

**first**  **seals**<sup>TM</sup>  
Division



**SMG Range**  
**Bellows Seal**

# SMG Range

## Bellows Seal

### Introduction

The first4seals™ bellows range has been specifically designed to offer the highest standard of operating performance, quality and availability of materials.

The quality of products is ensured by each seal being assembled in the first4seals™ UK headquarters. The components used have been produced in Group manufacturing facilities, thus ensuring that the product performs as intended each and every time.

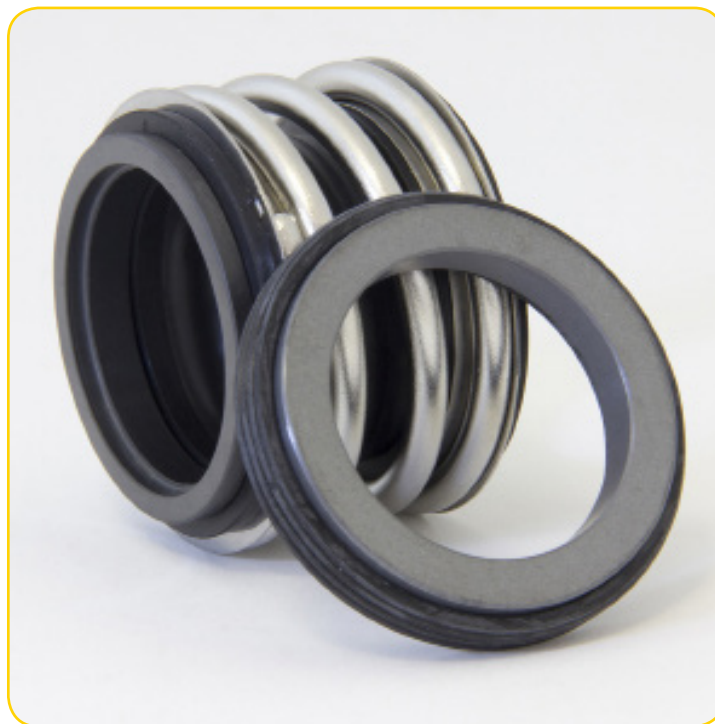
Please contact the first4seals™ Technical Department for any further information regarding material compliance, performance parameters or material specifications.

### Product Description

The SMG Range is an elastomeric bellows seal that is suitable for use in a wide range of industries and applications.

It offers the following features:

- **Full length bellows** – protects the shaft from particulates in the product media.
- **Close radial fit of bellows** – protects the rotary face from contact with the shaft during installation.
- **Maximised axial movement** – sealing capability maintained irrespective of shaft deflection due to axial movement.
- **Maximised spring wire diameter** – rotational drive is transmitted from the shaft to the rotary face.
- **DIN standard compliance** – SMG12, SMG13 meet DIN L1K and L1N working lengths when used with a G60 or G6 stationary face.
- **Modular Design** – the greatest number of product iterations available from stock.



first4seals™	AESSEAL	AESSEAL (OLD)	Eagle Burgmann	Flowserve	Vulcan
SMG1	B09SU	B02S	MG1		19
SMG12	B092SU	B012S	MG12		192
SMG13	B093SU	B013S	MG13		193
SMG1/G6	B09SSU	B02SS	MG1-G6		19S
SMG12/G6	B092SSU	B012SS	MG12-G6		192S
SMG13/G6	B093SSU	B013SS	MG13-G6		193S
SMG1/G9	B09SLU	B02SL	MG1-G9		19L
SMG12/G9	B092SLU	B012SL	MG12-G9		192L
SMG13/G9	B093SLU	B013SL	MG13-G9		193L
SMG1/G60	B09U	B02	MG1-G60	190	19B
SMG12/G60	B092U	B012	MG12-G60	192	192B
SMG13/G60	B093U	B013	MG13-G60	193	193B

