TENUTE - TR/N sealing rings

Sealing rings commonly defined as oil retainers are the commonest, used in standard applications in the automotive, traxcavators sectors etc.
These kind of seals, referable to the German standards DIN 3760 A and AS, are defined by TENUTE srl with the initials TRN & TRN/P.
The composition of these rings includes a metallic support fully drowned in the elastomer and a garter spring assuring the right preloade on the sealing lip.
The elastomer in the outer part of the seal has a double function:

- *It prevents the corrosion in the housing thus ensuring the seal long life.*
- *It absorbs, within a certain extent, the roughness or imperfection of the housing.*

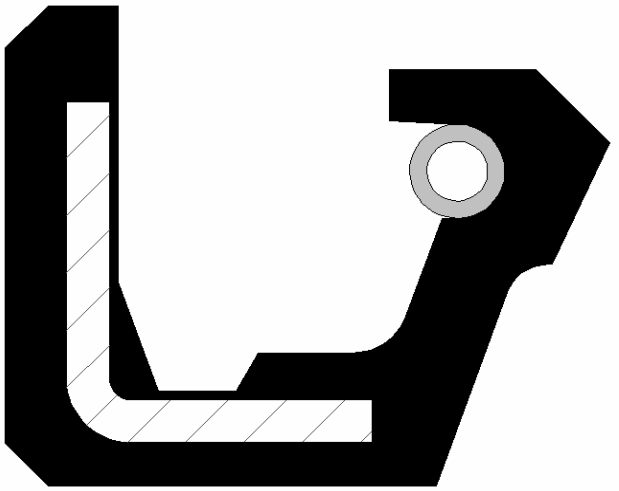

Figure 1

The TRN model can be assembled in open housing. It does not withstand, in the normal configuration, pressures higher than 0.5 Bar.
Some versions of the same model have already been made with different features studied for specific applications, among others also in the Split version.
TRN-P version incorporates an additional Dust Lip for dirt and dust exclusion. Other models are present in the following schedule.
If you're interested, feel free to contact TENUTE technical department

Material

The standard production is in Nitril elastomer NBR added with Ptfe,
but for particular condition of employ, it can be produced in: HNBR hydrogenated nitril elastomer, MQ silicon elastomer, FKM fluoro carbon elastomer.
In the table 1 there are the admissible working temperature (minimum, maximum and maximum point) for this kind of material.

MATERIAL	TEMPERATURE C°
NBR	-30° +100°(120°)
HNBR	-40° +150°(175°)
MQ	-50° +200°(250°)
FKM	-20° +200°(250°)

table 1

Sealing rings assembly

The figure 2 drawing shows a typical assembly of TR/N sealing ring.

The following table shows the most important and general data to be considered in the possible design of such a sealing system.

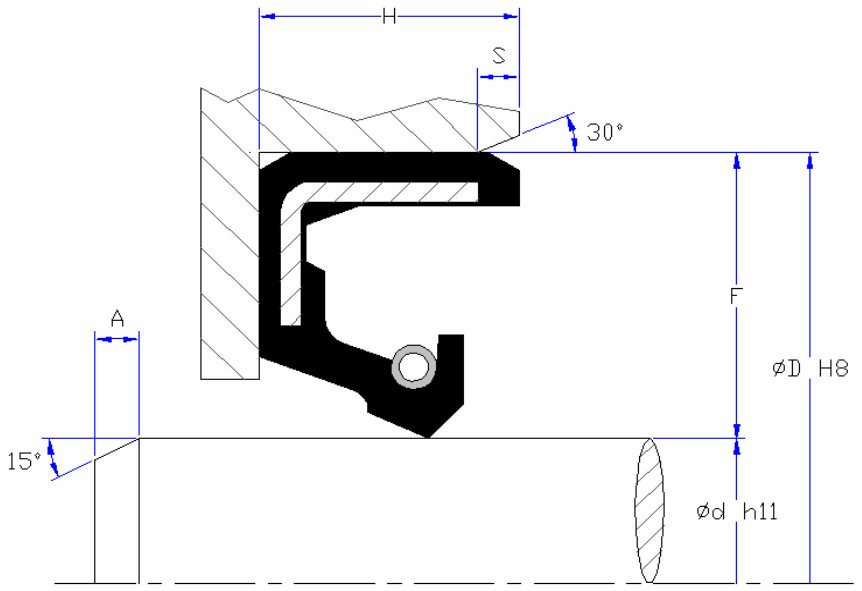

Figure 2

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 15	0 / -0,2	OVER	UP TO	(mm)	10	1
OVER	+ / -0,3	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
10	20	6	TR/N
10	22	7	TR/N
11	22	7	TR/N
12	24	7	TR/N-P
13	24	5	TR/N
14	24	7	TR/N
15	30	7	TR/N
16	30	7	TR/N
16	30	8	TR/N
17	30	7	TR/N
18	28	7	TR/N
18	32	7	TR/N
18	37	10	TR/N
19	27	6	TR/N
19	32	9,5	TR/N
19	35	10	TR/N
19	37	10	TR/N
20	30	5	TR/N
20	30	7	TR/N
20	32	7	TR/N
20	35	7	TR/N
20	40	10	TR/N
20	40	7	TR/N
22	32	7	TR/N
22	40	10	TR/N
24	37	7	TR/N
24	40	7	TR/N
25	40	7	TR/N
25	40	7	TR/N-P
25	47	10	TR/N
26	42	7	TR/N
27	42	7	TR/N
28	40	70	TR/N
30	40	7	TR/N
30	42	7	TR/N
30	43	4	TR/N

