

# DGS

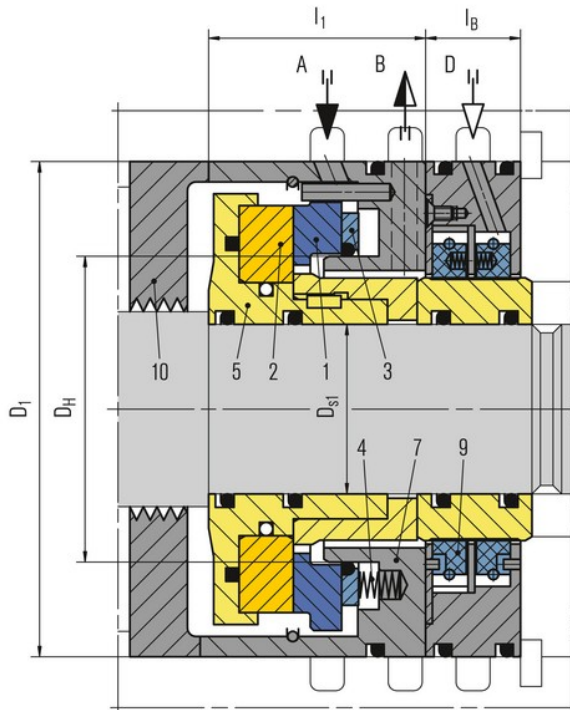
## Features

- Gas-lubricated
- Unidirectional or bidirectional available
- Ready-to-fit cartridge unit
- Single, Dual, Tandem and Tandem with intermediate labyrinth available

## Advantages

The proven standard gas seal for pressures up to 100 bar (1,450 PSI). Due to simple components a reliable and economical solution for low pressure applications.

Application single seal: The simplest seal is a Dry Gas Seal in single arrangement. This seal is used in case that due to the nature of the product gas no additional back up seal is required. Separation seals as labyrinths, radial clearance seals or CobraSeal are optionally available. This version is used as an emission-free arrangement with a corresponding flare/vent connection. Primary leakage is then discharged with the separating gas to the flare/vent. In the case of dirty gases the gas to be sealed has to be filtered in addition and conveyed to the seal chamber via connection "A". The resulting gas flow from the sealing compartment prevents any dirty/wet gas entering the seal.



## 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 (adapted in size to the installation space)
  - 9 Carbon ring type separation seal
  - 10 Labyrinth
  - 11 Intermediate labyrinth
- A Product flushing  
B Flare  
C Buffer gas  
D Separating gas  
S Vent

# DGS (2)

## Recommended applications

- Oil and gas industry
- Refining technology
- Petrochemical industry
- Hydrocarbon gas
- Ammonia
- Nitrogen
- Air
- Centrifugal compressors
- Turbo expanders
- Blowers

## Standards and approvals

- NACE

## Operating range

Shaft diameter:  $d_{S1} = 29 \dots 264 \text{ mm}$  (1.14" ... 10.39")  
 Pressure:  $p = 0 \dots 100 \text{ bar}$  (1,450 PSI)  
 Temperature:  $t = -20 \text{ }^\circ\text{C} \dots 200 \text{ }^\circ\text{C}$  (-4 °F ... 392 °F)  
 Sliding velocity:  $v_g = 0.6 \dots 200 \text{ m/s}$  (2 ... 656 ft/s)

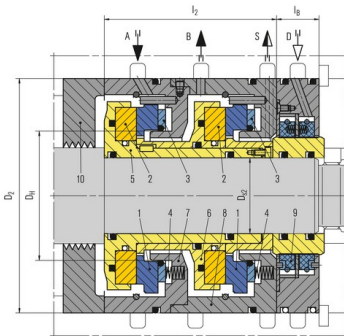
## Materials

Seal face: Silicon carbide (Q1) with DLC coating  
 Seat: Silicon carbide (Q1) with DLC coating  
 Secondary seals: FKM (V)\* Metal parts: 1.4006 and other stainless steels. \* Or other materials depending on product gas composition

## Product variants

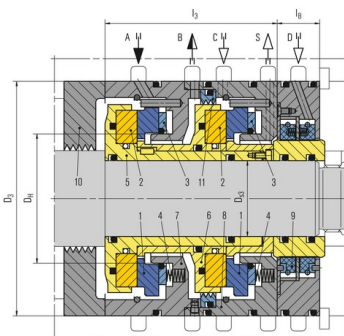
### DGS Tandem seal

Application: Where small product leakages of process gas are admissible, e.g. on gas pipeline compressors. Seal on the atmosphere side acting as a safety seal. The tandem arrangement provides a particularly high degree of operational safety. The seal on the product side and the seal on the atmosphere side are able to absorb the complete pressure differential. Under normal operating conditions the full pressure is reduced only by the seal on the product side. The space between the seal on the product side and the seal on the atmosphere side is cleared by a connection "B" to the primary vent (flare). The pressure differential to be sealed by the seal on the atmosphere side equals the primary vent pressure, so the leakage to the secondary vent (atmosphere) is very low. If the main seal fails, the second seal acts as a safety seal.