### Typical Industries

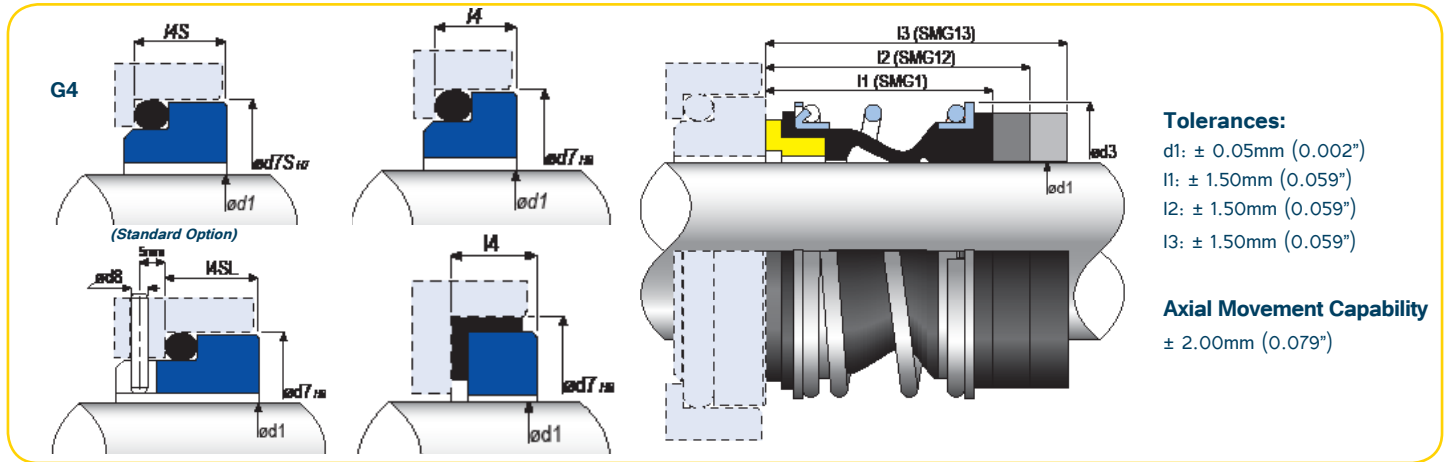
- Oil & Gas
- Power Generation
- Chemical
- Bio/Ethanol
- Mining & Minerals
- Pulp & Paper
- Water & Wastewater
- Automotive
- Metal Processing
- Building Services
- Marine
- Food & Beverage (4 prefix)
- Chemical Standard Pumps
- Helical Screw Pumps
- Stock Pumps
- Circulating Pumps

