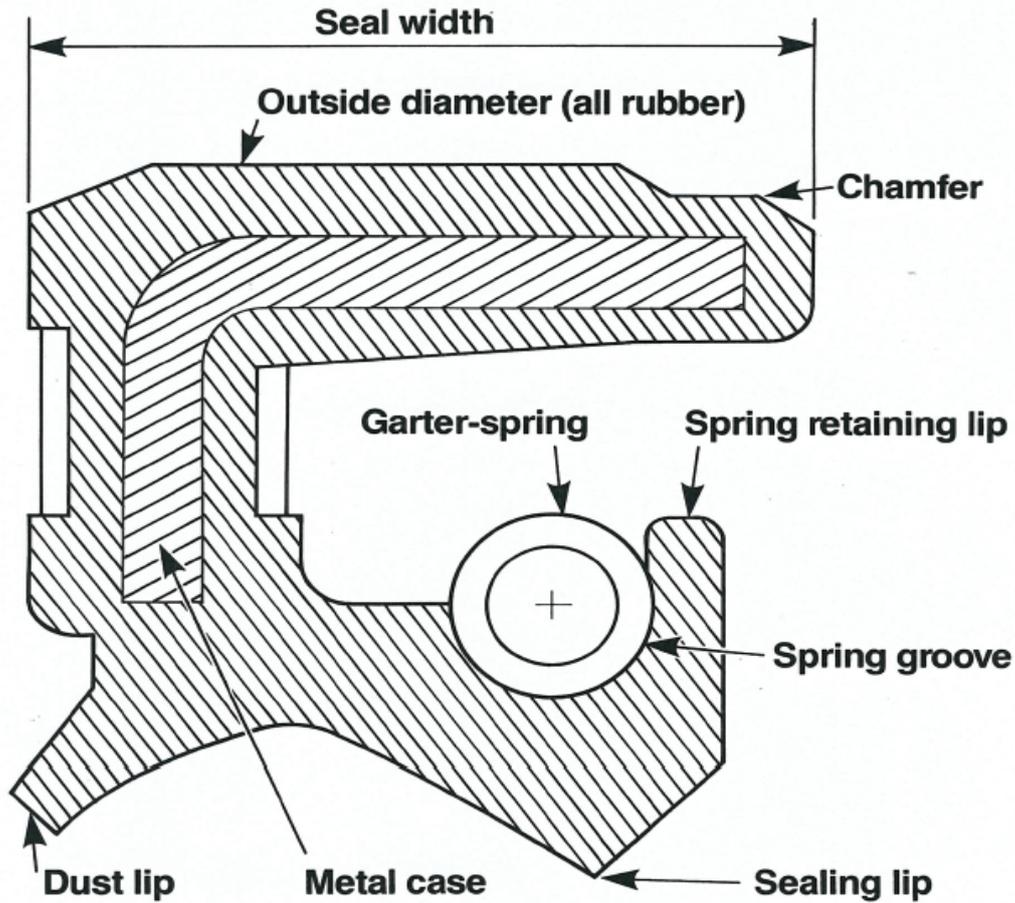


Finer Power Transmissions stock a large range of Nitrile/Natural Buna Rubber (NBR) oil seals. These are the most commonly used seals and have excellent resistance to the swelling effects of petroleum oils with a working temperature between -40°C and $+120^{\circ}\text{C}$.

