

Oil Seal TC



Seals that fits your need

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Oil Seals

Introduction

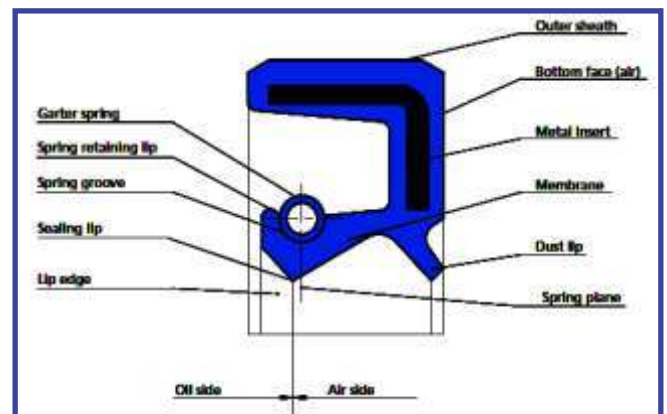
Oil Seals - radial shaft seals or often called grease seal are used to seal rotary elements, such as a shaft or rotating bore, between stationary and moving components in mechanical equipment. Early radial shaft seals utilized leather as the sealing element, the modern elastomers replaced leather, industry also added a garter spring which helps the sealing lip compensate for lip wear and elastomer material changes. The sealing lip is energized with a "Garter Spring".



Description of Oil Seal

Rotary shaft lip design will consist of a sprung main sealing lip which has a point contact with the shaft. The point contact is formed by two angles, with the air side angle usually less than the oil side angle. Depending on the seal type these two angles are varied to create a pressure distribution at the seal contact point which has a steeper slope on the oil side of the seal.

The shallower the slope on the oil side of the seal the wetter the seal will run. The spring is positioned such that axially the centerline of the spring is biased to the air side of the lip contact point.



Seal Lip Design

Different Applications

The seals are used in equipments of various applications, such as

- Power Transmission
- Manufacturing
- Automotive
- Oil Refineries

In machines it prevents the passage of fluids along a rotating shaft. Seals are necessary when a shaft extends from a housing (enclosure) containing oil, such as a pump or a gearbox, synthetic rubber such as NBR, Silicon and Viton are among the materials used for the sealing ring.

Radial Oil Seals

Profile	Type	Material	Metal Inserted with spring lip	Metal Outside with spring lip	Working Pressure Mpa (max.)	Standard Speed max.(m/s)	Working Temp. C
	SC	NBR Viton Silicon	●		0.05	30	-35/+220
	TC	NBR Viton Silicon	●		0.05	30	-35/+220
	SB	NBR Viton Silicon		●	0.05	30	-35/+220
	TB	NBR Viton Silicon		●	0.05	30	-30/+220
	SA	NBR Viton Silicon		●	0.05	30	-35/+220
	TA	NBR Viton Silicon		●	0.05	30	-30/+220
	VC	NBR Viton Silicon	● Without Spring		without	10	-30/+220
	DC-DS	NBR Viton Silicon	● Double Spring		0.05	10	-30/+220
	SL-WM	NBR+Fabric Viton+Fabric	● Without Metal		0.05	upto 25	-30/+200

V Rings

Profile	Type	Material	Standard (character)	with axial retention possibility	Working Pressure max.(bar)	Standard Speed max.(m/s)	Working Temp. C
	VA	NBR Viton	standard	●	without	10	-35/+220
	VS	NBR Viton	extended	●	without	10	-35/+220

