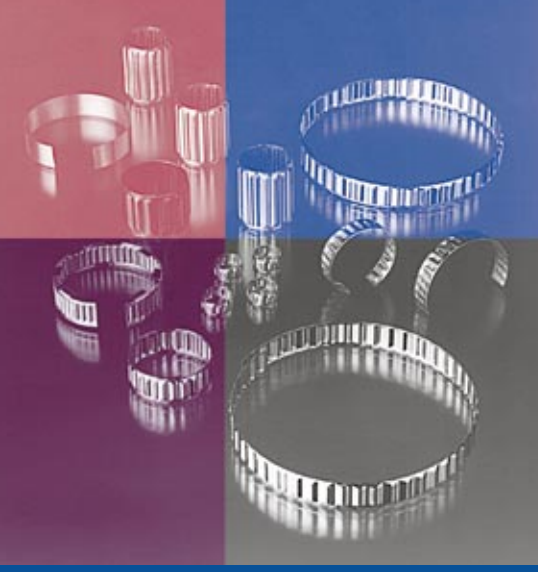


Easy, Step-By-Step Instructions...

How To Install a BN Style Tolerance Ring

The BN style ring has a free state diameter smaller than the shaft diameter over which they are to be installed, so that when mounted to the shaft, the ring conforms to and becomes self retaining on the shaft. The ring sits on the shaft with the waves on the outside to be compressed by the bore of the mating part.

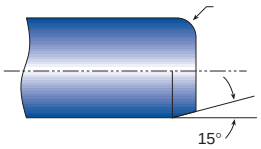
Design of Mating Parts

Assembly Procedure Considerations

The tops of the corrugations (the ID on AN rings, or the OD on BN rings) are formed with a rounded contour, which assists as a lead-in edge during assembly. It is very important that the lead-in edge of the mating part is contoured with a generous radius or a shallow (15°) chamfer. Sharp corners on the lead-in edge could dig in and mar the Tolerance Ring, sacrificing performance. It is also important that the housing bore should allow for a minimum .080" (2mm) wall thickness remaining after machining steel housing or at least .120" (3mm) for an aluminum zinc or magnesium housing. It should also be considered that when using low strength materials, such as aluminum, zinc, magnesium, plastics, etc., the housing bore should be reduced to provide more of an interference fit.

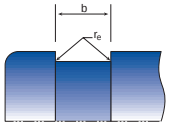
Best results of assembling mating parts are achieved by using an arbor press and fixturing the parts to hold them squarely in place during assembly. Except for very light duty rings, aligning the parts by hand and/or hammering the assembly together jeopardizes alignment and performance. If misalignment occurs during assembly, there is a tendency for the lead-in edge of the mating part to flatten corrugations in one are of the Tolerance Ring, resulting in reducing of ring integrity.

Radius or chamfer are options for part which slides on corrugations during assembly.

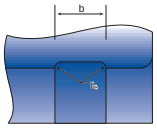


When using the centered arrangement, a small radius and adequate groove width should be used to ensure that the Tolerance Ring may be properly seated on the cylindrical surface.

r_e = .010 max for dia < 2"
= .020 max for dia > 2"
b_{min} = (3 x r_e) + ring width

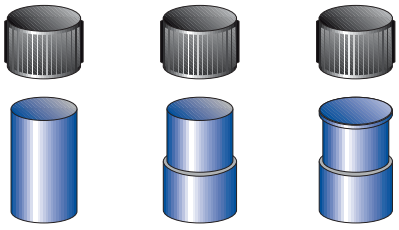


Groove in shaft O.D.



Groove in housing bore

Mounting Options



Free

Piloted (Half-Centered)

Centered

BN Style Rings:

1. Confirm the shaft size corresponds with USA Tolerance Ring specifications.
   A centered arrangement with a groove in the shaft to locate the tolerance ring is preferred. This will allow greater radial loads and control of runout. If a straight shaft or free state arrangement is used, a lock ring or special fixture must be used to back up the ring during assembly so that it does not slide on the shaft.

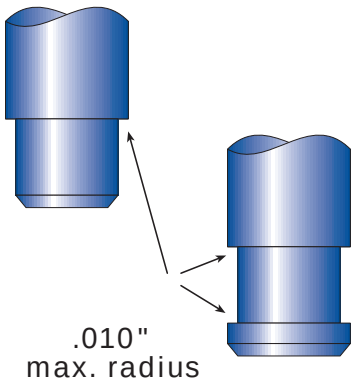
2. Confirm the housing bore size corresponds with USA Tolerance Ring specifications. Machine to recommended size, if required.

3. Spread the ring open. The BN style ring is made with a small gap or overlap so that it can fit tightly on the shaft. To avoid overstressing, gently spread open the tolerance ring's ends until it fits over the shaft. A conical tool is sometimes useful to open the ring and help slip it onto the shaft. Care must be taken not to scratch or mark the shaft. In critical applications, a protective sleeve can be used to protect the shaft from damage during assembly. A slight twisting action helps seal the tolerance ring. Make sure the tolerance ring fits fully within the groove and that the edge does not ride up onto the shaft.

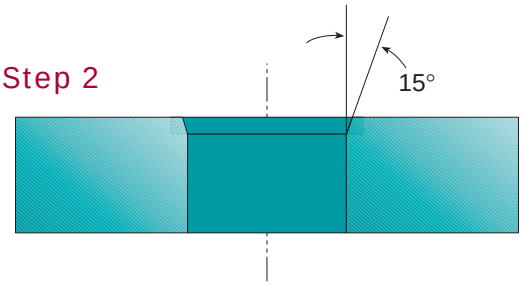
4. Place the shaft and ring subassembly along with the gear, bearing, cam, fan, pulley, etc. into an assembly press fixture. A fixture is necessary to ensure that the shaft and bore are held concentric and square to one another. The bore must have the correct diameter and 15° chamfer to facilitate assembly. Apply a uniform and consistent force using an arbor press or hydraulic cylinder to fully seat the ring in the bore.

1,2,3,4. . .A Perfect Fit.

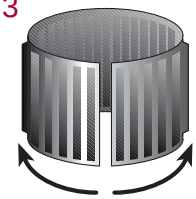
Step 1



Step 2

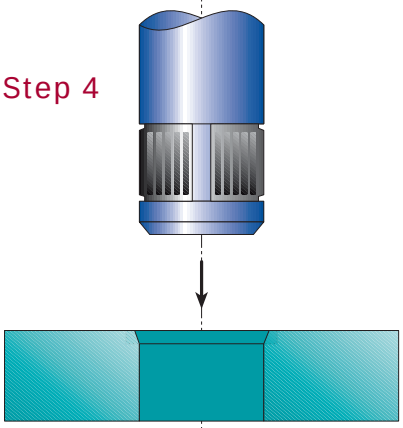


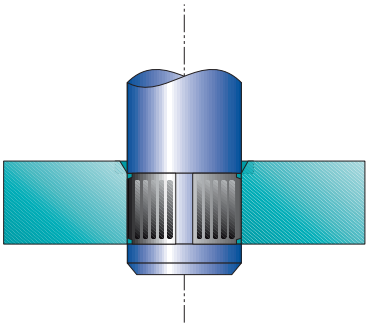
Step 3



Gently open ends

Step 4





Refer to your USA Tolerance Ring catalog for further application and design information.

Questions?

Contact our engineering department at 877-865-7464 (toll free) or fax 609-745-5012

Visit us at www.usatolerancerings.com

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