TC Oil Seal Design

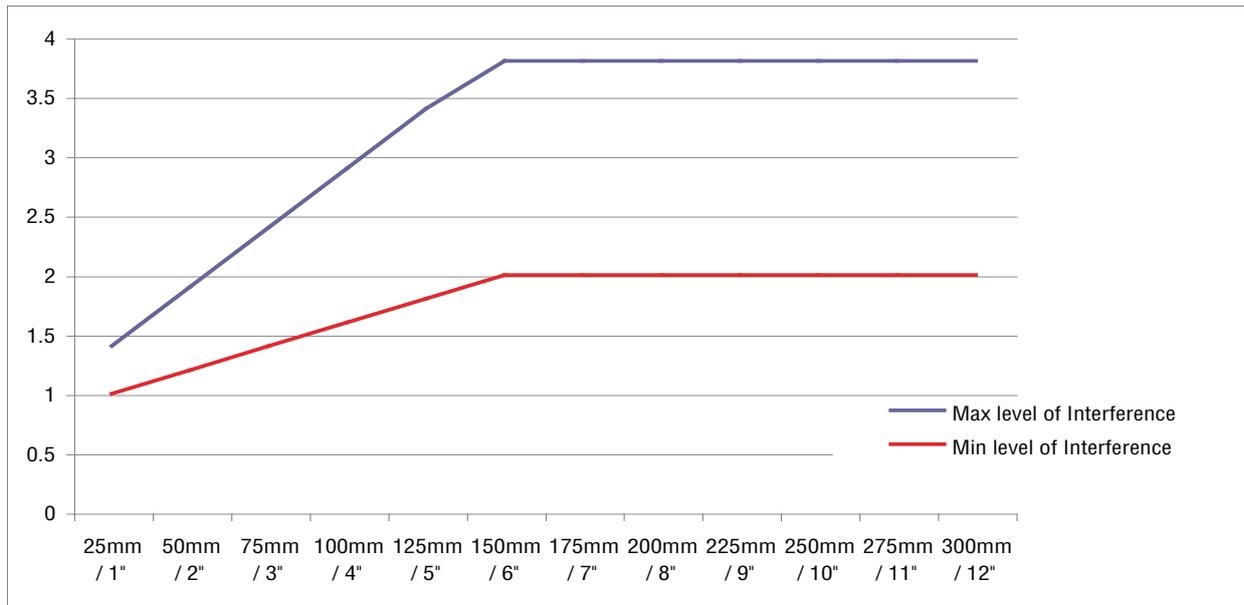


How to select an oil seal

To select the shaft size of an oil seal, the spring lip can be measured and by adding the expected interference with the shaft (using below graph), an estimation of the shaft size can be made.

An allowance must be made for seal lip wear. A heavily worn lip can end up the same as the shaft size. Each application must be considered on its own circumstances.

Interference Levels (mm)



Eg - The spring lip measures 48.5mm and does not appear to be heavily worn, the shaft diameter would be between 49.6mm and 50.3mm ($48.5 + 1.1 = 49.6$, $48.5 + 1.8 = 50.3$). Shaft size is most likely 50mm.

DIAMETRICAL TOLERANCE				
Outside Diameter	Metal Cased		Rubber Covered	
	mm	Inches	mm	Inches
Under 50mm / 1.968"	+0.20	+0.008	+0.30	+0.012
	+0.08	+0.003	+0.15	+0.006
50mm / 1.968" - 80mm / 3.150"	+0.23	+0.009	+0.35	+0.014
	+0.09	+0.0035	+0.20	+0.008
80mm / 3.150" - 120mm / 4.724"	+0.25	+0.010	+0.35	+0.014
	+0.10	+0.004	+0.20	+0.008
120mm / 4.724" - 180mm / 7.087"	+0.28	+0.011	+0.45	+0.018
	+0.12	+0.005	+0.25	+0.010
180mm / 7.087" - 300mm / 11.811"	+0.35	+0.014	+0.45	+0.018
	+0.15	+0.006	+0.25	+0.010
300mm / 11.811" - 440mm / 17.323"	+0.45	+0.018	+0.55	+0.022
	+0.20	+0.008	+0.30	+0.012

An oil seal can also be selected by the expected interference of the outside diameter of the seal using this chart.

Eg - A seal with a rubber cover would be made to suit a recess between 49.87 and 50.01 ($50.1 - 0.23 = 49.87$, $50.1 - 0.09 = 50.01$). Shaft size is most likely 50mm.

If the sample seal doesn't appear too badly damaged, it can be measured purely by dimensions (inside, outside, width).

Seal widths are not generally critical. A narrower seal will in most cases always replace a wider seal. Wider seals can also replace narrower seals if there is sufficient space in the application to allow it.

