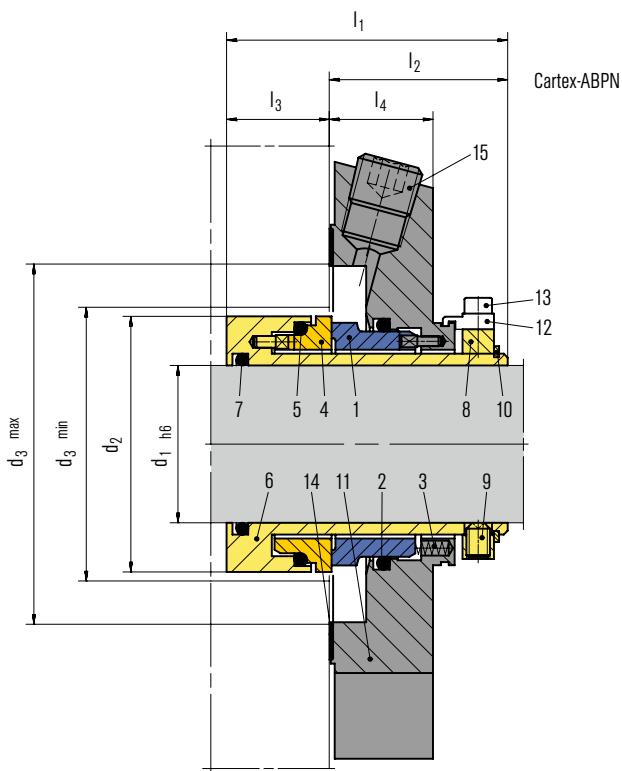
### Dimensions in mm

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	a <sub>2</sub>	d <sub>a</sub>	s
25	43.0	44.0	51.5	25.4	86.5	53.4	33.1	62	105	13.2
28	46.0	47.0	52.0	25.4	86.5	53.4	33.1	61	105	13.2
30	48.0	49.0	56.0	25.4	86.5	53.4	33.1	67	105	13.2
32	49.8	51.0	57.0	25.4	86.5	53.4	33.1	70	108	13.2
33	49.8	51.0	57.0	25.4	86.5	53.4	33.1	70	108	13.2
35	53.0	54.0	61.5	25.4	86.5	53.4	33.1	72	113	13.2
38	56.0	57.0	66.0	25.4	86.5	53.4	33.1	75	123	13.2
40	58.0	59.0	68.0	25.4	86.5	53.4	33.1	77	123	14.2
42	60.5	61.5	69.5	25.4	86.5	53.4	33.1	80	133	14.2
43	60.5	61.5	70.5	25.4	86.5	53.4	33.1	80	133	14.2
45	62.5	64.0	73.0	25.4	86.5	53.4	33.1	82	138	14.2
48	65.6	67.0	75.0	25.4	86.5	53.4	33.1	85	138	14.2
50	68.0	69.0	78.0	25.4	86.5	53.4	33.1	87	148	14.2
53	72.0	73.0	87.0	25.4	86.5	53.4	33.1	97	148	18.0
55	73.0	74.0	83.0	25.4	86.5	53.4	33.1	92	148	18.0
60	78.0	79.0	91.0	25.4	86.5	53.4	33.1	102	157	18.0
65	84.8	85.7	98.5	25.4	86.5	53.4	33.1	109	163	18.0
70	93.0	95.0	108.0	25.4	86.5	53.4	33.1	118	178	18.0
75	100.0	101.6	118.0	28.0	108.0	63.9	44.1	129	190	18.0
80	106.4	108.0	124.0	28.0	108.0	63.9	44.1	135	195	18.0
85	109.5	111.1	128.0	28.0	108.0	63.9	44.1	139	198	22.0
90	115.9	117.5	135.0	28.0	108.0	63.9	44.1	145	205	22.0
95	119.1	120.7	138.0	28.0	108.0	63.9	44.1	148	208	22.0
100	125.4	127.0	144.0	28.0	108.0	63.9	44.1	154	218	22.0

### Dimensions in inch

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	a <sub>2</sub>	d <sub>a</sub>	s
1.000	1.693	1.732	2.008	1.000	3.400	2.102	1.303	2.440	4.134	0.520
1.125	1.811	1.875	2.050	1.000	3.400	2.102	1.303	2.402	4.134	0.520
1.250	1.961	2.008	2.244	1.000	3.400	2.102	1.303	2.760	4.330	0.520
1.375	2.087	2.126	2.421	1.000	3.400	2.102	1.303	2.840	4.449	0.520
1.500	2.205	2.244	2.598	1.000	3.400	2.102	1.303	2.950	4.843	0.520
1.625	2.343	2.375	2.700	1.000	3.400	2.102	1.303	3.090	4.842	0.559
1.750	2.461	2.520	2.874	1.000	3.400	2.102	1.303	3.230	5.433	0.559
1.875	2.582	2.638	2.953	1.000	3.400	2.102	1.303	3.350	5.433	0.559
2.000	2.677	2.717	3.071	1.000	3.400	2.102	1.303	3.430	5.827	0.559
2.125	2.835	2.874	3.425	1.000	3.400	2.102	1.303	3.819	5.827	0.709
2.250	2.961	3.000	3.560	1.000	3.400	2.102	1.303	3.940	6.181	0.709
2.375	3.071	3.125	3.583	1.000	3.400	2.102	1.303	4.020	6.181	0.709
2.500	3.213	3.300	3.800	1.000	3.400	2.102	1.303	4.180	6.417	0.709
2.625	3.339	3.374	3.937	1.000	3.400	2.102	1.303	4.303	6.417	0.709
2.750	3.661	3.740	4.252	1.000	3.400	2.102	1.303	4.660	7.008	0.709
2.875	3.937	4.000	4.646	1.000	4.250	2.516	1.736	5.079	7.480	0.709
3.000	3.937	4.000	4.646	1.102	4.250	2.516	1.736	5.079	7.480	0.709
3.125	4.189	4.252	4.882	1.102	4.250	2.516	1.736	5.315	7.677	0.709
3.250	4.189	4.252	4.882	1.102	4.250	2.516	1.736	5.315	7.677	0.709
3.375	4.311	4.375	5.039	1.102	4.250	2.516	1.736	5.472	7.795	0.866
3.500	4.437	4.500	5.157	1.102	4.250	2.516	1.736	5.591	7.795	0.866
3.625	4.563	4.625	5.315	1.102	4.250	2.516	1.736	5.709	8.071	0.866
3.750	4.689	4.752	5.433	1.102	4.250	2.516	1.736	5.827	8.189	0.866
4.000	4.937	5.000	5.669	1.102	4.250	2.516	1.736	6.063	8.583	0.866

# Cartex ANSI Single seals



## Features

- Single seal
- Available for standard (Cartex-ASPN) and big bore (Cartex-ABPN) seal chambers
- Cartridge
- Balanced
- Independent of direction of rotation
- Single seals with flush (-ASPN, -ABPN) and with quench combined with lip seal (-ASQN, -ABQN) or throttle ring (-ASTN, -ABTN)

## Advantages

- Ideal for use in ANSI process pumps
- Universal applicable for packings conversions, retrofits or original equipment
- Seal for standardizations
- No dimensional modification of the seal chamber necessary, small radial installation height
- No damage of the shaft by dynamically loaded O-Ring
- Extended service life
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to pre-assembled unit (reduced down-times)

## Operating range (see note on page 1)

Cartex-ASPN, - ABPN, -ASTN, -ABTN, -ASQN, -ABQN

Shaft diameter:  $d_1 = 1.000'' \dots 3.750''$

Other sizes on request

Temperature:  $t = -40\text{ °C} \dots +220\text{ °C}$

$(-40\text{ °F} \dots +428\text{ °F})$

(Check O-Ring resistance)

Sliding face material combination BQ1

Pressure:  $p_1 = 25\text{ bar (363 PSI)}$

Sliding velocity:  $v_g = 16\text{ m/s (52 ft/s)}$

Sliding face material combination Q1Q1 or U2Q1

Pressure:  $p_1 = 12\text{ bar (174 PSI)}$

Sliding velocity:  $v_g = 10\text{ m/s (33 ft/s)}$

Axial movement:  $\pm 1.0\text{ mm, } d_1 \geq 75 \pm 1.5\text{ mm}$

## Item Description

1	Seal face
2, 5, 7	O-Ring
3	Spring
4	Seat
6	Shaft sleeve
8	Drive collar
9	Set screw
10	Snap ring
11	Cover
12	Assembly fixture
13	Screw
14	Gasket
15	Screw plug
16	Lip seal (-QN), throttle ring (-TN)

## Materials

Seal face: Silicon carbide (Q1), Carbon graphite resin impregnated (B), Tungsten carbide (U2)

Seat: Silicon carbide (Q1)

Secondary seals: FKM (V), EPDM (E), FFKM (K),

Perfluorocarbon rubber/PTFE (U1)

Springs: Hastelloy® C-4 (M)

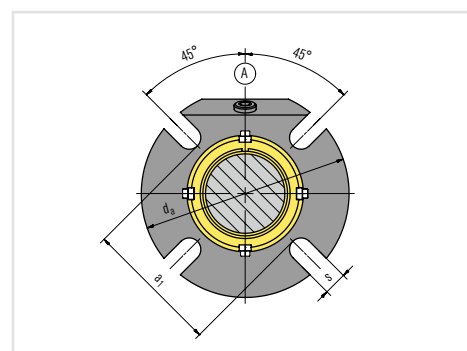
Metal parts: CrNiMo steel (G)

## Standards and approvals

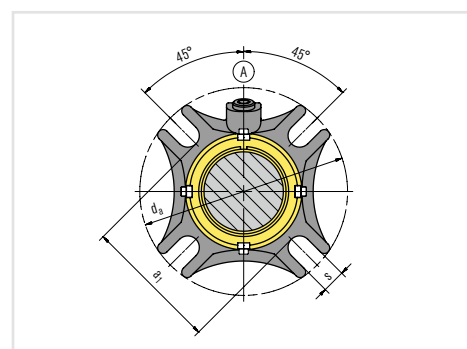
- ANSI

## Recommended applications

- Process industry
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Food and beverage industry
- Universally applicable
- ANSI process pumps



Machined cover version



Cast cover version



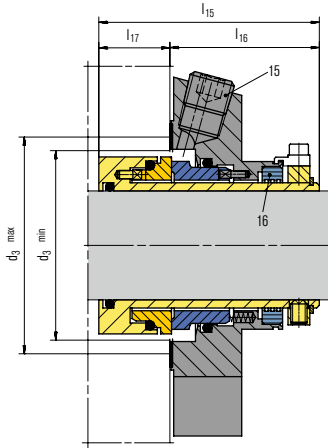
**Product variants**

**Cartex-ASTN and -ABTN**

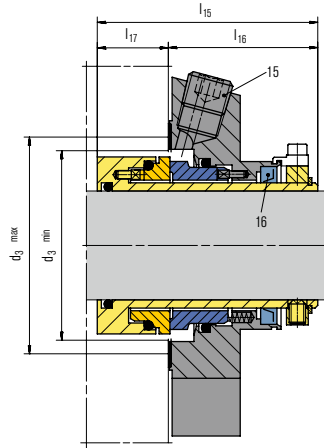
Single seal standard (S) and big bore (B) seal chambers. Same as Cartex-ASPN and -ABPN but with throttle ring (item 16) at the atmospheric side. The cover has auxiliary connections for flushing and quench. Throttle ring: PTFE carbon-graphite reinforced (T12)

**Cartex-ASQN and -ABQN**

Single seal for operation with unpressurized quench for standard (S) and big bore (B) seal chambers. Same as Cartex-ASPN and -ABPN version but with lip seal (item 16) at the atmospheric side. The cover has auxiliary connections for flushing and quench. Lip seal: NBR (P), PTFE carbon reinforced (T3)



**Cartex-ASTN**



**Cartex-ASQN**

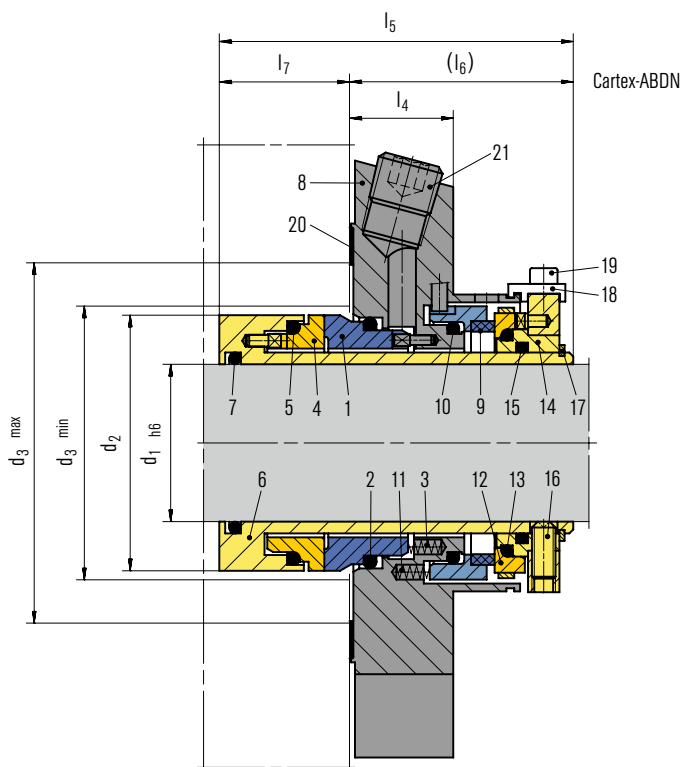
**Big bore - Dimensions in inch**

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>17</sub>	a <sub>1</sub>	d <sub>a</sub>	s	Connection
1.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.125	1.713	1.752	2.795	2.638	1.669	0.969	1.000	2.937	1.909	1.028	3.311	4.500	0.437	1/4 NPT
1.250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.375	1.960	2.000	3.189	2.638	1.669	0.969	1.000	2.947	1.919	1.028	3.543	5.118	0.437	1/4 NPT
1.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.625	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.750	2.461	2.500	4.055	2.638	1.669	0.969	1.000	3.012	1.984	1.028	4.567	6.496	0.559	3/8 NPT
1.875	2.583	2.661	3.937	2.638	1.669	0.969	1.000	3.071	2.059	1.012	4.409	5.984	0.551	3/8 NPT
2.000	2.677	2.756	4.567	2.638	1.929	0.709	1.260	3.130	2.102	1.028	4.882	6.260	0.551	3/8 NPT
2.125	2.834	2.913	4.528	2.638	1.669	0.969	1.000	3.012	1.984	1.028	5.276	6.890	0.709	3/8 NPT
2.250	2.960	3.093	4.409	2.638	1.945	0.693	1.276	3.130	2.120	1.028	4.685	6.417	0.709	3/8 NPT
2.500	3.212	3.299	5.276	2.638	1.919	0.719	1.250	3.130	2.120	1.028	5.512	7.795	0.709	3/8 NPT
2.625	3.338	3.417	5.118	2.638	1.919	0.719	1.250	3.130	2.120	1.028	5.354	6.890	0.709	3/8 NPT
2.750	3.660	3.740	5.236	2.638	1.945	0.693	1.276	3.130	2.120	1.028	5.512	7.480	0.630	3/8 NPT
3.000	3.937	4.016	5.512	3.307	2.276	1.031	1.276	3.858	2.516	1.343	5.906	8.228	0.650	3/8 NPT
3.250	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Standard bore - Dimensions in inch**

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>17</sub>	a <sub>1</sub>	d <sub>a</sub>	s	Connection
1.000	1.693	1.732	2.205	2.638	1.669	0.969	1.000	2.937	1.909	1.028	2.756	0.433	1/4 NPT	1/4 NPT
1.125	1.713	1.752	2.205	2.638	1.669	0.969	1.000	2.937	1.909	1.028	2.440	0.437	1/4 NPT	1/4 NPT
1.250	1.969	2.008	2.402	2.638	1.669	0.969	1.000	3.130	2.102	1.028	2.638	0.433	1/4 NPT	1/4 NPT
1.375	1.961	2.000	2.402	2.638	1.669	0.969	1.000	2.947	1.919	1.028	2.760	0.437	1/4 NPT	1/4 NPT
1.500	2.200	2.244	2.717	2.638	1.669	0.969	1.000	3.130	2.102	1.028	2.950	0.551	3/8 NPT	3/8 NPT
1.625	2.340	2.421	2.795	2.638	1.669	0.969	1.000	3.130	2.102	1.028	3.030	0.551	3/8 NPT	3/8 NPT
1.750	2.461	2.500	2.953	2.638	1.669	0.969	1.000	3.012	1.984	1.028	3.228	0.559	3/8 NPT	3/8 NPT
1.875	2.583	2.661	3.070	2.638	1.669	0.969	1.000	3.071	2.043	1.028	3.190	0.551	3/8 NPT	3/8 NPT
2.000	2.677	2.756	3.189	2.638	1.669	0.969	1.000	3.130	2.102	1.028	3.430	0.630	3/8 NPT	3/8 NPT
2.125	2.834	2.913	3.583	2.638	1.669	0.969	1.000	3.012	1.984	1.028	3.820	0.650	3/8 NPT	3/8 NPT
2.250	2.960	3.039	3.583	2.638	1.669	0.969	1.000	3.130	2.102	1.028	3.858	0.650	3/8 NPT	3/8 NPT
2.375	3.070	3.125	3.590	2.638	1.669	0.969	1.000	-	-	-	4.020	0.709	3/8 NPT	-
2.500	3.212	3.291	3.937	2.638	1.669	0.969	1.122	3.130	2.102	1.028	4.528	0.709	3/8 NPT	3/8 NPT
2.625	3.338	3.417	4.016	2.638	1.669	0.969	1.250	3.130	2.102	1.028	4.528	0.630	3/8 NPT	3/8 NPT
2.750	3.660	3.740	4.370	2.638	1.929	0.709	1.260	3.130	2.102	1.028	4.646	0.709	3/8 NPT	3/8 NPT
3.000	3.937	4.016	4.724	3.307	2.260	1.047	1.260	3.858	2.516	1.343	5.000	0.709	3/8 NPT	3/8 NPT
3.250	4.189	4.268	4.921	3.307	2.260	1.047	1.260	3.858	2.516	1.343	5.315	0.709	3/8 NPT	3/8 NPT
3.750	4.689	4.750	5.433	3.307	2.260	1.047	1.000	-	-	-	5.827	0.866	3/8 NPT	-

# Cartex ANSI Dual seals



## Features

- Dual seal
- Available for standard (Cartex-ASDN) and big bore (Cartex-ABDN) seal chambers
- Cartridge
- Balanced
- Independent of direction of rotation
- Double pressure balanced
- Integrated pumping device

## Advantages

- Ideal for use in ANSI process pumps
- Universal applicable for packings conversions, retrofits or OEM
- Ideal seal for standardizations
- No dimensional modification of the seal chamber necessary, small radial installation height
- No damage of the shaft by dynamically loaded O-Ring
- Extended service life
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to pre-assembled unit (reduced down-times)

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 25 \dots 100 \text{ mm (1.000" ... 4.000")}$   
 Other sizes on request  
 Temperature:  $t = -40 \text{ °C ... } +220 \text{ °C}$   
 ( $-40 \text{ °F ... } +428 \text{ °F}$ )  
 (Check O-Ring resistance)

Sliding face material combination BQ1  
 Pressure:  $p_1 = 25 \text{ bar (363 PSI)}$   
 Sliding velocity:  $v_g = 16 \text{ m/s (52 ft/s)}$

Sliding face material combination Q1Q1 or U2Q1  
 Pressure:  $p_1 = 20 \text{ bar (290 PSI)}$   
 Sliding velocity:  $v_g = 10 \text{ m/s (33 ft/s)}$

Barrier fluid circulation system:

$p_{3\text{max}} = 25 \text{ bar (363 PSI)}$   
 $\Delta p (p_3 - p_1)_{\text{ideal}} = 2 \dots 3 \text{ bar (29 ... 44 PSI)}$ ,  
 7 bar (102 PSI) for barrier media with poor lubricating properties

Pump startup:

$\Delta p (p_3 - p_1)_{\text{max}} = 25 \text{ bar (363 PSI)}$  allowed

Recommended supply medium: max. ISO VG 5  
 Axial movement:  $\pm 1.0 \text{ mm}$ ,  $ab \ d_1 = 75 \text{ mm } \pm 1.5 \text{ mm}$

## Item Description

1, 9	Seal face
2, 5, 7, 10, 13, 15	O-Ring
3, 11	Spring
4	Seat
6	Shaft sleeve
8	Cover
12	Seat
14	Drive collar
16	Set screw
17	Snap ring
18	Assembly fixture
19	HSH Cap screw
20, 22	Gasket
21	Screw plug

## Materials

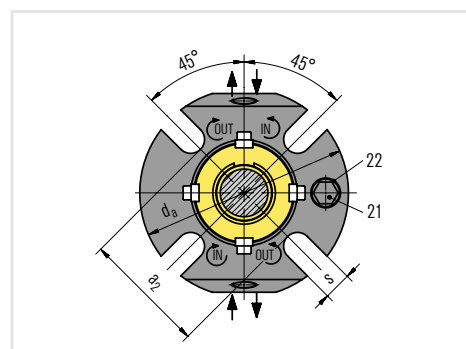
Seal face: Silicon carbide (Q1), Carbon graphite resin impregnated (B), Tungsten carbide (U2)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V), EPDM (E), FFKM (K), Perfluorocarbon rubber/PTFE (U1)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), CrNiMo cast steel (G)

## Standards and approvals

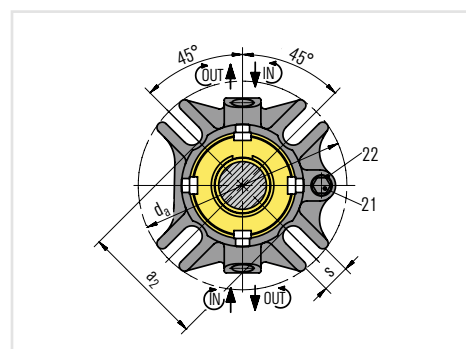
- ANSI

## Recommended applications

- Process industry
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Food and beverage industry
- Universally applicable
- ANSI process pumps



Machined cover version



Cast cover version

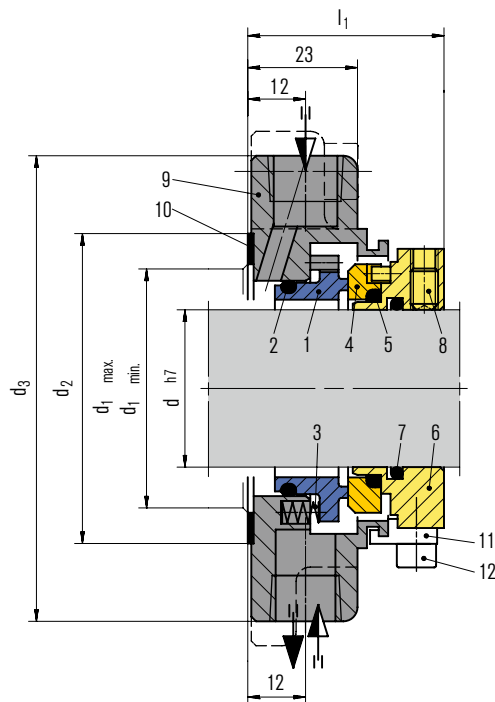
### Big bore - Dimensions in inch

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	a <sub>2</sub>	d <sub>a</sub>	s	Connection
1.000	-	-	-	-	-	-	-	-	-	-	-
1.125	1.713	1.752	2.795	1.000	3.228	1.886	1.343	3.311	4.500	0.437	1/4 NPT
1.250	-	-	-	-	-	-	-	-	-	-	-
1.375	1.960	2.000	3.189	1.000	3.406	2.083	1.323	3.543	5.118	0.437	1/4 NPT
1.500	-	-	-	-	-	-	-	-	-	-	-
1.625	-	-	-	-	-	-	-	-	-	-	-
1.750	2.461	2.500	4.055	1.000	3.406	2.083	1.323	4.567	6.496	0.559	3/8 NPT
1.875	2.583	2.661	3.937	1.000	3.406	2.083	1.323	4.409	5.984	0.551	3/8 NPT
2.000	2.677	2.756	4.567	1.260	3.406	2.102	1.303	4.882	6.260	0.551	3/8 NPT
2.125	2.834	2.913	4.528	1.000	3.406	2.102	1.303	5.276	6.890	0.709	3/8 NPT
2.250	2.960	3.093	4.409	1.276	3.406	2.102	1.303	4.685	6.417	0.709	3/8 NPT
2.500	3.212	3.299	5.276	1.250	3.406	2.102	1.303	5.512	7.795	0.709	3/8 NPT
2.625	3.338	3.417	5.118	1.250	3.406	2.102	1.303	5.354	6.890	0.709	3/8 NPT
2.750	3.660	3.740	5.236	1.276	3.406	2.102	1.303	5.512	7.480	0.630	3/8 NPT
3.000	3.937	4.016	5.512	1.276	3.406	2.516	1.303	5.906	8.228	0.650	3/8 NPT
3.250	-	-	-	-	-	-	-	-	-	-	-

### Standard bore - Dimensions in inch

d <sub>1</sub>	d <sub>2</sub>	d <sub>3 min.</sub>	d <sub>3 max.</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	a <sub>2</sub>	d <sub>a</sub>	s	Connection
1.000	1.693	1.732	2.205	1.000	3.406	2.102	1.303	2.441	3.937	0.433	1/4 NPT
1.125	1.713	1.752	2.205	1.000	3.228	3.228	1.343	2.441	4.134	0.437	1/4 NPT
1.250	1.969	2.008	2.402	1.000	3.406	2.102	1.303	2.756	4.252	0.433	1/4 NPT
1.375	1.961	2.000	2.402	1.000	3.406	2.083	1.303	2.756	4.213	0.437	1/4 NPT
1.500	2.200	2.244	2.717	1.000	3.406	2.102	1.303	2.953	4.488	0.551	3/8 NPT
1.625	2.340	2.421	2.795	1.000	3.406	2.102	1.303	3.091	4.921	0.551	3/8 NPT
1.750	2.461	2.500	2.953	1.000	3.406	2.102	1.303	3.228	5.118	0.559	3/8 NPT
1.875	2.583	2.661	3.070	1.000	3.406	2.102	1.303	3.307	5.118	0.551	3/8 NPT
2.000	2.677	2.756	3.189	1.000	3.406	2.102	1.303	3.425	5.472	0.630	3/8 NPT
2.125	2.834	2.913	3.583	1.000	3.406	2.102	1.303	3.819	5.512	0.650	3/8 NPT
2.250	2.960	3.039	3.583	1.000	3.406	2.102	1.303	3.858	5.866	0.650	3/8 NPT
2.375	3.070	3.125	3.590	1.000	-	-	-	-	6.181	0.709	3/8 NPT
2.500	3.212	3.291	3.937	1.122	3.406	2.102	1.303	4.528	6.693	0.709	3/8 NPT
2.625	3.338	3.417	4.016	1.250	3.406	2.102	1.303	4.528	6.378	0.630	3/8 NPT
2.750	3.660	3.740	4.370	1.260	3.406	2.102	1.303	4.646	7.441	0.709	3/8 NPT
3.000	3.937	4.016	4.724	1.260	4.252	2.516	1.736	5.000	7.835	0.709	3/8 NPT
3.250	4.189	4.268	4.921	1.260	4.252	2.516	1.736	5.315	7.830	0.709	3/8 NPT
3.750	4.689	4.750	5.433	1.000	-	-	-	-	8.189	0.866	3/8 NPT

# MA290 / MA390



## Features

- Cartridge
- Balanced
- Independent of direction of rotation
- Stationary multiple springs
- Springs and pin located on the atmospheric side

## Operating range (see note on page 1)

### MA290 / MA390:

Pressure:  $p = \dots 16 \text{ bar}$   
 Temperature:  $t = -20 \text{ °C} \dots +160 \text{ °C}$  ( $-4 \text{ °F} \dots +320 \text{ °F}$ )  
 (oil),  $0 \text{ °C} \dots +60 \text{ °C}$  ( $+32 \text{ °F} \dots +140 \text{ °F}$ ) (water)  
 Sliding velocity:  $v_g = \text{max. } 20 \text{ m/s}$  (66 ft/s)  
 Viscosity: 0.5 Pa·s  
 Solids content: 0.3 %

### MA291 / MA391:

Pressure:  $p = \dots 10 \text{ bar}$  (145 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +160 \text{ °C}$  ( $-4 \text{ °F} \dots +320 \text{ °F}$ )  
 (oil),  $0 \text{ °C} \dots +60 \text{ °C}$  ( $+32 \text{ °F} \dots +140 \text{ °F}$ ) (water)  
 Sliding velocity:  $v_g = \text{max. } 20 \text{ m/s}$  (66 ft/s)  
 Viscosity: 3 Pa·s  
 Solids content: 10 %

## Item Description

Item	Description
1	Seal face
2, 5, 7	O-Ring
3	Spring
4	Seat
6	Drive collar
8	Set screw
9	Seal cover
10	Gasket
11	Assembly fixture
12	HSH Cap screw

## Product variant

### MA390 (MA391)

Axially downsized type of MA290 (MA291).

## Materials

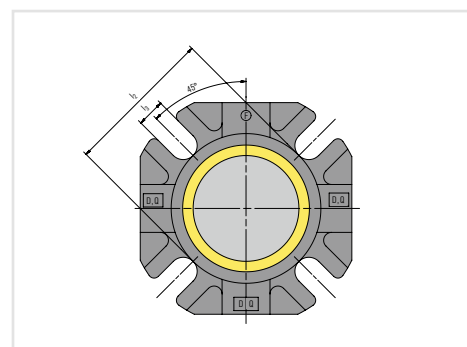
Seal face (MA290, MA390): High density carbon graphite  
 Seal face (MA291, MA391): Silicon carbide (Q1)  
 Seat (MA290/291, MA390/391): Silicon carbide (Q1)  
 Metal parts: 1.4401 (G)  
 Secondary seals: FKM (V)

## Standards and approvals

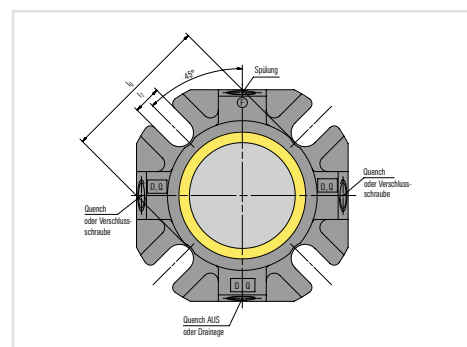
- EN 12756
- ISO 3096

## Recommended applications

- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Building services industry
- Food and beverage industry
- Universally applicable
- Centrifugal pumps
- Eccentric screw pumps
- Process pumps



Seal cover MA290 (MA291)

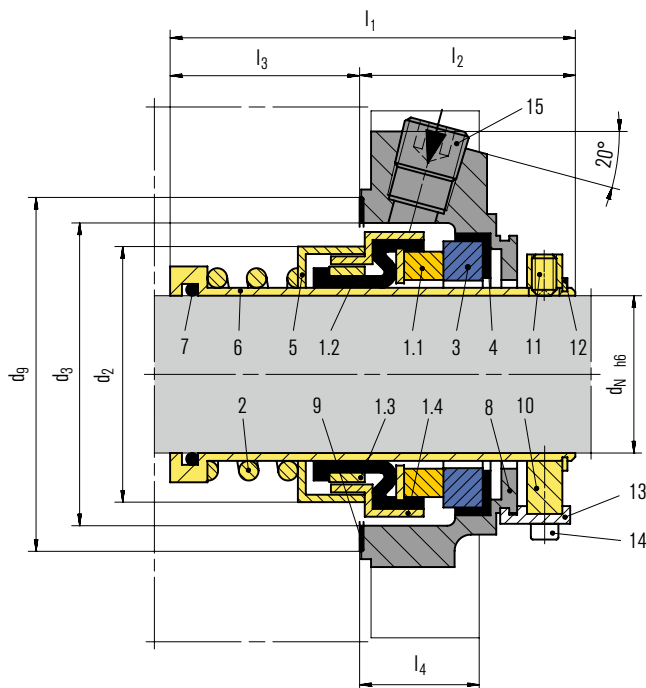


Seal cover MA390 (MA391)

## Dimensions in mm

d	d <sub>1min.</sub>	d <sub>1max.</sub>	d <sub>2</sub>	d <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
20	30	51	58	104	42	60	12
24	34	51	58	104	42	60	12
25	35	51	58	104	42	60	12
28	38	54	63	108	42	65	12
30	40	56	63	108	42	65	12
32	42	56	63	108	42	65	12
33	43	66	73	118	42	75	14
35	45	66	73	118	42	75	14
38	48	66	73	118	42	75	14
40	50	66	73	118	42	75	14
43	53	71	78	128	42	80	14
45	55	71	78	128	42	80	14
48	58	81	88	138	44	90	14
50	60	81	88	138	44	90	14
53	63	81	88	138	44	90	14
55	65	81	88	138	44	90	14
58	68	96	103	164	46	105	18
60	70	96	103	164	46	105	18
63	73	96	103	164	46	105	18
65	75	96	103	164	46	105	18
70	80	102	109	178	46	111	18
75	85	114	121	193	49	123	18
80	90	114	121	193	49	123	18
85	95	124	131	208	49	133	20
90	100	124	131	208	49	133	20
95	105	134	141	218	49	143	20
100	110	134	141	218	49	143	20

# Unitex



### Features

- Single cartridge seal
- Elastomer bellows
- Unbalanced
- Independent of direction of rotation
- Stationary seat, rotating spring
- Bellows and spring free from torsion
- Metric and inch sizes available

### Advantages

- Straightforward and easy installation
- Fits into any installation space due to smallest outer diameter
- Important material certifications available
- Universal application opportunities (standardization)
- No modifications of the pump's installation chamber necessary
- Economical cartridge solution
- Comes with flush connection acc. to API 682, Plan 11 for seal chamber cleaning and cooling

### Operating range (see note on page 1)

Shaft diameter:  $d_N = 25 \dots 75 \text{ mm}$  (1" ... 2.625")  
 Pressure:  $p_1 = 12 \text{ bar}$  (174 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +140 \text{ °C}$  (-4 °F ... +284 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)  
 Axial movement:  $\pm 0.5 \text{ mm}$

### Materials

Seal face: Carbon graphite resin impregnated (B), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V), EPDM (E)  
 Metal parts: CrNiMo steel (G), CrNiMo cast steel (G)

### Standards and approvals

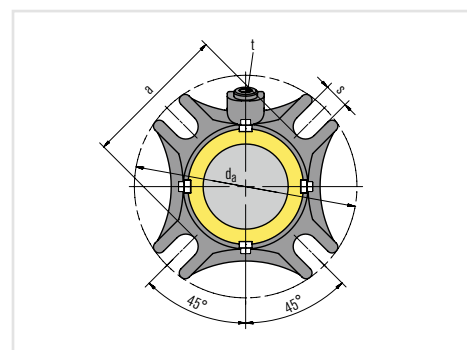
• Material approvals: e. g. FDA, KTW, WRAS, W270, NSF, ACS

### Recommended applications

- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Cold and hot water
- Cooling fluids
- Beverages
- Diluted lyes and acids
- Suspensions with low solids content
- Circulating pumps
- Water and waste water pumps
- Production of pressure oils for bio diesel fuels

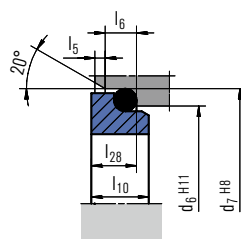
### Item Description

- |     |                          |
|-----|--------------------------|
| 1.1 | Seal face                |
| 1.2 | Bellows                  |
| 1.3 | Drive collar             |
| 1.4 | "L"-ring (Spring collar) |
| 2   | Spring                   |
| 3   | Seat (G60)               |
| 4   | O-Ring or corner sleeve  |
| 5   | Spacer ring              |
| 6   | Shaft sleeve             |
| 7   | O-Ring                   |
| 8   | Cover                    |
| 9   | Gasket                   |
| 10  | Drive collar             |
| 11  | Set screw                |
| 12  | Snap ring                |
| 13  | Assembly fixture         |
| 14  | HSH Cap screw            |
| 15  | Screw plug               |



Seal cover

### Seat alternative



G6 (EN 12756)

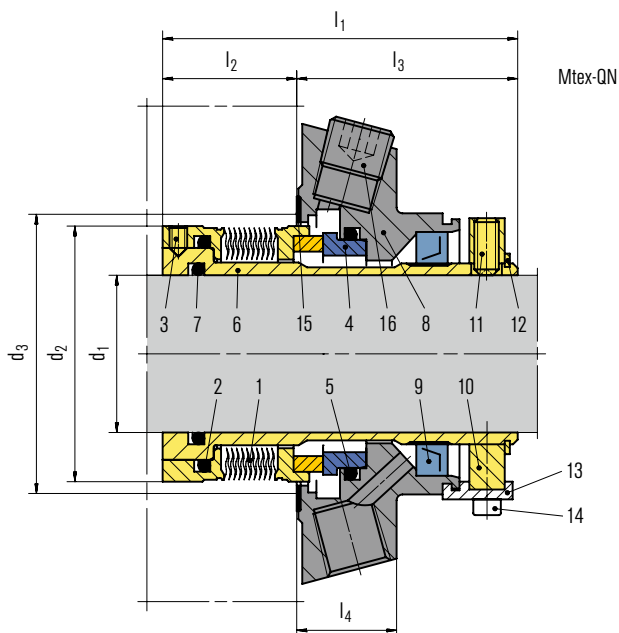
### Dimensions in mm

d <sub>N</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	d <sub>g</sub>	d <sub>a</sub>	a	s	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	t
25	38.4	41.5	51.0	60	105	62	13.2	65.5	41.0	24.5	23	1/4 NPT
28	42.4	44.5	52.0	60	105	62	13.2	68.0	41.5	26.5	23	1/4 NPT
30	42.4	45.5	56.0	63	105	67	13.2	68.0	41.5	26.5	23	1/4 NPT
33	45.0	48.0	57.0	65	110	67	13.2	69.5	42.0	27.5	23	1/4 NPT
35	49.1	50.8	61.5	68	107	70	13.2	72.5	44.0	28.5	26	1/4 NPT
38	51.3	54.5	66.0	73	123	75	14.7	72.5	44.0	28.5	26	1/4 NPT
40	54.3	57.5	68.0	75	123	77	14.7	75.5	44.5	31.0	26	1/4 NPT
43	56.3	59.5	70.5	78	133	80	14.7	76.5	44.5	32.0	26	1/4 NPT
45	59.8	63.0	73.0	79	130	82	14.2	76.5	44.5	32.0	26	1/4 NPT
48	61.8	65.0	75.0	82	130	84	14.2	78.0	45.0	33.0	26	1/4 NPT
50	64.8	68.0	78.0	85	148	87	14.7	80.5	47.0	33.5	28	3/8 NPT
53	66.8	70.0	87.0	95	148	97	17.5	81.5	47.0	34.5	28	3/8 NPT
55	71.0	73.0	83.0	90	148	92	17.5	83.5	47.0	36.5	28	3/8 NPT
60	76.5	79.0	91.0	100	157	102	17.5	85.5	47.0	38.5	28	3/8 NPT
65	83.0	85.7	98.5	108	162	110	17.5	88.0	48.5	39.5	28	3/8 NPT
70	88.0	94.0	108.0	116	178	118	17.5	92.0	48.5	43.5	28	3/8 NPT
75	93.4	98.4	118.0	125	190	127	17.5	93.5	49.0	44.5	28	3/8 NPT

### Dimensions in inch

d <sub>N</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	d <sub>g</sub>	d <sub>a</sub>	a	s	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	t
1.000	1.512	1.634	2.000	2.362	4.134	2.440	0.520	2.579	1.614	0.965	0.906	1/4 NPT
1.125	1.669	1.750	2.050	2.362	4.134	2.441	0.520	2.677	1.634	1.043	0.906	1/4 NPT
1.250	1.772	1.890	2.250	2.559	4.331	2.638	0.520	2.736	1.654	1.083	0.906	1/4 NPT
1.375	1.933	2.000	2.420	2.677	4.213	2.756	0.520	2.854	1.732	1.122	1.024	1/4 NPT
1.500	2.020	2.146	2.625	2.874	4.843	2.950	0.579	2.854	1.732	1.122	1.024	1/4 NPT
1.750	2.354	2.480	2.812	3.110	5.118	3.230	0.559	3.012	1.752	1.260	1.024	1/4 NPT
1.875	2.433	2.559	2.940	3.228	5.118	3.307	0.559	3.071	1.772	1.299	1.024	1/4 NPT
2.000	2.551	2.677	3.190	3.346	5.827	3.430	0.579	3.169	1.850	1.319	1.102	3/8 NPT
2.125	2.795	2.875	3.437	3.740	5.512	3.820	0.689	3.287	1.850	1.437	1.102	3/8 NPT
2.250	2.874	2.992	3.560	3.780	6.181	3.858	0.689	3.287	1.850	1.437	1.102	3/8 NPT
2.375	3.012	3.110	3.590	3.937	6.181	4.020	0.689	3.366	1.850	1.516	1.102	3/8 NPT
2.500	3.209	3.287	3.800	4.173	6.693	4.252	0.689	3.465	1.909	1.555	1.102	3/8 NPT
2.625	3.268	3.374	3.937	4.252	6.378	4.331	0.689	3.465	1.909	1.555	1.102	3/8 NPT

# Mtex Single seals



## Features

- Single seal
- Cartridge
- Balanced
- Independent of direction of rotation
- Metal bellows
- Single seal with quench and lip seal (-QN) or throttle ring (-TN)
- Version available with multipoint injection ring (-QNM, -TNM)
- Supply connections for flush (A) and quench (B)

## Advantages

- Ideal seal for standardizations
- Universal applicable for packings conversions, retrofits or OEM
- Suitable for high temperature
- No dimensional modification of the seal chamber necessary, small radial installation height
- Trouble-free running due to bellows unit with vibration dampers (essential in case of dry-running)
- No dynamically loaded O-Ring
- Self cleaning effect of the bellows
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to preassembled unit (reduced down-times)
- Individual adaptation to pump design possible

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 25 \dots 80 \text{ mm}$  (1" ... 3.15")  
 Temperature:  $t^* = -40 \text{ °C} \dots +220 \text{ °C}$  (-40 °F ... +428 °F)  
 Pressure:  $p = 25 \text{ bar}$  (363 PSI)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

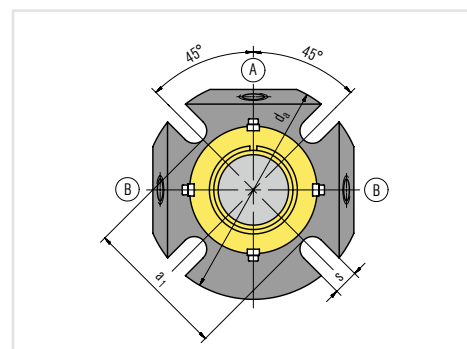
\* Operating limits of O-Rings to be observed

## Materials

Seal face: Carbon graphite antimony impregnated (A), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V), EPDM (E), FFKM (K)  
 Bellows: Inconel® 718 (M6)  
 Metal parts: CrNiMo steel (G), Duplex (G1)  
 Throttle ring: PTFE carbon graphite reinforced (T12)  
 Lip seal: NBR (P), PTFE carbon reinforced (T3)

## Item Description

1	Bellows unit
2, 5, 7	O-Ring
3, 11	Set screw
4	Seat
6	Shaft sleeve
8	Cover
9	Lip seal or throttle ring
10	Drive collar
12	Snap ring
13	Assembly fixture
14	HSH Cap screw
15	Gasket
16	Screw plug



Seal cover

## Recommended applications

- Process industry
- Chemical industry
- Hot media
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment



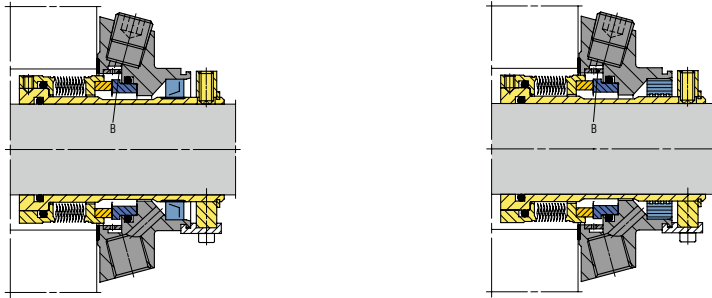
## Product variants

### Mtex-QNM

Single seal, as Mtex-QN  
with additional multipoint injection ring (item B).

### Mtex-TNM

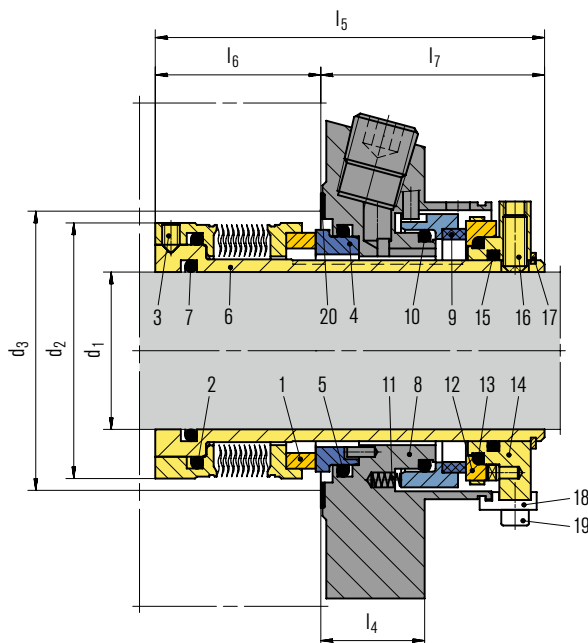
Single seal, as Mtex-TN  
with additional multipoint injection ring (item B).



## Dimensions in mm

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	d <sub>a</sub>	a <sub>1</sub>	s
25	45.0	47.0	51.0	79.5	26.1	53.4	25.4	105.0	62.0	13.2
30	49.4	52.0	56.0	78.4	25.0	53.4	25.4	105.0	67.0	13.2
32	52.3	54.5	57.0	78.4	25.0	53.4	25.4	108.0	70.0	13.2
33	52.3	54.5	57.0	78.4	25.0	53.4	25.4	108.0	70.0	13.2
35	54.8	58.0	61.5	78.4	25.0	53.4	25.4	113.0	72.0	13.2
38	57.5	60.0	66.0	78.4	25.0	53.4	25.4	123.0	75.0	13.2
40	58.8	62.0	68.0	78.2	24.8	53.4	25.4	123.0	77.0	14.2
43	61.9	64.5	70.5	78.4	25.0	53.4	25.4	133.0	80.0	14.2
45	65.0	68.5	73.0	78.4	25.0	53.4	25.4	138.0	82.0	14.2
48	68.4	71.0	75.0	78.7	25.3	53.4	25.4	138.0	85.0	14.2
50	70.0	73.0	78.0	79.1	25.7	53.4	25.4	148.0	87.0	14.2
53	71.9	75.0	87.0	77.8	24.4	53.4	25.4	148.0	97.0	18.0
55	74.6	77.0	83.0	78.9	25.5	53.4	25.4	148.0	92.0	18.0
60	83.9	87.0	91.0	80.1	26.7	53.4	25.4	157.0	102.0	18.0
65	87.5	90.0	98.5	80.0	26.6	53.4	25.4	163.0	109.3	18.0
70	93.0	98.0	108.0	81.5	28.1	53.4	25.4	178.0	118.3	18.0
75	96.8	101.6	118.0	94.4	30.5	63.9	28.0	190.0	129.0	18.0
80	104.7	108.0	124.0	94.4	30.4	64.0	28.0	195.0	135.0	18.0

# Mtex Dual seals



### Features

- Double seal
- Mtex-DN: API Plan 52 (53/54)
- Mtex9-DN: API Plan 53/54
- Cartridge
- Balanced
- Independent of direction of rotation
- Metal bellows
- Stationary O-Ring
- Pumping device independent of direction of rotation

### Advantages

- Ideal seal for standardizations
- Universal applicable for packings conversions, retrofits or OEM
- Suitable for high temperature
- No dimensional modification of the seal chamber necessary, small radial installation height
- Trouble-free running due to bellows unit with vibration dampers (essential in case of dry-running)
- No damage of the shaft by dynamically loaded O-Ring
- Self cleaning effect of the bellows
- Installation faults are avoided, cost-effective
- No damage caused by dirt entered during assembly
- Straightforward and easy installation due to preassembled unit (reduced down-times)
- Individual adaptation to pump design possible

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 25 \dots 80 \text{ mm}$  (1" ... 3.15")  
 Temperature:  $t^* = -40 \text{ °C} \dots +220 \text{ °C}$  (-40 °F ... +428 °F)  
 Pressure:  $p_1 = 25 \text{ bar}$  (232 PSI)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

### Barrier fluid circulation system:

$p_{3\text{max.}} = 16 \text{ bar}$  (232 PSI)  
 $\Delta p (p_3 - p_1)_{\text{ideal}} = 2 \dots 3 \text{ bar}$  (29 ... 44 PSI)  
 $\Delta p (p_3 - p_1)_{\text{max.}} = 10 \text{ bar}$  (145 PSI) at  $< 120 \text{ °C}$  ( $< 248 \text{ °F}$ )  
 $5 \text{ bar}$  (73 PSI) at  $\leq 220 \text{ °C}$  ( $\leq 232 \text{ PSI}$ )

API Plan 52 (53/54)

### Pump startup:

$\Delta p (p_3 - p_1)_{\text{max.}} = 16 \text{ bar}$  (232 PSI) allowed

\* Operating limits of O-Rings to be observed

### Item Description

1	Bellows unit
2, 5, 7, 10, 13, 15	O-Ring
3, 16	Set screw
4, 12	Seat
6	Shaft sleeve
8	Housing
9	Seal face
11	Spring
14	Drive collar
17	Snap ring
18	Assembly fixture
19	HSH Cap screw
20, 22	Gasket
23	Screw plug

### Recommended seal supply

EagleBurgmann TS2000 Thermosiphon system

### Recommended applications

- Process industry
- Chemical industry
- Hot media
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment

### Materials

Seal face: Carbon graphite (A), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1), Tungsten carbide (U2)  
 Secondary seals: FPM (V), EPDM (E), FFKM (K)  
 Bellows: Inconel® 718 (M6)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Duplex (G1)

### Product variant

#### Mtex9-DN

Dimensions, items and descriptions as for Mtex-DN, but with optimized seal face geometry for pressurized operation according to API Plan 53/54. A barrier fluid system (e.g. EagleBurgmann TS2000) is necessary.

Pressure:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

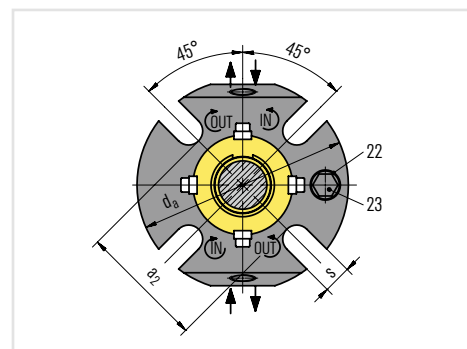
#### Barrier fluid circulation system:

$p_{3\text{max.}} = 16 \text{ bar}$  (232 PSI)  
 $\Delta p (p_3 - p_1)_{\text{ideal}} = 2 \dots 3 \text{ bar}$  (29 ... 44 PSI)  
 $\Delta p (p_3 - p_1)_{\text{max.}} = 16 \text{ bar}$  (232 PSI)

API Plan 53/54

#### Pump startup:

$\Delta p (p_3 - p_1)_{\text{max.}} = 16 \text{ bar}$  (232 PSI) allowed

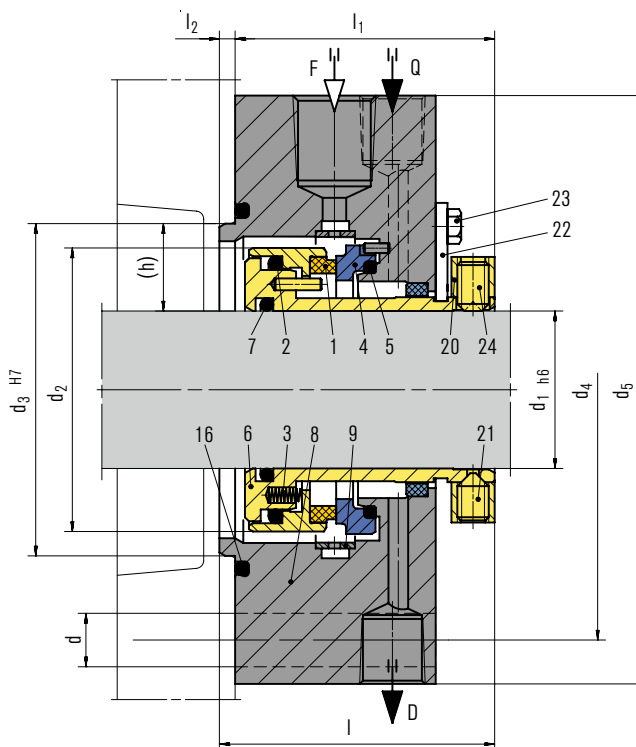
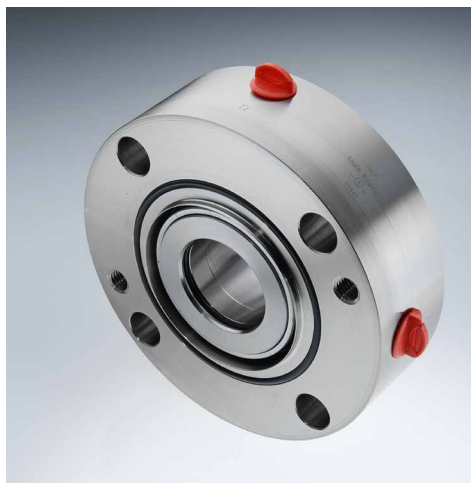


Seal cover

## Dimensions in mm

d <sub>1</sub>	d <sub>2</sub>	d <sub>3min.</sub>	d <sub>3max.</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	d <sub>a</sub>	a <sub>2</sub>	s
25	45.0	47.0	51.0	25.4	87.0	33.6	53.4	105.0	62.0	13.2
30	49.4	52.0	56.0	25.4	86.5	33.1	53.4	105.0	67.0	13.2
32	52.3	54.5	57.0	25.4	86.5	33.1	53.4	108.0	70.0	13.2
33	52.3	54.5	57.0	25.4	86.5	33.1	53.4	108.0	70.0	13.2
35	54.8	58.0	61.5	25.4	86.5	33.1	53.4	113.0	72.0	13.2
38	57.5	60.0	66.0	25.4	86.5	33.1	53.4	123.0	75.0	14.0
40	58.8	62.0	68.0	25.4	86.3	32.9	53.4	123.0	77.0	14.2
43	61.9	64.5	70.5	25.4	86.5	33.1	53.4	133.0	80.0	14.2
45	65.0	68.5	73.0	25.4	86.5	33.1	53.4	138.0	82.0	14.2
48	68.4	71.0	75.0	25.4	86.8	33.4	53.4	138.0	85.0	14.2
50	70.0	73.0	78.0	25.4	87.2	33.8	53.4	148.0	87.0	14.2
53	71.9	75.0	87.0	25.4	87.4	34.0	53.4	148.0	97.0	18.0
55	74.6	77.0	83.0	25.4	87.0	33.6	53.4	148.0	92.0	18.0
60	83.9	87.0	91.0	25.4	88.2	34.8	53.4	157.0	102.0	18.0
65	87.5	90.0	98.5	25.4	88.1	34.7	53.4	163.0	109.3	18.0
70	93.0	98.0	108.0	25.4	89.6	36.2	53.4	178.0	118.3	18.0
75	96.8	101.6	118.0	28.0	107.4	43.5	63.9	190.0	129.0	18.0
80	104.7	108.0	124.0	28.0	106.8	42.9	63.9	195.0	135.0	18.0

# APItex-S



## Features

- Single seal
- Cartridge unit
- Category 1, Type A, Arrangement 1
- Balanced
- Independent direction of rotation
- Shrink-fitted seal faces
- Solid mating ring

## Advantages

- Insensitive to shaft deflections and process fluctuations
- Good heat dissipation
- Pre-assembled unit, ready to install
- Low space requirements
- Springs protected from the product

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 110 \text{ mm}$  (0.79" ... 4.33")  
 Pressure:  $p_1 = 22 \text{ bar}$  (319 PSI)  
 Temperature:  $t = -40 \text{ °C} \dots +176 \text{ °C}$   
 (-40 °F ... +349 °F)  
 (>176 °C (349 °F) please inquire)  
 Sliding velocity:  $v_g = 23 \text{ m/s}$  (75 ft/s)

## Materials

Seal ring: Blister resistant carbon, Silicon carbide SSiC (Q12)  
 Mating ring: Silicon carbide SSiC (Q1)  
 Secondary seals: EPDM (E), NBR (P), FKM (V), FFKM (K)  
 Springs: Hastelloy® C-4 (M)\* and C-276 (M5)  
 Metal parts: CrNiMo steel 316 (G) or equivalent, optional materials on request.

\* EagleBurgmann standard

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Highly volatile hydrocarbons
- Toxic and hazardous media
- Media with poor lubrication properties
- Low solids content and low abrasive media
- Vertical and horizontal ANSI chemical standard pumps

## Standards and approvals

- API 682 / ISO 21049
- API 682 4th ed. Cat. 1 - 1CW-FX

## Item Description

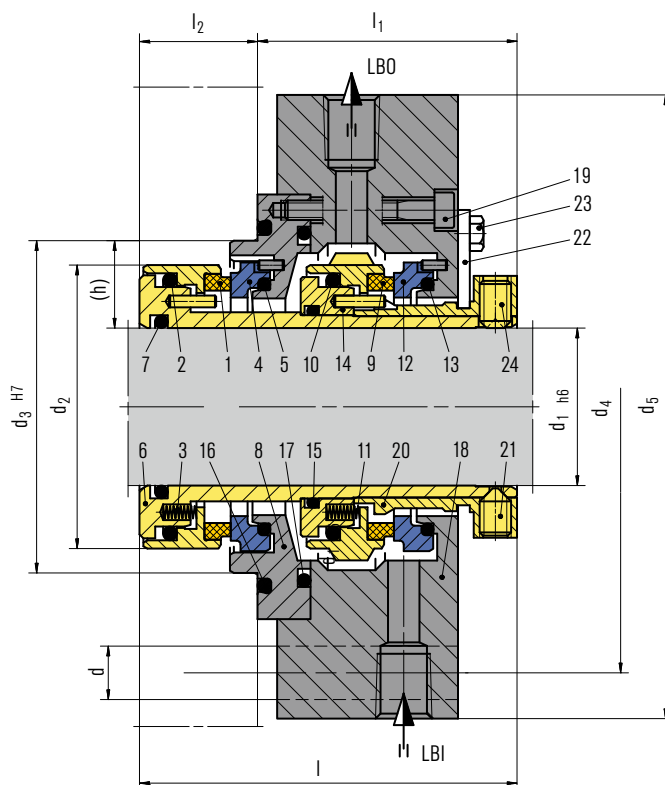
Item	Description
1	Seal ring
2, 5, 7, 16	O-Ring
3	Spring
4	Mating ring
6	Seal sleeve
8	Gland plate
9	Flow distributor
20	Set ring
21, 24	Set screw
22	Setting device
23	Hexagon bolt
F	Flush
Q	Quench
D	Drain

## Dimensions in mm

$d_1$	$d_2$	$d_3$	$d_4$	$d_5$	$l$	$l_1$	$l_2$	$d$	Qty.	Acc. ASME B73.1 (h min.)
20	50.4	58	105	127	70.5	66.5	4	13.5	4	19.05
25	55.4	63	110	132	70.5	66.5	4	13.5	4	19.05
30	60.4	68	115	137	70.5	66.5	4	13.5	4	19.05
35	65.4	73	120	142	70.5	66.5	4	13.5	4	19.05
40	70.4	78	125	147	70.5	66.5	4	13.5	4	19.05
45	75.4	83	135	162	70.5	66.5	4	17.5	4	19.05
50	80.4	88	140	167	72.5	68.5	4	17.5	4	19.05
55	85.4	93	145	172	72.5	68.5	4	17.5	4	19.05
60	96	105	160	187	87	83	4	17.5	4	22.22
65	101	110	165	192	87	83	4	17.5	4	22.22
70	106	115	170	197	87	83	4	17.5	4	22.22
75	111	120	175	202	87	83	4	17.5	4	22.22
80	116	125	185	218	87	83	4	22	4	22.22
85	123.5	136	190	223	86	71.5	14.5*	22	4	25.4
85	123.5	136	190	223	86	71.5	14.5*	22	4	25.4
90	128.5	141	195	228	86	71.5	14.5*	22	4	25.4
95	133.5	146	200	233	86	71.5	14.5*	22	4	25.4
100	138.5	151	205	238	86	71.5	14.5*	22	4	25.4
105	143.5	156	210	243	86	71.5	14.5*	22	4	25.4
110	152.5	161	215	248	86	71.5	14.5*	22	4	25.4

\* Immersion depth of seal sleeve into the stuffing box.

