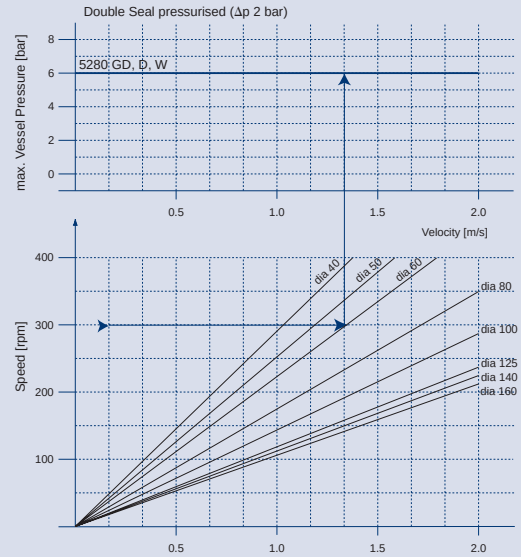
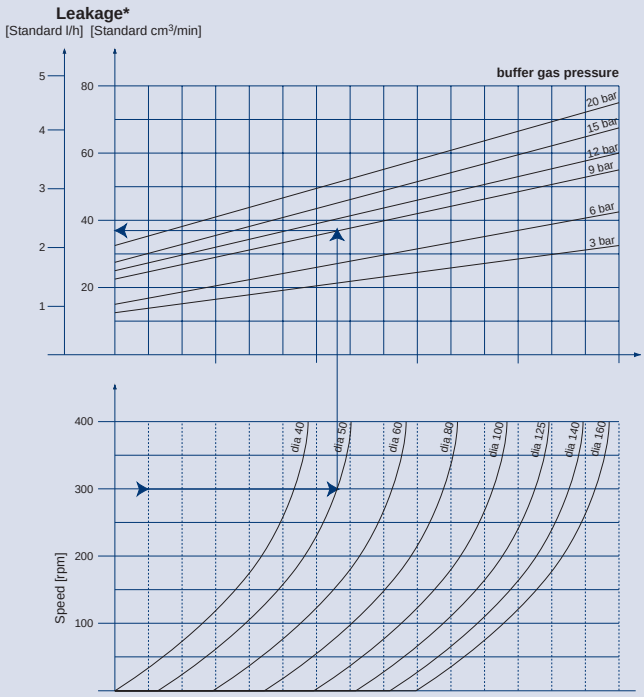
Type 5280 Seal Family

Performance Limits

Pressure and Velocity Limits

Data applies to seal types 5280, 5281





Leakage Curves

A guide to maximum gas leakage rate for dry running contacting agitator seals.

* *The leakage rate includes both seal interfaces and secondary seals. During the run-in period (up to 200 hours) the leakage rate can be higher. Under transient conditions leakage may rise for a short time until the interface has stabilised. Most of the time the leakage rate is only a fraction of the maximum value.*

