VESCO PLASTICS SALES

Tel +27 11 616 11 11
Fax +27 11 616 22 22
PO Box 40647, Cleveland,
South Africa, 2022

www.vesconite.com

vesconite@vesconite.com

CONTACT US

Marine Consultant
Sharon Murphy
sharon@vesconite.co.z
a
Mobile +27 82 853 1434
www.vesconite.com

Towards Zero maintenance

www.vesconite.com

Why Vesconite for Marine bearings?

Vesconite combines the advantages of metallic and non-metallic bearings and bushings.

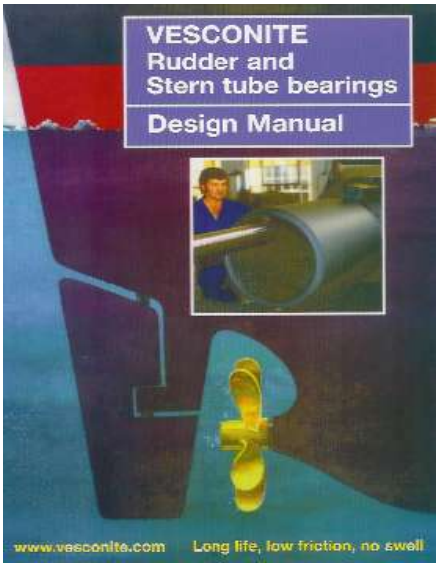
Vesconite is the marine bearing of choice – it remains hard in moist and immersed conditions, keeps its compression strength and maintains its excellent long life wear characteristics. Vesconite is extremely versatile. It outperforms in most plain bearing applications, whether unlubricated, grease and oil lubricated, or water lubricated.

Vesconite bearings form an integral part of a ship's long term maintenance strategy:

- low life cycle maintenance and operational costs
- reliable bearings

Vesconite is a technically superior bearing material

- **Vesconite does not swell or soften in water**
- **Vesconite carries a high load**
- **Vesconite has a low friction**
- **Vesconite gives a long life**
- **Vesconite gives you security**
- **Vesconite approved for use by major shipping authorities**
- **Vesconite gives low wear to shafts**
- **Vesconite is not subject to electrolytic corrosion**
- **Vesconite is easy to remove and install**
- **Vesconite is easy to machine on standard equipment to close tolerances**
- **Vesconite is resistant to many chemicals**
- **Vesconite does not delaminate**
- **Safe to use and environmentally friendly**



Vesconite
– marine bearing material rated above all others

Vesconite versus Bronze

- Vesconite outlasts bronze up to 10 times longer in dirty and abrasive applications
- Vesconite can operate without lubrication.

Vesconite versus Elastomers

- Vesconite does not swell and change size
- Vesconite remains hard under immersed conditions

Vesconite versus laminated materials

- Vesconite does not delaminate
- Vesconite does not wear shafts
- Vesconite does not swell
- Vesconite lasts longer

Vesconite versus Rubber lined Bearings

- Vesconite has less friction than rubber – leading to longer life
- Vesconite has no stick slip – leading to a quieter and smoother ride
- Vesconite does not swell

Vesconite versus white metal

- Vesconite has a higher design load than white metal (babbitt), a higher fatigue strength and two to three times the wear life.

VescoPlastics - About the company

Manufacturers of Low Friction, Long Life bearing materials

THE COMPANY

- Founded in 1958 as a precision engineering and engine reconditioning workshop.
- Located in Virginia, a gold mining town in the heart of the Free State goldfields of South Africa.
- VescoPlastics is the oldest manufacturer of engineering polymers in Africa.

The development of Vesconite started in 1968 in an attempt to find a bearing material suitable for use in the surrounding ultra deep mines - mines that extract gold up to 3500 m (2 miles) below the surface, in exceptionally harsh conditions.

Vesconite Hilube was introduced in 1976 as a further enhancement of the self lubricating properties of Vesconite.

First exports started in 1975 to Finland.

FACILITIES

The company is highly integrated and includes the following departments each of which occupy their own factory sites:

- Compounding and production of own raw materials
- Extrusion of rods, bushings and plates
- Injection moulding
- Machine Shop for finished parts

PRODUCTION RANGE

Compounding, extrusion moulding, injection moulding and machining of Vesconite, Vesconite Hilube, Hitemp 150 and Hitemp 230.

