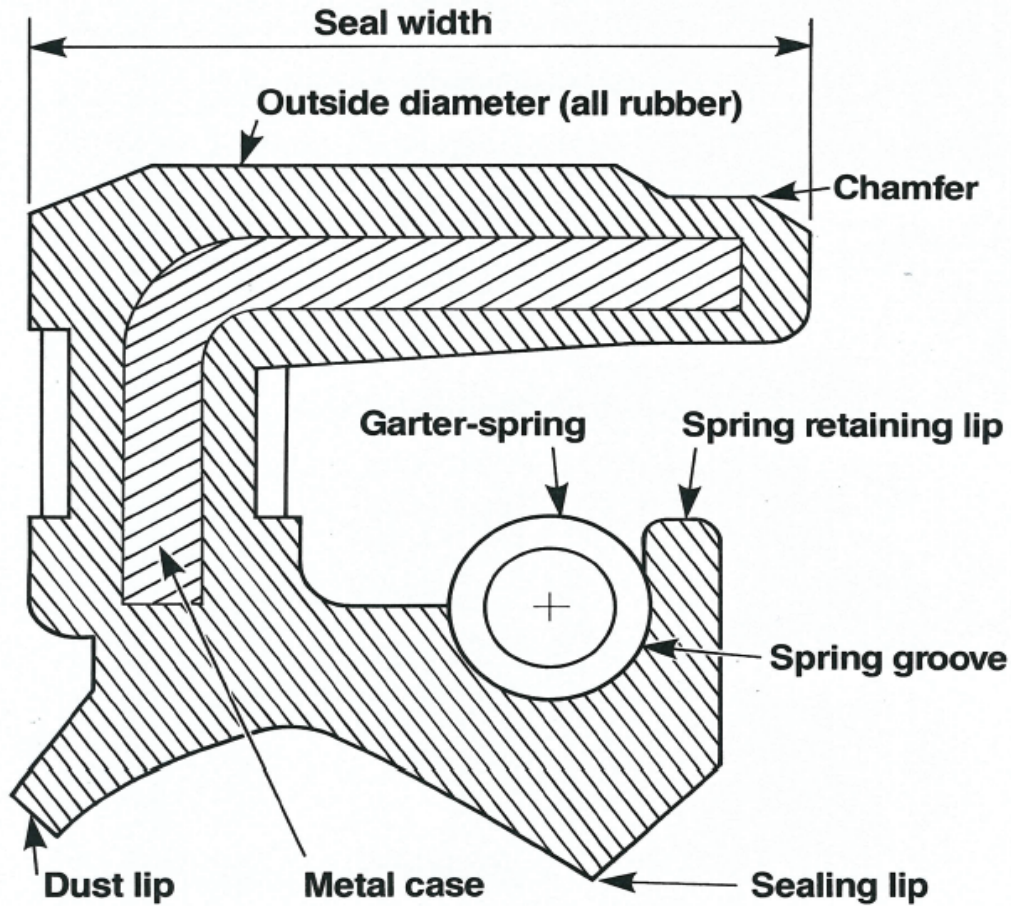


Finer Power Transmissions stock a large range of Nitrile/Natural Buna Rubber (NBR) oil seals. These are the most commonly used seals and have excellent resistance to the swelling effects of petroleum oils with a working temperature between -40°C and $+120^{\circ}\text{C}$.