# APItex-T



## Features

- Dual seal
- Cartridge unit
- Category 1, Type A, Arrangement 2 or 3
- Balanced
- Independent of direction of rotation
- Shrink-fitted seal faces
- Solid mating rings

## Advantages

- Suitable for pressure reversal
- Insensitive to shaft deflections and process fluctuations
- Cover distortion cannot cause mating ring misalignment
- Good heat dissipation
- No external pump necessary
- Pre-assembled unit, ready to install
- Low space requirements
- Security due to proofed design
- Springs protected from the product

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 110 \text{ mm (0.79" ... 4.33")}$

Pressure:  $p_1 = 22 \text{ bar (319 PSI)}$

Temperature:  $t = -40 \text{ °C ... +176 °C}$   
 (-40 °F ... +349 °F)

(>176 °C (349 °F) please inquire)

Sliding velocity:  $v_g = 23 \text{ m/s (75 ft/s)}$

## Materials

Seal ring: Blister resistant carbon,  
 Silicon carbide SSIC (Q12)  
 Mating ring: Silicon carbide SSIC (Q1)  
 Secondary seals:  
 EPDM (E), NBR (P), FKM (V), FFKM (K)  
 Springs: Hastelloy® C-4 (M)\* and C-276 (M5)  
 Metal parts: CrNiMo steel 316 (G) or equivalent,  
 optional materials on request.  
 \* EagleBurgmann standard

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Highly volatile hydrocarbons
- Toxic and hazardous media
- Media with poor lubrication properties
- Low solids content and low abrasive media
- Vertical and horizontal ANSI chemical standard pumps

## Item

Item	Description
1, 9	Seal ring
2, 5, 7, 10, 13, 15, 16, 17	O-Ring
3, 11	Spring
4, 12	Mating ring
6	Seal sleeve
8, 18	Gland plate
14	Driver
19	HSB Cap screw
20	Set ring
21, 24	Set screw
22	Setting device
23	Hexagon bolt

LBO Liquid buffer/barrier OUT

LBI Liquid buffer/barrier IN

## Standards and approvals

API 682 / ISO 21049

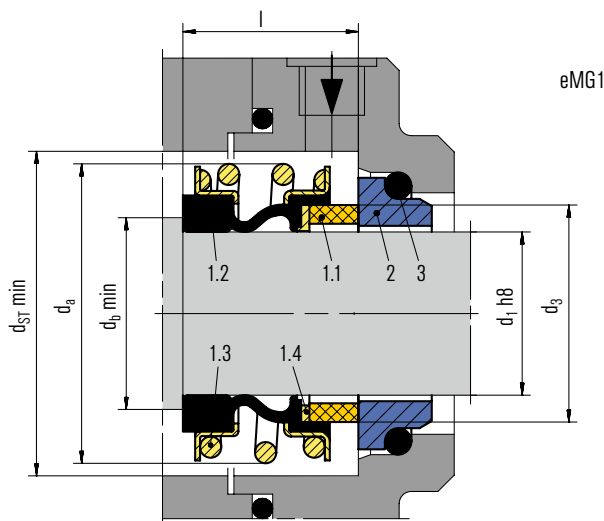
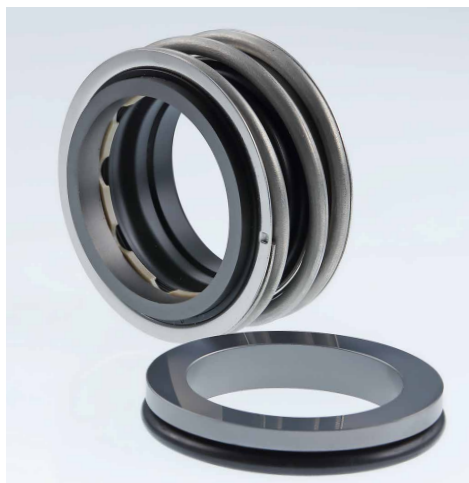
API 682 4th ed. Cat. 1 - 2CW-CW

API 682 4th ed. Cat. 1 - 3CW-FB

## Dimensions in mm

$d_1$	$d_2$	$d_3$	$d_4$	$d_5$	$l$	$l_1$	$l_2$	$d$	Qty.	Acc. ASME B73.1 (h min.)
20	50.4	58	105	127	96.5	68.5	28	13.5	4	19.05
25	55.4	63	110	132	96.5	68.5	28	13.5	4	19.05
30	60.4	68	115	137	96.5	68.5	28	13.5	4	19.05
35	65.4	73	120	142	96.5	68.5	28	13.5	4	19.05
40	70.4	78	125	147	96.5	68.5	28	13.5	4	19.05
45	75.4	83	135	162	96.5	68.5	28	17.5	4	19.05
50	80.4	88	140	167	100	72	28	17.5	4	19.05
55	85.4	93	145	172	100	72	28	17.5	4	19.05
60	96	105	160	187	127.5	88	39.5	17.5	4	22.22
65	101	110	165	192	127.5	88	39.5	17.5	4	22.22
70	106	115	170	197	127.5	88	39.5	17.5	4	22.22
75	111	120	175	202	127.5	88	39.5	17.5	4	22.22
80	116	125	185	213	127.5	88	39.5	22	4	22.22
85	123.5	136	190	223	131.5	92	39.5	22	4	25.4
90	128.5	141	195	228	131.5	92	39.5	22	4	25.4
95	133.5	146	200	233	131.5	92	39.5	22	4	25.4
100	138.5	151	205	238	131.5	92	39.5	22	4	25.4
105	143.5	156	210	243	131.5	92	39.5	22	4	25.4
110	152.5	161	215	248	131.5	92	39.5	22	4	25.4

# eMG1



## Features

- For plain shafts
- Elastomer bellows rotating
- Unbalanced
- Independent of direction of rotation
- Single and dual seal

## Advantages

- Small outer diameter of bellows support ( $d_0$ min) enables direct retaining ring support, or smaller spacer rings
- Optimal alignment characteristic through self-cleaning of disk/shaft
- Improved centering across entire pressure operating range
- No torsion on bellows
- Shaft protection over entire seal length
- Protection of seal face during installation due to special bellows design
- Insensitive to shaft deflections due to large axial movement ability
- Suitable for low-end sterile applications
- Dimension adaptations and additional seats available

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 15 \dots 110 \text{ mm}$  (0.59" ... 4.33")  
 Pressure:  $p_1 = 16 \text{ bar}$  (230 PSI),  
 vacuum ... 0.5 bar (7.25 PSI), up to 1 bar (14.5 PSI)  
 with seat locking  
 Temperature:  $t = -20 \text{ °C} \dots +140 \text{ °C}$  (-4 °F ... +284 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)  
 Axial movement:  $\pm 2.0 \text{ mm}$

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1, eSiC-Q7), Tungsten carbide (U3)  
 Seat: Silicon carbide (Q1, Q2, eSiC-Q7),  
 Tungsten carbide (U3), Special cast CrMo steel (S),  
 Aluminium oxide (V)  
 Elastomer: NBR (P), EPDM (E), FKM (V), HNBR (X4)  
 Metal parts: CrNiMo steel (G), Hastelloy® C-4 (M)

## Standards and approvals

- Various material approvals (depending on type and material combinations). Please inquire!
- FDA
- WRAS
- KTW
- ACS
- W270

## Recommended applications

- Process industry
- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Food and beverage industry
- Sugar industry
- Oil applications
- Water, waste water, slurries (up to 5 % by weight)
- Pulp (up to 4 % otro)
- Latex
- Dairies, beverages
- Sulfide slurries
- Chemicals
- Oils
- Chemical standard pumps
- Helical screw pumps
- Stock pumps
- Circulating pumps
- Submersible pumps
- Water and waste water pumps

## Item Description

Item	Description
1.1	Seal face
1.2	Bellows
1.3	Set of springs
1.4	PEEK-PTFE disk
2	Seat (G6)
3	O-Ring or cup rubber

## Notes

The eMG1 can also be used as a multiple seal in tandem or in a back-to-back arrangement. Installation proposals available upon request.

Dimension adaptations for specific conditions, e.g. shaft in inches or special seat dimensions are available upon request.

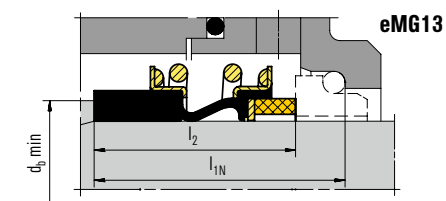
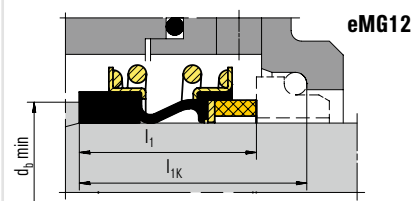
## Product variants

### eMG12

Dimensions, items and designations same as for eMG1, but with an extended bellows tail to achieve the fitting length  $l_{1K}$  according to EN 12756 in combination with seat G6 or G60 ( $d_a$  exceeds EN 12756).

### eMG13

Dimensions, items and designations same as for eMG1, but with an extended bellows tail to achieve the fitting length  $l_{1N}$  according to EN 12756 in combination with seat G6 or G60 ( $d_a$  exceeds EN 12756).

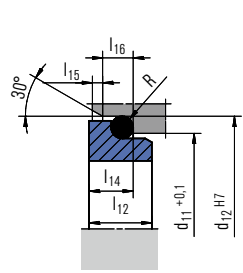


### eRMG1..

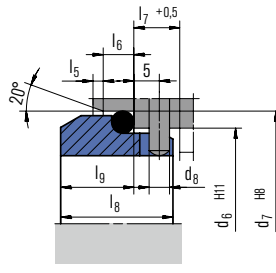
Identical to eMG1..., but with a special bellows surface on the shaft side. For use in hot water pumps up to 120 °C (248 °F) and 25 bar (363 PSI) or 140 °C (284 °F) and 16 bar (232 PSI). Only in combination with seat G606 ( $d_1 = 12 \dots 38 \text{ mm}$  (0.47" ... 1.50")).

Seal face: Tungsten carbide (U3)  
 Seat G606: Carbon graphite resin impregnated (B),  
 Carbon graphite antimony impregnated (A)

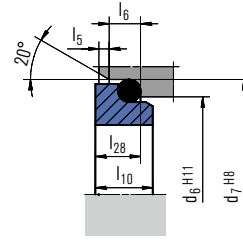
## Seat alternatives



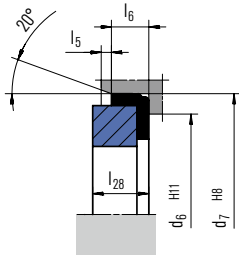
**G4**



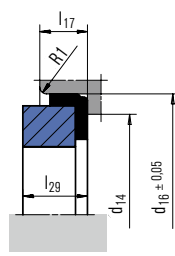
**G9 EN 12756**



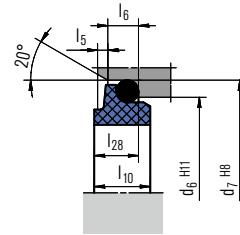
**G6 EN 12756**



**G60 EN 12756**



**G50 Euro standard**



**G606 EN 12756 (for eRMG1.. only)**

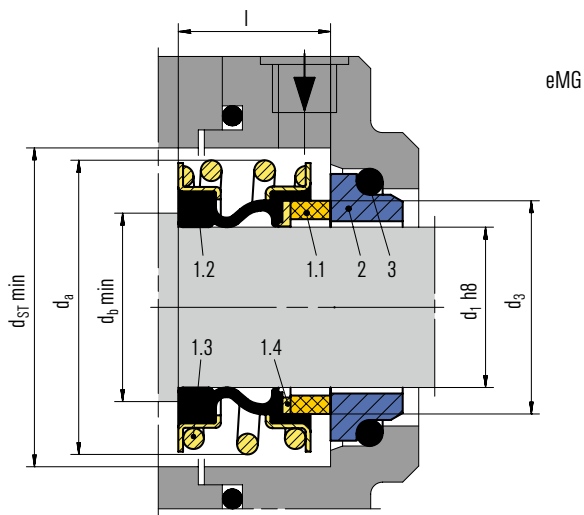
## Dimensions in mm

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>14</sub>	d <sub>16</sub>	d <sub>a</sub>	d <sub>b</sub> *	d <sub>ST</sub>	l	l <sub>1</sub>	l <sub>k</sub>	l <sub>1N</sub>	l <sub>2</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>	l <sub>12</sub>	l <sub>14</sub>	l <sub>15</sub>	l <sub>16</sub>	l <sub>17</sub>	l <sub>28</sub>	l <sub>29</sub>	R	
15	20.8	-	-	-	20.5	24.6	17.0	30.95	28.5	18.5	30	17.0	-	-	-	-	-	-	-	-	-	-	7.5	6.6	1.2	3.8	9.0	-	10.5	1.2	
16	21.0	23	27	3	22.0	28.0	17.0	30.95	28.5	19.5	30	17.0	28.4	35.0	40	33.4	1.5	4	8.5	17.5	10.0	7.5	8.5	7.5	1.5	5.0	9.0	6.6	10.5	1.5	
18	23.7	27	33	3	24.0	30.0	20.0	34.15	32.0	21.5	33	19.5	30.0	37.5	-	-	2.0	5	9.0	19.5	11.5	8.5	9.0	8.0	1.5	5.0	9.0	7.5	10.5	1.5	
20	26.7	29	35	3	29.5	35.0	21.5	35.70	37.0	24.0	38	21.5	30.0	37.5	-	-	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5	
22	27.7	31	37	3	29.5	35.0	23.0	37.30	37.0	26.0	38	21.5	30.0	37.5	-	-	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5	
24	31.2	33	39	3	32.0	38.0	26.5	40.50	42.5	28.0	44	22.5	32.5	40.0	-	-	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5	
25	31.2	34	40	3	32.0	38.0	26.5	40.50	42.5	29.0	44	23.0	32.5	40.0	-	-	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5	
28	35.0	37	43	3	36.0	42.0	29.5	47.65	49.0	32.0	50	26.5	35.0	42.5	50	42.5	2.0	5	9.0	19.5	11.5	8.5	10.0	9.0	1.5	5.0	10.5	7.5	12.0	1.5	
30	37.0	39	45	3	39.2	45.0	32.5	50.80	49.0	34.0	50	26.5	35.0	42.5	-	-	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5.0	10.5	7.5	12.0	1.5	
32	40.2	42	48	3	42.2	48.0	32.5	50.80	53.5	36.0	55	27.5	35.0	42.5	-	-	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5.0	10.5	7.5	12.0	1.5	
33	40.2	42	48	3	44.2	50.0	36.5	54.00	53.5	37.0	55	27.5	35.0	42.5	-	-	2.0	5	9.0	19.5	11.5	8.5	12.0	11.0	1.5	5.0	10.5	7.5	12.0	1.5	
35	43.2	44	50	3	46.2	52.0	36.5	54.00	57.0	40.0	59	28.5	-	-	-	-	2.0	5	9.0	19.5	11.5	8.5	12.0	11.0	1.5	5.0	10.5	7.5	12.0	1.5	
38	46.2	49	56	4	49.2	55.0	39.5	57.15	59.0	43.0	61	30.0	36.0	45.0	55	46.0	2.0	6	9.0	22.0	14.0	10.0	11.3	10.3	1.5	5.0	10.5	9.0	12.0	1.5	
40	48.8	51	58	4	52.2	58.0	42.5	60.35	62.0	45.0	64	30.0	36.0	45.0	-	-	2.0	6	9.0	22.0	14.0	10.0	11.8	10.8	1.5	5.0	10.5	9.0	12.0	1.5	
43	51.8	54	61	4	53.3	62.0	46.0	63.50	65.5	48.0	67	30.0	36.0	45.0	-	-	2.0	6	9.0	22.0	14.0	10.0	13.2	12.0	2.0	6.0	10.5	9.0	12.0	2.5	
45	53.8	56	63	4	55.3	64.0	46.0	63.50	68.0	50.0	70	30.0	36.0	45.0	-	-	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6.0	10.5	9.0	12.0	2.5	
48	56.8	59	66	4	59.7	68.4	49.0	66.70	70.5	53.0	74	30.5	36.0	45.0	60	51.0	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6.0	10.5	9.0	12.0	2.5	
50	58.8	62	70	4	60.8	69.3	52.0	69.85	74.0	55.0	77	30.5	-	-	-	-	2.5	6	9.0	23.0	15.0	10.5	12.8	11.6	2.0	6.0	12.0	9.5	13.5	2.5	
55	64.2	67	75	4	66.5	75.4	58.5	76.20	81.0	60.0	83	35.0	36.5	47.5	70	59.0	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6.0	12.0	11.0	13.5	2.5	
60	70.0	72	80	4	71.5	80.4	61.5	79.40	88.5	66.0	91	38.0	41.5	52.5	70	54.5	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6.0	12.0	11.0	13.5	2.5	
65	75.0	77	85	4	76.5	85.4	68.0	92.10	93.5	71.0	96	40.0	41.5	52.5	-	-	2.5	6	9.0	23.0	15.0	12.0	14.2	13.0	2.0	6.0	14.5	11.0	16.0	2.5	
70	80.0	83	92	4	83.0	92.0	71.0	95.25	99.5	76.0	103	40.0	-	-	-	-	2.5	7	9.0	26.0	18.0	12.5	14.2	13.0	2.0	6.0	14.5	11.3	16.0	2.5	
75	85.5	88	97	4	90.2	99.0	77.5	101.60	107.0	81.0	110	40.0	-	-	-	-	2.5	7	9.0	26.0	18.0	12.5	15.2	14.0	2.0	6.0	14.5	11.3	16.0	2.5	
80	90.5	95	105	4	95.2	104.0	84.0	114.30	112.0	86.0	116	40.0	-	-	-	-	3.0	7	9.0	26.2	18.2	13.0	16.2	15.0	2.0	6.0	18.5	14.0	20.0	2.5	
85	96.0	100	110	4	100.2	109.0	87.0	117.50	120.0	92.0	124	41.0	-	-	-	-	3.0	7	9.0	26.2	18.2	15.0	16.0	14.8	2.0	6.0	18.5	14.0	20.0	2.5	
90	102.0	105	115	4	105.2	114.0	93.5	123.85	127.0	97.0	131	45.0	-	-	-	-	3.0	7	9.0	26.2	18.2	15.0	16.0	14.8	2.0	6.0	18.5	14.0	20.0	2.5	
95	107.0	110	120	4	111.6	120.3	96.5	127.00	132.0	102.0	136	46.0	-	-	-	-	3.0	7	9.0	25.2	17.2	15.0	17.0	15.8	2.0	6.0	18.5	14.0	20.0	2.5	
100	112.0	115	125	4	114.5	123.3	103.0	133.35	137.0	107.0	140	47.0	-	-	-	-	3.0	7	9.0	25.2	17.2	15.0	17.0	15.8	2.0	6.0	18.5	14.0	20.0	2.5	
110	123.0	-	-	-	-	-	-	-	150.0	118.0	154	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fitting length/axial movement tolerances: d<sub>1</sub> 15 ... 18 mm ±1.0; d<sub>1</sub> 20 ... 26 mm ±1.5; d<sub>1</sub> 28 ... 110 mm ±2.0 mm

\* Minimum diameter of the mating collar

# eMG



## Features

- For plain shafts
- Elastomer bellows rotating
- Unbalanced
- Independent of direction of rotation
- Single and dual seal

## Advantages

- **Identical with eMG1 but with approx. 20% shorter installation length**
- Small outer diameter of bellows support ( $d_{b \min}$ ) enables direct retaining ring support, or smaller spacer rings
- Optimal alignment characteristic through self-cleaning of disk/shaft
- Improved centering across entire pressure operating range
- No torsion on bellows
- Shaft protection over entire seal length
- Protection of seal face during installation due to special bellows design
- Insensitive to shaft deflections due to large axial movement ability
- Dimension adaptations and additional seats available

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 15 \dots 110 \text{ mm}$  (0.59" ... 4.33")

Pressure:  $p_1 = 16 \text{ bar}$  (230 PSI),  
vacuum ... 0.5 bar (7.25 PSI), up to 1 bar (14.5 PSI)  
with seat locking

Temperature:  $t = -20 \text{ °C} \dots +140 \text{ °C}$  (-4 °F ... +284 °F)

Sliding velocity:  $v_0 = 10 \text{ m/s}$  (33 ft/s)

Axial movement:  $\pm 2.0 \text{ mm}$

## Recommended applications

- Process industry
- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Food and beverage industry
- Sugar industry
- Water, waste water, slurries
- (up to 5 % by weight)
- Pulp (up to 4 % otro)
- Latex
- Dairies, beverages
- Sulfide slurries
- Chemicals
- Oils
- Chemical standard pumps
- Helical screw pumps
- Stock pumps
- Circulating pumps
- Submersible pumps
- Water and waste water pumps

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
Carbon graphite resin impregnated (B),  
Silicon carbide (Q1, eSiC-Q7), Tungsten carbide (U3)

Seat: Silicon carbide (Q1, Q2, eSiC-Q7),  
Tungsten carbide (U3), Special cast CrMo steel (S),  
Aluminium oxide (V)

Elastomer: NBR (P), EPDM (E), FKM (V), HNBR (X4)

Metal parts: CrNiMo steel (G), Hastelloy® C-4 (M)

## Standards and approvals

- Various material approvals (depending on type and material combinations). Please inquire!
- FDA
- WRAS
- KTW
- ACS
- W270

## Item Description

1.1	Seal face
1.2	Bellows
1.3	Set of springs
1.4	PEEK-PTFE disk
2	Seat (G6)
3	O-Ring or cup rubber

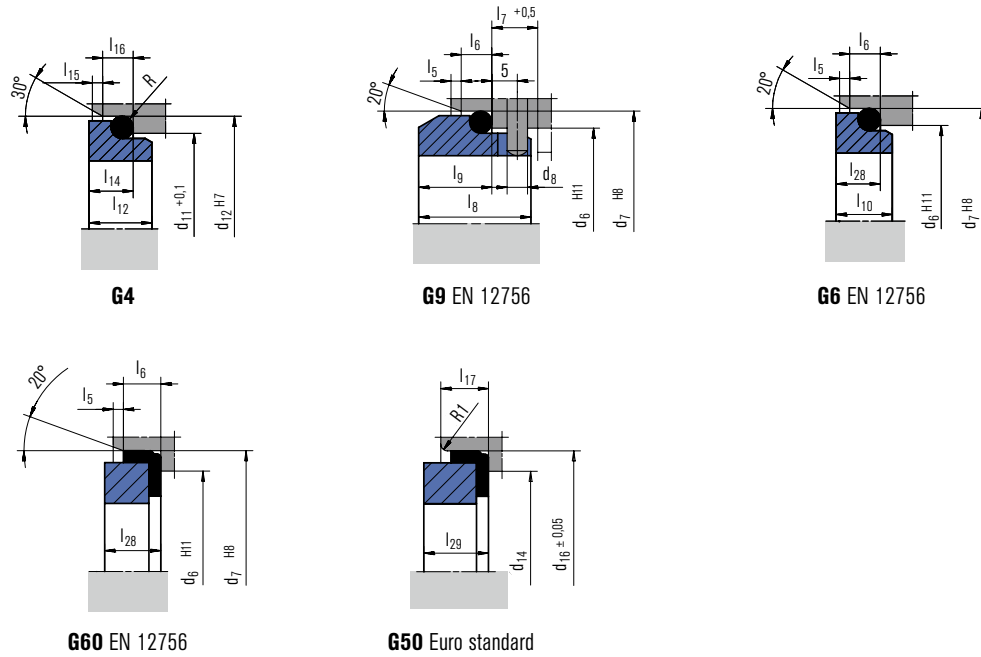
## Notes

The eMG can also be used as a multiple seal in tandem or in a back-to-back arrangement. Installation proposals available upon request.

Dimension adaptations for specific conditions, e.g. shaft in inches or special seat dimensions are available upon request.



## Seat alternatives



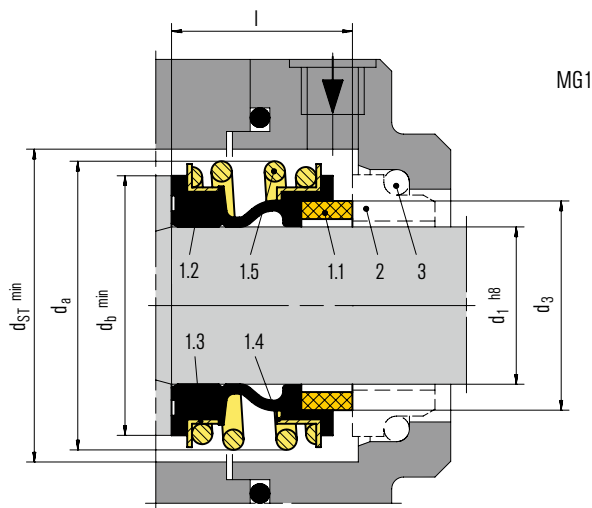
## Dimensions in mm

$d_1$	$d_3$	$d_6$	$d_7$	$d_8$	$d_{11}$	$d_{12}$	$d_{14}$	$d_{16}$	$d_a$	$d_b^*$	$d_{ST}$	$l$	$l_5$	$l_6$	$l_7$	$l_8$	$l_9$	$l_{10}$	$l_{12}$	$l_{14}$	$l_{15}$	$l_{16}$	$l_{17}$	$l_{28}$	$l_{29}$	$R$
15	20.8	-	-	-	20.5	24.6	17.0	30.95	28.5	18.5	30	15.0	-	-	-	-	-	-	7.5	6.6	1.2	3.8	9.0	-	10.5	1.2
16	21.0	23	27	3	22.0	28.0	17.0	30.95	28.5	19.5	30	15.0	1.5	4	8.5	17.5	10.0	7.5	8.5	7.5	1.5	5.0	9.0	6.6	10.5	1.5
18	23.7	27	33	3	24.0	30.0	20.0	34.15	32.0	21.5	33	17.0	2.0	5	9.0	19.5	11.5	8.5	9.0	8.0	1.5	5.0	9.0	7.5	10.5	1.5
20	26.7	29	35	3	29.5	35.0	21.5	35.70	37.0	24.0	38	19.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5
22	27.7	31	37	3	29.5	35.0	23.0	37.30	37.0	26.0	38	19.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5
24	31.2	33	39	3	32.0	38.0	26.5	40.50	42.5	28.0	44	19.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5
25	31.2	34	40	3	32.0	38.0	26.5	40.50	42.5	29.0	44	19.0	2.0	5	9.0	19.5	11.5	8.5	8.5	7.5	1.5	5.0	9.0	7.5	10.5	1.5
28	35.0	37	43	3	36.0	42.0	29.5	47.65	49.0	32.0	50	23.0	2.0	5	9.0	19.5	11.5	8.5	10.0	9.0	1.5	5.0	10.5	7.5	12.0	1.5
30	37.0	39	45	3	39.2	45.0	32.5	50.80	49.0	34.0	50	23.0	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5.0	10.5	7.5	12.0	1.5
32	40.2	42	48	3	42.2	48.0	32.5	50.80	53.5	36.0	55	23.5	2.0	5	9.0	19.5	11.5	8.5	11.5	10.5	1.5	5.0	10.5	7.5	12.0	1.5
33	40.2	42	48	3	44.2	50.0	36.5	54.00	53.5	37.0	55	23.5	2.0	5	9.0	19.5	11.5	8.5	12.0	11.0	1.5	5.0	10.5	7.5	12.0	1.5
35	43.2	44	50	3	46.2	52.0	36.5	54.00	57.0	40.0	59	24.5	2.0	5	9.0	19.5	11.5	8.5	12.0	11.0	1.5	5.0	10.5	7.5	12.0	1.5
38	46.2	49	56	4	49.2	55.0	39.5	57.15	59.0	43.0	61	25.0	2.0	6	9.0	22.0	14.0	10.0	11.3	10.3	1.5	5.0	10.5	9.0	12.0	1.5
40	48.8	51	58	4	52.2	58.0	42.5	60.35	62.0	45.0	64	25.5	2.0	6	9.0	22.0	14.0	10.0	11.8	10.8	1.5	5.0	10.5	9.0	12.0	1.5
43	51.8	54	61	4	53.3	62.0	46.0	63.50	65.5	48.0	67	25.5	2.0	6	9.0	22.0	14.0	10.0	13.2	12.0	2.0	6.0	10.5	9.0	12.0	2.5
45	53.8	56	63	4	55.3	64.0	46.0	63.50	68.0	50.0	70	25.5	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6.0	10.5	9.0	12.0	2.5
48	56.8	59	66	4	59.7	68.4	49.0	66.70	70.5	53.0	74	26.0	2.0	6	9.0	22.0	14.0	10.0	12.8	11.6	2.0	6.0	10.5	9.0	12.0	2.5
50	58.8	62	70	4	60.8	69.3	52.0	69.85	74.0	55.0	77	26.0	2.5	6	9.0	23.0	15.0	10.5	12.8	11.6	2.0	6.0	12.0	9.5	13.5	2.5
55	64.2	67	75	4	66.5	75.4	58.5	76.20	81.0	60.0	83	30.0	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6.0	12.0	11.0	13.5	2.5
60	70.0	72	80	4	71.5	80.4	61.5	79.40	88.5	66.0	91	32.0	2.5	6	9.0	23.0	15.0	12.0	14.5	13.3	2.0	6.0	12.0	11.0	13.5	2.5
65	75.0	77	85	4	76.5	85.4	68.0	92.10	93.5	71.0	96	34.0	2.5	6	9.0	23.0	15.0	12.0	14.2	13.0	2.0	6.0	14.5	11.0	16.0	2.5
70	80.0	83	92	4	83.0	92.0	71.0	95.25	99.5	76.0	103	34.0	2.5	7	9.0	26.0	18.0	12.5	14.2	13.0	2.0	6.0	14.5	11.3	16.0	2.5
75	85.5	88	97	4	90.2	99.0	77.5	101.60	107.0	81.0	110	34.0	2.5	7	9.0	26.0	18.0	12.5	15.2	14.0	2.0	6.0	14.5	11.3	16.0	2.5
80	90.5	95	105	4	95.2	104.0	84.0	114.30	112.0	86.0	116	34.0	3.0	7	9.0	26.2	18.2	13.0	16.2	15.0	2.0	6.0	18.5	12.0	20.0	2.5
85	96.0	100	110	4	100.2	109.0	87.0	117.50	120.0	92.0	124	35.0	3.0	7	9.0	26.2	18.2	15.0	16.0	14.8	2.0	6.0	18.5	14.0	20.0	2.5
90	102.0	105	115	4	105.2	114.0	93.5	123.85	127.0	97.0	131	38.0	3.0	7	9.0	26.2	18.2	15.0	16.0	14.8	2.0	6.0	18.5	14.0	20.0	2.5
95	107.0	110	120	4	111.6	120.3	96.5	127.00	132.0	102.0	136	39.0	3.0	7	9.0	25.2	17.2	15.0	17.0	15.8	2.0	6.0	18.5	14.0	20.0	2.5
100	112.0	115	125	4	114.5	123.3	103.0	133.35	137.0	107.0	140	40.0	3.0	7	9.0	25.2	17.2	15.0	17.0	15.8	2.0	6.0	18.5	14.0	20.0	2.5
110	123.0	-	-	-	-	-	-	-	150.0	118.0	154	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fitting length/axial movement tolerances:  $d_1$  15 ... 18 mm  $\pm 1.0$ ;  $d_1$  20 ... 26 mm  $\pm 1.5$ ;  $d_1$  28 ... 110 mm  $\pm 2.0$  mm

\* Minimum diameter of the mating collar

# MG1



## Features

- For plain shafts
- Single and dual seal
- Elastomer bellows rotating
- Unbalanced
- Independent of direction of rotation
- No torsion on bellows

## Advantages

- Shaft protection over entire seal length
- Protection of seal face during installation due to special bellows design
- Insensitive to shaft deflections due to large axial movement ability
- Universal application opportunities
- Important material certifications available
- High flexibility due to wide offer on materials
- Suitable for low-end sterile applications
- Special design for hot water pumps (RMG12) available
- Dimension adaptations and additional seats available

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 10 \dots 100 \text{ mm}$  (0.39" ... 3.94")  
 Pressure:  $p_1 = 16 \text{ bar}$  (230 PSI),  
 vacuum ... 0,5 bar (7.25 PSI), up to 1 bar (14.5 PSI)  
 with seat locking  
 Temperature:  $t = -20 \text{ °C} \dots +140 \text{ °C}$  (-4 °F ... +284 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)  
 Axial movement:  $\pm 2.0 \text{ mm}$

## Recommended applications

- Process industry
- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Food and beverage industry
- Sugar industry
- Oil applications
- Water, waste water, slurries (up to 5 % by weight)
- Pulp (up to 4 % otro)
- Latex
- Dairies, beverages
- Sulfide slurries
- Chemicals
- Oils
- Chemical standard pumps
- Helical screw pumps
- Stock pumps
- Circulating pumps
- Submersible pumps
- Water and waste water pumps

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B), Silicon carbide (Q1),  
 Tungsten carbide (U3)  
 Seat: Silicon carbide (Q1, Q2), Tungsten carbide (U3),  
 Special cast CrMo steel (S), Aluminium oxide (V)  
 Elastomer: NBR (P), EPDM (E), FKM (V), HNBR (X4)  
 Metal parts: CrNiMo steel (G), Hastelloy® C-4 (M)

## Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	481	Bellows
1.3	484.2	"L"-ring (spring collar)
1.4	484.1	"L"-ring (spring collar)
1.5	477	Spring
2	475	Seat
3	412	O-Ring or cup rubber

## Standards and approvals

- Various material approvals e.g. FDA, WRAS, KTW, ACS, W270, NSF available (depending on type and material combinations). Please inquire!
- EN 12756 (MG12, MG13)

## Product variants

### MG12

Dimensions, items and designations same as for MG1, but with an extended bellows tail to achieve the fitting length  $l_{1k}$  according to EN 12756 in combination with seat G6 or G60 ( $d_a$  exceeds EN 12756).

### MG1S20

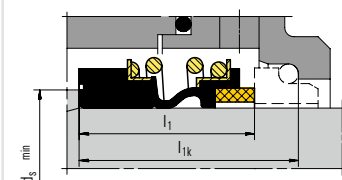
Dimensions, items and designations same as for MG1, but with an extended bellows tail to achieve the special fitting length  $l_{1s}$  in combination with seat G50.

### MG13

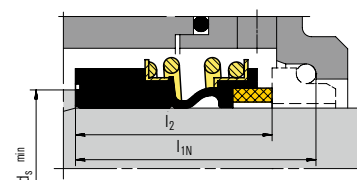
Dimensions, items and designations same as for MG1, but with an extended bellows tail to achieve the fitting length  $l_{1N}$  according to EN 12756 in combination with seat G6 or G60 ( $d_a$  exceeds EN 12756).

### RMG12

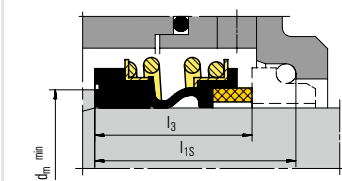
Identical to MG12, but with a special bellows surface on the shaft side. For use in hot water pumps up to 120 °C (248 °F) and 25 bar (363 ft/s) or 140 °C (284 °F) and 16 bar (232 PSI). Only in combination with seat G606 ( $d_1 = 12 \dots 38 \text{ mm}$ ) (0.47" ... 1.50").  
 Seal face: Tungsten Carbide (U3)  
 Seat G606: Carbon graphite resin impregnated (B)



MG12



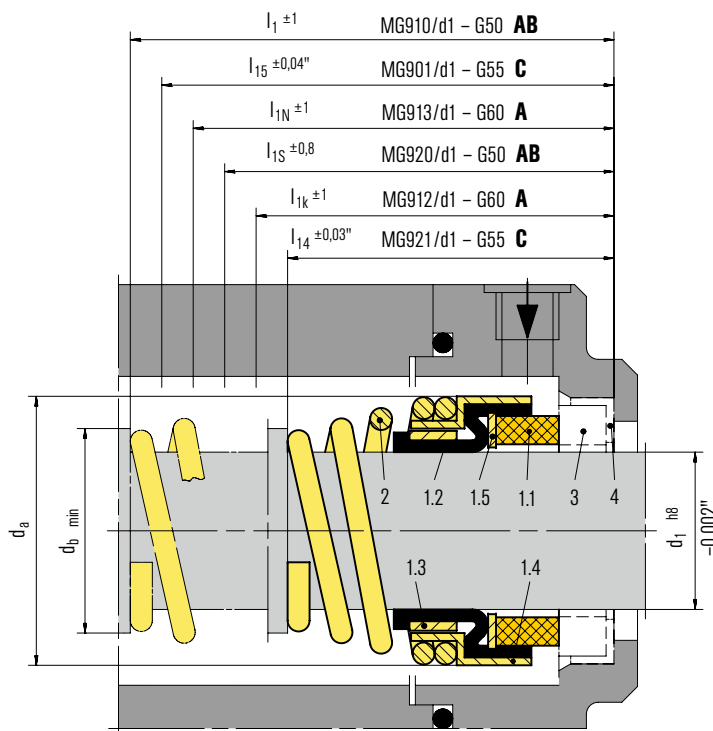
MG13



MG1S20



# MG9



## Features

- For plain shafts
- Single and dual seal
- Elastomer bellows rotating
- Unbalanced
- Independent of direction of rotation
- No torsion on bellows and spring
- Conical or cylindrical spring
- Metric and inch sizes available
- Special seat dimensions available
- US Patent No. 6.220.601

## Advantages

- Fits into any installation space due to smallest outer seal diameter
- Important material approvals available
- Individual installation length can be achieved
- High flexibility due to extended selection of materials
- Universal application (standardization))

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 10 \dots 100 \text{ mm}$  (0.375" ... 4")  
 Pressure:  $p_1 = 12 \text{ bar}$  (174 PSI),  
 vacuum ... 0,5 bar (7.25 PSI), up to bar (14.5 PSI)  
 with seat locking  
 Temperature:  $t = -20 \text{ °C} \dots +140 \text{ °C}$  (-4 °F ... +284 °F)  
 Sliding velocity:  $v_0 = 10 \text{ m/s}$  (33 ft/s)  
 Axial movement:  $\pm 0.5 \text{ mm}$

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1, Q2), Aluminium oxide (V)  
 Elastomer: NBR (P), EPDM (E), FKM (V), HNBR (X4)  
 Metal parts: CrNiMo steel (G)

## Standards and approvals

- EN 12756
- Various material approvals e.g. FDA, WRAS, KTW, ACS, W270, NSF available (depending on type and material combinations). Please inquire!

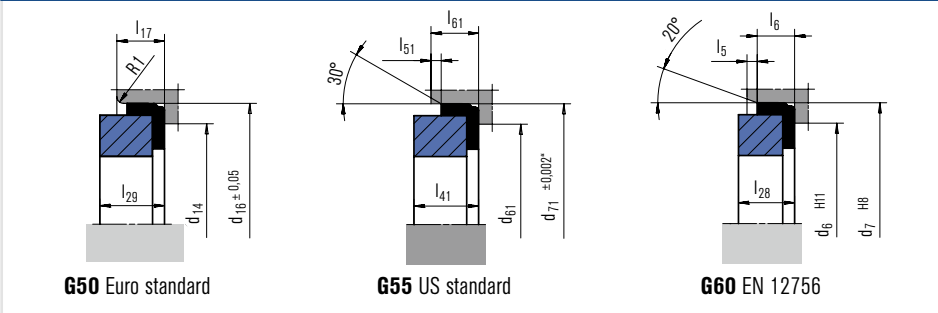
## Recommended applications

- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Cooling fluids
- Media with low solids content
- Pressure oils for bio diesel fuels
- Circulating pumps
- Submersible pumps
- Multi-stage pumps (non-drive side)
- Water and waste water pumps
- Oil applications

## Item Part no. to DIN 24250 Description

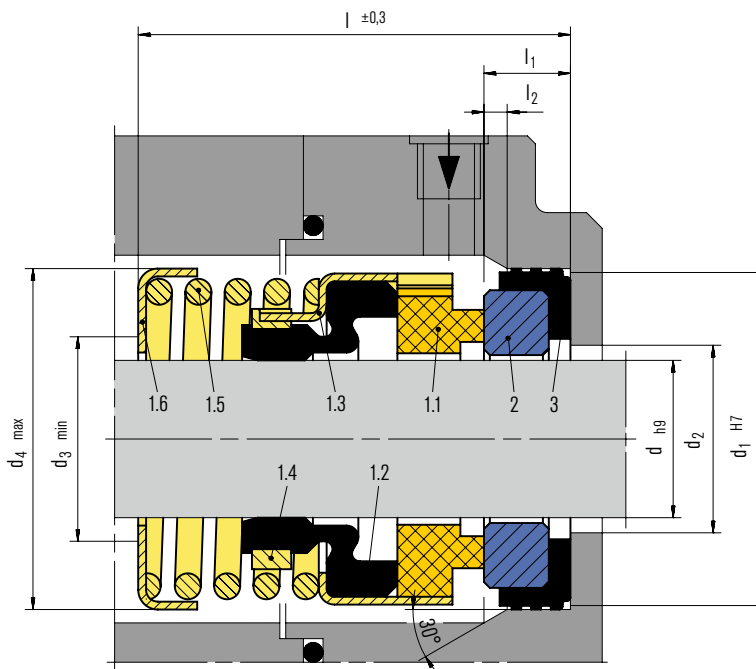
Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	481	Bellows
1.3	485	Drive collar
1.4	484.1	"L" ring (spring collar)
1.5	474	Washer
2	477	Spring
3	475	Seat
4	412	Rubber cup

## Seat alternatives





# EA560



### Features

- Single seal
- Loosely inserted seal face provides self-adjusting capability
- In-house manufactured sliding parts

### Advantages

The EA560 is self-adjusting to shaft misalignments and deflections because of the loosely inserted seal face as well as the ability of the bellows to stretch and tighten. The length of the contact area of the bellows with the shaft is an optimum compromise between ease of assembly (less friction) and sufficient adhesive force for torque transmission. Additionally the seal fulfills very specific leakage requirements. Because the sliding parts are made in-house, a wide variety of special needs can be accommodated.

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 8 \dots 50 \text{ mm}$  (0.375" ... 2")  
 Pressure:  $p_1 = 7 \text{ bar}$  (102 PSI),  
 vacuum ... 0.1 bar (1.45 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +100 \text{ °C}$  (-4 °F ... +212 °F)  
 Sliding velocity:  $v_g = 5 \text{ m/s}$  (16 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

### Materials

Seal face: Carbon graphite resin impregnated (B), Silicon carbide (Q1, Q2)  
 Seat: Aluminium oxide (V), Silicon carbide (Q1, Q2)  
 Elastomer: NBR (P), FKM (V)  
 Metal parts: 1.4301 (F)

### Recommended applications

- Process industry
- Chemical industry
- Water and waste water technology
- Glycols
- Oils
- Industrial pumps/equipment
- Submersible pumps
- Engine pumps
- Circulating pumps

### Item Description

- | Item | Description   |
|------|---------------|
| 1.1  | Seal face     |
| 1.2  | Bellows       |
| 1.3  | Spring collar |
| 1.4  | Drive collar  |
| 1.5  | Spring        |
| 1.6  | Spring holder |
| 2    | Seat          |
| 3    | Corner sleeve |

### Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	l	l <sub>1</sub>	l <sub>2</sub>
8	21	13	12	20,0	18	7	2
9	24	16	13	21,0	23	7	2
10	24	16	14	23,5	23	7	2
11	24	16	15	23,5	23	7	2
12	26	17	16	26,0	24	7	2
13	26	17	17	26,0	24	7	2
14	28	21	18	28,0	25	7	2
15	28	21	19	28,0	25	7	2
16	32	22	20	30,0	27	8	2
17	32	22	21	32,5	27	8	2
18	35	25	22	32,5	26	8	2
19	35	25	23	32,5	26	8	2
20	38	27	24	35,5	28	8	2
22	40	29	26	37,5	28	8	2
25	44	32	29	42,0	29	9	2
28	46	34	32	45,5	30	9	2
30	50	38	35	48,0	31	9	2
32	54	40	37	50,0	33	9	2
35	58	44	40	54,5	36	10	2
38	60	46	43	58,5	37	10	2
40	64	48	45	62,5	38	10	2
45	66	52	50	66,5	40	10	2
50	72	58	55	72,5	42	10	2

### Dimensions in inch

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	l	l <sub>1</sub>	l <sub>2</sub>
0.375	9.525	22.225	14.3	12.7	23.5	28.6	6.4
0.500	12.700	25.400	17.5	15.9	26.0	28.6	6.4
0.625	15.875	31.750	20.6	19.1	30.0	32.5	8.7
0.750	19.050	34.925	23.8	22.2	32.5	32.5	8.7
0.875	22.225	38.100	27.0	25.4	37.5	34.1	8.7
1.000	25.400	41.275	30.2	28.6	44.0	36.5	9.5
1.125	28.575	44.450	33.3	31.8	48.0	38.1	9.5
1.250	31.750	47.625	36.5	34.9	50.0	38.1	9.5
1.375	34.925	50.800	39.7	38.1	54.5	39.7	9.5
1.500	38.100	53.975	42.9	41.3	58.5	39.7	9.5
1.625	41.275	60.325	46.0	44.5	64.0	47.6	11.1
1.750	44.450	63.500	49.2	47.6	67.0	47.6	11.1
1.875	47.625	66.675	52.4	50.8	71.0	50.8	11.1
2.000	50.800	69.850	55.6	54.0	73.5	50.8	11.1

# ED560

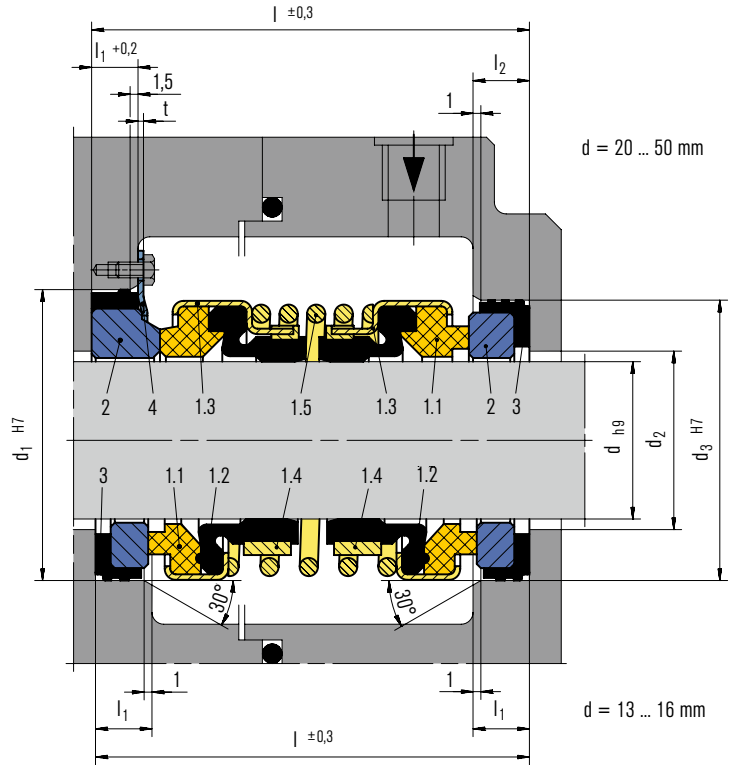


## Features

- Dual seal
- Good chemical resistance and ability to handle solids
- In-house manufactured sliding parts

## Advantages

The ED560 is a dual seal in a back-to-back arrangement with an EA560 base. Therefore, the seal combines the advantages of the EA560 with the advantages of a dual seal.



## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 13 \dots 50 \text{ mm}$  (0.51" ... 1.96")  
 Pressure:  $p_1 = d \leq 19 \text{ mm}$ : 2 bar (29 PSI),  
 $d \geq 20 \text{ mm}$ : 3 bar (44 PSI),  
 vacuum ... 0.1 bar (1.45 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$  (-4 °F ... +158 °F)  
 Sliding velocity:  $v_0 = 5 \text{ m/s}$  (16 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

## Materials

Seal face: Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1, Q2)  
 Seat: Aluminium oxide (V), Silicon carbide (Q1, Q2)  
 Elastomer: NBR (P)  
 Metal parts: 1.4301 (F)

## Recommended applications

- Process industry
- Chemical industry
- Water and waste water technology
- Glycols
- Oils
- Industrial pumps/equipment
- Submersible pumps
- Engine pumps
- Circulating pumps

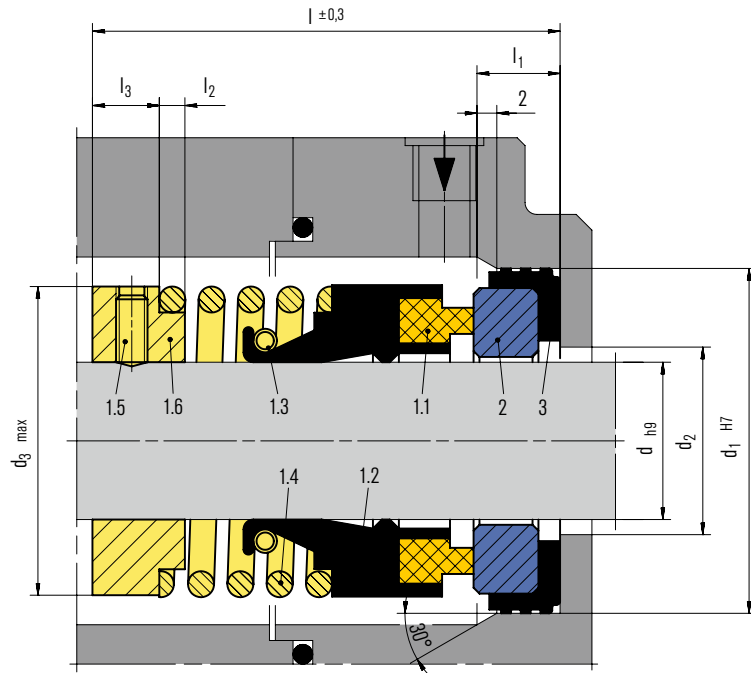
## Item Description

- | Item | Description   |
|------|---------------|
| 1.1  | Seal face     |
| 1.2  | Bellows       |
| 1.3  | Spring collar |
| 1.4  | Drive collar  |
| 1.5  | Spring        |
| 2    | Seat          |
| 3    | Corner sleeve |
| 4    | Washer        |

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
13	25	17	25	-	-	36	5	-	-
14	30	20	30	-	-	36	5	-	-
15	30	20	30	-	-	36	5	-	-
16	30	20	30	-	-	36	5	-	-
20	44	23	38	60	72	49	7	7	1.0
25	50	28	44	60	72	51	9	7	1.0
30	57	33	50	70	82	59	9	8	1.0
35	65	38	58	80	94	61	9	9	1.2
40	70	43	64	85	100	64.5	11	9	1.2
45	70	48	66	90	105	65	10	9	1.0
50	80	53	72	95	109	69.5	10	9	1.2

# EA100



### Features

- Single seal
- In-house manufactured carbon seal faces
- Three different impeller connection available

### Advantages

The EA100 is the specialist for low duty applications and one of our historic and bestselling seals in this sector. The seal is easy to handle and quick to install. An incorporated garter spring assures a good grip of the bellows on the shaft and enhances satisfactory sealing performance. With the ability of the bellows to stretch and tighten, the EA100 is insensitive to shaft movements.

The seal design is available in 3 types, each with a different impeller connection: EA102 is with a collar. EA103 is without a collar. EA104 provides a different coil spring installation. More information on EA103 and EA104 is available on request.

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 8 \dots 20 \text{ mm}$  (0.32" ... 0.78")  
 Pressure:  $p_1 = 5 \text{ bar}$  (73 PSI), vacuum ... 0.1 bar (1.45 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +100 \text{ °C}$  (-4 °F ... +212 °F)  
 Sliding velocity:  $v_g = 5 \text{ m/s}$  (16 ft/s)  
 Axial movement:  $\pm 2.0 \text{ mm}$

### Materials

Seal face: Carbon graphite resin impregnated (B)  
 Seat: Aluminium oxide (V)  
 Elastomer: NBR (P)  
 Metal parts: 1.4301 (F)

### Recommended applications

- Water and waste water technology
- Drinking water
- Hot water circulation pumps
- Industrial pumps/equipment
- Domestic pumps
- Low duty water pumps
- Pumps for water & under floor
- heating systems
- Pumps for solar systems

### Item Description

- |     |               |
|-----|---------------|
| 1.1 | Seal face     |
| 1.2 | Bellows       |
| 1.3 | Garter spring |
| 1.4 | Spring        |
| 1.5 | Set screw     |
| 1.6 | Collar        |
| 2   | Seat          |
| 3   | Corner sleeve |

### Product variants

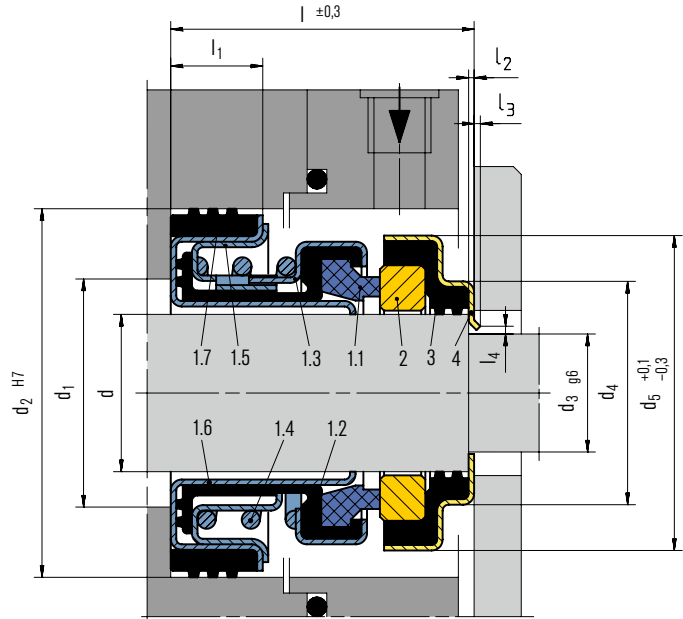
- EA102**  
As EA100 but with a collar.
- EA103**  
As EA100 but without a collar. Please inquire.
- EA104**  
As EA100 but with different coil spring installations. Please inquire.

### Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
8	21	13	18.5	26	7	2	8
9	24	16	22.5	31	7	2	8
10	24	16	22.5	31	7	2	8
11	24	16	22.5	31	7	2	8
12	26	17	24.5	32	7	2	8
13	26	17	24.5	32	7	2	9
14	28	21	28.5	34	7	3	9
15	28	21	28.5	34	7	3	9
16	32	22	30.5	26	8	3	9
17	32	22	30.5	36	8	3	9
18	35	25	33.5	39	8	3	10
19	35	25	33.5	39	8	3	10
20	38	27	35.5	41	8	3	10



# EH700



## Features

- Single seal
- Stationary spring-loaded unit enables operation in high-range loads area
- Balanced
- In-house manufactured carbon seal faces

## Advantages

The seal for stationary applications. The EH700 is based on a unique stationary spring loaded unit that enables the seal to operate under high speed and high pressure. An additional advantage of the seal is the balanced design, which ensures good sealing performance in high-load conditions.

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 15 \dots 35 \text{ mm}$  (0.59" ... 1.38")  
 Pressure:  $p_1 = 15 \text{ bar}$  (218 PSI), vacuum ... 0.1 bar  
 Temperature:  $t = -20 \text{ °C} \dots +100 \text{ °C}$  (-4 °F ... +212 °F)  
 Sliding velocity:  $v_0 = 10 \text{ m/s}$  (33 ft/s)  
 Axial movement:  $\pm 1.0 \text{ mm}$

## Materials

Seal face: Carbon graphite resin impregnated (B)  
 Seat: Aluminium oxide (V, V1), Silicon carbide (Q1, Q2)  
 Secondary seals: NBR (P), FKM (V)  
 Metal parts: 1.4301 (F)

## Recommended applications

- Water and waste water technology
- Food and beverage industry
- Water and waste water
- Glycols
- Industrial pumps
- Engine pumps
- Skyscraper water supply pumps

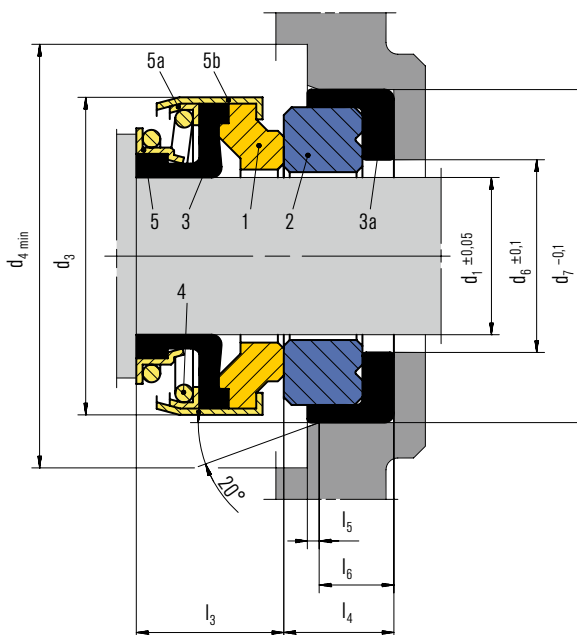
## Item Description

- | Item | Description   |
|------|---------------|
| 1.1  | Seal face     |
| 1.2  | Bellows       |
| 1.3  | Spring collar |
| 1.4  | Spring        |
| 1.5  | Spring holder |
| 1.6  | Cartridge     |
| 1.7  | Seat ring     |
| 2    | Seat          |
| 3    | Corner sleeve |
| 4    | Case          |

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>
15	22	41	12	22	34	29.5	9.5	0.6	-	-	-
20	30	45	12	27.2	45	31	11	0.6	2	1	3.4
25	35	52	22	33.6	52	37	11.5	0.8	2.5	1	4.2
35	45	66	32	43.6	66	41.6	12.5	0.8	4	1	5.2

# BT-AR



Mechanical seal for large-series cold water pumps, produced in millions of units per year. The BT-AR owes its success to the wide range of application, the short axial length (this allows for more economic pump construction and saves material), and the best quality/price ratio. The elasticity of the bellows design enables a more robust operation.

The BT-AR can also be used as a multiple seal in tandem or back-to-back arrangement when the product media cannot ensure lubrication, or when sealing media with a higher solids content. Installation proposals can be provided upon request.