### Typical Pumps

# SMG Range

## Bellows Seal

### Dimensional Information



Seal Size	d1		d3		d7		d7S		d8		I1		I2		I3		I4		I4S		I4SL	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
0100	10.00	0.394	24.00	0.945	21.00	0.827	19.20	0.756	3.00	0.118	14.50	0.571	25.90	1.020	33.40	1.315	6.60	0.260	6.60	0.260	10.10	0.398
0120	12.00	0.472	24.00	0.945	23.00	0.906	21.60	0.850	3.00	0.118	15.00	0.591	25.90	1.020	33.40	1.315	6.60	0.260	5.60	0.220	12.00	0.472
0140	14.00	0.551	28.00	1.102	25.00	0.984	24.60	0.969	3.00	0.118	17.00	0.669	28.40	1.118	33.40	1.315	6.60	0.260	5.60	0.220	10.00	0.394
0160	16.00	0.630	29.00	1.142	27.00	1.063	28.00	1.102	3.00	0.118	17.00	0.669	28.40	1.118	33.40	1.315	6.60	0.260	7.50	0.295	10.00	0.394
0170	17.00	0.669	31.00	1.220	33.00	1.299	30.00	1.181	3.00	0.118	19.50	0.768	30.00	1.181	37.50	1.476	7.50	0.295	7.50	0.295	10.00	0.394
0180	18.00	0.709	31.00	1.220	33.00	1.299	30.00	1.181	3.00	0.118	19.50	0.768	30.00	1.181	37.50	1.476	7.50	0.295	7.50	0.295	10.00	0.394
0200	20.00	0.787	36.00	1.417	35.00	1.378	35.00	1.378	3.00	0.118	21.50	0.846	30.00	1.181	37.50	1.476	7.50	0.295	7.50	0.295	11.50	0.453
0220	22.00	0.866	36.00	1.417	37.00	1.457	35.00	1.378	3.00	0.118	21.50	0.846	30.00	1.181	37.50	1.476	7.50	0.295	7.50	0.295	11.50	0.453
0240	24.00	0.945	40.50	1.594	39.00	1.535	38.00	1.496	3.00	0.118	22.50	0.886	32.50	1.280	42.50	1.673	7.50	0.295	7.50	0.295	11.50	0.453
0250	25.00	0.984	41.00	1.614	40.00	1.575	38.00	1.496	3.00	0.118	23.00	0.906	32.50	1.280	42.50	1.673	7.50	0.295	7.50	0.295	11.50	0.453
0280	28.00	1.102	47.00	1.850	43.00	1.693	42.00	1.654	3.00	0.118	26.50	1.043	35.00	1.378	42.50	1.673	7.50	0.295	9.00	0.354	11.50	0.453
0300	30.00	1.181	47.00	1.850	45.00	1.772	45.00	1.772	3.00	0.118	26.50	1.043	35.00	1.378	42.50	1.673	7.50	0.295	10.5	0.413	11.50	0.453
0320	32.00	1.260	51.00	2.008	48.00	1.890	48.00	1.890	3.00	0.118	27.50	1.083	35.00	1.378	47.50	1.870	7.50	0.295	10.50	0.413	11.50	0.453
0330	33.00	1.299	51.00	2.008	48.00	1.890	50.00	1.969	3.00	0.118	27.50	1.083	35.00	1.378	47.50	1.870	7.50	0.295	11.00	0.433	11.50	0.453
0350	35.00	1.378	55.00	2.165	50.00	1.969	52.00	2.047	3.00	0.118	28.50	1.122	35.00	1.378	47.50	1.870	7.50	0.295	11.00	0.433	11.50	0.453
0380	38.00	1.496	58.00	2.283	56.00	2.205	55.00	2.165	4.00	0.157	30.00	1.181	36.00	1.417	46.00	1.811	9.00	0.354	10.30	0.406	14.00	0.551
0400	40.00	1.575	60.00	2.362	58.00	2.283	58.00	2.283	4.00	0.157	30.00	1.181	36.00	1.417	46.00	1.811	9.00	0.354	10.80	0.425	14.00	0.551
0430	43.00	1.693	63.00	2.480	61.00	2.402	62.00	2.441	4.00	0.157	30.00	1.181	36.00	1.417	51.00	2.008	9.00	0.354	12.00	0.472	14.00	0.551
0450	45.00	1.772	65.00	2.559	63.00	2.480	64.00	2.520	4.00	0.157	30.00	1.181	36.00	1.417	51.00	2.008	9.00	0.354	11.60	0.457	14.00	0.551
0480	48.00	1.890	69.00	2.717	66.00	2.598	68.40	2.693	4.00	0.157	30.50	1.201	36.00	1.417	51.00	2.008	9.00	0.354	11.60	0.457	14.00	0.551
0500	50.00	1.969	71.00	2.795	70.00	2.756	69.30	2.728	4.00	0.157	30.50	1.201	38.00	1.496	50.50	1.988	9.50	0.374	11.60	0.457	15.00	0.591
0530	53.00	2.087	76.00	2.992	73.00	2.874	72.30	2.846	4.00	0.157	33.00	1.299	36.50	1.437	59.00	2.323	11.00	0.433	12.30	0.484	15.00	0.591
0550	55.00	2.165	78.00	3.071	75.00	2.953	75.40	2.969	4.00	0.157	35.00	1.378	36.50	1.437	59.00	2.323	11.00	0.433	13.30	0.524	15.00	0.591
0580	58.00	2.283	82.00	3.228	78.00	3.071	78.40	3.087	4.00	0.157	37.00	1.457	41.50	1.634	59.00	2.323	11.00	0.433	13.30	0.524	15.00	0.591
0600	60.00	2.362	85.00	3.346	80.00	3.150	80.40	3.165	4.00	0.157	38.00	1.496	41.50	1.634	59.00	2.323	11.00	0.433	13.30	0.524	15.00	0.591
0650	65.00	2.559	90.00	3.543	85.00	3.346	85.40	3.362	4.00	0.157	40.00	1.575	41.50	1.634	69.00	2.717	11.00	0.433	13.00	0.512	15.00	0.591
0680	68.00	2.677	94.00	3.701	90.00	3.543	91.50	3.602	4.00	0.157	40.00	1.575	48.70	1.917	68.70	2.705	11.30	0.445	13.70	0.539	18.00	0.709
0700	70.00	2.756	97.00	3.819	92.00	3.622	92.00	3.622	4.00	0.157	40.00	1.575	48.70	1.917	68.70	2.705	11.30	0.445	13.00	0.512	18.00	0.709
0750	75.00	2.953	102.00	4.016	97.00	3.819	99.00	3.898	4.00	0.157	40.00	1.575	48.00	1.890	68.70	2.705	11.30	0.445	14.00	0.551	18.00	0.709
0800	80.00	3.150	108.00	4.252	105.00	4.134	104.00	4.094	4.00	0.157	40.00	1.575	48.00	1.890	78.00	3.071	12.00	0.472	15.00	0.591	18.20	0.717
0850	85.00	3.346	117.00	4.606	110.00	4.331	109.00	4.291	4.00	0.157	41.00	1.614	46.00	1.811	76.00	2.992	14.00	0.551	14.80	0.583	18.20	0.717
0900	90.00	3.543	126.00	4.961	115.00	4.528	114.00	4.488	4.00	0.157	45.00	1.772	51.00	2.008	76.00	2.992	14.00	0.551	14.80	0.583	18.20	0.717
0950	95.00	3.740	131.00	5.157	120.00	4.724	120.30	4.736	4.00	0.157	46.00	1.811	51.00	2.008	76.00	2.992	14.00	0.551	15.80	0.622	17.20	0.677
1000	100.00	3.937	136.00	5.354	125.00	4.921	123.30	4.854	4.00	0.157	47.00	1.850	51.00	2.008	76.00	2.992	14.00	0.551	15.80	0.622	17.20	0.677