Recommended Practice Shaft ISO Limits

Tolerances

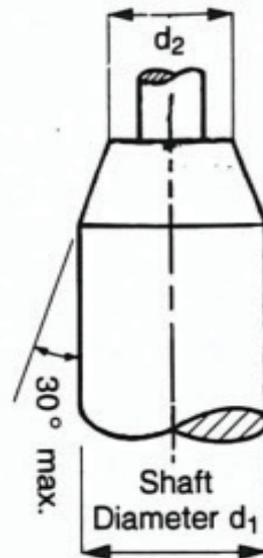
Shaft diameters should conform to the tolerance bands if ISO h.11.

Relative to the application, departures from roundness of shafts must be kept as low as practicable.

Shaft lead-in chamfer to ISO Standards.

If a shaft lead-in chamfer is used, it cannot be less than $d_1 - d_2$ diametral difference in the table below.

d1 (mm)	d1-d2 (mm)
Up to 10	1.5
11-20	2
21-30	2.5
31-40	3
41-50	3.5
51-70	4
71-95	4.5
96-130	5.5
131-240	7
241-400	11



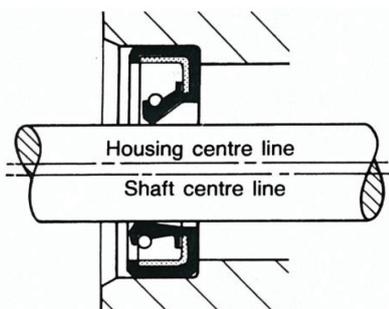
Shaft Eccentricity

Shaft should run in true concentricity with the bore of the housing. When this cannot be assured, eccentricity must be kept to a minimum. Due to inertia, excessive eccentricity may cause the sealing lip to lift at high surface speeds resulting in leakage.

Ideally the seal will be located next to a bearing and bearing play should be minimized.

Eccentricity appears in two forms and may unfavorably affect the seal.

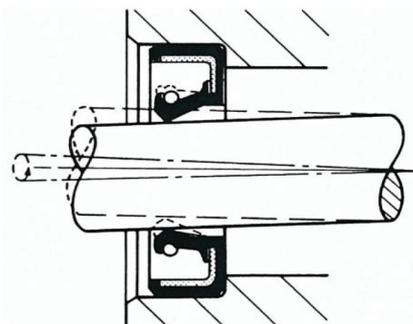
Shaft to Housing Bore Misalignment



Due to errors machining or excessive build-up of adverse tolerances can cause excessive wear on one side of sealing lip because of unilateral loading of lip.

Shaft Runout or Whip

This is when the geometric axis does not coincide with the axis of rotation which may cause lift in the bearing due to wear, flexing of the shaft due to imbalance and excessive overhang or overloading. These conditions may extremely impair the effectiveness of the seal. When operating at high speeds the rate of recovery of the seal lip may not be sufficient to maintain constant contact with shaft.





