TENUTE TRS/2 sealing rings

This kind of seals is largely employed in the industrial sector. It is largely used in the automotive, traxcavators, power transfer, reducers sectors, etc.
It is referable to the German standards DIN 3760 C and they are defined by TENUTE srl with the initials TRS/2 & TRS/2-P.
The composition of these rings includes the metallic support on which the elastomer is directly cured. The seal is then enclosed in another metallic box supporting the first one. The lip garter spring allows the sealing lip to keep the right pressure on the rotating shaft over time. The stiffening of metallic boxes allows TRS/2 model to operate in more demanding applications compared to the TRSS model. In addition, the internal metallic part further protects the sealing lip from external contaminations.
The TRS/2 ring can be assembled in open housing.
The TRS/2 model does not withstand pressures higher than 0.5 bar in their normal configuration.
Some versions of the same model have already been made with different features studied for specific applications.

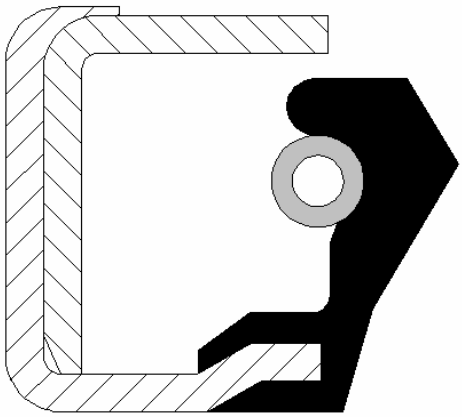


Figure 1

Materials

The materials utilised are variable according to necessity. We have two different lines.
Standard Production, are made with the following table 1.

Metal Case	Carbon Steel
Inner Ring	Carbon Steel
Lip	Nitrile Rubber NBR
Spring	Carbon Steel

Table 1

SPECIAL PRODUCTION materials are summarized in the table 2

Metal Case	Inner Ring	Lip	Spring
Stainless Steel	Stainless Steel	FKM Fluor Carbon Rubber	Stainless Steel AISI 302-304-306-316
		MQ Silicone Rubber	
		NBR Nitrile Rubber added with PTFE	
		THN Nitrile Hydrogenate	

Table 2

Sealing rings assembly

The figure 2 drawing shows a typical assembly of TRS/2 sealing ring.
The following table shows the most important and general data to be considered in the possible design of such a sealing system.

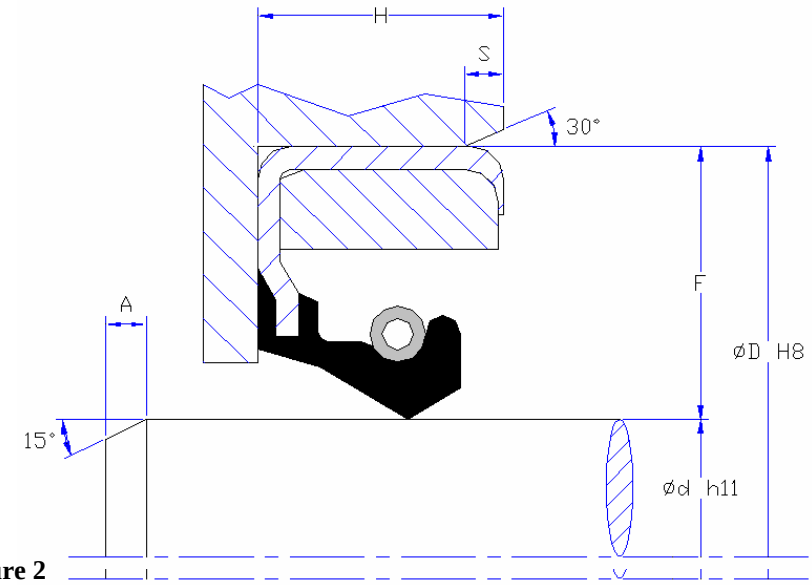


Figure 2

Tolerance and roughness of the metallic parts

Housing Height tolerance		Shaft chamfers			Housing chamfer	
H (mm)	(mm)	Ød(mm)		A minimum	H(mm)	S(mm)
UP TO 10	0 / -0,3	OVER	UP TO	(mm)	10	1
OVER	+ / -0,4	3	50	5	15	1.5
		50	250	10	20	2
		250	800	15	30	3
		800	1500	20	40	4
		1500	2500	25		

SURFACES FINISHING

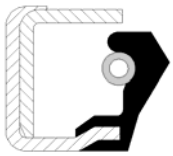
A roughness of Ra 0.2/0.6 µm is recommended for the shaft, in normal applications, while in case of high speeds, a finishing of 0.2/0.4 µm is recommended.
Furthermore, in case of water, it is advisable to perform chromium plating of the shaft/sealing lip contact surfaces, in order to avoid a rapid wear due to iron oxides that are removed by the sealing lip. A finish turning is enough for housings.

