

RELY ON EXCELLENCE

## HR

Mechanical seals | Mechanical seals for pumps | Engineered seals



### 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

### Operating range

Shaft diameter:  
dN = 36 ... 270 mm (1.4" ... 10.63")  
Pressure: p1\* = 16 bar (230 PSI)  
Temperature:  
t = -20 °C ... +160 °C (-4 °F ... +320 °F)  
Sliding velocity: v<sub>g</sub> = 10 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

### Notes

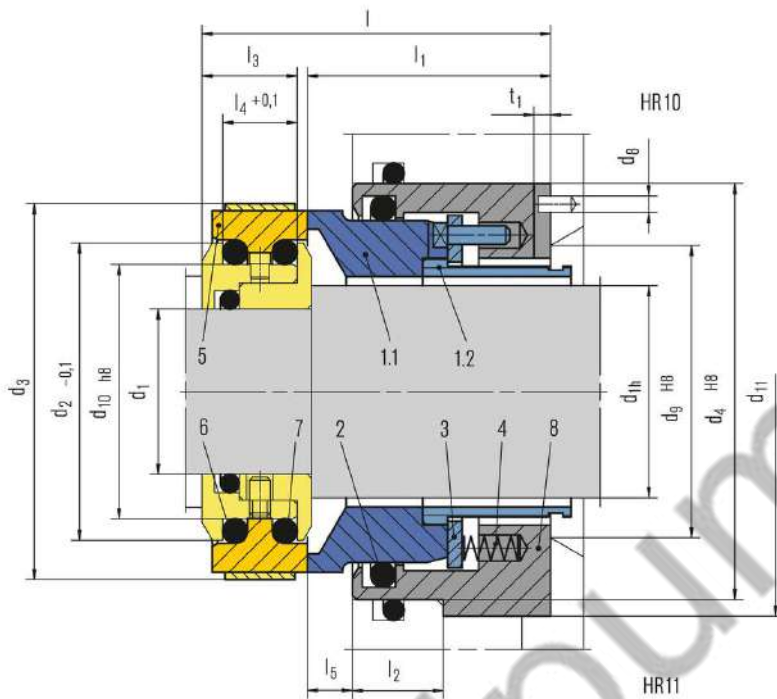
Direction of installation:

- From the impeller side: HR10
- From the bearing side: HR11

### 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
- Contaminated, abrasive and solids containing media
- Sewage water pumps
- Dredger pumps
- Oil sand extraction
- Suspension pumps of flue-gas desulphurization plants (FGD)

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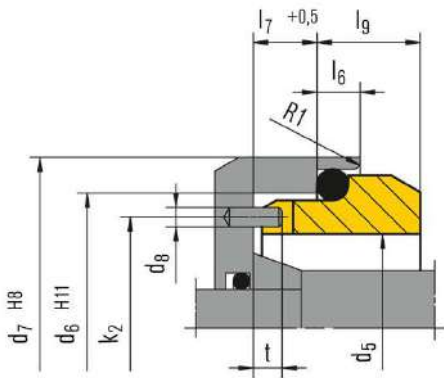
**Item Part no. Description**  
**DIN 24250**

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

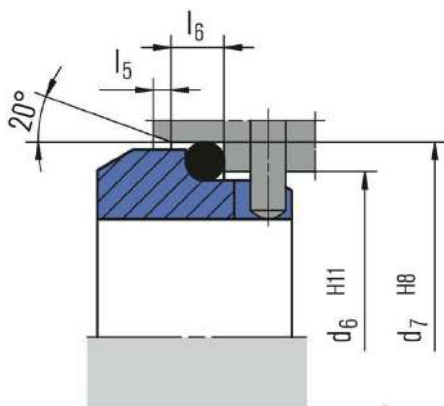
Direction of installation: - from the impeller side  
HR10 - from the bearing side HR11

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## Seat alternatives



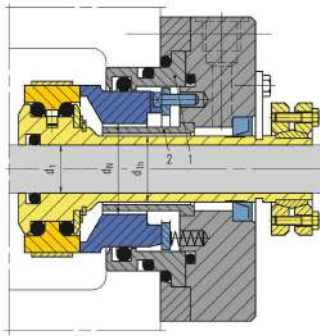
**G2**  
(dN 36 ... 90 mm)



**G9**  
(dN 95 ... 180 mm)

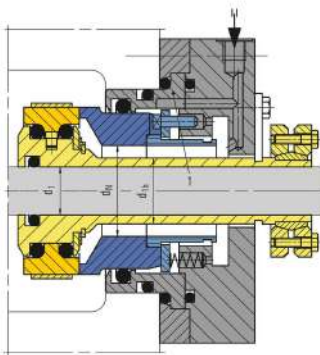
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## Product variants



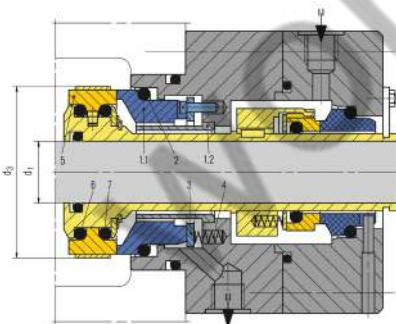
### HR2

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.



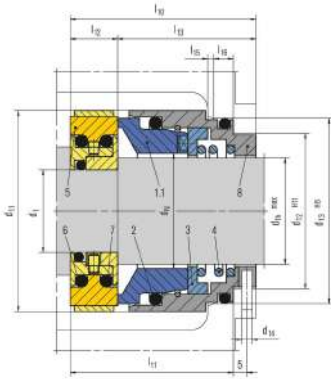
### HRKS-D

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

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### 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.  $l_{1k}$ . Intermediate sizes on request.



## Dimensions

d <sub>1</sub>	d <sub>1h</sub>	d <sub>N</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>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub> +0.2 min	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>	l <sub>9</sub>	k <sub>2</sub>	t	t <sub>1</sub>
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	168.2	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

Dimensions in Millimeter. Dimensions for shaft diameters up to 300 mm on request.

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### Dimensions

d <sub>N</sub>	d <sub>1h</sub>	d <sub>1</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub>	l <sub>10</sub>	l <sub>11</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>15</sub>	l <sub>16</sub>								
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								

HRZ1 - Dimensions in millimeter