# SMG Range

## Bellows Seal

### Material Variations

Metal Parts: 304 Stainless Steel  
 Rotary Face: Refer to table below  
 Stationary Face: Refer to table below  
 Elastomer: Refer to table below

Prefix	Type	Seal Size	Material	Suffix
3	SMG1	0100 to 1000	Refer to table below	G60
	SMG12			G9
4*	SMG13			G6

	Material Code	Rotary Face	Stationary Face	Elastomer	Standard Material	Alternative Option	
Rotary Only	X6V--	Carbon	N/A	Nitrile	✓	FS	
	X7V--	Carbon	N/A	EPR	✓	FS	
	XYV--	Carbon	N/A	Viton	✓	FS	
	X6K--	Reaction Bonded SiC	N/A	Nitrile	✓	FS (on request)	
	X7K--	Reaction Bonded SiC	N/A	EPR	✓	FS (on request)	
	XYK--	Reaction Bonded SiC	N/A	Viton	✓	FS (on request)	
	X6B--	Antimony Carbon	N/A	Nitrile		✓	
	X7B--	Antimony Carbon	N/A	EPR		✓	
	XYB--	Antimony Carbon	N/A	Viton		✓	
	X6Q--	Sintered SiC	N/A	Nitrile		✓ FS (on request)	
	X7Q--	Sintered SiC	N/A	EPR		✓ FS (on request)	
	XYQ--	Sintered SiC	N/A	Viton		✓ FS (on request)	
	X6R--	Tungsten Carbide	N/A	Nitrile		✓ FS (on request)	
	X7R--	Tungsten Carbide	N/A	EPR		✓ FS (on request)	
	XYR--	Tungsten Carbide	N/A	Viton		✓ FS (on request)	
	Complete	V26	Carbon	99% Alumina Ceramic	Nitrile	✓	FS
		V27	Carbon	99% Alumina Ceramic	EPR	✓	FS
		V2Y	Carbon	99% Alumina Ceramic	Viton	✓	FS
		X6VK6	Carbon	Reaction Bonded SiC	Nitrile	✓	FS
X7VK7		Carbon	Reaction Bonded SiC	EPR	✓	FS	
XYVKY		Carbon	Reaction Bonded SiC	Viton	✓	FS	
X6KK6		Reaction Bonded SiC	Reaction Bonded SiC	Nitrile	✓	FS (on request)	
X7KK7		Reaction Bonded SiC	Reaction Bonded SiC	EPR	✓	FS (on request)	
XYKKY		Reaction Bonded SiC	Reaction Bonded SiC	Viton	✓	FS (on request)	
X6VK6		Carbon	Reaction Bonded SiC	Nitrile	✓	FS	
X7VK7		Carbon	Reaction Bonded SiC	EPR	✓	FS	
XYVKY		Carbon	Reaction Bonded SiC	Viton	✓	FS	
X6VQ6		Carbon	Sintered SiC	Nitrile	✓	FS	
X7VQ7		Carbon	Sintered SiC	EPR	✓	FS	
XYVQY		Carbon	Sintered SiC	Viton	✓	FS	
X6VR6		Carbon	Tungsten Carbide	Nitrile	✓	FS	
X7VR7		Carbon	Tungsten Carbide	EPR	✓	FS	
XYVR7		Carbon	Tungsten Carbide	Viton	✓	FS	
X6QQ6		Sintered SiC	Sintered SiC	Nitrile		✓ FS (on request)	
X7QQ7		Sintered SiC	Sintered SiC	EPR		✓ FS (on request)	
XYQQY		Sintered SiC	Sintered SiC	Viton		✓ FS (on request)	
B26		Antimony Carbon	99% Alumina Ceramic	Nitrile		✓	
B27		Antimony Carbon	99% Alumina Ceramic	EPR		✓	
B2Y		Antimony Carbon	99% Alumina Ceramic	Viton		✓	
X6BK6		Antimony Carbon	Reaction Bonded SiC	Nitrile		✓	
X7BK7		Antimony Carbon	Reaction Bonded SiC	EPR		✓	
XYBK7		Antimony Carbon	Reaction Bonded SiC	Viton		✓	
X6BQ6		Antimony Carbon	Sintered SiC	Nitrile		✓	
X7BQ7		Antimony Carbon	Sintered SiC	EPR		✓	
XYBQY		Antimony Carbon	Sintered SiC	Viton		✓	
X6BR6		Antimony Carbon	Tungsten Carbide	Nitrile		✓	
X7BR7		Antimony Carbon	Tungsten Carbide	EPR		✓	
XYBRY	Antimony Carbon	Tungsten Carbide	Viton		✓		
X6RR6	Tungsten Carbide	Tungsten Carbide	Nitrile		✓ FS (on request)		
X7RR7	Tungsten Carbide	Tungsten Carbide	EPR		✓ FS (on request)		
XYRRY	Tungsten Carbide	Tungsten Carbide	Viton		✓ FS (on request)		