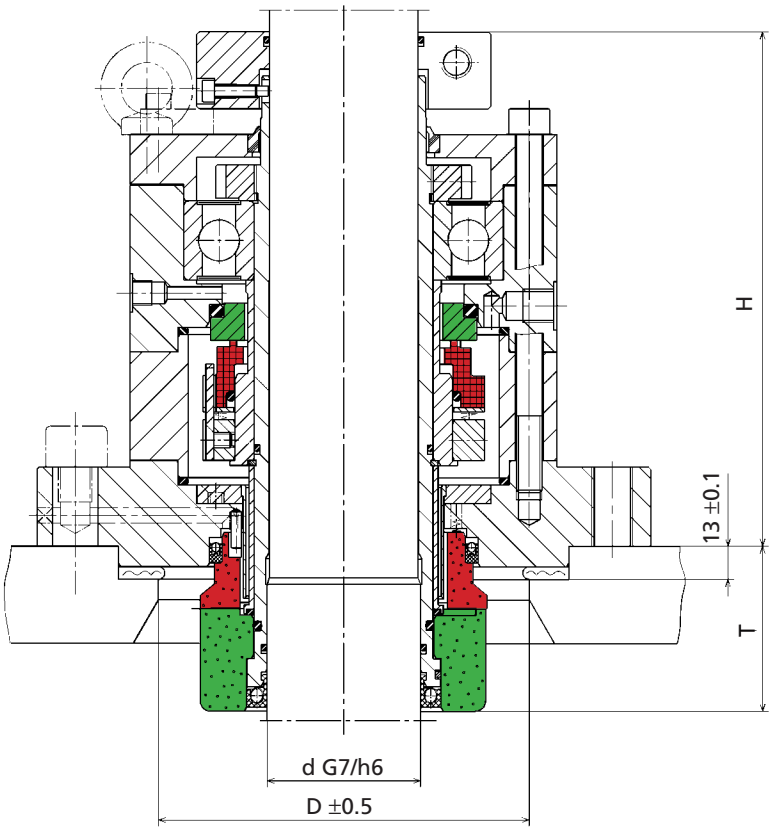
Maximum temperature limit = 200˚C

Material Chart

Item		Standard	EN code	Options	EN code
Seat	(Wet)	Resin impregnated carbon (171)	B	SiC (277)	Q1
	(Dry & Gas)	Resin impregnated carbon (646)	B3	DIA-SiC (Gas Only) (648)	Q6
Face		SiC (277)	Q1	DIA-SiC (Gas Only) (648)	Q6
Secondary Seals					
Medium side		PTFE (138)	T		
Atmospheric side		Fluorocarbon (134)	V	high-temperature perfluoro elastomer (230)	K
				perfluoro elastomer (394)	K1
				EPT (FDA approved) (235)	E
				perfluoro elastomer (FDA approved) (199) (Chemraz SD-505)	K4
Metal Parts		Stainless steel (316SS) (001) DIN 1.4571	G		
In contact with the medium **Type 5282 only**				Any 'special' material which is required for service conditions involved (Hastelloy C4, C276, 2000, Monel, Titanium etc.)	
Springs		Stainless steel (316SS) (001)	G		

For the atmospheric side face and seat material will be used vice versa.

Type 5280 Seal Family – Technical Data



Type 5280 Dimensional Data (mm)

Shaft Diameter	Minimum Flange Size	H		T	
d	D	5280	5281	5280	5281
40	110	195	195	65	72
50	120	204	204	65	72
60	130	207	216	65	72
80	155	220	228	65	72
100	175	233	236	65	72
125	210	241	245	65	76
140	230	260	260	70	76
160	255	280	280	70	76
180	280	300	300	70	80
200	300	310	310	70	80
220	320	350	350	70	80

Performance Capabilities

Speed	0 to 400 min^{-1}
Vessel Pressure	Vacuum to 6 bar
Seal Pressure	Max. 8.5 bar
Temperature	-40 °C to + 200 °C
	(-100 °C with special materials)

John Crane

Asia Pacific
Singapore
Tel: 65-861-1288
Fax: 65-862-4117

Europe, Africa and Asia
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Tel: 44-1753-224000
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Latin America
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Tel: 55-11-3049-9979
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If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated.

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Sterile Vessel and Agitator Mechanical Seals for Pharmaceutical and Life Sciences

5280 Seal Family

The Life Sciences Solution

5280 Seal Family
Sterile Vessel and Agitator Mechanical Seals

Process demands and product sensitivity in the Life Sciences industry forces manufacturers to develop innovative solutions to these new unique process and environmental demands. The 5280 seal family is the first choice for such critical applications.

The requirements of good manufacturing processes, CIP and SIP have ensured that the 5280/5281 family of seals include the design features considered essential for these processes.

All wetted materials of construction conform to FDA requirements, even the unique PTFE secondary seal, required if truly sterile environments are to be maintained throughout the full operating envelope, whilst the flange fitting has been designed for better access, ensuring effective sterilisation during operation. This requirement differentiates the designs from these required for standard DIN vessels.