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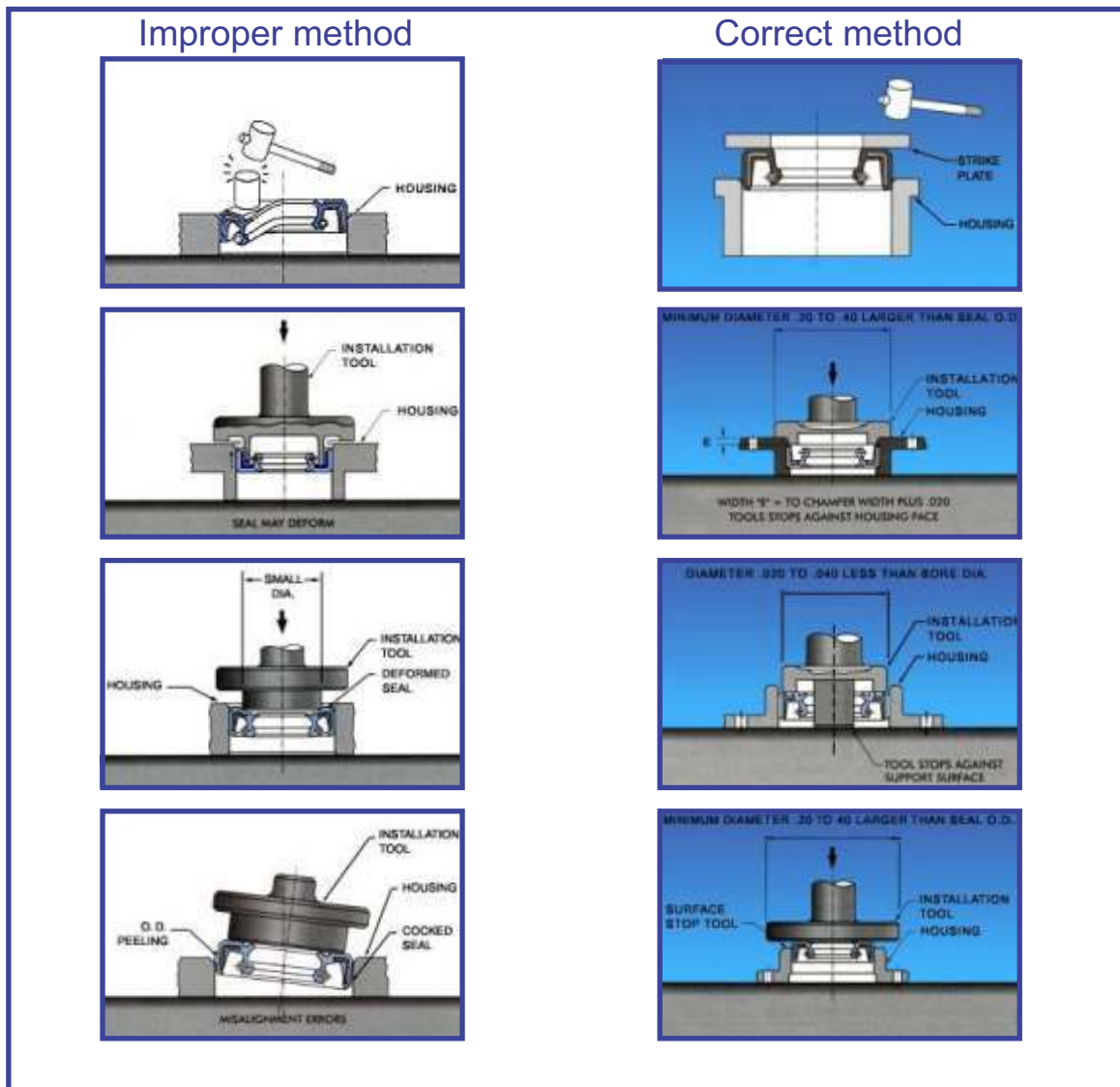
Oil Seal Installation

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Installation

Fitco recommends shaft seal should never run without proper lubrication, both the seal lip and the shaft should be lubricated prior to installation of the seal, to making the installation both easier and less potentially damaging to the seal, lubrication minimizes

Examples of Improper & Correct Installation methods.



Proper tools and method are required for of good installation of seal,with the right amount of force,if seal is not installed properly than it could damage the other parts of the assembly, it could lead to unplanned and unwanted friction, heat, and wear, all of which can contribute to premature seal failure.

