

MECHANICAL SEAL
TSHA

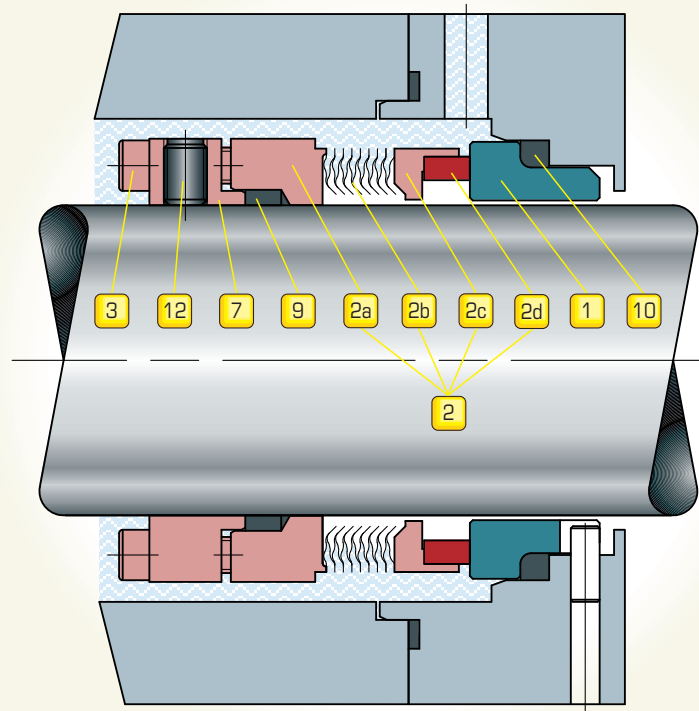


CAT021 ENG REV 12.09

Mechanical seal featuring welded metal bellows which allows to have both secondary seals of static type. The flexibility of the bellows gives the capability to tolerate misalignments and vibrations. Secondary seals in Grafoil make *TSHA* seal particularly suitable for high temperature service (i.e. diathermic oil and hydrocarbons in refinery process). *TSHA* is a single balanced seal, stationary seat type A, bi-directional.

In addition to the standard type, the following series are available:
- Shaft dimensions in inches
- Stationary seal
- Double wall for high pressure
Customized cartridge versions, complete of sleeve and flange, designed according API 682 standard, are available.

**MECHANICAL SEAL
TSHA**



ELEMENTS:

- 1 STATIONARY SEAT
- 2 BELLOWS COMPLETE
- 3 SCREW
- 7 DRIVING RING
- 9 ROTARY FACE GASKET
- 10 STATIONARY SEAT GASKET
- 12 SETSCREW

OPERATING CONDITIONS:

DIAMETER: (mm)	SPEED: (m/sec)	PRESSURE: (bar)	TEMPERATURE: (°C)
100 ↑ 25	20 ↑ 0	22 ↑ 0	+420 ↑ -70

CHARACTERISTICS:



SINGLE



BI-DIRECTIONAL



BALANCED



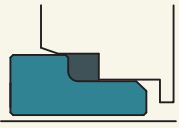
RESISTANT TO
ACIDS & BASES



HIGH
TEMPERATURE

STATIONARY SEAT: 1

SOLID TYPE A



Cr-Mo Steel: **Y1**
Silicon Carbide: **U31**

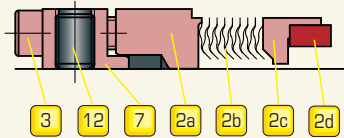
STATIONARY SEAT GASKET: 10

Grafoil: **G5**

ROTARY FACE GASKET: 9

Grafoil: **G5**

ROTARY PART:



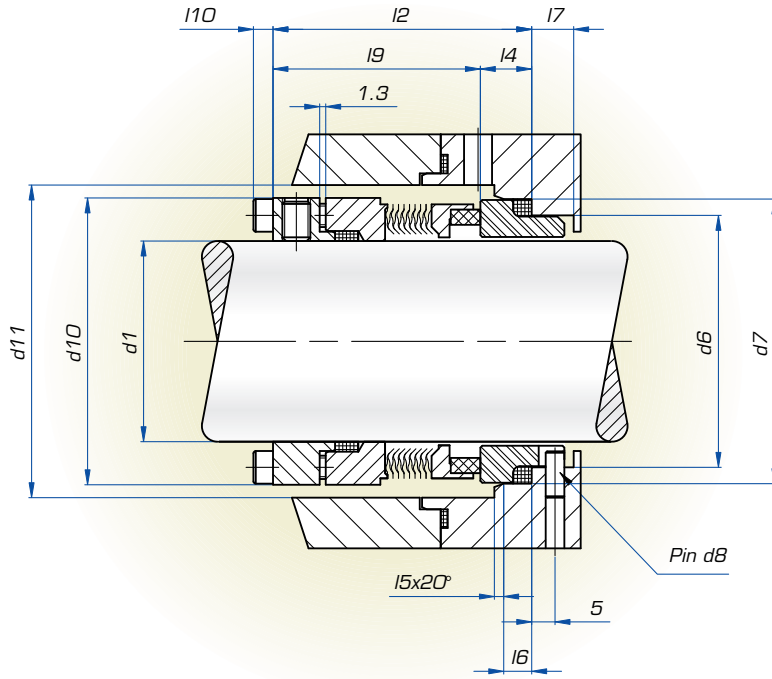
INSERT

Insert (Pos. 2d) in Graphite Antimony impr.: **Z12**
Insert (Pos. 2d) in Silicon Carbide: **U32**
Insert (Pos. 2d) in Tungsten Carbide: **K22**

BELLOWS AND OTHER PARTS

Bellows (Pos. 2b) AM350 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12/3/7) AISI 316: **xK**

Bellows (Pos. 2b) Inconel 718 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12/3/7) AISI 316: **xL**



Seal Diam.	d1	d10	d11	d6	d7	d8	12	19	14	15	16	17	110
	h_6			H_{11}	H_8		$\pm 0,5$	$\pm 0,5$					
25	25	39,7	42	34	40	3	52,8	42,8	10	2	5	9	3,2
28	28	42,8	44	37	43	3	49,7	39,7	10	2	5	9	3,2
30	30	46	48	39	45	3	52,8	42,8	10	2	5	9	3,2
32	32	46	48	42	48	3	52,8	42,8	10	2	5	9	3,2
33	33	49	51	42	48	3	54,5	44,5	10	2	5	9	3,2
35	35	49	51	44	50	3	54,5	44,5	10	2	5	9	3,2
38	38	55,1	58	49	56	4	55,5	44,5	11	2	6	9	4,2
40	40	58,3	62	51	58	4	55,5	44,5	11	2	6	9	4,2
43	43	61,5	65	54	61	4	55,5	44,5	11	2	6	9	4,2
45	45	62,3	65	56	63	4	55,5	44,5	11	2	6	9	4,2
48	48	64,6	68	59	66	4	55,5	44,5	11	2	6	9	4,2
50	50	67,8	71	62	70	4	57,5	44,5	13	2,5	6	9	4,2
53	53	71,1	75	65	73	4	57,5	44,5	13	2,5	6	9	4,2
55	55	74,2	79	67	75	4	60,6	47,6	13	2,5	6	9	4,2
60	60	77,3	87	72	80	4	60,6	47,6	13	2,5	6	9	4,2
63	63	81	88	75	83	4	60,6	47,6	13	2,5	6	9	4,2
65	65	84,1	90	77	85	4	60,6	47,6	13	2,5	6	9	4,2
70	70	87,3	95	83	92	4	62,6	47,6	15	2,5	7	9	4,2
75	75	95,3	104	88	97	4	62,6	47,6	15	2,5	7	9	4,8
80	80	98,4	109	95	105	4	63,1	47,6	15,5	3	7	9	4,8
85	85	105	114	100	110	4	63,1	47,6	15,5	3	7	9	4,8
90	90	110,6	119	105	115	4	63,1	47,6	15,5	3	7	9	4,8
95	95	114,3	124	110	120	4	63,1	47,6	15,5	3	7	9	4,8
100	100	120,7	129	115	125	4	63,1	47,6	15,5	3	7	9	4,8

Dimensions subject to modifications without notice.

Example:

To order the seals shown on this page for shaft 55 mm and material shown in the table below :

2 (Insert)	1	9	10	2 12 3 7 (Bellows and other parts)
Z12	U31	G5	G5	xL

The code will be: TSHA055 - Z12U31G5xL ⁽³⁾

NOTES:

- 1) The material shown on this page is only part of the available range, for other products stock items, please call our Technical Sales Office.
- 2) The material should be chosen according to the operating conditions. All queries should be sent to our Technical Sales Office
- 3) When the material of the seal on the stationary seat gasket is the same as the seal on the rotary face gasket the product code is not repeated.

MECHANICAL SEAL
TSHAP



CAT024.ENG REV 12.09

Mechanical seal featuring welded metal bellows which allows to have both secondary seals of static type. The flexibility of the bellows gives the capability to tolerate misalignments and vibrations. Secondary seals in Grafoil make *TSHAP* seal particularly suitable for high temperature service (i.e. diathermic oil and hydrocarbons in refinery process).