5280W is a liquid lubricated design, used in a traditional wet seal arrangement with a process compatible liquid between the seals to lubricate and remove generated heat.

5280D is a gas lubricated fully contacting design that uses a specially developed carbon allowing operation on a dry nitrogen sealant without a humidifier, which is often not process compatible.

5280GD is a gas lubricated non-contacting inboard, contacting outboard design running on a dry nitrogen sealant. A non-contacting inboard seal ensures high levels of product purity, low heat generation and reduced power consumption. A dry contacting outboard seal as used in 5280D reduces sealant gas consumption by up to 50%.

Where an ultra clean process environment exists, non-contacting outboard seal faces are an option.

Typical ultra sterile top, bottom and side entry applications include:

- Genetics
- Fermentation
- Dryers
- Antibiotics
- All ultra clean processes

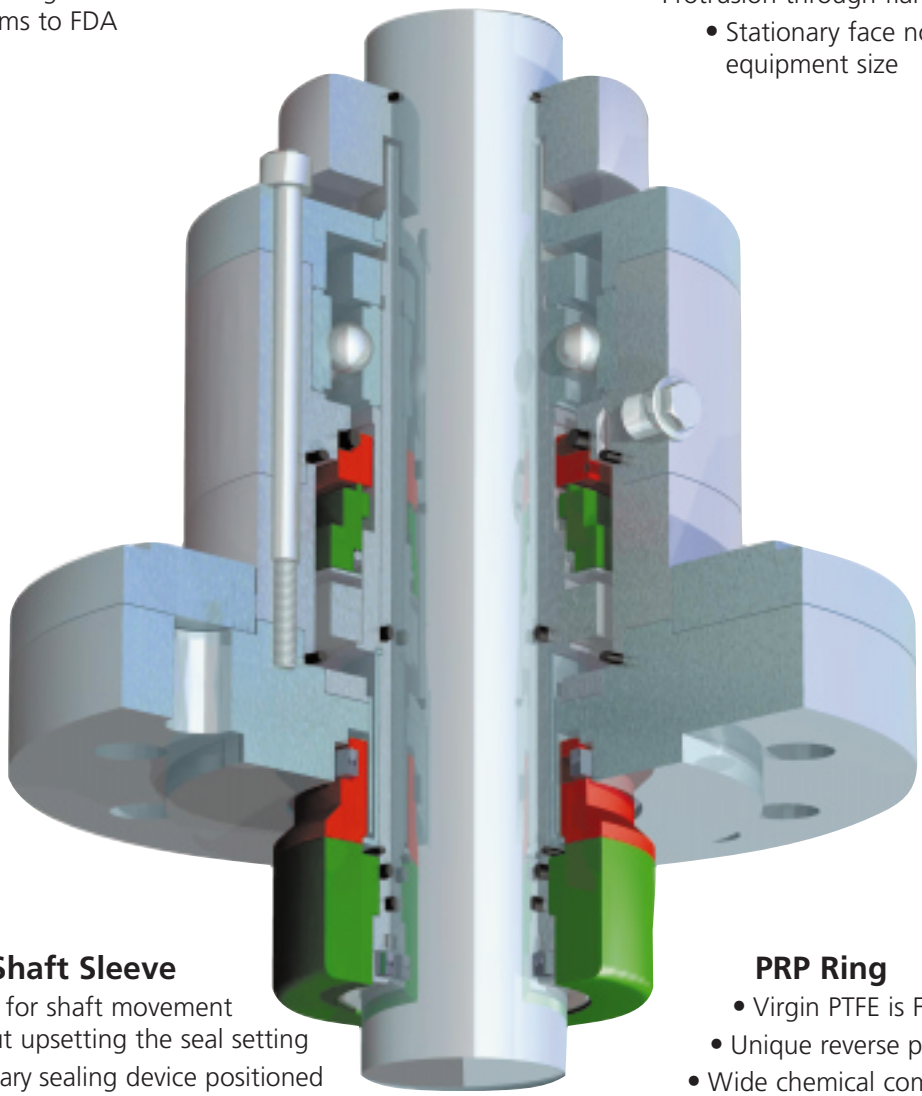
Type 5280 Seal Family – Design Features

Optimised Outboard Seal Faces

- Balanced for optimum performance
- Unique material for enhanced dry running performance
- Dry running material conforms to FDA

