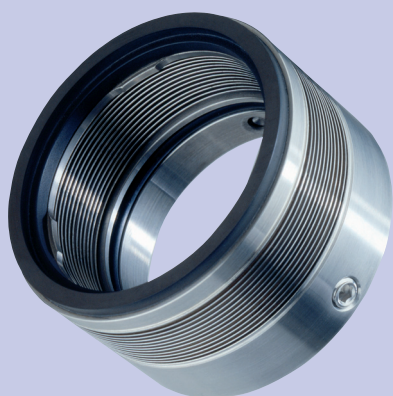


MECHANICAL SEAL
TSMA



CAT020 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 are "O" Ring type.

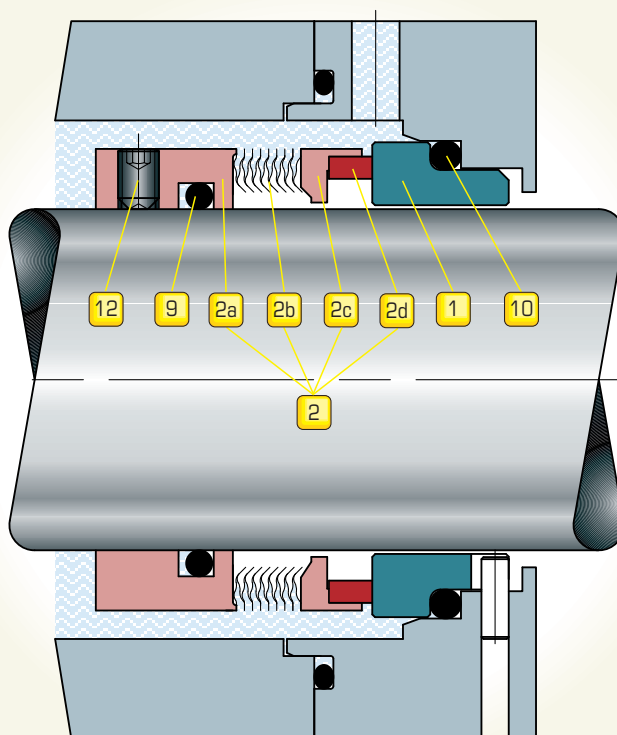
The TSMA is particularly suitable for medium-high temperature service, with products crystallizing in atmosphere and with highly corrosive products when featuring bellows in Hastelloy.

TSMA is a single balanced seal, stationary seat type A, bi-directional, designed according standard UNI EN 12756 (ex DIN 24960)

In addition to the standard type, the following series are available:
- Shaft dimensions in inches
Customized cartridge versions, complete of sleeve and flange, designed according API 682 and API 610 standards, are available.



MECHANICAL SEAL
TSMA



ELEMENTS:

- 1 STATIONARY SEAT
- 2 BELLOWS COMPLETE
- 9 ROTARY FACE "O" RING
- 10 STATIONARY SEAT "O" RING
- 12 SETSCREW

OPERATING CONDITIONS:

DIAMETER: (mm)	SPEED: (m/sec)	PRESSURE: (bar)	TEMPERATURE: (°C)
100	20	22	+300
↑	↑	↑	↑
20	0	0	-70

CHARACTERISTICS:



SINGLE



BI-DIRECTIONAL



BALANCED



UNI EN 12756



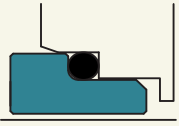
RESISTANT TO ACIDS & BASES



CRYSTALLIZING PRODUCTS

STATIONARY SEAT: 1

SOLID TYPE A



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

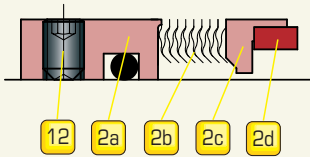
STATIONARY SEAT "O" RING: 10

- Nitrile Rubber: **G**
- Ethylene Propylene: **D**
- Fluoroelastomer: **V**
- Perfluoroelastomer: **G711**
- PTFE: **T**