Figures shown above are some of example of the sealing installations

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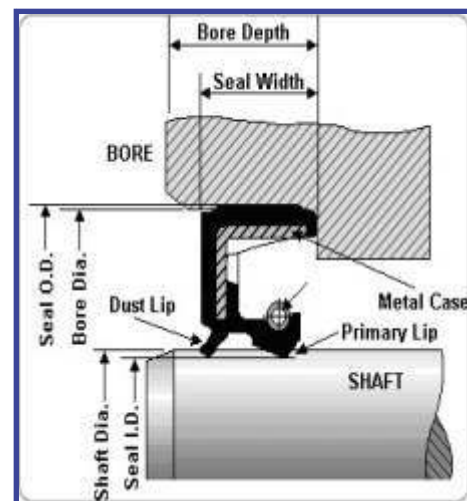
Oil Seal Installation

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Press fit allowance and permissible eccentricity

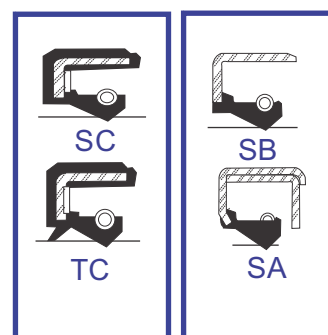
Seal Outside Diameter Tolerance

Bore Diameter	Press-fit Allowance SB,SA	Press-fit Allowance SC,TC	Permissible Eccentricity
up to 50	+0.20/+0.10	+0.30/+0.15	0.25
Over 50 to 80	+0.23/+0.13	+0.35/+0.20	0.35
Over 80 to 120	+0.25/+0.15	+0.35/+0.20	0.50
Over 120 to 180	+0.28/+0.18	+0.45/+0.25	0.65
Over 180 to 300	+0.30/+0.20	+0.45/+0.25	0.80
Over 300 to 500	+0.35/+0.23	+0.55/+0.30	1.00



Seal Width Tolerance

Unit	Width Range	Tolerance
inch	All	+/-0.015
mm	up to 10	+/-0.20
mm	over 10	+/-0.30



Seal Installation Checklist

- Is the spring properly in place, or has it been displaced during handling?
- Have you made sure there are no nicks, scratches, or spiral grooves on the shaft surface?
- Have you pre-lubricated the seal's lip for initial break-in?
- Are you installing the seal with the lip facing in the right direction?
- Are you installing the seal at a right angle to the center lines of the bore and shaft?
- Have you made sure that bore adhesives do not contaminate the shaft or seal lip?
- Have you taken measures to keep the lip from being damaged by passing over splines, threads, or burrs on the shaft?
- Have you inspected the bore to make sure there are no burrs or scratches?
- Have you ensured proper protection for the seal during painting or cleaning operations?
- Have you made sure that assembly components do not rub and that any vents are not clogged?

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Oil Seal Interchange Table

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Interchange Table of Standard Oil Seals

Profile						
Fitco	SC	TC	SB	TB	SA	TA
DIN3760	A	AS	B	BS	C	CS
CFW	BA	BASL	B1	B1-SL	B2	B2-SL
Goetze	827N	827S	822N	822S	824N	824S
Kaco	DG	DGS	DF	DFS	SFK	DFSK
Stefa	CB	CC	BB	BC	DB	DC
NOK	SC	TC	SB	TB	SA	TA
National	35	32	48	47	45	41
Chicago	–	–	CRW 1	CRWA 1	CRWH 1	CRWHA 1
Pioneer	R 21	R23	R4	R6	R1	–

Fitco can provide replacement shaft seals against OEM profile (for reference purpose only) for brands above.

Shelf life & Storage

The shelf life of seals depends to a large extend on the polymer type.

NBR - 6 years
FKM, VMQ - 10 years
EPDM - 8 years

Extension of the shelf life is possible by a checkup after the above periods.

Seals must be stored with precaution to avoid deterioration of sealing material it must be kept in dust free dry area and kept in original packing .

Be careful while storing seals on shelves or boxes ,do not drop seals nor hang on hooks, wire since seal lip can be damaged, seals must be kept in horizontal position.

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Oil Seal Material

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Sealing Material

Fitco sealing material selection is based on size, operating temperature, environment, pressure and maximum shaft surface speed, to resist wear the general hardness is kept between 70 to 85 Shore A with following elastomers.