## Features

- Rubber bellows mechanical seal
- Unbalanced
- Single spring
- Independent of direction of rotation
- Short axial installation length

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 6 \dots 70 \text{ mm}$  (0.24" ... 2.76")  
 Pressure:  $p_1^* = 6 \text{ bar}$  (87 PSI),  
 vacuum ... 0.5 bar (7.45 PSI)  
 up to 1 bar (14.5 PSI) with seat locking  
 Temperature:  $t^* = -20 \text{ }^\circ\text{C} \dots +120 \text{ }^\circ\text{C}$  (-4 °F ... +248 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)

\* Dependent on medium, size and material

## Materials

Seal face: Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B), Carbon graphite, full carbon (B3), Silicon carbide (Q1, Q6), Tungsten carbide (U), PTFE glass fiber reinforced (Y)  
 Seat: Steatite (X), Aluminium oxide (V, V1), Silicon carbide (Q1, Q6, Q7), Tungsten carbide (U), Cr steel (E), CrNi steel (F), CrNiMo steel (G)  
 Elastomers: NBR (P), EPDM (E), FKM (V), HNBR (X4)  
 Metal parts: CrNi steel 1.4301 (F), CrNiMo steel 1.4401 (G), CrNi steel 1.4057 (F1)

## Item Description

- |    |                 |
|----|-----------------|
| 1  | Seal face       |
| 2  | Stationary seat |
| 3  | Bellows         |
| 3a | Gasket          |
| 4  | Spring          |
| 5  | Ring            |
| 5a | Locking ring    |
| 5b | Collar          |

## Recommended applications

- Water and waste water technology
- Pool and spa applications
- Household appliances
- Domestic and garden pumps
- Whirlpool and swimming pool pumps
- Dishwasher pumps
- Submersible motors / pumps
- Water pumps / waste water pumps

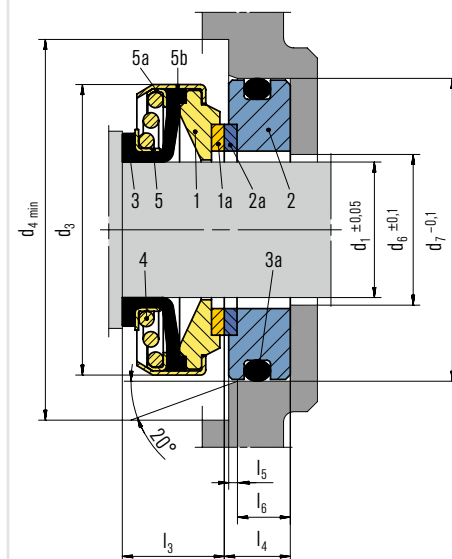
## Certificates

- KTW
- W270
- ACS
- WRAS
- NSF
- DM 174/04
- FDA

## Product variants

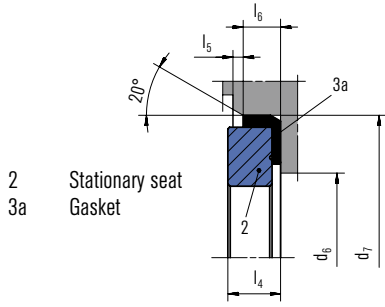
### BT-AR3

Seal faces with brazed tungsten carbide (U) for abrasive media. Elastomers and diameter range the same as BT-AR. The BT-AR3 is the right choice of seal for use in high duty applications or when abrasives (e.g. waste water) could damage the seal faces.

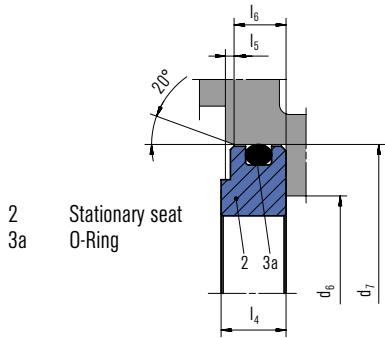


- |    |                         |
|----|-------------------------|
| 1  | Seal face housing       |
| 1a | Brazed seal face        |
| 2  | Stationary seat housing |
| 2a | Brazed stationary seat  |
| 3  | Bellows                 |
| 3a | O-Ring                  |
| 4  | Spring                  |
| 5  | Ring                    |
| 5a | Locking ring            |
| 5b | Collar                  |

**Seat alternatives**



**PF C**



**PF A**

**Dimensions BT-AR in mm**

Type	d <sub>1</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>6</sub>	d <sub>7</sub>	l <sub>3</sub>	tol	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	Note
6	6	18	23	8	22.0	8.0	+0.5/0	4.0	0.5	3.5	
8S	8	20	23	10	22.0	11.0	+0.5/0	4.0	0.5	3.5	*
8	8	24	27	10	26.0	11.0	+0.5/0	8.0	1.0	6.0	
10	10	24	27	12	26.0	11.0	+0.5/0	5.5	0.5	4.5	*
11	11	24	27	13	26.0	11.0	+0.5/0	8.0	1.0	6.0	
12C	12	24	27	14	26.0	11.0	+0.5/0	5.5	0.5	4.5	*
12	12	24	27	14	26.0	12.8	+0.7/0	8.0	1.0	6.0	
13	13	24	27	15	26.0	12.8	+0.7/0	5.5	0.5	4.5	*
14S	14	28	30	18	28.5	12.8	+0.7/0	8.0	1.0	6.0	*
14L	14	28	30	18	28.5	15.3	±0.8	7.5	1.0	5.5	
14	14	32	35	16	29.5	12.8	+0.7/0	8.0	1.0	6.0	
15	15	32	35	17	29.5	12.8	+0.7/0	8.0	1.0	6.0	
16R	16	32	35	18	29.5	12.8	+0.7/0	6.0	1.0	4.0	*
16	16	39	43	18	42.0	12.8	+0.7/0	8.0	1.0	6.0	
17	17	39	43	19	42.0	12.8	+0.7/0	6.0	1.0	4.0	*
18	18	39	43	20	42.0	12.8	+0.7/0	8.0	1.0	6.0	
19	19	39	43	21	42.0	12.8	+0.7/0	8.0	1.0	6.0	
20R	20	35	39	22	35.0	17.8	±0.7	7.5	1.0	5.5	
20	20	39	43	22	42.0	12.8	+0.7/0	8.0	1.0	6.0	
20S	20	42	47	22	45.0	12.8	+0.7/0	10.0	1.0	8.0	
22	22	42	47	24	45.0	12.8	+0.7/0	10.0	1.0	8.0	
23	23	47	52	25	50.0	13.5	+1/0	10.0	1.0	8.0	
24	24	47	52	26	50.0	13.5	+1/0	10.0	1.0	8.0	
25R	25	42	52	27	50.0	13.5	+1/0	10.0	1.0	8.0	
25	25	47	52	27	50.0	13.5	+1/0	10.0	1.0	8.0	*
26	26	47	52	29	50.0	13.5	+1/0	10.0	1.0	8.0	
27	27	47	52	30	50.0	13.5	+1/0	10.0	1.0	8.0	
28	28	54	60	31	57.0	15.0	+1/0	10.0	1.0	8.0	
30	30	54	60	33	57.0	15.0	+1/0	10.0	1.0	8.0	
32	32	54	60	35	57.0	15.0	+1/0	10.0	1.0	8.0	
35	35	60	70	38	63.0	16.0	+1/0	10.0	1.0	8.0	
38	38	65	75	41	68.0	18.0	+1/0	12.0	2.0	9.0	
40	40	65	75	43	68.0	18.0	+1/0	12.0	2.0	9.0	
45	45	70	80	48	73.0	20.0	+1/0	12.0	2.0	9.0	
50	50	85	95	53	88.0	23.0	+1/0	15.0	2.0	12.0	
60	60	105	115	63	110.0	30.0	+1/0	15.0	2.0	12.0	
70	70	105	115	73	110.0	32.0	+1/0	15.0	2.0	12.0	

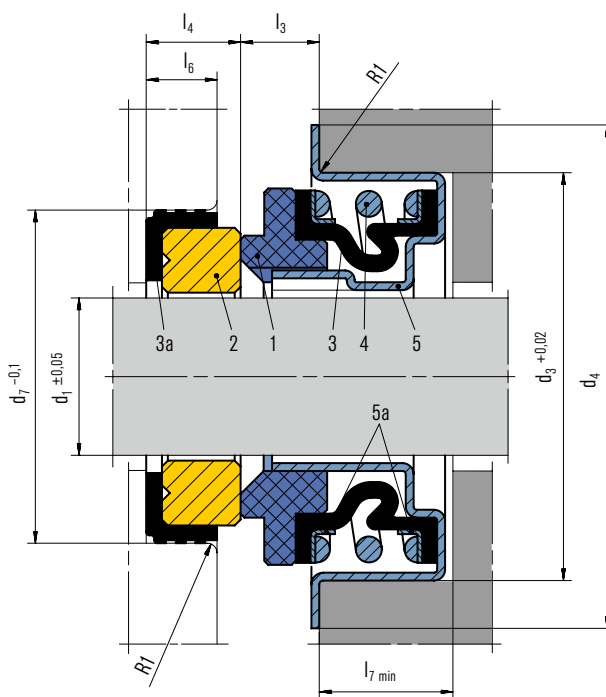
\* Alternative seat dimensions

**Dimensions BT-AR in inch/mm**

d <sub>1</sub>	d <sub>1</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>6</sub>	d <sub>7</sub>	l <sub>3</sub>	tol	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	Note
0.375"	9.53	24	27	12	25.40	11.0	+0.5/0	5.5	0.5	4.5	*
0.500"	12.70	24	27	15	25.40	12.8	+0.7/0	7.5	1.0	5.5	
0.625"	15.88	32	36	18	31.75	12.8	+0.7/0	10.3	1.0	8.0	

\* Alternative seat dimensions

# BT-A2



Stationary mechanical seal in inch dimensions. Spread throughout the world, this type of mechanical seal has reached an unsurpassed quality level. The BT-A2 features all carbon or high quality resin impregnated carbon, aluminium oxide 96 %, is stationary and the rubber bellows are glued on collar. Static air pressure test to 100 % production. Excellent solution for swimming pool pumps.

### Features

- Rubber bellows mechanical seal
- Unbalanced
- Single spring
- Independent of direction of rotation
- Stationary design

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 1/2", 5/8", 3/4"$   
 Pressure:  $p_1^* = 4 \text{ bar (58 PSI)}$   
 Temperature:  $t^* = -20\text{ °C} \dots +90\text{ °C} (-4\text{ °F} \dots +194\text{ °F})$   
 Sliding velocity:  $v_g = 10 \text{ m/s (33 ft/s)}$

\* Dependent on medium, size and material

### Materials

Seal face: Carbon graphite resin impregnated (B),  
 Carbon graphite, full carbon (B3)  
 Seat: Aluminium oxide (V1), Silicon carbide (Q1)  
 Elastomers: NBR (P), EPDM (E), FKM (V)  
 Metal parts: CrNi steel (F), CrNiMo steel (G)

### Recommended applications

- Pool and spa applications
- Household appliances
- Domestic and garden pumps
- Clean water pumps
- Swimming pool pumps
- Whirlpool pumps

### Item Description

- | Item | Description |
|------|-------------|
| 1    | Seal face   |
| 2    | Seat        |
| 3    | Bellows     |
| 3a   | Gasket      |
| 4    | Spring      |
| 5    | Collar      |
| 5a   | L-ring      |

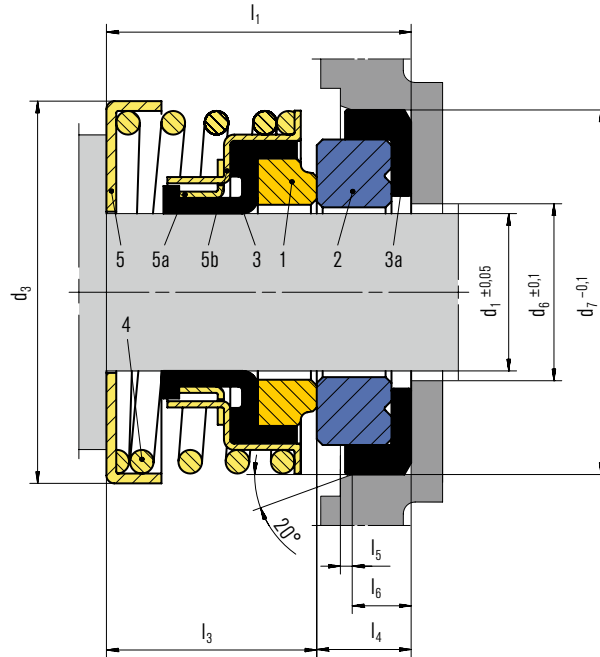
### Dimensions BT-A2 in inch/mm

$d_1$	$d_1$	$d_3$	$d_4$	$d_7$	$l_3$	tol	$l_4$	$l_6$	$l_7$
0.500"	12.70	28.55	35.00	25.40	5.2	+0.5	8.0	6.0	10
0.625"	15.88	36.45	41.00	31.75	6.8	+0.5	10.3	8.5	10
0.750"	19.05	40.00	44.00	34.95	6.5	+0.5	10.3	8.0	11

# BT-PN



The BT-PN is a large series mechanical seal with a simple yet effective design that is easy to assemble. The special spring arrangement allows a short axial installation length. This advantage is combined with an increased working pressure capability of up to 12 bar (174 PSI). The spring is free from torque transmission.



## Features

- Rubber bellows mechanical seals
- Unbalanced
- Single spring
- Independent of direction of rotation

## Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 8 \dots 40 \text{ mm}$  (0.31" ... 1.57")  
 Pressure:  $p_1^{**} = 12 \text{ bar}$  (174 PSI),  
 vacuum ... 0.5 bar (7.45 PSI)  
 Temperature:  $t^{**} = -20 \text{ °C} \dots +120 \text{ °C}$  (-4 °F ... +248 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)

Operating limits depend on  $p \cdot v_g$  factor

\* Other diameters upon request

\*\* Dependent on medium, size and material

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1, Q6)

Seat: Aluminium oxide (V), Steatite (X),  
 Silicon carbide (Q1, Q6, Q7)

Elastomers: NBR (P), FKM (V), EPDM (E)

Metal parts: CrNi steel 1.4301 (F), CrNiMo steel 1.4401 (G)

## Certificates

- KTW
- W270
- ACS
- WRAS
- NSF
- FDA
- DM 174/04

## Recommended applications

- Pool and spa applications
- Household appliances
- Water and waste water technology
- Food and beverage industry
- Submersible oil filled motors (4" / 6")
- Submersible pumps, back-to-back installation
- Peripheral pumps for industrial applications
- Domestic and garden pumps
- Coffee machines
- Shower pumps

## Item Description

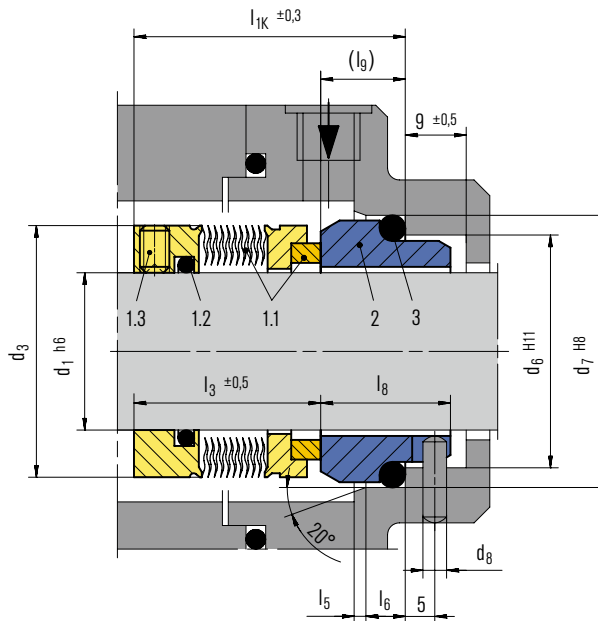
- |    |                 |
|----|-----------------|
| 1  | Seal face       |
| 2  | Stationary seat |
| 3  | Bellows         |
| 3a | Gasket          |
| 4  | Spring          |
| 5  | Ring            |
| 5a | Drive ring      |
| 5b | Collar          |

## Dimensions BT-PN in mm

$d_1$	$d_3$	$d_6$	$d_7$	$l_1$	$l_3$	tol	$l_4$	$l_5$	$l_6$
8.00	23	10	22.0	17.5	13.5	±1	4.0	0.5	3.5
8.00	23	10	25.4	19.0	13.5	±1	5.5	0.5	4.5
9.53	23	12	25.4	19.0	13.5	±1	5.5	0.5	4.5
10.00	23	12	25.4	19.0	13.5	±1	5.5	0.5	4.5
13.00	32	17	29.5	20.8	12.8	+0.7/0	8.0	1.0	6.0
14.00	32	17	29.5	20.8	12.8	+0.7/0	8.0	1.0	6.0
15.00	32	17	29.5	20.8	12.8	+0.7/0	8.0	1.0	6.0
16.00	32	17	29.5	20.8	12.8	+0.7/0	8.0	1.0	6.0
16.00*	32	17	29.5	24.3	16.3	+0.7/0	8.0	1.0	6.0
20.00	44	22	42.0	22.0	14.0	±1	8.0	1.0	6.0
25.00	50	27	45.0	27.0	17.0	±1	10.0	1.0	8.0
30.00	60	33	52.0	34.0	22.0	±1	12.0	1.5	8.5

\* 4" submersible motor

# MBS100



## Features

- For unstepped shafts
- Rotating bellows
- Single seal
- Balanced
- Independent of direction of rotation

## Advantages

- For extreme temperature ranges
- No dynamically loaded O-Ring
- Self cleaning effect

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 100 \text{ mm (0.79" ... 4")}$   
 Pressure:  $p_1 = \dots 25 \text{ (16*) bar (363 (232*) PSI)}$   
 Temperature:  $t = -40 \text{ }^\circ\text{C} \dots +220 \text{ }^\circ\text{C (160*) }^\circ\text{C}$   
 ( $-40 \text{ }^\circ\text{F} \dots +428 \text{ (320*) }^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 20 \text{ m/s (66 ft/s)}$

\* Operating limits for material combination Q1/Q1

## Materials

Seal face: Carbon graphite (A), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q12)  
 Bellows: Inconel® 625 (T3)  
 Secondary seals: FKM (V)  
 Metal parts: Duplex (G1)

## Standards and approvals

- EN 12756

## Recommended applications

- Process industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Hot media
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment

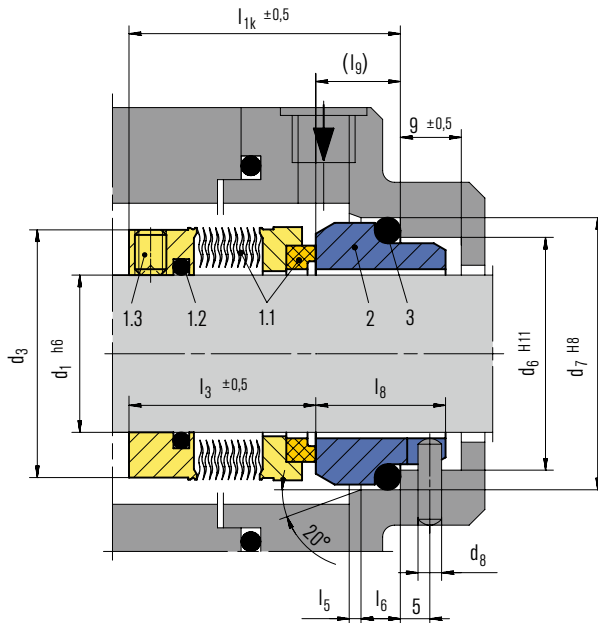
## Item Description

- | Item | Description                 |
|------|-----------------------------|
| 1.1  | Seal face with bellows unit |
| 1.2  | O-Ring                      |
| 1.3  | Set screw                   |
| 2    | Seat (G9)                   |
| 3    | O-Ring                      |

## Dimensions in mm

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	l <sub>1k</sub>	l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>8</sub>	l <sub>9</sub>
20	33.3	29	35	3	37.5	30.5	2.0	5	15.0	7.0
22	36.5	31	37	3	37.5	30.5	2.0	5	15.0	7.0
24	39.0	33	39	3	40.0	28.5	2.0	5	19.5	11.5
25	39.0	34	40	3	40.0	28.5	2.0	5	19.5	11.5
28	42.0	37	43	3	42.5	31.0	2.0	5	19.5	11.5
30	44.0	39	45	3	42.5	31.0	2.0	5	19.5	11.5
32	46.0	42	48	3	42.5	31.0	2.0	5	19.5	11.5
33	47.0	42	48	3	42.5	31.0	2.0	5	19.5	11.5
35	49.2	44	50	3	42.5	31.0	2.0	5	19.5	11.5
38	52.4	49	56	4	45.0	31.0	2.0	6	22.0	14.0
40	55.6	51	58	4	45.0	31.0	2.0	6	22.0	14.0
43	58.7	54	61	4	45.0	31.0	2.0	6	22.0	14.0
45	58.7	56	63	4	45.0	31.0	2.0	6	22.0	14.0
48	61.9	59	66	4	45.0	31.0	2.0	6	22.0	14.0
50	65.1	62	70	4	47.5	32.5	2.5	6	23.0	15.0
53	68.3	65	73	4	47.5	32.5	2.5	6	23.0	15.0
55	69.7	67	75	4	47.5	32.5	2.5	6	23.0	15.0
58	74.6	70	78	4	52.5	37.5	2.5	6	23.0	15.0
60	74.6	72	80	4	52.5	37.5	2.5	6	23.0	15.0
65	84.1	77	85	4	52.5	37.5	2.5	6	23.0	15.0
70	87.3	83	92	4	60.0	42.0	2.5	7	26.0	18.0
75	95.3	88	97	4	60.0	42.0	2.5	7	26.0	18.0
80	98.4	95	105	4	60.0	41.8	3.0	7	26.2	18.2
85	104.8	100	110	4	60.0	41.8	3.0	7	26.2	18.2
90	108.0	105	115	4	65.0	46.8	3.0	7	26.2	18.2
95	114.3	110	120	4	65.0	47.8	3.0	7	25.2	17.2
100	120.7	115	125	4	65.0	47.8	3.0	7	25.2	17.2

# MFL85N



## Features

- For unstepped shafts
- Rotating bellows
- Single seal
- Balanced
- Independent of direction of rotation
- Metal bellows

## Advantages

- For extreme temperature ranges
- No dynamically loaded O-Ring
- Self cleaning effect
- Short installation length possible
- Pumping screw for highly viscous media available (dependant on direction of rotation).

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 16 \dots 100 \text{ mm}$  (0.64" ... 4")  
 Externally pressurized:  $p_1 = \dots 25 \text{ bar}$  (363 PSI)  
 Internally pressurized:  
 $p_1 < 120 \text{ °C}$  (248 °F) 10 bar (145 PSI)  
 $p_1 < 220 \text{ °C}$  (428 °F) 5 bar (72 PSI)  
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$   
 (-40 °F ... +428 °F), stationary seat lock necessary.  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

## Materials

Seal face: Carbon graphite antimony impregnated (A), Silicon carbide (Q12)  
 Seat: Silicon carbide (Q1)  
 Bellows: Inconel® 718 hardened (M6), Hastelloy® C-276 (M5)  
 Metal parts: CrNiMo steel (G), Duplex (G1), Hastelloy® C-4 (M)

## Standards and approvals

- EN 12756

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Hot media
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment

Item	Part no. to DIN 24250	Description
1.1	472/481	Seal face with Bellows unit
1.2	412.1	O-Ring
1.3	904	Set screw
2	475	Seat (G9)
3	412.2	O-Ring

## Product variants

### MFL90N

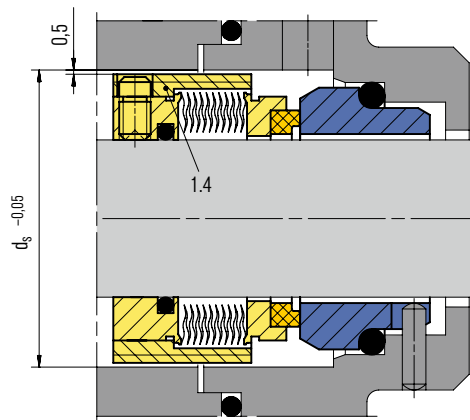
Shaft diameter:  $d_1 = 20 \dots 100 \text{ mm}$  (0.79" ... 4")  
 Internally pressurized:  $p_1 = \dots 16 \text{ bar}$  (232 PSI), stationary seat lock necessary.  
 Externally pressurized:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$   
 (-40 °F ... +428 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

### MFL85P / MFL90P

Version with pumping ring. Dependent on direction of rotation. Can be retrofitted.

### MFL85F

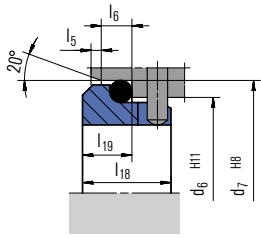
Dimensions, items and description as for MFL85N, but with pumping screw (item no. 1.4). Dependent on direction of rotation! The pumping screw can be retrofitted.



MFL85F



## Seat alternative



### G16

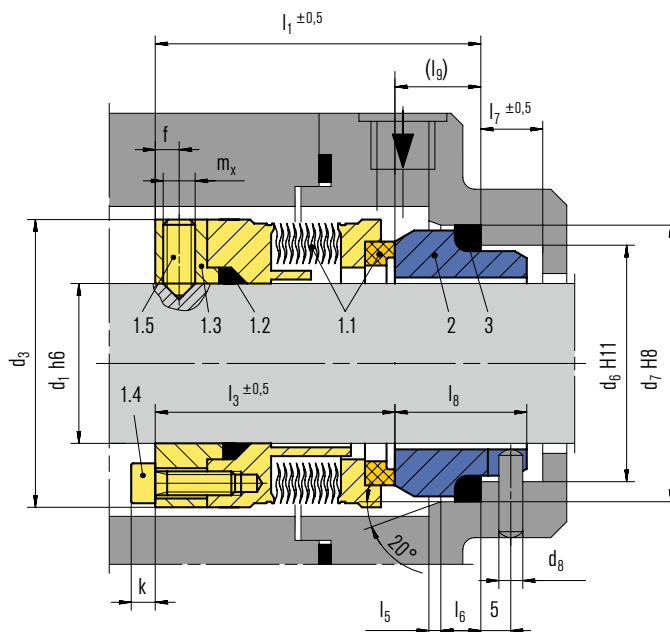
(l<sub>1k</sub> shorter than specified by EN 12756)

## Dimensions in mm

d <sub>1</sub>	d <sub>3</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>5</sub>	l <sub>1k</sub>	l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>18</sub>	l <sub>19</sub>	b	s
16	30.0	23	27	3	38	42.5*	32.5	1.5	4	17.5	10.0	-	-	1.6	9.0
18	32.0	27	33	3	39	42.0	30.5	2.0	5	14.0	11.5	15.0	7.0	1.6	10.0
20	33.5	29	35	3	41	42.0	30.5	2.0	5	14.0	11.5	15.0	7.0	1.6	10.0
22	36.5	31	37	3	44	37.5	30.5	2.0	5	14.0	11.5	15.0	7.0	1.6	10.0
24	39.0	33	39	3	47	40.0	28.5	2.0	5	19.5	11.5	15.0	7.0	1.6	8.2
25	39.6	34	40	3	48	40.0	28.5	2.0	5	19.5	11.5	15.0	7.0	1.6	8.5
28	42.8	37	43	3	51	42.5	31.0	2.0	5	19.5	11.5	15.0	7.0	1.6	9.0
30	45.0	39	45	3	53	42.5	31.0	2.0	5	19.5	11.5	15.0	7.0	1.6	8.5
32	46.0	42	48	3	55	42.5	31.0	2.0	5	19.5	11.5	15.0	7.0	1.6	9.2
33	48.0	42	48	3	56	42.5	31.0	2.0	5	19.5	11.5	15.0	7.0	1.6	9.2
35	49.2	44	50	3	58	42.5	31.0	2.0	5	19.5	11.5	15.0	7.0	1.6	9.5
38	52.3	49	56	4	61	45.0	31.0	2.0	6	22.0	14.0	16.0	8.0	1.6	9.2
40	55.5	51	58	4	64	45.0	31.0	2.0	6	22.0	14.0	16.0	8.0	1.6	9.2
43	57.5	54	61	4	67	45.0	31.0	2.0	6	22.0	14.0	16.0	8.0	1.6	9.2
45	58.7	56	63	4	69	45.0	31.0	2.0	6	22.0	14.0	16.0	8.0	1.6	9.5
48	61.9	59	66	4	72	45.0	31.0	2.0	6	22.0	14.0	16.0	8.0	1.6	9.2
50	65.0	62	70	4	74	47.5	32.5	2.5	6	23.0	15.0	17.0	9.5	1.6	10.5
53	68.2	65	73	4	77	47.5	32.5	2.5	6	23.0	15.0	17.0	9.5	1.6	10.5
55	70.0	67	75	4	80	47.5	32.5	2.5	6	23.0	15.0	17.0	9.5	1.6	10.0
58	71.7	70	78	4	83	52.5	37.5	2.5	6	23.0	15.0	18.0	10.5	3.0	14.0
60	74.6	72	80	4	85	52.5	37.5	2.5	6	23.0	15.0	18.0	10.5	3.0	14.0
63	79.0	75	83	4	88	52.5	37.5	2.5	6	23.0	15.0	18.0	10.5	3.0	14.0
65	84.1	77	85	4	95	52.5	37.5	2.5	6	23.0	15.0	18.0	10.5	3.0	14.0
68	87.3	81	90	4	96	52.5	34.5	2.5	7	26.0	18.0	18.5	11.0	1.6	10.0
70	87.3	83	92	4	96	60.0	42.0	2.5	7	26.0	18.0	19.0	11.5	3.0	17.0
75	95.0	88	97	4	104	60.0	42.0	2.5	7	26.0	18.0	19.0	11.5	3.0	16.0
80	98.4	95	105	4	109	60.0	41.8	3.0	7	26.2	18.2	19.0	11.5	3.0	16.0
85	104.7	100	110	4	114	60.0	41.8	3.0	7	26.2	18.2	19.0	11.5	3.0	16.0
90	111.0	105	115	4	119	65.0	46.8	3.0	7	26.2	18.2	20.5	13.0	3.0	21.0
95	114.0	110	120	4	124	65.0	47.8	3.0	7	25.2	17.2	20.5	13.0	3.0	21.0
100	117.4	115	125	4	129	65.0	47.8	3.0	7	25.2	17.2	20.5	13.0	3.0	20.0

\* Installation length is longer than l<sub>1k</sub> specified by EN 12756

# MFLWT



### Features

- For unstepped shafts
- Rotating bellows
- Single seal
- Balanced
- Independent of direction of rotation
- Metal bellows

### Advantages

- For extreme high temperature ranges
- No dynamically loaded O-Ring
- Self cleaning effect
- Short installation length possible
- Pumping screw for highly viscous media available (dependent on direction of rotation).

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 16 \dots 150 \text{ mm (0.64" ... 6")}$

Externally pressurized:  $p_1 = \dots 25 \text{ bar (363 PSI)}$

Internally pressurized:

$p_1 < 120 \text{ °C (248 °F)}$  10 bar (145 PSI)

$p_1 < 220 \text{ °C (428 °F)}$  5 bar (73 PSI)

$p_1 < 400 \text{ °C (752 °F)}$  3 bar (44 PSI)

stationary seat lock necessary

Temperature:  $t = -20 \text{ °C ... } +400 \text{ °C (-4 °F ... } +752 \text{ °F)}$

Sliding velocity:  $v_g = 20 \text{ m/s (66 ft/s)}$

### Materials

Seal face: Carbon graphite antimony impregnated (A),

Silicon carbide (Q12)

Seat: Silicon carbide (Q1)

Bellows: Inconel® 718 hardened (M6),

Hastelloy® C-276 (M5)

Metal parts: CrNiMo steel (G), Duplex (G1),

Carpenter® 42 (T4), Hastelloy® C-4 (M)

### Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Pulp and paper industry
- Hot media
- Highly viscous media
- Pumps
- Special rotating equipment

### Item Part no. to DIN 24250 Description

1.1	472/481	Seal face with bellows unit
1.2	410	Sealing ring
1.3	474	Drive collar
1.4		HSH Cap screw
1.5	904	Set screw
2	475	Seat
3	412	Sealing ring

### Product variant

#### MFLWT90

Shaft diameter:  $d_1 = 16 \dots 150 \text{ mm (0.64" ... 6")}$

Externally pressurized:  $p_1 = \dots 16 \text{ bar (232 PSI)}$

Internally pressurized:  $p_1 = 10 \text{ bar (145 PSI)}$

Temperature:  $t = -20 \text{ °C ... } +400 \text{ °C (-4 °F ... } +752 \text{ °F)}$

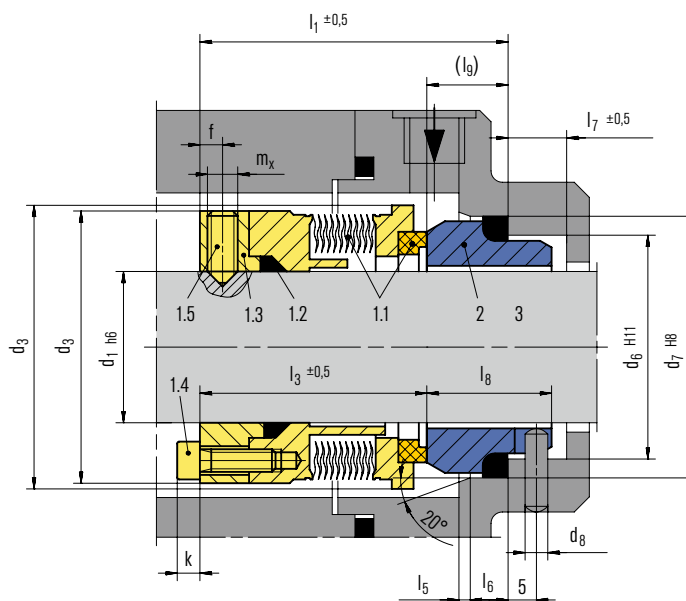
stationary seat lock necessary

Sliding velocity:  $v_g = 20 \text{ m/s (66 ft/s)}$

### Dimensions in mm

$d_1$	$d_3$	$d_6$	$d_7$	$d_8$	$l_1$	$l_3$	$l_5$	$l_6$	$l_7$	$l_8$	$l_9$	$f$	$k$	$m_x$
16	38	29.0	35.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
18	40	31.0	37.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
20	42	34.0	40.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
22	44	37.0	43.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
24	46	37.0	43.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
25	47	39.0	45.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
28	50	42.0	48.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M6
30	52	44.0	50.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M6
32	54	49.0	56.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
33	55	49.0	56.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
35	57	51.0	58.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
38	60	54.0	61.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
40	66	56.0	63.0	4	61.5	47.5	2.0	6	9	22.0	14.0	5	6	M6
43	69	59.0	66.0	4	61.5	47.5	2.0	6	9	22.0	14.0	5	6	M6
45	71	62.0	70.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
48	74	65.0	73.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
50	76	67.0	75.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
53	79	70.0	78.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
55	81	72.0	80.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
58	85	75.0	83.0	4	68.0	53.0	2.5	6	9	23.0	15.0	5	6	M6
60	87	77.0	85.0	4	68.0	53.0	2.5	6	9	23.0	15.0	6	6	M8
63	90	81.0	90.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
65	92	83.0	92.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
68	95	88.0	97.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
70	97	88.0	97.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
75	102	95.0	105.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
80	107	100.0	110.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
85	112	105.0	115.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
90	117	110.0	120.0	4	71.0	53.8	3.0	7	9	25.2	17.2	6	6	M8
95	122	115.0	125.0	4	71.0	53.8	3.0	7	9	25.2	17.2	6	6	M8
100	127	122.2	134.3	5	74.0	54.0	3.0	9	11	30.0	20.0	6	6	M8

# MFLCT



### Features

- For unstepped shafts
- Rotating bellows
- Single seal
- Balanced
- Independent of direction of rotation
- Metal bellows

### Advantages

- For extreme cold temperature ranges
- No dynamically loaded O-Ring
- Self cleaning effect
- Short installation length possible
- Pumping screw for highly viscous media available (dependent on direction of rotation).

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 24 \dots 150 \text{ mm}$  (0.94" ... 6")  
 Externally pressurized:  $p_1 = \dots 25 \text{ bar}$  (363 PSI)  
 Internally pressurized:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 stationary seat lock necessary  
 Temperature:  $t = -100 \text{ °C} \dots +100 \text{ °C}$   
 (-148 °F ... +212 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

### Materials

Seal face: Carbon graphite antimony impregnated (A),  
 Silicon carbide (Q12)  
 Seat: Silicon carbide (Q1)  
 Bellows: Inconel® 718 hardened (M6),  
 Hastelloy® C-276 (M5)  
 Metal parts: CrNiMo steel (G)  
 Hastelloy® C-4 (M)

### Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment

### Item Part no. to DIN 24250 Description

1.1	472/481	Seal face with bellows unit
1.2	410	Sealing ring
1.3	474	Drive collar
1.4		HSH Cap screw
1.5	904	Set screw
2	475	Seat
3	412	Sealing ring

### Product variant

#### MFLCT90

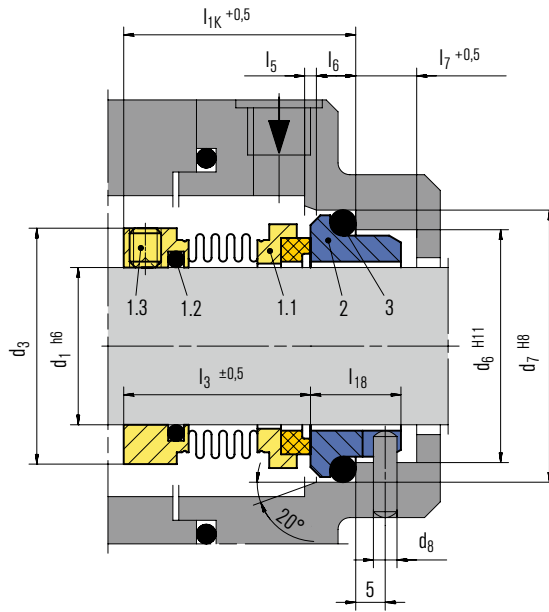
Shaft diameter:  $d_1 = 20 \dots 150 \text{ mm}$  (0.64" ... 6")  
 Internally pressurized:  $p_1 = \dots 16 \text{ bar}$  (232 PSI),  
 stationary seat lock necessary  
 Externally pressurized:  $p_1 = 10 \text{ bar}$  (145 PSI)  
 Temperature:  $t = -100 \text{ °C} \dots +100 \text{ °C}$  (-148 °F ... +212 °F)  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft/s)

### Dimensions in mm

$d_1$	$d_3$	$d_3^{2)}$	$d_6$	$d_7$	$d_8$	$l_1$	$l_3$	$l_5$	$l_6$	$l_7$	$l_8$	$l_9$	$f$	$k$	$m_x$
16	38	-	29.0	35.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
18	40	-	31.0	37.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
20	42	-	34.0	40.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
22	44	-	37.0	43.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
24	46	49.8	37.0	43.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
25	47	51.7	39.0	45.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M5
28	50	54.5	42.0	48.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M6
30	52	56.6	44.0	50.0	3	58.0	46.5	2.0	5	9	19.5	11.5	5	5	M6
32	54	59.5	49.0	56.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
33	55	59.5	49.0	56.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
35	57	62.5	51.0	58.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
38	60	65.7	54.0	61.0	4	60.5	46.5	2.0	6	9	22.0	14.0	5	5	M6
40	66	65.7	56.0	63.0	4	61.5	47.5	2.0	6	9	22.0	14.0	5	6	M6
43	69	68.6	59.0	66.0	4	61.5	47.5	2.0	6	9	22.0	14.0	5	6	M6
45	71	71.5	62.0	70.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
48	74	75.1	65.0	73.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
50	76	76.1	67.0	75.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
53	79	80.8	70.0	78.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
55	81	80.8	72.0	80.0	4	62.5	47.5	2.5	6	9	23.0	15.0	5	6	M6
58	85	84.0	75.0	83.0	4	68.0	53.0	2.5	6	9	23.0	15.0	5	6	M6
60	87	92.3	77.0	85.0	4	68.0	53.0	2.5	6	9	23.0	15.0	6	6	M8
63	90	95.5	81.0	90.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
65	92	95.5	83.0	92.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
68	95	101.3	88.0	97.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
70	97	101.3	88.0	97.0	4	71.0	53.0	2.5	7	9	26.0	18.0	6	6	M8
75	102	105.0	95.0	105.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
80	107	110.6	100.0	110.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
85	112	117.0	105.0	115.0	4	71.0	52.8	3.0	7	9	26.2	18.2	6	6	M8
90	117	120.2	110.0	120.0	4	71.0	53.8	3.0	7	9	25.2	17.2	6	6	M8
95	122	125.2	115.0	125.0	4	71.0	53.8	3.0	7	9	25.2	17.2	6	6	M8
100	127	130.2	122.2	134.3	5	74.0	54.0	3.0	9	11	30.0	20.0	6	6	M8

<sup>2)</sup>  $d_3$  executed in Hastelloy®

# MF95N



### Features

- For unstepped shafts
- Rotating bellows
- Single seal
- Balanced
- Independent of direction of rotation
- Roller bellows

### Advantages

- For extreme temperature ranges
- No dynamically loaded O-Ring
- Very good self cleaning effect
- Suitable for low-end sterile applications

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 14 \dots 100$  mm (0.55" ... 3.94")  
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$  (-40 °F ... +428 °F)  
 Pressure:  $p = 16$  bar (232 PSI)  
 Sliding velocity:  $v_g = 20$  m/s (66 ft/s)  
 Axial movement:  $\pm 0.5$  mm

### Materials

Bellows: Hastelloy® C-276 (M5)  
 Seal face: Silicon carbide (Q12),  
 Carbon graphite resin impregnated (B),  
 Carbon graphite antimony impregnated (A)  
 Seat: Silicon carbide (Q1)  
 Metal parts: CrNiMo steel (G1)

### Standards and approvals

- EN 12756

### Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Chemical industry
- Pharmaceutical industry
- Pulp and paper industry
- Food and beverage industry
- Hot media
- Cold media
- Highly viscous media
- Pumps
- Special rotating equipment

### Item Part no. to DIN 24250 Description

1.1	472/481	Seal face with bellows unit
1.2	412.1	O-Ring
1.3	904	Set screw
2	475	Seat (G16)
3	412.2	O-Ring

### Product variant

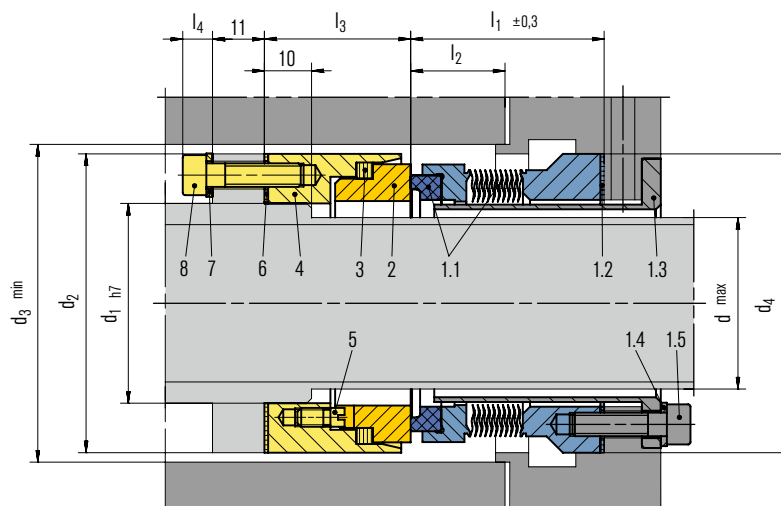
#### MF90N

Shaft diameter:  $d_1 = 14 \dots 100$  mm (0.55" ... 3.94")  
 Temperature:  $t = -40 \text{ °C} \dots +220 \text{ °C}$  (-40 °F ... +428 °F)  
 Internally pressurized:  $p = 10$  bar (145 PSI),  
 stationary seat lock necessary.  
 Sliding velocity:  $v_g = 20$  m/s (66 ft/s)  
 Axial movement:  $\pm 0.5$  mm

### Dimensions in mm

$d_1$	$d_3$	$d_6$	$d_7$	$d_8$	$l_{1k}$	$l_3$	$l_5$	$l_6$	$l_7$	$l_{18}$
14	24	21	25	3	35.0	30.5	1.5	4	8.5	15.0
16	26	23	27	3	35.0	29.5	1.5	4	8.5	15.0
18	32	27	33	3	37.5	30.5	2.0	5	9.0	15.0
20	34	29	35	3	37.5	30.5	2.0	5	9.0	15.0
22	36	31	37	3	37.5	30.5	2.0	5	9.0	15.0
24	39	33	39	3	40.0	33.0	2.0	5	9.0	15.0
25	39	34	40	3	40.0	33.0	2.0	5	9.0	15.0
28	42	37	43	3	42.5	35.5	2.0	5	9.0	15.0
30	44	39	45	3	42.5	35.5	2.0	5	9.0	15.0
32	46	42	48	3	42.5	35.5	2.0	5	9.0	15.0
33	47	42	48	3	42.5	35.5	2.0	5	9.0	15.0
35	49	44	50	3	42.5	35.5	2.0	5	9.0	15.0
38	54	49	56	4	45.0	37.0	2.0	6	9.0	16.0
40	56	51	58	4	45.0	37.0	2.0	6	9.0	16.0
43	58	54	61	4	45.0	37.0	2.0	6	9.0	16.0
45	61	56	63	4	45.0	37.0	2.0	6	9.0	16.0
48	64	59	66	4	45.0	37.0	2.0	6	9.0	16.0
50	66	62	70	4	47.5	38.0	2.5	6	9.0	17.0
53	69	65	73	4	47.5	38.0	2.5	6	9.0	17.0
55	71	67	75	4	47.5	38.0	2.5	6	9.0	17.0
58	78	70	78	4	52.5	42.0	2.5	6	9.0	18.0
60	80	72	80	4	52.5	42.0	2.5	6	9.0	18.0
63	83	75	83	4	52.5	42.0	2.5	6	9.0	18.0
65	85	77	85	4	52.5	42.0	2.5	6	9.0	18.0
68	87	81	90	4	52.5	41.5	2.5	7	9.0	18.5
70	90	83	92	4	60.0	48.5	2.5	7	9.0	19.0
75	99	88	97	4	60.0	48.5	2.5	7	9.0	19.0
80	104	95	105	4	60.0	48.5	3.0	7	9.0	19.0
85	109	100	110	4	60.0	48.5	3.0	7	9.0	19.0
90	114	105	115	4	65.0	52.0	3.0	7	9.0	20.5
95	119	110	120	4	65.0	52.0	3.0	7	9.0	20.5
100	124	115	125	4	65.0	52.0	3.0	7	9.0	20.5

# YE400



## Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary metal bellows

## Advantages

- For high or low temperature applications

## Operating range (see note on page 1)

Pressure (single ply bellows):  
 $p = \text{vacuum} \dots 20 \text{ bar} (\dots 290 \text{ PSI})$   
 Pressure (two ply bellows):  
 $p = \text{vacuum} \dots 35 \text{ bar} (\dots 508 \text{ PSI})$   
 Temperature:  
 $t = -240 \text{ }^\circ\text{C} \dots +425 \text{ }^\circ\text{C} (-400 \text{ }^\circ\text{F} \dots +797 \text{ }^\circ\text{F})$   
 Sliding velocity:  $v_g = \dots 50 \text{ m/s} (164 \text{ ft/s})$   
 Viscosity:  $\dots 1 \text{ Pa}\cdot\text{s}$

## Materials

Seal face: High density carbon graphite  
 Seat: Silicon carbide (Q2)  
 Bellows: Inconel® 718 (M6)  
 Secondary seals: Graphite  
 Metal parts: 1.4404, Carpenter® 42 (T4)

## Recommended applications

- Refining technology
- Power plant technology
- Chemical industry
- High and low temperature hydrocarbon services
- Bottom fluid
- Residual oil
- Gas oil
- Low temperature ethylene
- Pumps
- Special rotating equipment

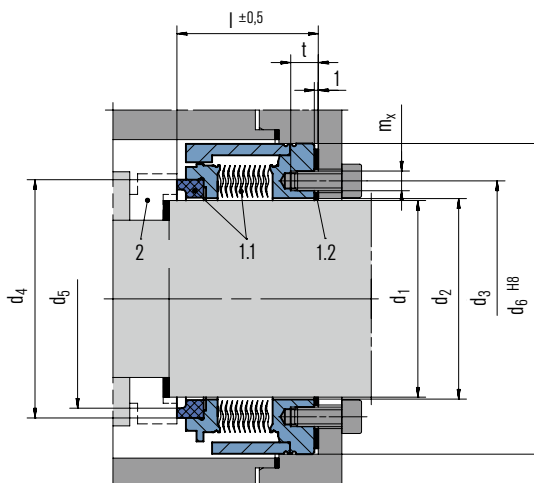
## Item Description

- | Item   | Description     |
|--------|-----------------|
| 1      | Stationary unit |
| 1.1    | Bellows unit    |
| 1.2, 6 | Gasket          |
| 1.3    | Clamp sleeve    |
| 1.4, 7 | Spring washer   |
| 1.5, 8 | HSH Cap screw   |
| 2      | Seat Housing    |
| 3      | Secondary seal  |
| 4      | Seat housing    |
| 5      | Drive pin       |

## Dimensions in mm

Size code	d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>
X14	18	21	42	47	44	36	15	31	6.3
X16	21	26	47	50	47	38	17	31	6.3
X18	24	29	50	53	50	38	17	31	6.3
X20	27.5	32	53	56	53	38	17	31	6.3
X22	31	36	57	60	57	38	17	31	6.3
X24	33	39	60	64	60	41	20	31	6.3
X26	36	42	63	67	63	41	20	31	6.3
X28	39	45	66	70	66	41	20	31	6.3
X30	42	48	69	73	69	41	20	31	6.3
X32	45	51	72	76	72	41	20	31	6.3
X34	46.5	54	75	80	76	43	22	31	6.3
X36	50	58	79	83	79	43	22	31	6.3
X38	53	61	82	86	82	43	22	31	6.3
X40	55	64	85	89	85	51	30	31	6.3
X42	58.5	67	89	92	88	51	30	31	6.3
X44	62.5	71	92	96	92	51	30	31	6.3
X46	64	74	96	99	95	55	34	31	6.3
X48	67	77	99	102	98	55	34	31	6.3
X50	70	81	102	105	101	55	34	31	6.3
X52	73	84	105	108	104	55	34	31	6.3
X54	75.5	87	109	111	107	55	34	31	6.3
X56	78.5	90	113	116	111	58	37	31	6.3
X58	82	93	116	120	114	58	37	31	6.3
X60	85	96	119	122	117	58	37	31	6.3
X62	88	99	122	125	120	58	37	31	6.3
X64	91	103	125	128	123	58	37	31	6.3
X70	100	111	138	142	134	60	39	31	6.3
X78	110	116	147	152	145	60	39	41	7.5
X90	129	137	168	173	166	63	42	41	7.5

# MFL65



## Features

- Stationary bellows
- Single seal
- Balanced
- Independent of direction of rotation

## Advantages

- For high temperature
- High sliding velocities
- No elastomer secondary seals

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 16 \dots 100 \text{ mm}$  (0.63" ... 4"),  
( $>100 \text{ mm}$  on request)

Externally pressurized:  $p_1 = 25 \text{ bar}$  (363 PSI),  
(higher pressure possible, please inquire)

Internally pressurized:  
 $p_1 < 120 \text{ °C}$  (248 °F) 10 bar (145 PSI),  
 $p_1 < 220 \text{ °C}$  (428 °F) 5 bar (72 PSI),  
 $p_1 < 400 \text{ °C}$  (752 °F) 3 bar (44 PSI)  
 Stationary seat lock necessary

Temperature:  $t = -20 \dots +400 \text{ °C}$  (-4 °F ... +752 °F)  
 Sliding velocity:  $v_g = 50 \text{ m/s}$  (165 ft/s)

## Materials

Bellows: Inconel® 718 (M6), Hastelloy® C-276 (M5)  
 Seal face: Carbon graphite antimony impregnated (A),  
 Silicon carbide (Q12)  
 Seat: Silicon carbide (Q1), Special cast CrMo steel (S)  
 Metal parts: Duplex (G1), Carpenter® 42 (T4),  
 Hastelloy® C-4 (M)

## Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Hot media
- High sliding velocities
- Pumps
- Special rotating equipment

## Item Part no. to DIN 24250 Description

Item	Part no. to DIN 24250	Description
1.1	472 and 481	Seal face and bellows unit
1.2	400.1	Flat gasket
2	475	Seat

## Product variant

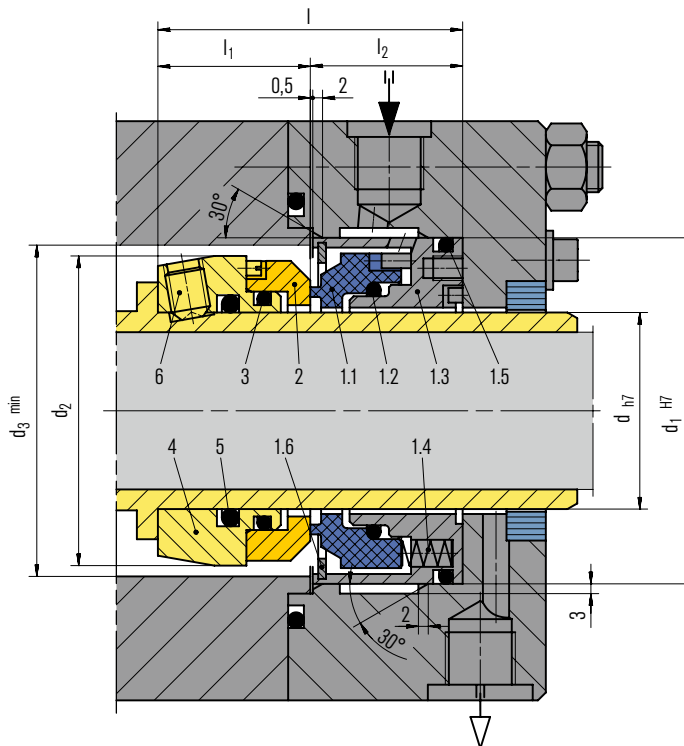
### MFL69

Shaft diameter:  $d_1 = 16 \dots 100 \text{ mm}$  (0.64" ... 4"),  
( $>100 \text{ mm}$  on request)  
 Internally pressurized:  $p_1 = 16 \text{ bar}$  (232 PSI),  
(higher pressure possible, on request)  
 Externally pressurized:  $p_1 = 10 \text{ bar}$  (145 PSI),  
 stationary seat lock necessary.  
 Temperature:  $t = -20 \text{ °C} \dots +400 \text{ °C}$  (-4 °F ... +752 °F)  
 Sliding velocity:  $v_g = 50 \text{ m/s}$  (165 ft/s)

## Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l	n x m <sub>x</sub>	t
19	16-19	20.5	29	30.3	25.3	45.0	33.5	4 x M4	6
24	20-24	25.5	35	38.8	33.8	49.0	33.5	4 x M4	6
30	25-30	31.5	40	43.6	38.6	55.0	34.5	6 x M4	6
35	31-35	36.0	45	45.8	40.8	59.0	33.0	6 x M4	6
40	36-40	41.0	50	51.5	46.5	65.0	30.5	6 x M4	6
45	41-45	46.0	55	55.2	50.2	69.0	35.5	6 x M4	6
51	46-51	52.0	63	64.7	59.7	76.5	40.5	6 x M5	7
60	52-60	61.0	70	70.6	65.6	84.0	32.0	6 x M5	7
70	61-70	71.0	80	82.8	76.8	95.0	38.0	6 x M5	7
82	71-82	83.5	95	98.0	92.0	112.0	41.0	6 x M6	7
88	83-88	89.5	100	107.7	101.7	120.0	47.0	6 x M6	7
100	89-100	101.0	112	112.7	106.7	130.0	47.0	6 x M6	7

# EK777



### Features

- Single seal
- Balanced
- Independent of direction of rotation
- Stationary multiple springs
- Compact construction
- API 682 (Type A) compliant seal
- Angled set screw drive configuration ensures precise vertical alignment of rotary seat
- Distributed flush ensures even cooling flow to seal faces

### Operating range (see note on page 1)

Pressure (product seal):  $p = \text{vacuum} \dots 60 \text{ bar} (\dots 870 \text{ PSI})$   
 Temperature:  $t = -20 \text{ °C} \dots +200 \text{ °C} (-4 \text{ °F} \dots +392 \text{ °F})$   
 Sliding velocity:  $v_g = 50 \text{ m/s} (164 \text{ ft/s})$   
 Viscosity:  $\dots 300 \text{ mPa}\cdot\text{s}$   
 Solids content:  $\dots 0.3 \%$

### Materials

Seal face: High density carbon graphite  
 Seat: Silicon carbide (Q1, Q2)  
 Secondary seals: FKM (V)  
 Metal parts: 1.4401 (G), 1.4301 (F)

### Standards and approvals

- API 682/ISO 21049

### Recommended applications

- Power plant technology
- Oil and gas industry
- LPG
- Hot water
- High pressure pumps
- Compressors
- Blowers
- High speed pumps
- Boiler feed pumps
- LPG

### Item

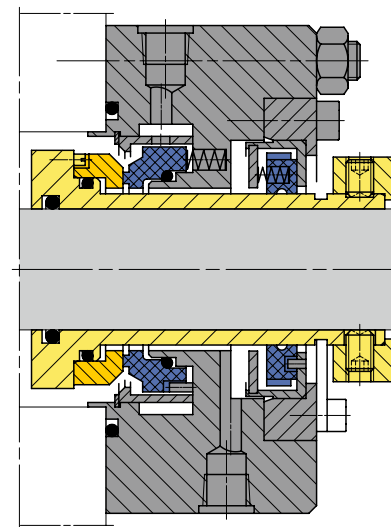
### Description

- | Item           | Description  |
|----------------|--------------|
| 1.1            | Seal face    |
| 1.2, 1.5, 3, 5 | O-Ring       |
| 1.3            | Adapter      |
| 1.4            | Spring       |
| 1.6            | Snap ring    |
| 2              | Seat         |
| 4              | Drive collar |
| 6              | Set screw    |

### Product variant

#### Configuration example

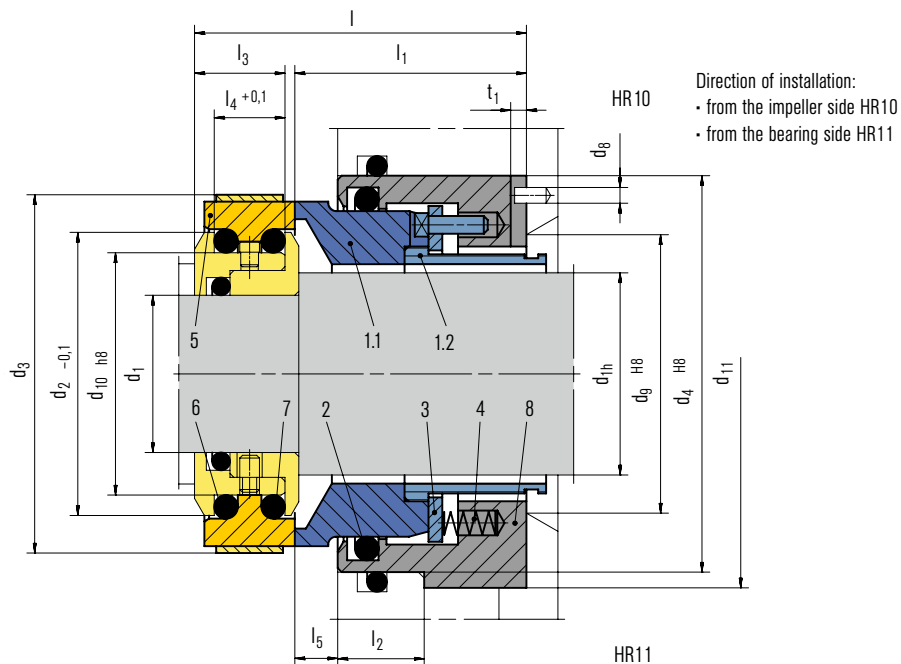
in acc. with API 682 (1CW-FL)



### Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	l	l <sub>1</sub>	l <sub>2</sub>
20	50	40	46	56	27	29
25	54	46	52	56	27	29
30	60	51	57	56	27	29
35	64	56	62	56	27	29
40	72	63	69	62	31	31
45	76	68	74	62	31	31
50	85	76	82	66	33	33
55	90	82	88	66	33	33
60	100	90	96	66	33	33
65	105	93	99	66	33	33
70	110	99	105	66	33	33
75	115	104	110	66	33	33
80	120	111	117	68	35	33
85	127	117	123	68	35	33
90	132	120	126	68	35	33
95	140	129	135	68	35	33
100	145	132	138	68	35	33
105	150	137	143	68	35	33
110	162	144	150	68	35	33

# HR



### Features

- Single seal
- Balanced
- Independent of direction of rotation
- Multiple springs stationary
- Seat rotating
- Seat arranged directly behind the impeller
- Spring protection sleeve
- Variant with cylindrical spring and acc. EN 12756 (HRZ1) available
- Variant as cartridge with/without guide sleeve for application with/without quench (HR2, HR3)
- Dual seal as cartridge unit (HRKS-D) available

### Advantages

- Especially for application in solids containing media without external flush or internal product circulation. Solids content 40 % (single seal) and 60 % (double seal)
- Operation under vacuum without seat locking possible
- Pumping screw for increased circulation available
- Springs are protected from product and leakage
- No damage of the shaft by dynamically loaded O-Ring
- Insensitive to shaft deflections due to stationary design

### Operating range (see note on page 1)

Shaft diameter:  $d_N = 36 \dots 270 \text{ mm}$  (1.4" ... 10.63")  
 Pressure:  $p_1^* = 16 \text{ bar}$  (230 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +160 \text{ }^\circ\text{C}$  (-4 °F ... +320 °F)  
 Sliding velocity:  $v_g = 10 \text{ m/s}$  (33 ft/s)

\* For operation under vacuum it is necessary to arrange for quenching on the atmosphere side.