Seagull Oil Seals - Metric

5X18X7TC	13X25X7TC	17X30X7TC	20X45X7TC	25X45X8TC	30X45X7TC
6X16X7TC	13X26X7TC	17X32X7TC	20X47X7TC	25X47X7TC	30X45X8TC
6X19X7TC	13X27X7TC	17X35X7TC	20X48X7TC	25X48X8TC	30X46X7TC
6X22X7TC	13X28X7TC	17X36X7TC	20X50X7TC	25X50X8TC	30X47X7TC
6X24X7TC	13X30X7TC	17X37X7TC	20X52X7TC	25X52X7TC	30X48X7TC
7X22X7TC	13X35X7TC	17X38X7TC	22X32X7TC	25X55X8TC	30X50X8TC
8X16X7TC	14X22X7TC	17X40X8TC	22X35X7TC	25X60X8TC	30X52X7TC
8X18X7TC	14X24X7TC	17X45X7TC	22X36X7TC	25X62X8TC	30X55X8TC
8X19X7TC	14X25X7TC	17X46X7TC	22X37X7TC	26X37X7TC	30X56X10TC
8X22X7TC	14X26X7TC	17X47X8TC	22X38X7TC	26X40X7TC	30X58X10TC
8X24X7TC	14X27X7TC	18X28X7TC	22X40X8TC	26X42X8TC	30X60X8TC
9X18X7TC	14X28X7TC	18X30X7TC	22X42X7TC	26X45X8TC	30X62X8TC
9X22X7TC	14X30X7TC	18X32X7TC	22X43X8TC	26X47X7TC	30X65X8TC
9X24X7TC	14X32X7TC	18X33X7TC	22X45X7TC	27X37X7TC	30X68X8TC
9X26X7TC	14X35X7TC	18X35X7TC	22X47X7TC	27X40X7TC	30X70X8TC
9X28X8TC	15X24X7TC	18X36X7TC	22X48X8TC	27X41X7TC	30X72X8TC
10X18X7TC	15X25X7TC	18X37X7TC	22X50X8TC	27X42X8TC	31X50X8TC
10X19X7TC	15X26X7TC	18X38X7TC	22X52X7TC	27X43X9TC	32X42X8TC
10X20X7TC	15X28X7TC	18X40X7TC	23X35X7TC	27X45X8TC	32X44X7TC
10X22X7TC	15X30X7TC	19X30X8TC	23X37X7TC	27X47X8TC	32X45X8TC
10X24X7TC	15X32X7TC	19X32X7TC	23X40X7TC	27X48X8TC	32X46X8TC
10X25X7TC	15X33X7TC	19X35X7TC	23X42X7TC	27X52X8TC	32X47X7TC
10X26X7TC	15X35X7TC	19X36X7TC	24X34X7TC	28X38X7TC	32X48X8TC
10X28X7TC	15X36X7TC	19X37X7TC	24X35X7TC	28X40X8TC	32X50X8TC
10X30X7TC	15X37X7TC	19X38X7TC	24X37X7TC	28X42X8TC	32X52X7TC
10X35X7TC	15X38X7TC	19X40X7TC	24X38X7TC	28X43X7TC	32X52X8TC
11X22X7TC	15X40X7TC	19X42X7TC	24X40X7TC	28X45X7TC	32X54X8TC
11X26X7TC	15X42X7TC	19X45X7TC	24X42X7TC	28X45X8TC	32X55X8TC
12X21X7TC	16X24X7TC	19X47X7TC	24X45X7TC	28X47X7TC	32X56X10TC
12X22X7TC	16X26X7TC	20X28X7TC	24X47X7TC	28X48X7TC	32X58X8TC
12X23X7TC	16X28X7TC	20X30X7TC	24X50X8TC	28X50X8TC	32X60X8TC
12X24X7TC	16X30X7TC	20X32X7TC	24X52X7TC	28X52X8TC	32X62X8TC
12X25X7TC	16X32X7TC	20X32X8TC	25X35X7TC	28X55X7TC	32X65X10TC
12X26X7TC	16X35X7TC	20X34X7TC	25X36X7TC	29X40X8TC	32X78X10TC
12X27X7TC	16X36X7TC	20X35X7TC	25X37X7TC	29X50X8TC	33X45X7TC
12X28X7TC	16X37X7TC	20X36X7TC	25X38X7TC	29X52X8TC	33X50X7TC
12X30X7TC	16X38X7TC	20X37X7TC	25X39X7TC	30X40X7TC	33X52X10TC
12X32X7TC	16X40X7TC	20X38X7TC	25X40X7TC	30X41X7TC	33X55X10TC
12X35X7TC	16X45X7TC	20X40X7TC	25X42X8TC	30X42X7TC	33X56X10TC
12X37X7TC	17X26X7TC	20X40X8TC	25X43X7TC	30X43X8TC	34X44X8TC
13X20X7TC	17X28X7TC	20X42X7TC	25X44X7TC	30X44X9TC	34X46X8TC



