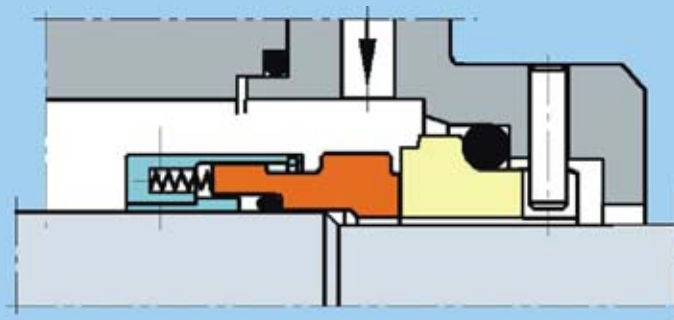




ISO 9001
ISO 14001

GAS LUBRICATED MECHANICAL SEALS

GS Single

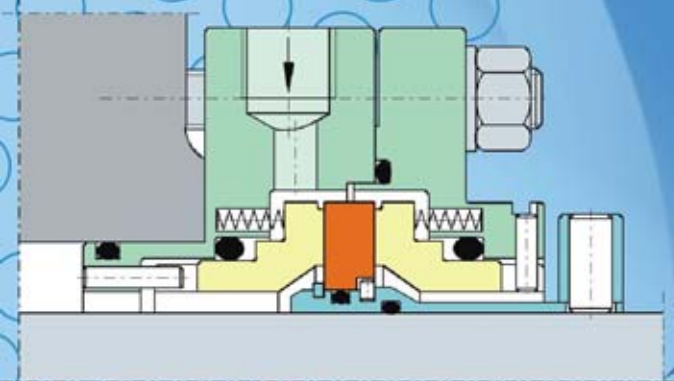
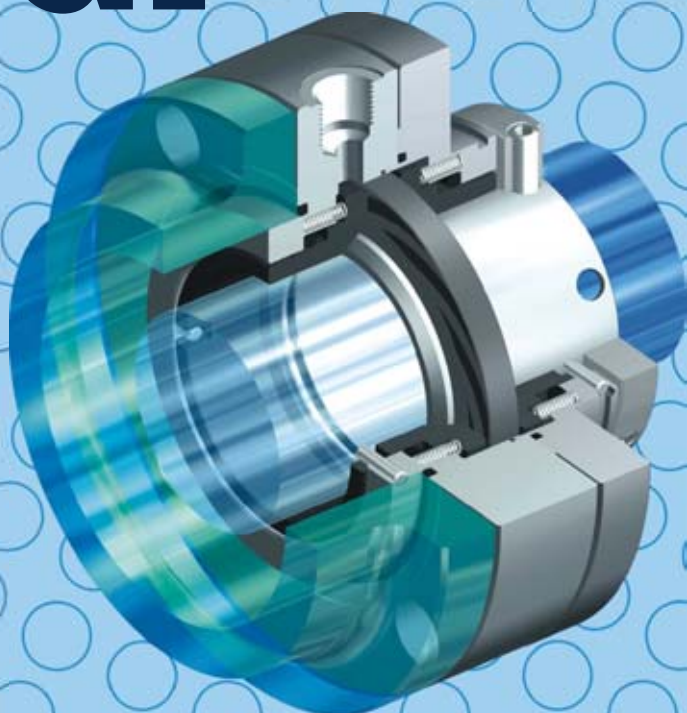


Working parameters

- temperature $t = -20^{\circ}$ to $180\ (220)^{\circ}\text{C}$
- pressure $p_{\max} = 1,5\ \text{MPa}$
- speed $v_{\max} = 25\ \text{m/s}$

- intended for environment friendly gas applications, mainly on fans and blowers
- used as the secondary seal in so called dry tandem arrangements, securing gas outflow to the atmosphere, and taking over the primary seal in a case of failure
- is an element in GT seal installation on process pumps
- dimensions up to EN 12756 (DIN 24960) Standard, and for pump applications with stuffing boxes in ANSI EN 12756 (DIN 24960) and API standards.

GF Double face to face



Working parameters

- temperature $t = -20^{\circ}$ to $180\ (220)^{\circ}\text{C}$
- pressure $p_{\max} = 1,2\ \text{MPa}$
- speed $v_{\max} = 25\ \text{m/s}$

Dynamical gas seals are the latest generation in mechanical sealing engineering in which, due to an air cushion effect, non-contact operation of the sliding pairs is obtained.