### Materials

Seal face: Silicon carbide (Q1), (Q2)  
 Seat: Silicon carbide (Q1), (Q2)

### Standards and approvals

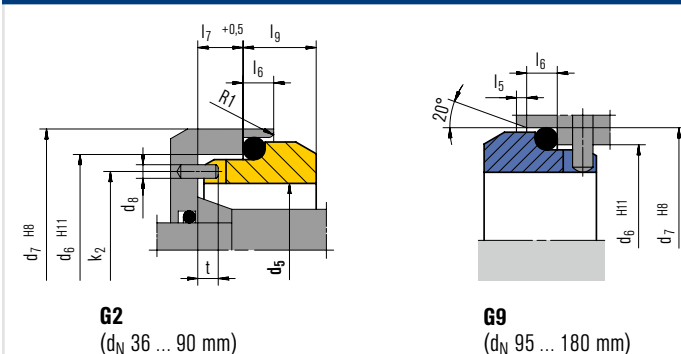
- EN 12756 (HRZ1)

### Recommended applications

- Process industry
- Oil and gas industry
- Refining technology
- Chemical industry
- Power plant technology
- Pulp and paper industry
- Water and waste water technology
- Mining industry
- Sugar industry
- Cement industry
- Dirty, abrasive and solids containing media
- Sewage water pumps
- Dredger pumps
- Oil sand extraction
- Scrubbers in flue-gas desulfurization plants (FGD)

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	520	Sleeve
2	412.1	O-Ring
3	474	Thrust ring
4	477	Spring
5	475	Seat (G11)
6	412.2	O-Ring
7	412.3	O-Ring
8	441	Housing

### Seat alternatives





## Product variants

### HR2

Cartridge-type single seal with guide sleeve (Item no. 2) for use with quench. Insert (Item no. 1) either metal or Silicon carbide.

### HR3

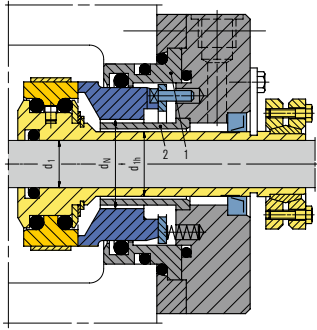
Cartridge-type single seal. Insert (Item no. 1) either metal or silicon carbide. Optional without maintenance rinsing.

### HRKS-D

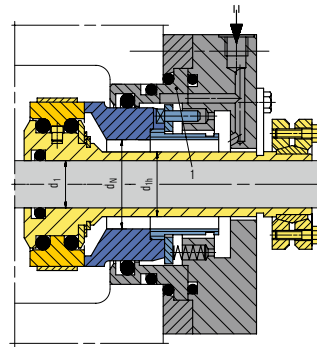
Double seal in cartridge design for operation in barrier or buffer pressure mode (does not open if barrier pressure fails and closes automatically in the event of pressure reversal), available alternatively with a pumping screw for a higher rate of circulation. Torque transmission e.g. by shrink disk.

### HRZ1

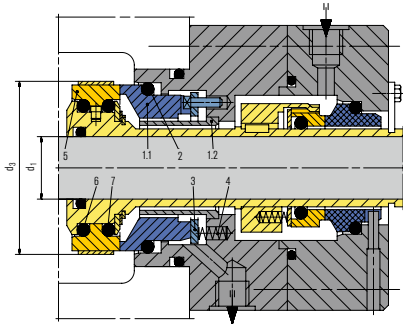
Single seal with cylindrical spring and type G76 seat. For installation in covers with installation dimensions according to EN 12756 B or U. Installation length  $l_{11}$  corresponds to max. 11k. Intermediate sizes on request.



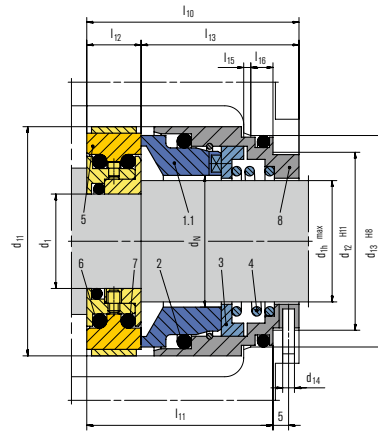
HR2



HR3



HRKS-D



HRZ1

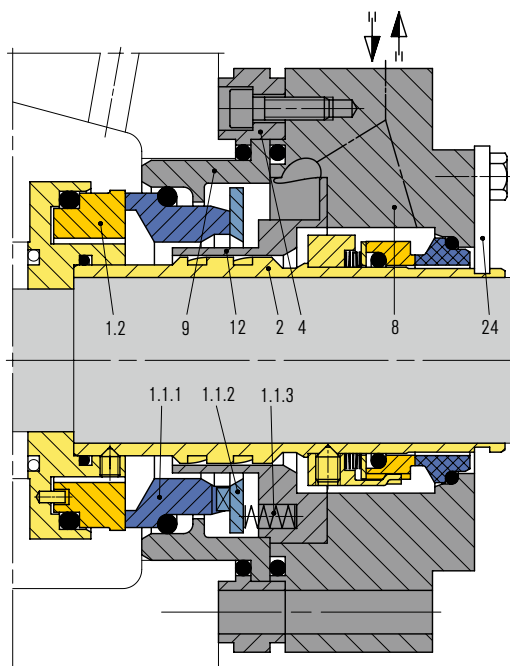
## Dimensions in mm

$d_1$	$d_{1h}$	$d_N$	$d_2$	$d_3$	$d_4$	$d_5$	$d_6$	$d_7$	$d_8$	$d_9$	$d_{10}$	$d_{11} + 0.2 \text{ min.}$	$l$	$l_1$	$l_2$	$l_3$	$l_4$	$l_5$	$l_6$	$l_7$	$l_9$	$k_2$	$t$	$t_1$
20	28	36	47.1	65	70	46	56.0	63.0	4	40	38	75	75	53	20	19.5	17	10.5	6	9	8.0	51.0	4.5	3
25	33	41	52.1	70	75	51	62.0	70.0	4	45	43	80	75	53	20	19.5	17	10.5	6	9	9.5	56.5	4.5	3
28	38	46	57.1	75	80	56	67.0	75.0	4	50	48	85	75	53	20	19.5	17	10.5	6	9	9.5	61.5	4.5	3
33	43	51	62.1	80	85	61	72.0	80.0	4	55	53	90	75	53	20	19.5	17	10.5	6	9	10.5	66.5	4.5	3
38	48	56	67.1	85	90	66	77.0	85.0	4	60	58	95	75	53	20	19.5	17	10.5	6	9	10.5	71.5	4.5	3
43	53	61	72.1	90	95	69	81.0	90.0	4	65	63	100	75	53	20	19.5	17	10.5	7	9	11.0	75.0	4.5	3
48	58	66	77.1	95	100	76	88.0	97.0	4	70	68	105	75	53	20	19.5	17	10.5	7	9	11.5	82.0	4.5	3
53	63	71	82.1	101	105	81	95.0	105.0	4	75	73	110	75	53	20	19.5	17	10.5	7	9	11.5	88.0	4.5	3
55	65	75	87.1	106	110	86	100.0	110.0	4	79	78	115	75	53	20	19.5	17	10.5	7	9	11.5	93.0	4.5	3
60	70	80	92.1	111	115	91	105.0	115.0	4	84	83	120	75	53	20	19.5	17	10.5	7	9	13.0	98.0	4.5	3
65	75	85	97.1	116	120	96	110.0	120.0	4	89	88	125	75	53	20	19.5	17	10.5	7	9	13.0	103.0	4.5	3
70	80	90	102.1	121	125	101	115.0	125.0	4	94	93	130	75	53	20	19.5	17	10.5	7	9	13.0	108.0	4.5	3
75	85	95	107.1	126	130	107	122.2	134.3	5	99	98	135	75	53	20	19.5	17	10.5	10	12	20.0	114.5	7.0	3
80	90	100	112.1	131	135	107	122.2	134.3	5	104	103	140	75	53	20	19.5	17	10.5	10	12	20.0	114.5	7.0	3
90	100	110	126.1	147	155	117	136.2	148.3	5	116	117	163	98	73	30	22.0	19	16.0	10	12	20.0	126.5	7.0	4
100	110	120	136.1	157	165	132	146.2	158.3	5	126	127	173	98	73	30	22.0	19	16.0	10	12	20.0	139.0	7.0	4
110	120	130	145.1	167	175	142	156.2	168.3	5	136	136	183	98	73	30	22.0	19	16.0	10	12	20.0	149.0	7.0	4
120	130	140	154.1	177	185	152	166.2	180.3	5	146	145	193	98	73	30	22.0	19	16.0	10	12	22.0	160.0	7.0	4
130	140	150	163.9	188	195	162	178.2	190.3	5	156	155	203	98	73	30	22.0	19	16.0	12	12	24.0	170.0	7.0	4
140	150	160	174.9	189	205	172	188.2	200.3	5	166	166	213	98	73	30	22.0	19	16.0	12	12	24.0	180.0	7.0	4
160	170	180	193.9	220	230	187	212.5	224.3	5	186	185	238	98	73	30	22.0	19	16.0	12	12	28.0	199.5	7.0	4
180	190	200	213.9	240	255	-	-	-	-	206	205	265	98	73	30	22.0	19	16.0	-	-	-	-	-	4
190	200	210	231.9	255	270	-	-	-	-	218	220	280	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5
200	210	220	241.9	265	280	-	-	-	-	228	230	290	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5
210	220	230	251.9	275	290	-	-	-	-	238	240	300	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5
220	230	240	261.9	285	300	-	-	-	-	248	250	310	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5
230	240	250	271.9	295	310	-	-	-	-	258	260	320	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5
250	260	270	291.9	315	330	-	-	-	-	278	280	340	115	83	40	28.35	24.7	19.0	-	-	-	-	-	5

## HRZ1 – Dimensions in mm

$d_N$	$d_{1h}$	$d_1$	$d_{11}$	$d_{12}$	$d_{13}$	$d_{14}$	$l_{10}$	$l_{11}$	$l_{12}$	$l_{13}$	$l_{15}$	$l_{16}$
35	33	20	56	42	48	3	57.7	49.2	15.0	42.7	2.0	5
43	39	27	67	54	61	4	57.7	49.2	15.0	42.7	2.0	6
54	50	35	78	65	73	4	59.8	52.1	15.5	44.3	2.5	6
66	60	47	91	77	85	4	66.0	58.0	16.5	49.5	2.5	6
77	72	55	103	88	97	4	74.5	66.0	17.5	57.0	2.5	7
100	90	70	125	110	120	4	82.0	73.0	21.0	61.0	3.0	7

# HRC...N



## Features

- Cartridge
- Balanced
- Independent of direction of rotation
- Stationary multiple springs
- Variant with short installation length (HRC1100N)
- Spring protection sleeve
- Variant for operation with pressureless quench available (HRC2000N)
- Dual seal with and without pumping screw (HRC3300NF, HRC3300N) available

## Advantages

- Insensitive to solids containing media. Solids content 40 % (single seal) and 60 % (double seal)
- Springs are protected from product and leakage
- Broad field of application due to modular system
- Optimal for standardization purposes
- Variant with short installation length to meet limited space conditions (HRC1100N)
- Seal remains closed in case of barrier pressure failure, self-closing at pressure reversal (HRC3300NF)
- Operation under vacuum without seat locking possible
- Pumping screw for increased circulation available
- No damage of the shaft by dynamically loaded O-Ring
- Insensitive to shaft deflections due to stationary design
- Straightforward installation due to pre-assembled unit
- Installation errors are excluded
- No damage caused by dirt entered during assembly

## Operating range (see note on page 1)

Shaft diameter:  $d_{10} = 30 \dots 60 \text{ mm}$  (1,181" ... 2,362")  
 Pressure:  $p_1 = 23 \text{ bar}$  (334 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +160$  (200\*)  $^\circ\text{C}$   
 ( $-4 \text{ }^\circ\text{F} \dots +320$  (382\*)  $^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 20 \text{ m/s}$  (66 ft)  
 Axial movement:  $\pm 1.0 \text{ mm}$

\* Due to shrinking

## Materials

Seal face: Silicon carbide (Q1, Q2)  
 Seat: Carbon graphite antimony impregnated (A), Silicon carbide (Q1, Q2)

## Standards and approvals

- DIN 24960 C

## Recommended applications

- Chemical industry
- Process industry
- Petrochemical industry
- Mining industry
- Sugar industry
- Dirty, abrasive and solids containing media
- Various chemical processes
- Chemical standard pumps

## HRC3300NF

With uni-directional pumping screw. Dual seal remains closed in case of barrier pressure failure and closes in the event of pressure reversal. With guide sleeve (item no. 12). Operation as single seal with quench possible. Encapsulated stationary seat on the product side (bursting protection). Parted seal sleeve for application of highly resistant materials e.g. Hastelloy®.

Item	Part no. to DIN 24250	Description
1.1.1	472.1	Seal face
1.1.2	474	Thrust ring
1.1.3	477.1	Spring
1.2	475.1	Seat
2	523	Shaft sleeve
4	513	Insert
8	160	Cover plate
9	509	Spring carrier
12		Spring protection sleeve
19		Plug
24		Assembly fixture

## Product variants

### HRC1000N

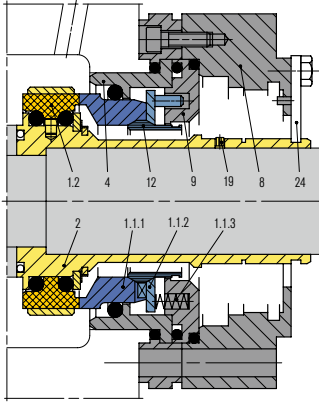
Single seal

### HRC1100N

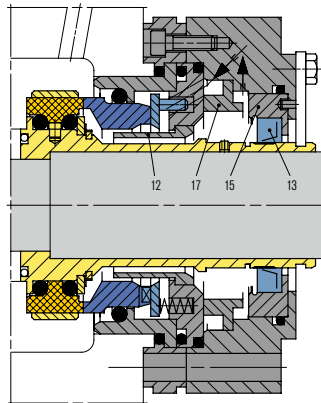
ASame design as HRC1000N, but with a shorter cover plate featuring integral spring and drive pin pockets (Item no. 8). No adapter (Item no. 9). Shaft sleeve (Item no. 2) uncoated. Differs from modular system!

### HRC2000N

Single seal with pressureless quench for cooling, featuring guide sleeve (Item no. 12) baffle (Item no. 17), adapter (Item no. 15) and lip seal (Item no. 13) on the atmosphere side. Option: Throttle ring for sealing steam quench on the atmosphere side.



HRC1000N

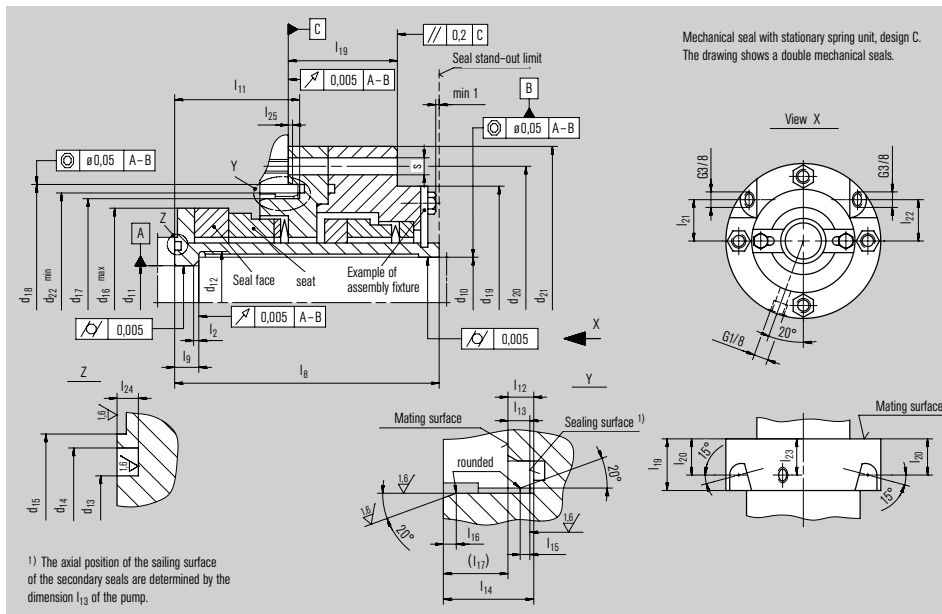


HRC2000N

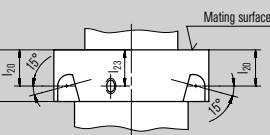
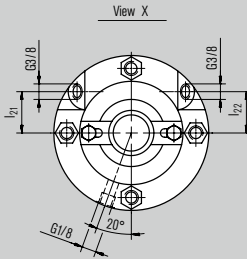
## Dimensions in mm

$d_{10}^{1)}$	$d_{11}^{1)}$	$d_{12}^{2)}$	$d_{13}^{3)}$	$d_{14}^{2)}$	$d_{15}^{4)}$	$d_{16}$	$d_{17}^{5)}$	$d_{18}^{1)6)}$	$d_{19}$	$d_{20}$	$d_{21}$	$d_{22}$	$l_8^{7)}$	$l_9$	$l_{10}$	$l_{11}^{2)7)}$	$l_{12}^{2)7)}$	$l_{13}^{8)}$	$l_{14}$	$l_{15}$	$l_{16}$	$l_{17}$	$l_{18}$	$l_{19}$	$l_{20}$	$l_{21}$	$l_{22}$	$l_{23}$	$l_{24}^{9)}$	$l_{25}$	S
30	24	31	35	41	44	82	85	95	$d_{19} < d_{20}$	110	129	86	115	10	15	50	4	4	20	1	16	0.5	55	39	35	35	39	2	0.5	M10	
40	32	41	45	51	54	92	95	110		130	155	96	130	10	15	52	4	4	22	1	18	0.5	60	44	40	40	44	2	0.5	M12	
50	42	51	55	61	66	105	110	125		145	168	111	140	12	15	55	4	4	25	1	21	0.5	60	44	45	45	44	2	0.5	M12	
60	50	61	61	67	76	120	125	140		160	185	126	166	14	20	70	4	4	30	1	26	0.5	60	44	50	50	44	2	0.5	M12	

1) H7 2) +0.2 3) -0.2 4) +0.5 5) h8 6) +7 7) +0.1 8) -0.1 9) ±0.05

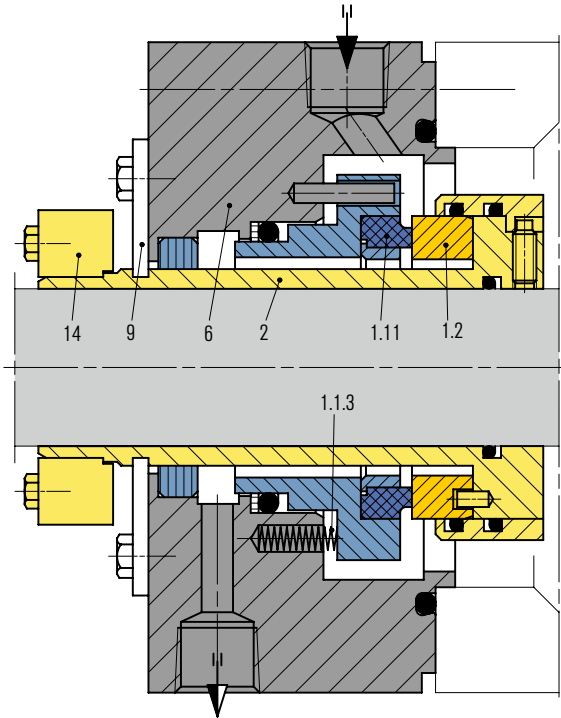


Mechanical seal with stationary spring unit, design C. The drawing shows a double mechanical seals.



1) The axial position of the sealing surface of the secondary seals are determined by the dimension  $l_{13}$  of the pump.

# SH(V)



### Features

- Cartridge design
- Single seal
- Balanced
- Stationary spring loaded unit
- Shrink-fitted seal face
- Multiple springs

### Advantages

- Deformation-optimized seal for high pressures and high sliding velocities (static up to 500 bar and dynamic up to 150 bar)
- Economical due to standardized inner components
- High flexibility due to adaptation of the connection parts to the pump seal chamber
- Insensitive to shaft deflections due to stationary design
- Pre-assembled unit for quick and easy installation
- Suitable for use in compliance with API 682, type ES
- Version with loose-fitted seal face available, for extreme applications
- Only small number of components

### Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 40 \dots 250 \text{ mm}$  (1.57" ... 9.84")  
 Pressure:  $p_1 = 150 \text{ bar}$  (2.175 PSI)  
 Temperature:  $t = +200 \text{ }^\circ\text{C}$  (+394 °F)  
 Sliding velocity:  $v_0 = 60 \text{ m/s}$  (197 ft/s)  
 Axial movement:  $\pm 3 \text{ mm}$

\* Other sizes on request

### Materials

Seal face: SiC-C-Si, silicon impregnated carbon (Q3), Carbon graphite, antimony impregnated (A)  
 Seat: Silicon carbide (Q)  
 Secondary seals: FKM (V), EPDM (E), FFKM (K)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Duplex (G1), Super Duplex (G4), Titanium (T2), Hastelloy® C-4 (M)

### Standards and approvals

- API 682/ISO 21049

### Recommended seal supply

- API Plan 11, 31, 32, 61, 62, 13, 41

### Recommended applications

- Power plant technology
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Pulp and paper industry
- Water and waste water technology
- Hot water
- Sour water
- Caustic soda
- Amines
- Crystallizing media
- Crude oil
- Process water
- Crude oil feed pumps
- Injection pumps
- Multi-phase pumps

### Item Description

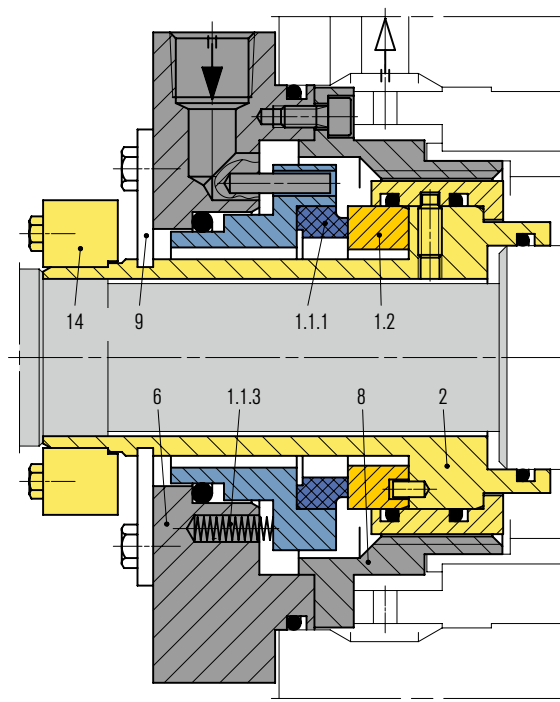
Item	Description
1.1.1	Seal face
1.1.3	Spring
1.2	Seat
2	Shaft sleeve
6	Housing
9	Assembly fixture
14	Shrink disk

### Product variant

#### SH(V)I

Same design as SH(V) but with loosely inserted seal face for extreme applications.  
 Pressure:  $p_1 = 200 \text{ bar}$  (2,900 PSI)

# SHF / SHP



### Features

- Cartridge design
- Single seal
- Balanced
- Dependent of direction of rotation
- Integrated pumping device
- Stationary spring loaded unit
- Shrink-fitted seal face
- Multiple springs

### Advantages

- Deformation-optimized seal for high sliding velocities and medium pressures
- Economical due to standardized inner components
- Universal application for OEM or retrofits of boiler feed water pumps with floating ring seals, labyrinths or packings
- High flexibility due to adaptation of the connection parts to the pump seal chamber
- Optimum heat dissipation due to integrated pumping device and optimized seat design
- Insensitive to shaft deflections due to stationary design
- Pre-assembled unit for quick and easy installation
- Only small number of components
- Short built

### Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 40 \dots 250 \text{ mm}$  (1.57" ... 9.84")

Pressure:  $p_1 = 50 \text{ bar}$  (725 PSI)

Temperature:  $t = +300 \text{ }^\circ\text{C}$  (+572  $^\circ\text{F}$ )

Sliding velocity:  $v_g = 60 \text{ m/s}$  (197 ft/s)

Axial movement:  $\pm 3 \text{ mm}$

\* Other sizes on request

### Materials

Seal face: Silicon carbide (Q), Carbon graphite antimony impregnated (A), Carbon graphite resin impregnated (B)  
 Seat: Silicon carbide (Q)

Secondary seals: EPDM (E), FFKM (K)

Springs: CrNiMo steel (G)

Metal parts: CrNiMo steel (G)

### Recommended seal supply

- API Plan 23

### Recommended applications

- Power plant technology
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Boiler feed water pumps

### Item Description

Item	Description
1.1.1	Seal face
1.1.3	Spring
1.2	Seat
2	Shaft sleeve
6	Cover
8	Pumping screw with flow guide
9	Assembly fixture
14	Shrink disk

### Product variant

#### SHF4

Single mechanical seal with integrated jacket cooling, for boiler feed pumps.



# SHPV / SHFV



### Features

- Cartridge design
- Single seal
- Balanced
- Dependent of direction of rotation
- Integrated pumping device
- Stationary spring loaded unit
- Shrink-fitted seal face
- Multiple springs

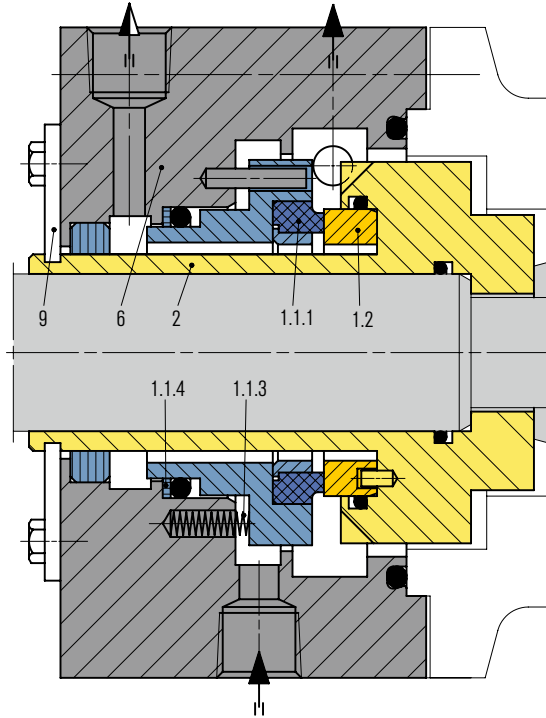
### Advantages

- Deformation-optimized seal for highest pressure levels
- Economical due to standardized inner components
- High flexibility due to adaptation of the connection parts to the pump seal chamber
- Optimum heat dissipation due to integrated pumping device and optimized seat design
- Insensitive to shaft deflections due to stationary design
- Pre-assembled unit for quick and easy installation
- Only small number of components

### Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 40 \dots 250 \text{ mm}$  (1.57" ... 9.84")  
 Pressure:  $p_1 = 150 \text{ bar}$  (2,175 PSI)  
 Temperature:  $t = +350 \text{ }^\circ\text{C}$  (+662 °F)  
 Sliding velocity:  $v_g = 60 \text{ m/s}$  (197 ft/s)  
 Axial movement:  $\pm 3 \text{ mm}$

\* Other sizes on request



### Materials

Seal face: Carbon graphite antimony impregnated (A)  
 Seat: Silicon carbide (Q)  
 Secondary seals: EPDM (E), FFKM (K)  
 Springs: CrNiMo steel (G)  
 Metal parts: CrNiMo steel (G)

### Recommended seal supply

- API Plan 23

### Recommended applications

- Power plant technology
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Boiler feed water
- Boiler circulation pumps

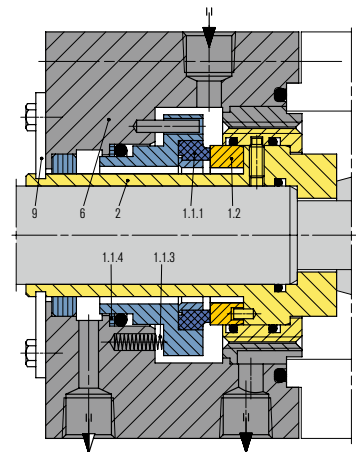
### Item Description

Item	Description
1.1.1	Seal face pressure-stabilized
1.1.3	Spring
1.1.4	Back-up ring
1.2	Seat
2	Seat housing with pumping screw (F) or pumping ring (P)
6	Cover
9	Assembly fixture

### Product variant

#### SHFV

Same design as SHPV but with pumping screw.



# SAF(V) / SAP(V)



### Features

- Cartridge design
- Single seal
- Balanced
- Dependent on direction of rotation
- Integrated pumping device
- Stationary spring loaded unit
- Inserted seal face
- Rotating carbon seat

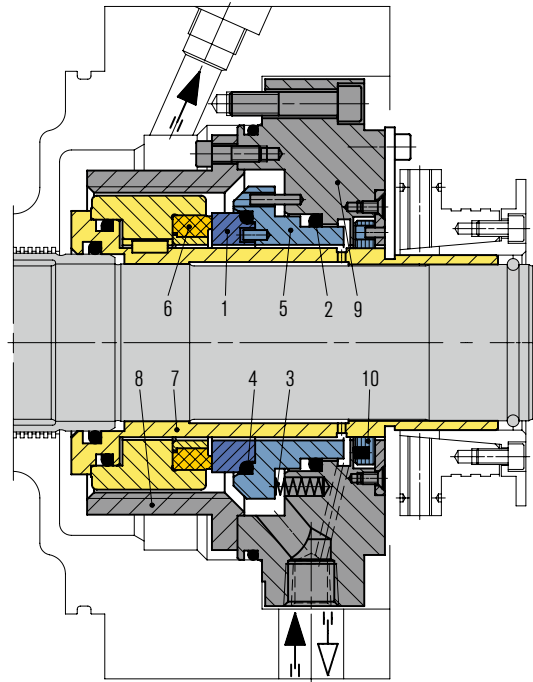
### Advantages

- Deformation-optimized seal for high sliding velocities and medium pressures
- Economical due to standardized inner components
- High flexibility due to adaptation of the connection parts to the pump seal chamber
- Optimum heat dissipation due to integrated pumping device and optimized seat/seal face design
- Insensitive to shaft deflections due to stationary design
- Pre-assembled unit for quick and easy installation
- Only small number of components

### Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 120 \dots 250 \text{ mm}$  (4.72" ... 9.84")  
 Pressure:  $p_1 = 50 \text{ bar}$  (725 PSI)  
 Temperature:  $t = +300 \text{ }^\circ\text{C}$  (+572 °F)  
 Sliding velocity:  $v_0 = 65 \text{ m/s}$  (213 ft/s)  
 Axial movement:  $\pm 3 \text{ mm}$

\* Other sizes on request



### Materials

Seal face: Silicon carbide (Q), SiC-C-Si, silicon impregnated carbon (Q3)  
 Seat: Carbon graphite resin impregnated (B), SiC-C-Si, silicon impregnated carbon (Q3)  
 Secondary seals: EPDM (E), FFKM (K)  
 Springs: CrNiMo steel (G)  
 Metal parts: CrNiMo steel (G)

### Recommended seal supply

- API Plan D2 + 23 (with jacket cooling)

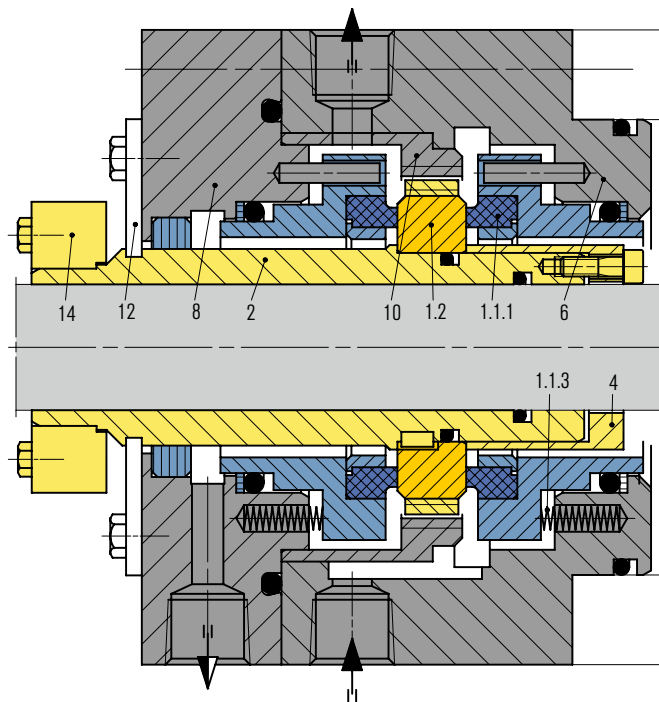
### Recommended applications

- Power plant technology
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Chemical industry
- Boiler feed water with low conductivity
- Boiler feed pumps

### Item Description

Item	Description
1	Seal face
2, 4	O-Ring
3	Spring
5	Seat collar
6	Seat
7	Shaft sleeve
8	Pumping sleeve
9	Cover
10	Throttle ring

# SHF(V)I-D / SHP(V)I-D



## Features

- Cartridge design
- Dual seal
- Balanced
- Integrated pumping device
- Stationary spring loaded unit
- Multiple springs arrangement
- Shrink-fitted seal face
- One rugged seat

## Advantages

- Deformation-optimized seal for high pressures and high sliding velocities (static up to 500 bar (7,250 PSI)) and dynamic up to 150 bar (2,175 PSI)
- Economical due to standardized inner components
- High flexibility due to adaptation of the connection parts to the pump seal chamber
- Optimum heat dissipation due to integrated pumping device
- Insensitive to shaft deflections due to stationary design
- Pre-assembled unit for quick and easy installation
- Dual seal does not open even in the event of barrier fluid pressure failure
- Reliable operation due to one rugged seat with bandage
- Suitable for use in compliance with API 682, type ES
- Version with loose-fitted seal face available, for extreme applications
- Only small number of components

## Operating range (see note on page 1)

Shaft diameter:  $d_1^* = 40 \dots 250 \text{ mm}$  (1.57" ... 9.84")  
 Pressure:  $p_3 = 150 \text{ bar}$  (2,175 PSI)  
 Temperature:  $t = +200 \text{ }^\circ\text{C}$  (+392 °F)  
 Sliding velocity:  $v_g = 60 \text{ m/s}$  (197 ft/s)

\* Other sizes on request

## Materials

Seal face: SiC-C-Si, silicon impregnated carbon (Q3), Carbon graphite, antimony impregnated (A)  
 Seat: Silicon carbide  
 Secondary seals: FKM (V), EPDM (E), FFKM (K)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Duplex (G1), Super Duplex (G4), Pure Titanium (T2), Hastelloy® C-4 (M)

## Standards and approvals

- API 682/ISO 21049

## Recommended seal supply

- API Plan 53A, 53B, 53C, 54

## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Power plant technology
- Chemical industry
- Volatile and non-volatile hydrocarbons
- Crude oil
- Process water
- Crude oil feed pumps
- Injection pumps
- Multi-phase pumps

## Item Description

Item	Description
1.1.1	Seal face
1.1.3	Spring
1.2	Seat
2	Shaft sleeve
4	Clamping sleeve
6	Housing
8	Cover
10	Pumping sleeve
12	Assembly fixture
14	Shrink disk

## Product variants

### SHF(V)-D / SHP(V)-D

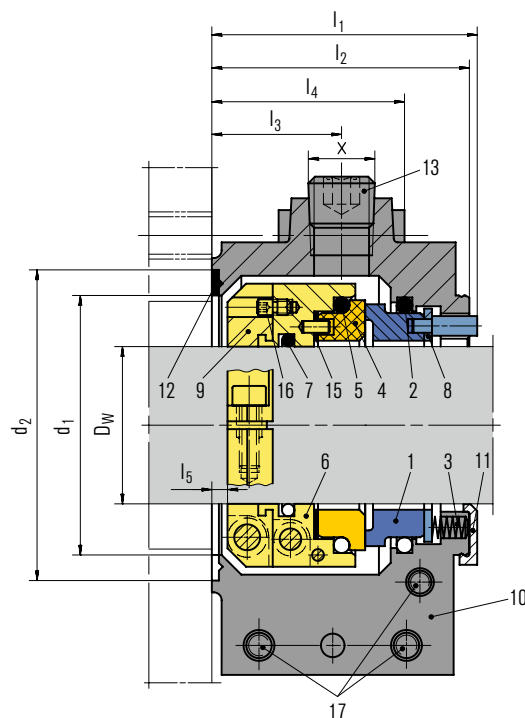
Same design as SHF(V)-D/SHP(V)-D but with loosely inserted seal face for extreme applications.  
 Pressure:  $p_1 = 200 \text{ bar}$  (2,900 PSI)







# Splitex



## Features

- Fully split single seal, 2 x 2 segments, pre-assembled
- Semi-cartridge
- Balanced
- Stationary springs
- Bi-directional
- External pressurization
- Built-in flushing connections
- Installation and wear control

## Advantages

- Reduced repair and downtime: 2x2 pre-assembled design speeds up and simplifies installation because pump does not have to be disassembled.
- Long service life: precise pre-alignment because of pre-assembled segments. Stationary springs which are protected from the product prevent clogging.
- Greater flexibility during installation: no modification necessary because the seal is located outside of the stuffing box.
- Shaft protection: uniform torque transmission via clamping ring prevents damage caused by set screws.
- Dependable operation: mechanical decoupling of clamping ring (torque transmission) avoids distortion of the seat.
- Simple monitoring of the seal during operation because of mechanical wear indicator on the seal face.
- Low leakage: elimination of secondary seals eliminates leakage paths between split components.
- High tolerance to shaft deflections ensured by stationary design and elastic seat mounting (gasket).

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 50 \dots 150 \text{ mm}$   
(1.940" ... 6.000")

Pressure:  $p_1 = 10 \text{ bar}$  (145 PSI)

Temperature:  $t = -40 \dots +150 \text{ }^\circ\text{C}$  (-40 ... +300 °F),  
above 80 °C (175 °F) flush is recommended

Sliding velocity:  $v_0 = 10 \text{ m/s}$  (33 ft/s)

Axial movement:  $\pm 1.5 \text{ mm}$  (1/16")

Radial movement:  $\pm 0.8 \text{ mm}$  (1/32")

## Materials

Seal face: Carbon graphite antimony impregnated (A),  
Silicon carbide (Q6)

Seat: Silicon carbide (Q6)

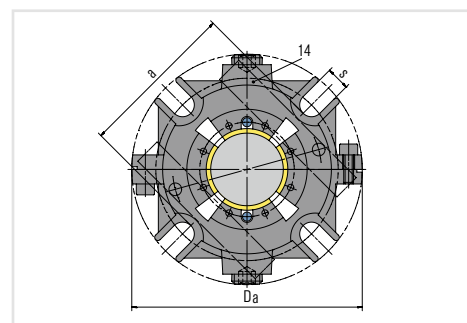
Secondary seals: FKM (V), EPDM (E), NBR (P)

Springs: CrNiMo steel (G)

Metal parts: CrNiMo steel (G), CrNiMo cast steel (G)

## Item Description

1	Seal face
2, 5, 7	O-Ring
3	Spring
4	Seat
6	Driver
8	Thrust ring
9	Clamp collar
10	Housing
11	Assembly fixture
12, 15	Gasket
13	Head Screw plug
14	Mounting plate
16	Set screw
17	HSH Cap screw



Seal cover

## Recommended applications

- Process industry
- Petrochemical industry
- Chemical industry
- Power plant technology
- Pulp and paper industry
- Pulp
- Centrifugal pumps
- Agitators
- Displacement pumps
- Conveying pulp with stock pumps
- Conveying timber to refiners with pumping screws
- Circulation of pulp-and-water mixtures in storage vessels
- Pump stations for waste water treatment
- Cooling water pumps for energy generation

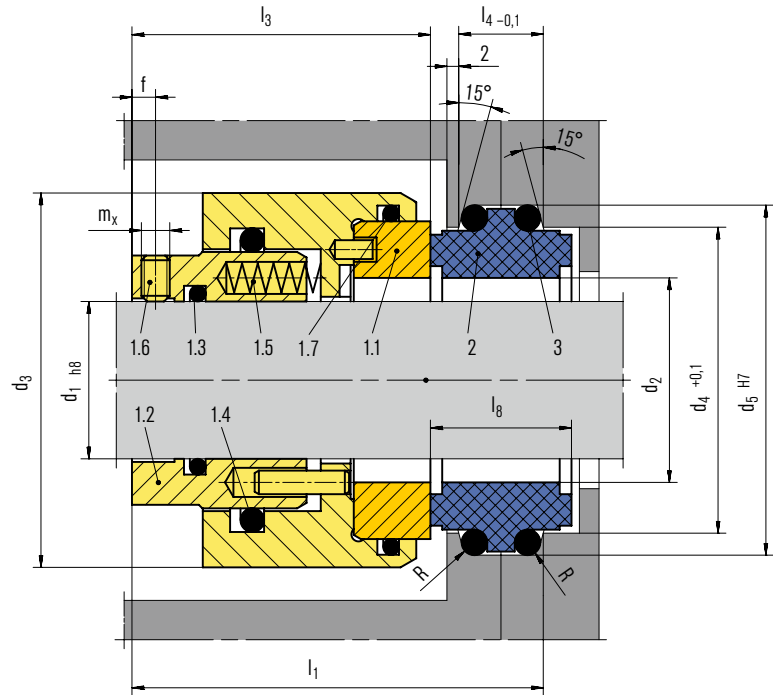
### Dimensions in mm

D <sub>w</sub>	D <sub>w</sub>	d <sub>1</sub>	d <sub>2</sub>	D <sub>a</sub>	a	s	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	X
50	1.969	75	84	138	88	15	63	61	30	45	3	3/8 NPT
60	2.362	89	101	149	105	17.5	64	62	30	46	3	3/8 NPT
70	2.756	98	113	176	118	20	64	62	30	46	3	3/8 NPT
80	3.150	110	132	191	135	20	65	63	31	47	3	3/8 NPT
90	3.543	121	140	203	145	22	72.5	70.5	31.5	50.5	3	1/2 NPT
100	3.937	131	150	216	155	22	72.5	70.5	31.5	50.5	3	1/2 NPT
110	4.331	142	165	230	170	22	72.5	70.5	31.5	50.5	3	1/2 NPT
120	4.724	152	175	240	180	22	72.5	70.5	31.5	50.5	3	1/2 NPT
125	4.921	162	185	268	190	26	89.5	87.5	43.5	62.5	4	1/2 NPT
140	5.512	175	200	303	205	26	89.5	87.5	43.5	62	4	1/2 NPT
150	5.906	188	215	308	220	26	89.5	57.5	43.5	62.5	4	1/2 NPT

### Dimensions in inch

D <sub>w</sub>	D <sub>w</sub>	d <sub>1</sub>	d <sub>2</sub>	D <sub>a</sub>	a	s	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	X
1.940	49.276	2.953	3.307	5.433	3.456	0.591	2.480	2.402	1.181	1.772	0.118	3/8 NPT
2.000	50.800	2.953	3.307	5.433	3.456	0.591	2.480	2.402	1.181	1.772	0.118	3/8 NPT
2.125	53.975	3.110	3.465	5.787	3.622	0.591	2.480	2.402	1.142	1.772	0.118	3/8 NPT
2.375	60.325	3.504	3.976	5.866	4.134	0.689	2.520	2.441	1.181	1.811	0.118	3/8 NPT
2.438	61.925	3.642	4.114	6.181	4.272	0.689	2.520	2.441	1.181	1.811	0.118	3/8 NPT
2.500	63.500	3.642	4.114	6.181	4.272	0.689	2.520	2.441	1.181	1.811	0.118	3/8 NPT
2.750	69.850	3.858	4.449	6.929	4.646	0.787	2.520	2.441	1.181	1.811	0.118	3/8 NPT
2.938	74.625	4.213	4.803	7.559	5.000	0.787	2.559	2.480	1.299	1.850	0.118	3/8 NPT
3.000	76.200	4.213	4.803	7.559	5.000	0.787	2.559	2.480	1.299	1.850	0.118	3/8 NPT
3.250	82.550	4.331	5.197	7.520	5.315	0.787	2.559	2.480	1.220	1.850	0.118	3/8 NPT
3.500	88.900	4.764	5.512	7.992	5.709	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
3.625	92.075	4.764	5.512	7.992	5.709	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
3.750	95.250	4.921	5.630	8.110	5.827	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
3.875	98.425	5.157	5.906	8.504	6.102	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
4.000	101.600	5.157	5.906	8.504	6.102	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
4.250	107.950	5.591	6.496	9.055	6.693	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
4.500	114.300	5.984	6.890	9.449	7.087	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
4.750	120.650	5.984	6.890	9.449	7.087	0.866	2.854	2.776	1.240	1.988	0.118	1/2 NPT
5.000	127.000	6.378	7.283	10.551	7.480	1.024	3.524	3.445	1.713	2.461	0.157	1/2 NPT
5.500	139.700	6.890	7.874	11.929	8.071	1.024	3.524	3.445	1.713	2.461	0.157	1/2 NPT
6.000	152.400	7.402	8.465	12.126	8.661	1.024	3.524	3.445	1.713	2.461	0.157	1/2 NPT

# HGH201



## Features

- For plain shafts (HGH201)
- Semi split single seal
- Multiple springs rotating
- Balanced
- Independent of direction of rotation
- Unsplit as original equipment (HGH200)
- Cartridge available (based on HGH210)
- Variant for stepped shafts available (HGH211)
- Splitted seal parts: sliding faces and O-Rings

## Advantages

- Economical: no complete dismantling of pump necessary
- Reduction of down-times and installation times
- Springs are protected from the product
- Rugged seal design
- Split seat can be used on both sides

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 50 \dots 310 \text{ mm}$  (2" ... 12.20")  
 (larger diameters on request)  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t_1 = +150 \text{ °C}$  (+302 °F)  
 Sliding velocity:  $v_0 = 20 \text{ m/s}$  (66 ft/s)  
 Axial movement:  $\pm 2.0 \text{ mm}$

## Materials

Seal face: Silicon carbide (Q1, Q2)  
 Seat: Silicon carbide (Q1, Q2),  
 Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Secondary seals: FKM, (V), EPDM (E), NBR, (P)  
 Metal parts: CrNiMo steel (G)

## Recommended applications

- Pulp and paper industry
- Water and waste water technology
- Shipbuilding
- Sea water desalination
- Pulp with up to 5 % fiber content
- Water turbines
- Chest agitators
- Stern tubes
- Cooling water pumps
- Gears
- Defibrators
- Storage pumps

## Item Description

Item	Description
1.1	Seal face <sup>1)</sup>
1.2	Drive collar
1.3, 1.4, 1.7, 3	O-Ring <sup>1)</sup>
1.5	Spring
1.6	Set screw
2	Stationary seat <sup>1)</sup>

<sup>1)</sup> For disassembly of unsplit seal faces, seats and O-Ring these should be broken or cut.

## Torque transmission

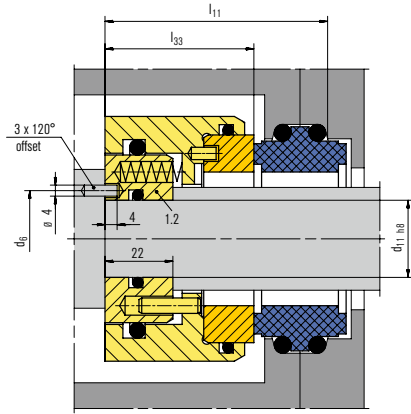


$d_1 \geq 105 \text{ mm}$   
**Set screws with cone point**  
 4 x offset by 90°

## Product variants

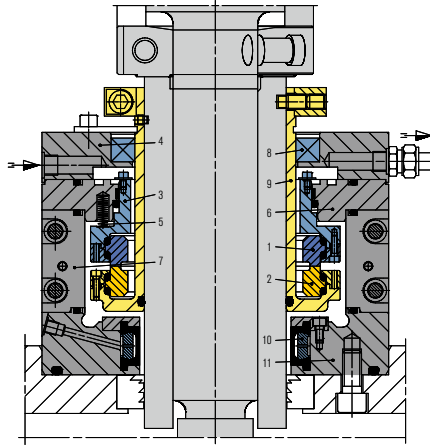
### HGH211

Dimensions, items and descriptions as HGH201. Item 1.2 driver collar is modified for securing on stepped shafts. Unsplit as original equipment: Designation HGH210.



### HGH300S1

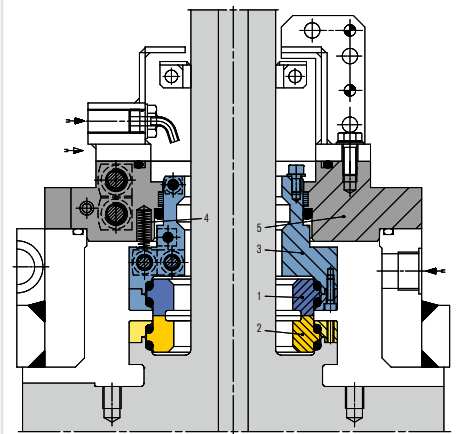
Stationary design. For first fit the seals come with unsplit sliding faces and O-rings. Seal face also available in carbon graphite resin impregnated (B). Dimensions on request.



- |      |           |    |              |
|------|-----------|----|--------------|
| 1    | Seal face | 7  | Housing      |
| 2    | Seat      | 8  | Packing      |
| 3, 4 | Adapter   | 9  | Shaft sleeve |
| 5    | Spring    | 10 | Pneumostop   |
| 6    | Cover     | 11 | Flange       |

### VGH300S1

Fully split seal based on HGH. Stationary design with rotating seat. To make a straightforward installation possible, all parts of the seal are split.

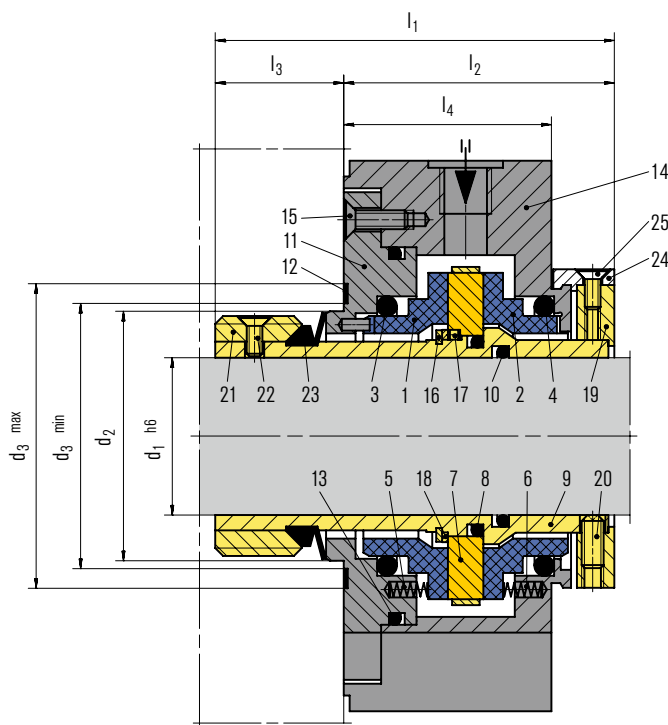


- |   |           |   |        |
|---|-----------|---|--------|
| 1 | Seal face | 4 | Spring |
| 2 | Seat      | 5 | Cover  |
| 3 | Adapter   |   |        |

## Dimensions in mm

d <sub>1</sub>	d <sub>11</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>1</sub>	l <sub>11</sub>	l <sub>3</sub>	l <sub>33</sub>	l <sub>4</sub>	l <sub>6</sub>	R	f	m <sub>x</sub>
50	40	60	95	80.5	89.6	55	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
55	45	65	100	85.5	94.6	60	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
60	50	70	105	90.5	99.6	65	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
65	55	75	110	95.5	104.6	70	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
70	60	80	115	100.5	109.6	75	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
75	65	85	120	105.5	114.6	80	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
80	70	90	125	110.5	119.6	85	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
85	75	95	130	115.5	124.6	90	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
90	80	100	135	120.5	129.6	95	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
95	85	105	140	125.5	134.6	100	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
100	90	110	145	130.5	139.6	105	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
105	95	115	150	135.5	144.6	110	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
110	100	120	155	140.5	149.6	115	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
115	105	125	160	145.5	154.6	120	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
120	110	130	165	150.5	159.6	125	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
125	115	135	170	155.5	164.6	130	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
130	120	140	175	160.5	169.6	135	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
135	125	145	180	165.5	174.6	140	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
140	130	150	185	170.5	179.6	145	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
145	135	155	190	175.5	184.6	150	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
150	140	160	195	180.5	189.6	155	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
155	145	165	200	185.5	194.6	160	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
160	150	170	205	190.5	199.6	165	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
165	155	175	210	195.5	204.6	170	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
170	160	180	215	200.5	209.6	175	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
175	165	185	220	205.5	214.6	180	95.3	75.3	70	50	18.8	31.8	2.5	6	M8
180	170	192	225	212.5	224.6	185	104.2	84.2	72	52	26.4	38.0	3.5	6	M8
185	175	197	230	217.5	229.6	190	104.2	84.2	72	52	26.4	38.0	3.5	6	M8
190	180	202	235	222.5	234.6	195	104.2	84.2	72	52	26.4	38.0	3.5	6	M8
195	185	207	240	227.5	239.6	200	104.2	84.2	72	52	26.4	38.0	3.5	6	M8
200	190	212	245	232.5	244.6	205	109.2	84.2	77	52	26.4	38.0	3.5	6	M10
205	195	217	255	237.5	249.6	210	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
210	200	222	260	242.5	254.6	215	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
220	210	232	270	252.5	264.6	225	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
230	220	242	280	262.5	274.6	235	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
240	230	252	290	272.5	284.6	245	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
250	240	262	300	282.5	294.6	255	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
260	250	272	310	295.5	307.6	265	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
270	260	282	320	305.5	317.6	275	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
280	270	292	330	315.5	327.6	285	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
290	280	302	340	325.5	337.6	295	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
300	290	312	350	335.5	347.6	305	109.2	84.2	77	52	26.4	38.0	3.5	8	M10
310	300	322	360	345.5	357.6	315	109.2	84.2	77	52	26.4	38.0	3.5	8	M10

# GSO-DN



## Features

- Seat rotating
- Stationary springs
- Double seal
- Balanced
- Standard version with V-grooves, U-grooves optional (independent of direction of rotation)
- Gas-lubricated

## Advantages

- Contact free operation
- Face-to-face
- Cartridge unit
- Does not open in the event of buffer pressure failure
- Self closing at pressure reversal
- No additional complex components to dissipate frictional heat

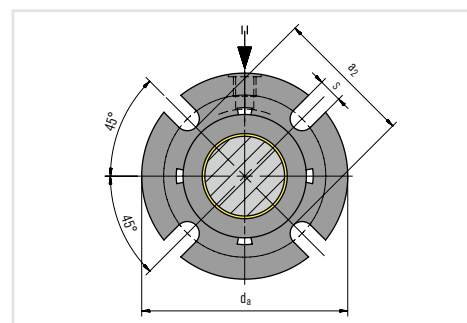
## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 30 \dots 75 \text{ mm}$  (1.125" ... 2,625")  
 (other dimensions on request)  
 Product pressure:  $p_1 = \text{max. } 22 \text{ bar}$  (319 PSI),  
 (dependent on shaft diameter and sliding materials)  
 Barrier pressure:  $p_3 = \text{max. } 25 \text{ bar}$  (362 PSI)  
 Differential pressure:  $\Delta p = \text{min. } 3 \text{ bar}$  (44 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +170 \text{ }^\circ\text{C}$  (-4 °F ... +338 °F)  
 (dependent on resistance of O-Rings)  
 Sliding velocity:  $v_g = 16 \text{ m/s}$  (52 ft/s),  
 with special design max. 25 m/s (82 ft/s)  
 Axial movement:  $\pm 0.2 \text{ mm}$

## Materials

Seal faces: Carbon graphite (A)  
 Seat: Silicon carbide (Q1, Q2)  
 Secondary seals: FKM (V), EPDM (E), FFKM (K)  
 Springs: Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Hastelloy® C-4 (M)

Item	Description
1, 2	Seal face
3, 4, 8, 10, 13	O-Ring
5, 6	Spring
7	Seat
9	Shaft sleeve
11	Flange
12	Gasket
14	Cover
15, 22, 25	Countersunk screw
16	Retaining ring
17	Pin
18	Ring
19	Set ring
20	Set screw
21	Pumping ring
23	V-Seal
24	Assembly fixture



Seal cover

## Recommended applications

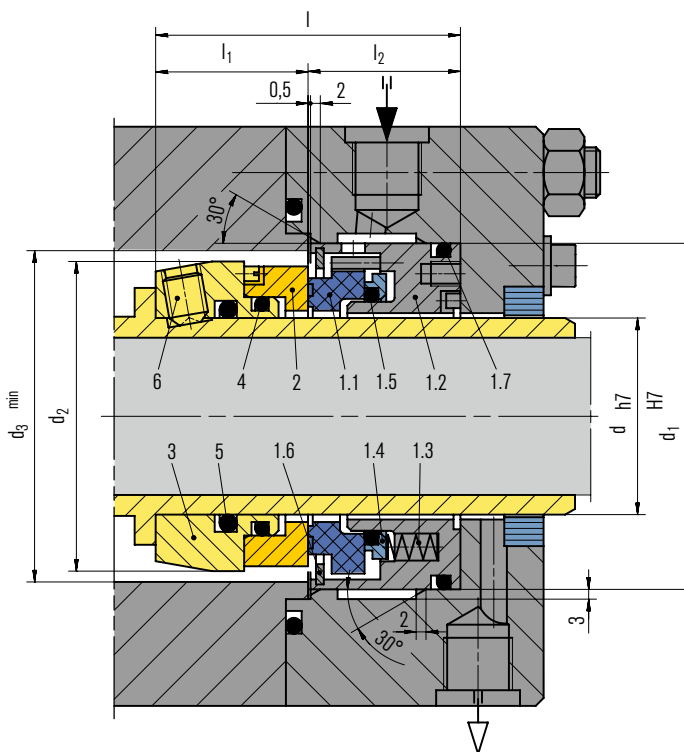
- Chemical industry
- Refining technology
- Gases and liquids
- Media which require high purity
- Environmental harmful media
- Blowers
- Fans
- Pumps

## Dimensions in mm

	$d_1$	$d_2$	$d_{3min.}$	$d_{3max.}$	$l_1$	$l_2$	$l_3$	$l_4$	$d_a$	$a_2$	$s$
GSO-DN/30-00-R	30	46	49	59	85	55	30	39	104	69.7	14
GSO-DN/33-00-R	33	49	53	65	85.5	55.5	30	39.5	122	72.7	14
GSO-DN/35-00-R	35	51	52	65	85.5	55.5	30	39.5	124	74.7	14
GSO-DN/43-00-R	43	63	64	78	90.5	57.5	33	41.5	138	84.7	16
GSO-DN/48-00-R	48	69	69	80	90.5	57.5	33	41.5	145	89.7	16
GSO-DN/50-00-R	50	70	72	82	90.5	57.5	33	41.5	147	91.7	16
GSO-DN/53-00-R	53	73	73	87	92.8	57.8	35	41.8	148	94.7	18
GSO-DN/60-00-R	60	85	87	102	97.5	60.5	37	44.5	157	104	18
GSO-DN/65-00-R	65	90	91	107	100.5	59.5	41	43.5	178	109	18

Other sizes on request.