TC Oil Seal Design

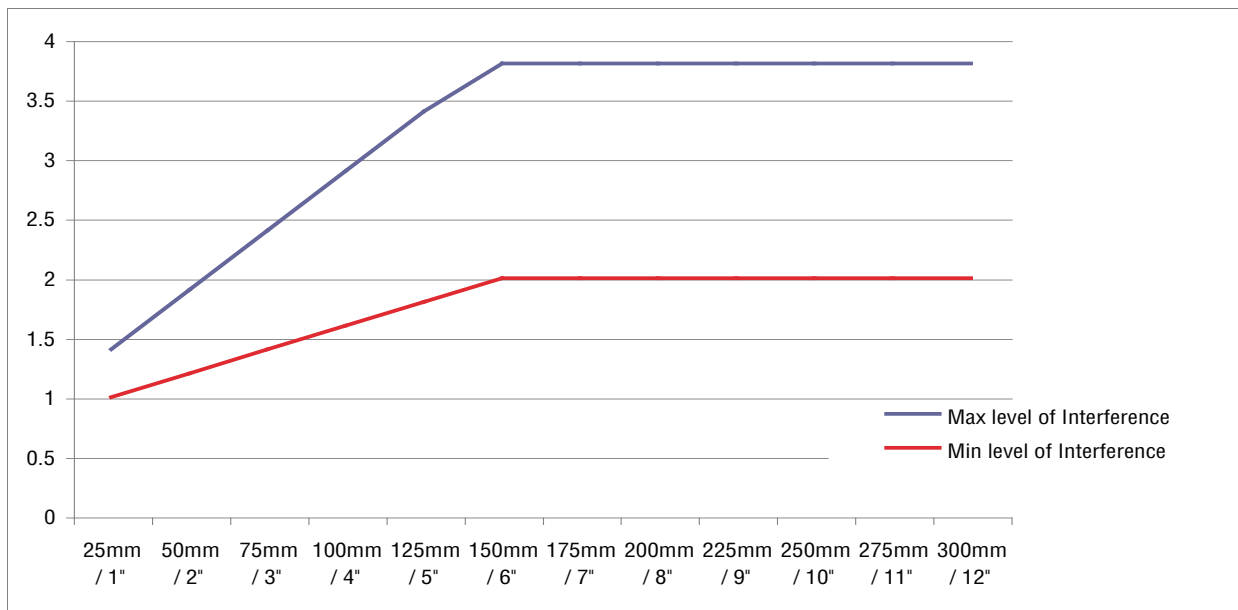


How to select an oil seal

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

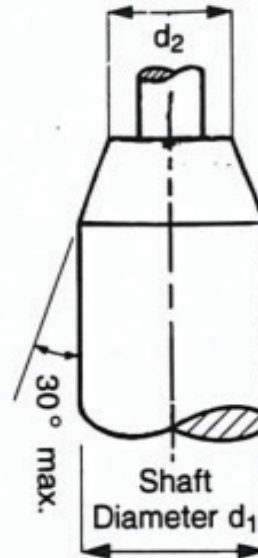
Shaft diameters should conform to the tolerance bands if ISO h.11.

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



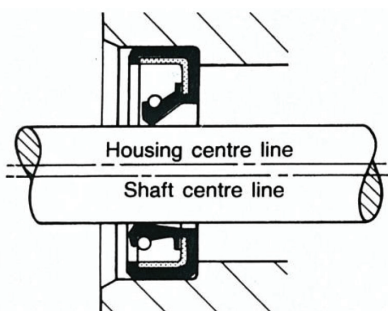
Shaft Eccentricity

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.