Nitrile Butadine Rubber (NBR)

Hardness 70 Shore A & 90 Shore A ,Color: Black

Working Temperature Range: -40° C to+ 100° C

Nitrile Rubber is general purpose elastomer for Hydraulic and Pneumatic systems and used as seal energizer for low pressure applications such as pneumatic, it has excellent resistance to mineral oil, greases, water, hydro-carban fuels, compression set resistance and good elastic properties, it is not suitable to automotive brakes fluid.

Fluorinated Rubber FKM (Viton)

Hardness 70 Shore A ,Color: Geryish Black/ Brown

Working Temperature Range: -30° C to+ 220° C

Viton Rubber is excellent resistance to mineral oils, hot water, steam, fuels, alcohol, hot oils, aliphatic and aromatic hydrocarbon, it has poor resistance to methanol, ketones & esters also exhibits excellent chemical resistance for use in harsh environments such as phosphate esters.

Silicon Rubber (VQM)

Hardness 70 Shore A ,Color: Orange

Working Temperature Range: -60° C to+ 200° C

Silicon Rubber has great cold flexibility as well as high thermal resistance. It has excellent de-electric properties and very good resistance to attack by oxygen, ozone and sunlight. It has poor strength & tear resistance to mineral oils.

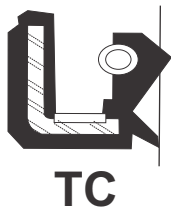
Ethylene Propylene Rubber (EPDM /EPM)

Hardness 70 Shore A ,Color: Black

Working Temperature Range: -45° C to +150° C

EPDM has good resistance to ozone ageing and weathering, water and steam, Dilute acid, alkalies ketones, alcohol, fire retardent hydraulic fluids and hydraulic brakes fluids. This elastomer must not come in contact with mineral oils and greases.

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Oil Seal Standard Sizes

DIN 3760 / ISO 6194-1, NBR 70A

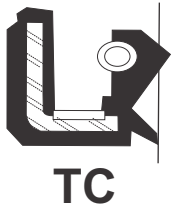
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
6	16	7
6	22	7
7	18	7
7	20	7
7	22	7
8	18	7
8	22	7
8	24	7
8	25	8
8	34	8
9	22	7
9	28	8
10	20	7
10	21	8
10	22	7
10	22	8
10	25	7
10	26	7
10	26	8
10	28	8
10	30	7
11	22	7
11	25	7
11	30	7
11	30	10
12	22	7
12	23	8
12	25	7
12	28	7
12	30	7

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
12	30	9
12	32	7
13	25	7
13	28	7
13	30	8
14	24	6
14	24	7
14	25	7
14	28	7
14	28	11
14	30	7
14	32	9
15	24	7
15	25	7
15	26	7
15	28	7
15	30	7
15	30	10
15	32	7
15	32	9
15	34	10
15	35	7
15	35	8
15	37	7
16	26	7
16	28	6
16	28	7
16	30	7
16	32	8
16	35	7

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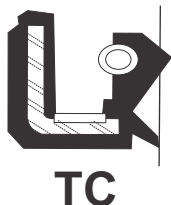
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
16	38	9
17	28	6
17	30	6
17	30	7
17	30	8
17	32	7
17	32	8
17	35	6
17	35	7
17	35	8
17	35	10
17	38	7
17	40	8
17	40	9
17	40	10
18	30	7
18	30	8
18	32	7
18	32	9
18	35	7
18	35	8
18	35	9
18	38	7
19	30	8
19	32	8
19	35	7
19	35	8
19	36	7
19	38	7
19	38	10

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
19	40	10
20	30	7
20	30	9
20	32	6
20	32	8
20	34	7
20	35	7
20	35	8
20	35	10
20	36	7
20	37	7
20	37	9
20	37	10
20	38	7
20	40	7
20	40	8
20	40	9
20	40	10
20	40	11
20	42	8
20	42	10
20	44	12
20	45	8
20	45	12
20	47	7
21	35	7
21	38	8
21	40	7
22	32	7
22	35	7