# EM300



## Features

- Balanced
- Independent of direction of rotation
- Stationary multiple springs
- API 682 arrangement 2 containment seal

## Advantages

- Dry contact secondary seal
- Prevention of hazardous emissions
- Can be used as a secondary seal of tandem seal in liquid applications

## Operating range (see note on page 1)

Pressure:  $p = 2$  bar (29 PSI) normal operation, max. 60 bar (870 PSI)

Temperature:  $t = -20$  °C ...  $+200$  °C ( $-4$  °F ...  $+392$  °F)

Sliding velocity:  $v_g = 25$  m/s (82 ft/s)

## Materials

Seal face: Special carbon

Seat: Silicon carbide (Q1, Q2)

Secondary seals: FKM (V)

Metal parts: 1.4401 (G)

## Standards and approvals

- API 682/ISO 21049

## Recommended applications

- Chemical industry
- Refining technology

## Item

## Description

1.1	Seal face
1.2	Adapter
1.3	Spring
1.4	Thrust ring
1.5, 1.7, 4, 5	O-Ring
1.6	Retaining ring
2	Seat
3	Drive collar
6	Set screw

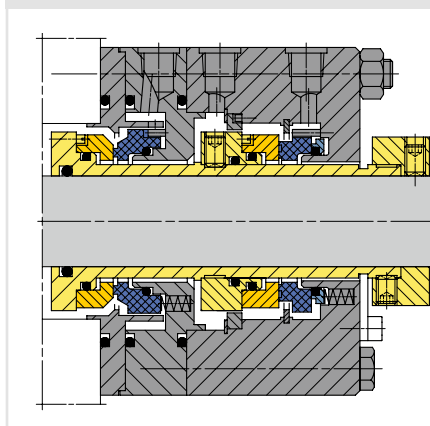
## Dimensions in mm

d <sub>max.</sub>	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	l	l <sub>1</sub>	l <sub>2</sub>
20	50	40	46	56	27	29
25	54	46	52	56	27	29
30	60	51	57	56	27	29
35	64	56	62	56	27	29
40	72	63	69	62	31	31
45	76	68	74	62	31	31
50	85	76	82	66	33	33
55	90	82	88	66	33	33
60	100	90	96	66	33	33
65	105	93	99	66	33	33
70	110	99	105	66	33	33
75	115	104	110	66	33	33
80	120	111	117	68	35	33
85	127	117	123	68	35	33
90	132	120	126	68	35	33
95	140	129	135	68	35	33
100	145	132	138	68	35	33

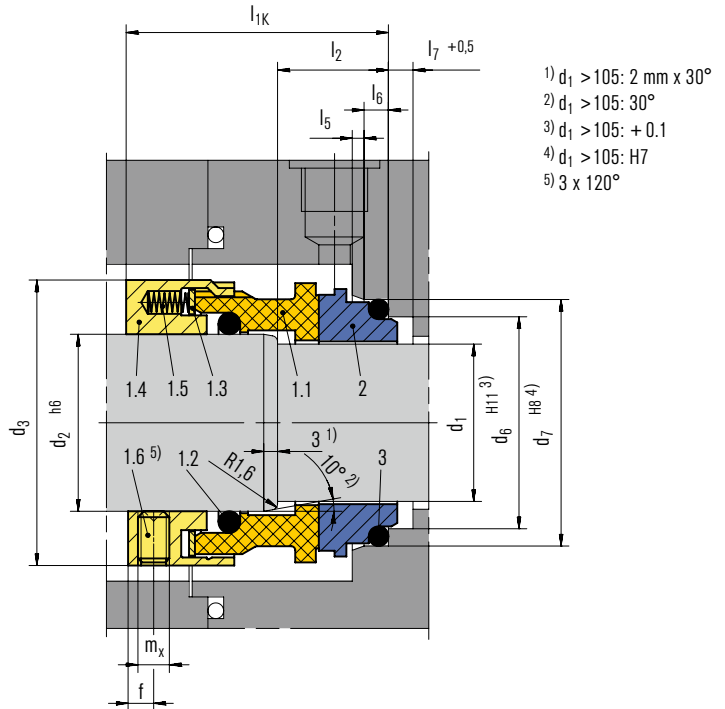
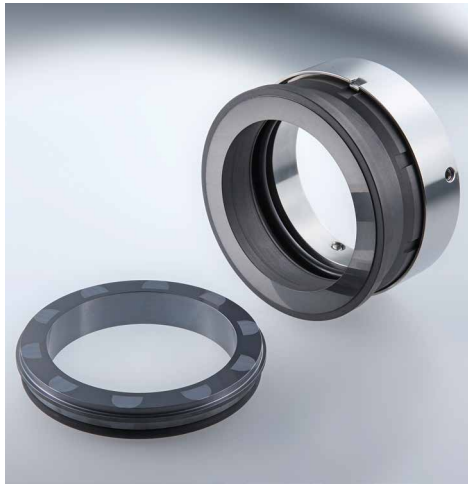
## Product variant

### Configuration example

in acc. with API 682 (1CW-FL)



# CGSH-K



- 1)  $d_1 > 105$ : 2 mm x 30°
- 2)  $d_1 > 105$ : 30°
- 3)  $d_1 > 105$ : + 0.1
- 4)  $d_1 > 105$ : H7
- 5) 3 x 120°

## Features

- For stepped shafts
- Rotating spring
- Single or double seal available
- Balanced
- Standard version with U-grooves, V-grooves optional (dependent of direction of rotation)
- Gas-lubricated
- Does not open in the event of buffer pressure failure, self closing at pressure reversal

## Advantages

- Contact-free operation, no friction
- No differential pressure required with hard/soft material combination
- Applicable as containment seal acc. to API 682

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 28 \dots 125 \text{ mm}$  (1.10" ... 4.92")  
 Pressure:  $p_1 = 25 \text{ bar}$  (363 PSI)  
 Temperature:  $t^* = -20 \text{ °C} \dots +170 \text{ °C}$  (-4 °F ... +338 °F)  
 Sliding velocity:  $v_g = 4 \dots 25 \text{ m/s}$  (13 ... 82 ft/s)

\* Depending on resistance of O-Rings

## Materials

Seal face: Carbon graphite antimony impregnated (A), Silicon carbide (Q2),  
 alternatively: Carbon graphite resin impregnated (B), Silicon carbide (Q1)  
 Seat: Silicon carbide (Q1, Q2),  
 Silicon carbide (Q19, Q29) with seal face in Q1 resp. Q2  
 Metal parts: CrNiMo steel (G)

## Standards and approvals

- EN 12756
- API 682/ISO 21049

## Recommended applications

- Chemical industry
- Refining technology
- Gases and liquids (single seals only gas)
- Gases and liquids which must not get into the atmosphere (dual seal)
- Gases not harmful to the environment (single seal)
- Fans
- Small steam turbines
- Blowers
- Roots compressors
- Pumps

Item	Part no. to DIN 24250	Description
1.1	472	Seal face
1.2	412.1	O-Ring
1.3	474	Thrust ring
1.4	485	Drive collar
1.5	477	Spring
1.6	904	Set screw
2	475.1	Seat
3	412.3	O-Ring



## Product variants

### CGSH-KD

Double seal back-to-back, buffered with gas, according to API 682 configuration 3NC-BB, Plan 74.

Items, descriptions and unspecified dimensions as for CGSH-K.

Pressure:  $p_1 = \dots 22 \text{ bar (319 PSI)}$ ,

$p_3 = \dots 25 \text{ bar (363 PSI)}$

(over the whole nominal diameter range, higher values on request).

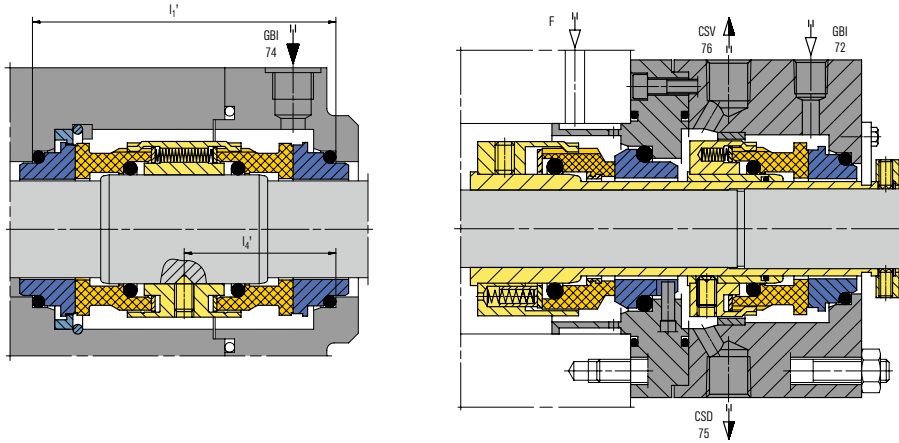
Differential pressure  $\Delta p = \text{min. } 3 \text{ bar (44 PSI)}$

Other operating limits as CGSH-K.

### Tandem arrangement acc. to API 682 3rd Edition

Configuration: 2CW-CS, Plan 72, 75, 76.

For media with a gaseous leakage. H75VN on the product side. In case of a failure, the CGSH on the atmosphere side, works as a liquid seal.



## Dimensions in mm

$d_1$	$d_2$	$d_3$	$d_6$	$d_7$	$l_{1k}$	$l_1'$	$l_2$	$l_4'$	$l_5$	$l_6$	$l_7$	$f$	$mx$
28*	33	53	37.0	43.0	50.0	89	20	44.5	2.0	5	9	5	M6
30*	35	55	39.0	45.0	50.0	89	20	44.5	2.0	5	9	5	M6
32*	38	60	42.0	48.0	50.0	89	20	44.5	2.0	5	9	5	M6
33*	38	60	42.0	48.0	50.0	89	20	44.5	2.0	5	9	5	M6
35*	40	62	44.0	50.0	50.0	89	20	44.5	2.0	5	9	5	M6
38*	43	65	49.0	56.0	52.5	95	23	47.5	2.0	6	9	5	M6
40*	45	67	51.0	58.0	52.5	95	23	47.5	2.0	6	9	5	M6
43*	48	70	54.0	61.0	52.5	95	23	47.5	2.0	6	9	5	M6
45*	50	72	56.0	63.0	52.5	95	23	47.5	2.0	6	9	5	M6
48*	53	75	59.0	66.0	52.5	95	23	47.5	2.0	6	9	5	M6
50*	55	77	62.0	70.0	57.5	104	25	52.0	2.5	6	9	5	M6
53*	58	84	65.0	73.0	57.5	104	25	52.0	2.5	6	9	5	M6
55*	60	86	67.0	75.0	57.5	106	25	53.0	2.5	6	9	5	M6
58*	63	89	70.0	78.0	62.5	112	25	56.0	2.5	6	9	7	M8
60*	65	91	72.0	80.0	62.5	112	25	56.0	2.5	6	9	7	M8
63*	68	94	75.0	83.0	62.5	112	25	56.0	2.5	6	9	7	M8
65*	70	97	77.0	85.0	62.5	112	25	56.0	2.5	6	9	7	M8
70*	75	104	83.0	92.0	70.0	126	28	63.0	2.5	7	9	7	M8
75*	80	109	88.0	97.0	70.0	126	28	63.0	2.5	7	9	7	M8
80*	85	114	95.0	105.0	70.0	126	28	63.0	3.0	7	9	7	M8
85*	90	119	100.0	110.0	75.0	126	28	63.0	3.0	7	9	7	M8
90*	95	124	105.0	115.0	75.0	126	28	63.0	3.0	7	9	7	M8
95*	100	129	110.0	120.0	75.0	126	28	63.0	3.0	7	9	7	M8
100*	105	132	115.0	125.0	75.0	126	28	63.0	3.0	7	9	7	M8
105*	115	153	122.2	134.3	73.0	136	32	68.0	2.0	10	-	7	M8
110*	120	158	128.2	140.3	73.0	136	32	68.0	2.0	10	-	7	M8
115*	125	163	136.2	148.3	73.0	136	32	68.0	2.0	10	-	7	M8
120*	130	168	138.2	150.3	73.0	136	32	68.0	2.0	10	-	7	M8
125*	135	173	142.2	154.3	73.0	136	32	68.0	2.0	10	-	7	M8

\* EN 12756

# HRGS-D



## Features

- Double seal
- Balanced
- Standard version with U-grooves (bi-directional)
- Gas-lubricated

## Advantages

- Contact-free operation
- Suitable for solids containing media
- Internally pressurized
- Cartridge unit
- Does not open in the event of buffer pressure failure, self closing at pressure reversal
- HR principle with rotating seat
- No friction on the seal faces, no heat generated at the seal or in the medium

## Operating range (see note on page 1)

Shaft diameter:  $d_w = 20 \dots 200 \text{ mm}$  (0.787" ... 7.874")  
 Pressure HRGS-DC:  $p_1 = \dots 22 \text{ bar}$  (319 PSI),  
 $p_3 = \dots 25 \text{ bar}$  (362 PSI)  
 Pressure HRGS-DD:  $p_1 = \dots 40 \text{ bar}$  (580 PSI)  
 $p_3 = \dots 43 \text{ bar}$  (624 PSI)  
 Operating temperature limits for:  
 EPDM  $-20 \text{ }^\circ\text{C} \dots +140 \text{ }^\circ\text{C}$  ( $-4 \text{ }^\circ\text{F} \dots +284 \text{ }^\circ\text{F}$ )  
 FFKM  $-20 \text{ }^\circ\text{C} \dots +120 \text{ }^\circ\text{C}$  ( $-4 \text{ }^\circ\text{F} \dots +248 \text{ }^\circ\text{F}$ )  
 FKM  $-20 \text{ }^\circ\text{C} \dots +170 \text{ }^\circ\text{C}$  ( $-4 \text{ }^\circ\text{F} \dots +338 \text{ }^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 4 \dots 25 \text{ m/s}$  (13 ... 82 ft/s)  
 Differential pressure  $\Delta p = \text{min. } 3 \text{ bar}$  (44 PSI),  
 max. 16 bar (232 PSI) (internal pressure)

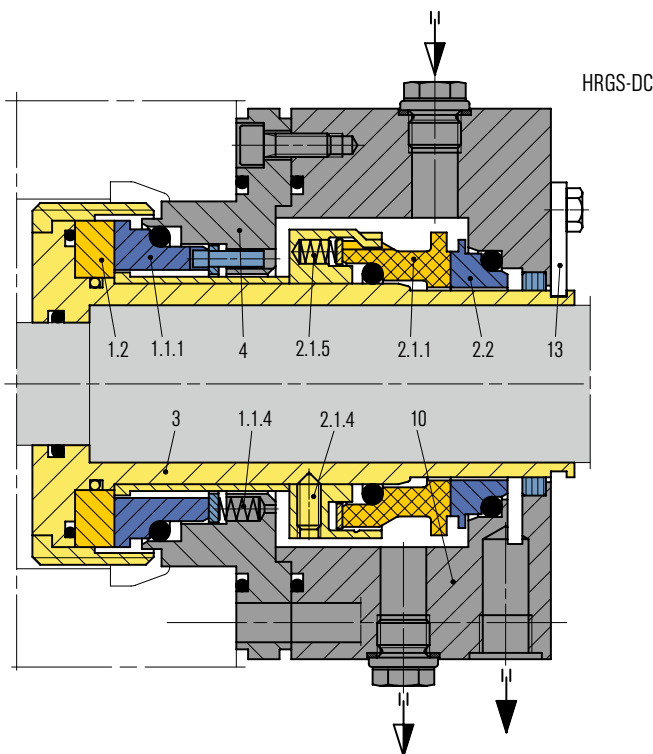
## Materials

Product side (HRGS-DC, HRGS-DD):  
 Seal face: Silicon carbide (Q19, Q29)  
 Seat: Silicon carbide (Q1, Q2)

Atmosphere side HRGS-DC:  
 Seal face: Carbon graphite antimony impregnated (A),  
 Carbon graphite resin impregnated (B)  
 Seat: Silicon carbide (Q1, Q2)

Atmosphere side HRGS-DD:  
 Seal face: Silicon carbide (Q19, Q29)  
 Seat: Silicon carbide (Q1, Q2)

Springs: CrNiMo steel (G), Hastelloy® C-4 (M)  
 Metal parts: CrNiMo steel (G), Hastelloy® C-4 (M)



## Recommended applications

- Chemical industry
- Refining technology
- Gases and liquids
- Media which require high purity
- Environmental harmful media
- Pumps

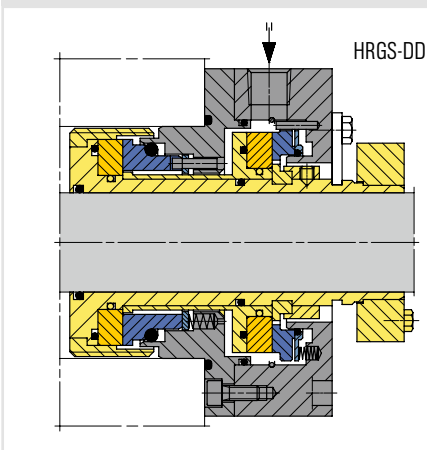
## Product variants

### HRGS-DC

Gas-buffered double seal. The HRGS-DC is designed for applications involving fitting dimensions in line with DIN 24960 C or ANSI Big Bore standard, but can also be used even when the fitting dimensions are not of standardized nature if large, open spaces are available for installation. The CGSH is used as outboard seal up to nominal width 125.

### HRGS-DD

Acc. to API 682 configuration 3NC-FB, Plan 74. The HRGS-DD corresponds to the HRGS-DC in terms of design principal and materials. It is designed for applications involving large shaft diameters of up to 200 mm (7.87") or fairly high pressure levels of up to 40 bar (580 PSI). The outboard seal used in such cases is the DGS.

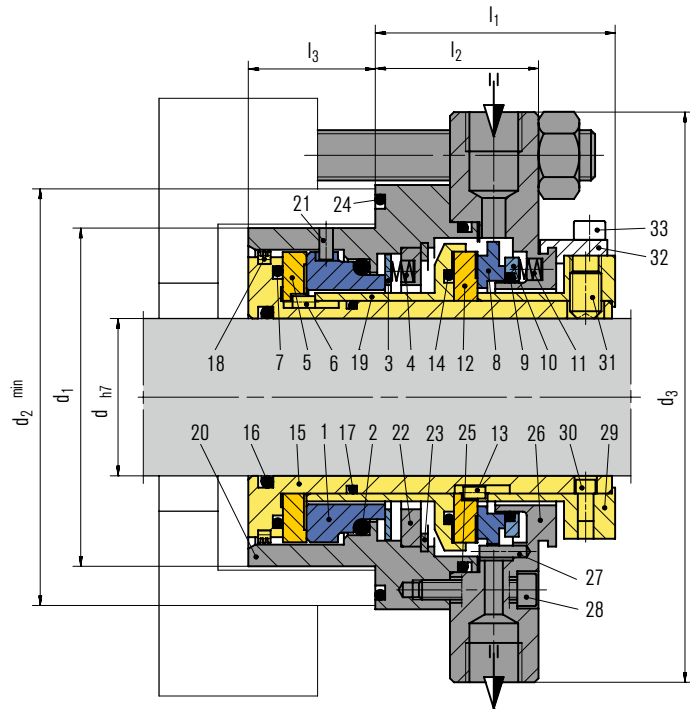


Item	Part no. to DIN 24250	Description
1.1.1	472.1	Seal face
1.1.4	477	Spring
1.2	475.1	Seat
2.1.1	472.2	Seal face
2.1.4	485	Drive collar
2.1.5	477	Spring
2.2	475.2	Seat
3	523	Shaft sleeve
4	513	Insert
10	441	Housing
13		Assembly fixture

## Dimensions

Dimensions on request

# NF992



### Features

- Cartridge
- Balanced
- Bi-directional
- Gas-lubricated, gas-buffered

### Operating range (see note on page 1)

Pressure:  $p = \text{vacuum} \dots 16 \text{ bar} (\dots 232 \text{ PSI})$   
 Temperature:  $t = -20 \text{ °C} \dots +160 \text{ °C} (-66 \text{ °F} \dots +320 \text{ °F})$   
 Sliding velocity:  $20 \text{ m/s} (66 \text{ ft/s})$   
 Viscosity:  $\dots 300 \text{ mPa}\cdot\text{s}$   
 Solids content:  $\dots 20 \%$

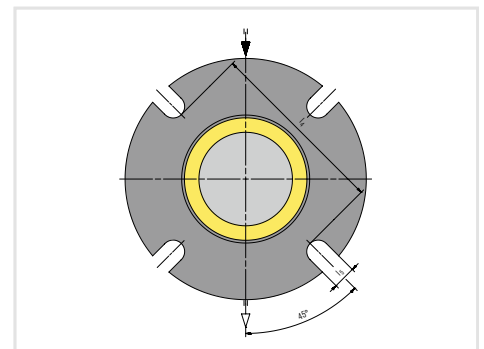
### Materials

Seal face: Silicon carbide (Q1), High density carbon graphite  
 Seat: Silicon carbide (Q1)  
 Secondary seals: FKM (V)  
 Metal parts: 1.4401 (G)

### Recommended applications

- Chemical industry
- Refining technology
- Hazardous media
- Monomers
- Monomere pumps

Item	Description
1,8	Seal face
2, 7, 9, 14, 16, 17, 24, 25	O-Ring
3, 10	Thrust ring
4, 11	Spring
5, 12	Seat
6, 13, 21, 27, 30	Pin
15	Shaft sleeve
18	Labyrinth
19	Adapterhülse
20, 26	Housing
22	Adapter
23	Retaining ring
28, 33	HSH Cap screw
29	Clamping sleeve
31	Set screw
32	Assembly fixture

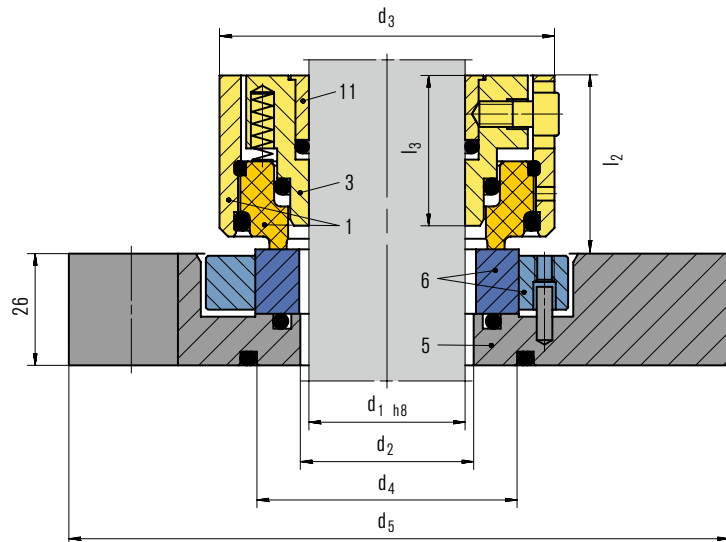


Seal cover

### Dimensions in mm

d	d <sub>1</sub>	d <sub>2min</sub>	d <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>
25	62	76	118	49	31.5	38	76	12
30	67	81	118	49	31.5	38	81	12
35	72	86	128	52	32.5	41	86	14
40	77	91	138	52	32.5	41	91	14
45	82	96	138	52	32.5	41	96	14
50	90	107	164	54	34.5	43	107	18
55	95	112	164	54	34.5	43	112	18
60	100	117	178	54	34.5	43	117	18
65	105	122	193	54	34.5	43	122	18
70	110	127	193	54	34.5	43	127	18
75	118	132	208	56	34.5	43	132	20
80	123	137	208	56	34.5	43	137	20
85	128	142	218	56	34.5	43	142	20
90	133	147	218	56	34.5	43	147	20
95	138	152	228	56	34.5	43	152	20
100	145	157	228	56	34.5	43	157	20

# SeccoMix 1



## Features

- For top entry drives, on request side drive possible
- Dry-running
- Single seal
- Balanced
- Outboard mounted
- Multiple springs rotating
- Independent of direction of rotation

## Advantages

- Available as semi-cartridge with or without basic flange
- Suitable for pressure reversal/vacuum operation
- Friction-locked connection to the shaft
- ATEX certification available on request
- Inherently safe, even without temperature monitoring

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 25 \dots 220 \text{ mm}$  (0.98" ... 8.66")  
 Pressure:  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI)  
 Temperature:  $t_1 = -20 \text{ }^\circ\text{C} \dots +150 \text{ (250}^*\text{)} \text{ }^\circ\text{C}$   
 (-4  $^\circ\text{F} \dots +302 \text{ (482}^*\text{)} \text{ }^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 0 \dots 2 \text{ m/s}$  (0 ... 6 ft/s)  
 Axial movement:  $\pm 1.5 \text{ mm}$   
 Radial movement:  $\pm 1.5 \text{ mm}$

For applications beyond this range, please inquire.

\* with cooling flange

## Item Description

1	Seal face with seal face housing
3	Drive collar
5	Flange
6	Seat with seat housing
11	Clamping ring

## Options

- Without flange
  - Cooling resp. heating flange
  - Wear trap with flush
  - Wear trap with flush and cooling / heating flange
- See page 101.

## Materials

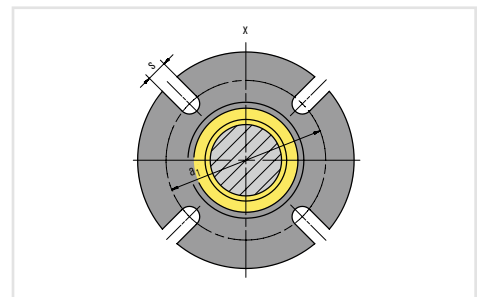
Seal face: Carbon graphite, FDA conform  
 Seat: Silicon carbide, FDA conform  
 Secondary seals and metal parts according to application and customer's specifications.

## Standards and approvals

- FDA
- ATEX

## Recommended applications

- Chemical industry
- Petrochemical industry
- Pharmaceutical industry
- Food and beverage industry
- Non-toxic media
- Agitators
- Mixers
- Reactors

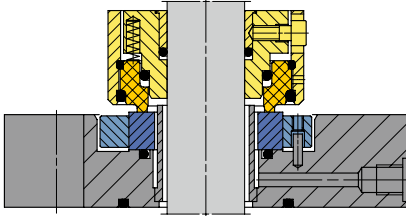


Seal flange

## Product variants

### SeccoMix1-11

The SeccoMix1-11 is equipped in addition with a sleeve for trapping any abraded particles from the seal face. Contamination of the medium in the container is thus ruled out. The sleeve can be cleaned through a flushing bore. Please note: diameters ( $d_2$  to  $d_5$ ) increase to the next possible design size.



## Dimensions in mm

$d_1$ (mm)	$d_1$ (inch)	$d_2$	$d_3$	$d_4$	$d_5$	$l_2$	$l_3$	$a_1$ (min.)	$a_1$ (max.)	s
25	1.000	34	68	-	148	41.5	35	100	132	11
28	1.125	34	68	55	148	41.5	35	100	132	11
30	-	34	68	55	148	41.5	35	100	132	11
32	1.250	39	73	60	153	41.5	35	105	137	11
35	1.375	39	73	60	153	41.5	35	105	137	11
38	1.500	44	78	65	158	41.5	35	110	142	11
40	-	44	78	65	158	41.5	35	110	142	11
45	1.625	49	83	68	163	41.5	35	115	152	11
-	1.750	49	83	68	163	41.5	35	115	152	11
48	1.875	54	88	73	178	41.5	35	125	160	14
50	-	54	88	73	178	41.5	35	125	160	14
55	2.000	59	93	78	183	41.5	35	130	165	14
-	2.125	59	93	78	183	41.5	35	130	165	14
60	2.250	64	98	85	188	41.5	35	135	170	14
65	2.375	69	103	90	193	44.5	35	140	175	14
-	2.500	69	103	90	193	44.5	35	140	175	14
70	2.625	74	108	95	198	44.5	38	145	180	14
-	2.750	74	108	95	198	44.5	38	145	180	14
75	2.875	79	113	100	203	44.5	38	150	185	14
80	3.000	84	118	105	208	44.5	38	155	190	14
85	3.250	89	123	110	213	44.5	38	160	195	14
90	3.500	94	128	115	218	44.5	38	165	200	14
95	3.750	99	133	120	223	44.5	38	170	205	14
100	-	104	138	125	228	44.5	38	175	210	14
105	4.000	109	143	130	233	44.5	38	180	215	14
110	4.250	114	148	135	238	44.5	38	185	220	14
115	4.500	119	153	140	267	44.5	38	196	243	18
125	4.750	129	163	150	277	44.5	38	206	253	18
140	5.000	144	178	165	297	44.5	38	221	273	18
-	5.250	144	178	165	297	44.5	38	221	273	18
-	5.500	144	178	165	297	44.5	38	221	273	18
150	5.750	154	188	175	307	44.5	38	231	283	18
160	6.000	164	198	185	317	44.5	38	241	293	18
-	6.250	164	198	185	317	44.5	38	241	293	18

# SeccoMix 481



### Features

- For top entry drives
- For steel vessels acc. to DIN resp. Non-DIN
- Nitrogen pressurized dual seal, single seal optional
- Balanced
- Independent of direction of rotation
- Multiple springs rotating
- Dry running
- Cartridge unit

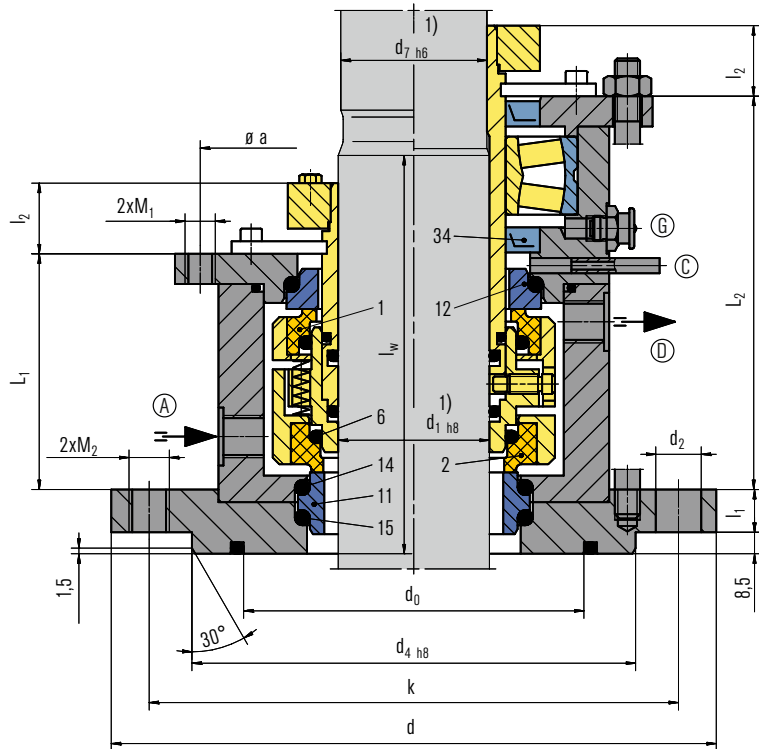
### Advantages

- Ready-to-fit and factory-tested unit
- With or without bearing available
- Suitable for pressure reversal e.g. in case of barrier pressure failure
- No contamination of the product by barrier fluid
- Friction-locked connection to the shaft
- Connections to DIN 28138 standards or as required (SeccoMix 451)
- ATEX certification available on request

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 40 \dots 200 \text{ mm}$  (1.57" ... 7.87")  
 Pressure:  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI)  
 Temperature:  $t_1 = -20 \text{ }^\circ\text{C} \dots +150 \text{ (250*) }^\circ\text{C}$   
 (-4 °F ... +302 (482\*) °F)  
 Sliding velocity:  $v_g = 0 \dots 2 \text{ m/s}$  (0 ... 6 ft/s)

For applications beyond this range, please inquire.  
 \* with cooling flange



### Item Description

1	Seal face, atmosphere side
2	Seal face, product side
6, 14, 15	O-Ring
11	Seat, product side
12	Seat, atmosphere side
34	Lip seal

### Materials

Seal face: Carbon graphite, FDA conform  
 Seat: Silicon carbide, FDA conform  
 Secondary seals and metal parts according to application and customer's specifications.

### Standards and approvals

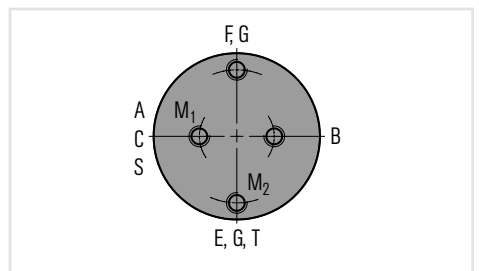
- FDA
- ATEX
- DIN 28138 (mechanical seals for agitator shafts)
- DIN 28136 T2 (steel vessels)
- DIN 28141 (flange connection for steel vessels)
- DIN 28154 (shaft end for steel vessels)

### Recommended applications

- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Agitators
- Mixers
- Reactors

### Recommended seal supply

Gas supply EagleBurgmann GSS4015/A400-D0 for dual seals SeccoMix 481...D.



Supply connections

Designation and position acc. to DIN 28138 T3.

- A Barrier gas IN
- B Barrier gas OUT
- C Drainage
- E Cooling IN
- F Cooling OUT
- G Grease
- S Flush
- T Temperature metering

For reasons of standardization, the supply connections of single seals are matched to those of the double seals.

## Product variants

### SeccoMix 481

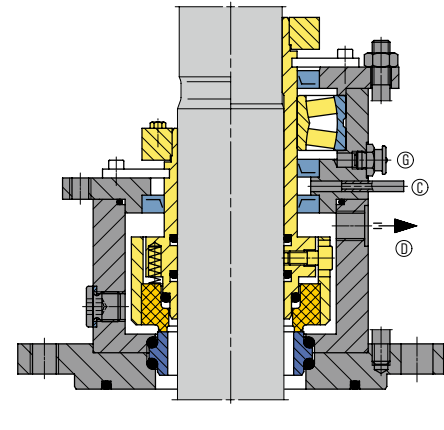
Single seal.

### SeccoMix 481L

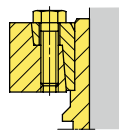
Single seal with integrated floating bearing.

### SeccoMix 451

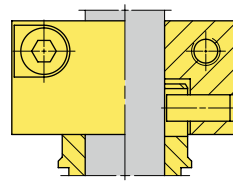
All types of the SeccoMix 481 range are also available for unstepped shafts. Seal identification: SeccoMix 451... Customized design or e.g. different torque transmissions are available.



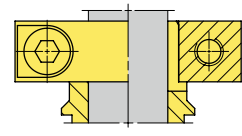
## Torque transmissions



Shrink disk

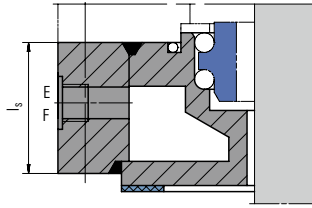


Clamping ring with pin



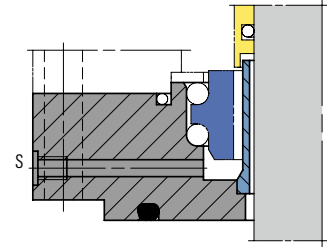
Clamping ring

## Options

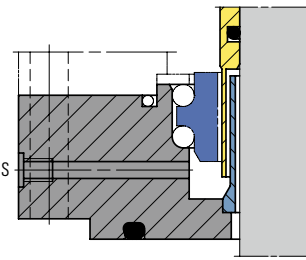


### Cooling flange

Can be used alternatively as a heating flange.

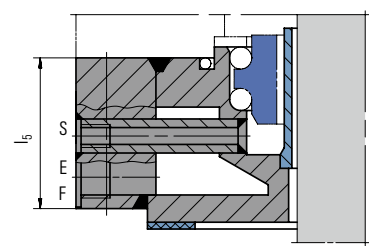


### Wear trap with flush.



### Polymerization barrier

Can be used alternatively as wear trap with flush.



### Wear trap

with flush and cooling / heating flange.

## Dimensions in mm

$d_1^{1)}$	$d_7^{1)}$	$d$	$n \times d_2$	$d_4$	$d_0$	$k$	$L_1$	$L_2$	$L_w^{2)}$	$l_1$	$l_2$	$a$	$M_1$	$M_2$	A, B
40	38	175	4x18	110	90	145	87	136	143	15	28	122	M12	M16	G3/8
50	48	240	8x18	176	135	210	89	149	148	17	28	157	M12	M16	G3/8
60	58	240	8x18	176	135	210	93.5	156	158	17	28	168	M12	M16	G3/8
80	78	275	8x22	204	155	240	104.5	189	168	20	34	203	M16	M20	G1/2
100	98	305	8x22	234	190	270	109	190	178	20	34	228	M16	M20	G1/2
125	120	330	8x22	260	215	295	110	205	203	20	40	268	M20	M20	G1/2
140	135	395	12x22	313	250	350	124	222	208	20	40	285	M20	M20	G1/2
160	150	395	12x22	313	265	350	127.5	219.5	213	25	40	297	M20	M20	G1/2
180	170	445	12x22	364	310	400	132.5	230	233	25	45	332	M24	M20	G1/2
200	190	445	12x22	364	310	400	137.5	237.5	243	25	45	352	M24	M20	G1/2
220	210	505	16x22	422	340	460	149.5	249.5	263	25	50	381	M24	M20	G1/2

<sup>1)</sup> Shaft diameters  $d_1$  and  $d_7$  to DIN 28154

<sup>2)</sup> Shaft step to DIN 28154

# SeccoMix 461



## Features

- For top entry drives
- For glass-lined vessels acc. to DIN resp. Non-DIN
- Dry running
- Nitrogen pressurized dual seal
- Balanced
- Multiple springs rotating
- Independent of direction of rotation

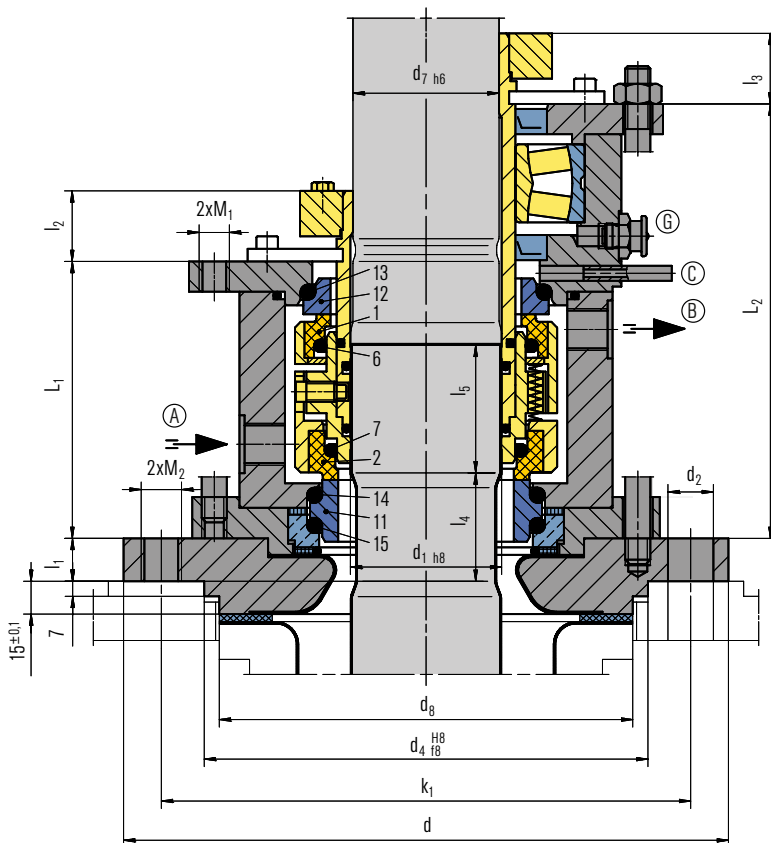
## Advantages

- Ready-to-fit and factory-tested unit
- With or without bearing available
- Suitable for pressure reversal e.g. in case of barrier pressure failure
- No contamination of the product by barrier fluid
- Friction-locked connection to the shaft
- Connections to DIN 28138 standards or as required (SeccoMix 491)
- ATEX certification available on request
- The seal can be lifted off the glass-lined flange as a complete cartridge. The sensitive glass-lined basic flange remains mounted on the vessel.

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 40 \dots 200 \text{ mm}$  (1,57" ... 7,87")  
 Pressure:  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI)  
 Temperature:  $t_1 = -20 \text{ }^\circ\text{C} \dots +150$  (250\*)  $^\circ\text{C}$   
 (-4  $^\circ\text{F} \dots +302$  (482\*)  $^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 0 \dots 2 \text{ m/s}$  (0 ... 6 ft/s)

For applications beyond this range, please inquire.  
 \* with cooling flange



## Item Description

1	Seal face, atmosphere side
2	Seal face, product side
6, 7, 13, 14, 15	O-Ring
11	Seat, product side
12	Seat, atmosphere side

## Materials

Seal face: Carbon graphite, FDA conform  
 Seat: Silicon carbide, FDA conform  
 Secondary seals and metal parts according to application and customer's specifications.

## Standards and approvals

- FDA
- ATEX
- DIN 28138 (mechanical seals for agitator shafts)
- DIN 28136 T3 (for glass-lined vessels)
- DIN 28137 T2 (flange connection for glass-lined vessels)
- DIN 28159 (shaft end for glass-lined vessels)

## Options

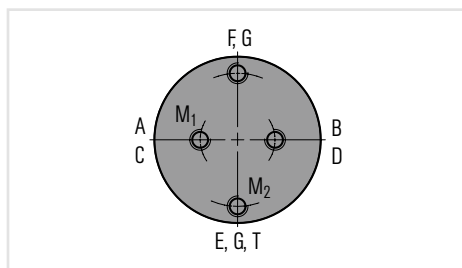
- Cooling or heating flange
- See page 101.

## Recommended applications

- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Agitators
- Mixers
- Reactors

## Recommended seal supply

EagleBurgmann GSS4015/A400-D0 for double seals  
 SeccoMix 461...D..



Supply connections

Designation and positions acc. to DIN 28138 T3.

- A Barrier gas IN
- B Barrier gas OUT
- C Drainage
- E Cooling IN
- F Cooling OUT
- G Grease
- S Flush
- T Temperature metering



## Product variants

### SeccoMix 461-D

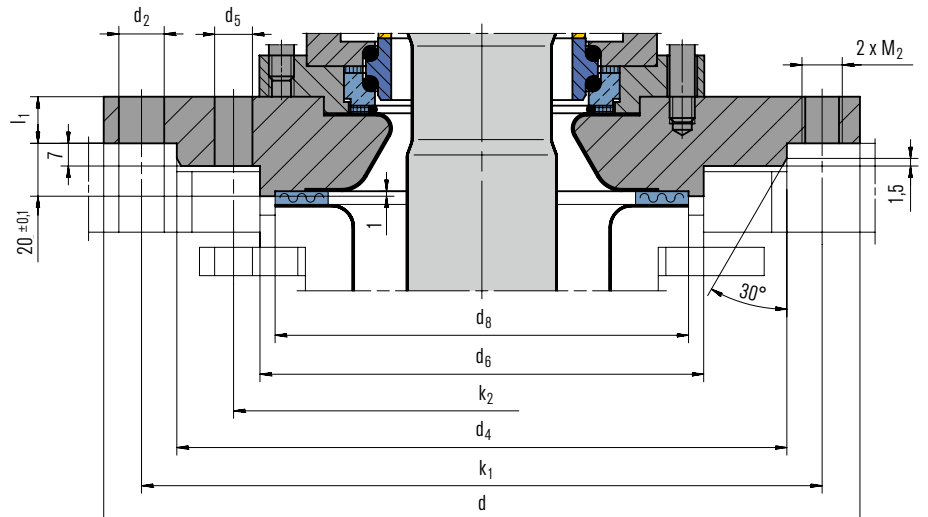
Dual seal

### SeccoMix 461L-D

Dual seal with integrated floating bearing.

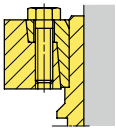
### SeccoMix 491

Seal design for adaptations beyond DIN (e.g. unstepped shaft).

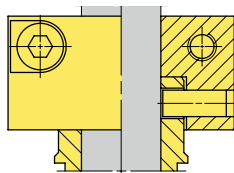


Flange connections acc. to DIN 28137 T2  
for nominal diameters 125 ... 161.

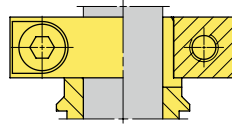
## Torque transmissions



Shrink disk



Clamping ring with pin



Clamping ring

## Dimensions in mm

d <sub>1</sub> <sup>1)</sup>	d <sub>7</sub> <sup>1)</sup>	Nominal size	Flange size <sup>2)</sup>	d	nxd <sup>2)</sup>	d <sub>4</sub>	nxd <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	k <sub>1</sub>	k <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	M <sub>1</sub>	M <sub>2</sub>	A, B
40	38	40	E125	175	4x18	110	-	-	102	145	-	142	184	25	35	28	50	50	M12	M16	G3/8
50	48	50	E200	240	8x18	176	-	-	138	210	-	147	195	25	40	28	50	50	M12	M16	G3/8
60	58	60	E250	275	8x22	204	-	-	188	240	-	158	203	25	42	28	50	60	M12	M20	G3/8
80	78	80	E300	305	8x22	234	-	-	212	270	-	170	240	30	45	34	60	60	M16	M20	G1/2
100	98	100	E400	395	12x22	313	-	-	268	350	-	177	240	30	52	34	60	60	M16	M20	G1/2
100	98	100	E500	395	12x22	313	-	-	268	350	-	177	240	30	52	34	60	60	M16	M20	G1/2
125	120	125	E700	505	4x22	422	12x22	320	306	460	350	208	266	30	75	40	60	80	M20	M20	G1/2
140	135	140	E700	505	4x22	422	12x22	320	306	460	350	223	282	30	79	40	60	80	M20	M20	G1/2
160	150	160	E700	505	4x22	422	12x22	320	306	460	350	228	282	30	77	40	60	85	M20	M20	G1/2
160	150	160	E900	505	4x22	422	12x22	320	306	460	350	228	282	30	77	40	60	85	M20	M20	G1/2
160	150	161	E901	565	4x26	474	12x22	370	356	515	400	228	282	30	77	40	60	85	M20	M20	G1/2

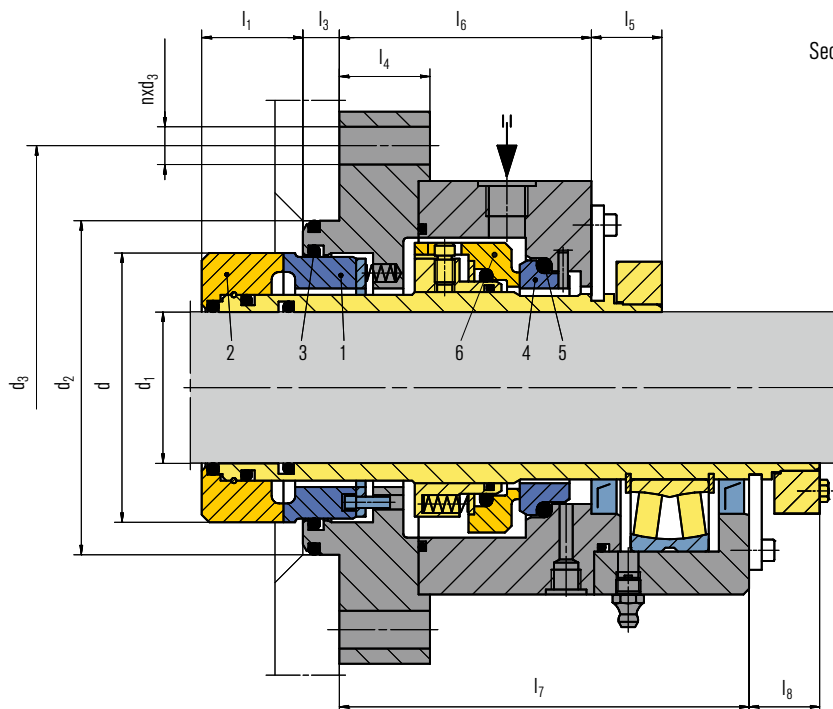
<sup>1)</sup> Shaft diameters d<sub>1</sub> and d<sub>7</sub> to DIN 28154

<sup>2)</sup> Shaft step to DIN 28154

# SeccoMix R



SeccoMix R3



### Features

- For top, side and bottom entry drives
- Dry running
- Nitrogen pressurized dual seal
- Rotating seat at product side
- Balanced
- Independent of direction of rotation

### Advantages

- Ready-to-fit and factory-tested units
- With or without bearing available
- Smooth surface, free of dead spaces
- No contamination of the product by barrier fluid
- Friction-locked connection to the shaft
- ATEX certification available on request

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 45 \dots 220$  (300) mm  
(1,77" ... 8,66" (11.81"))

Pressure:  $p_1 = \text{vacuum} \dots 6$  bar (87 PSI)

Temperature:  $t_1 = -20 \text{ }^\circ\text{C} \dots +150 \text{ }^\circ\text{C}$  (-4 °F ... +302 °F)

Sliding velocity:  $v_g = 0 \dots 2$  m/s (0 ... 6 ft/s)

For applications beyond this range, please inquire.

### Item Description

- |   |                            |
|---|----------------------------|
| 1 | Seal face, product side    |
| 2 | Seat, product side         |
| 3 | O-Ring, dynamic            |
| 4 | Seat, atmosphere side      |
| 5 | O-Ring                     |
| 6 | Seal face, atmosphere side |

### Materials

Seal face: Carbon graphite, FDA conform

Seat: Silicon carbide, FDA conform

Secondary seals and metal parts according to application and customer's specifications.

### Standards and approvals

- FDA
- ATEX

### Options

- Axial bellows expansion joint (shaft movement)
- Scraper (shaft movement)

### Recommended applications

- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Agitators
- Mixers
- Kneaders
- Dryers
- Reactors

### Recommended seal supply

Gas supply EagleBurgmann GSS4015/A400-D0 for double seals SeccoMix R.

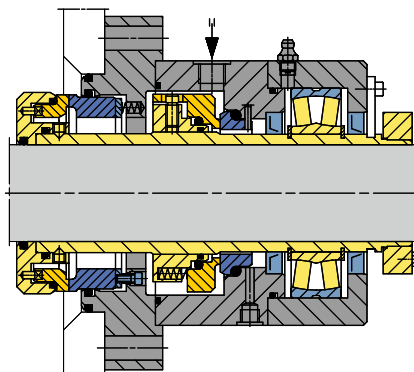
### Product variants

#### SeccoMix R3

Dual seal with solid seat and integrated floating bearing  $d_1 \leq 140$  mm (5,51"). As an option with fixed bearing or without bearing available.

#### SeccoMix R5

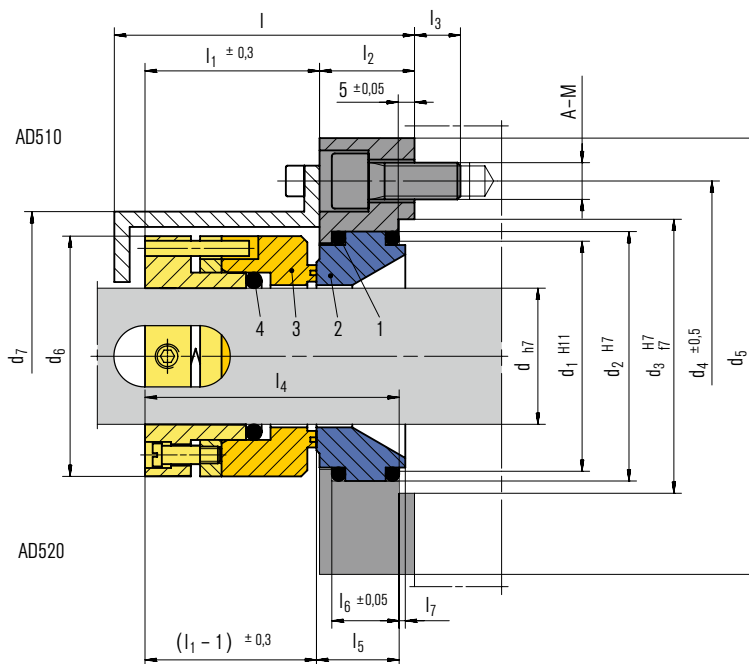
Dual seal with „hook-sleeve“ and integrated floating bearing  $d_1 > 140$  mm (5,51"). As an option with fixed bearing or without bearing available.



### Dimensions in mm

$d_1$	$d$	$l_1$	$d_2$	$l_3$	$d_3$	$n \times d_3$	$l_4$	$l_5$	$l_6$	$l_7$	$l_8$
45	82.7	43	119.5	13	166	8 x 13.5	43.0	26.0	103.0	149.5	26.0
50	90.0	43	119.5	13	190	8 x 17.5	40.5	28.5	110.0	165.0	28.5
60	100.0	43	134.5	14	200	8 x 17.5	41.0	28.0	118.0	173.0	28.0
80	130.0	46	160.5	15	248	8 x 17.5	48.0	34.0	133.0	212.0	34.0
100	150.0	49	181.5	12	264	8 x 22.0	54.0	33.5	145.0	219.0	33.5
120	172.0	49	209.5	12	293	8 x 22.0	52.0	40.0	148.0	232.0	40.0
140	195.0	49	224.5	12	338	12 x 22.0	52.0	39.5	160.5	251.5	39.5

# AD510 / AD520



### Features

- Dry running
- Single seal
- Independent of direction of rotation

### Advantages

- AD510 includes housing
- Options: Cooling jacket on the flange side of the boiler with carbon throttle and version with gas flushing and lip seal.

### Operating range (see note on page 1)

Vessel pressure: p = vacuum (7 mbara) ... 5 bar (73 PSI)

Vessel temperature: t = -30 °C ... +175 °C

(-22 °F ... +347 °F)

Sliding velocity:  $v_g = \text{max. } 1.0 \text{ m/s (3 ft/s)}$

Allowable gas consumption: 2 NI/h

### Item Description

- 1, 4 O-Ring
- 2 Seat
- 3 Seal face

### Materials

Seal face: PTFE, Carbon fiber and glass fiber reinforced

Seat: Silicon carbide (Q), Aluminium oxide (V)

### Recommended applications

- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Reactors
- Polymerization agitators
- Mixers

### Product variant

**AD520**

### Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	l	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	A-M
20	36	42	50	70	90	46	60	77	44	24	11	63	20	16	2	4-M8
25	41	47	55	75	95	51	65	77	44	24	11	63	20	16	2	4-M8
30	46	52	60	80	100	56	70	77	44	24	11	63	20	16	2	4-M8
35	51	57	65	85	105	61	75	77	44	24	11	63	20	16	2	4-M8
40	60	66	75	95	120	70	85	82	47	26	12	68	22	18	2	4-M10
45	65	71	80	100	125	75	90	82	47	26	12	68	22	18	2	4-M10
50	70	76	85	105	130	80	95	82	47	26	12	68	22	18	2	8-M10
55	75	81	90	110	135	85	100	82	47	26	12	68	22	18	2	8-M10
60	85	91	100	120	145	92	110	89	51	28	12	74	24	20	2	8-M10
65	90	96	105	125	150	97	115	89	51	28	12	74	24	20	2	8-M10
70	95	101	110	130	155	102	120	91	51	30	12	76	26	21	2	8-M10
75	104	110	120	140	165	109	130	91	51	30	12	76	26	21	2	8-M10
80	109	115	125	150	178	114	130	98	57	31	15	83	27	22	2	8-M12
85	114	120	130	155	183	120	140	98	57	31	15	83	27	22	2	8-M12
90	119	125	135	160	188	124	140	98	57	31	15	83	27	22	2	8-M12
95	124	130	140	165	193	130	150	98	57	31	15	83	27	22	2	8-M12
100	129	135	145	170	198	134	150	98	57	31	15	83	27	22	2	8-M12
105	134	140	150	175	203	140	160	98	57	31	15	83	27	22	2	8-M12
110	139	145	155	180	208	146	165	98	57	31	15	83	27	22	2	8-M12
120	150	160	170	200	236	160	180	110	63	37	20	95	33	27	3	8-M16
130	160	170	180	210	246	170	190	110	63	37	20	95	33	27	3	8-M16
140	175	185	195	225	260	180	200	110	63	37	20	95	33	27	3	8-M16
150	190	200	210	240	276	200	225	136	85	40	20	120	36	30	3	8-M16
160	200	210	220	250	286	210	230	136	85	40	20	120	36	30	3	8-M16
170	210	220	230	260	296	220	250	136	85	40	20	120	36	30	3	8-M16
180	220	230	240	270	306	230	250	136	85	40	20	120	36	30	3	8-M16

# AGSZ



## Features

- For top entry drives
- Double seal
- Balanced
- Independent of direction of rotation
- Gas-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested unit
- Central rotating seat
- Torque transmission by clamping ring for large axial movements
- Non-contacting operation
- No friction on the seal faces, no heat generated at the seal or in the medium
- ATEX certification on request

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 40 \dots 220 \text{ mm}$  (1.6" ... 8.7")  
 Pressure  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI),  
 $\Delta p \text{ min.} = 3 \text{ bar}$  (44 PSI),  $p_3 = 9 \text{ bar}$  (131 PSI)  
 Temperature:  $t_1 = 0 \text{ }^\circ\text{C} \dots +150 \text{ }^\circ\text{C}$  (+250\* $^\circ\text{C}$ )  
 (+32  $^\circ\text{F} \dots +302 \text{ }^\circ\text{F}$  (+482\* $^\circ\text{F}$ ))  
 Sliding velocity:  $v_g = 0 \dots 2 \text{ m/s}$  (0 ... 7 ft/s), higher velocities on request.

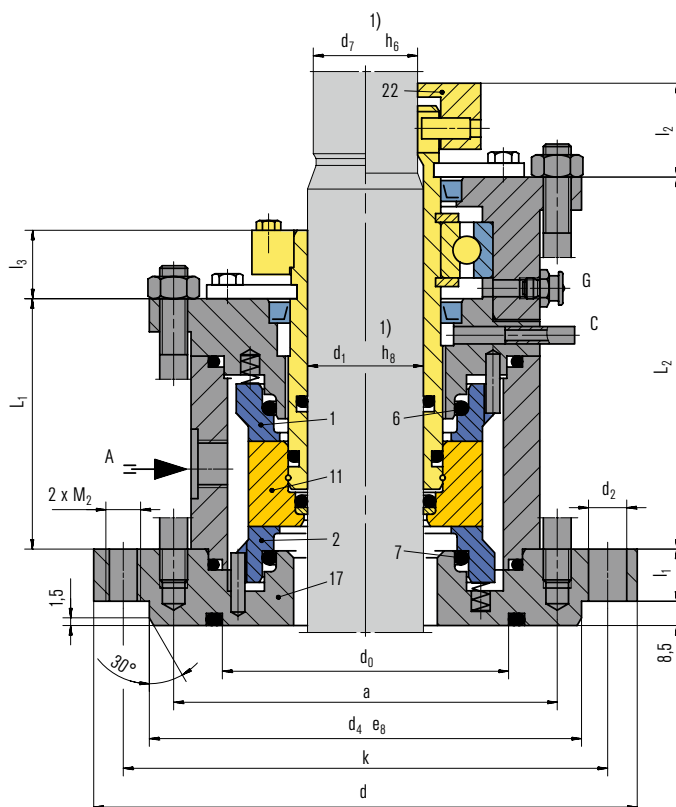
\* with cooling flange

## Materials

Seal faces and seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.

## Standards and approvals

- FDA
- ATEX
- DIN 28138 (mechanical seals for agitator shafts)
- DIN 28136 T2 (for steel vessels)
- DIN 28141 (flange connection for steel vessels)
- DIN 28154 (shaft end for steel vessels)
- DIN 28136 T3 (for glass-lined vessels)
- DIN 28137 T2 (flange connection for glass-lined vessels)
- DIN 28159 (shaft end for glass-lined vessels)



AGSZ481...

## Item Description

1	Seal face, atmosphere side
2	Seal face, product side
6, 7	O-Ring
11	Seat
17	Flange
22	Clamping ring

## Options

- Cooling resp. heating flange
- Flush

See page 113.