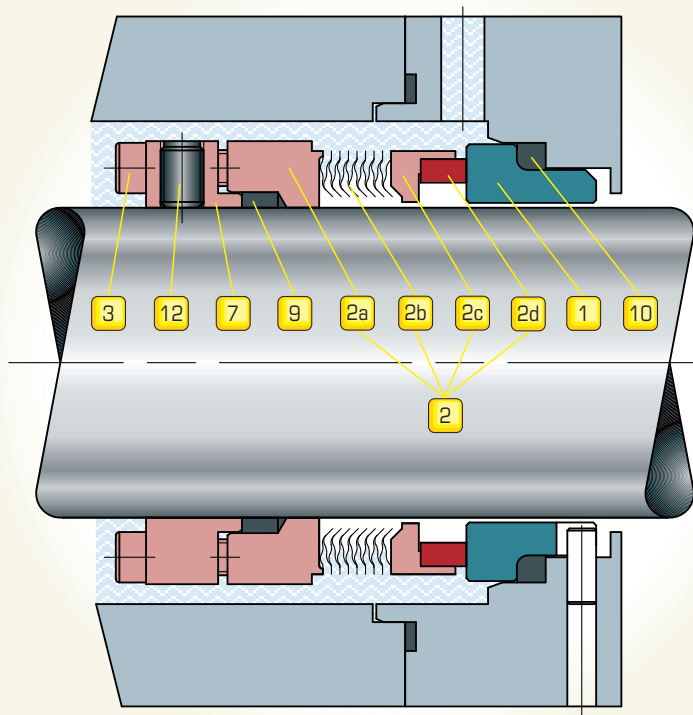
TSHAP is a single balanced seal, stationary seat type A, bi-directional, designed with dimensions in inches.

In addition to the standard type, the following series are available:

- Stationary seal
 - Double wall for high pressure
- Customized cartridge versions, complete of sleeve and flange, designed according API 682 standard, are available.



**MECHANICAL SEAL
TSHAP**



ELEMENTS:

- 1** STATIONARY SEAT
- 2** BELLOWS COMPLETE
- 3** SCREW
- 7** DRIVING RING
- 9** ROTARY FACE GASKET
- 10** STATIONARY SEAT GASKET
- 12** SETSCREW

OPERATING CONDITIONS:

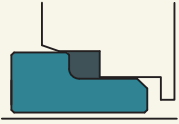
DIAMETER: (inch)	SPEED: (m/sec)	PRESSURE: (bar)	TEMPERATURE: (°C)
4.3/4"	20	22	+420
1"	0	0	-70

CHARACTERISTICS:

- SINGLE
- BI-DIRECTIONAL
- BALANCED
- RESISTANT TO ACIDS & BASES
- HIGH TEMPERATURE
- INCHES DIMENSIONS

STATIONARY SEAT: 1

SOLID TYPE A



Cr-Mo Steel: **Y1**
Silicon Carbide: **U31**

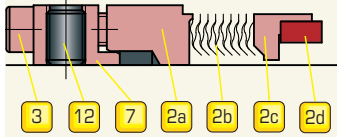
STATIONARY SEAT GASKET: 10

Grafoil: **G5**

ROTARY FACE GASKET: 9

Grafoil: **G5**

ROTARY PART:



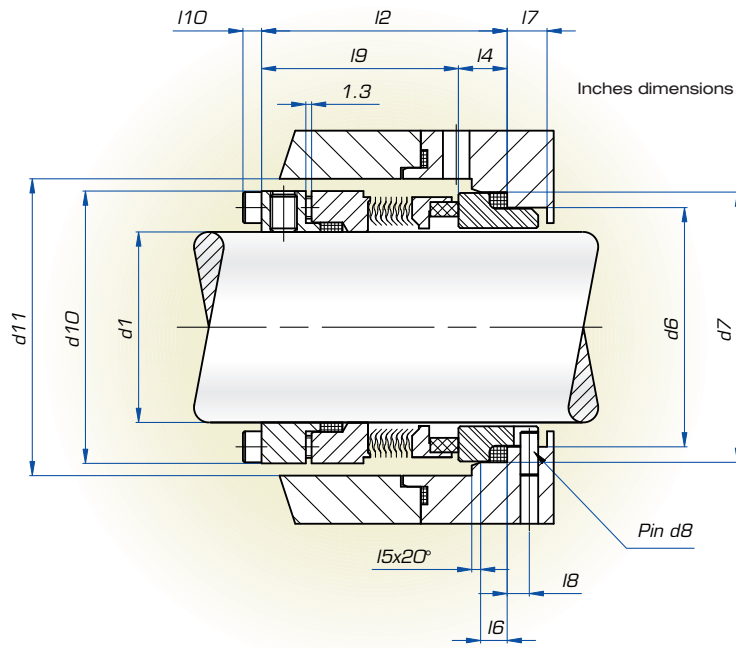
INSERT

Insert (Pos. 2d) in Graphite Antimony impr.: **Z12**
Insert (Pos. 2d) in Silicon Carbide: **U32**
Insert (Pos. 2d) in Tungsten Carbide: **K22**