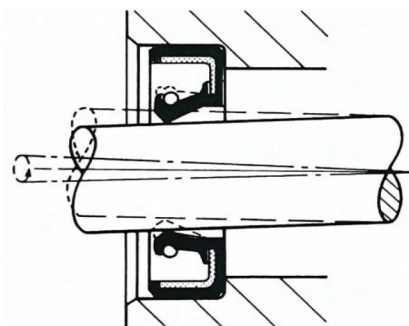
Shaft to Housing Bore Misalignment



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 - Imperial

250-625-187SC	750-1750-375SC	1125-1625-375SC	1375-2125-375TC	1375-2125-375TC	1875-2875-375TC
250-750-250TC	750-1812-250TC	1125-1687-250TC	1375-2187-375TC	1625-2437-375TC	1875-2937-375TC
250-1000-250TC	750-1875-250TC	1125-1750-375TC	1375-2250-375TC	1625-2500-375TC	1875-3000-375TC
312-750-250TC	750-1937-375TC	1125-1812-250TC	1375-2312-375TC	1625-2562-375TC	1875-3125-375TC
312-875-250TC	812-1187-250SC	1125-1875-375TC	1375-2375-375TC	1625-2625-375SC	1938-2625-375TC
375-750-250TC	812-1312-250TC	1125-2000-375TC	1375-2437-375TC	1625-2687-375TC	1938-2750-375TC
375-875-250TC	812-1375-250TC	1125-2062-250SC	1375-2500-375TC	1625-2750-375SC	1938-3000-375TC
375-1000-250TC	812-1500-375TC	1125-2125-250SC	1375-2687-375TC	1625-2812-375TC	2000-2500-250TC
375-1062-250TC	812-1625-375SC	1125-2250-375SC	1375-2750-375TC	1625-2875-375TC	2000-2625-375TC
375-1125-250SC	812-2000-375TC	1125-2312-375TC	1375-2875-375TC	1625-2937-375TC	2000-2687-375TC
375-1375-375SC	875-1250-250TC	1125-2375-375TC	1375-3000-375TC	1625-3000-375TC	2000-2750-375TC
375-1500-375TC	875-1375-250TC	1125-2437-375TC	1437-2125-250TC	1687-2500-375TC	2000-2875-375TC
437-875-250TC	875-1500-250TC	1125-2500-375TC	1437-2250-375TC	1687-2750-375TC	2000-2937-375TC
437-1000-250TC	875-1500-375TC	1187-1750-250TC	1437-2375-375TC	1687-3000-375TC	2000-3000-375TC
437-1125-375TC	875-1625-375TC	1187-1875-250SC	1437-2500-375TC	1750-2250-375TC	2000-3062-375TC
500-875-250TC	875-1875-375TC	1187-2000-250TC	1500-2000-375TC	1750-2312-250TC	2000-3125-375SC
500-937-250TC	875-1937-375TC	1250-1625-250TC	1500-2062-250TC	1750-2375-375TC	2000-3250-375SC
500-1000-250TC	875-2000-375TC	1250-1687-250TC	1500-2125-375TC	1750-2437-375TC	2000-3375-375TC
500-1062-250TC	937-1375-250TC	1250-1750-250TC	1500-2187-375TC	1750-2500-375TC	2000-3500-375SC
500-1125-250TC	937-1500-250TC	1250-1750-375TC	1500-2250-375TC	1750-2562-375TC	2000-3625-500TC