This effect arises as the result of dynamical gas compression (nitrogen or air) in very small hollows of the sealing ring races

Research and development works has been carried out in synergy with Fluid-flow Machinery Institute of Politechnika Łódzka and with the Technique and Technology Agency support.

Features:

- very long operation life and long periods between repairs
- no emission of the medium to the atmosphere meet stringent ecological requirements within the range of the harmful substances emission
- low operating costs due to savings of the repair, overhaul and cooling water costs
- very big energy savings
- simple construction (compact installation of GF, GT and GB) ensuring easy assembly and disassembly
- installation consistent with EN 12756 (DIN 24960), API and ANSI standards
- with barrier gas pressure failure, the seal continues the operation in the contact mode
- the costs of barrier gas systems are lower then those of traditional liquid systems
- easy application for almost every process pump
- ensures the total air-tightness of a pump
- operation in media non forming lubrication film
- feeding block ensures continuous seal operation monitoring



45GF seal installed on the 5A25A WAFAPOMP pump

Application:

Dynamical gas seals are used for media:

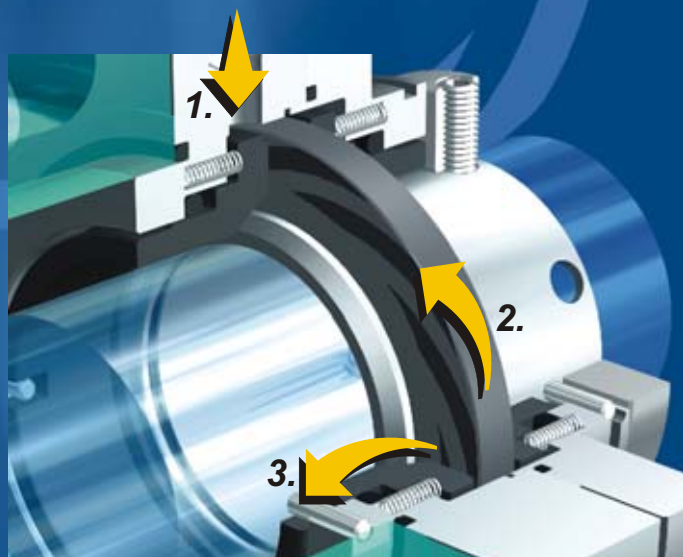
- toxic
- corrosive
- explosive (with the self-ignition possibility)
- abrasive (content of solid particles up to about 8%)
- carcinogenic
- process gases

in all industry branches, but especially in processes being environment and health hazard, and then in industries:

- chemical
- petrochemical
- pharmaceutical
- metallurgy
- chemistry of coke

Materials used in dynamic gas seals:

Components	Name	Code
Sliding rings	Antimony impregnated carbon composite	A
	Resin impregnated carbon composite	B
	Silicon carbide	Q
	Tungsten carbide	U
Secondary seal elements	EPDM Ethylene propylene elastomer	E
	PFPM Perfluoroelastomer	K
	FKM Fluoroelastomer	V
	NBR Nitrile-butadiene-rubber	P
Springs	Hastelloy® C-4	M
Other	Acid-proof steel	G



Principle of operation:

1. barrier gas supplied from an installation
2. barrier gas penetrates the ring grooves
3. barrier gas forms an air cushion and pushes aside the rings.

