



Custom Machining Options for Shafts

Special Machining

Standard 60 Plus shafting, which is available from stock, can be cut with special length tolerances. 60 Plus shafting may also be drilled with a variety of radial holes and tapped if needed. Shafts can be supplied with flats, keyways, and reduced diameters. Shafts can also be plated.

There is an extra charge for all special machining operations. For specific prices, send your drawing or technical description to PBC Linear.

Special Length Tolerances

PBC Linear standard length tolerances are:

< 1 1/4" diameter	$\pm 1/32"$ ($\pm .03"$)
1 3/8"-2" diameter	$\pm 1/16"$ ($\pm .06"$)
> 2" diameter	$\pm 1/8"$ ($\pm .125"$)

Contact us with special requirements. PBC Linear can accommodate up to $\pm .001"$.

Special Straightness Tolerances

PBC Linear standard length tolerances are .001 to .002"/foot cumulative. Except for 3/8" diameters and less. Contact us with special requirements.

Standard Chamfers



Diameter	Size	Tolerance
$\leq 3/8"$	Break Edge	$\pm 10.005-0.010" \times 45^\circ$
10 mm-7/8"	1/32" x 45°	$\pm 0.005"$
1"-2"	1/16" x 45°	$\pm 0.010"$
2 1/2"-3"	1/8" x 45°	$\pm 0.010"$

Special chamfer at any angle can be supplied for an additional charge.

Machining Shaft Ends

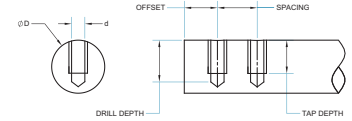
For all machining requirements with turned ends, PBC Linear will anneal the end. The annealing process may cause approximately 1/4" to 1/2" of heat travel from machined area (depending on major shaft O.D.). Hardness of major shaft diameter near the machined area will be below the Rockwell for the material. If annealing effects are objectionable, alternate machining processes can be used which prevent major diameter softening.

Contact factory for special options.

Radial Holes Drilled and Tapped to Center of Shaft

U.N.C. or U.N.F. Class 2-B thread.

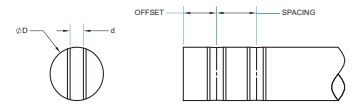
Note: Hole depth full threads to 1/2" of the shaft diameter.



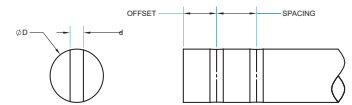
Hole to Hole	$\pm 0.010"$ Non-Accum
Hole to Centerline	$\pm 0.0075"$
Hole to End	$\pm 0.030"$ ($\pm .06$ mm)

Radial Holes Drilled and Tapped through Shaft

Annealed and soft around circumference in hole area.



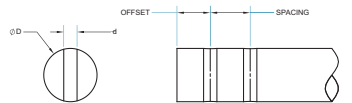
Radial Holes Drilled through Shaft



Hole Diameter	$\pm 0.005"$
Hole to Hole	$\pm 0.010"$ Non-Accum
Hole to Centerline	$\pm 0.0075"$
Hole to End	$\pm 0.030"$

Radial Holes Drilled and Reamed through Shafts

Annealed and soft around circumference in hole area.



Hole Diameter	$\pm 0.001"$
Hole to Hole	$\pm 0.010"$ Non-Accum
Hole to Centerline	$\pm 0.0075"$
Hole to End	$\pm 0.030"$

Threaded Shaft Diameter

Standard threads are either Unified National Coarse or Unified National Fine, Class 2-A fit. Shafts will be annealed and soft around the circumference of threaded areas within the case

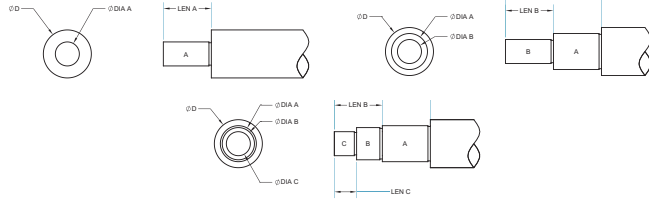


Standard Threads	UNC or UNF Class 2-A
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Note: Threading area will be annealed and soft.

Reduced Shaft Diameter

Standard diameter tolerances on turned down diameters are $\pm .001"$. Special tolerances of $\pm .0001"$ are available. Runout is within $.001"$ total indicator reading. Shafts are annealed and soft in turned down sections within case. Two-step shaft diameter reduction is also available.



Normal Tolerance	$\pm .001"$
Concentricity	$\pm .002"$ MAX T.I.R.

Note: Shafts turned down require annealing.

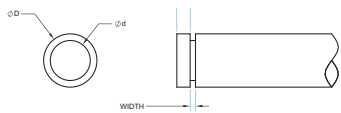
Coaxial Holes Drilled and Tapped in Center of End of Shaft



Concentricity	0.01"
Diameter of Holes	$\pm 0.006"$
Bored Holes	$\pm 0.001"$
Bolt Circles	$\pm 2^\circ$
Coaxial on Both Ends	OAL $\pm 0.015"$
Axial on One End	OAL $\pm 0.030"$

Note: Depth is twice the diameter of the tap minimum.

Retaining Ring Groove



Location Tolerance	$\pm 0.062"$ Standard $\pm 0.005"$ Custom
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Note: Retaining ring location will be annealed.

Dowel Joints



Match over joint of 0.002 Maximum TIR	
All Linear Dimensions	$\pm 0.010"$
First Hole	$\pm 0.0075"$
Shaft Diameter	5/8" to 3"

Note: Ends machined square without chamfer.

Butted Joints

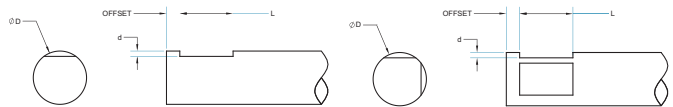
Ends machined square, no chamfer. Available for all Nominal shaft diameters.

Perpendicularity	$\pm 0.001"$ MAX
All Linear Dimensions	$\pm 0.010"$

Note: Ends machined square without chamfer.

Flat(s) on Shaft

Flats are available. Flats extending over large portion of shaft or entire length of shaft are not available. Cutting into hardened layer would cause considerable warping and subsequent straightening costs would be prohibitive.



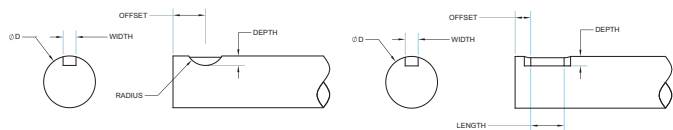
Location Tolerance	$\pm 0.010"$
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Keyways

Keyways may be square, flat or American Standard Woodruff. Available for Nominal shaft diameters from 1/2" through 4".



Other options available. Contact us for a quote.



Width	$\pm 0.001"$
Length	$\pm 0.010"$
Linear Locations	$\pm 0.010"$
Location to C/L	$\pm 0.0075"$
Depth	1/2" width + "M" on table 8

Note: Square or American Standard Woodruff. Maximum length in house is 48".



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