

Installing and Securing Vesconite Bearings

Freeze fitting is the easiest way to install Vesconite bearings. Dry ice is an ideal agent but liquid nitrogen can be used if dry ice is not available.

Using Dry Ice

Vesconite has a thermal expansion coefficient of $6 \times 10^{-5} \text{ mm/mm/}^\circ\text{C}$ ($3.3 \times 10^{-5} \text{ in/in/}^\circ\text{F}$).

Cooling in dry ice for two to three hours reduces bearing temperatures by 40 to 60°C (70 to 100°F). This results in a shrinkage of $1,2 \text{ mm}$ ($0.05''$) on a 500 mm ($20''$) diameter bearing.

Good ventilation must be used in confined spaces to avoid possible lack of air.

Using Liquid Nitrogen

Use an insulated container as shown below. The container may be any suitably sized metal drum.

To insulate, simply wrap around with glass or rock wool, or several layers of corrugated cardboard, or bubble wrap. These may be held in place by tape, wire or strapping.

Place the bearing on wooden blocks or bricks to raise it 150 mm ($6''$) above the bottom of the container. Do not place the bearing directly onto the floor of the container.

Place a loose fitting lid on top of the container. If the lid is made from chipboard or plywood 18 to 25 mm thick ($0.75''$ to $1''$), it will act as an insulator as well.

Slowly pour liquid nitrogen into the bottom of the container - about 50 mm ($2''$) deep.

Only sufficient liquid nitrogen to cover the bottom of the

container is needed.

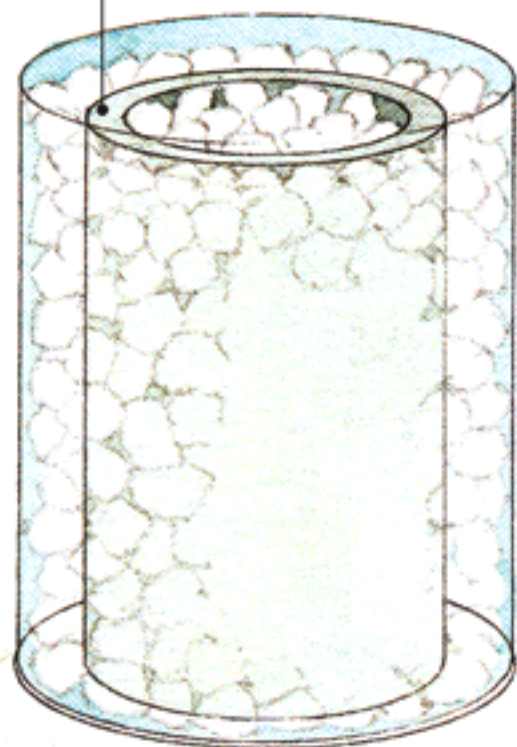
It is important to ensure that the liquid nitrogen does not come into direct contact with the Vesconite bearing.

Allow the bearing to cool for approximately 1 to $1\frac{1}{2}$ hours which should be enough to shrink it sufficiently for a sliding fit.

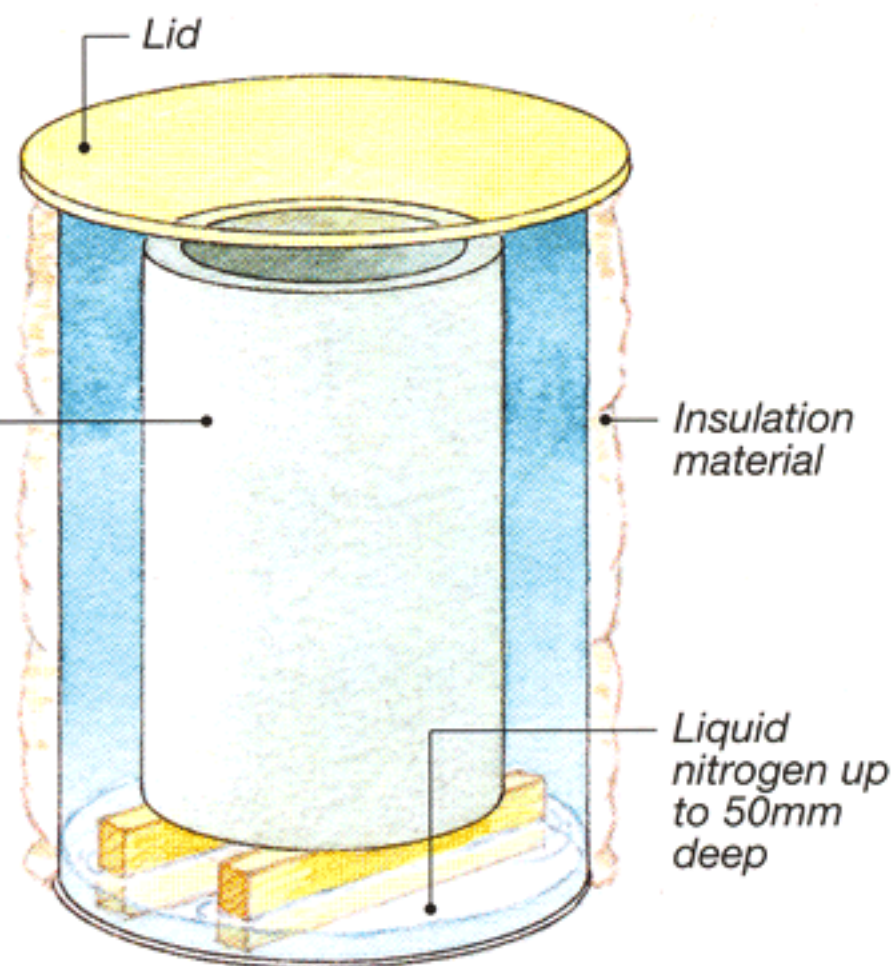
Measure the top outside diameter with a vernier to ensure that sufficient shrinkage has occurred before removing the bearing from the container.