BELLOWS AND OTHER PARTS

Bellows (Pos. 2b) AM350 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12/3/7) AISI 316: **xK**

Bellows (Pos. 2b) Inconel 718 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12/3/7) AISI 316: **xL**



Seal Code	d1 h6	d10	d11 min	d6 H11	d7 H8	d8 ± 0,5	12 ± 0,5	19 ± 0,5	14	15	16	17	18	110
100	1"	1,562	1,654	1,457	1,693	0,118	2,081	1,687	0,394	0,079	0,197	0,354	0,197	0,125
118	1.1/8"	1,687	1,732	1,535	1,772	0,118	1,956	1,562	0,394	0,079	0,197	0,354	0,197	0,125
114	1.1/4"	1,812	1,890	1,654	1,890	0,118	2,081	1,687	0,394	0,079	0,197	0,354	0,197	0,125
138	1.3/8"	1,937	2,008	1,732	1,969	0,118	2,144	1,750	0,394	0,079	0,197	0,354	0,197	0,164
112	1.1/2"	2,170	2,283	2,008	2,283	0,157	2,183	1,750	0,433	0,079	0,236	0,354	0,197	0,164
158	1.5/8"	2,295	2,441	2,126	2,402	0,157	2,183	1,750	0,433	0,079	0,236	0,354	0,197	0,164
134	1.3/4"	2,420	2,559	2,205	2,480	0,157	2,183	1,750	0,433	0,079	0,236	0,354	0,197	0,164
178	1.7/8"	2,545	2,677	2,323	2,598	0,157	2,183	1,750	0,433	0,079	0,236	0,354	0,197	0,164
200	2"	2,670	2,795	2,559	2,874	0,157	2,262	1,750	0,512	0,098	0,236	0,354	0,197	0,164
218	2.1/8"	2,795	2,953	2,638	2,953	0,157	2,262	1,750	0,512	0,098	0,236	0,354	0,197	0,164
214	2.1/4"	2,920	3,110	2,756	3,071	0,157	2,387	1,875	0,512	0,098	0,236	0,354	0,197	0,164
238	2.3/8"	3,045	3,425	2,953	3,150	0,157	2,387	1,875	0,512	0,098	0,236	0,354	0,197	0,164
212	2.1/2"	3,187	3,465	2,953	3,268	0,157	2,387	1,875	0,512	0,098	0,236	0,354	0,197	0,164
258	2.5/8"	3,312	3,543	3,268	3,622	0,157	2,466	1,875	0,591	0,098	0,276	0,354	0,197	0,164
234	2.3/4"	3,437	3,740	3,268	3,622	0,157	2,466	1,875	0,591	0,098	0,276	0,354	0,197	0,164
278	2.7/8"	3,625	3,921	3,465	3,819	0,157	2,466	1,875	0,591	0,098	0,276	0,354	0,197	0,190
300	3"	3,750	4,094	3,740	4,134	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
318	3.1/8"	3,875	4,291	3,740	4,134	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
314	3.1/4"	4,000	4,375	3,937	4,331	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
338	3.3/8"	4,125	4,488	4,134	4,528	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
312	3.1/2"	4,250	4,609	4,134	4,528	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
358	3.5/8"	4,375	4,734	4,331	4,724	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
334	3.3/4"	4,500	4,882	4,331	4,724	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
378	3.7/8"	4,625	4,984	4,528	4,921	0,157	2,485	1,875	0,610	0,118	0,276	0,354	0,197	0,190
400	4"	4,750	5,079	4,744	5,079	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236	0,190
418	4.1/8"	5,125	5,375	4,744	5,079	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250
414	4.1/4"	5,125	5,375	4,941	5,276	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250
438	4.3/8"	5,375	5,750	5,138	5,472	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250
412	4.1/2"	5,375	5,750	5,138	5,472	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250
458	4.5/8"	5,625	6,000	5,335	5,669	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250
434	4.3/4"	5,625	6,000	5,335	5,669	0,157	2,748	2,000	0,748	0,118	0,276	0,472	0,236	0,250

Dimensions subject to modifications without notice.

Example:

To order the seals shown on this page for shaft 3 inches and 1/4 and material shown in the table below :

2 (Insert)	1	9	10	2 12 3 7 (Bellows and other parts)
Z12	U31	G5	G5	xL

The code will be: TSHP314 - Z12U31G5xL ⁽³⁾

NOTES:

- 1) The material shown on this page is only part of the available range, for other products stock items, please call our Technical Sales Office.
- 2) The material should be chosen according to the operating conditions. All queries should be sent to our Technical Sales Office
- 3) When the material of the seal on the stationary seat gasket is the same as the seal on the rotary face gasket the product code is not repeated.