

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



# SM3 Range

## Taper Spring Seal

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### Introduction

The first4seals™ taper spring 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 SM3 Range is a taper spring driven, o’ring mounted rotary seal that is suitable for use in a wide range of industries and applications.

It offers the following features:

- **Taper Spring Drive** - ensures rotational drive is transmitted to the rotary face without the risk of slippage or damage to the shaft by set screws.
- **Standardised Rotary Head Design** - ensures that the greatest product flexibility is achieved without compromising on availability.
- **Monolithic Rotary Face** - Offered in Stainless Steel as standard but also available in Alumina Ceramic for better sealing performance.
- **Modular Design** - The greatest number of product iterations available from stock.

first4seals™	AESSEAL	AESSEAL (OLD)	Eagle Burgmann	Flowserve	Vulcan
SM3	T02U	T02	M3	39	8B

### Typical Industries

- Power Generation
- Chemical
- Bio/Ethanol
- Automotive
- Building Services
- Marine
- Food & Beverage (4 prefix)

### Typical Pumps

- Submersible Pumps
- Chemical Standard Pumps
- Eccentric Screw Pumps
- Cooling Water Pumps

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### Dimensional Information

**Tolerances:**  
 d1: ± 0.05mm (0.002")  
 l1: ± 1.00mm (0.039")

**Axial Movement Capability**  
 ± 1.00mm (0.039")

Seal Size	d1		d3		d7		l1		l4	
	mm	in	mm	in	mm	in	mm	in	mm	in
0100	10.00	0.394	20.00	0.787	19.20	0.756	15.50	0.610	7.10	0.280
0120	12.00	0.472	22.00	0.866	21.60	0.850	15.50	0.610	7.60	0.299
0140	14.00	0.551	24.00	0.945	24.60	0.969	15.50	0.610	7.60	0.299
0150	15.00	0.591	25.00	0.984	24.60	0.969	15.50	0.610	8.60	0.339
0160	16.00	0.630	26.00	1.024	28.00	1.102	17.50	0.689	9.00	0.354
0180	18.00	0.709	31.00	1.220	30.00	1.181	18.50	0.728	10.00	0.394
0190	19.00	0.748	32.00	1.260	31.00	1.220	20.00	0.787	9.00	0.354
0200	20.00	0.787	34.00	1.339	35.00	1.378	20.00	0.787	9.50	0.374
0220	22.00	0.866	36.00	1.417	35.00	1.378	21.50	0.846	9.50	0.374
0240	24.00	0.945	38.00	1.496	38.00	1.496	23.00	0.906	9.50	0.374
0250	25.00	0.984	39.00	1.535	38.00	1.496	24.50	0.965	9.50	0.374
0260	26.00	1.024	40.00	1.575	40.00	1.575	24.50	0.965	10.00	0.394
0280	28.00	1.102	42.00	1.654	42.00	1.654	24.50	0.965	11.00	0.433
0300	30.00	1.181	44.00	1.732	45.00	1.772	24.50	0.965	11.00	0.433
0320	32.00	1.260	46.00	1.811	48.00	1.890	28.00	1.102	11.00	0.433
0350	35.00	1.378	49.00	1.929	52.00	2.047	28.00	1.102	11.50	0.453
0380	38.00	1.496	54.00	2.126	55.00	2.165	31.00	1.220	11.50	0.453
0400	40.00	1.575	56.00	2.205	58.00	2.283	34.00	1.339	11.50	0.453
0420	42.00	1.654	59.00	2.323	62.00	2.441	35.00	1.378	14.30	0.563
0430	43.00	1.693	59.00	2.323	63.00	2.480	35.00	1.378	14.30	0.563
0450	45.00	1.772	61.00	2.402	64.00	2.520	36.50	1.437	14.30	0.563
0480	48.00	1.890	64.00	2.520	68.40	2.693	42.00	1.654	14.30	0.563
0500	50.00	1.969	66.00	2.598	69.30	2.728	43.00	1.693	14.30	0.563
0550	55.00	2.165	71.00	2.795	75.40	2.969	47.00	1.850	15.30	0.602
0580	58.00	2.283	78.00	3.071	78.40	3.087	50.00	1.969	15.30	0.602
0600	60.00	2.362	79.00	3.110	80.40	3.165	51.00	2.008	15.30	0.602
0650	65.00	2.559	85.00	3.346	85.40	3.362	52.00	2.047	15.30	0.602
0680	68.00	2.677	88.00	3.465	91.50	3.602	53.00	2.087	16.00	0.630
0700	70.00	2.756	90.00	3.543	92.00	3.622	54.00	2.126	15.30	0.602
0750	75.00	2.953	98.00	3.858	99.00	3.898	55.00	2.165	15.30	0.602
0800	80.00	3.150	103.00	4.055	104.00	4.094	58.00	2.283	16.30	0.642

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### Material Variations

Spring:	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	SM3	/ 0100 to 0800 /	/ Refer to table below /	R
4*				L

\* EC 1935/2004 Compliant Materials used

	Material Code	Rotary Face	Stationary Face	Elastomer	Standard Material	Alternative Option
Rotary Only	X6X--	Stainless Steel	N/A	Nitrile	✓	FS (on request)
	X7X--	Stainless Steel	N/A	EPR	✓	FS (on request)
	XYX--	Stainless Steel	N/A	Viton	✓	FS (on request)
	X62--	99% Alumina Ceramic	N/A	Nitrile		✓
	X72--	99% Alumina Ceramic	N/A	EPR		✓
	XY2--	99% Alumina Ceramic	N/A	Viton		✓
Complete	X6XV6	Stainless Steel	Carbon	Nitrile	✓	
	X7XV7	Stainless Steel	Carbon	EPR	✓	
	XYXVY	Stainless Steel	Carbon	Viton	✓	
	X62V6	99% Alumina Ceramic	Carbon	Nitrile		✓
	X72V7	99% Alumina Ceramic	Carbon	EPR		✓
	XY2VY	99% Alumina Ceramic	Carbon	Viton		✓