Stock shapes are produced in various forms

- Solid rods are produced from 8 to 135 mm diameter
- Bushing is made from 20 to 730 mm diameter (¾" to 28")
- Plates are made from 2 mm thickness up to 75 mm (5/64" to 3")
- Custom moulded shapes in small and large sizes for cost savings when making medium to large quantities.

APPLICATIONS

VescoPlastics specialises in polymeric materials for bearing applications - applications where relatively high loads are carried at relatively low speeds, with little or no lubrication, often in dirty or immersed conditions. These include small and large bushings, wear pads and strips, and many parts subject to friction and wear, in many industries including railways, shipping, heavy transport, earth moving, mining and light manufacturing.

Vesconite

Vesconite self lubricating bearings and bushes solve wear problems

Vesconite is a specialised thermoplastic made from internally lubricated polymers. Proved since the 1960's as an exceptional bearing material in demanding conditions, Vesconite gives low wear even in dirty or unlubricated conditions.

Up to 10 times the life of bronze in dirty conditions.

Vesconite has high dimensional stability and does not swell in water, in contrast to most synthetic materials which swell in water. For example, nylon swells up to 3% in water and softens (leading to creep problems)

Vesconite gives excellent savings over its installed life cycle. Vesconite offers many advantages over traditional bearing materials.

Vesconite Hilube

Vesconite Hilube is the advanced grade of Vesconite.

Developed to solve wear problems in unlubricated and dirty applications, Vesconite Hilube is a premium long life, low maintenance plain bearing material, which also gives outstanding performance when lubricated.

Vesconite Hilube is compounded from an advanced engineering thermoplastic incorporating an advanced internal lubricant.

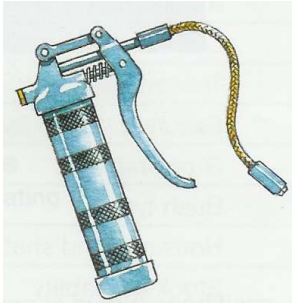
It has a very low dynamic friction (approaching that of PTFE) and an even lower static friction. The low static friction means no stick-slip problems in applications with intermittent motion.

The dynamic and static unlubricated friction of Vesconite Hilube against steel goes as low as 0.08 - similar to glass and graphite filled PTFE and one third that of nylon.

The dynamic friction co-efficient of Vesconite Hilube remains constant over long periods of operation, unlike many so-called low friction materials where the friction co-efficient starts off low but rises steadily. Vesconite Hilube's friction remains low even with a rise in temperature. It declines to its lowest at 60 ºC (140 ºF), even under high loads.

Advantages of Vesconite and Vesconite Hilube

Internally lubricated

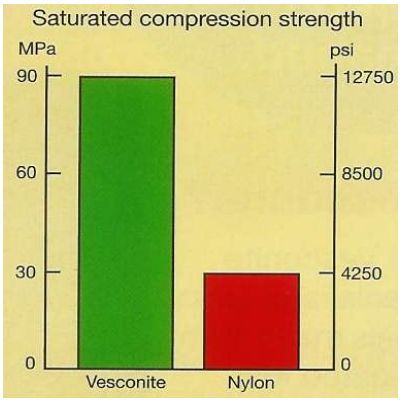


Vesconite has built in lubricants which give a low friction and long life even when greasing is irregular.

Wear resistance

Vesconite provides outstanding wear resistance, resulting in many times longer service life when compared with bronze. It is also less affected by poor lubrication and dirty conditions.

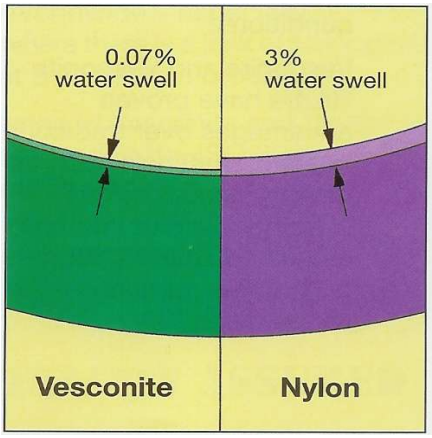
High load bearing strength



Vesconite has very low creep rates and is suited to design loads up to 30 MPa (4275 psi). It has a much higher load capacity than nylon, and its compressive strength and clearances are not affected by water absorption.