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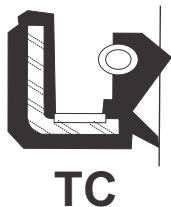
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
22	35	8
22	36	10
22	37	8
22	38	8
22	38	12
22	40	7
22	40	8
22	40	10
22	40	11
22	42	7
22	42	10
22	42	11
22	47	7
23	32	7
23	42	11
24	38	7
24	38	8
24	38	10
24	40	7
24	40	8
24	45	7
24	45	10
25	35	6
25	35	7
25	37	8
25	38	7
25	38	8
25	40	7
25	40	8
25	40	10

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
25	42	8
25	42	9
25	42	10
25	42	11
25	44	7
25	45	7
25	45	8
25	45	10
25	45	11
25	45	12
25	46	7
25	47	6
25	47	7
25	47	8
25	48	7
25	48	8
25	49	12
25	50	9
25	50	12
25	50	14
25	52	7
25	52	8
25	52	10
26	38	7
26	38	8
26	40	7
26	40	8
26	40	9
26	42	8
26	48	11

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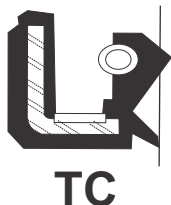
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
26	52	8
27	42	7
27	42	8
27	43	9
27	47	11
28	38	7
28	40	7
28	40	8
28	42	7
28	42	8
28	44	8
28	44	11
28	45	8
28	45	11
28	47	7
28	47	8
28	48	8
28	48	11
28	50	8
28	50	10
28	52	7
29	45	9
30	40	7
30	42	7
30	42	8
30	44	7
30	44	9
30	45	7
30	45	8
30	45	11

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
30	45	12
30	46	7
30	46	9
30	46	10
30	47	7
30	47	8
30	47	10
30	48	7
30	48	8
30	48	11
30	50	7
30	50	8
30	50	9
30	50	10
30	50	11
30	50	13
30	52	7
30	52	8
30	52	10
30	52	11
30	52	12
30	55	12
30	55	14
31	45	9
31	47	7
31	50	8
32	44	9
32	45	7
32	45	8
32	46	8

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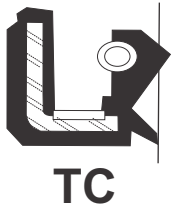
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
32	47	7
32	47	8
32	48	7
32	48	8
32	51	10
32	52	7
32	52	8
32	52	11
32	54	10
33	44	8
33	50	7
33	50	8
33	50	11
33	52	7
33	56	12
34	48	8
34	50	7
34	52	11
34	54	11
35	46	7
35	47	7
35	48	8
35	50	7
35	50	8
35	50	11
35	50	12
35	52	7
35	52	8
35	52	9
35	52	10

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
35	52	11
35	52	12
35	55	7
35	55	8
35	55	9
35	55	10
35	55	11
35	55	12
35	56	10
35	58	9
35	60	8
35	60	12
35	60	14
35	62	10
35	62	12
36	50	7
36	54	8
36	58	12
37	53	7
37	62	12
38	50	8
38	55	7
38	55	8
38	55	9
38	56	10
38	58	7
38	58	8
38	58	11
38	58	13
38	60	11

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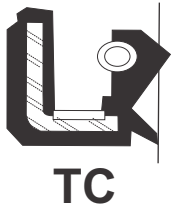
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
38	62	7
38	62	8
38	62	9
38	62	11
40	52	7
40	52	8
40	55	7
40	55	8
40	55	9
40	55	10
40	56	8
40	56	10
40	58	7
40	58	8
40	58	12
40	60	8
40	60	10
40	60	12
40	62	7
40	62	8
40	62	11
40	62	12
40	63	7
40	65	10
40	65	12
40	65	14
42	55	8
42	55	9
42	58	10
42	60	9

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
42	62	8
42	62	10
42	65	9
42	65	12
43	60	10
44	60	9
44	62	10
45	60	8
45	60	9
45	62	8
45	62	9
45	62	10
45	62	12
45	65	8
45	65	10
45	65	12
45	68	9
45	68	10
45	68	12
45	68	14
45	70	12
45	70	14
45	72	10
45	72	12
46	64	11
46	65	9
47	70	12
48	62	8
48	62	9
48	65	9