### 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.**

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### Application Limits

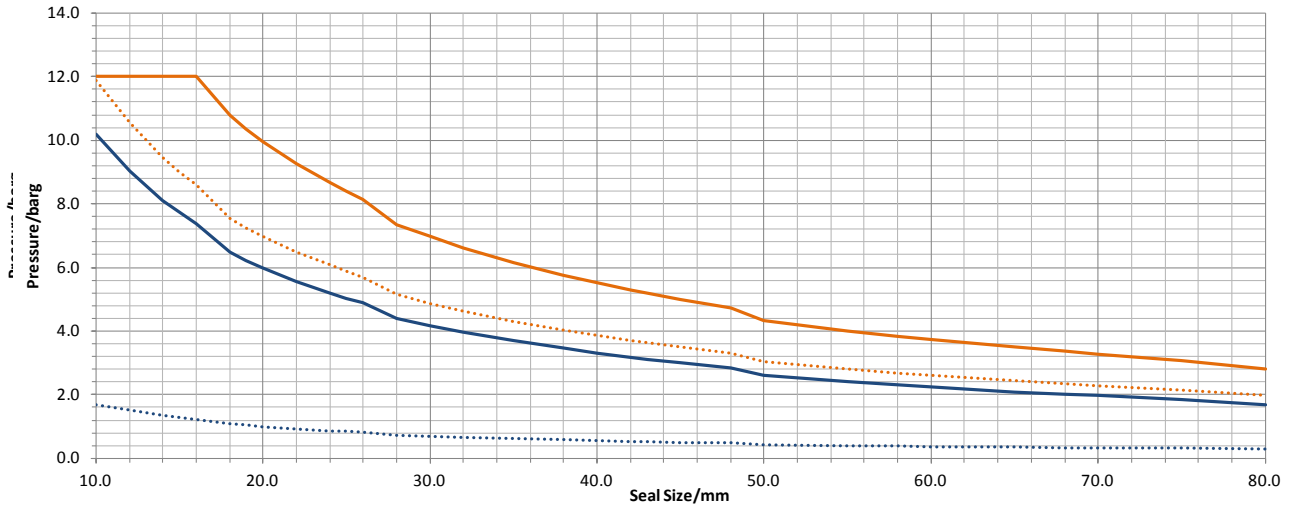
The following graphs show the maximum pressure that the particular sized seals are capable of sealing at temperatures below 80°C (176°F), whilst ensuring that they are operating within the PV limit for the particular face material combinations. If in doubt please contact the first4seals™ Technical Department.

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.

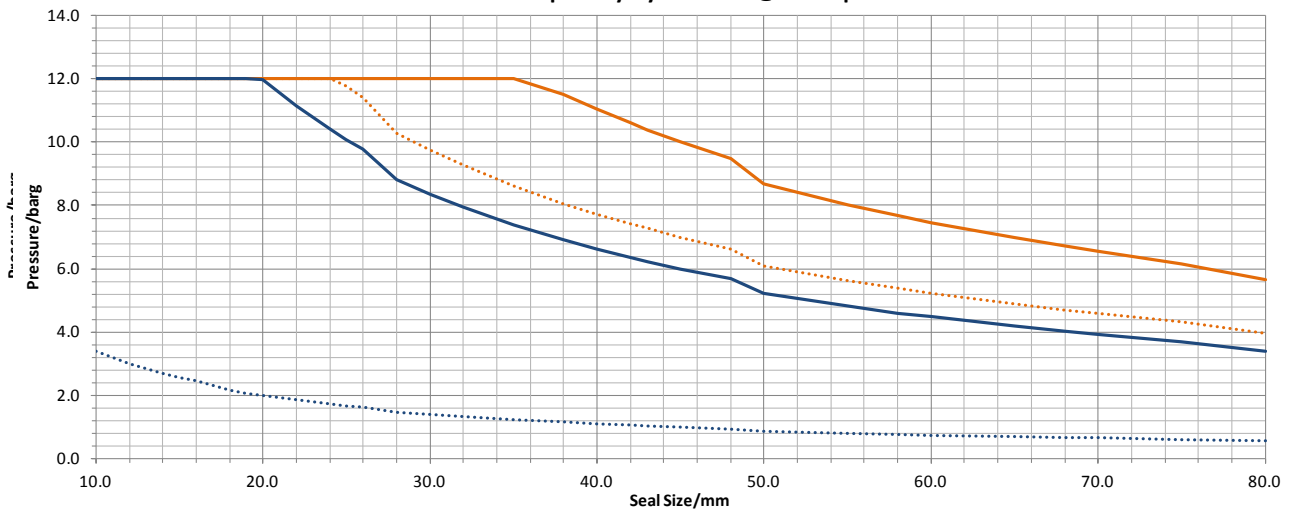
### Rotation Speed (Maximum)

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



— Cer/Car in Non-Aqueous Solutions    ..... Cer/Car in Aqueous Solutions    — SS/Car in Non-Aqueous Solutions    ..... SS/Car 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

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