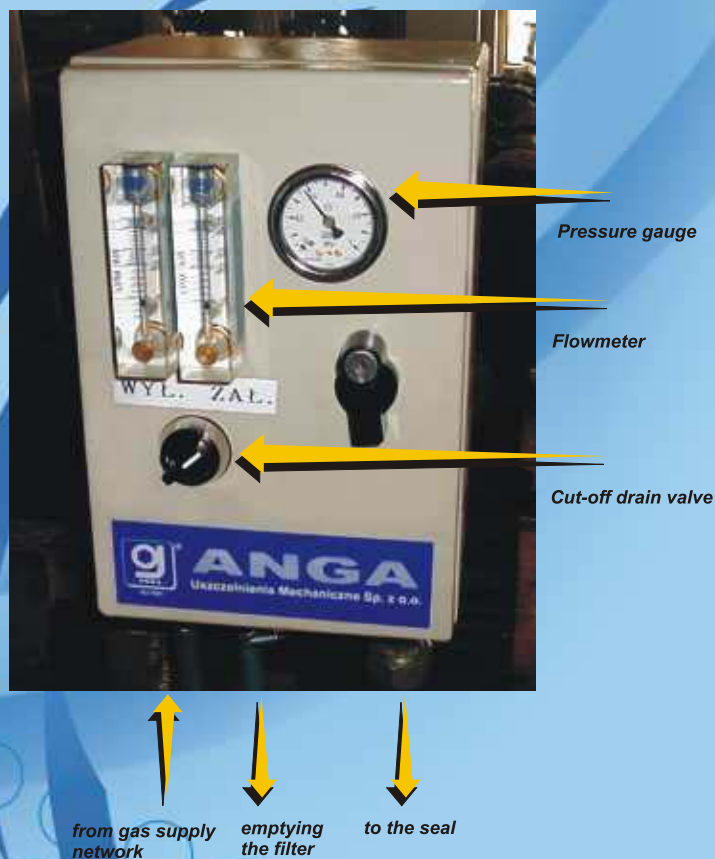
Barrier gas installations

ANGA provides feeding blocks of barrier gas installations

It is required barrier gas pressure has to be 0,15 to 0,2 MPa higher then sealed medium.

Pressure failure of the barrier gas causes that the seal automatically takes over the function of a contact seal - operates so-called hydraulic seal and unsealing does not appear.

Barrier gas feeding block for the GF seal



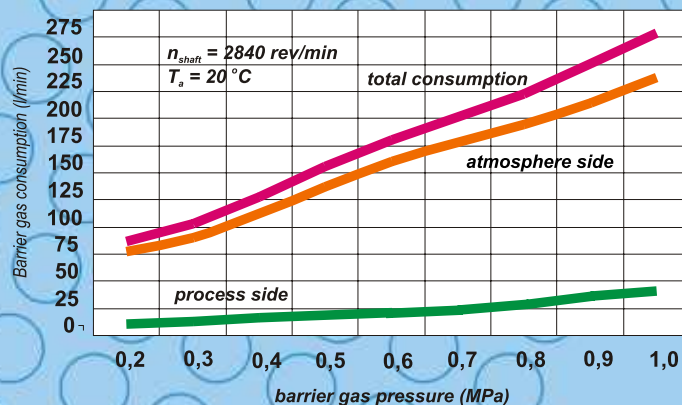
Barrier gas systems aim to ensure the proper operation of the dynamical gas seals. These are specially designed for this group of seals, and have the tasks:

- control of barrier gas pressure in the seal
- barrier gas filtering
- seal operation monitoring
- prevention of medium back flow to the barrier gas system (non-return valve)
- alarm switching on in a case of gas pressure drop or exceeding of flow value (optionally).

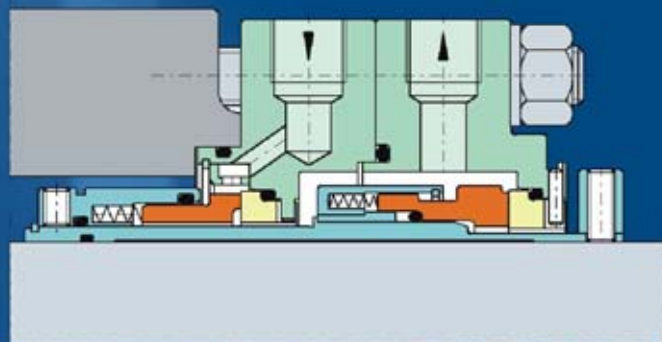
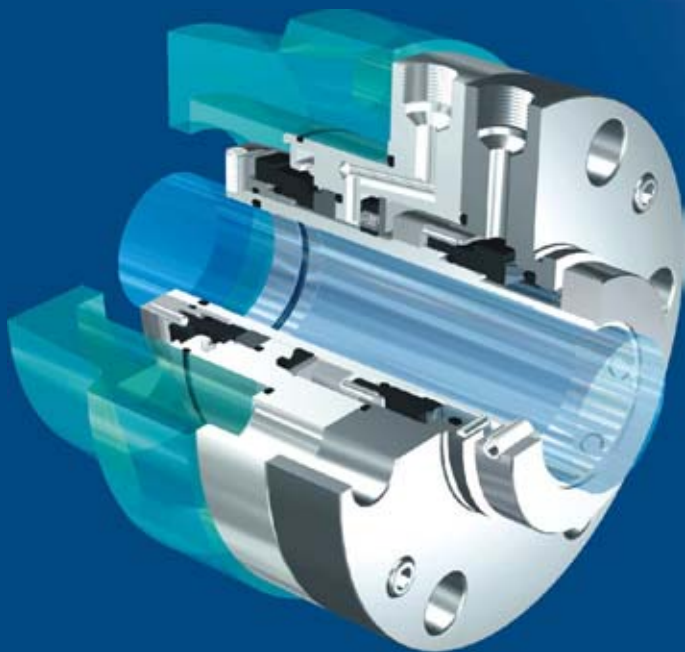