ROTARY FACE "O" RING: 9

- Nitrile Rubber: **G**
- Ethylene Propylene: **D**
- Fluoroelastomer: **V**
- Perfluoroelastomer: **G711**

ROTARY PART:



INSERT

Insert (Pos. 2d) in Graphite Resins impr.: **Z32**
Insert (Pos. 2d) in Silicon Carbide: **U32**
Insert (Pos. 2d) in Tungsten Carbide: **K22**

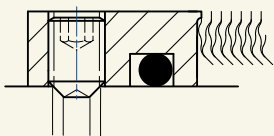
BELLOWS AND OTHER PARTS

Bellows (Pos. 2b) AM350 +
Intert Support (Pos. 2c) AISI 316 +
Other Parts (Pos. 2a/12) AISI 316: **xG**

Bellows (Pos. 2b) Hastelloy C +
Intert Support (Pos. 2c) Hastelloy C +
Other Parts (Pos. 2a/12) Hastelloy C: **xH**

Bellows (Pos. 2b) Hastelloy C +
Insert Support (Pos. 2c) AISI 316 +
Other Parts (Pos. 2a/12) AISI 316: **xI**

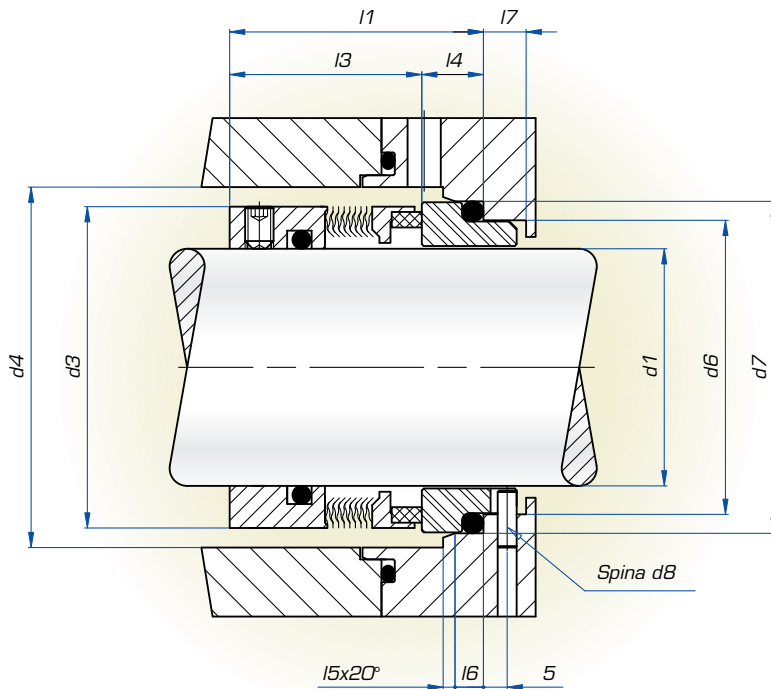
Bellows (Pos. 2b) AM350 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12) AISI 316: **xK**



Pressure > 10 bar

Blocking system with setscrew with
the end cup-shaped in dimple shaft.

For dimple shaft dimensions, please
call our Technical Sales Office.