Ø d	Ø D	H	PROFILE
30	47	10	TR/N
30	47	8	TR/N
30	47	8	TR/N-P
30	50	7	TR/N
30	52	10	TR/N
30	60	7	TR/N-P
30	62	7	TR/N-P
30	62	7	TR/N
32	45	6	TR/N
32	62	10	TR/N
33	50	10,9	TR/N
35	47	7	TR/N
35	50	10	TR/N
35	50	7	TR/N
35	52	10	TR/N
35	52	7	TR/N
35	55	10	TR/N
35	62	10	TR/N
35	72	10	TR/N
38	55	7	TR/N
40	50	12	TR/N
40	52	7	TR/N
40	55	7	TR/N-P
40	55	8	TR/N-P
40	55	8	TR/N
40	56	10	TR/N
40	56	12	TR/N
40	56	8	TR/N
40	60	10	TR/N
40	62	10	TRN/-P
40	62	7	TR/N
40	68	10	TR/N
40	72	10	TR/N
42	56	7	TR/N
42	60	10	TR/N
42	62	10	TR/N

Ø d	Ø D	H	PROFILE
42	62	8	TR/N
42	65	10	TR/N
45	60	10	TR/N
45	60	10	TR/N
45	60	7	TR/N
45	60	7	TR/N-P
45	60	8	TR/N
45	60	8	TR/N-P
45	60	9	TR/N
45	62	10	TR/N
45	62	12	TR/N
45	65	8	TR/N
45	80	10	TR/N
45	85	10	TR/N-P
45	85	10	TR/N
47	65	10	TR/N-P
48	62	8	TR/N
48	62	8	TR/N-P
48	70	9	TR/N
50	60	10	TR/N
50	62	10	TR/N
50	65	8	TR/N
50	68	10	TR/N
50	68	8	TR/N
50	70	10	TR/N-P
50	70	9	TR/N
50	72	10	TR/N
50	72	7	TR/N
50	72	8	TR/N
52	72	10	TR/N
53	68	10	TR/N
55	70	8	TR/N
55	72	10	TR/N
55	75	10	TR/N
55	80	10	TR/N-P
55	80	10	TR/N
55	80	13	TR/N
55	90	10	TR/N-P
55	90	10	TR/N

Ø d	Ø D	H	PROFILE
55	100	10	TR/N
58	80	9	TR/N
58	86	14	TR/N
58	90	10	TR/N
60	75	8	TR/N
60	80	10	TR/N
60	80	8	TR/N
60	85	10	TR/N
60	90	10	TR/N
60	90	11/14	TR/N-FS
60	95	10	TR/N
60	95	10	TR/N-P
60	100	13	TR/N
62	80	8	TR/N
62	85	13	TR/N
62	92	13	TR/N
62	100	12	TR/N
63	85	13	TR/N
64	90	6	TR/N
65	80	10	TR/N
65	80	8	TR/N
65	85	10	TR/N
65	85	12	TR/N
65	90	10	TR/N
68	85	10	TR/N
68	90	10	TR/N
70	85	8	TR/N
70	90	10	TR/N
70	90	10	TR/N-P
70	90	15	TR/N
70	95	10	TR/N
70	95	13	TR/N
70	100	10	TR/N
70	100	10	TR/N-P
70	100	12	TR/N
70	110	12	TR/N-P
70	110	12	TR/N
72	90	10	TR/N
75	90	8	TR/N

Ø d	Ø D	H	PROFILE
75	95	10	TR/N
75	100	10	TR/N
75	100	10	TR/N-P
75	100	12	TR/N
75	100	12	TR/N
75	100	12	TR/N-FS
75	120	12	TR/N
78	110	12	TR/N
80	100	10	TR/N
80	100	12	TRN-DE
80	100	13	TR/N
80	105	12	TR/N
80	105	13	TR/N-P
80	105	13	TR/N
80	110	10	TR/N
80	110	12	TR/N
80	115	12	TR/N
82	105	12	TR/N
82	110	12	TR/N
85	110	12	TR/N
85	115	12	TR/N
85	120	13	TR/N
90	110	12	TR/N
90	110	8	TR/N
90	115	12	TR/N-P
90	120	12	TR/N
90	120	12	TR/N-P
90	120	13	TR/N
95	110	12	TR/N
95	115	13	TR/N
95	120	12	TR/N
96	136	12	TR/N
100	115	8	TR/N
100	115	9	TR/N
100	120	10	TR/N-P
100	120	12	TR/N
100	120	12	TR/N-P
100	125	10	TR/N
100	125	12	TR/N-P