Use nitrogen only in well ventilated areas. Take care in handling and adhere to the general safety rules for liquid nitrogen as it can cause severe burns. Consult your supplier of liquid nitrogen for detailed precautions. Safety visors and protective clothing should be used.

Vesconite bearing packed in a container with dry ice.



Vesconite bearing packed in a container supported by wooden blocks 100 - 150 mm (4 - $6''$) high.



Ensure that liquid nitrogen does not come into direct contact with Vesconite bearing.

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HydroWatt (530) 265-5099

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Housings

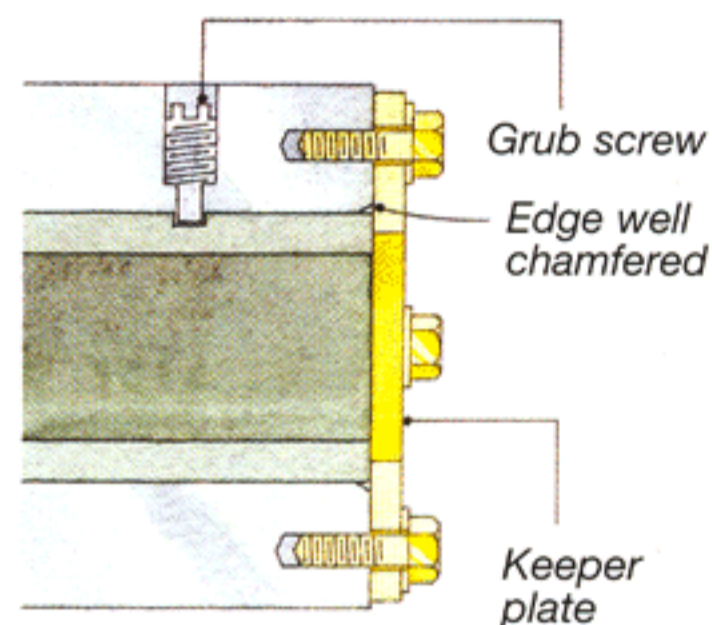
While Vesconite is a fairly rigid material, it will generally conform to the size and shape of the housing. Therefore out-of-round or out-of-line

housings should be avoided, unless the housing is made round or in-line through machining.

Mechanical Securing

As a standard safety precaution, bearings should always be secured using conventional mechanical means such as keeper rings. Grub screws may be used on small bearings.

Mechanical securing to prevent possible rotation and end keeper rings are especially important for bearings that may be used in sub-zero conditions.



Adhesive Bonding

If desired, anaerobic adhesives such as Loctite 603 or 648 retaining compound may be used. Adhesive bonding is recommended when using sliding fits.

Machine a lead in chamfer of 15° to 35° on the leading edge of the bearing. Prime

initially with Loctite Primer T and allow to dry.

Loctite 603 or 648 (former for smaller gaps and the latter for larger gaps) should be applied to both the Vesconite bearing and metal housing surfaces. The bearing should be pressed into place and excess adhesive wiped off.

Fitting Staves

Fitting of Vesconite staves is facilitated by cooling the staves in dry ice for 3 hours before fitting.

Shaft and Other Mating Surfaces

Metal mating surfaces must be suited to the wear conditions encountered, for example when operating in sandy conditions. **Hard shaft surfaces ensure longer shaft and bearing life.**

Hardchrome plated surfaces, seawater corrosion resistant stainless steel and admiralty and gunmetal bronze liners are generally satisfactory as mating surfaces for Vesconite.

Carbon steel and hardened steel shafts may be used as mating surfaces provided that they do not corrode under the conditions of use.

A good finish of the order of 0.5 micrometre R_a (20 micro-inches R_a) should be provided on shaft surfaces.

Rough surface finishes and corroded and scored shafts will cause wear of Vesconite bearings and should be avoided.

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