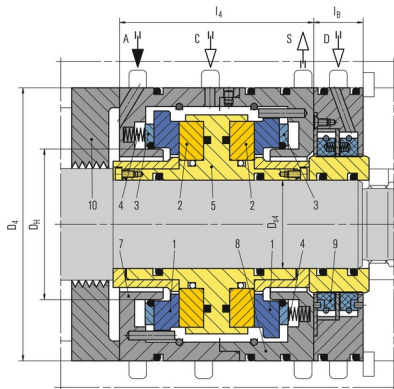


### DGS Tandem seal with intermedia labyrinth

Application: Where product leakages to the atmosphere as well as buffer gas leakages to the product are inadmissible, e.g. on H<sub>2</sub>, ethylene or propylene compressors. With this version the product pressure to be sealed is reduced via the seal on the product side. The entire process gas leakage is discharged via connection "B" to the primary vent. The seal on the atmosphere side is pressurized with buffer gas (nitrogen) via connection "C". The pressure of the buffer gas ensures that a nitrogen flows via the labyrinth to the flare/vent outlet.



# DGS (3)



## DGS Dual Seal

Application: Where product leakages to the atmosphere are inadmissible and tandem arrangements are not suitable because of too small product gas pressures. Buffer gas leakages into the product must be admissible (buffer pressure  $p_3 > p_1$ ). This seal is used when a neutral buffer gas of suitable pressure is available. Typical applications are to be found mainly in the chemical industry, e.g. on HC gas compressors. A buffer gas, e.g. nitrogen, is fed between the seals via connection "C" at a higher pressure than the product pressure. One part of the buffer gas leakage escapes to the atmosphere side and the other part to the product.

## Dimensions

D <sub>N</sub>	D <sub>H</sub>	D <sub>s1</sub>	D <sub>1</sub>	l <sub>1</sub>	D <sub>s2</sub>	D <sub>2</sub>	l <sub>2</sub>	D <sub>s3</sub>	D <sub>3</sub>	l <sub>3</sub>	D <sub>s4</sub>	D <sub>4</sub>	l <sub>4</sub>	l <sub>B</sub>
40	52.8	29	93	40	25	93	78	25	107	78	29	97	73	46
46	59.5	35	99	40	31	99	78	31	114	78	35	103	73	46
49	61.7	38	102	40	34	102	78	34	117	78	38	106	73	46
56	69.9	45	111	40	41	111	78	41	126	78	45	115	73	46
63	76.8	52	118	40	47	118	78	47	133	78	52	122	73	47
68	83.9	57	129	40	52	129	90	52	144.5	90	57	133	73	47
73	88.8	63	134	48	58	134	95	58	149.5	95	63	138	89	48
78	93.8	68	139	48	63	139	96	63	154.5	96	68	143	89	48
83	98.7	73	144	48	68	144	96	68	159.5	96	73	148	89	48
88	103.7	78	149	51	73	149	104.5	73	164.5	104.5	78	153	95.5	48.5
93	108.7	83	155	51	78	155	104.5	78	170.5	104.5	83	159	95.5	48.5
98	113.7	88	161	51	83	161	103.5	83	175.5	103.5	88	165	95.5	46.5
103	118.6	93	165	51	88	165	102.5	88	180.5	102.5	93	169	95.5	46.5
108	123.6	98	170	51	93	170	102.5	93	185.5	102.5	98	174	95.5	46.5
113	128.6	103	175	51	98	175	103.5	98	191	103.5	103	179	95.5	46.5
118	133.6	108	180	51	103	180	102.5	103	196	102.5	108	184	95.5	48
123	138.6	113	185	52.5	108	185	104.5	108	201	104.5	113	189	99	47.5
130	150.5	120	197	52.5	114	197	106.5	114	213	106.5	120	201	99	47.5
135	155.5	125	202	55.5	119	202	110.5	119	218	110.5	125	206	99	47.5
140	160.5	130	207	55.5	124	207	110.5	124	223	110.5	130	211	99	47
145	165.5	135	212	55.5	129	212	109.5	129	228	109.5	135	216	99	47.5
150	171.4	139	223	55.5	133.5	223	115	133.5	241.5	115	139	227	99	48.5
155	176.4	144	228	55.5	138.5	228	116	138.5	247.5	116	144	232	99	48
160	181.4	148	233	59.5	143.5	233	120	143.5	252.5	120	148	237	109	48.5
165	186.4	153	238	59.5	148.5	238	119	148.5	257.5	119	153	242	109	49
170	191.4	158	243	59.5	153.5	243	119	153.5	261	119	158	247	109	49
180	201.4	168	253	59.5	163.5	253	122	163.5	271	122	168	257	109	54
190	211.4	178	263	64	173.5	263	128.5	173.5	281	128.5	178	267	118	56.5
200	221.3	187	273	64	183.5	273	128.5	183.5	291	128.5	187	277	118	56.5
210	231.3	197	283	67	193.5	283	134.5	193.5	301	134.5	197	287	120	59.5
220	241.3	207	293	72	203.5	293	142.5	203.5	309	142.5	207	297	129	61
230	251.3	217	303	72	213.5	303	143.5	213.5	320	143.5	217	307	129	63
240	261.3	224	313	72	222.5	313	143.5	222.5	330.5	143.5	224	317	129	62
250	271.3	234	323	77	232.5	323	156	232.5	340.5	156	234	335	138	63.5
260	282.2	244	339	82	242.5	339	161	242.5	355	161	244	351	145	65.5
270	292.2	254	349	82	252.5	349	162	252.5	364	162	254	361	145	68.5
280	302.2	264	359	87	262.5	359	175.5	262.5	376	175.5	264	371	154	67.5

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# DGS (4)

Dimensions in millimeter

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