Ø d	Ø D	H	PROFILE
100	125	12	TR/N
100	130	12	TR/N-P
100	130	13	TR/N-P
100	130	13	TR/N
100	150	13	TR/N
104	125	10	TR/N
105	130	12	TR/N-P
105	130	12	TR/N
105	140	12	TR/N-AP
105	140	12	TR/N
110	130	12	TR/N-P
110	130	12	TR/N
110	130	12	TRN
110	130	13	TR/N
110	140	12	TR/N
110	140	12	TR/N-P
110	145	13	TR/N-P
115	140	10	TR/N
115	140	12	TR/N
115	140	12	TR/N-P
115	140	12	TR/N
115	150	12	TR/N-P
120	150	12	TR/N
120	150	12	TR/N-P
120	150	12	TR/N-P
120	150	12	TR/N-FS
120	150	13	TR/N
120	150	15	TR/N-P
125	150	12	TR/N
125	151	17	TR/N-FS
125	160	12	TR/N
130	150	12	TR/N-P
130	150	15	TR/N-P
130	155	12	TR/N-FS
130	160	12	TR/N-P
130	160	12	TR/N
130	160	12	TR/N
130	160	15	TR/N
130	170	12	TR/N

Ø d	Ø D	H	PROFILE
135	160	12	TR/N
135	170	12	TR/N
140	160	12	TR/N-P
140	160	12	TR/N
140	160	13	TR/N-P
140	170	12	TR/N
140	170	15	TR/N
140	170	15	TR/N-P
140	170	15	TR/N-SPLIT
140	180	12	TR/N
145	175	15	TR/N
145	180	12	TR/N-P
145	180	12	TR/N
145	180	14	TR/N
148	170	16	TR/N
150	170	12	TR/N-P
150	180	12	TR/N
150	180	12	TR/N
150	180	15	TR/N-P
150	180	15	TR/N
150	180	15	TR/N
150	180	15	TR/N-P
155	175	12	TR/N
160	180	15	TR/N
160	185	10	TR/N
160	190	15	TR/N
160	190	15	TR/N-P
160	200	12	TR/N
160	200	15	TR/N-P-AP
162	190	12	TR/N
162	190	15	TR/N
162	190	15	TR/N
165	195	11,5	TR/N-DE
168	196	15	TR/N
168,27	196,83	15,87	TR/N
170	190	15	TR/N-P
170	200	12	TR/N
170	200	15	TR/N-DE
170	200	15	TR/N

Ø d	Ø D	H	PROFILE
170	200	15	TR/N-DE
170	200	15	TR/N
170	210	16	TR/N
174,62	206,37	30,95	TR/N-FS
175	200	10	TR/N
175	200	15	TR/N
180	200	16	TR/N-SPLIT
180	210	15	TR/N
180	210	15	TR/N-P
180	220	15	TR/N
185	210	13	TR/N-P
185	210	13	TR/N
185	230	16	TR/N
188,91	204,78	9,525	TR/N
190	200	15	TR/N
190	215	16	TR/N
190	220	15	TR/N-P
190	220	15	TR/N
190	220	16	TR/N
190	230	16	TR/N
195	215	15	TR/N-P
200	225	15	TR/N
200	230	13	TR/N
200	230	15	TR/N
200	240	16	TR/N
205	230	16	TR/N
210	240	15	TR/N-P
210	240	15	TR/N
210	240	16	TR/N
210	250	15	TR/N-P
210	250	15	TR/N
220	250	15	TR/N
230	260	10	TR/N
230	260	13	TRN/DE
230	260	15	TR/N
230	270	16	TR/N
230	286	17,5	TR/N
240	256	10	TR/N
240	270	15	TR/N-P

Ø d	Ø D	H	PROFILE
240	270	15	TR/N
240	270	16	TR/N
240	280	15	TR/N
240	280	16	TR/N
241	292	25	TR/N
241,3	292,1	25,4	TR/N
250	280	15	TR/N
258	290	16	TR/N
260	290	15	TR/N
260	290	16	TR/N
260	300	20	TR/N-FS
260	300	20	TR/N
270	310	16	TR/N
274,5	309	9,25	TR/N-FS
275	310	15	TR/N
279	325	17,5	TR/N
279,75	315	14	TR/N-FS
280	310	15	TR/N-P
280	310	15	TR/N
280	315	14	TR/N
280	320	18	TR/N-P
300	332	16	TR/N-P

Ø d	Ø D	H	PROFILE
300	340	16	TR/N
300	340	18	TR/N
300	340	20	TR/N
320	360	18	TR/N
320	360	20	TR/N
330	370	18	TR/N
330	370	20	TR/N
340	380	18	TR/N
340	380	20	TR/N
355	393,7	19	TR/N-SPLIT
355,09	406,5	38	TR/N-DE
355,09	406,55	38	TR/N-P
358,7	396,77	38,08	TR/N-DE
370	410	18	TR/N
380	420	20	TR/N
380	420	20	TR/N-P
400	440	20	TR/N
420	460	20	TR/N
420	460	20	TR/N
460	500	20	TR/N
500	550	22	TR/N
650	700	25	TR/N