We suggest to ask our Technical Department for more information, for the assembling and the applications.

Tooling List Up-To Date on May 2005

Ø d	Ø D	H	PROFILE
25	40	10	TRS/2
25	52	9	TRS/2
35	52	6,5	TRS/2-P
38,1	54,14	12,7	TRS/2
40	55	12	TRS/2
40	62	9	TRS/2
41,27	63,6	12,7	TRS/2
42	62	10	TRS/2
44,53	60,3	6,9	TRS/2
47	76,2	12,7	TRS/2
48	70	8	TRS/2
48	76,2	12,7	TRS/2
52	72	10	TRS/2
57,5	82,5	12,7	TRS/2
58	78	13	TRS/2
61,8	88,9	9,52	TRS/2
62	82	12	TRS/2
63,5	82,67	9,52	TRS/2
63,5	88,9	12,7	TRS/2
63,5	89,99	12,7	TRS/2
65	90	10	TRS/2
65	100	13	TRS/2
70	90	12	TRS/2
70	90	13	TRS/2
70	100	6	TRS/2
71,437	95,25	12,7	TRS/2
72	95	12	TRS/2
75	95	12	TRS/2
75	100	10	TRS/2
75	110	13	TRS/2
76,2	95,25	9,525	TRS/2

Ø d	Ø D	H	PROFILE
76,2	101,6	10	TRS/2
77	95	10	TRS/2
80	100	10	TRS/2-P
80	100	13	TRS/2
80	105	12	TRS/2
80	110	12	TRS/2
80	110	13	TRS/2
82	105	12	TRS/2
82	108	14,5	TRS/2
82,5	101,7	11,8	TRS/2
82,5	113	13	TRS/2
82,55	114,3	11,91	TRS/2
85	110	13	TRS/2
85	110	15	TRS/2-P
85	140	12	TRS/2
88,9	114,3	12	TRS/2
89,4	111,3	11,1	TRS/2
90	110	13	TRS/2-P
90	110	13	TRS/2
90	120	13	TRS/2
90	120	15	TRS/2
92,075	117,47	12,7	TRS/2
92,27	117,21	12	TRS/2
92,27	117,21	12,7	TRS/2
94,43	127	12,7	TRS/2
95	110	9	TRS/2
95	115	13	TRS/2
95	120	12	TRS/2
95	120	12	TRS/2-P
95,25	127	12,7	TRS/2
96	120	13	TRS/2

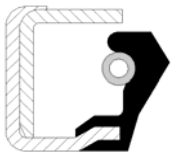


Ø d	Ø D	H	PROFILE
96	120	15	TRS/2-P
96	120	15	TRS/2
100	130	13	TRS/2
101,6	127	12,7	TRS/2
101,6	127,12	12,7	TRS/2
105	130	13	TRS/2
106,6	134	12	TRS/2
110	128	9	TRS/2
110	140	12	TRS/2
110	140	13	TRS/2
110	140	15	TRS/2
110	150	12	TRS/2
111,1	136,5	12,7	TRS/2
112	140	13	TRS/2
114,3	139,7	12,7	TRS/2
115	150	13	TRS/2
115	150	15	TRS/2
115	152	15	TRS/2
117,45	142,87	12,7	TRS/2
117,47	142,9	12,7	TRS/2
118	140	13	TRS/2
118	150	15	TRS/2
119	152	10	TRS/2
120	140	13	TRS/2
120	150	13	TRS/2
120,7	146,1	12,7	TRS/2
123,8	149,2	12,7	TRS/2
123,82	165,1	12	TRS/2
125	150	12	TRS/2
125	150	13	TRS/2
125	150	15	TRS/2
127	152,7	12,7	TRS/2
127	158,9	14,287	TRS/2
128	160	15	TRS/2

Ø d	Ø D	H	PROFILE
128,6	140	10	TRS/2
130	155	10	TRS/2
130	160	12	TRS/2
130	160	13	TRS/2-P
130	160	13	TRS/2
130	160	15	TRS/2
130	180	15	TRS/2
133,35	165,1	12	TRS/2
133,4	158,8	12,7	TRS/2
135	160	13	TRS/2
135	160	15	TRS/2
135	170	12	TRS/2
139,7	171,62	12,7	TRS/2
140	165	15	TRS/2
140	180	14	TRS/2
145	165	12	TRS/2
145	170	13	TRS/2
145	170	15	TRS/2
145	180	14	TRS/2
145	185	20	TRS/2
146,05	177,8	12,7	TRS/2
149,22	190,65	14,3	TRS/2
149,225	180,975	12,7	TRS/2
150	180	12	TRS/2
150	180	13	TRS/2
150	180	16	TRS/2
152	180	15	TRS/2
152,4	177,8	12,7	TRS/2
152,4	184,2	15,9	TRS/2
152,4	190,5	19	TRS/2
152,4	190,7	19,05	TRS/2
154	175	12	TRS/2
155	180	15	TRS/2
155	190	15	TRS/2