\*EC 1935/2004 Compliant Materials used

**KEY:**

✓ : Available (Not Food Safe)

FS : Food Safe Option

✓ FS : Available as not Food Safe or Food Safe on request

**Availability:**

Standard materials are typically available ex-stock for same day or next day shipment.

Alternative material options are typically available on an 8-10 week lead time, however, this may vary depending on the exact components required.

Please contact the first4seals™ Sales Office for exact availability and lead time.

Alternatively log onto the first4seals™ Customer Portal Stock Checker for full details of availability as well as the capability to track orders.

To access the portal go to <https://portal.first4seals.com>

**N.B. Due to the modular design and build to order process, special material options can be made available on request. Please contact first4seals™ for more information.**

# SMG Range

## Bellows Seal

### Application Limits

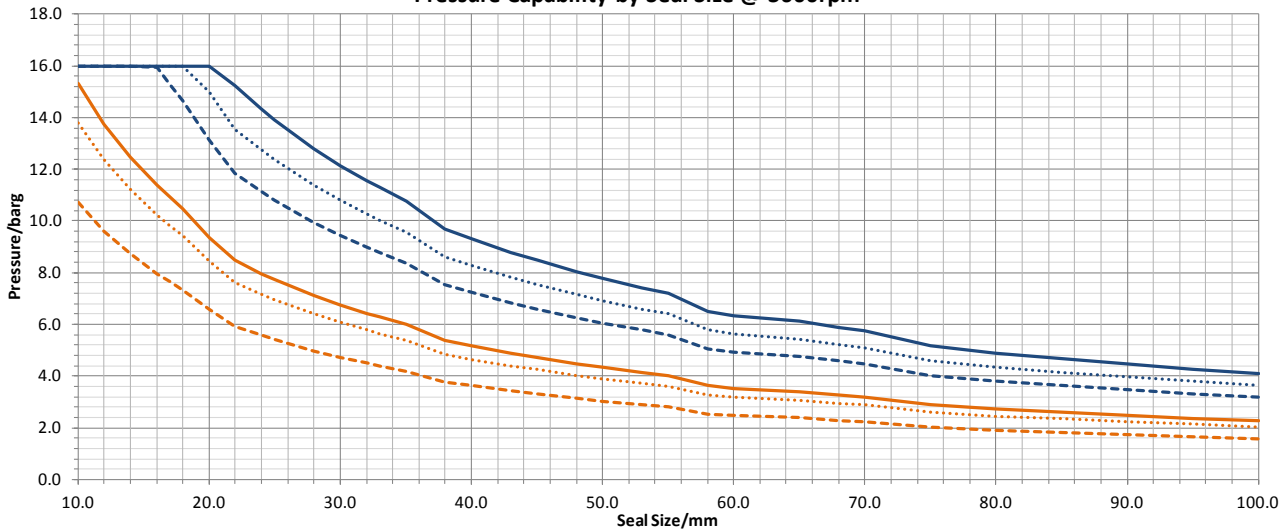
The following graphs show the maximum pressure that the particular sized seals are capable of sealing at temperatures below 80°C (176°F) whilst ensuring that they are operating within the PV limit for the particular face material combinations. If in doubt please contact the first4seals™ Technical Department.