Diam. Tenuta	d1	d3 ⁽⁴⁾	d4 ⁽⁴⁾	d6	d7	d8	l1	l3	l4	l5	l6	l7
	h6		min	H11	H8		± 0,5	± 0,5				
20	20	37*	39*	29	35	3	37,5	27,5	10	2	5	9
22	22	37*	39*	31	37	3	37,5	27,5	10	2	5	9
24	24	37	40	33	39	3	40	30	10	2	5	9
25	25	37	41	34	40	3	40	30	10	2	5	9
28	28	42,8*	44	37	43	3	42,5	32,5	10	2	5	9
30	30	43	46	39	45	3	42,5	32,5	10	2	5	9
32	32	43	48	42	48	3	42,5	32,5	10	2	5	9
33	33	49,2*	51*	42	48	3	42,5	32,5	10	2	5	9
35	35	49,2*	51	44	50	3	42,5	32,5	10	2	5	9
38	38	49,4	58	49	56	4	45	34	11	2	6	9
40	40	55,5	60	51	58	4	45	34	11	2	6	9
43	43	58,7	63	54	61	4	45	34	11	2	6	9
45	45	58,7	65	56	63	4	45	34	11	2	6	9
48	48	61,9	68	59	66	4	45	34	11	2	6	9
50	50	65,1	70	62	70	4	47,5	34,5	13	2,5	6	9
53	53	68,2	73	65	73	4	47,5	34,5	13	2,5	6	9
55	55	71,4*	75	67	75	4	47,5	34,5	13	2,5	6	9
58	58	74,6	83	70	78	4	52,5	39,5	13	2,5	6	9
60	60	74,6	85	72	80	4	52,5	39,5	13	2,5	6	9
63	63	80,9	88	75	83	4	52,5	39,5	13	2,5	6	9
65	65	84,1	90	77	85	4	52,5	39,5	13	2,5	6	9
68	68	87,3	93	81	90	4	52,5	37,5	15	2,5	7	9
70	70	87,3	95	83	92	4	60	45	15	2,5	7	9
75	75	92,1	104	88	97	4	60	45	15	2,5	7	9
80	80	98,4	109	95	105	4	60	44,5	15,5	3	7	9
85	85	104,8	114	100	110	4	60	44,5	15,5	3	7	9
90	90	108	119	105	115	4	65	49,5	15,5	3	7	9
95	95	114,3	124	110	120	4	65	49,5	15,5	3	7	9
100	100	120,7	129	115	125	4	65	49,5	15,5	3	7	9

Dimensions subject to modifications without notice.

Example:

To order the seals shown on this page for shaft 70 mm and material shown in the table below :

2 (Insert)	1	9	10	2 12 (Bellows and other parts)
U32	U31	V	V	xH

The code will be: T SMA070 - U32U31VxH⁽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 "O" ring is the same as the seal on the rotary face "O" ring the product code is not repeated.
- 4) Dimension marked with asterisk are greater than dimensions specified on standard UNI EN 12756.

MECHANICAL SEAL TSMAP



CAT023 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 are "O" Ring type.

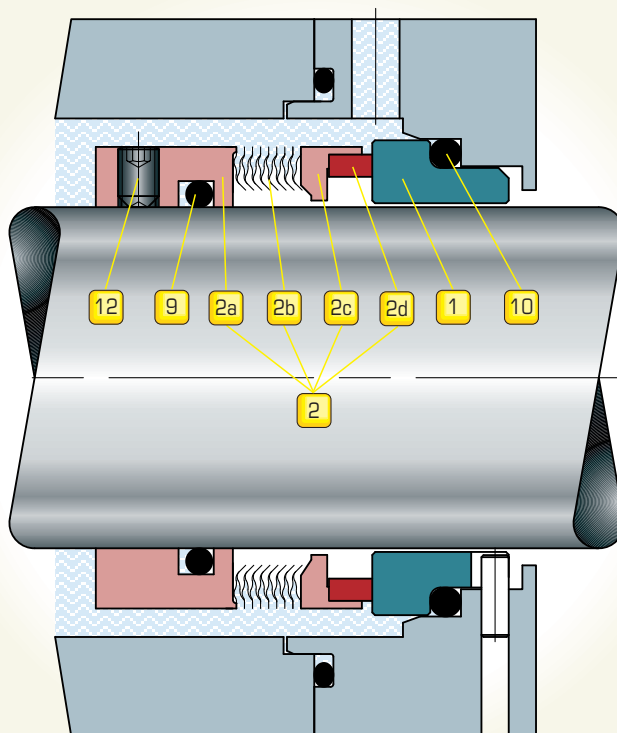
The TSMAP is particularly suitable for medium-high temperature service, with products crystallizing in atmosphere and with highly corrosive products when featuring bellows in Hastelloy.

TSMAP 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:
- customized cartridge versions, complete of sleeve and flange, designed according API 682 and API 610 standards, are available.