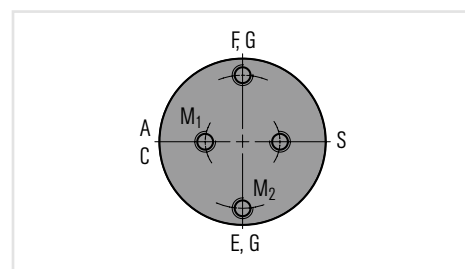
## Recommended seal supply

Gas supply by EagleBurgmann GSS4015/A400-D0, GSS4016/A250-D1 or GSS4016/A350-D1.

Note: To assure a sufficient supply of the mechanical seal, pressure at entry of the supply system must be min. 2 bar (29 PSI) above max. barrier pressure always.

## Recommended applications

- Chemical industry
- Food and beverage industry
- Pharmaceutical industry
- Gases and liquids
- Media which require high purity
- Environmental harmful media with double seals
- Agitators
- Reactors



Supply connections

Designation and positions of supply connections, pull-off and jacket threads acc. to DIN 28138 T3.

- A Barrier gas IN
- C Leakage
- E Cooling IN
- F Cooling OUT
- S Flush
- G Grease

## Product variants

### AGSZ481K(L)-D

Double seal (with integrated bearing) for steel vessels to DIN 28136, connection flange to DIN 28141 and shaft ends to DIN 28154.

### AGSZ461K(L)-D

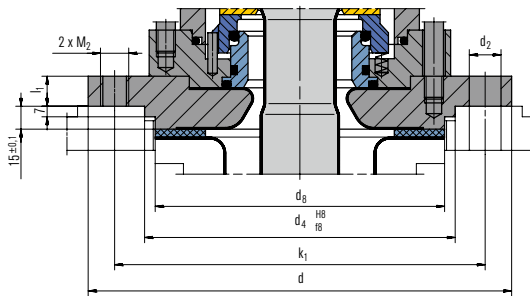
Double seal (with integrated bearing) for glass-lined vessels to DIN 28136, connection flange to DIN 28137 and shaft ends to DIN 28159.

### AGSZ451K(L)-D

Version with special connection dimensions or unstepped shafts. For steel vessels.

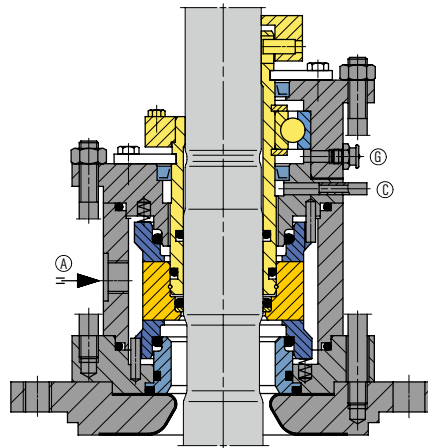
### AGSZ491K(L)-D

Variant with special connection dimensions for glass-lined vessels.



AGSZ461K(L)-D

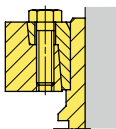
Flange connection acc. to DIN 28137 T2 for nominal diameters 40 ... 100.



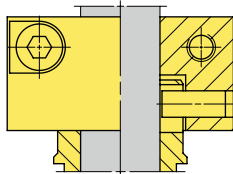
AGSZ461K(L)-D

Flange connection acc. to DIN 28137 T2 for nominal diameters 125 ... 161.

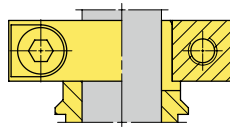
## Torque transmissions



Shrink disk



Clamping ring with pin



Clamping ring

### AGSZ481 – Dimensions in mm

d <sub>1</sub> <sup>1)</sup>	d <sub>7</sub> <sup>1)</sup>	d	n x d <sub>2</sub>	d <sub>4</sub>	d <sub>0</sub>	k	L <sub>1</sub>	L <sub>2</sub>	L <sub>w</sub> <sup>1)</sup>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	a	M <sub>1</sub>	M <sub>2</sub>	A
40	38	175	4 x 18	110	90	145	81	137	143	15	35	28	122	M12	M16	G3/8
50	48	240	8 x 18	176	135	210	82.5	130.5	148	17	42	28	155	M12	M16	G3/8
60	58	240	8 x 18	176	135	210	78.5	128	158	18	39	28	176	M12	M16	G3/8
80	78	275	8 x 22	204	155	240	94.5	146	168	20	50	34	203	M16	M20	G1/2
100	98	305	8 x 22	234	190	270	95	156.5	178	20	56.5	34	228	M16	M20	G1/2
125	120	330	8 x 22	260	215	295	95	163.5	203	20	60	39	268	M20	M20	G1/2
140	135	395	12 x 22	313	250	350	97	168.5	208	20	82	41	285	M20	M20	G1/2
160	150	395	12 x 22	313	265	350	97	176.5	213	25	81	41	302	M20	M20	G1/2
180	170	445	12 x 22	364	310	400	-	-	233	25	-	-	332	M24	M20	G1/2
200	190	445	12 x 22	364	310	400	-	-	243	25	-	-	352	M24	M20	G1/2
220	210	505	16 x 22	422	340	460	-	-	263	25	-	-	-	M24	M20	G1/2

<sup>1)</sup> Shaft diameters d<sub>1</sub> and d<sub>7</sub> to DIN 28154

### AGSZ461 – Dimensions in mm

d <sub>1</sub> <sup>1)</sup>	d <sub>7</sub> <sup>1)</sup>	Nominal size	Flange size <sup>2)</sup>	d	n x d <sub>2</sub>	d <sub>4</sub>	n x d <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	k <sub>1</sub>	k <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	M <sub>1</sub>	M <sub>2</sub>	A.B
40	38	40	E125	175	4 x 18	110	-	-	102	145	-	142	184	25	35	28	50	50	M12	M16	G3/8
50	48	50	E200	240	8 x 18	176	-	-	138	210	-	147	195	25	40	28	50	50	M12	M16	G3/8
60	58	60	E250	275	8 x 22	204	-	-	188	240	-	158	203	25	42	28	50	60	M12	M20	G3/8
80	78	80	E300	305	8 x 22	234	-	-	212	270	-	170	240	30	45	34	60	60	M16	M20	G1/2
100	98	100	E400	395	12 x 22	313	-	-	268	350	-	177	240	30	52	34	60	60	M16	M20	G1/2
100	98	100	E500	395	12 x 22	313	-	-	268	350	-	177	240	30	52	34	60	60	M16	M20	G1/2
125	120	125	E700	505	4 x 22	422	12 x 22	320	306	460	350	208	266	30	75	40	60	80	M20	M20	G1/2
140	135	140	E700	505	4 x 22	422	12 x 22	320	306	460	350	223	282	30	79	40	60	80	M20	M20	G1/2
160	150	160	E900	505	4 x 22	422	12 x 22	320	306	460	350	228	282	30	77	40	60	85	M20	M20	G1/2
160	150	161	E901	565	4 x 26	474	12 x 22	370	356	515	400	228	282	30	77	40	60	85	M20	M20	G1/2

<sup>1)</sup> Shaft diameters d<sub>1</sub> and d<sub>7</sub> to DIN 28159

<sup>2)</sup> Flange size to DIN 28137T2

# AGSR



## Features

- For top, bottom and side entry drives
- Double seal
- Balanced
- Stationary springs on product side
- Independent of direction of rotation
- Gas-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested unit
- Rotating seat at product side
- Torque transmission by clamping ring for large axial movements
- Non-contacting operation
- No friction on the seal faces, no heat generated at the seal or in the medium
- Sterile design available
- ATEX certification on request

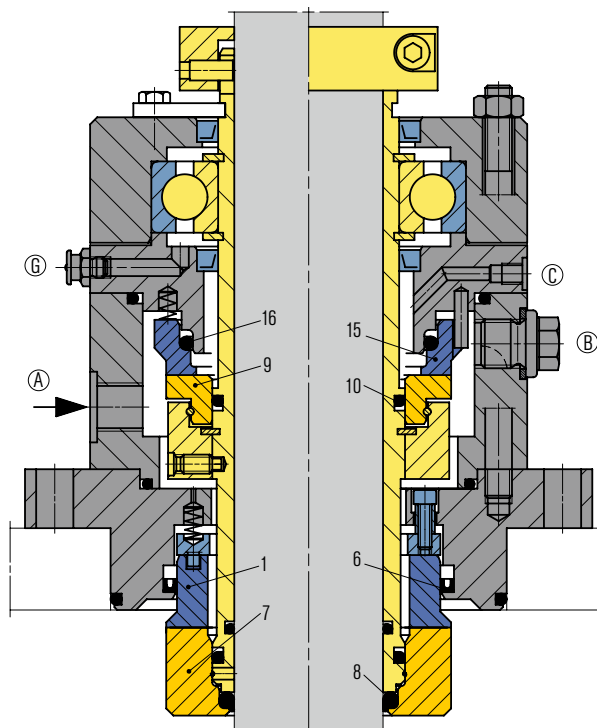
## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 200 \text{ mm}$  (0.8" ... 7.9")  
 Pressure:  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI),  
 $\Delta p \text{ min.} = 3 \text{ bar}$  (44 PSI),  $p_3 \text{ max.} = 9 \text{ bar}$  (131 PSI)  
 Temperature:  $t_1 = 0 \text{ }^\circ\text{C} \dots +150 \text{ }^\circ\text{C}$  (+32 °F ... +302 °F)  
 Sliding velocity:  $v_g = 0 \dots 2 \text{ m/s}$  (0 ... 7 ft/s)\*

\* Higher velocities on request.

## Standards and approvals

- FDA
- ATEX



## Materials

Seal faces and seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.

## Recommended applications

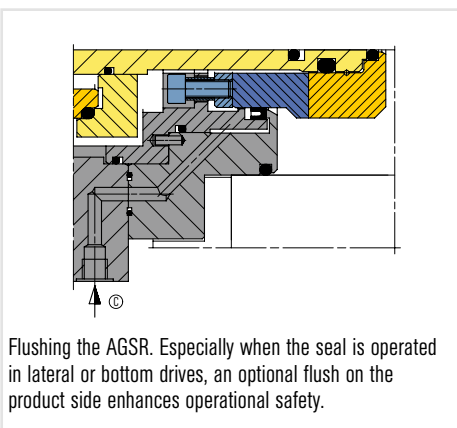
- Chemical industry
- Food and beverage industry
- Pharmaceutical industry
- Mixers
- Dryers
- Special rotating equipment

## Dimensions

Dimensions on request

## Option

- Flush



Flushing the AGSR. Especially when the seal is operated in lateral or bottom drives, an optional flush on the product side enhances operational safety.

## AGSR3(L)-D

Double seal (with floating bearing for the shaft) for sterile applications. The specific design free of dead spaces with polished surfaces on the product side meets the requirements for hygienic applications.

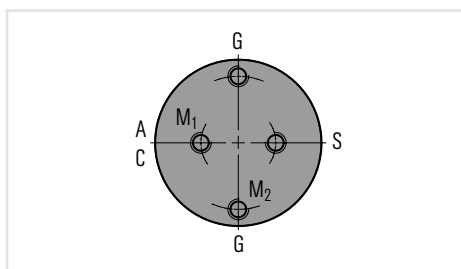
## Item Description

Item	Description
1, 15	Seal face
6	Sealing ring
7, 9	Seat
8, 10, 16	O-Ring

## Recommended seal supply

Gas supply by EagleBurgmann GSS4015/A400-D0, GSS4016/A250-D1 or GSS4016/A350-D1.

Note: To assure a sufficient supply of the mechanical seal, pressure at entry of the supply system must be min. 2 bar (29 PSI) above max. barrier pressure always.



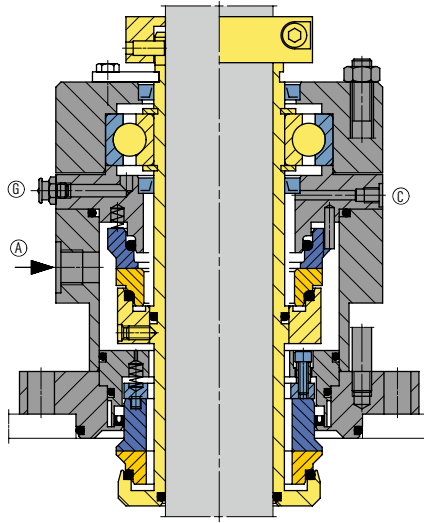
Supply connections

- A Barrier gas IN
- C Leakage
- G Grease
- S Flush

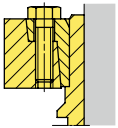
### Product variants

#### AGSR5(L)-D

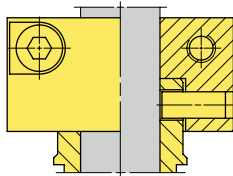
Double seal (with floating bearing for the shaft). If the seal has to run in the product, please inquire.



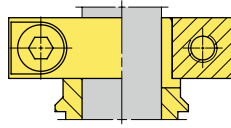
### Torque transmissions



Shrink disk



Clamping ring with pin



Clamping ring

# ERB



## Features

- Cartridge unit
- Double seal with integrated bearing
- Unbalanced
- Independent of direction of rotation

## Advantages

- Ready-to-fit and factory-tested units
- Available with or without bearing
- Suitable for standardizations
- Balanced seal can be applied at high pressure

## Operating range (see note on page 1)

Pressure:  $p = \text{vacuum} \dots 10 \text{ bar (145 PSI)}$   
 Temperature:  $t = -30 \text{ }^\circ\text{C} \dots +200 \text{ }^\circ\text{C} (-22 \text{ }^\circ\text{F} \dots +392 \text{ }^\circ\text{F})$   
 Rotational speed:  $n = \text{max. } 200 \text{ min}^{-1}$   
 Axial movement: max. 0.3 mm

## Materials

Shaft diameter 50 ... 100 mm:  
 Seal faces: Carbon graphite resin impregnated (B)  
 Seat: Silicon carbide (Q1), Tungsten carbide (U1),  
 Chromium oxide coated

Diameter 110 ... 200 mm:  
 Seal faces: Silicon carbide (Q1), Tungsten carbide (U1),  
 Chromium oxide coated  
 Seats: Carbon graphite resin impregnated (B),  
 Silicon carbide (Q1), Tungsten carbide (U1)

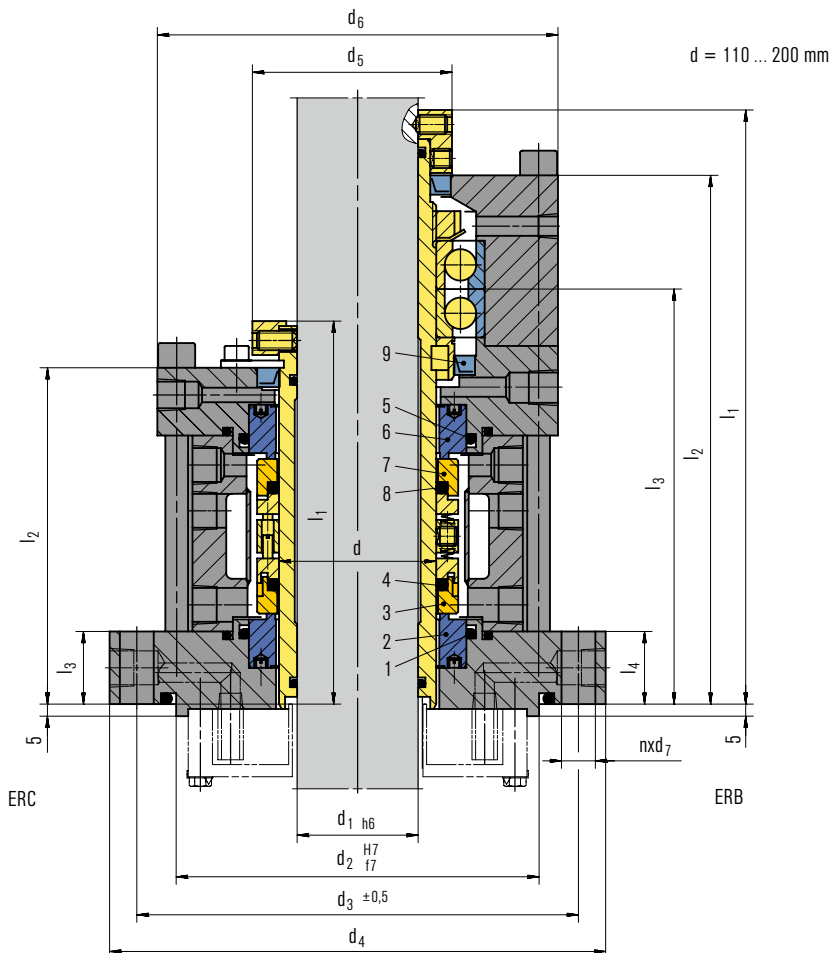
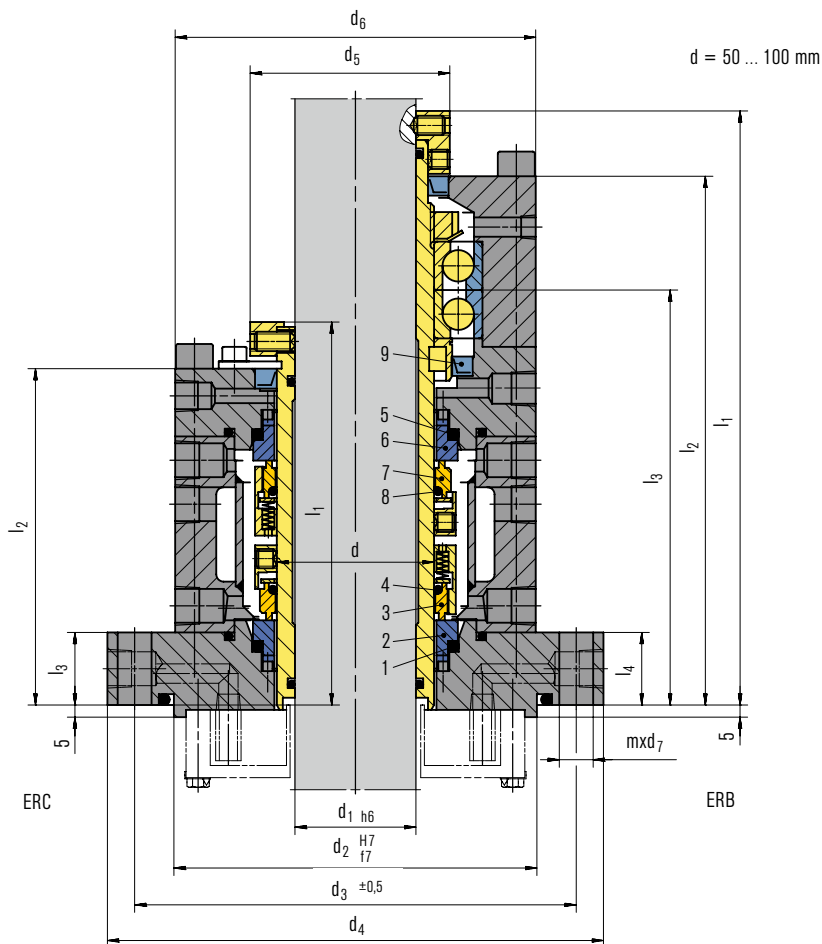
## Recommended applications

- Chemical industry
- Food and beverage industry
- Reactors
- Polymerization agitators
- Mixers

Item	Description
1, 4, 5, 8	O-Ring
2, 6	Seat
3, 7	Seal face
9	Shaft seal

## Options

Cooling jacket on the vessel side flange. Please inquire.





## Product variants

**ERA**  
Double seal integrated shaft and bearing.

**ERD**  
Single seal integrated shaft and bearing.

**ERG**  
Double seal with integrated bearing.  
For glasslined vessels.

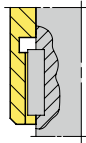
**ERC**  
Double seal without bearing.

**ERE**  
Single seal integrated bearing.

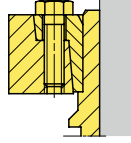
## Torque transmissions



**Set screw with cone point** for diameter  $d_1 > 120$  mm and/or vessel pressure  $p > 1$  barg



**Drive key**



**Shrink disk**

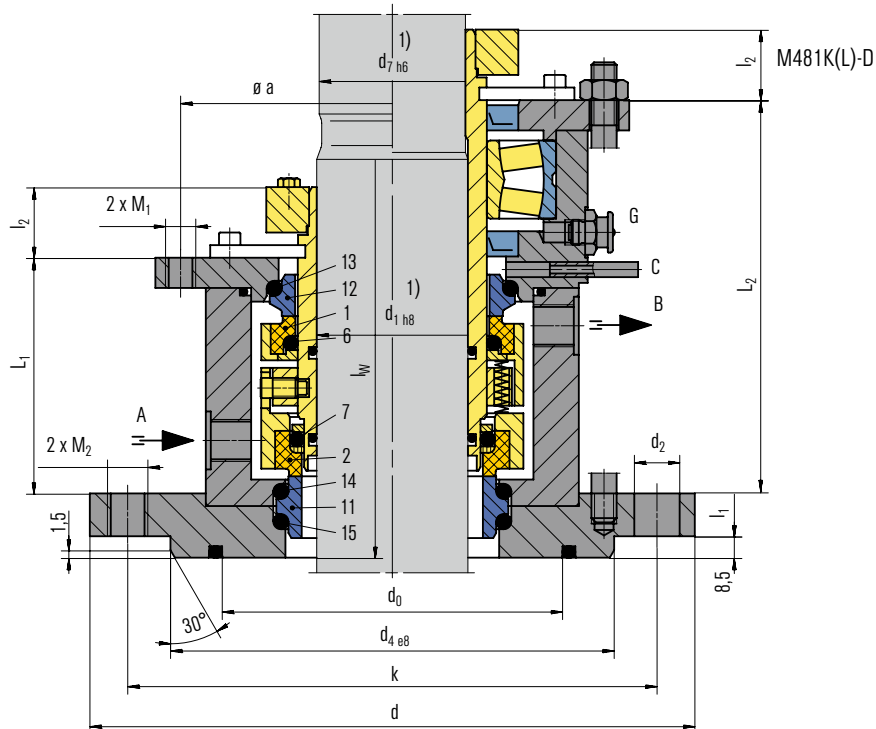
## ERB – Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	n	Lagertyp
50	35	135	170	195	61	134	14	268	237	185	30	8	#7210ADB
60	45	145	180	205	75	144	14	283	252	197	30	8	#7212ADB
70	55	155	190	215	85	154	14	293	262	205	30	8	#7014ADB
80	65	165	200	225	95	164	14	303	272	207	30	8	#7016ADB
90	75	175	210	235	105	174	14	323	287	219	30	8	#7018ADB
100	85	185	220	245	115	184	14	323	287	219	30	8	#7020ADB
110	95	205	240	265	125	218	14	333	291	216	30	8	#7022ADB
120	105	215	261	289	135	235	19	371	309	233	35	12	#7024ADB
130	110	225	271	299	145	245	19	364	322	238	35	12	#7026ADB
140	120	235	281	309	159	255	19	369	322	238	35	12	#7028ADB
150	130	280	335	375	169	295	23	424	377	288	45	12	#7030ADB
160	140	290	345	385	179	305	23	433	386	291	45	12	#7032ADB
170	150	300	355	395	189	315	23	452	400	295	45	12	#7034ADB
180	160	310	365	405	199	328	23	458	406	299	45	12	#7036ADB
190	170	320	375	415	209	338	23	473	416	309	45	12	#7038ADB
200	180	330	390	430	219	358	23	483	426	312	45	12	#7040ADB

## ERC – Dimensions in mm

d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	n
50	35	135	170	195	66	134	14	162	144	30	8
60	45	145	180	205	76	144	14	175	157	30	8
70	55	155	190	215	86	154	14	186	168	30	8
80	65	165	200	225	96	164	14	186	168	30	8
90	75	175	210	235	110	174	14	198	178	30	8
100	85	185	220	245	120	184	14	198	178	30	8
110	95	205	240	265	130	218	14	200	173	30	8
120	105	215	261	289	140	235	19	217	190	35	12
130	110	225	271	299	154	245	19	222	190	35	12
140	120	235	281	309	164	255	19	222	190	35	12
150	130	280	335	375	174	295	23	261	229	45	12
160	140	290	345	385	184	305	23	263	231	45	12
170	150	300	355	395	194	315	23	263	231	45	12
180	160	310	365	405	204	328	23	263	231	45	12
190	170	320	375	415	214	338	23	273	241	45	12
200	180	330	390	430	224	358	23	277	245	45	12

# M481



## Features

- For top entry drives
- Single or double seals
- Unbalanced
- Independent of direction of rotation
- Multiple springs rotating
- Liquid-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested units
- Available with or without bearing
- Suitable for standardizations
- Double seals can be applied at higher pressure and rotating speed than specified by DIN
- Self-closing on product side
- ATEX certification on request

## Operating range (see note on page 1)

DIN 28138 T2  
Shaft diameter:  $d_1 = 40 \dots 220 \text{ mm}$  (1.57" ... 8.66")

Single seals:  
Pressure:  $p_1 = \text{vacuum} \dots 6 \text{ bar}$  (87 PSI),  
 $p_3 = \text{pressureless}$   
Temperature:  $t_1 = -40 \text{ }^\circ\text{C} \dots +150 \text{ (250)} \text{ }^\circ\text{C}$   
(-40 °F ... +302 (482\*) °F)

Double seals:  
Pressure:  $p_1 = \text{vacuum} \dots 16 \text{ bar}$  (232 PSI),  
 $p_3 = \text{max. } 18 \text{ bar}$  (261 PSI)  
Temperature:  $t_1 = -40 \text{ }^\circ\text{C} \dots +200 \text{ (350)} \text{ }^\circ\text{C}$   
(-40 °F ... +392 (662\*) °F)

Sliding velocity:  $v_g = 0 \dots 5 \text{ m/s}$  (0 ... 16 ft/s)

For applications beyond this range, please inquire.  
\* with cooling flange

## Materials

Seal faces: Carbon graphite or Silicon carbide, FDA conform  
Seats: Silicon carbide, FDA conform  
Secondary seals and metallic parts acc. to application and customers' requirement.

## Item Description

1	Seal face, atmosphere side
2	Seal face, product side
6, 7, 13, 14, 15	O-Ring
11	Seat, product side
12	Seat, atmosphere side

## Standards and approvals

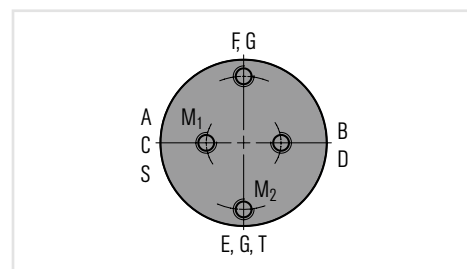
- FDA
- ATEX
- DIN 28138 (mechanical seals for agitator shafts)
- DIN 28136 T2 (for steel vessels)
- DIN 28141 (flange connection for steel vessels)
- DIN 28154 (shaft end for steel vessels)

## Recommended seal supply

- Closed circuit EagleBurgmann TS system
- Open circuit EagleBurgmann SPA, EagleBurgmann SPN

## Recommended applications

- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Agitators
- Reactors



Designation and position acc. to DIN 28138 T3.

- A Supply liquid IN
- B Supply liquid OUT
- C Drainage
- D Leakage drain
- E Cooling IN
- F Cooling OUT
- G Grease
- S Flush
- T Temperature metering

For reasons of standardization, the supply connections of single seals are matched to those of the double seals (in deviation from DIN 28138T3).

## Product variants

### M481K

Single seal

### M481KL

Single seal with integrated floating bearing.

Operation of single seals only with pressureless quench.

### M481K-D

Double seal

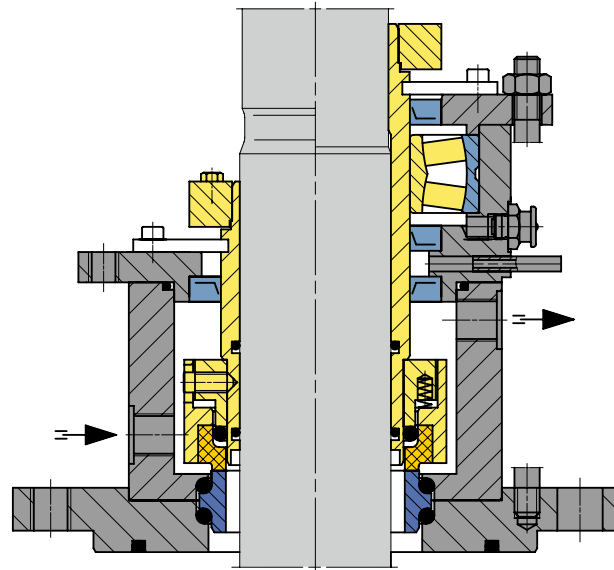
### M481KL-D

Double seal with integrated floating bearing.

These seals are designed to be self-closing on the product side, i.e. they will remain closed even with pressure variations or a pressure reversal. Operation is optionally the same as for the single version ( $p_{max} = 6 \text{ bar (87 PSI)}$ ) or  $\Delta p_{max} = 6 \text{ bar (87 PSI)}$  at  $p_1 > p_3$ ). In view of the mechanical seal on the atmosphere side it can be used as a buffer pressurized double seal  $p_1 = 16 \text{ bar (232 PSI)}$ .

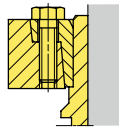
### M451

All types of the M481 range available for unstepped shafts (all diameters). Seal identification: M451 ... Customized design or e.g. different drives (torque transmissions) are available.

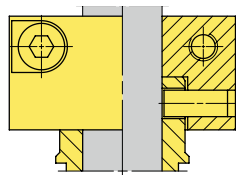


M481K(L)

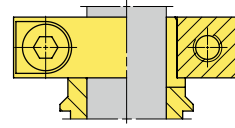
## Torque transmissions



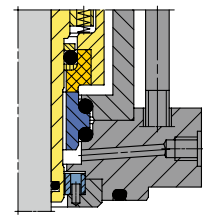
Shrink disk



Clamping ring with pin



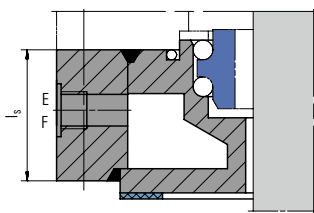
Clamping ring



Flush

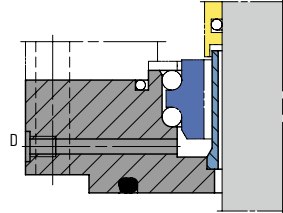
## Options

## Options



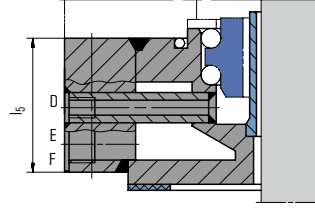
### Cooling flange

Can be used alternatively as a heating flange.



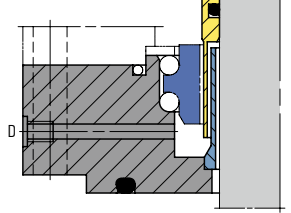
### Leakage drain

Can be used alternatively as a flush.



### Leakage drain with cooling flange

Can be used alternatively as a flush or as a heating flange.



### Polymerization barrier

Can be used alternatively as a leakage drain or a flush.

## Dimensions in mm

d <sub>1</sub> <sup>1)</sup>	d <sub>7</sub> <sup>1)</sup>	d	n x d <sub>2</sub>	d <sub>4</sub>	d <sub>0</sub>	k	L <sub>1</sub>	L <sub>2</sub>	L <sub>w</sub> <sup>2)</sup>	I <sub>1</sub>	I <sub>2</sub>	a	M <sub>1</sub>	M <sub>2</sub>	A. B
40	38	175	4 x 18	110	90	145	87	136	143	15	28	122	M12	M16	G3/8
50	48	240	8 x 18	176	135	210	89	149	148	17	28	157	M12	M16	G3/8
60	58	240	8 x 18	176	135	210	93.5	156	158	17	28	168	M12	M16	G3/8
80	78	275	8 x 22	204	155	240	104.5	189	168	20	34	203	M16	M20	G1/2
100	98	305	8 x 22	234	190	270	109	190	178	20	34	228	M16	M20	G1/2
125	120	330	8 x 22	260	215	295	110	205	203	20	40	268	M20	M20	G1/2
140	135	395	12 x 22	313	250	350	124	222	208	20	40	285	M20	M20	G1/2
160	150	395	12 x 22	313	265	350	127.5	219.5	213	25	40	297	M20	M20	G1/2
180	170	445	12 x 22	364	310	400	132.5	230	233	25	45	332	M24	M20	G1/2
200	190	445	12 x 22	364	310	400	137.5	237.5	243	25	45	352	M24	M20	G1/2
220	210	505	16 x 22	422	340	460	149.5	249.5	263	25	50	381	M24	M20	G1/2

<sup>1)</sup> Shaft diameters d<sub>1</sub> and d<sub>7</sub> to DIN 28154

<sup>2)</sup> Shaft step to DIN 28154

# M461



## Features

- For top entry drives
- For glass-lined vessels
- Double seal, single seal on request
- Unbalanced
- Independent of direction of rotation
- Multiple springs rotating
- Liquid-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested unit
- Available with or without bearing
- Suitable for standardizations
- Double seals can be applied at higher pressure and rotating speed than specified by DIN
- Self-closing on product side
- The seal can be lifted off the glass-lined flange as a complete cartridge. The sensitive glass lined basic flange remains mounted on the vessel.
- ATEX certification on request

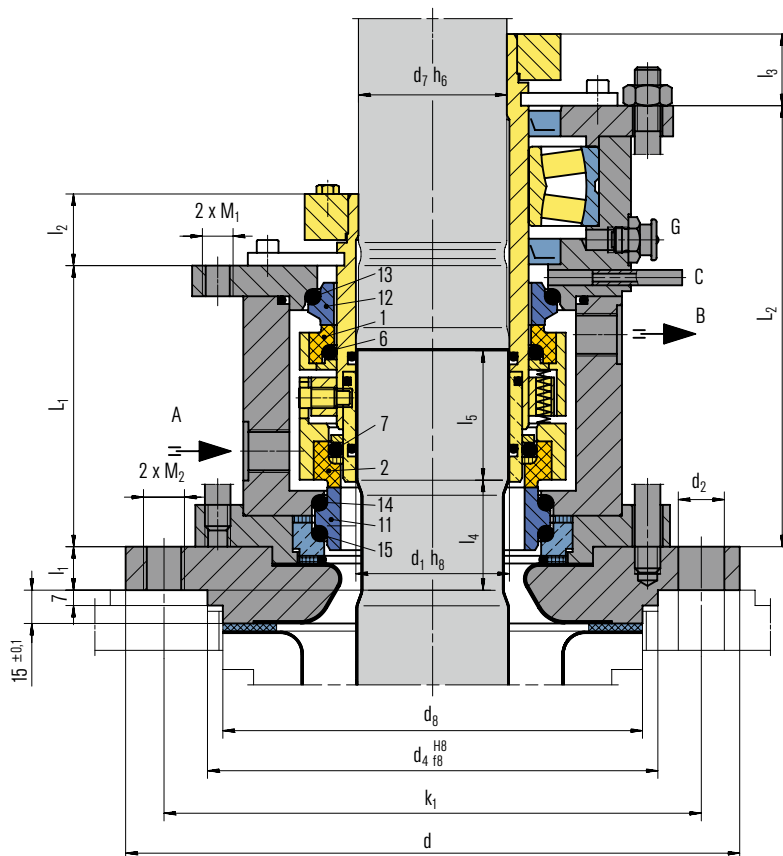
## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 40 \dots 160 \text{ mm (1.57" \dots 6.30")}$   
 Pressure:  $p_1 = \text{vacuum} \dots 16 \text{ bar (232 PSI)}$ ,  
 $p_3 = \text{max. } 18 \text{ bar (261 PSI)}$   
 Temperature:  $t_1 = -40 \text{ }^\circ\text{C} \dots +200 \text{ (250}^*\text{)} \text{ }^\circ\text{C}$   
 $(-40 \text{ }^\circ\text{F} \dots +392 \text{ (482}^*\text{)} \text{ }^\circ\text{F})$   
 Sliding velocity:  $v_g = 0 \dots 5 \text{ m/s (0 \dots 16 ft/s)}$

For applications beyond this range, please inquire.  
 \* with cooling flange

## Materials

Seal faces: Carbon graphite or Silicon carbide, FDA conform  
 Seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.



## Item Description

Item	Description
1	Seal face, atmosphere side
2	Seal face, product side
6, 7, 13, 14, 15	O-Ring
11	Seat, product side
12	Seat, atmosphere side

## Standards and approvals

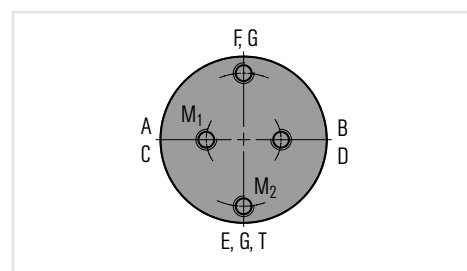
- FDA
- ATEX
- DIN 28138 (mechanical seals for agitator shafts)
- DIN 28136 T3 (for glass-lined vessels)
- DIN 28137 T2 (flange connection for glass-lined vessels)
- DIN 28159 (shaft end for glass-lined vessels)

## Recommended seal supply

- Closed circuit EagleBurgmann TS system
- Open circuit EagleBurgmann SPA, EagleBurgmann SPN

## Options

- Cooling resp. heating flange
  - Leakage drain resp. flush
- See page 113.



Supply connections

Designation and positions of screwed connections, pull-off and jacket threads acc. to DIN 28138 T3.

- A Liquid IN
- B Liquid OUT
- C Drainage
- D Leakage drain
- E Cooling IN
- F Cooling OUT
- G Grease
- T Temperature metering

## Recommended applications

- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Agitators
- Reactors

## Product variants

### M461K-D

Double seal

### M461KL-D

Double seal with integrated floating bearing.

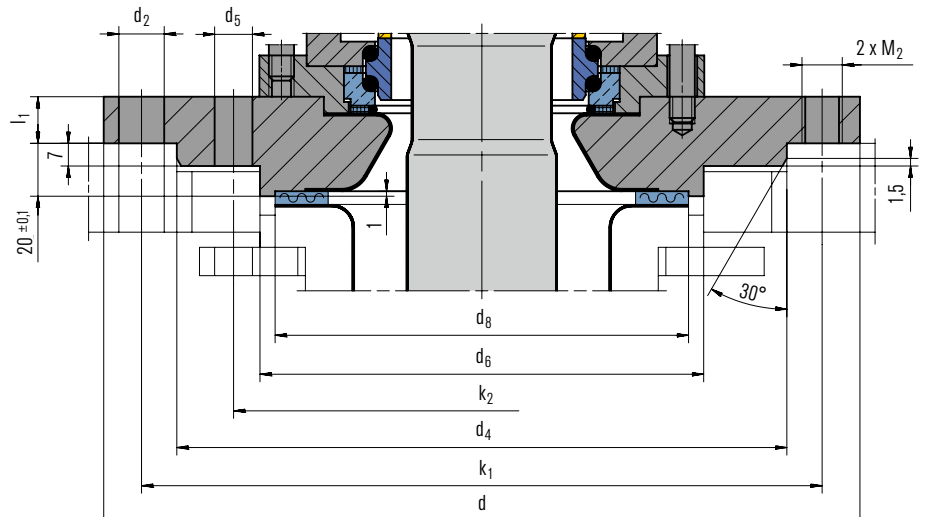
### M56K(L)-D

Double seal without/with floating bearing for PN 25  
(Special seal on request).

These seals are designed to be self-closing on the product side, i.e. they will remain closed even with pressure variations or a pressure reversal. Operation is optionally the same as for the single version ( $p_{max} = 6 \text{ bar (87 PSI)}$ ) or  $\Delta p_{max} = 6 \text{ bar at } p_1 > p_3$ ). In view of the mechanical seal on the atmosphere side it can be used as a buffer pressurized double seal  $p_1 = 16 \text{ bar (232 PSI)}$ .

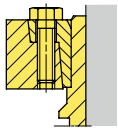
### M491

All types of the M461 range available for unstepped shafts (all diameters). Seal identification: M491... Customized design or e.g. different drives (torque transmissions) are available.

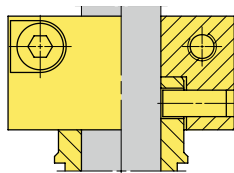


Flange connections acc. to DIN 28137 T2  
for nominal diameters 125 ... 161.

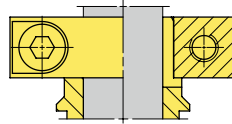
## Torque transmissions



Shrink disk



Clamping ring with pin



Clamping ring

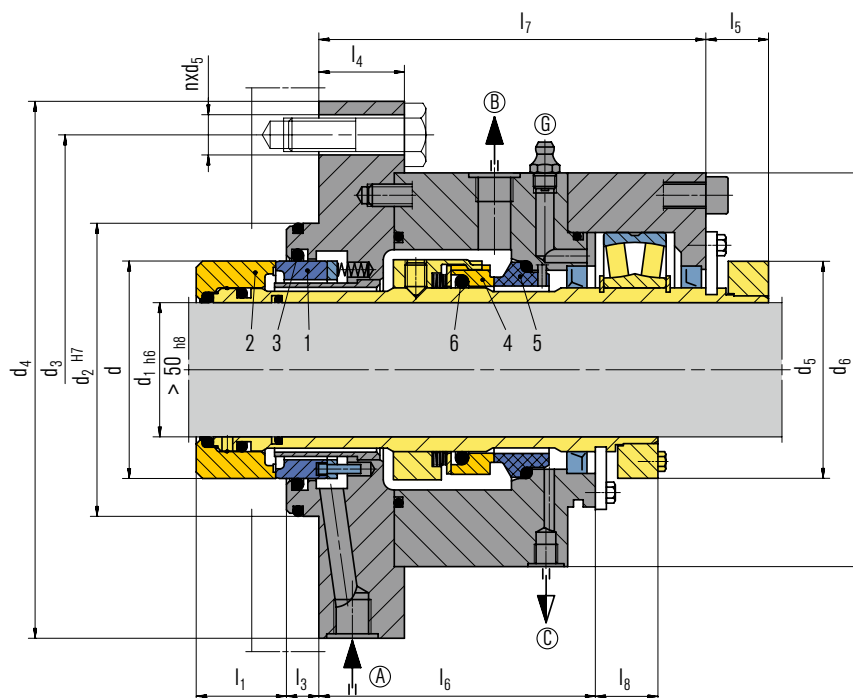
## Dimensions in mm

$d_1^{1)}$	$d_7^{1)}$	Nominal size	Flange size <sup>2)</sup>	$d$	$n \times d_2$	$d_4$	$n \times d_5$	$d_6$	$d_8$	$k_1$	$k_2$	$L_1$	$L_2$	$l_1$	$l_2$	$l_3$	$l_4$	$l_5$	$M_1$	$M_2$	A,B
40	38	40	E125	175	4 x 18	110	-	-	102	145	-	107	156	25	35	28	50	50	M12	M16	G3/8
50	48	50	E200	240	8 x 18	176	-	-	138	210	-	107	167	25	40	28	50	50	M12	M16	G3/8
60	58	60	E250	275	8 x 22	204	-	-	188	240	-	116	175	25	42	28	50	60	M12	M20	G3/8
80	78	80	E300	305	8 x 22	234	-	-	212	270	-	125	206	30	45	34	60	60	M16	M20	G1/2
100	98	100	E400	395	12 x 22	313	-	-	268	350	-	125	143	30	52	34	60	60	M16	M20	G1/2
100	98	100	E500	395	12 x 22	313	-	-	268	350	-	125	143	30	52	34	60	60	M16	M20	G1/2
125	120	125	E700	505	4 x 22	422	12 x 22	320	306	460	350	133	226	30	75	40	60	80	M20	M20	G1/2
140	135	140	E700	505	4 x 22	422	12 x 22	320	306	460	350	144	242	30	79	40	60	80	M20	M20	G1/2
160	150	160	E700	505	4 x 22	422	12 x 22	320	306	460	350	151	242	30	77	40	60	85	M20	M20	G1/2
160	150	160	E900	505	4 x 22	422	12 x 22	320	306	460	350	151	242	30	77	40	60	85	M20	M20	G1/2
160	150	161	E901	565	4 x 26	474	12 x 22	370	356	515	400	151	242	30	77	40	60	85	M20	M20	G1/2

<sup>1)</sup> Shaft diameters  $d_1$  and  $d_7$  to DIN 28159

<sup>2)</sup> Flange size to DIN 28137T2

# MR-D



## Features

- For top, side and bottom entry drives
- Seat at product side rotating
- Unbalanced
- Liquid-lubricated
- Double seal
- Independent of direction of rotation
- Cartridge unit
- With or without bearing available
- Shaft sleeve not in contact with product

## Advantages

- Smooth surface, free of dead spaces
- CIP-/SIP (Cleaning in Place, Sterilization in Place) capable
- Sliding materials FDA conform
- Variant for sterile applications available
- ATEX certification on request

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 35 \dots 140$  (500) mm  
(1.38" ... 5.51" (19.68"))

Axial offset shaft/housing:  $d_1 = 35 \dots 60$  mm  
(1.38" ... 2.36"): max.  $\pm 1.5$  mm  
 $d_1 > 60$  mm (2.36"): max.  $\pm 2.0$  mm  
Radial offset shaft/housing: max.  $\pm 0.3$  mm

Pressure:  $p_1 = \text{vacuum} \dots 14$  (23) bar (203 (334 PSI))  
 $p_3 = \text{max. } 16$  (25) bar (232 (363 PSI))  
 $\Delta p_{3-p_1} = 2 \dots 10$  bar (29 ... 145 PSI),  
higher  $\Delta p$  on request

Temperature:  $t_1 = -20 \text{ }^\circ\text{C} \dots +200$  (300)  $^\circ\text{C}$   
(-4  $^\circ\text{F} \dots +392$  (572)  $^\circ\text{F}$ )  
Sliding velocity:  $v_0 = \text{max. } 10$  (20) m/s (33 (66) ft/s)

For applications beyond this range and for values in brackets,  
please inquire.

## Standards and approvals

- FDA

## Recommended seal supply

- Closed circuit: EagleBurgmann TS system,  
EagleBurgmann DRU pressure booster
- Open circuit: EagleBurgmann SPA/SPN

## Item Description

- |      |                            |
|------|----------------------------|
| 1    | Seal face, product side    |
| 2    | Seat, product side         |
| 3, 4 | O-Ring, dynamic            |
| 4    | Seal face, atmosphere side |
| 5    | Seat, atmosphere side      |

## Materials

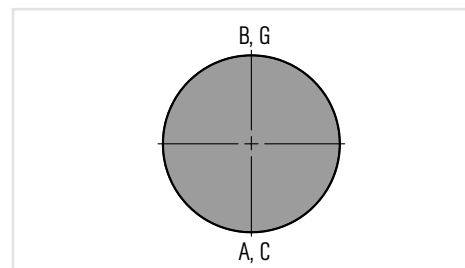
Seal faces: Silicon carbide, FDA conform  
Seat: Carbon graphite (atmosphere side) resp. Silicon carbide (product side), FDA conform  
Secondary seals and metallic parts acc. to application and customers' requirement.

## Options

- Cooling resp. heating flange
  - Temperature sensor
  - Axial expansion joint (shaft movement)
  - Wiper ring (shaft movement)
  - Metal-free on product side
- Please inquire.

## Recommended applications

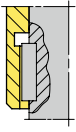
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Mixers
- Dryers
- Mills
- Kneaders
- Reactors
- Pressure filters



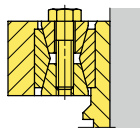
Supply connections

- A Barrier fluid IN
- B Barrier fluid OUT
- C Drainage
- G Grease

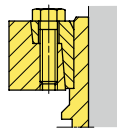
## Torque transmissions



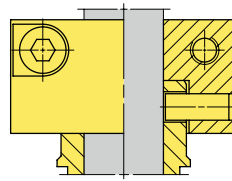
Drive key



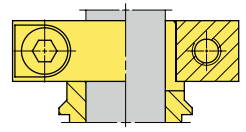
Clamping set



Shrink disk



Clamping ring with pin



Clamping ring

Special designs on request.

## Dimensions in mm

d <sub>1</sub>	d	l <sub>1</sub>	d <sub>2</sub>	l <sub>3</sub>	d <sub>3</sub>	n x d <sub>5</sub>	d <sub>4</sub>	l <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	l <sub>5</sub>	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>
35	68.0	41	105.0	15	148	8 x 13.5	170	35.5	69	118.5	20.5	97.0	141.0	30.5
45	82.7	41	119.5	15	166	8 x 13.5	190	43.0	86	138	26.0	103.0	149.5	34.5
50	90.0	41	119.5	15	190	8 x 17.5	220	40.5	90	158	28.5	110.0	165.0	28.5
60	100.0	42	134.5	15	200	8 x 17.5	230	41.0	100	168	28.0	118.0	173.0	28.0
80	130.0	46	160.5	15	248	8 x 17.5	280	48.0	130	208	34.0	133.0	212.0	34.0
100	150.0	46	181.5	15	264	8 x 22.0	300	54.0	150	223	33.5	145.0	219.0	33.5
120	172.0	46	209.5	15	293	8 x 22.0	330	52.0	174	253	40.0	148.0	232.0	40.0
140	195.0	46	224.5	15	338	12 x 22.0	375	52.0	194	288	39.5	160.5	251.5	39.5

# HS-D



### Features

- For top entry drives
- Double seal
- Unbalanced
- Independent of direction of rotation
- Multiple springs rotating
- Liquid-lubricated
- Cartridge unit

### Advantages

- Ready-to-fit and factory-tested unit
- With or without bearing available
- Patented hydrodynamic grooves
- Designed for medium pressure range
- Connection dimensions to customers' requirements
- Self-closing on product side
- ATEX certification on request

### Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 500 \text{ mm}$  (0.79" ... 19.69")  
 Pressure:  $p_1 = \text{vacuum} \dots 30 \text{ bar}$  (... 435 PSI)  
 Temperature:  $t = -40 \text{ }^\circ\text{C} \dots +200 \text{ (350}^\circ\text{)} \text{ }^\circ\text{C}$   
 (-40 °F ... +392 (662\*) °F)  
 Sliding velocity:  $v_g = 0 \dots 5 \text{ m/s}$  (0 ... 16 ft/s)

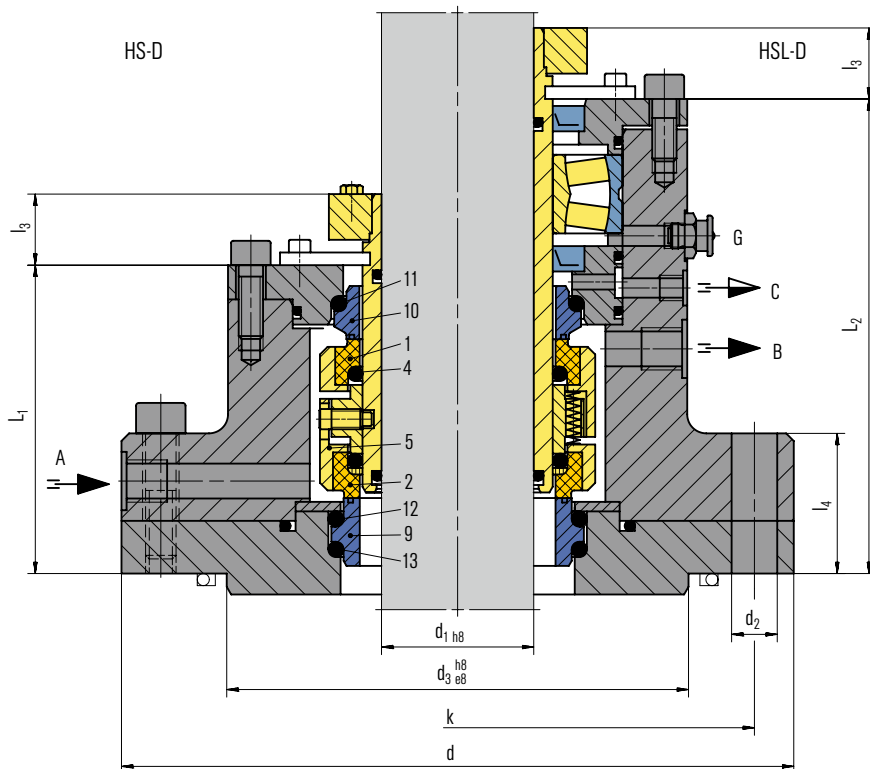
For applications beyond this range, please inquire.  
 \* with cooling flange

### Standards and approvals

- FDA

### Dimensions in mm

$d_1$	$d$	$n \times d_2$	$d_3$	$k$	$L_1$	$L_2$	$l_3$	$l_4$
40	200	6 x 18	80	170	115	170	35	45
50	230	8 x 18	100	200	120	185	35	55
60	255	8 x 18	120	225	140	210	35	60
80	295	8 x 23	145	260	145	230	44	60
100	315	8 x 23	170	280	160	245	44	65
120	345	8 x 23	190	310	160	250	50	65
140	380	12 x 23	215	345	165	265	50	65
160	440	12 x 27	240	395	185	300	50	75
180	475	12 x 27	260	430	185	310	55	75
200	465	12 x 27	290	420	190	290	55	75



Item	Description
1	Seal face, atmosphere side
2	Seal face, product side
4, 5, 11, 12, 13	O-Ring
9	Seat, product side
10	Seat, atmosphere side

### Materials

Seal faces: Carbon graphite or Silicon carbide, FDA conform  
 Seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.

### Recommended seal supply

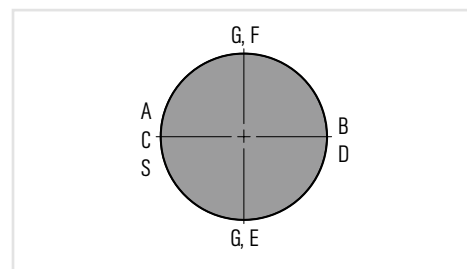
Open barrier fluid circuit  
 e. g. EagleBurgmann SPA, EagleBurgmann SPN

### Recommended applications

- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Reactors
- Agitators
- Special rotating equipment

### Options

- Cooling resp. heating flange
  - Leakage drain
  - Flush
  - Polymerization barrier
- See page 113.



### Supply connections

- A Barrier fluid IN
- B Barrier fluid OUT
- C Drainage
- D Leakage drain G1/8"
- E Cooling IN G3/8"
- F Cooling OUT G3/8"
- G Grease
- S Flush

### Product variants

#### HS ... -D

Double seal

#### HSL-D

Double seal with integrated floating bearing.

#### HS ..(L)U-D

Double seal for bottom and side entry drives with or without floating bearing.  
 These seals are designed to be self-closing on the product side, i.e. they will remain closed even with pressure variations or a pressure reversal.



# HSB-D



## Features

- For top entry drives
- Double seal
- Balanced
- Independent of direction of rotation
- Multiple springs rotating
- Liquid-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested unit
- With or without bearing available
- Patented hydrodynamic grooves
- Designed for high pressure range
- Connection dimensions to customers' requirements
- ATEX certification on request

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 20 \dots 400 \text{ mm}$  (0.79" ... 15.75")  
 Pressure:  $p_1 = \text{vacuum} \dots 250 \text{ bar}$  (... 3,625 PSI)\*,  
 $p_3 = p_1 + 10 \%$   
 Temperature:  $t = -40 \text{ }^\circ\text{C} \dots +200$  (350\*\*)  $^\circ\text{C}$   
 (-40  $^\circ\text{F} \dots +392$  (662\*\*)  $^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 0 \dots 5 \text{ m/s}$  (0 ... 16 ft/s)

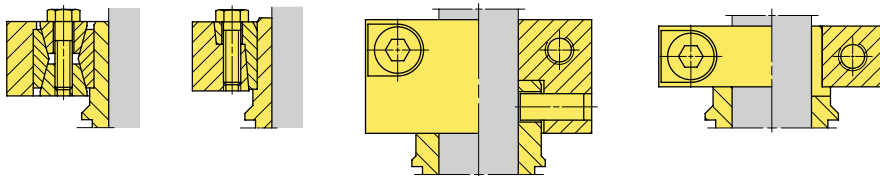
\* Depending on size, from 100 ... 150 bar (1,450 ... 2,175 PSI) executed as tandem seal (pressure reduction in 2 stages).

\*\* with cooling flange

## Standards and approvals

- FDA

## Torque transmissions (HS-D, HSB-D)

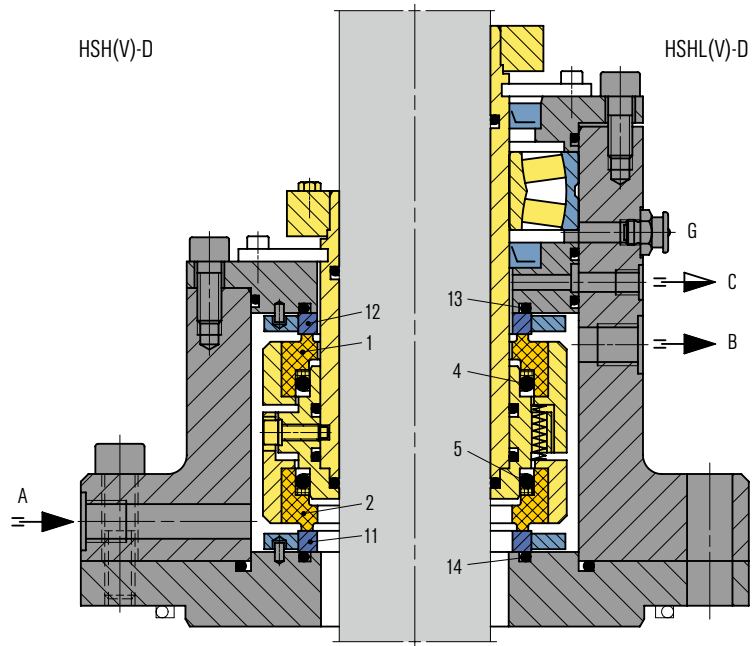


Clamping set

Shrink disk

Clamping ring with pin

Clamping ring



Item	Description
1	Seal face, atmosphere side
2	Seal face, product side
4, 5, 13, 14	O-Ring
11	Seat, product side
12	Seat, atmosphere side

## Materials

Seal faces: Carbon graphite, FDA conform  
 Seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.

## Recommended seal supply

Open barrier fluid circuit  
 e. g. EagleBurgmann SPA, EagleBurgmann SPN

## Recommended applications

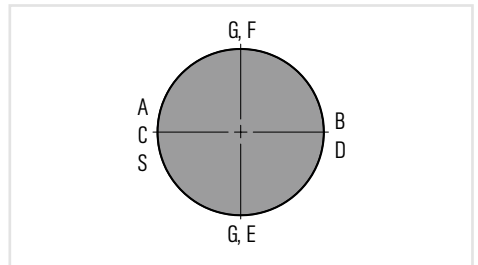
- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Reactors
- Agitators
- Special rotating equipment with top entry drive

## Dimensions

Dimensions on request

## Options

- Cooling resp. heating flange
  - Leakage drain
  - Flush
  - Polymerization barrier
- See page 113.



## Supply connections

- A Barrier fluid IN
- B Barrier fluid OUT
- C Drainage
- D Leakage drain
- E Cooling IN
- F Cooling OUT
- G Grease
- S Flush

## Product variants

### HSB(V)-D

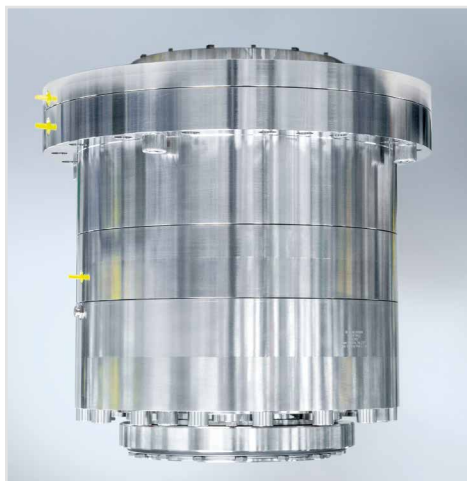
Double seal

### HSHL(V)-D

Double seal with integrated floating bearing (axial thrust bearing on request).

These seals are designed to be self-closing on the product side, i.e. they will remain closed even with pressure variations or a pressure reversal.