22GF type seal installed on the S42DT HYDRO-VACUUM pump

Barrier gas demand in the 45GF seal



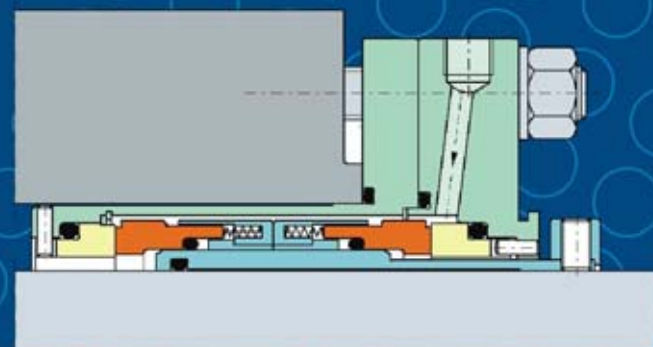
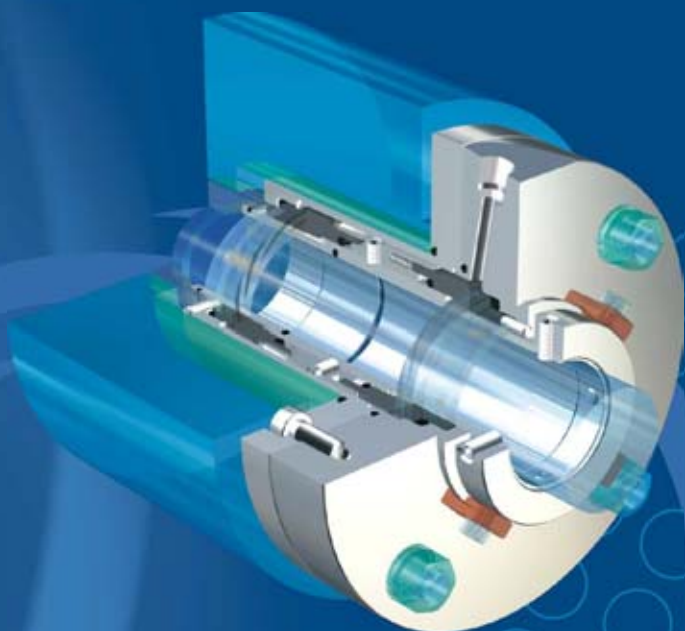
GT Double tandem



Working parameters

- temperature $t = -20^{\circ}$ to $180\ (220)^{\circ}\text{C}$
- pressure $p_{\text{max}} = 2,0\ (3,2)\ \text{MPa}$
- speed $v_{\text{max}} = 25\ \text{m/s}$

GB Double back to back



Working parameters

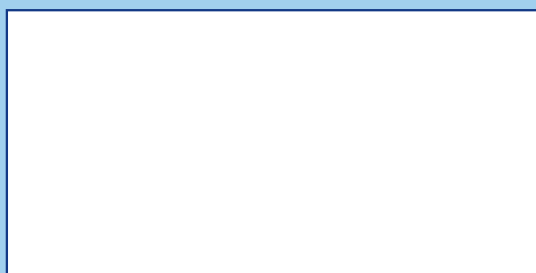
- temperature $t = -20^{\circ}$ to $180\ (220)^{\circ}\text{C}$
- pressure $p_{\text{max}} = 2,0\ \text{MPa}$
- speed $v_{\text{max}} = 25\ \text{m/s}$

- serial installation of two seals, which from the primary seal (on a process side) could be a contact seal
- low pressure (0,1 to 0,2 MPa) of a buffer gas ensures an air-tight sealing between seals
- a buffer gas is carried away to burning equipment or filter system providing the complete elimination of volatile components emission or toxic substance vapours



AGENCJA
TECHNIKI I TECHNOLOGII

INNOWACYJNY
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