MECHANICAL SEAL TSMAP



ELEMENTS:

- 1 STATIONARY SEAT
- 2 BELLOWS COMPLETE
- 9 ROTARY FACE "O" RING
- 10 STATIONARY SEAT "O" RING
- 12 SETSCREW

OPERATING CONDITIONS:

DIAMETER: (inch)	SPEED: (m/sec)	PRESSURE: (bar)	TEMPERATURE: (°C)
4.3/4"	20	22	+205
1"	0	0	-70

CHARACTERISTICS:



SINGLE



BI-DIRECTIONAL



BALANCED



INCHES
DIMENSIONS



RESISTANT TO
ACIDS & BASES

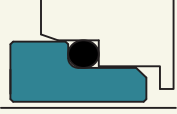


CRYSTALLIZING
PRODUCTS

TSMAP

STATIONARY SEAT: 1

SOLID TYPE A



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

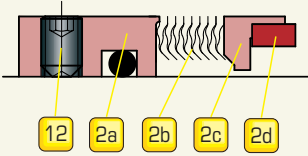
STATIONARY SEAT "O" RING: 10

- Nitrile Rubber: **G**
- Ethylene Propylene: **D**
- Fluoroelastomer: **V**
- Perfluoroelastomer: **G711**
- PTFE: **T**

ROTARY FACE "O" RING: 9

- Nitrile Rubber: **G**
- Ethylene Propylene: **D**
- Fluoroelastomer: **V**
- Perfluoroelastomer: **G711**

ROTARY PART:



INSERT

Insert (Pos. 2d) in Graphite Resins impr.: **Z32**
Insert (Pos. 2d) in Silicon Carbide: **U32**
Insert (Pos. 2d) in Tungsten Carbide: **K22**

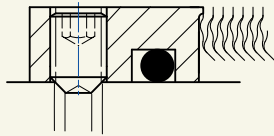
BELLOWS AND OTHER PARTS

Bellows (Pos. 2b) AM350 +
Intert Support (Pos. 2c) AISI 316 +
Other Parts (Pos. 2a/12) AISI 316: **xK**

Bellows (Pos. 2b) Hastelloy C +
Intert Support (Pos. 2c) Hastelloy C +
Other Parts (Pos. 2a/12) Hastelloy C: **xH**

Bellows (Pos. 2b) Hastelloy C +
Insert Support (Pos. 2c) AISI 316 +
Other Parts (Pos. 2a/12) AISI 316: **xI**

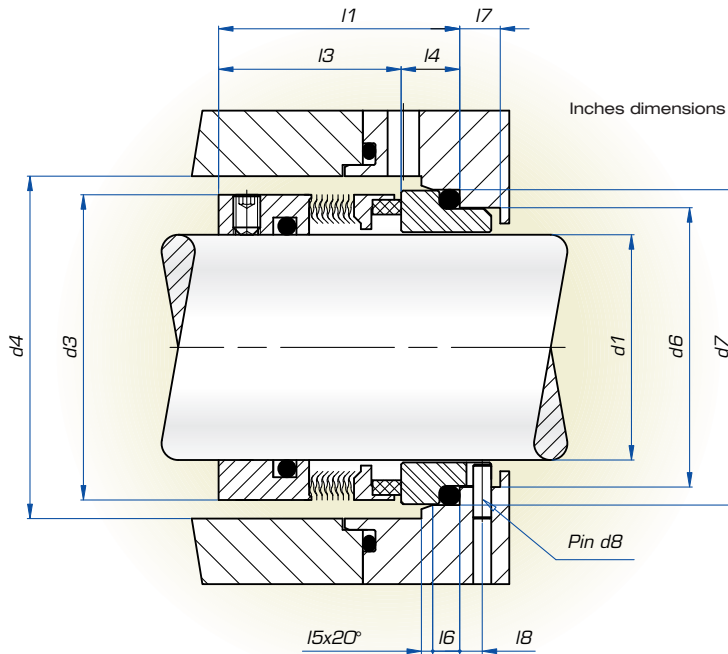
Bellows (Pos. 2b) AM350 +
Insert Support (Pos. 2c) Carpenter 42 +
Other Parts (Pos. 2a/12) AISI 316: **xK**



Pressure > 10 bar

Blocking system with setscrew with
the end cup-shaped in dimple shaft.