Gas Lubricated Inboard Seal Faces

- Uni-directional or bi-directional designs
- Calibrated for minimum buffer gas consumption
- Diamond coating when 2 hard faces employed
- Protrusion through flange for better CIP/SIP
- Stationary face not limited by equipment size

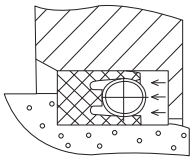


Unique Shaft Sleeve

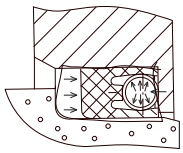
- Allows for shaft movement without upsetting the seal setting
- Secondary sealing device positioned for vacuum applications
- Divided sleeve can be made from exotic materials to ensure product compatibility

PRP Ring

- Virgin PTFE is FDA compatible
- Unique reverse pressure design
- Wide chemical compatibility
- Interchangeable with O-ring if required



Pressurised By Sealant



Reverse Pressurised

Modular Seal Design Ensures Process Compatibility

5280 W – liquid lubricated
5280 D – dry gas lubricated
5280 GD – unique gas/dry face combination

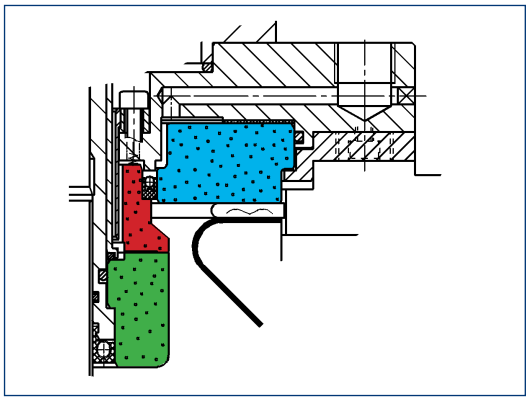
Special Features

- Thrust bearing ensures control of the seal
- No hidden debris wells
- Glass lined, steel or special equipment can be accommodated with flange adapter
- Cartridge design for trouble free installation

Type 5280 Seal Family – Design Options

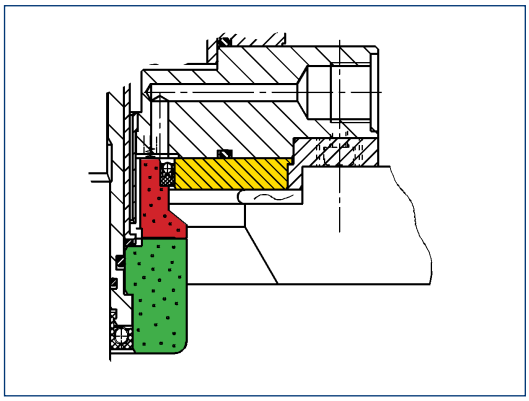
5281: Where a flange is required for lined vessels:

- Ceramic flange adapter for full compatibility with glass or ceramic lined vessels
- Enhanced corrosion resistance
- Fully SIP/CIP compliant



5282: Where enhanced corrosion resistance is required for steel vessels:

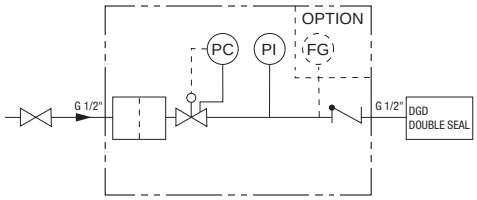
- Hastelloy C flange adapter ensures wide corrosion resistance
- Main seal metal parts fully protected from vessel media
- Alternative materials can be supplied for more specialist application



Sealant System Options to Suit All Seal Designs

Gas Sealant System

Piping and Instrumentation



Wet Seal System