500-1375-250TC	937-1750-375TC	1250-1875-375TC	1500-2375-375TC	1750-2625-375TC	2000-3750-500TC
562-1000-250TC	1000-1375-250TC	1250-1937-375TC	1500-2437-375TC	1750-2687-375TC	2062-2875-375SC
562-1125-250TC	1000-1437-250TC	1250-2000-375TC	1500-2500-375TC	1750-2750-375TC	2062-3000-375TC
562-1250-250SC	1000-1500-375TC	1250-2062-250SC	1500-2562-375TC	1750-2812-375TC	2125-2750-375TC
625-937-250TC	1000-1625-375TC	1250-2125-375SC	1500-2625-375SC	1750-2875-375TC	2125-2875-375TC
625-1000-250TC	1000-1687-250TC	1250-2187-375TC	1500-2687-375TC	1750-2937-375TC	2125-3000-375TC
625-1062-250TC	1000-1750-375TC	1250-2250-375TC	1500-2750-375TC	1750-3000-375TC	2125-3062-375SC
625-1125-250TC	1000-1812-250TC	1250-2312-375TC	1500-2812-375TC	1750-3125-375TC	2125-3125-375TC
625-1250-250TC	1000-1875-250TC	1250-2375-375SC	1500-2875-375SC	1750-3375-375TC	2125-3250-375TC
625-1500-375TC	1000-2000-375TC	1250-2500-375SC	1500-2937-375TC	1750-3500-500TC	2125-3375-375SC
687-1125-250TC	1000-2062-250SC	1250-2625-375TC	1500-3000-375TC	1750-3625-500TC	2125-3500-375SC
687-1250-250TC	1000-2125-250TC	1250-2750-375TC	1562-2125-375TC	1812-2500-375TC	2187-2562-250TC
687-1375-250TC	1000-2187-375TC	1250-2875-250TC	1562-2250-375TC	1812-2625-375TC	2187-2875-375TC
750-1125-250TC	1000-2250-375TC	1312-2000-250TC	1562-2375-375TC	1812-2750-375TC	2187-3000-375TC
750-1187-250TC	1000-2312-375TC	1312-2125-375TC	1562-2500-250SC	1812-2875-375TC	2187-3250-375TC
750-1250-250TC	1000-2500-375TC	1312-2250-375TC	1562-2625-375TC	1812-3000-375TC	2250-2750-375TC
750-1375-250TC	1062-1500-250TC	1312-2375-375TC	1562-2750-375TC	1875-2375-250TC	2250-2875-375TC
750-1375-375TC	1062-1625-250TC	1312-2500-375TC	1562-3000-375TC	1875-2500-375TC	2250-3000-375TC
750-1437-250SC	1062-1750-375TC	1375-1875-250TC	1625-2125-375TC	1875-2625-375TC	2250-3062-375SC
750-1500-375TC	1062-1875-375TC	1375-2000-375TC	1625-2187-375TC	1875-2750-375TC	2250-3125-375TC
750-1625-375TC	1125-1500-250TC	1375-2062-250TC	1625-2250-500TC	1875-2812-375TC	2250-3187-375TC