Seagull Oil Seals - Metric

34X48X8TC	37X59X8TC	42X52X8TC	47X62X8TC	54X72X10TC	60X110X10TC
34X50X7TC	37X60X9TC	42X55X8TC	47X65X8TC	54X74X8TC	60X130X10TC
34X52X8TC	37X62X10TC	42X56X8TC	47X70X8TC	54X81X10TC	62X80X10TC
34X54X9TC	38X50X7TC	42X58X8TC	48X60X8TC	54X82X10TC	62X82X10TC
34X55X10TC	38X52X8TC	42X60X8TC	48X62X8TC	55X67X10TC	62X85X10TC
34X58X10TC	38X54X8TC	42X62X8TC	48X65X8TC	55X68X10TC	62X90X10TC
34X62X10TC	38X55X8TC	42X65X8TC	48X68X8TC	55X70X10TC	62X95X10TC
34X72X10TC	38X56X10TC	42X67X10TC	48X70X8TC	55X72X10TC	62X100X10TC
34X75X10TC	38X58X8TC	42X68X10TC	48X72X8TC	55X75X10TC	63X82X8TC
35X42X8TC	38X60X8TC	42X70X8TC	48X74X10TC	55X78X10TC	63X85X10TC
35X45X7TC	38X62X10TC	42X72X8TC	48X75X8TC	55X80X10TC	63X90X10TC
35X46X8TC	38X65X10TC	42X75X8TC	48X80X8TC	55X82X10TC	64X80X8TC
35X47X7TC	38X68X10TC	43X56X7TC	48X82X8TC	55X85X10TC	64X85X10TC
35X48X8TC	38X70X10TC	43X60X10TC	48X85X8TC	55X90X10TC	65X80X10TC
35X50X8TC	38X72X10TC	43X64X10TC	50X62X8TC	55X95X10TC	65X82X10TC
35X52X8TC	38X74X10TC	43X66X10TC	50X65X8TC	55X100X10TC	65X85X10TC
35X54X8TC	38X75X8TC	43X69X10TC	50X67X9TC	55X120X10TC	65X88X8TC
35X55X9TC	38X80X8TC	43X73X10TC	50X68X8TC	56X70X8TC	65X90X10TC
35X56X8TC	39X62X7TC	44X58X10TC	50X69X10TC	56X72X8TC	65X92X10TC
35X57X10TC	39X63X7TC	44X60X7TC	50X70X8TC	56X78X10TC	65X95X10TC
35X58X10TC	39X65X10TC	44X61X8TC	50X72X8TC	56X80X8TC	65X100X10TC
35X60X8TC	40X50X8TC	44X62X8TC	50X74X10TC	56X85X8TC	65X105X10TC
35X62X8TC	40X52X8TC	44X65X8TC	50X75X10TC	57X85X7TC	65X110X10TC
35X65X8TC	40X54X7TC	44X72X10TC	50X78X10TC	58X72X8TC	65X115X12TC
35X68X10SC	40X55X8TC	45X55X7TC	50X80X10TC	58X74X10TC	65X120X10TC
35X70X8TC	40X56X8TC	45X58X7TC	50X82X8TC	58X75X10TC	65X140X10TC
35X72X8TC	40X58X8TC	45X60X8TC	50X85X10TC	58X80X8TC	67X85X10TC
35X75X8TC	40X60X8TC	45X62X8TC	50X90X10TC	58X85X10TC	67X89X10TC
35X77X9TC	40X62X8TC	45X65X8TC	50X95X13TC	58X90X10TC	68X85X10TC
35X80X8TC	40X65X8TC	45X67X10TC	50X110X10TC	60X70X10TC	68X88X9TC
36X47X7TC	40X68X8TC	45X68X8TC	52X68X8TC	60X72X10TC	68X90X10TC
36X48X7TC	40X70X8TC	45X70X10TC	52X69X8TC	60X74X10TC	68X100X10TC
36X50X7TC	40X72X8TC	45X72X8TC	52X70X8TC	60X75X8TC	70X85X10TC
36X52X8TC	40X73X8TC	45X75X10TC	52X72X10TC	60X78X10TC	70X87X10TC
36X54X8TC	40X75X8TC	45X80X10TC	52X75X10TC	60X80X10TC	70X88X10TC
36X58X10TC	40X80X10TC	45X85X10TC	52X80X10TC	60X82X10TC	70X90X10TC
36X60X8TC	40X85X8TC	45X90X8TC	52X85X10TC	60X85X8TC	70X92X10TC
36X62X8TC	40X90X8TC	45X100X10TC	52X90X10TC	60X90X10TC	70X95X10TC
36X72X9TC	41X55X8TC	46X64X8TC	53X68X10TC	60X95X10TC	70X100X10TC
37X50X10TC	41X56X7TC	46X72X10TC	54X68X10TC	60X100X10TC	70X105X10TC
37X52X7TC	41X58X9TC	46X78X10TC	54X70X10TC	60X105X10TC	70X110X10TC