For dimple shaft dimensions, please
call our Technical Sales Office.



Seal Code	d1 h6	d3 min	d4 H11	d6 H8	d7 H8	d8 ± 0,5	l1 ± 0,5	l3 ± 0,5	l4	l5	l6	l7	l8
100	1"	1,457	1,614	1,457	1,693	0,118	1,644	1,250	0,394	0,079	0,197	0,354	0,197
118	1.1/8"	1,687	1,732	1,535	1,772	0,118	1,644	1,250	0,394	0,079	0,197	0,354	0,197
114	1.1/4"	1,694	1,890	1,654	1,890	0,118	1,706	1,312	0,394	0,079	0,197	0,354	0,197
138	1.3/8"	1,937	2,008	1,732	1,969	0,118	1,831	1,437	0,394	0,079	0,197	0,354	0,197
112	1.1/2"	1,944	2,283	2,008	2,283	0,157	1,870	1,437	0,433	0,079	0,236	0,354	0,197
158	1.5/8"	2,187	2,362	2,126	2,402	0,157	1,870	1,437	0,433	0,079	0,236	0,354	0,197
134	1.3/4"	2,312	2,559	2,205	2,480	0,157	1,870	1,437	0,433	0,079	0,236	0,354	0,197
178	1.7/8"	2,437	2,677	2,323	2,598	0,157	1,933	1,500	0,433	0,079	0,236	0,354	0,197
200	2"	2,562	2,756	2,559	2,874	0,157	2,012	1,500	0,512	0,098	0,236	0,354	0,197
218	2.1/8"	2,687	2,874	2,638	2,953	0,157	2,012	1,500	0,512	0,098	0,236	0,354	0,197
214	2.1/4"	2,812	2,953	2,756	3,071	0,157	2,074	1,562	0,512	0,098	0,236	0,354	0,197
238	2.3/8"	2,937	3,346	2,953	3,150	0,157	2,074	1,562	0,512	0,098	0,236	0,354	0,197
212	2.1/2"	3,187	3,465	2,953	3,268	0,157	2,074	1,562	0,512	0,098	0,236	0,354	0,197
258	2.5/8"	3,312	3,543	3,268	3,622	0,157	2,216	1,625	0,591	0,098	0,276	0,354	0,197
234	2.3/4"	3,437	3,740	3,268	3,622	0,157	2,216	1,625	0,591	0,098	0,276	0,354	0,197
278	2.7/8"	3,625	3,921	3,465	3,819	0,157	2,278	1,687	0,591	0,098	0,276	0,354	0,197
300	3"	3,750	4,094	3,740	4,134	0,157	2,297	1,687	0,610	0,118	0,276	0,354	0,197
318	3.1/8"	3,875	4,291	3,740	4,134	0,157	2,360	1,750	0,610	0,118	0,276	0,354	0,197
314	3.1/4"	4,000	4,375	3,937	4,331	0,157	2,360	1,750	0,610	0,118	0,276	0,354	0,197
338	3.3/8"	4,125	4,488	4,134	4,528	0,157	2,360	1,750	0,610	0,118	0,276	0,354	0,197
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
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
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
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
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
418	4.1/8"	5,125	5,375	4,744	5,079	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236
414	4.1/4"	5,125	5,375	4,941	5,276	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236
438	4.3/8"	5,375	5,750	5,138	5,472	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236
412	4.1/2"	5,375	5,750	5,138	5,472	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236
458	4.5/8"	5,625	6,000	5,335	5,669	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236
434	4.3/4"	5,625	6,000	5,335	5,669	0,157	2,623	1,875	0,748	0,118	0,276	0,472	0,236

Dimensions subject to modifications without notice.

Example:

To order the seals shown on this page for shaft 1 inch and material shown in the table below :

2 (Insert)	1	9	10	2 12 (Bellows and other parts)
U32	U31	V	V	xH

The code will be: TSMAP100 - U32U31VxH ⁽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 "O" ring is the same as the seal on the rotary face "O" ring the product code is not repeated.