# HSH(L)U-D



## Features

- For bottom entry drives
- Double seal
- Balanced
- Independent of direction of rotation
- Multiple springs rotating
- Liquid-lubricated
- Cartridge unit

## Advantages

- Ready-to-fit and factory-tested unit
- With or without bearing available
- Patented hydrodynamic grooves
- High pressure seal for customer-specific solutions
- Floating throttle on product side for protection of the seal or for flush
- Connection dimensions to customers' requirements
- Self-closing on product side
- ATEX certification on request

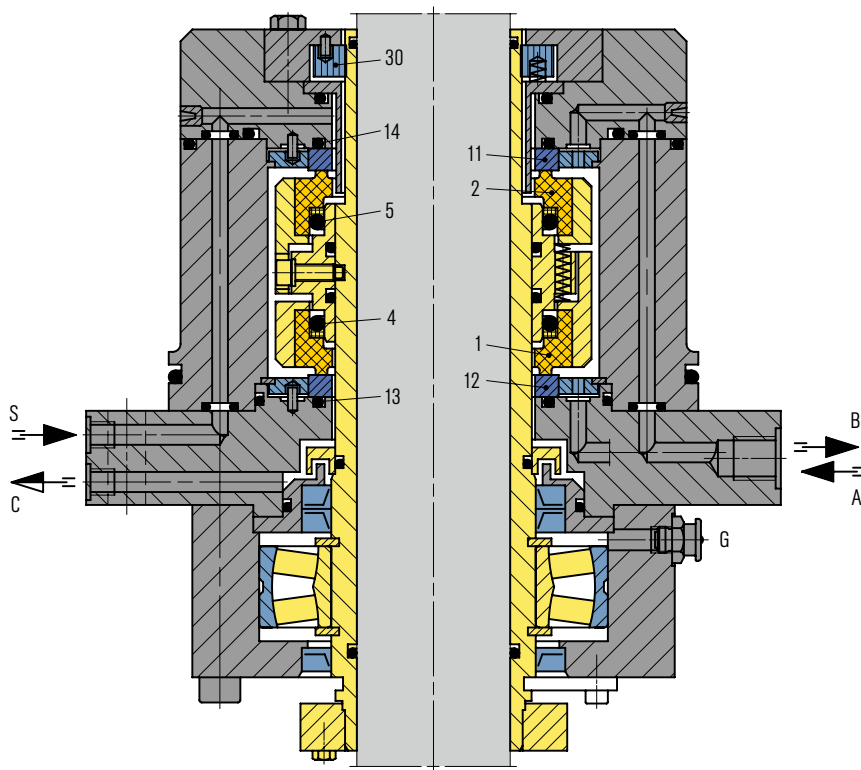
## Operating range (see note on page 1)

Shaft diameter:  $d_1 = \dots 400 \text{ mm}$  ( $\dots 15.75''$ )  
 Pressure:  $p_1 = \text{vacuum} \dots 60 \text{ bar}$  (870 PSI)  
 Temperature:  $t = -40 \text{ }^\circ\text{C} \dots +200 \text{ }^\circ\text{C}$  ( $-40 \text{ }^\circ\text{F} \dots +392 \text{ }^\circ\text{F}$ )  
 Sliding velocity:  $v_g = 0 \dots 5 \text{ m/s}$  ( $0 \dots 16 \text{ ft/s}$ )

For applications beyond this range, please inquire.

## Standards and approvals

- FDA



Item	Description
1	Seal face, atmosphere side
2	Seal face, product side
4, 5, 13, 14	O-Ring
11	Seat, product side
12	Seat, atmosphere side
30	Throttle ring

## Materials

Seal faces: Carbon graphite, FDA conform  
 Seats: Silicon carbide, FDA conform  
 Secondary seals and metallic parts acc. to application and customers' requirement.

## Recommended seal supply

Open barrier fluid circuit  
 e. g. EagleBurgmann SPA, EagleBurgmann SPN

## Recommended applications

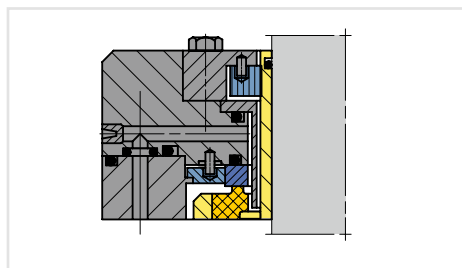
- Refining technology
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry
- Agitators
- Reactors
- Dryers
- Mixers
- Filters
- Special rotating equipment with bottom entry drive

## Dimensions

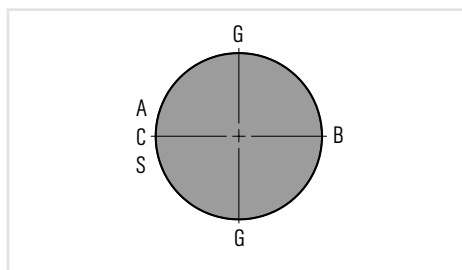
Dimensions on request

## Options

- Cooling resp. heating flange
  - Shut-down seal
- See page 113 and 121.



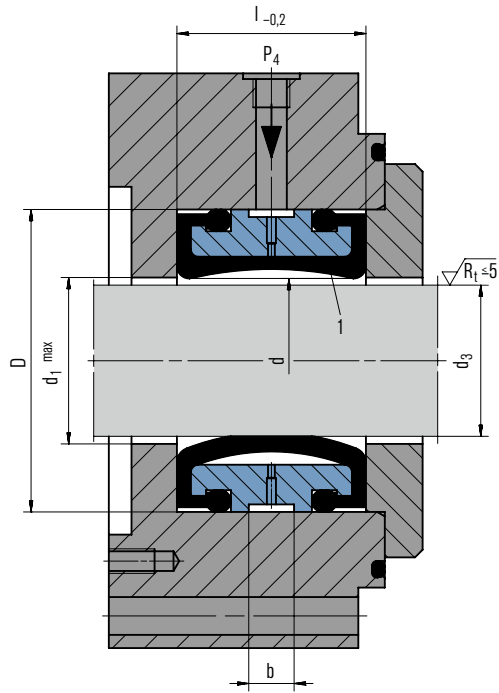
Flush



Supply connections

- A Barrier fluid IN
- B Barrier fluid OUT
- C Drainage
- G Grease
- S Flush

# STD1



## Advantages

If a STD is employed, it is possible to change seals with the vessel loaded and under pressure (shaft must be stationary!). Can be installed in each position. Installation dimensions according to DIN 28138 Part 1 are possible. Material properties have to be taken into account.

## Operating range (see note on page 1)

Shaft diameter:  $d_3 = 40 \dots 200 \text{ mm}$  (1.57" ... 7.87")  
 Pressure:  $p_1 = 16 \text{ bar}$  (232 PSI)  
 Temperature:  $t = +100 \text{ }^\circ\text{C}$  (+212 °F)

## Recommended applications

- Chemical industry
- Pharmaceutical industry
- Agitators

## Note

This seal can only be used if the product does not harden or congeal during the shut down period or for sterile operation (fermenting vessels). Not available in PTFE.

Elastomer sealing element (Item no. 1) with pneumatic or hydraulic actuation (closing pressure  $p_4 > p_1$ ).

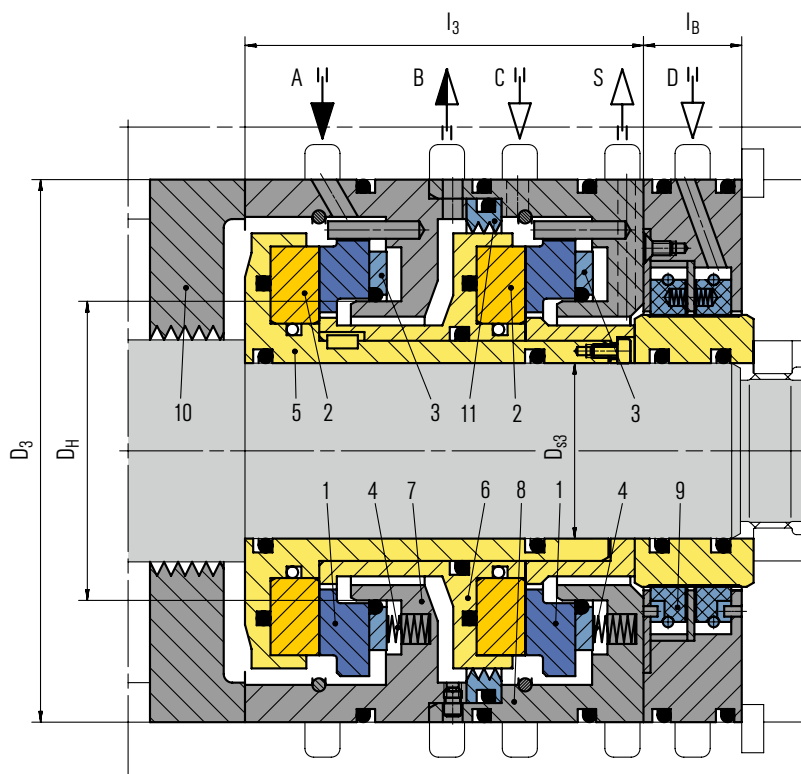
## Dimensions in mm

$d_3$	D	d	$d_1$	l	b
40	76	42.5	42	38.0	8
50	84	52.5	52	38.0	8
60	95	62.5	62	44.5	10
80	118	82.5	82	45.0	10
100	138	102.5	102	45.0	10
125	160	127.5	127	45.0	10
140	180	143.5	143	50.0	12
160	200	163.5	163	50.0	12
180	215	183.5	183	50.0	12
200	240	203.5	203	50.0	12

# DGS



Compressor seals of the DGS series are based on a common technology and technical features, for instance O-Rings as secondary sealing elements. The different product variants are tailored to particular fields of application. The advantage over other products on the market is hidden in the detail. For example, the torque is transmitted to the rotating seat by friction forces only. And thus no holes and resulting weakening of the material are needed.



## Features

- Gas-lubricated
- Uni-directional or bi-directional
- Ready-to-fit cartridge unit
- Single, double, tandem and tandem with intermediate labyrinth available
- Separation seals as labyrinths, radial clearance seals or CobraSeal are optionally available

## Advantages

- Wear-free and contact-free operation
- Self-cleaning 3D gas grooves
- High gas film stiffness
- Secure cupped retainer for seat
- Available in various materials for optimized chemical resistance
- Proven, reliable and economical solution

## Operating range (see note on page 1)

Shaft diameter:  $d_{s1} = 29 \dots 400 \text{ mm}$  (1.14" ... 15.75")  
 Pressure:  $p = 0 \dots 160 \text{ bar}$  (2,320 PSI)  
 Temperature:  $t = -46 \text{ °C} \dots +230 \text{ °C}$  (-51 °F ... +446 °F)  
 Sliding velocity:  $v_{\theta} = \text{up to } 227 \text{ m/s}$  (744 ft/s)

## Materials

Seal face: Silicon carbide with DLC coating,  
 Carbon graphite  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: FKM  
 Metal parts: 1.4006 or other stainless steels

Other materials on request.

Available also with EagleBurgmann DiamondFace technology.

## Standards and approvals

- NACE

## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Hydrocarbon gas
- Ammonia
- Nitrogen
- Air
- Centrifugal compressors
- Turbo expanders
- Blowers

## DGS Tandem seal with intermediate labyrinth

Application: where product leakage to the atmosphere is unacceptable, e.g. H<sub>2</sub>, ethylene or propylene compressors. With this type of seal, the product pressure to be sealed is reduced via the seal on the process side. The entire process gas leakage is routed to the flare via connection "B". The bearing side seal is pressurized with secondary seal gas (nitrogen) via connection "C". The pressure of the secondary seal gas ensures the flow through the labyrinth to the flare/tapping point.

- A Primary seal gas supply
- B Primary vent
- C Secondary gas seal supply
- S Secondary vent
- D Separation gas supply

## Item Description

- | Item | Description                                  |
|------|--|
| 1    | Seal face, stationary                        |
| 2    | Seat, rotating                               |
| 3    | Thrust ring                                  |
| 4    | Spring                                       |
| 5    | Shaft sleeve and seat retainer               |
| 6    | Intermediate sleeve and seat retainer        |
| 7, 8 | Housing (size matched to installation space) |
| 9    | Separation seal (CSR)                        |
| 10   | Labyrinth                                    |
| 11   | Intermediate labyrinth                       |

## Other available seal arrangements

### DGS Tandem seal

Application: where no  $N_2$  is available and minimal process gas leakage to the atmosphere is acceptable, e.g. gas pipeline compressors. The seal on the bearing side is intended as a safety seal. The tandem arrangement offers particularly good operational safety. The process side and bearing side seals are able to withstand the full pressure. In normal operation, only the process side seal reduces the full pressure. The space between the process side and bearing side seals is routed to the flare via connection "B". The pressure to be sealed on the bearing side corresponds to the flare pressure. There is thus very little leakage to the bearing side or to the vent. If the primary seal fails, the secondary seal is activated as a back-up and operates at primary seal conditions.

- A Primary seal gas supply
- B Primary vent
- S Secondary vent
- D Separation gas supply

### DGS Single seal

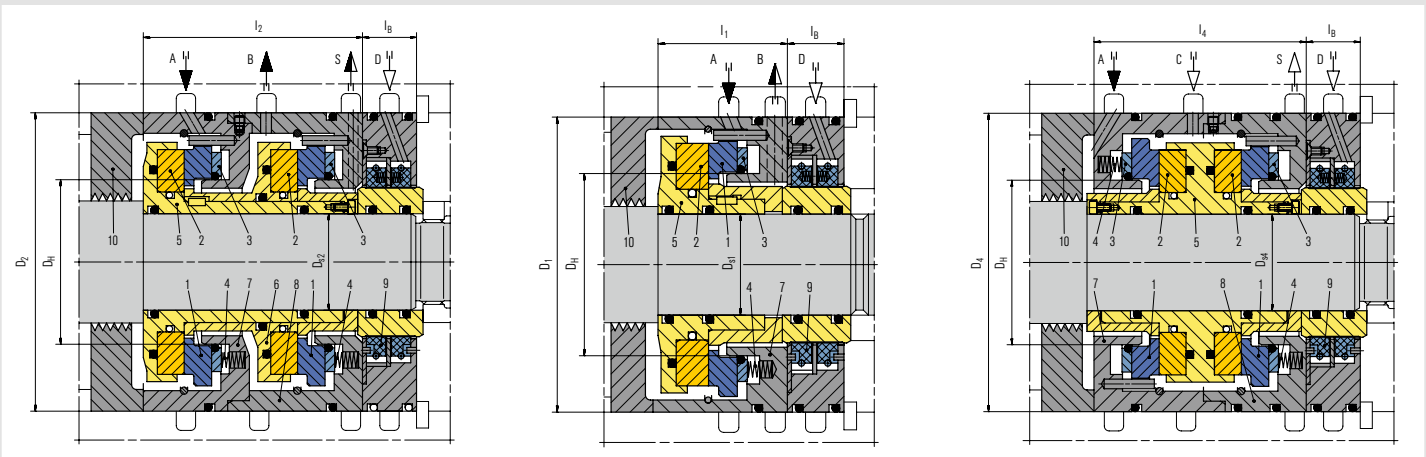
Application: where leakage of the product into the atmosphere is not harmful, e.g. from air or nitrogen compressors or the axial cavity does not allow a tandem seal (e.g. geared compressors). This version allows process gas leakage to the corresponding flare / vent connection. Primary seal leakage is dissipated with the separation gas to the vent. The gas to be sealed must also be filtered and routed to the seal chamber via connection "A". The resulting flow from the sealed space to the impeller side prevents contaminated / wet gas reaching the Dry Gas Seal on the process gas side, e.g. towards the labyrinth.

- A Seal gas supply
- B Vent
- D Separation gas supply

### DGS Double seal

Application: where product leakage to the atmosphere/ flare is unacceptable or for low pressure applications. Seal gas leakage into the product needs to be permitted (seal gas pressure  $p_3 > p_1$ ). This is used when a neutral seal gas is available at the appropriate pressure. Typical applications can be found in the chemical and petrochemical industries, e.g. in HC gas compressors. A seal gas, e.g. nitrogen at a pressure higher than the product pressure, is supplied between the seals via connection "C". Part of the seal gas leakage dissipates to the bearing side, while the other part goes to the product.

- A Buffer gas supply
- C Seal gas supply
- S Vent
- D Separation gas supply



## Product variants

### DGS32

Due to the cost effective design, simple components and a hard/soft sliding material combination the DGS32 represents a reliable and economical solution for applications with partial contact of seal faces. This include, for example, slow-roll and turning operation (steam turbine driven compressors) or long and very frequent start/stop cycles.

#### Operating range

Shaft diameter:  $d_{s1} = 30 \dots 400 \text{ mm}$  (1.18" ... 15.75")  
 Pressure:  $p = 0 \dots 120 \text{ bar}$  (0 ... 1,740 PSI)  
 Temperature:  $t = -46 \text{ °C} \dots +230 \text{ °C}$  (-51 °F ... +446 °F)  
 Sliding velocity:  $v_g = 0 \dots 140 \text{ m/s}$  (0 ... 295 ft/s)

#### Materials

Seal face: Carbon graphite  
 Seat: Silicon carbide  
 Secondary seals: FKM or other elastomers depending on product gas composition  
 Metal parts: 1.4006 or other stainless steels

### DGS20

Seals of the DGS20 series are the standard for medium pressures up to 120 bar (1,740 PSI). They have proven their suitability in thousands of applications worldwide. The seals are very rugged and are based on a mature design concept.

#### Operating range

Shaft diameter:  $d_{s1} = 40 \dots 280 \text{ mm}$  (1.57" ... 11.02")  
 Pressure:  $p = 20 \dots 120 \text{ bar}$  (290 ... 1,740 PSI)  
 Temperature:  $t = -46 \text{ °C} \dots +230 \text{ °C}$  (-51 °F ... +446 °F)  
 Sliding velocity:  $v_g = \text{up to } 227 \text{ m/s}$  (744 ft/s)

#### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: FKM or other elastomers depending on product gas composition  
 Metal parts: 1.4006 or other stainless steels

### DGS21

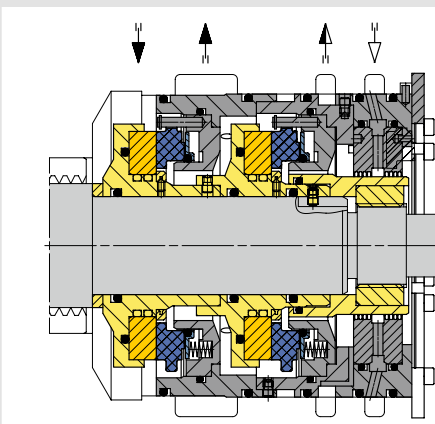
Seals of the DGS21 series offer the lowest leakages of the elastomer-based DGS platform. They are therefore suitable for applications with high demands on low leakage. As some parts of the high-pressure PDGS series are used in the DGS21 series, the seal can be applied up to a pressure of 160 bar (2,320 PSI).

#### Operating range

Shaft diameter:  $d_{s1} = 68 \dots 280 \text{ mm}$  (2.68" ... 11.02")  
 Pressure:  $p = 50 \dots 160 \text{ bar}$  (725 ... 2,320 PSI)  
 Temperature:  $t = -46 \text{ °C} \dots +230 \text{ °C}$  (-51 °F ... +446 °F)  
 Sliding velocity:  $v_g = \text{up to } 227 \text{ m/s}$  (744 ft/s)

#### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: FKM or other elastomers depending on product gas composition  
 Metal parts: 1.4006 or other stainless steels



# PDGS



A well-established compressor seal for high pressure and both low and high temperature applications. Innovative design features allow it to cope with even the highest pressures without problems. The application of U-cups and special dynamic sealing elements opens up a wide range of uses for this versatile and successful seal series.

### Features

- Gas-lubricated
- Uni-directional or bi-directional
- Elastomer-free
- Ready-to-fit cartridge unit
- Single, double, tandem seal and tandem with intermediate labyrinth available
- Separation seals as labyrinths, radial clearance seals or CobraSeal are optionally available

### Advantages

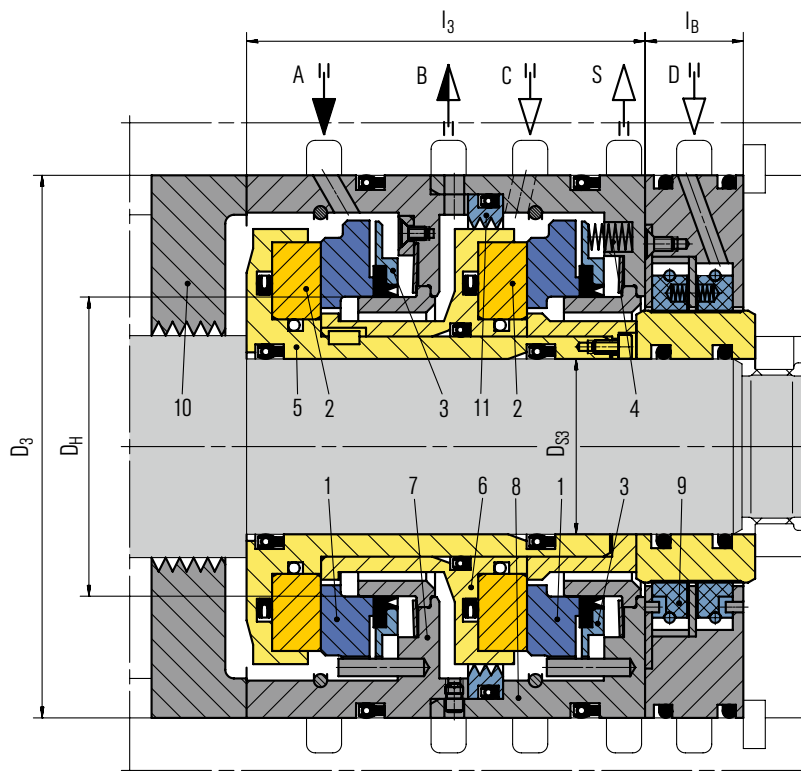
- Wear-free and contact-free operation
- Self-cleaning 3D gas grooves
- High gas film stiffness
- Secure cupped retainer for seat
- Available in various materials for optimized chemical resistance
- Proven, reliable and economical solution

### Operating range (see note on page 1)

Shaft diameter:  $D_{S1} = 29 \dots 355 \text{ mm}$  (1.14" ... 13.98")  
 Pressure:  $p = 0 \dots 450 \text{ bar}$  (0 ... 6,525 PSI)  
 Temperature:  $t = -170 \text{ °C} \dots +230 \text{ °C}$   
 (-274 °F ... +446 °F)  
 Sliding velocity:  $v_{qj} = 0.6 \dots 200 \text{ m/s}$   
 (2 ft/s ... 656 ft/s)

### Standards and approvals

- NACE



### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: Polymer rings  
 Metal parts: 1.4006 or other stainless steels.

Other materials on request.

Available also with EagleBurgmann DiamondFace technology.

### Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Hydrocarbon gas
- Ammonia
- Nitrogen
- Refrigerants
- Air
- Centrifugal compressors
- Turbo expanders
- Blowers

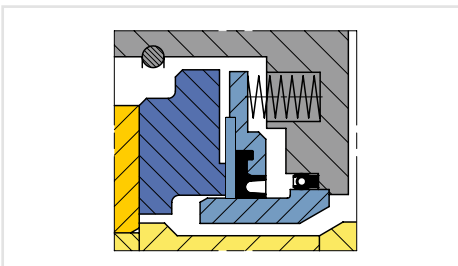
### PDGS Tandem seal with intermediate labyrinth

Application: where product leakage to the atmosphere is unacceptable, e.g. H<sub>2</sub>, ethylene or propylene compressors. With this type of seal, the product pressure to be sealed is reduced via the seal on the process side. The entire process gas leakage is routed to the flare via connection "B". The bearing side seal is pressurized with secondary seal gas (nitrogen) via connection "C". The pressure of the secondary seal gas ensures the flow through the labyrinth to the flare/tapping point.

- A Primary seal gas supply
- B Primary vent
- C Secondary gas seal supply
- S Secondary vent
- D Separation gas supply

### Item Description

- | Item | Description                                  |
|------|--|
| 1    | Seal face, stationary                        |
| 2    | Seat, rotating                               |
| 3    | Thrust ring                                  |
| 4    | Spring                                       |
| 5    | Shaft sleeve and seat retainer               |
| 6    | Intermediate sleeve                          |
| 7, 8 | Housing (size matched to installation space) |
| 9    | Separation seal (CSR)                        |
| 10   | Labyrinth                                    |
| 11   | Intermediate labyrinth                       |



Main components of the dynamic secondary seal of the PDGS are made of the extremely rigid material tungsten carbide which allows an optimum control of the extrusion clearance over the full range of operation. The specific design of the polymer cup seals ensures minimum sliding forces combined with wear-free operation.

## Other available seal arrangements

### PDGS Tandem seal

Application: where no  $N_2$  is available and minimal process gas leakage to the atmosphere is acceptable, e.g. gas pipeline compressors. The seal on the bearing side is intended as a safety seal. The tandem arrangement offers particularly good operational safety. The process side and bearing side seals are able to withstand the full pressure. In normal operation, only the process side seal reduces the full pressure. The space between the process side and bearing side seals is routed to the flare via connection "B". The pressure to be sealed on the bearing side corresponds to the flare pressure. There is thus very little leakage to the bearing side or to the vent. If the primary seal fails, the secondary seal is activated as a back-up and operates at primary seal conditions.

- A Primary seal gas supply
- B Primary vent
- S Secondary vent
- D Separation gas supply

### PDGS Single seal

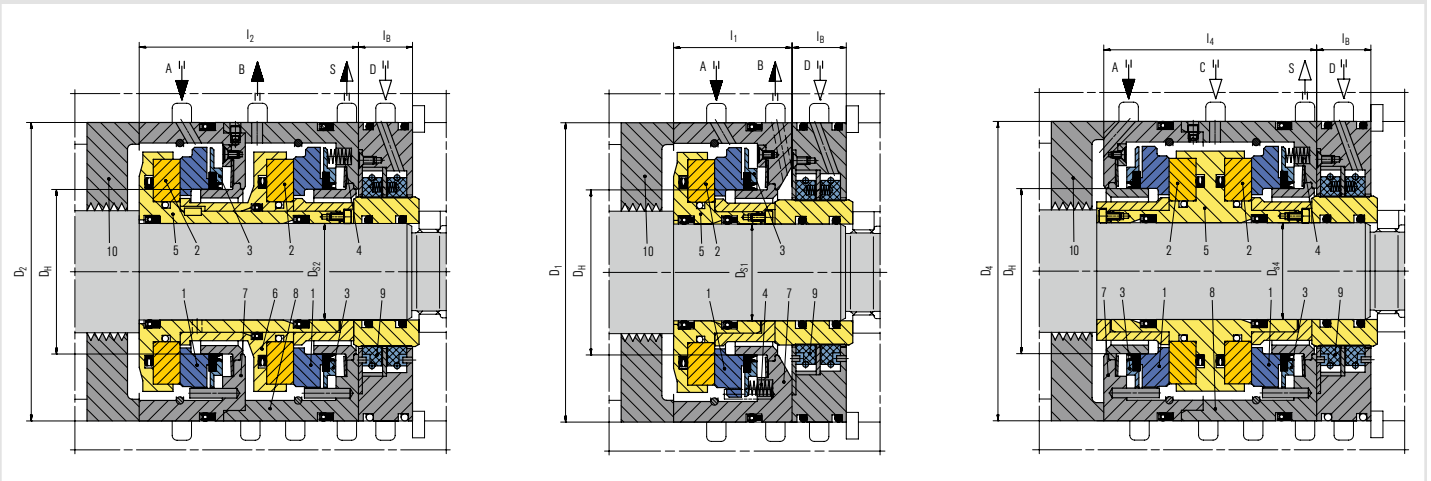
Application: where leakage of the product into the atmosphere is not harmful, e.g. from air or nitrogen compressors or the axial cavity does not allow a tandem seal (e.g. geared compressors). This version allows process gas leakage to the corresponding flare / vent connection. Primary seal leakage is dissipated with the separation gas to the vent. The gas to be sealed must also be filtered and routed to the seal chamber via connection "A". The resulting flow from the sealed space to the impeller side prevents contaminated / wet gas reaching the Dry Gas Seal on the process gas side, e.g. towards the labyrinth.

- A Seal gas supply
- B Vent
- D Separation gas supply

### PDGS Double seal

Application: where product leakage to the atmosphere/ flare is unacceptable or for low pressure applications. Seal gas leakage into the product needs to be permitted (seal gas pressure  $p_3 > p_1$ ). This is used when a neutral seal gas is available at the appropriate pressure. Typical applications can be found in the chemical and petrochemical industries, e.g. in HC gas compressors. A seal gas, e.g. nitrogen at a pressure higher than the product pressure, is supplied between the seals via connection "C". Part of the seal gas leakage dissipates to the bearing side, while the other part goes to the product.

- A Buffer gas supply
- C Seal gas supply
- S Vent
- D Separation gas supply



## Product variants

### PDGS51

The PDGS51 was developed for use in extreme high pressure applications. Adapted sliding faces and an innovative design of the shaft sleeve allow pressures up to 450 bar (6,525 PSI) and more. Most of these seals are successful in use in compressors for gas injection.

#### Operating range

Shaft diameter:  $d_{s1} = 100 \dots 165 \text{ mm}$  (3.94" ... 6.49")  
 Pressure:  $p = \text{up to } 450 \text{ bar}$  (6,525 PSI)  
 Temperature:  $t = -50 \text{ }^\circ\text{C} \dots +230 \text{ }^\circ\text{C}$  (-58 °F ... +446 °F)  
 Sliding velocity:  $v_g = 0,6 \dots 190 \text{ m/s}$  (2 ... 623 ft/s)

#### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: Polymer rings  
 Metal parts: 1.4006 or other stainless steels

### PDGS10

The PDGS10 is the standard seal for high pressures up to 220 bar (3,191 PSI). Since many years the seal demonstrates their reliability worldwide in a wide variety of applications. It is characterized by very low leakage and sets the standard in the market for low-emission compressor gas seals.

#### Operating range

Shaft diameter:  $d_{s1} = 40 \dots 390 \text{ mm}$  (1.57" ... 15.35")  
 Pressure:  $p = 0 \dots 220 \text{ bar}$  (725 ... 3,191 PSI)  
 Temperature:  $t = -50 \text{ }^\circ\text{C} \dots +230 \text{ }^\circ\text{C}$  (-58 °F ... +446 °F)  
 Sliding velocity:  $v_g = \text{up to } 227 \text{ m/s}$  (744 ft/s)

#### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: Polymer rings  
 Metal parts: 1.4006 or other stainless steels

### PDGS15

The PDGS15 series enable the sealing of very cold media up to  $-200 \text{ }^\circ\text{C}$  (-328 °F). Therefore special, cold-resistant steels are used. For years, these seals are successfully used in LNG liquefaction plants, for example.

#### Operating range

Shaft diameter:  $d_{s1} = 40 \dots 390 \text{ mm}$  (1.57" ... 15.35")  
 Pressure:  $p = 0 \dots 50 \text{ bar}$  (725 PSI)  
 Temperature:  $t = -200 \text{ }^\circ\text{C} \dots +230 \text{ }^\circ\text{C}$   
 (-328 °F ... +446 °F)  
 Sliding velocity:  $v_g = \text{up to } 227 \text{ m/s}$  (744 ft/s)

#### Materials

Seal face: Silicon carbide with DLC coating  
 Seat: Silicon carbide with DLC coating  
 Secondary seals: Polymer rings  
 Metal parts: 1.4006 or other stainless steels

# MDGS



EagleBurgmann MDGS are rugged seals for screw compressors. They have a rotating ring made from ductile material with a high-performance coating. Rotating rings are "in-situ shrouded", making them practically indestructible. The coating offers excellent wear resistance in the low speed range (e.g. coast-down operation) in which contact between the seal faces is unavoidable.

The stationary, spring-mounted system is optionally available as a sub-cartridge in combination with a rotating seat made from ductile material. A secondary sealing function using O-rings allows it to be applied as a component seal.

## Features

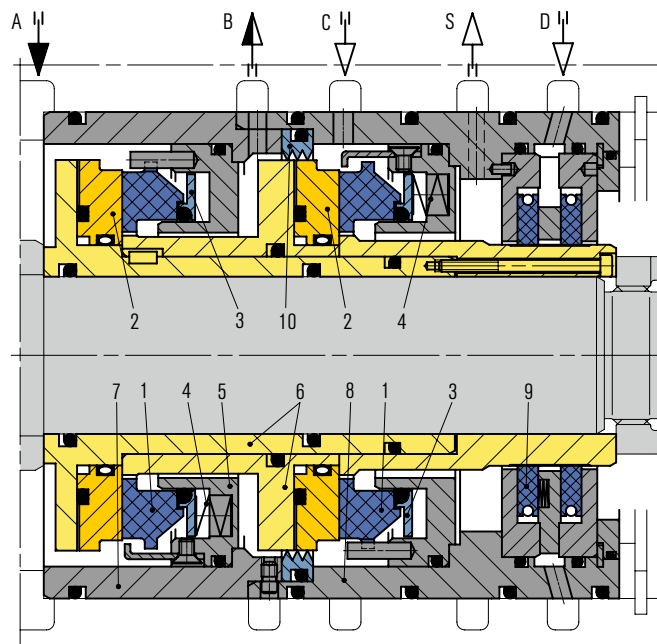
- Gas-lubricated
- Bi-directional
- Compact, radial design
- Ready-to-fit cartridge unit, also available as a component seal
- Single, double, tandem seal and tandem with intermediate labyrinth available

## Advantages

- Wear-free and contact-free operation
- Self-cleaning 3D gas grooves
- High gas film stiffness
- Fits into small spaces (e.g. process gas screw compressors)
- Available in various materials for optimized chemical resistance
- Proven, reliable and economical solution

## Operating range (see note on page 1)

Shaft diameter:  $d_1 = 48 \dots 200 \text{ mm}$  (1.89" ... 7.87")  
 Pressure:  $p = 0 \dots 50 \text{ bar}$  (0 ... 725 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +200 \text{ °C}$  (-4 °F ... +392 °F)  
 Sliding velocity:  $v_g = 0.6 \dots 200 \text{ m/s}$  (2 ... 656 ft/s)



## Materials

Seal face: Carbon graphite  
 Seat: Ductile stainless steel with DM-TiN coating  
 Secondary seals: FKM  
 Metal parts: 1.4006 or other stainless steels.

## Standards and approvals

- NACE

## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Hydrocarbon gas
- Nitrogen
- Air
- Centrifugal compressors
- Dry process gas screw compressors
- Blowers

## MDGS Tandem seal with intermediate labyrinth

Application: where product leakage to the atmosphere is unacceptable, e.g.  $\text{H}_2$ , ethylene or propylene compressors. With this type of seal, the product pressure to be sealed is reduced via the seal on the process side. The entire process gas leakage is routed to the flare via connection "B". The bearing side seal is pressurized with secondary seal gas (nitrogen) via connection "C". The pressure of the secondary seal gas ensures the flow through the labyrinth to the flare/tapping point.

- A Primary seal gas supply
- B Primary vent
- C Secondary gas seal supply
- S Secondary vent
- D Separation gas supply

## Item Description

- | Item | Description                                  |
|------|--|
| 1    | Seal face, stationary                        |
| 2    | Seat, rotating                               |
| 3    | Thrust ring                                  |
| 4    | Spring                                       |
| 5    | Adapter                                      |
| 6    | Shaft sleeve, Intermediate sleeve            |
| 7, 8 | Housing (size matched to installation space) |
| 9    | Carbon ring separation seal (CSE)            |
| 10   | Intermediate labyrinth                       |



## Other available seal arrangements

### MDGS Tandem seal

Application: where no  $N_2$  is available and minimal process gas leakage to the atmosphere is acceptable, e.g. gas pipeline compressors. The seal on the bearing side is intended as a safety seal. The tandem arrangement offers particularly good operational safety. The process side and bearing side seals are able to withstand the full pressure. In normal operation, only the process side seal reduces the full pressure. The space between the process side and bearing side seals is routed to the flare via connection "B". The pressure to be sealed on the bearing side corresponds to the flare pressure. There is thus very little leakage to the bearing side or to the vent. If the primary seal fails, the secondary seal is activated as a back-up and operates at primary seal conditions.

- A Primary seal gas supply
- B Primary vent
- S Secondary vent
- D Separation gas supply

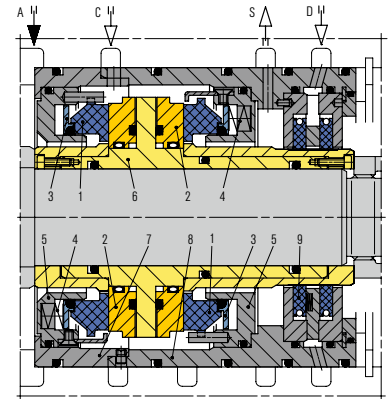
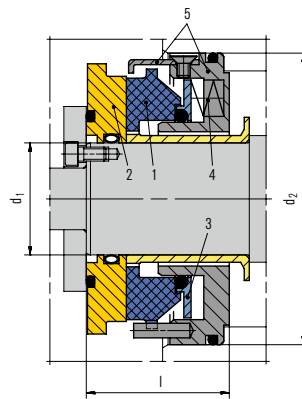
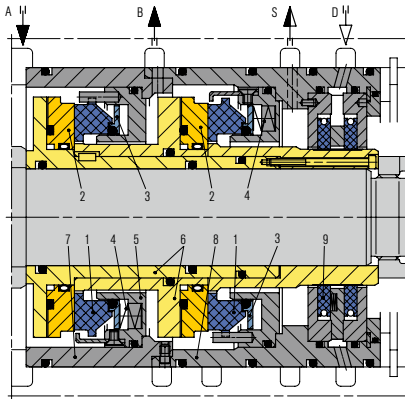
### MDGS Single seal

Application: where leakage of the product into the atmosphere is not harmful, e.g. from air or nitrogen compressors or the axial cavity does not allow a tandem seal (e.g. geared compressors). This version allows process gas leakage to the corresponding flare / vent connection. Primary seal leakage is dissipated with the separation gas to the vent. The gas to be sealed must also be filtered and routed to the seal chamber via connection "A". The resulting flow from the sealed space to the impeller side prevents contaminated / wet gas reaching the Dry Gas Seal on the process gas side, e.g. towards the labyrinth.

### MDGS Double seal

Application: where product leakage to the atmosphere/ flare is unacceptable or for low pressure applications. Seal gas leakage into the product needs to be permitted (seal gas pressure  $p_3 > p_1$ ). This is used when a neutral seal gas is available at the appropriate pressure. Typical applications can be found in the chemical and petrochemical industries, e.g. in HC gas compressors. A seal gas, e.g. nitrogen at a pressure higher than the product pressure, is supplied between the seals via connection "C". Part of the seal gas leakage dissipates to the bearing side, while the other part goes to the product.

- A Buffer gas supply
- C Seal gas supply
- S Vent
- D Separation gas supply



# TDGS



The gas seal for single-stage steam turbines. A metal bellows allows it to work reliably even at high temperatures. Any steam leakage that does occur will be just a fraction of the leakage from carbon ring seals. This both saves energy and improves the performance of the turbine. The bearing oil is no longer contaminated by condensed steam, extending the bearing life and reducing maintenance costs accordingly.

### Features

- Gas-lubricated
- Uni-directional or bi-directional
- Elastomer-free, no dynamic O-ring
- Ready-to-fit cartridge unit
- Single seal available

### Advantages

- Wear-free and contact-free operation
- Self-cleaning 3D gas grooves
- High gas film stiffness
- Extremely low steam leakage
- Bearing oil not contaminated with condensed steam

### Operating range (see note on page 1)

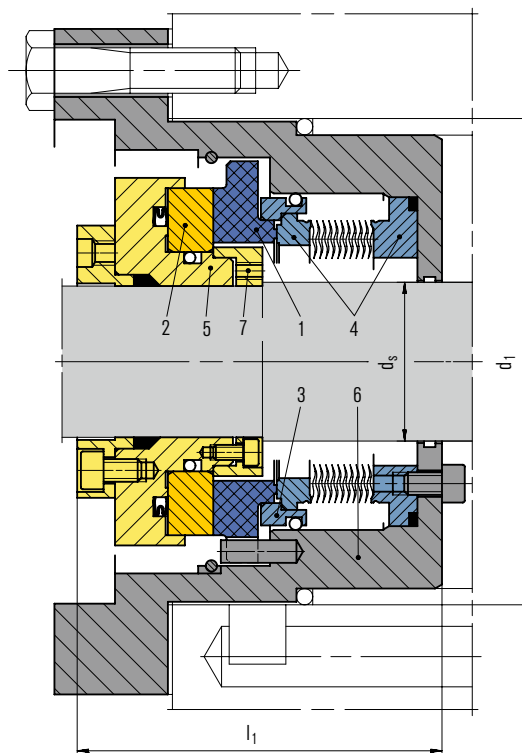
Shaft diameter:  $d_s = 40 \dots 140 \text{ mm}$  (1.57" ... 5.51")

Pressure:  $p = 0 \dots 10 \text{ bar}$  (0 ... 145 PSI)

Temperature:  $t = -50 \text{ °C} \dots +450 \text{ °C}$

(-58 °F ... +842 °F)

Sliding velocity:  $v_g = 130 \text{ m/s}$  (427 ft/s)



### Materials

Seal face: Carbon graphite  
Seat: Silicon carbided

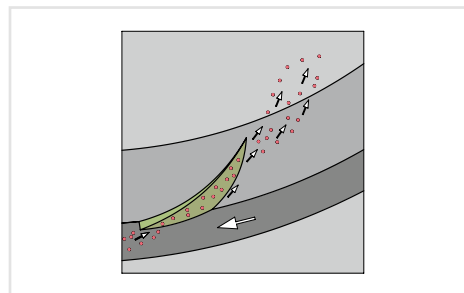
### Standards and approvals

- NACE

### Recommended applications

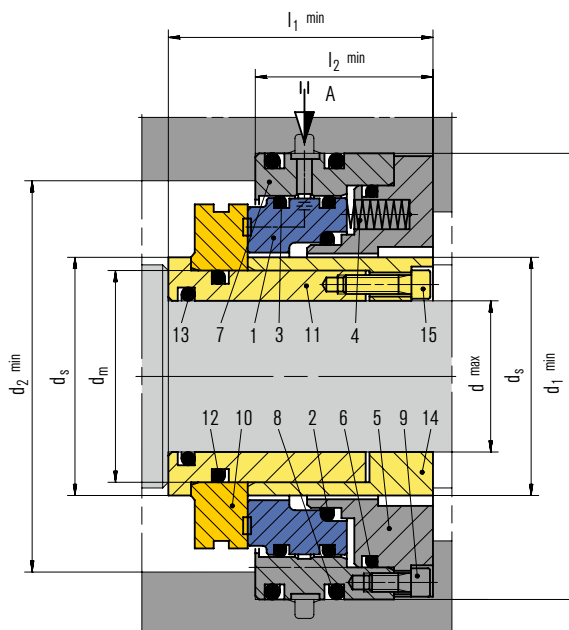
- Refining technology
- Petrochemical industry
- Power plant technology
- Single stage steam turbines

Item	Description
1	Seal face, stationary
2	Seat, rotating
3	Sleeve
4	Metal bellows cartridge unit
5	Shaft sleeve
6	Housing (size matched to installation space)
7	Clamping ring



One outstanding feature of the EagleBurgmann gas grooves is its inclined bottom (picture: V-grooves, uni-directional). The lack of sharp baffle edges at the groove outlet allows dirt particles to be pulled through the sealing gap, reliably avoiding any clogging and guaranteeing safe operation. If deposits do build up in the sealing gap while the turbine is idle, they are expelled once the machine is restarted.

# NF941



Seals from the NF941 series are used in screw compressors for special applications. They are hybrid seals that seal both aerostatically and aerodynamically. The separation gas is routed through holes in the stationary seal ring directly between the seal faces, while the lift-off is caused by specially designed gas grooves.

### Features

- Single seal with double seal function
- Non-contacting from static to high speed condition
- Balanced
- Bi-directional
- Stationary multiple springs

### Advantages

- Wear-free and contact-free operation
- Prevents the ingress of foreign particles

### Operating range (see note on page 1)

Pressure:  $p = 5 \text{ bar (73 PSI)}$   
 Temperature:  $t = -20 \text{ °C ... } +200 \text{ °C (-4 °F ... } +392 \text{ °F)}$   
 Sliding velocity:  $v_g = 60 \text{ m/s (197 ft/s)}$

### Materials

Seal face: High-density carbon graphite  
 Seat: Ductile stainless steel with TiN-coating or silicon carbide  
 Secondary seals: FKM  
 Metal parts: CrNiMo steel

### Recommended applications

- Process industry
- Single wafer cleaning systems
- Dry screw compressors
- Blowers
- Agitators

### Item

### Description

1	Seal face
2, 3, 6, 8, 12, 13	O-Ring
4	Spring
5	Adapter
7	Housing
9, 15	HSH Cap screw
10	Seat
11	Shaft sleeve
14	Clamp sleeve
A	Seal gas supply

# WRS



The WRS is an **oil-lubricated** seal that safely seals various types of compressors and organic media. With its rugged design, low life-cycle costs and long service life, the WRS can be found in thousands of applications. The design is optimized by using the finite element method and computational fluid dynamics.

### Features

- Oil-lubricated
- Bi-directional
- Externally pressurized
- Ready-to-fit cartridge unit
- Single, face bushing and double seal available
- Suitable for high speed
- Hydrodynamic grooves for increased operating capabilities and stabilized low leakage

### Advantages

- Low oil consumption
- Rugged seat with bandage ensures reliable operation
- Wear-free operation by use of lift-off-design
- Does not open if oil pressure drops

### Operating range (see note on page 1)

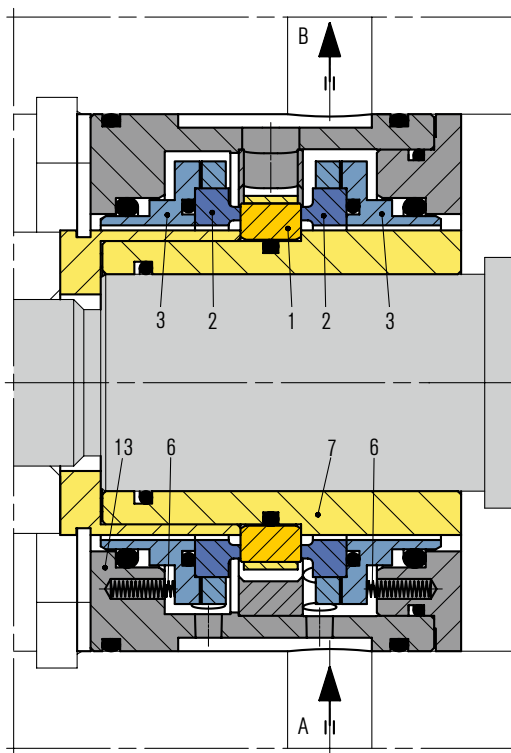
Shaft diameter: 30 ... 300 mm (1.18 " ... 11.81")

Pressure:  $p = \dots 50$  bar (725 PSI)

Gas temperature:  $t = -20$  °C ...  $+200$  °C  
( $-4$  °F ...  $+392$  °F)

Sliding velocity:  $v_{sl} = 5 \dots 100$  m/s (16 ... 328 ft/s)

Oil viscosity: ISO VG up to 68



WRS  
Double seal

### Materials

Seal face: Silicon carbide  
 Seat: Silicon carbide  
 Secondary seals: FKM  
 Metal parts: 1.4006 or other stainless steels

### Item Description

1	Seat, rotating
2	Seal face, stationary
3	Face housing
6	Spring
7	Shaft sleeve
13	Housing
A	Oil IN
B	Oil OUT

### Standards and approvals

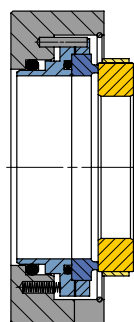
- NACE

### Recommended applications

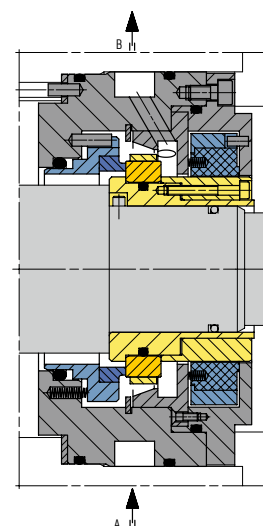
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Refrigerants
- Screw compressors
- Centrifugal compressors
- Geared compressors

### Product variants

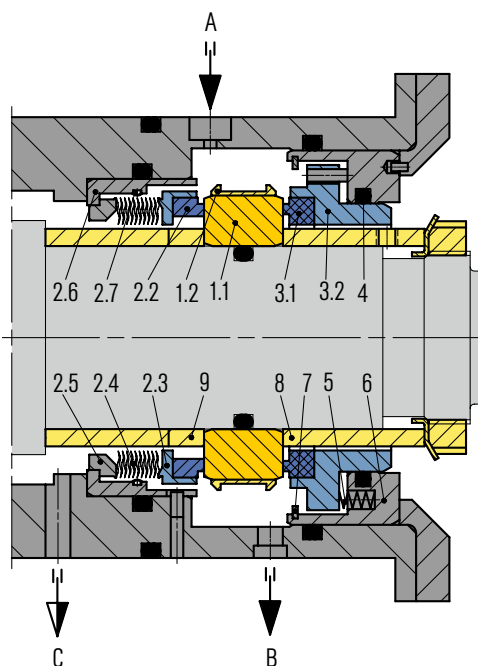
#### WRS Single seal



#### WRS Single seal with face bushing



# EBU800



This special shaft seal is characterized by its straightforward structure, compact length and quiet running even under changing pressure conditions. It also seals reliably at both high and low temperatures.

## Features

- Oil-lubricated
- Double seal
- Balanced
- Bi-directional
- Stationary bellows (process side)
- Multiple springs (bearing side)
- Shrink-fit seat
- Double-pressure balanced

## Advantages

- Suitable for high sliding velocities
- Seal does not open if oil pressure drops
- Rugged seat with bandage ensures reliable operation
- Compact design with few sealing components

## Operating range (see note on page 1)

Shaft diameter:  $d = \dots 220 \text{ mm (8.66" )}$

Pressure:  $(p_2 - p_1) = \dots 5 \text{ bar (73 PSI)}$

Sliding velocity:  $v_g = 90 \text{ m/s (295 ft/s)}$

## Materials

Bellows: AM350, Inconel® 718, Hastelloy®-C  
 Seal face: Special SiC, high-density carbon graphite  
 Seat: Silicon carbide  
 Secondary seals: FKM (bearing side)  
 Metal parts: 1.4301, Carpenter® 42, Inconel® 718, Hastelloy®-C

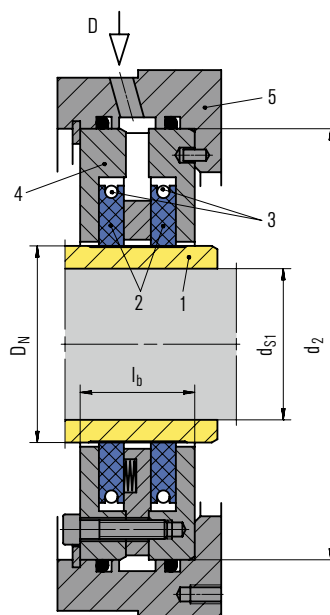
## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry

## Item Description

Item	Description
1.1	Seat
1.2, 2.3, 3.2	Retainer
2.2, 3.1	Seal face
2.4	Bellows
2.5	Adapter
4	O-Ring
5	Spring
2.6, 6	Housing
2.7	Damper
7	Retaining ring
8	Sleeve
9	Spacer
A	Oil IN
B	Oil OUT
C	Drain

# CSE



The service-proven bearing oil seal with low gas consumption. Non contact type carbon rings are segmented rings held together by a garter spring at the outer diameter. A defined minimum radial gap provides a contact-free operation. Robust design and reliable operation provide secure oil sealing even at extreme conditions.

### Features

- Non-contact type separation seal
- Gas-lubricated
- Bi-directional
- Ready-to-fit cartridge unit
- Equipped with Espey carbon rings type WKA400

### Advantages

- Low leakage
- Slow roll capability
- Insensitive to dry nitrogen

### Operating range (see note on page 1)

Shaft diameter: 38 ... 390 mm (1.50" ... 15.35")  
 Design pressure:  $p = \dots 10$  bar (145 PSI)  
 Operating pressure:  $p = 0.1 \dots 0.2$  bar (1.45 ... 2.90 PSI)  
 Temperature:  $t = -20$  °C ...  $+200$  °C (-4 °F ...  $+392$  °F)  
 Sliding velocity:  $v_g = 0 \dots 200$  m/s (656 ft/s)  
 Dew point: No limitation

Project specific special designs possible.

### Materials

Seal face: Carbon graphite impregnated  
 Secondary seals: FKM  
 Shaft sleeve: Stainless steel, TC-coated  
 Metal parts: 1.4006 or other stainless steels

### Standards and approvals

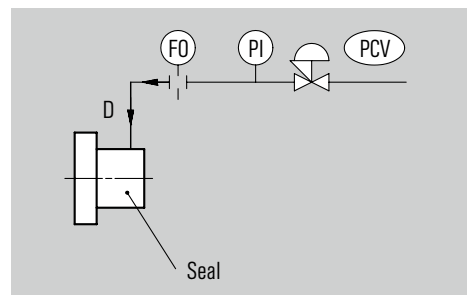
- NACE

### Recommended applications

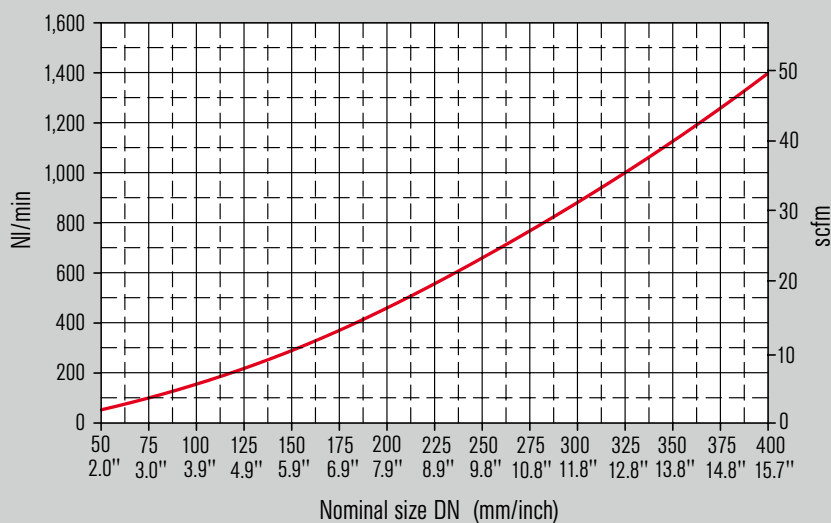
- Oil and gas industry
- Refining technology
- Petrochemical industry
- Nitrogen
- Air
- Centrifugal compressors
- Turbo expanders
- Screw compressors
- Blowers

### Item Description

- | Item | Description                                  |
|------|--|
| 1    | Shaft sleeve                                 |
| 2    | Segmented carbon ring                        |
| 3    | Garter spring                                |
| 4    | Housing of the standardized sub-cartridge    |
| 5    | Housing (size matched to installation space) |
| D    | Separation gas                               |

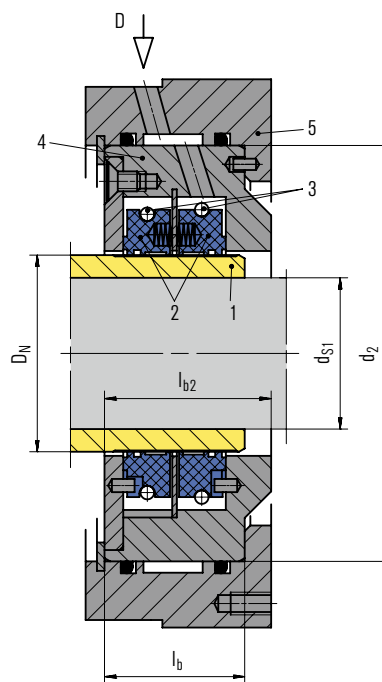


Piping and instrumentation diagram of a CSE (flow controlled separating gas supply).



Gas flow rate towards seal (required to ensure safe oil separation in every condition). Valid for flow controlled separating gas supply.

# CSR



Lift-off type carbon ring seals feature very low gas consumption for both dynamic and static operation modes. In static operation the carbon segments will contact the shaft reducing gas consumption to a minimum. In dynamic operation, the profiled inner surface of the segmented ring will ensure an aerodynamic lift-off at circumferential speeds >10 m/s (33 ft/s). The segmented carbon rings float on a very thin gas film of few  $\mu\text{m}$ .

### Features

- Lift-off type separation seal
- Gas-lubricated
- Bi-directional
- Ready-to-fit cartridge unit

### Advantages

- Very low leakage
- No increased leakage in static operation

### Operating range (see note on page 1)

Shaft diameter: 38 ... 360 mm (1.50" ... 14.17")  
 Design pressure:  $p = 0.5 \dots 10 \text{ bar}$  (7.25 ... 145 PSI)  
 Operating pressure:  $p = 0.5 \dots 0.8 \text{ bar}$  (7.25 ... 11.60 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots +200 \text{ }^\circ\text{C}$  (-4 °F ... +392 °F)  
 Sliding velocity:  $v_g = 10 \dots 140 \text{ m/s}$  (33 ... 459 ft/s)  
 Separation gas dew point at 0.8 bar (11.6 PSI):  
 $t = -50 \text{ }^\circ\text{C} \dots -20 \text{ }^\circ\text{C}$  (-58 °F ... -4 °F)

### Materials

Seal face: Carbon graphite impregnated  
 Secondary seals: FKM  
 Shaft sleeve: Stainless steel TC-coated  
 Metal parts: 1.4006 or other stainless steels

### Standards and approvals

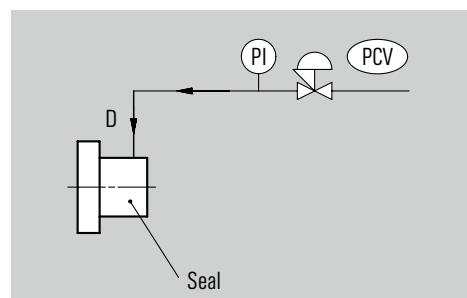
- NACE

### Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Nitrogen
- Air
- Centrifugal compressors
- Blowers

### Item Description

1	Shaft sleeve
2	Segmented carbon ring
3	Garter spring
4	Housing of standardized sub-cartridge
5	Housing (size matched to installation space)
D	Separation gas

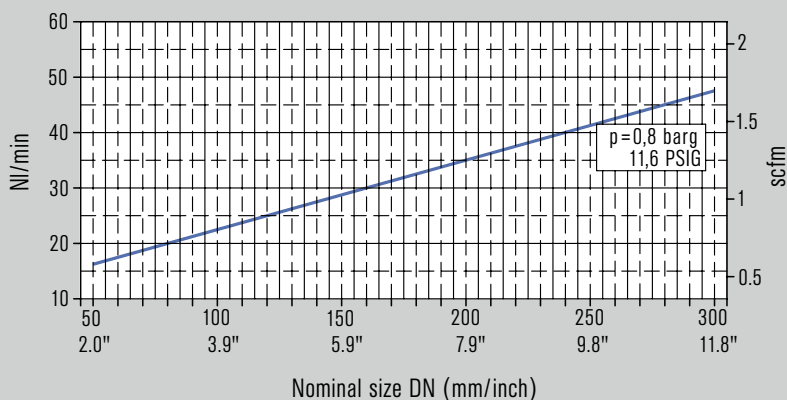


Piping and instrumentation diagram of a CSR (pressure controlled separation gas supply).

### Product variant

#### CSR version for dry nitrogen

The CSR separation seal is also available for operation with very dry nitrogen with a dew point of at least  $-90 \text{ }^\circ\text{C}$  ( $-130 \text{ }^\circ\text{F}$ ). Newly developed carbon ring materials ensure smooth operation even when the CSR is supplied with very pure nitrogen, from e.g. cryogenic production. The reliability of the system can be increased significantly as a result.