For temperatures above 80°C (176°F) refer to the de-rating factors below to arrive at the application specific pressure rating of the seal.

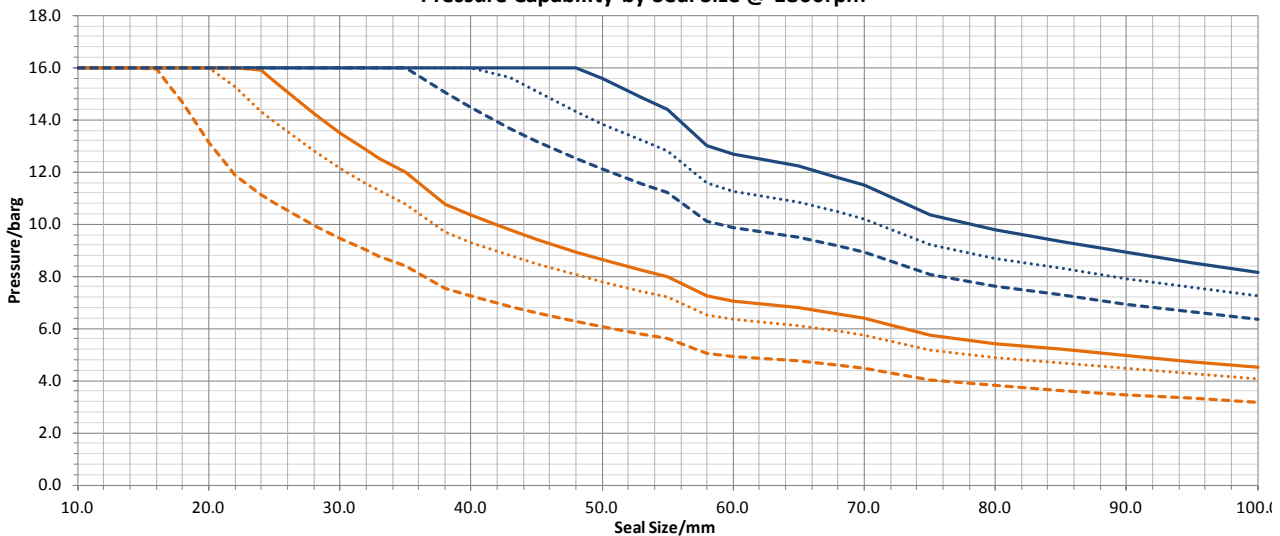
### Rotation Speed (Maximum)

3600rpm or 20m/s (4000fpm) peripheral velocity - whichever value is exceeded first. Maximum rotational speed of 3600rpm and a peripheral velocity of 20m/s (4000fpm) is reached at sizes greater than 90mm seal size. Shaft sizes above this will have a lower rotational speed limit. For shaft speeds above 3600rpm contact first4seals™ Technical Department.

Pressure Capability by Seal Size @ 3600rpm



Pressure Capability by Seal Size @ 1800rpm



— Car/SiC in Aqueous Solutions & Car/SiC or Car/TC in Non-Aqueous Solutions  
— SiC/SiC in Aqueous Solutions & Car/Cer in Non-Aqueous Solutions  
- - - TC/TC in Aqueous Solutions  
- - - Car/Cer in Aqueous Solutions  
- - - SiC/SiC in Non-Aqueous Solutions  
- - - TC/TC in Non-Aqueous Solutions & Car/TC in Aqueous Solutions

Media Temperature	Multiplier
<80°C(175°F)	x1.00
Above 80°C(175°F) to 120°C(250°F)	x0.90
Above 120°C(250°F) to 180°C(355°F)	x0.80
Above 180°C(355°F) to 230°C(445°F)	x0.65

UK Sales & Technical Advice:  
**AESSEAL Marine plc**  
Unit 4 Venlo Industrial Estate  
Knowles Street  
Bradford  
West Yorkshire  
BD4 6HA

tel: **+44 (0) 1274 720775**  
fax: **+44 (0) 1274 729022**  
email: **technical@first4seals.com**  
web: **www.first4seals.com**

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