Vesconite remains hard and does not soften in water

No Swell



Vesconite does not swell when exposed to water or humid conditions, while nylon can swell up to 3% when immersed.

Vesconite bearings maintain clearances.

To compensate for water swell, excessive clearances are often used with other materials but should be avoided because of

- Increased vibration
- Increased wear rates

Low friction

Vesconite has outstanding dynamic friction, with a friction coefficient of less than half that of bronze or nylon. This allows for higher combinations of loads and speeds.

Greasing of Vesconite bushes on assembly further decreases friction, allowing higher speeds to be used and generally improving performance.

Vesconite performs exceptionally well in water, making Vesconite ideal for many immersed applications.

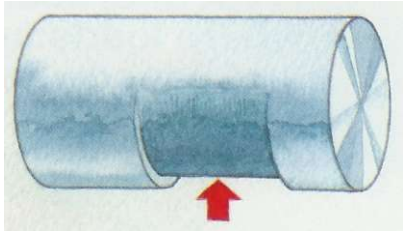
Vesconite has low friction, even in actual working conditions.

In a rudder with low amplitude oscillations, low friction Vesconite gives less bearing wear, as well as a smoother operation and less wear to the whole steering gear.

Temperature limits

Vesconite is suitable for continuous use at 100º to 120°C (212º to 248°F) in dry conditions and 60° to 70°C (140° to 158°F) in wet conditions.

Longer life of shafts and pins



The wear of metal pins and shafts is reduced by as much as 90% when Vesconite bushes are used. The high cost of replacing expensive shafts and pins can often be saved. This valuable benefit alone justifies the change over to Vesconite in many applications.

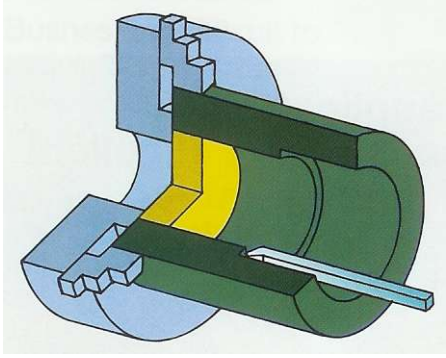
No Delamination

Vesconite is a homogenous bearing material without a lamination reinforcement. Therefore delamination cannot take place.

Chemical resistance

Vesconite is resistant to dilute and moderate acids, organic solvents, oils and petroleum. It has limited resistance to strong acids and alkalis. Lengthy immersion in boiling water should be avoided. See the Vesconite Chemical Resistance Chart for details.

Easy to machine



Vesconite machines easily on wood working and metal working equipment, such as lathes, milling machines, bandsaws, drilling machines, planers, spindle moulders and routers.

Marine Stern Tube and Strut Bearings

Vesconite is an ideal material for stern tube bearings

Low water swell

Vesconite does not swell in water and Vesconite can be designed with close running clearances without the fear of siezure.

Long bearing life

RP Jackson – pilot cutter

In 1977 the pilot vessel, RP Jackson was fitted with new A-frame propeller shaft bushes, the starboard one being Vesconite and the port one of the conventional rubber type.

RP Jackson in the Durban harbour

The propeller shafts each transmit a maximum of 525kW (700BHP) and have an average RPM of 400. The total length of the bearing was 550mm (21.7").

Longitudinal U-shaped water grooves, 11mm (0.43") wide by 2mm (0.08") deep were formed on the inside of the bush, each running the full length of the bearing. The wall thickness of the bearing was ±20mm (0.78").

The RP Jackson operated between 12 and 16 hours a day in and off Durban harbour under fairly abnormal and severe conditions. The waters contain a relatively high percentage of suspended sand particles arising mainly from propeller wash. The loads and speeds vary constantly.

During September 1982 the propeller shafts were drawn for the first time since 1977. The bearing area of the shaft was highly polished and smooth and because of this aspect coupled with the very low wear rates, the shaft was reinstalled as it was drawn.

On installation the Vesconite bush had an inside diameter of 145.64mm (5.734"). After five years the inside diameter was measured at 147.14mm (5.793") which showed wear of only 1.50mm (0.059"). The outside diameter of the stainless steel shaft was 145.14mm (5.714"). After five years the outside diameter was measured at 144.91mm (5.705") – wear of only 0.23mm (0.009").