Separating gas consumption (expected)  
 Gas:  $\text{N}_2$   
 Inlet temperature:  $20 \text{ }^\circ\text{C}$  (68 °F)  
 Static and dynamic operation  
 Guaranteed gas consumption = curve value x 2

# CobaSeal



Since it was launched on the market, this innovative sealing solution has proven its worth worldwide in both first fit and retrofit applications. It consists of a rotating seat made of ductile material and a stationary, spring-loaded seal face. The separation gas is routed through axial holes in the stationary seal ring into the middle of the sliding face. It is then divided in the sealing gap into two leakage flows which are routed to the inner and outer diameters of the seal face.

## Features

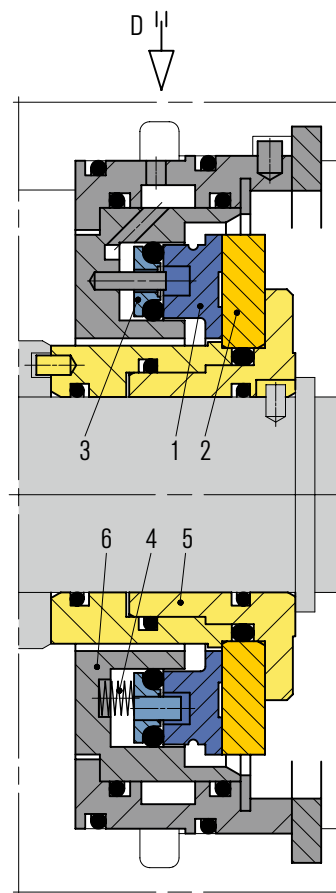
- Gas-lubricated
- Bi-directional
- Ready-to-fit cartridge unit
- Self cleaning 3D gas grooves
- Aerostatic and aerodynamic lift-off

## Advantages

- Extremely low leakage
- Double arranged (co-axial) dry gas seal with just one pair of seal faces
- Insensitive to oil contamination due to its special design
- Wear-free, non-contacting operation in all conditions
- Insensitive to radial vibrations due to axial sealing gap
- Slow-roll or turning operation capable (static lift-off)
- No limits regarding dew point of separation gas (silicon carbide instead of carbon)
- Lower N<sub>2</sub> consumption than any other system
- N<sub>2</sub> can be switched off during standstill - the gap will close and still provide the best oil sealing performance
- Best in class oil sealing by extremely small sealing gap and sling effect of rotating ring

## Operating range (see note on page 1)

Shaft diameter: 29.5 ... 355 mm (1.16" ... 13.97")  
 Design pressure (vent):  $p = 0 \dots 15 \text{ bar}$  (0 ... 218 PSI)  
 Operating pressure:  $p = 2.7 \text{ bar}$  (39.16 PSI)  
 Temperature:  $t = -20 \text{ °C} \dots +200 \text{ °C}$  (-4 °F ... +392 °F)  
 Sliding velocity:  $v_{sl} = 0 \dots 150 \text{ m/s}$  (0 ... 492 ft/s)  
 Dew point: No limitation



## Materials

Seal face: Silicon carbide\*  
 Seat: Ductile stainless steel\*  
 Secondary seals: FKM  
 Metal parts: 1.4006

\* With special EagleBurgmann high performance iDLC (in situ Diamond-Like-Carbon) coating

## Standards and approvals

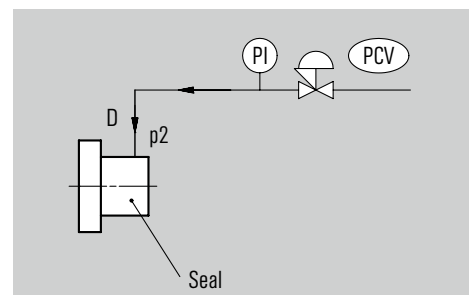
- NACE

## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Nitrogen
- Air
- Centrifugal compressors
- Blowers

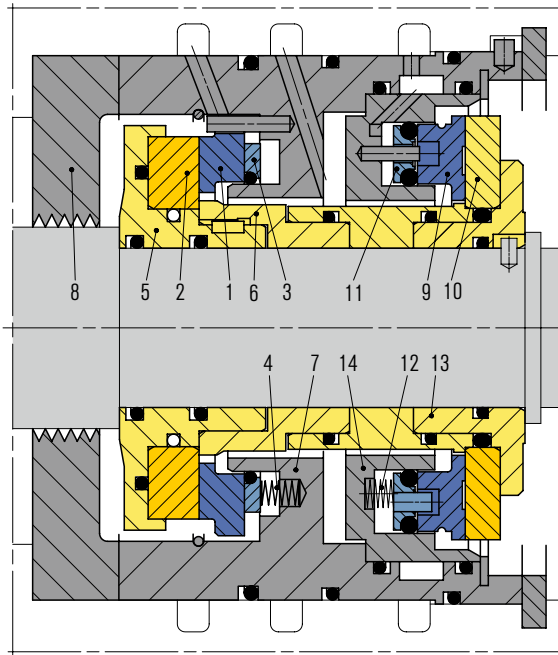
## Item Description

1	Seal face, stationary
2	Seat, rotating
3	Thrust ring
4	Spring
5	Shaft sleeve and seat retainer
6	Housing (size matched to installation space)
D	Separation gas



Piping and instrumentation diagram of a CobaSeal (pressure controlled separating gas supply).  
 Alternative solution: Differential pressure control for safe regulation of the separating gas pressure in any operating condition.





#### Option

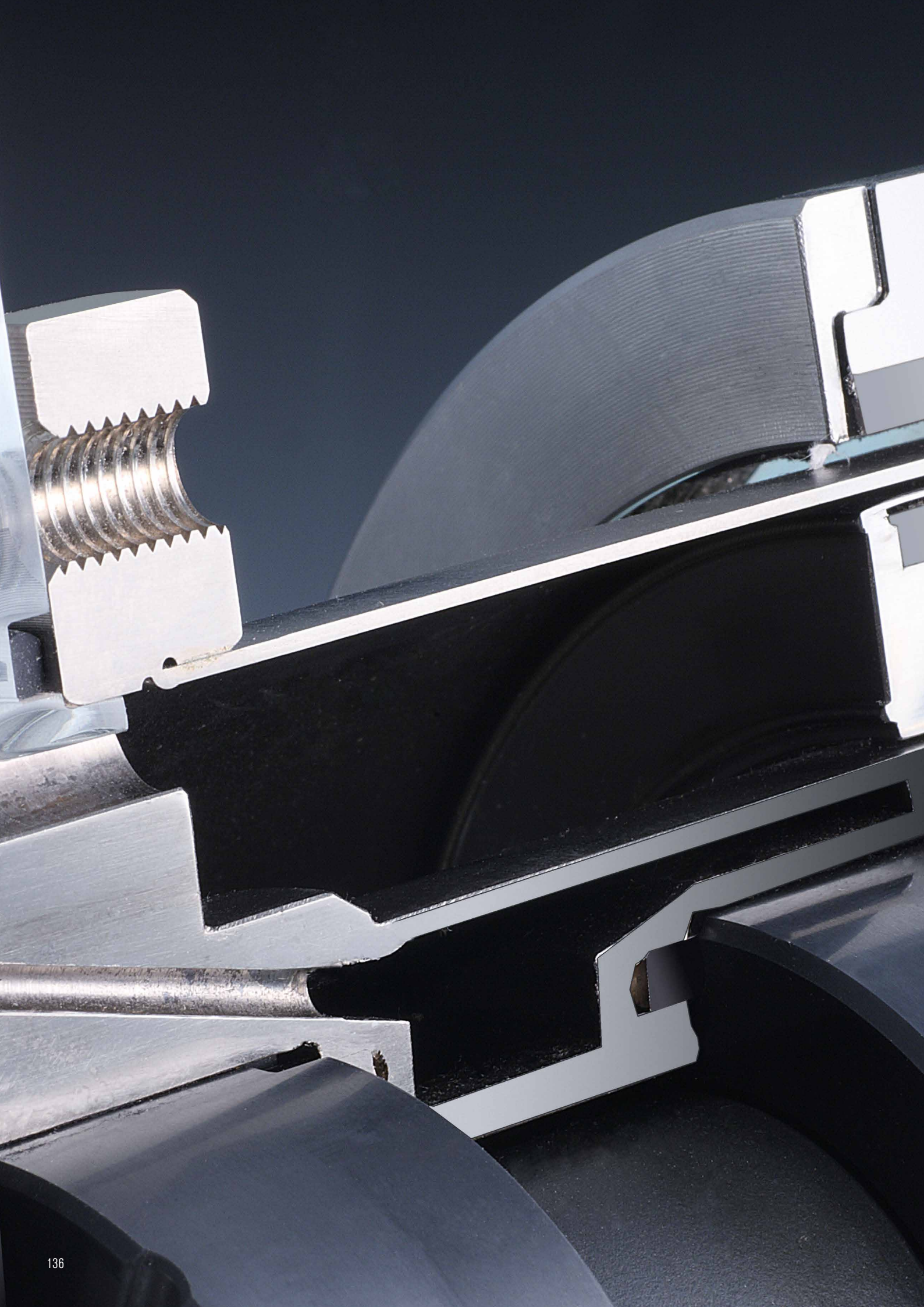
#### Single DGS + CobraSeal = Tandem seal

The CobraSeal is not just an excellent separation seal. It can also be used as a true back-up seal for greater safety. A DGS-CobraSeal tandem arrangement can be operated at sealing pressures up to 20 bar (290 PSI). It does not need an intermediate labyrinth with N<sub>2</sub> supply and existing single seals can be simply retrofitted, thus benefitting from increased operational safety.

The single DGS + CobraSeal combination is also shorter than conventional tandem seals with separation seal and costs can be saved on the gas supply system in low pressure applications.

#### Item Description

1, 9	Seal face, stationary
2, 10	Seat, rotating
3, 11	Thrust ring
4, 12	Spring
5, 13	Shaft sleeve
6	Adapter sleeve
7, 14	Housing
8	Labyrinth



Uncompromising sealing technology for very demanding applications. Hermetically sealed magnetic couplings guarantee leakage-free and maintenance-free pumping and mixing. The media remains within closed system circulation loops.

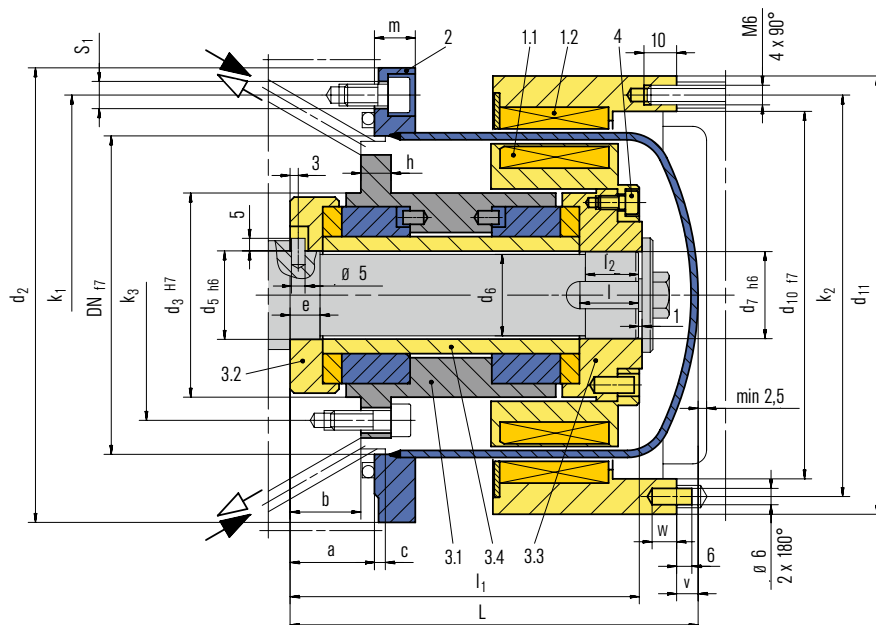
## Couplings

MAK66 .....	138
MAK685 .....	140
NMB .....	141
SMAK .....	142

## Bearings

LMF1 .....	143
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# MAK66



### Features

Magnetic couplings (MAK) are a hermetic sealing solution for pumps and agitators. Dangerous or precious media remain isolated in the closed system circuit.

### Advantages

- Magnetic coupling for standard applications
- Hermetically sealed
- No contact of torque transmitting elements
- No maintenance necessary
- Hastelloy® can for high performance
- High efficient can optional
- Product lubricated sliding bearing included

### Functional description

The power transmission occurs contact-free through magnets from the drive shaft to the product-wetted output shaft. Between the two rotating parts is the can which is bolted to the container.

### Operating range (see note on page 1)

- Shaft diameter:  $d = \dots 40 \text{ mm (1.57")}$
- Pressure:  $p = 25 \text{ bar (363 PSI)}$
- Temperature:  $t = -40 \text{ °C } \dots +250 \text{ °C}$   
( $-40 \text{ °F } \dots +482 \text{ °F}$ ) (SmCo),  
 $+120 \text{ °C (+248 °F)}$  (NdFeB)
- Speed:  $n = 3,600 \text{ min}^{-1}$
- Chemical resistance: pH 0 ... 14
- Viscosity: 0.3 ... 5,000 mPas (SiC)
- Torque: max. 462 Nm
- Solids: max. 0.1 mm; max. 5 % by weight;  
grain hardness max. 700 HV

### Materials

Sliding faces: Silicon carbide SiC (Q1), Carbon silicon impregnated SiC-C-Si (Q3), Carbon graphite resin impregnated (B)  
Magnets: Samarium-Cobalt (MA3), Neodymium-Iron-Boron (MA8)  
Metal parts: CrNiMo steel 1.4571 (G), CrNiMo steel 1.4462 (G1), Hastelloy® C-4 2.4610 (M))

Item	Description
1	Coupling
1.1	Inner rotor
1.2	Outer rotor
2	Can
3	Bearing assembly
3.1	Radial journal bearing
3.2, 3.3	Axial journal bearing
3.4	Shaft sleeve
4	HSH Cap screw

### Recommended applications

- Chemical industry
- Oil and gas industry
- Refining technology
- Pharmaceutical industry
- Food processing industry
- Centrifugal pumps
- Gear pumps
- Top drive mixers/agitators
- Fans
- Blowers
- Autoclaves

### Product variants

- Different variants are available to meet specific requirements:
- Coolable or heatable bearing arrangements
  - Vertical drive with dry running roller bearing
  - High temperature variant
  - Without bearing
- Can variants:
- Double wall
  - High pressure can
  - Ceramic, PEEK carbon fiber, Titanium cans



Ceramic and PEEK carbon fiber cans

### Static break-away torque (Nm)

DN	60		75		110		135		165		
No. of poles	8		10		16		20		24		
Material	MA3	MA8	MA3	MA8	MA3	MA8	MA3	MA8	MA3	MA8	
2	6.5	9	9	13	24	33					
Magnet length in cm	4	14.5	20	21	29	53	74	85	119	115	160
6	22	31	34	48	85	119	128	180	185	259	
8							176	247	260	364	
10									330	462	

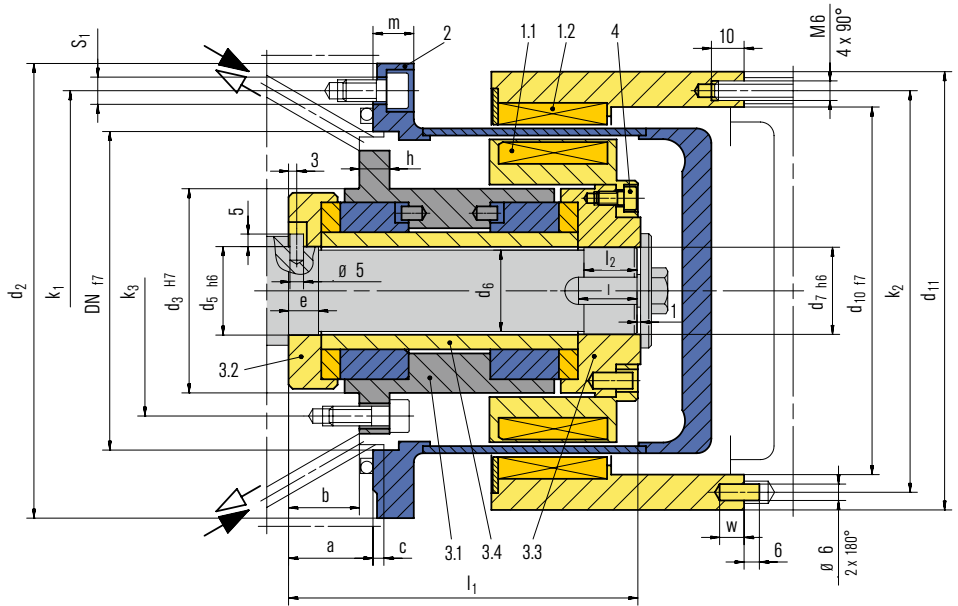
Static break-away torque (Nm) at room temperature.

Magnet material: MA3 = SmCo, MA8 = NdFeB

### Dimensions in mm

DN	LK	L	Can							Outer rotor				
			DN	d <sub>2</sub>	a	c	m	k <sub>1</sub>	s <sub>1</sub>	d <sub>10</sub>	d <sub>11</sub>	V	W	k <sub>2</sub>
75	2-6	119	75	118	17	4	13	100	9	90	110	0	5	100
110	2-6	146	110	153	31	4	13	133	9	125	145	4	5	135
135	4-8	156	135	178	17	4	14	158	9	150	170	4	5	160
165	4-10	187	163.5	218	17	5	16	192	11	178	198	5	8	188
Bearing arrangement														
DN	DNL	d <sub>3</sub>	d <sub>5</sub>	d <sub>6</sub>	b	e	l <sub>1</sub>	l <sub>2</sub>	h	k <sub>3</sub>	d <sub>7</sub>	l	t	u
75	22	44	16.5	15.8	21	8	103	29	7	55	16	16	18	5
110	43	75	32.5	31.5	26	11	128.5	20	8	87	32	22	35	10
135	43	75	32.5	31.5	26	11	138.5	20	8	87	32	22	35	10
165	55	92	40.5	39.5	27	12	169.5	30	10	103	40	32	46	12

# MAK685



## Features

Magnetic couplings (MAK) are a hermetic sealing solution for pumps and agitators. Dangerous or precious media remain isolated in the closed system circuit.

## Advantages

- Magnetic coupling for applications acc. to API 685 (similar to API 610)
- Hermetically sealed
- Single seal
- No contact of torque transmitting elements
- No maintenance necessary
- Hastelloy® can for high performance
- High efficiency can optional
- Product-lubricated sliding bearings included

## Functional description

The power transmission occurs contact-free through magnets from the drive shaft to the product-wetted output shaft. Between the two rotating parts is the can which is bolted to the container.

## Operating range (see note on page 1)

Shaft diameter:  $d = \dots 40 \text{ mm (1.57")}$   
 Pressure:  $p = 40 \text{ bar (580 PSI)}$   
 Temperature:  $t = -40 \text{ }^\circ\text{C} \dots +250 \text{ }^\circ\text{C}$   
 ( $-40 \text{ }^\circ\text{F} \dots +482 \text{ }^\circ\text{F}$ ) (SmCo),  
 $+120 \text{ }^\circ\text{C (+248 }^\circ\text{F)}$  (NdFeB)  
 Speed:  $n = 3,600 \text{ min}^{-1}$   
 Chemical resistance: pH 0 ... 14  
 Viscosity: 0.3 ... 5,000 mPas (SiC)  
 Torque: 434 Nm  
 Solids: max. 0.1 mm; max. 5% by weight;  
 grain hardness max. 700 HV

## Dimensions in mm

		Can								Outer rotor					
DN	LK	L	DN	d <sub>2</sub>	a	c	m	k <sub>1</sub>	s <sub>1</sub>	d <sub>10</sub>	d <sub>11</sub>	V	W	k <sub>2</sub>	
75	2-6	119	75	118	17	4	13	100	9	90	110	0	5	100	
110	2-6	156	110	168	31	4	22	133	13.5	125	145	4	5	135	
135	4-8	156	135	188	17	4	20	158	11	150	170	4	5	160	
165	4-10	198.5	163.5	218	17	5	22	192	11	178	198	5	8	188	
Bearing arrangement															
DN	DNL	d <sub>3</sub>	d <sub>5</sub>	d <sub>6</sub>	b	e	l <sub>1</sub>	l <sub>2</sub>	h	k <sub>3</sub>	d <sub>7</sub>	l	t	u	
75	22	44	16.5	15.8	21	8	103	29	7	55	16	16	18	5	
110	43	75	32.5	31.5	26	11	128.5	20	8	87	32	22	35	10	
135	43	75	32.5	31.5	26	11	138.5	20	8	87	32	22	35	10	
165	55	92	40.5	39.5	27	12	169.5	30	10	103	40	32	46	12	

## Item Description

- |          |                        |
|----------|------------------------|
| 1        | Coupling               |
| 1.1      | Inner rotor            |
| 1.2      | Outer rotor            |
| 2        | Can                    |
| 3        | Bearing assembly       |
| 3.1      | Radial journal bearing |
| 3.2, 3.3 | Axial journal bearing  |
| 3.4      | Shaft sleeve           |
| 4        | HSH Cap screw          |

## Recommended applications

- Oil and gas industry
- Refining technology
- Centrifugal pumps

## Product variants

- Different variants are available to meet specific requirements:
- High temperature variant
- High pressure can
- PEEK carbon fiber can



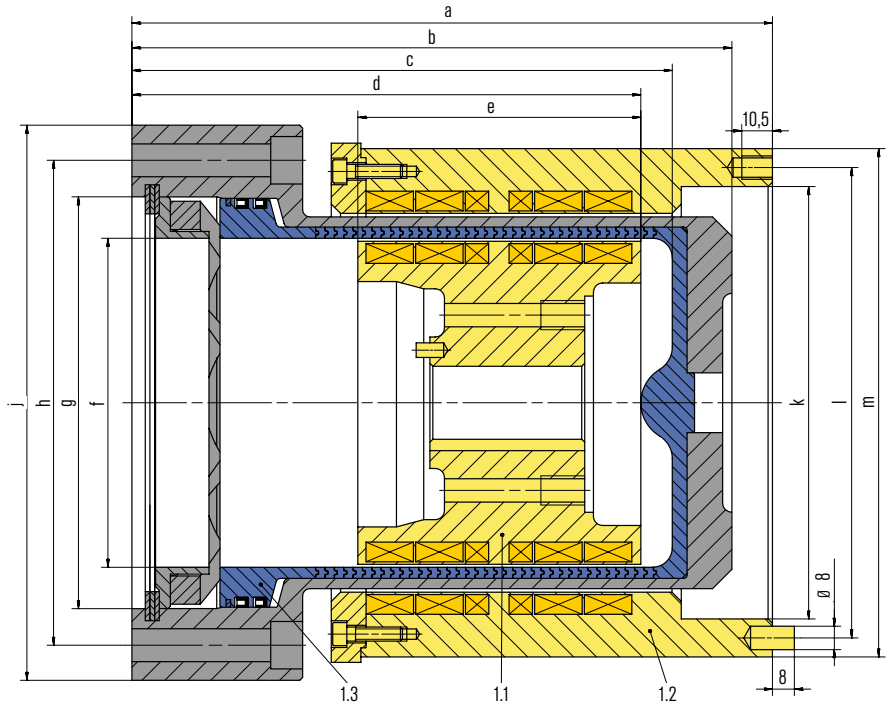
PEEK carbon fiber can

## Materials

Sliding faces: Silicon carbide SiC (Q1), Carbon silicon impregnated SiC-Si (Q3)  
 Carbon graphite resin impregnated (B)  
 Magnets: Samarium-Cobalt (MA3), Neodymium-Iron-Boron (MA8)  
 Metal parts: CrNiMo steel 1.4571 (G), CrNiMo steel 1.4462 (G1), Hastelloy® C-4 2.4610 (M)

## Standards and approvals

- API 685



### Features

The NMB series is used successfully in many applications worldwide. The can is made from PTFE-seal insulated rings and a slotted outer can, which reduces EC-losses to a minimum. They are designed for increased safety and energy savings. Thus they can handle large motor torques, high speed and high pressure.

### Advantages

- Magnetic coupling for applications acc. to API 685 (similar to API 610)
- Hermetically sealed
- No contact of torque transmitting elements
- No maintenance necessary
- High efficiency can (insulated rings and slotted outer can) for lowest eddy current losses (approx. 2 % of motor power)
- Increased safety and energy savings compared to solid Hastelloy® cans
- Sliding bearing optional

### Functional description

The power transmission occurs contact-free through magnets from the drive shaft to the product wetted output shaft. Between the two rotating parts is the can which is bolted to the container.

### Operating range (see note on page 1)

Pressure:  $p = 45 \text{ bar (653 PSI)}$   
 Shaft diameter:  $d = \dots 40 \text{ mm (1.57")}$   
 Pressure:  $p = 40 \text{ bar (580 PSI)}$   
 Temperature:  $t = -40 \text{ °C} \dots +250 \text{ °C}$   
 ( $-40 \text{ °F} \dots +482 \text{ °F}$ ) (SmCo),  
 $+120 \text{ °C (+248 °F)}$  (NdFeB)  
 Torque:  $18 \dots 1.879 \text{ Nm}$

### Materials

Magnets: Samarium cobalt (MA3),  
 Neodymium iron boron (MA8)  
 Metal parts: CrNiMo steel 1.4401/1.4436,  
 PTFE Polytetrafluoroethylene (T)

### Standards and approvals

- API 685

### Item Description

- 1.1 Inner rotor
- 1.2 Outer rotor
- 1.3 Can

### Product variants

Different variants are available to meet specific requirements:

- Dry running roller bearing
- High temperature variant
- High pressure can

### Recommended applications

- Chemical industry
- Oil and gas industry
- Refining technology
- Pharmaceutical industry
- Food processing industry
- Centrifugal pumps
- Gear pumps
- Top drive mixers/agitators
- Fans
- Blowers
- Autoclaves

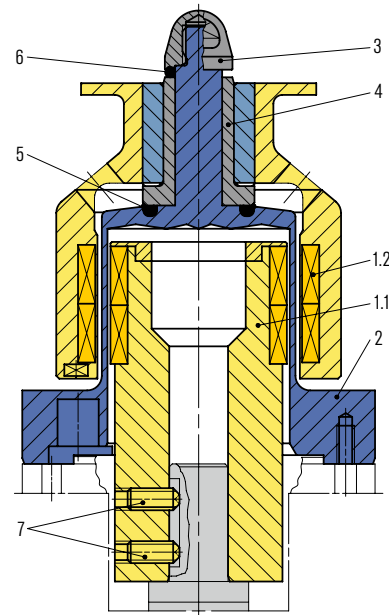
### Break-away torque (Nm)

Version	Samarium cobalt (SC2)		Neodymium iron boron (ND2)	
	Static break-away torque at 20 °C Nm	Eddy current losses at 3,000 min <sup>-1</sup> kW	Static break-away torque at 20 °C Nm	Eddy current losses at 3,000 min <sup>-1</sup> kW
16P-2R-45	114	0.60	153	0.78
16P-3R-45	204	1.10	252	1.43
16P-4R-45	291	1.60	370	2.08
16P-5R-45	370	2.10	475	2.73
16P-6R-45	451	2.60	589	3.38
16P-7R-45	544	3.10	703	4.03
16P-8R-45	628	3.60	805	4.68
22P-4R-40	460	1.70	649	2.60
22P-5R-40	604	2.33	857	3.37
22P-6R-40	748	2.97	1,019	4.13
22P-7R-40	875	3.60	1,199	4.90
22P-8R-40	1,028	4.24	1,416	5.67
22P-9R-40	1,205	4.87	1,680	6.44
22P-10R-40	1,348	5.50	1,879	7.20

### Dimensions in mm

	a	b	c	d	e	f	g	h	j	k	l
16P-2R	226.1	200.1	174.7	160	88.9	156.6	184.9	217.5	250	192	205
16P-3R	253.3	229.1	203.7	187.1	116.1	156.6	184.9	217.5	250	192	205
16P-4R	278.7	254.9	229.5	212.5	141.5	156.6	184.9	217.5	250	192	205
16P-5R	305.9	280.7	255.3	239.7	168.7	156.6	184.9	217.5	250	192	205
16P-6R	331.3	306.5	281.1	265.1	194.1	156.6	184.9	217.5	250	192	205
16P-7R	358.5	332.3	306.9	292.3	221.2	156.6	184.9	217.5	250	192	205
16P-8R	400	358.1	332.7	317.7	246.6	156.6	184.9	217.5	250	192	205
22P-4R	316.6	269.3	363.3	219	141.5	205.8	235.7	276.5	310	243	254
22P-5R	339.4	295.1	262.1	246.2	168.7	205.8	235.7	276.5	310	243	254
22P-6R	365.2	320.9	287.9	271.6	194.1	205.8	235.7	276.5	310	243	254
22P-7R	395	349.9	316.9	298.8	221.2	205.8	235.7	276.5	310	243	254
22P-8R	420.1	375.7	342.7	324.2	246.6	205.8	235.7	276.5	310	243	254
22P-9R	445.9	401.6	368.5	351.3	273.8	205.8	235.7	276.5	310	243	254
22P-10R	470	427.4	394.3	376.7	299.2	205.8	235.7	276.5	310	243	254

# SMAK



## Features

Magnetic couplings of the SMAK series are used to transfer torque into mixers and agitators. Top drive, bottom drive or lateral drive. Dangerous or precious media remain isolated in the closed vessel.

## Advantages

- Magnetic coupling for mixers and agitators
- Hermetically sealed
- Sterile design
- Surfaces in contact with the medium are electro-polished
- No contamination by buffer media
- No contact of torque transmitting elements
- No maintenance necessary
- Sliding bearing for bottom drives included
- Speed monitoring optional
- Weld-in or screw-in flanges available

## Functional description

The power transmission occurs contact-free through magnets from the drive shaft to the product wetted output shaft. Between the two rotating parts is the can which is bolted to the container.

## Operating range (see note on page 1)

Shaft diameter:  $d = \dots 40 \text{ mm (1.57")}$   
 Pressure: vacuum  $\dots 7 \text{ bar (102 PSI)}$   
 Temperature:  $t = -40 \text{ °C } \dots +150 \text{ °C}$   
 ( $-40 \text{ °F } \dots +302 \text{ °F}$ ) (SmCo),  
 $+120 \text{ °C (+248 °F)}$  (NdFeB)  
 Speed:  $n = \dots 400 \text{ min}^{-1}$   
 Chemical resistance: pH 0  $\dots 14$   
 Viscosity: 0.3  $\dots 5,000 \text{ mPas (SiC)}$   
 Torque: max. 270 Nm (bottom drive),  
 330 Nm (top drive)  
 Solids: max. 0.1 mm; max. 5 % by weight;  
 grain hardness max. 700 HV

## Materials

Sliding faces: Silicon carbide SiC (Q1)  
 Magnets: Samarium cobalt (MA3),  
 Neodymium iron boron (MA8)  
 Metal parts: CrNiMo steel 1.4571 (G), 1.4435

## Dimensions

Dimensions on request

## Item Description

- 1.1 Inner rotor
- 1.2 Outer rotor
- 2 Can
- 3 Nut
- 4 Bearing bushing
- 5, 6 O-Ring
- 7 Set screw

## Standards and approvals

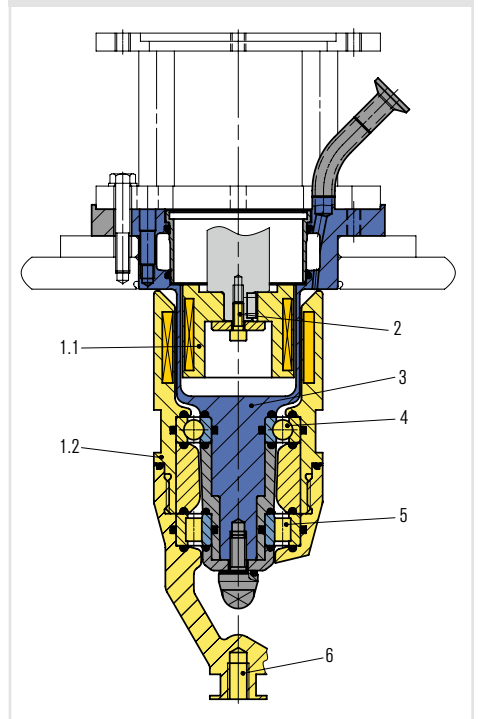
- Material approvals: QHD, GMP, FDA

## Recommended applications

- Chemical industry
- Pharmaceutical industry
- Food processing industry
- Agitators
- Mixers

## Product variant

SMAK for top drive

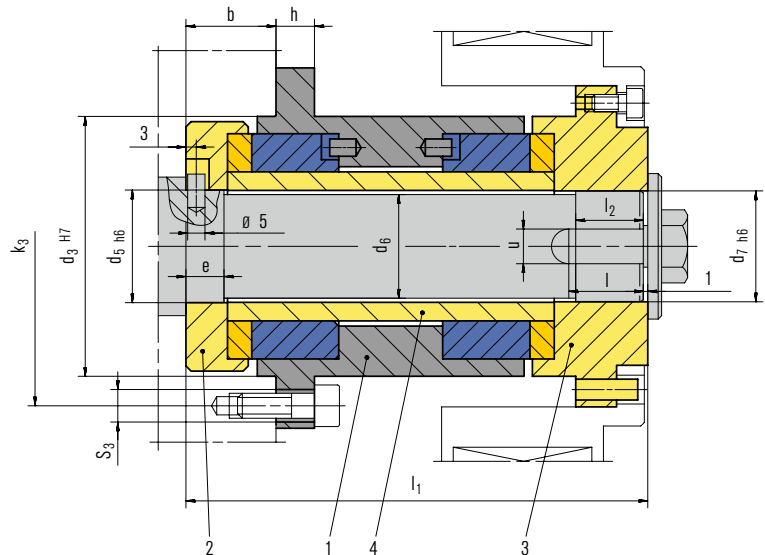


## Item Description

- 1.1 Inner rotor
- 1.2 Outer rotor
- 2 Motor connection
- 3 Can
- 4, 5 Bearing
- 6 Agitator blade connection



# LMF1



## Features

Sliding bearings are used for the shaft end in magnetic coupled centrifugal or displacement pumps. The sliding parts are made of SiC. The pump liquid is circulating between the rotating and static parts to ensure lubrication and cooling. EagleBurgmann LMF bearings are successfully used for many years in applications worldwide. They are almost wearless and therefore extremely durable.

## Advantages

- Sliding bearing for the shaft of an impeller in a pump
- Self lubrication through pump liquid
- Adapted to MAK66 magnetic couplings

## Functional description

The shaft end is connected to the shaft sleeve and two bearing rings for the axial bearing forces. It is running against the stationary bearing bushings.

## Operating range (see note on page 1)

Viscosity: 0.3 ... 5,000 mPas (SiC)

Speed:  $n = 3,600 \text{ min}^{-1}$

Solids: max. 0.1 mm; max. 5 % by weight;  
grain hardness max. 700 HV

## LMF1 - Dimensions in mm

	$d_3$	$d_5$	$d_6$	$b$	$e$	$l_1$	$l_2$	$h$	$k_3$	$n_3$	$s_3$	$d_7$	$l$	$u$
<b>LMF1-22/54-00</b>	44	16.5	15.8	21.0	8	87.0	29	7.0	55	5	5.5	16	16	5
<b>LMF1-43/80-00</b>	75	32.5	31.5	26.0	11	129.3	20	8.0	87	5	6.6	32	22	10
<b>LMF1-43/90-00</b>	75	32.5	31.5	26.0	11	139.3	20	8.0	87	5	6.6	32	22	10
<b>LMF1-55/110-00</b>	92	40.5	39.5	27.0	12	170.3	30	10.0	103	5	6.6	40	32	12
<b>LMF1-65/188-00</b>	115	50.5	49.5	34.5	15	188.5	14	13.5	130	5	9.0	50	-	-

## LMF10 - Dimensions in mm

	$d_3$	$d_5$	$d_6$	$b$	$e$	$l_1$	$l_2$	$h$	$k_3$	$n_3$	$s_3$	$d_7$
<b>LMF10-43/90-00</b>	75	32.5	31.5	26.0	12	139.3	20	8.0	87	5	6.6	32
<b>LMF10-55/110-00</b>	92	40.5	39.5	27.0	12	170.3	30	10.0	103	5	6.6	40
<b>LMF10-55/144-00</b>	92	40.5	39.5	30.0	12	184.3	12	20.0	107	5	6.6	40
<b>LMF10-65/188-00</b>	115	50.5	49.5	34.5	15	188.5	14	13.5	130	5	9.0	50
<b>LMF10-65/264-00</b>	115	50.5	49.5	43.5	15	264.5	14	28.5	150	6	11.0	50

## Item Description

- |   |                        |
|---|------------------------|
| 1 | Radial journal bearing |
| 2 | Axial journal bearing  |
| 3 | Axial journal bearing  |
| 4 | Shaft sleeve           |

## Materials

Sliding faces: Silicon carbide SiC (Q1),  
Carbon silicon impregnated SiC-C-Si (Q3),  
Carbon graphite resin impregnated (B)  
Metal parts: CrNiMo steel 1.4462 (G1)

## Recommended applications

- Chemical industry
- Oil and gas industry
- Refining technology
- Pharmaceutical industry
- Food processing industry
- Centrifugal pumps
- Gear pumps

## Product variants

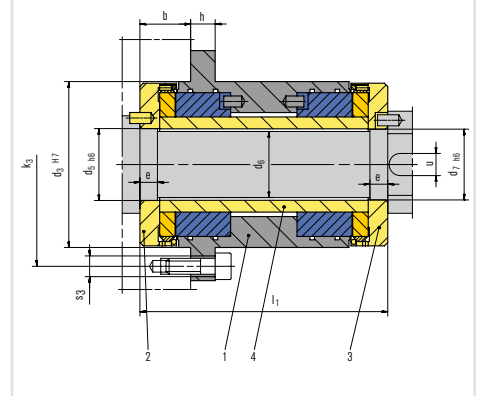
Variants for low ( $-110 \text{ }^\circ\text{C}$  ( $-230 \text{ }^\circ\text{F}$ )) and high temperature ( $\dots +400 \text{ }^\circ\text{C}$  ( $+752 \text{ }^\circ\text{F}$ )) and variants with heatable or coolable chamber available.

## LMF10

Bearing for demanding application conditions. Axial journal bearing not shrunk but inserted.

Materials as for LMF1, optionally shaft sleeve made of 1.4462 with chromium dioxide coating.

Dimensions see table.



# Additional EagleBurgmann product lines

## Seal supply systems



Depending on the design, application and mode of operation, supply systems are required to flush, cool and pressurize mechanical seals and magnetic couplings and provide leakage compensation. EagleBurgmann supplies a complete range of solutions from a single source including design, production, commissioning and service. The portfolio includes a complete range of API compliant supply systems.

### Quench systems

- Versions with polyethylene or stainless steel tanks
- API 682 versions
- Circulation of buffer fluid possible

### Thermosiphon systems

- Comprehensive modularized product range
- Sterilizable versions
- API 682 versions for Plan 52 and 53A

### Heat exchangers

- Comprehensive standard range
- Extremely efficient cooling
- Compact design
- API 682 versions

### SPO (SPB/SPC) closed-circuit barrier fluid systems

- Suitable for applications with high pressure
- No connection to nitrogen supply necessary
- API 682 versions

### SPA open-circuit buffer/barrier fluid systems

- High cooling capacity
- Combined supply of various seals

### SPN refill units

- Manual, automatic and mobile versions

### Gas supply systems

- Customized versions for all types and requirements in gas-lubricated mechanical seal applications
- Seal management system
- API 682 / 614

### RoTechBooster

- Ensures seal gas flow to the gas seal when the differential pressure across a compressor is insufficient to provide adequate flow.

### Typical applications:

Liquid and gas lubricated mechanical seals, magnetic couplings

## Carbon floating ring seals



Carbon floating ring seals are supplied as maintenance-free compact labyrinth cartridge seals with low leakage. The floating self-adjusting sealing rings provide radial sealing on the shaft with a very small gap. The seal requires no additional lubrication, and it is designed for dry running. Besides pure gas, carbon floating ring seals are also suitable for Atex applications, toxic media, media containing solids, flue gas, dust, powder, vapor, liquid mist, oil mist and penetrating oil.

### Espey WD series (split housing)

- Split housing and seal rings allow easy installation
- Pressure: vacuum ... 20 bar (... 290 PSI)
- Shaft diameter: 40 ... 340 mm (1.57" ... 13.39")
- Radial clearance: max.  $\pm 5.0$  mm (0.2")
- Axial movement: theoretically unlimited
- Temperature:  $-120$  °C ...  $+800$  °C ( $-184$  °F ...  $+1,472$  °F)
- Sliding velocity: 40 ... 150 m/s (131 ... 492 ft/s)

### Espey WDK-BHS for bulkhead shaft penetrations

- Split housing and seal rings allow easy installation
- Verified leakage rates
- International type approvals
- Pressure: max. 3 bar (44 PSI)
- Shaft diameter: 40 ... 800 mm (1.57" ... 31.5")
- Radial play: max. 5 mm (0.2")
- Axial movement: theoretically unlimited
- Temperature: max. 225 °C (437 °F)
- Sliding velocity: 40 m/s (131 ft/s)

### Special Espey WD series variants

- Seals for top driven agitators and DIN seal chambers
- Blast furnace seals, shaft ... 4,000 mm (... 157.48")
- Seals for mills and centrifuge feed heads

### Espey WKA series

- Chamber seal (modular design – can be combined in any order), optional with housing and lid
- Pressure: vacuum ... 250 bar (... 3,626 PSI)
- Shaft diameter: 20 ... 340 mm (0.79" ... 13.39")
- Radial play: max.  $\pm 2.0$  mm (0.08")
- Axial movement: theoretically unlimited
- Temperature:  $-120$  °C ...  $+500$  °C ( $-184$  °F ...  $+932$  °F)
- Sliding velocity: 150 ... 240 m/s (492 ... 787 ft/s),
- depending on type

### Espey shaft sleeves

- Metallic or ceramic coating
- One-piece or split design
- Shaft diameter: 45 ... 340 mm (1.77" ... 13.39")
- Temperature: ...  $+1,000$  °C (...  $+1,832$  °F)

### Typical applications:

Blowers, compressors, turbines, centrifuges, mills, agitators, dryers, bulkheads, steam turbines, throttle/control valves, gear units, motors

# Additional EagleBurgmann product lines

## Compression packings



A cost effective and reliable method for sealing pump shafts, valve spindles and rotating shafts in process equipment. Manufactured from a range of material combinations – traditional and innovative – using state-of-the-art production techniques. Supplied in boxed lengths or pre-cut rings. Approvals/certification includes BAM, DVGW, FDA, API, ISO, TA-Luft. Fire-safe, low leakage, low emission and nuclear grades are available with full documentation and certification.

### Rotatherm graphite rings

An accepted industry-standard for valves and pumps in high pressure and high temperature service. Manufactured as moulded rings (with and without steel reinforcement) or special seals. Suits all industry applications including the power and nuclear industries. Approvals/certification includes: BAM, DVGW, API, ISO, TA-Luft.

### BuraTAL Fugitive emission products

A comprehensive range of low leakage packing sets manufactured in graphite or our unique non-woven materials. All current fugitive emission standards are met with outstanding performance, low friction, ease of installation, and a long service life. Approvals/certification includes: API 622, ISO 15848, TA-Luft.

### Burajet Injectable packings

The Burajet Injectable packing system offers a wide range of injectable compounds for pumps, valves, and process equipment. An ideal product for the mining and paper & pulp industries. Approvals/Certification includes: FDA

### Buraglas Glass packings

Manufactured from non-ceramic materials and fibres, BuraGlas packings are suitable for sealing of vessels, coal mills, industrial furnaces, oven doors, hatches and covers. Produced in lengths in sizes up to 150 mm section. Approvals/Certification: Hydrolytische Klasse 1; DIN 12111.

### Packing cartridges

Packing cartridges combine quick and easy installation with robust simple construction to provide minimum downtime and maximum reliability in critical process applications. Manufactured to individual requirements to fit into DIN/ASME standard equipment e.g. agitators. Cartridges can be supplied with live-loading and additional bellows containment for maximum environmental safety.

### Typical applications:

Pumps, agitators, mixers, kneaders, dryers, fans, blowers, filters, refiners, pulpers, mills, valves

## Gaskets



### Fibre gasket sheets

#### Burasil-Basic, -Universal and Buratherm N gasket

sheets for service in low to medium pressure and temperature applications for process equipment and pipework in industry and for utility applications like gas and water supply. Approvals/certification includes: DVGW, KTW, HTB, WRAS, WRC, TA-Luft, BAM (Oxygen max. = 120 °C/ 130 bar)

### PTFE gasket sheets and tapes

Burachem is a highly chemical resistant modified PTFE gasket material range offering varying properties of mechanical strength and chemical resistance depending upon application. Approvals/certification includes: DVGW, KTW, HTB, WRAS, WRC, BAM (Oxygen max. = 120 °C/ 130 bar), TA-Luft.

**Quick-Seal MultiTex** tape is the latest development in the field of expanded PTFE sealing materials for in-place sealing of vessel and pipe flanges.

### Graphite seals and tapes

#### Statotherm Graphite gasket sheets, tapes

Soft, flexible, graphite gasket sheets ideal for pump, valve, and equipment gaskets.

**Statotherm R Profile rings** for static sealing in high temperature applications, e.g. in heat exchangers, valves or pumps.

**Statotherm V and V-Flex cover seals** are used as self-sealing gaskets in high-pressure valves e.g. for power plants at high temperatures. Statotherm V-Flex is supplied by the meter.

### Metal gaskets

Approvals/certification include BAM, DVGW, TA-Luft

**Spiraltherm spiral wound gaskets.** Available to suit all international flange standards and in a wide choice of materials.

**Corratherm corrugated gaskets** are for heavy duty applications.

Kammprofile serrated gaskets are for applications with high demands for operating safety and tightness.

**Buralloy metal jacketed gaskets** are produced in a wide variety of different materials (in various combinations), in many styles for heat exchangers, pipe flanges, boilers, and process equipment.

**Buralloy ring type joints** are available to suit all ASME and DIN flanges from stock. Sizes: 15 ... 900 mm (0.5" ... 36"); manufactured to ASME B16.20 and to API 6A.

### Typical applications:

Stationary machine parts, flanges, flange-like joints, bulkheads

# Additional EagleBurgmann product lines

## Expansion joints



Expansion joints are vital components in most industrial plants. They are installed as flexible connections in pipe and duct systems to take up or compensate for thermal expansion, vibration and misalignments. Advancements in processing and generating technologies are being combined with high demands for efficiency. This, along with a clear orientation towards environmental protection, puts high demands on expansion joint designs.

Customized expansion joints made of fabric or metal are the solution of choice.

### Fabric expansion joints

- Single and multilayer designs
- Dimensions: according to customer specifications
- Temperature:  $-35\text{ °C} \dots +1,000\text{ °C}$  ( $-31\text{ °F} \dots +1,832\text{ °F}$ ) (higher temperature, on request)
- Pressure:  $\pm 0.35\text{ bar}$
- Versions with wiremesh reinforcement
- Versions with high chemical resistance
- Versions with Nekal-tight design
- Fabric expansion joints are available as units, including bolster and steel parts.

### Metal expansion joints

- Dimensions: Circular: DN40 and up.
- Rectangular: According to customer specifications
- Temperature:  $-198\text{ °C} \dots +1,371\text{ °C}$  ( $-324\text{ °F} \dots +2,500\text{ °F}$ )
- Pressure: vacuum ... 172 bar (... 2,500 PSI)
- Materials: stainless steel, Incoloy®, Inconel®, Hastelloy®, titanium, special materials
- Single and universal designs
- Metal expansion joints are available with for example tie rods, hinges, gimbals, refractory lining, elbow, pantograph.

Dimensions and pressure range depends on design, material selection, type of expansion joint and duct insulation.

### Typical applications:

Air and flue gas ducts, pipelines, sewer systems

## Special products



For particular applications, innovative, customized solutions are the only answer. The supplier must have a wealth of in-depth expertise, many years of experience and above all the willingness and ability to translate ideas into solutions that work in practical application.

### Contoured diaphragm couplings

For demanding rotating equipment such as turbines and compressors in the oil and gas industries as well as petrochemicals, conventional and nuclear power generation, marine applications and the aerospace industry.

They are lightweight, easy to install and maintain, and demonstrate high reliability in stress analysis. Low bearing load, best dynamic balance repeatability and no fretting or wearing are advantages of the coupling. Uniquely shaped flexible elements in the metal diaphragms located at each end of the spacers attain optimum performance. Additional features:

- Couplings acc. to API 671 / ISO10441 or API 610 / ISO13709
- Multi diaphragms, compensation for large misalignments
- Low (reduced) moment
- Electrically insulated
- Spark resistant materials
- Tuned for rotor dynamics
- Torque overload releasing device
- Torque measuring system

Operating range: Max. torque: 2,700 kNm, max. speed:  $100,000\text{ min}^{-1}$

### High-grade metal bellows

for specialized applications in the nuclear power, semi conductor and medical equipment industries, etc.

### Dynamic and static sealing elements

for the aerospace industry which meet extremely demanding quality requirements.

### Stern tube and marine seals

with various approvals and certifications, for marine outfitters and users.

### Rotary kiln sealing systems

as single and double seals in drying, calcination, combustion and pyrolysis applications.

### Typical applications:

Engineered solutions designed to meet customer requirements



# Table of materials

Material code	Description
<sup>1)</sup> EN 12756 EagleBurgmann	

## Face materials (Item 1/2)

### Synthetic carbons

▶ A	Buko 03	Carbon graphite antimony impregnated
▶ B	Buko 1	Carbon graphite resin impregnated, approved for foodstuffs
B3	Buko 02	Carbon graphite resin impregnated
B5	Buko 34	Carbon, resin bonded
C	Buko 22	Electrographite antimony impregnated

### Metals

▶ E	Bume 20	Cr steel
G	Bume 17	CrNiMo steel
▶ S	Bume 5	Special cast CrMo steel
T41	Bube 281	1.4462 DLC-coated

### Carbides

U = Tungsten carbides

▶ U1	Buka 1 brazed	Tungsten carbide, Co-binder
▶ U2	Buka 16 solid	Tungsten carbide, Ni-binder
▶ U22	Buka 16 shrunk-in	Tungsten carbide, Ni-binder
U3	Buka 15 solid	Tungsten carbide, NiCrMo-binder
U37	Buka 15 shrunk-in	Tungsten carbide, NiCrMo-binder
U7	Buka 17 solid	Tungsten carbide, binder-free

Q = Silicon carbides

▶ Q1	Buka 22 solid	SiC, silicon carbide, sintered pressureless
▶ Q12	Buka 22 shrunk-in	SiC, sintered pressureless
▶ Q2	Buka 20 solid	SiC-Si, reaction bonded
▶ Q22	Buka 20 shrunk-in	SiC-Si, reaction bonded
Q3	Buka 30 solid	SiC-C-Si, carbon silicon impr.
Q32	Buka 30 shrunk-in	SiC-C-Si, carbon silicon impr.
Q6	Buka 32 solid	SiC-C, SiC sintered pressureless with carbon
Q4	Buka 24 solid	C-SiC, carbon surface silicated
Q19	Buka 221	SiC, DLC-coated
Q15	Buka 225	SiC, DiamondFace

### Metal oxides (Ceramics)

V	Buke 5	Al-Oxide > 99 %
V2	Buke 3	Al-Oxide > 96 %
X	Buke 8	Steatite (Magnesia silicate)

### Plastics

▶ Y1	Buku 2	PTFE glassfibre reinforced
Y2	Buku 3	PTFE carbon reinforced

Material code	Description
<sup>1)</sup> EN 12756 EagleBurgmann	

## Secondary seal components (Item 3)

### Elastomers, not wrapped

▶ E	E	Ethylene propylene rubber (EPDM <sup>2)</sup> ) e. g. Nordel <sup>®</sup>
▶ K	K	Perfluorocarbon rubber (FFKM <sup>2)</sup> ) e. g. Kalrez <sup>®</sup> , Chemraz <sup>®</sup> , Simriz <sup>®</sup>
N	N	Chloroprene rubber (CR <sup>2</sup> ) e. g. Neopren <sup>®</sup>
▶ P	P	Nitrile-butadiene-rubber (NBR <sup>2)</sup> ) e. g. Perbunan <sup>®</sup>
S	S	Silicone rubber (VMQ <sup>2)</sup> ) e. g. Silopren <sup>®</sup>
▶ V	V	Fluorocarbon rubber (FKM <sup>2)</sup> ) e. g. Viton <sup>®</sup>
X	X4	Hydrogenated Nitrile-rubber (HNBR <sup>2)</sup> )
X	X5	Tetrafluoroethylene propylene rubber (FEPM <sup>2)</sup> ) e. g. Aflas <sup>®</sup> , Fluoraz <sup>®</sup>

### Elastomers, wrapped

▶ M1	TTV	FKM, double PTFE wrapped
▶ M2	TTE	EPDM, double PTFE wrapped
M3	TTS	VMQ, double PTFE wrapped
M4	TTN	CR, double PTFE wrapped
M5	FEP	FKM, FEP wrapped
M7	TTV/T	FKM double PTFE wrapped/PTFE solid

### Differing materials

U1	K/T	Perfluorocarbon rubber/PTFE
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### Non-Elastomers

G	Statotherm	Pure graphite
T	T	PTFE (Polytetrafluoroethylene)
T2	T2	PTFE glass fiber reinforced
T3	T3	PTFE carbon reinforced
T12	T12	PTFE carbon-graphite reinforced
Y1	Burasil-U	Plastic fiber/Aramid

Material code	Description
<sup>1)</sup> EN 12756 EagleBurgmann	

## Spring and construction materials (Item 4/5)

### Spring materials

▶ G	1.4571	CrNiMo steel
▶ M	2.4610	Hastelloy <sup>®</sup> C-4 Nickel-base alloy

### Construction materials

D	St	C steel
▶ E	1.4122	Cr steel
F	1.4301	CrNi steel
F	1.4308	CrNi cast steel
F1	1.4313	Special cast CrNi steel
▶ G	1.4401	CrNiMo steel
▶ G	1.4404	CrNiMo steel
▶ G	1.4571	CrNiMo steel
G	1.4581	CrNiMo cast steel
▶ G1	1.4462	CrNiMo steel – Duplex
G2	1.4439	CrNiMo steel
G3	1.4539	NiCrMo steel
▶ G4	UNSS32760-Nor	CrNiMoCu steel - Superduplex
M = Nickel-base alloy		
▶ M	2.4610	Hastelloy <sup>®</sup> C-4
M1	2.4617	Hastelloy <sup>®</sup> B-2
M3	2.4660	Carpenter <sup>®</sup> 20 Cb3
M4	2.4375	Monel <sup>®</sup> alloy K500
M5	2.4819	Hastelloy <sup>®</sup> C-276
M6	2.4668	Inconel <sup>®</sup> 718

T = Other materials

T1	1.4505	CrNiMoCuNb steel
T2	3.7035	Pure titanium
T3	2.4856	Inconel <sup>®</sup> 625
T4	1.3917	Carpenter <sup>®</sup> 42
T5	1.4876	Incoloy <sup>®</sup> 800

▶ Preferred materials

1) Standard following EN 12756, Dec. 2000

2) Abbreviations acc. to ISO 1629, Nov. 2004

## Color code

Shaft

Housing, installation chamber

Elastomers

Stationary seal parts

Stationary seal faces

Rotary seal parts

Rotating seal faces

# TotalSealCare Service

## TotalSealCare service modules

The modular seal service offered through TotalSealCare is as individual as are the demands of our customers. The range of services spans complete maintenance of all installed seals, through to stock management, as well as engineering, training and electronic data documentation.

Our TotalSealCare services consist of individual modules from which we assemble individualized service packages.

You can benefit from our many years of experience and expertise in all areas of seal technology, and our major store of practical knowledge.



## Consulting & engineering

After establishing and analyzing all of the seals in a system, we work out standardization concepts based on the as-is status. The results we are hoping for are to reduce the number of seal types, sizes and materials used, and to improve the key figures of the system. We advise you relating to codes of practice and statutory regulations, and indicate what actions need to be taken.

## Maintenance

In the plant or in the service center, qualified fitters and technicians look after all the aspects of seal maintenance: installation, startup, servicing, conversion, overhaul and repair. We record and document functionally relevant data (fault causes, measures for repair, costs). This means it is possible to assess seal operating times and maintenance costs on a continuous basis, thereby defining measures for extending service intervals.

## On-site service

Our on-site service includes the components of an overhaul service, conversions and service container. We deploy a service unit directly on your premises: equipped with the basic suite of seals or a stock of seals discussed with you in advance, and staffed by qualified personnel. On-site, our work includes producing the necessary gaskets, ensuring that the documentation is complete and advising our customers on selecting and installing seals. Our range of services is rounded off by complete conversions (e. g. acc. to TA-Luft).

## Inventory management

Based on your individual requirements and the applicable quality regulations, we develop a concept for inventory management of complete seals and spare parts. Furthermore, we optimize stocking on site or in the EagleBurgmann service center. In this way, you can reduce your administration overhead and concentrate on your key operations.

## Seminars & training

We offer an extensive range of continuing education programs in seal technology. For service and maintenance personnel, skilled staff and engineers from various branches of industry such as refining, chemicals, power generation, foodstuffs, paper and pharmaceuticals. Our range includes group seminars, individual training and seminars specifically tailored to your requirements. At our premises or at a location of your choice.

## Technical analysis & support

A team of seal specialists is responsible for rectifying process malfunctions or "bad actors". The latest methods such as thermography or data logging are used for diagnosing positions that are critical for the operation of the system and for working out measures to rectify them. In our research and development centers, we perform realistic tests on test rigs or in original pumps. The objective is to extend the MTBF and to increase system serviceability by individual and constructive solutions.

## Service agreements

We offer our customers specific agreements that can be combined from the six service modules. Whether for individual seal systems, critical process elements, specific system areas or an extensive seal service for complete plants: the modular structure of our service makes it possible to satisfy individual requirements. With our tried-and-tested monitoring instrument, SEPRO, we can also record all data relevant for the seals for documentation and evaluation purposes.

Algeria · Angola · **Argentina** · **Australia** · **Austria** · Azerbaijan · Bahrain · Bangladesh · Belarus · **Belgium** · Botswana · **Brazil** · Bulgaria · Cameroon · **Canada** · **Chile** · **China** · **Colombia** · Congo · Cyprus · **Czech Republic** · **Denmark** · **Ecuador** · Egypt · Estonia · Finland · **France** · Gabon · **Germany** · Ghana · **Great Britain** · Greece · **Hungary** · **India** · **Indonesia** · Iraq · Ireland · Israel · **Italy** · Ivory Coast · **Japan** · Jordan · Kazakhstan · Kenya · **Korea** · Kuwait · Latvia · Lebanon · Libya · Lithuania · Madagascar · **Malaysia** · Mauritius · **Mexico** · Morocco · Myanmar · Namibia · **Netherlands** · **New Zealand** · Nigeria · **Norway** · Oman · Pakistan · Paraguay · Peru · **Philippines** · **Poland** · Qatar · Romania · **Russia** · **Saudi Arabia** · Serbia · **Singapore** · Slovak Republic · Slovenia · **South Africa** · **Spain** · Sudan · **Sweden** · **Switzerland** · **Taiwan** · **Thailand** · Trinidad and Tobago · Tunisia · **Turkey** · Ukraine · **United Arab Emirates** · Uruguay · **USA** · **Venezuela** · **Vietnam** · Yemen · Zambia · Zimbabwe · [www.eagleburgmann.com/world](http://www.eagleburgmann.com/world)



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EagleBurgmann, a joint venture of the German Freudenberg Group and the Japanese Eagle Industry Group, is one of the internationally leading companies for industrial sealing technology. Our products are used everywhere where safety and reliability are important: in the oil and gas industry, refining technology, the petrochemical, chemical and pharmaceutical industries, food processing, power, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 6,000 employees in more than 60 subsidiaries contribute their ideas, solutions and commitment towards ensuring that customers all over the world can rely on our seals. Our modular TotalSealCare service underlines our strong customer orientation and offers tailor-made services for every application.

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a member of **EKK** and **FREUDENBERG**

**EagleBurgmann®**

Rely on excellence