



REDWOOD
PLASTICS AND RUBBER

MACHINIST CHART FOR PLASTIC BEARINGS

CLEARANCE TABLES

Table A - SHAFT RUNNING CLEARANCE

If the shaft diameter in inches is:	1	2	3	4	5	6	7	8	9	10	11	12
Clearance in inches is:	.007	.010	.013	.015	.018	.020	.022	.024	.026	.028	.030	.032

Table B - BEARING WALL EXPANSION CLEARANCE (only for normal operating temperatures)*

If the bearing wall thickness is:	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Clearance in inches is:	.002	.004	.006	.008	.010	.012	.015	.017	.020	.024	.028	.033

Table C - PRESS FIT INTERFERENCE CLEARANCE (only if press fit)

If housing I.D. in inches is:	2	3	4	5	6	7	8	9	10	11	12	13
Clearance in inches is:	.007	.009	.011	.012	.013	.015	.016	.017	.018	.019	.020	.021

Table D - MOISTURE EXPANSION CLEARANCE (only if water-lubricated bearing)**

If bearing wall thickness in inches is:	1/8	1/5	1/4	3/8	1/2	3/4	1 or more
Clearance in inches is:	.012	.017	.021	.026	.030	.032	.033

If bearing is press fit, add clearances A, B, C. Then, add the total to the shaft diameter. The result is the finished inside diameter of the plastic bearing.

TYPICAL RUNNING CLEARANCES

For REDCO 750 & NYLON Bearing Materials

Note: If bearing is press fit, add corresponding value to both the Housing ID and the Bushing ID.

Shaft Size	Wall	Housing ID	Inside Diameter	Inside Dia. (if water lub.)	Press Fit
1 7/16	.250	1.937	1.449	1.470	.007
	.375	2.187	1.451	1.477	.007
	.500	2.437	1.453	1.483	.007
1 15/16	.250	2.437	1.951	1.972	.008
	.375	2.607	1.953	1.979	.008
	.500	2.937	1.955	1.983	.008
2 3/16	.250	2.687	2.201	2.222	.009
	.375	2.937	2.203	2.229	.009
	.500	3.187	2.205	2.235	.009
2 7/16	.375	3.187	2.453	2.471	.010
	.500	3.437	2.455	2.481	.010
	.750	3.937	2.457	2.487	.010
2 15/16	.375	3.687	2.956	2.982	.011
	.500	3.937	2.958	2.988	.011
	.750	4.437	2.962	2.994	.011
3 7/16	.375	4.187	3.457	3.483	.011
	.500	4.437	3.459	3.489	.011
	.750	4.937	3.463	3.495	.011
3 15/16	.375	4.687	3.958	3.984	.012
	.500	4.937	3.960	3.990	.012
	.750	5.437	3.961	3.996	.012
4 7/16	.500	5.437	4.462	4.492	.013
	.750	5.937	4.466	4.498	.013
	1.000	6.437	4.471	4.501	.013
4 15/16	.500	5.937	4.963	4.993	.014
	.750	6.437	4.967	4.999	.014
	1.000	6.937	4.972	5.005	.014
5 7/16	.500	6.437	5.464	5.494	.015
	.750	6.937	5.468	5.500	.015
	1.000	7.437	5.473	5.506	.015

NOTE

* - Plastics are subject to many variables (ie. Moisture, cold, heat, etc.) when being machined for specific applications.

** - If lubrication is supplied to a plastic bearing the load and life are increased, dependent on the type and volume of lubricant.

Tool Types:

- H.S.S. - 10° - 12° side clearance, 2° - 4° rake, 1/8 radius
- Carbide 7° side clearance, 0° rake, 1/32 radius
- H.S.S. - 10° - 12° side clearance, 10° - 15° rake, 1/64 radius
- Drill - H.S.S. - negative cutting edge, positive clearance
- Part off tool - Carbide or H.S.S. - neutral rake
- Part off tool H.S.S. positive rake
- Knife tool

Material	Tool Type	S.F.M. / Speed-Feed
Redco UHMW & HDPE	1&2 (fine finish) 4&5	Up to 600m/min depending on size ie: 2 1/2" 1000/1500 rpm
Comments: Subject to creeping-free machining/ Heavy extrusions should be done in several passes, due to built in stress. Can be plunge drilled.		
Redco Urethanes - 750	1 1/2, 4 & 5	Up to 300m/min ie: 4" 700 rpm/010 feed facing .015/.030
Comments: Very stable, holds size well, shiny, smooth finish, easy to obtain. Use coolant when drilling deep holes.		
Redco 750SXL & Synsteel	2, 4 & 5 Carbide Required	Half of above
Comments: Quite abrasive, slower feeds necessary for finish.		
Redco 80A & Softer	7,6 & 4	Higher feeds & medium speed to prevent heat build-up & sticking
Comments: Material is peeled with approx. .100 per side cuts. Lighter tend to tear.		
Redco Nylons	1, 2, 4, & 5	Approx. same as 750 depending on finish required & size. Lubed nylon approx. 25 - 30% faster rpm
Comments: Quite brittle, holds size well, good finish easy to obtain.		
Redco Teflons	2, 4 & 5	Approx. same as 750, slower feed recommended to achieve good finish
Comments: Free machining - quite soft-glass filled, should be machined at about 75% virgin speeds. Carbide with chip breaker works well.		
Redco Acrylics	2, 4 & 5 Generally small radius tools	About 150m/min. Slower rpm to prevent heat build-up, light cuts & small depth to prevent cracking
Comments: Very brittle, easily scratched, lub & oil improves finish & clarity when used as a cutting fluid.		
Redco Phenolics Duragyde, BL 400	Carbide recomm. H.S.S can be used at greatly reduced speeds/ feeds	Approx 300m/min - fine feeds (approx. .006-.008 rep's to produce reasonable finish.
Comments: Abrasive materials - finish difficult to maintain without secondary operation such as sanding to remove fuzzy finish.		

Spinwelding: Most cast and extruded plastics can be spin welded with the exception of moly filled, pffe/virginpffe, and phenolics. This technique is used to join several pieces of material, utilizing heat build-up thru friction and pressure. Basically, one piece is spun in the lathe quickly and another piece is held stationary (not rotating) and pressure is applied (gently) with the tailstock. When enough frictional heat is built-up, as witnessed by melting at the mating surfaces, rotation is stopped abruptly and heavier pressure is applied. A cooling off period of about 10 to 15 seconds will yield a secure bonding.



CDN 1 800 667 0999 USA 1 866 733 2684
sales@redwoodplastics.com
redwoodplastics.com



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