

SHAFT SURFACE FINISH

Surface finish greatly affects the degree of wear on the seal lip. deVries International recommends a surface finish of 10 to 20 Ra measured along the axis of the shaft. We also recommend that this finish be created by plunge grinding the surface. This will prevent a machine lead on the shaft which would accelerate lip wear and possibly pump fluid under the seal lip.

SURFACE FINISH CONVERSION: MICRO-INCH TO MICRO-METER					
MICRO-INCH	MICRO-METER	MICRO-INCH	MICRO-METER	MICRO-INCH	MICRO-METER
4	0.1	32	0.8	100	2.5
8	0.2	40	1.0	125	3.2
10	0.25	50	1.25	160	4.0
16	0.4	63	1.6	200	5.0
20	0.5	80	2.0	250	6.3

BORE

The same four factors which concern the shaft apply to the bore as well: surface finish, hardness, chamfer, and tolerance.

BORE FINISH

A bore surface that is too rough may cause leakage between the bore and the seal. Here are the maximum bore finishes recommended for metal and rubber-covered outside diameter seals:

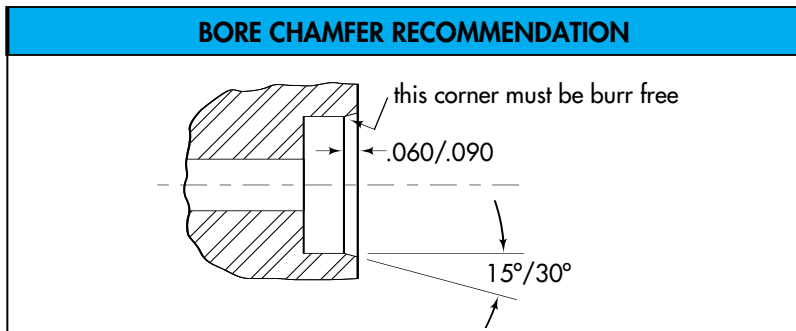
BORE SURFACE FINISH RECOMMENDATION	
Metal OD	20–80 Ra
Rubber-Covered OD	63–150 Ra

BORE HARDNESS

There is no minimum Rockwell hardness recommended for the bore. However, steel and cast iron provide good bore surfaces for both rubber-covered and metal OD seals. When the bore is of softer metals or plastic, deVries International recommends using a rubber-covered rather than a metal OD seal.

BORE CHAMFER

As with the shaft, a lead-in angle helps prevent damage during installation. The diagram below shows recommended bore chamfer.



BORE TOLERANCE

The following table lists recommended tolerances and fits between bore and seal. To measure a seal's outside diameter (OD), take a minimum of three measurements equally spaced from one another on the OD and calculate the average. This will give you an accurate measurement. Out-of-round is the maximum allowable variation between the readings used to determine a seal's outside diameter.

INCH BORE TO SEAL INTERFACE DESIGN DATA							
BORE DATA		METAL O.D. SEALS			RUBBER O.D. SEALS		
BORE DIAMETER	TOLERANCE	NOMINAL PRESS FIT	SEAL O.D. TOLERANCE	SEAL MAX OUT OF ROUND	NOMINAL PRESS FIT	SEAL O.D. TOLERANCE	SEAL MAX OUT OF ROUND
up to 2.000	± .001	.005	± .002	.007	.008	± .003	.010
2.001 to 3.000	± .001	.006	±.003	.010	.010	± .003	.014
3.001 to 5.000	± .0015	.006	±.003	.012	.010	± .003	.020
5.001 to 7.000	± .0015	.007	±.003	.016	.012	± .004	.026
7.001 to 12.000	± .002	.009	±.004	.025	.012	± .004	.031

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METRIC BORE TO SEAL INTERFACE DESIGN DATA							
BORE DATA		METAL O.D. SEALS			RUBBER O.D. SEALS		
BORE DIAMETER	TOLERANCE	NOMINAL PRESS FIT	SEAL O.D. TOLERANCE	SEAL MAX OUT OF ROUND	NOMINAL PRESS FIT	SEAL O.D. TOLERANCE	SEAL MAX OUT OF ROUND
0 to 50	± 0.025	0.13	± 0.05	0.18	0.20	± 0.08	0.26
51 to 76	± 0.025	0.15	± 0.07	0.26	0.25	± 0.08	0.36
77 to 127	± 0.04	0.15	± 0.07	0.31	0.25	± 0.08	0.51
128 to 178	± 0.04	0.17	± 0.07	0.41	0.30	± 0.10	0.66
179 to 305	± 0.05	0.20	± 0.09	0.65	0.30	± 0.10	0.79