Legend: 1000 = 1"



Seagull Oil Seals - Imperial

2250-3250-375SC	2625-4000-500TC	3250-4125-500SC	3750-5625-500TC	4500-6000-500TC	6625-7625-500TC
2250-3375-375TC	2625-4125-500SC	3250-4250-500TC	3812-4875-500TC	4500-6250-500TC	6750-7750-500TC
2250-3500-500TC	2687-3500-375SC	3250-4375-500TC	3875-4625-500TC	4562-5625-500SC	6875-7625-500SC
2250-3625-375TC	2750-3500-375TC	3250-4500-500TC	3875-4750-500SC	4625-5625-500SC	6875-7875-500SC
2250-3750-375SC	2750-3625-375TC	3250-4625-500SC	3875-4875-500TC	4625-5750-500TC	7000-8000-500TC
2313-3125-375SC	2750-3750-375TC	3250-4750-500SC	3875-5000-500SC	4625-6000-500TC	7000-8500-500TC
2313-3187-375TC	2750-3875-375TC	3312-4375-500TC	3875-5250-500TC	4687-5750-500TC	7125-8625-562TC
2313-3375-375TC	2750-4000-500TC	3312-4500-500TC	3875-5375-500TC	4750-5750-500TC	7250-8750-562TC
2375-2875-375TC	2750-4125-500SC	3375-4125-500SC	3875-5687-500TC	4750-6250-500TC	7250-8875-625TC
2375-3000-375TC	2750-4250-500SC	3375-4250-500TC	3937-5000-500TC	4812-5875-500TC	7375-8875-562TC
2375-3062-375SC	2750-4500-500TC	3375-4375-500SC	4000-4750-500TC	4937-6000-500TC	7500-8500-500TC
2375-3125-375TC	2812-3375-375SC	3375-4500-500TC	4000-5000-500TC	5000-5750-500TC	7500-9000-500TC
2375-3250-375SC	2812-3625-375TC	3375-4625-500SC	4000-5125-500TC	5000-6000-500TC	7625-9125-562TC
2375-3250-500TC	2875-3625-375TC	3375-4750-500TC	4000-5250-500TC	5000-6250-500TC	7750-9250-562TC
2375-3375-375TC	2875-3875-375SC	3375-4875-500TC	4000-5375-500TC	5000-6500-500TC	7875-9375-562TC
2375-3500-375TC	2875-4000-500TC	3375-5000-500TC	4000-5500-500TC	5062-6125-500TC	8000-9000-500TC
2375-3625-375SC	2875-4125-500SC	3437-4500-500TC	4000-5625-500TC	5125-6125-500TC	8000-9500-562TC
2375-3750-375TC	2875-4250-500SC	3500-4125-500SC	4000-5750-500TC	5125-6750-500TC	8125-9625-562TC
2437-3250-375TC	2875-4500-500TC	3500-4250-500SC	4062-5125-500SC	5187-6250-500SC	8250-9750-562TC
2437-3625-500TC	2937-3750-375SC	3500-4375-500TC	4125-5000-500TC	5250-6250-500SC	8375-9875-562TC
2500-3000-375TC	3000-3750-375TC	3500-4500-500TC	4125-5125-500SC	5312-6375-500SC	8500-10000-562TC
2500-3062-375TC	3000-3875-375TC	3500-4625-500TC	4187-5250-500SC	5375-6375-500SC	8625-10125-562TC
2500-3187-375TC	3000-4000-500TC	3500-4750-500TC	4187-5875-500TC	5437-6500-500SC	8750-10250-562TC
2500-3250-375TC	3000-4125-500SC	3500-4875-500SC	4250-5000-500TC	5500-6500-500TC	8875-10375-562TC
2500-3375-375SC	3000-4250-500SC	3500-5000-500TC	4250-5250-500TC	5562-6625-500TC	9000-10000-625TC
2500-3500-375TC	3000-4375-500TC	3500-5250-500TC	4250-5500-500TC	5625-7000-500TC	9000-10500-562TC
2500-3625-375TC	3000-4500-500TC	3562-4625-500SC	4250-5625-500SC	5625-7500-500TC	9125-10625-562TC
2500-3750-375TC	3000-4625-500SC	3625-4375-500TC	4250-5750-500TC	5687-6750-500SC	9250-10750-562TC
2500-3875-500TC	3000-4750-500SC	3625-4500-500SC	4250-6000-500TC	5750-6750-500TC	9375-10875-562TC
2500-4000-500TC	3000-5000-500TC	3625-4625-500TC	4250-6250-500TC	5812-6875-500TC	9500-11000-562TC
2500-4125-500SC	3062-4125-500SC	3625-4750-500TC	4312-5375-500SC	5875-6875-500TC	9625-11125-562TC
2562-3375-375SC	3125-3875-375SC	3625-5000-500TC	4375-5250-500TC	5937-7000-500TC	9750-11250-562TC
2562-3500-500TC	3125-4000-500TC	3625-5250-500SC	4375-5375-500TC	6000-7000-500TC	9875-11375-562TC
2562-3750-500TC	3125-4250-500SC	3687-4750-500TC	4375-5750-500TC	6000-7187-625TC	10000-11500-562TC
2625-3125-375SC	3125-4375-500SC	3687-5625-500TC	4375-6000-500TC	6000-7500-500TC	9625-11125-562TC
2625-3250-375SC	3125-4500-500TC	3750-4375-500SC	4375-6250-500TC	6125-7125-500TC	9750-11250-562TC
2625-3375-375TC	3125-4625-500TC	3750-4500-500SC	4437-5500-500SC	6250-7000-500TC	9875-11375-562TC
2625-3500-375SC	3125-4750-500TC	3750-4625-500SC	4500-5250-500TC	6250-7250-500TC	10000-11500-562TC
2625-3625-375TC	3187-4250-500TC	3750-4750-500TC	4500-5375-500SC	6375-7375-500SC	Legend: 1000 = 1"
2625-3750-375SC	3187-4500-500TC	3750-4875-500TC	4500-5500-500TC	6500-7500-500TC	
2625-3875-500SC	3250-4000-500TC	3750-5000-500TC	4500-5750-500SC	6500-8000-500SC	