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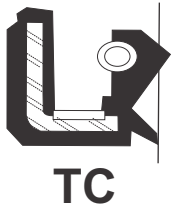
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
48	68	10
48	70	9
48	70	12
48	70	14
49	70	11
50	65	8
50	65	9
50	68	8
50	68	9
50	68	10
50	70	10
50	70	11
50	70	12
50	72	8
50	72	9
50	72	10
50	72	12
50	72	13
50	74	12
50	80	12
50	80	14
52	70	9
52	72	10
52	75	9
52	75	12
52	75	14
52	78	12
54	70	9
54	72	12
54	80	10

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
55	70	8
55	70	9
55	72	8
55	72	9
55	72	12
55	75	9
55	78	9
55	78	12
55	78	14
55	79	13
55	80	8
55	80	10
55	80	12
55	85	14
56	72	9
56	78	9
56	78	12
57	78	10
58	75	9
58	80	9
58	80	12
58	90	11
60	75	8
60	75	9
60	78	9
60	80	8
60	80	10
60	80	12
60	80	13
60	82	9

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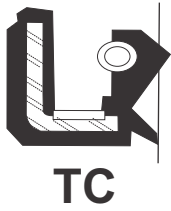
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
60	82	12
60	82	14
60	85	8
60	85	12
60	90	11
60	90	13
60	90	14
62	80	9
62	85	9
62	85	12
63	80	9
63	85	12
65	82	10
65	82	12
65	85	10
65	85	12
65	88	12
65	88	14
65	90	10
65	90	12
65	90	13
65	95	12
65	95	14
66	86	10
67	90	10
68	90	12
68	95	13
70	88	12
70	90	10
70	90	12

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
70	92	12
70	92	14
70	95	10
70	95	13
70	100	13
70	100	14
71	95	13
72	100	12
75	95	10
75	95	13
75	100	10
75	100	13
75	105	12
75	105	15
80	100	9
80	100	10
80	100	12
80	100	13
80	105	13
80	105	15
80	110	10
80	115	15
82	105	13
85	110	12
85	110	13
85	110	15
85	115	15
85	120	12
85	120	15
88	115	13

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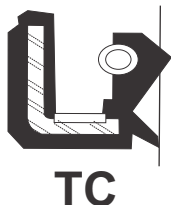
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Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
90	110	12
90	110	13
90	115	13
90	115	15
90	120	12
90	120	13
90	120	15
90	125	15
90	125	17
90	135	15
95	115	13
95	120	12
95	120	13
95	120	15
95	125	12
95	130	15
100	120	12
100	125	12
100	125	13
100	126	12
100	125	15
100	135	15
105	130	12
105	135	14
105	140	15
110	130	12
110	140	12
110	140	14
110	145	15
112	145	14

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
115	140	12
115	140	15
115	145	14
120	150	12
120	150	14
120	155	16
125	150	12
125	155	14
125	155	16
125	160	16
130	160	12
130	160	14
130	170	16
135	165	14
135	170	12
140	160	14
140	170	14
140	170	15
140	185	16
145	175	14
145	175	15
145	190	16
150	180	14
150	180	15
150	180	16
155	180	15
155	190	14
155	200	20
160	190	15
160	190	16

These are some of the Standard Sizes mentioned above, we also manufacture new sizes & designs as per specifications.

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Oil Seal Standard Sizes

DIN 3760 / ISO 6194-1, NBR 70A

FITCO®

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
160	195	18
160	210	20
170	200	15
170	200	16
170	205	16
170	210	15
170	225	20
180	210	15
180	210	16
180	220	20
185	210	15
190	220	15
190	225	15
190	225	16
195	245	22
200	230	14
200	230	15
200	230	16
200	240	20
200	242	20
200	250	16
210	240	15
210	250	20
210	265	25
220	250	15
220	250	16
220	255	16
220	255	18
220	259	22
220	275	23

Oil Seal TC-DL		
Inner Dia	Outer Dia	Width
230	260	15
230	270	16
230	270	20
230	285	23
240	270	15
240	270	20
240	275	16
250	280	15
250	310	25
260	300	20
280	316	18
280	320	20
280	330	24
300	340	20
320	360	20
340	380	20
360	400	20
380	420	20
400	440	20
420	460	20
440	480	20
460	500	20
480	520	20
500	540	20

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