Seagull Oil Seals - Metric

70X112X10TC	85X100X10TC	100X125X12TC	120X165X12TC	150X180X15TC	210X250X15TC
70X115X13TC	85X105X10TC	100X130X12TC	120X170X15TC	150X190X15TC	215X240X12TC
70X125X13TC	85X110X10TC	100X135X12TC	120X180X15TC	150X200X15TC	215X250X16TC
70X150X13TC	85X115X13TC	100X140X13TC	120X215X15TC	150X210X15TC	220X250X15TC
72X88X8TC	85X120X12TC	100X150X13TC	120X260X15TC	150X225X15TC	220X255X16TC
72X90X10TC	85X125X12TC	100X180X13TC	125X143X13TC	155X180X15TC	220X260X14TC
72X95X10TC	85X130X13TC	105X125X13TC	125X145X15TC	155X190X15TC	220X270X15TC
72X100X10TC	85X140X12TC	105X130X12TC	125X150X12TC	155X200X15TC	225X250X15TC
72X105X13TC	85X150X12TC	105X135X12TC	125X155X12TC	160X180X13TC	230X260X15TC
73X100X10TC	85X180X12TC	105X140X12TC	125X160X12TC	160X185X13TC	230X265X15TC
75X90X10TC	88X110X12TC	105X145X12TC	125X165X15TC	160X190X15TC	230X270X16TC
75X95X10TC	88X115X13TC	105X150X13TC	125X170X15TC	160X200X15TC	230X280X15TC
75X100X10TC	90X105X12TC	105X160X13TC	128X150X13TC	160X240X15TC	235X270X16TC
75X105X10TC	90X110X12TC	105X170X12TC	130X150X12TC	160X290X15TC	240X270X15TC
75X110X10TC	90X115X13TC	105X190X13TC	130X160X15TC	165X190X12TC	240X280X15TC
75X115X12TC	90X118X12TC	110X130X12TC	130X165X15TC	165X200X15TC	250X280X15TC
75X120X12TC	90X120X12TC	110X135X12TC	130X170X15TC	170X190X13TC	250X285X15TC
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75X160X13TC	90X130X13TC	110X145X12TC	130X200X15TC	170X210X15TC	260X290X15TC
76X110X13TC	90X135X12TC	110X150X12TC	135X160X15TC	170X220X16TC	260X300X18TC
77X93X10TC	90X140X12TC	110X155X12TC	135X165X15TC	175X200X15TC	270X300X15TC
77X95X10TC	90X160X12TC	110X160X13TC	135X170X15TC	175X210X15TC	280X310X15TC
78X100X10TC	90X190X12TC	110X170X13TC	140X160X13TC	180X200X15TC	280X320X18TC
80X95X8TC	94X126X12TC	110X200X13TC	140X165X15TC	180X210X15TC	285X310X16TC
80X100X10TC	95X110X12TC	114X135X13TC	140X170X15TC	180X215X15TC	300X340X18TC
80X105X10TC	95X115X12TC	115X135X12TC	140X175X15TC	180X220X16TC	315X350X15TC
80X110X10TC	95X120X12TC	115X140X12TC	140X180X15TC	180X230X15TC	315X355X16TC
80X115X13TC	95X125X12TC	115X145X13TC	140X210X15TC	185X210X15TC	320X360X18TC
80X120X13TC	95X130X13TC	115X150X12TC	140X250X15TC	185X215X16TC	320X380X25TC
80X125X12TC	95X135X13TC	115X160X12TC	145X165X15TC	190X220X15TC	340X380X20TC
80X130X13TC	95X145X13TC	118X140X13TC	145X170X14TC	190X230X15TC	340X400X25TC
80X135X12TC	95X170X13TC	120X140X13TC	145X175X15TC	195X220X15TC	
80X140X12TC	95X200X13TC	120X145X13TC	145X180X15TC	200X230X15TC	
80X170X12TC	98X130X13TC	120X150X12TC	150X165X15TC	200X240X15TC	
82X105X13TC	100X118X12TC	120X155X12TC	150X168X13TC	200X250X15TC	
84X100X10TC	100X120X12TC	120X160X12TC	150X170X15TC	210X240X15TC	