Ø d	Ø D	H	PROFILE
158	180	15	TRS/2
158,75	184,15	12,7	TRS/2
158,75	196,85	12,7	TRS/2
160	190	13	TRS/2
160	200	15	TRS/2
165	190	13	TRS/2
165	203	16	TRS/2
165,1	203,2	19,05	TRS/2
168,275	206,375	15,875	TRS/2
170	195,4	12,7	TRS/2
171,46	209,56	15,88	TRS/2
175	200	15	TRS/2
177	210	15	TRS/2
177,5	203	15	TRS/2
177,8	203,2	14,28	TRS/2
177,8	203,2	15,875	TRS/2
180,97	213,91	12,7	TRS/2
182	203,2	15	TRS/2
182	215	16	TRS/2
184,15	222,25	15,875	TRS/2
185	210	13	TRS/2
185	215	15	TRS/2
185	225	16	TRS/2
188	215	16	TRS/2
195	220	15	TRS/2
195	230	15	TRS/2
195	235	19	TRS/2
203,2	241,3	19,05	TRS/2
209,5	234,9	15,8	TRS/2
212,72	257,6	15,8	TRS/2
215	248	19	TRS/2
215,9	241,3	25,4	TRS/2
220	270	15	TRS/2
220	270	16	TRS/2

Ø d	Ø D	H	PROFILE
226	258	16	TRS/2
228,6	260,4	16	TRS/2
228,6	266,7	19,05	TRS/2
230	260	15	TRS/2
230	270	16	TRS/2
235	266,7	16	TRS/2
235	275	16	TRS/2
240	270	16	TRS/2
240	271,75	15,85	TRS/2
240	280	16	TRS/2
240	290	16	TRS/2
241,3	266,7	15,8	TRS/2
249	280	14	TRS/2
250	280	15	TRS/2
254	292,1	19,05	TRS/2
254	304,8	25,4	TRS/2
258	290	16	TRS/2
266,7	317,5	15,875	TRS/2
266,7	317,5	19,05	TRS/2
270	310	15	TRS/2
279,4	317,5	15,87	TRS/2
280	310	16	TRS/2
280	320	20	TRS/2
280	324	13,3	TRS/2
280	324	20	TRS/2
280	350	16	TRS/2
290	330	16	TRS/2
290	330	18	TRS/2
300	340	20	TRS/2
300	345	25	TRS/2
304,8	355,6	18,8	TRS/2
311,15	361,95	21	TRS/2
315	355	18	TRS/2
320	360	20	TRS/2



Ø d	Ø D	H	PROFILE
330	370	18	TRS/2
336,55	387,35	25,4	TRS/2
340	380	18	TRS/2
340	380	20	TRS/2
340	384	20	TRS/2-P
350	380	16	TRS/2
350	390	18	TRS/2
350	405	20	TRS/2
360	404	20	TRS/2
367	405	17	TRS/2
368,2	406,4	17,46	TRS/2
370	410	20	TRS/2-D
370	410	20	TRS/2
380	412	16	TRS/2
384	414	15	TRS/2
390	420	15	TRS/2
390	430	18	TRS/2
393,69	444,49	23,810	TRS/2
400	440	20	TRS/2-P
419,1	457,2	19,05	TRS/2
420	460	20	TRS/2
420	470	20	TRS/2
430	480	25	TRS/2
440	490	25	TRS/2
467	510	20	TRS/2
480	530	25	TRS/2
482,6	520	19,05	TRS/2
490	540	25	TRS/2-P
500	540	20	TRS/2
508	546	19	TRS/2
508	560	25	TRS/2
533,39	584,19	22,22	TRS/2
555	595	20	TRS/2
560	610	20	TRS/2

Ø d	Ø D	H	PROFILE
575	619	20	TRS/2
650	690	20	TRS/2
710	760	20	TRS/2
760	800	20	TRS/2
810	860	25	TRS/2
810	880	25	TRS/2
820	860	20	TRS/2
820	860	20	TRS/2-D
850	914	25	TRS/2
850,8	914,4	22,23	TRS/2
850,9	914,9	22,5	TRS/2-D
850,9	914,9	22,5	TRS/2
900	964	22	TRS/2
930	990	25	TRS/2
933,45	984,5	20	TRS/2