Vesconite being freeze fitted for a stern tube bearing

Stern tube strut (with rubber bearing)

Vesconite installed into a strut

Vesconite freeze fitted for a stern tube bearing

Rudder Bearings

Why Vesconite is ideal for rudder bearings

High Load capacity

Vesconite is designed to a safe bearing static load of 30 MPa. This is higher than most alternative bearing materials and significantly higher than requirements from classification societies.

Vesconite does not soften in wet conditions.

Low swell

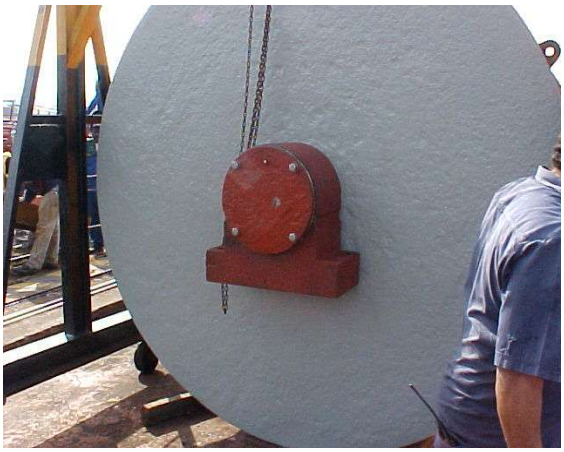
Vesconite does not swell in water and Vesconite can be designed with close running clearances without the fear of siezure.

Rudder during refurbishment

Vesconite rudder bushes being fitted by freezing

Rudders on a yacht

Other Marine Applications

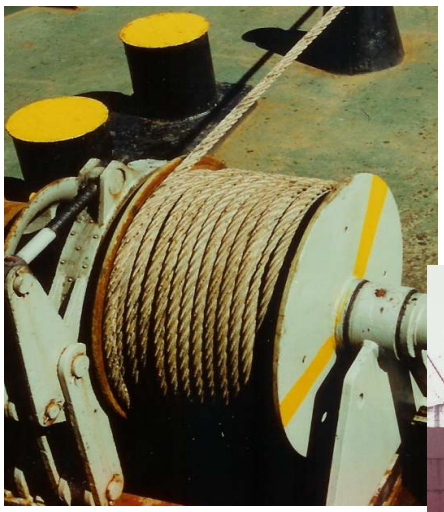


Stern rollers

Hatch Covers

Rollers

Davitts



Winches

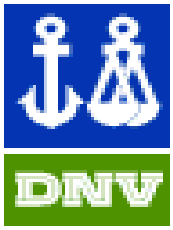
Sheave Wheels

Grabs

Classification Approval

Vesconite has been approved for use in rudders and stern tubes by the world's major ship classification societies.

ABS



Det Norske Veritas

Lloyds Register

Bureau Veritas

NKK (Japan)

Germanischer Lloyd

CCS

CRS

KRS (Korea)

Biro (Indonesia)

Rina

Quality Approvals

Vesconite is manufactured according to **ISO 9001:2000** quality management standard.

Production of materials is strictly controlled to ensure consistently superior products and machining within agreed specifications.

www.vesconite.com

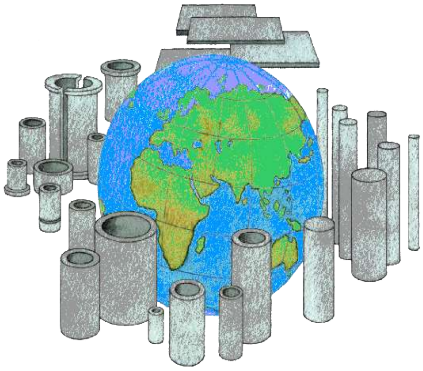
- **Online Design-a-Bearing calculators**
- **Find Stock Worldwide**
- **Information on some of the ships fitted**
- **Machining instructions**
- **Installation instructions**

Stock

Vesconite is stocked worldwide.

Bushings up to 715 mm diameter available on the shelf.

Can be manufactured to larger diameters



Testing

Vesconite has been tested according to classification methods to assess friction and wear characteristics.

RESULTS - after 80 000 cycles

10 MPa loading	**0.08 mm wear**
20 MPa loading	**0.155 mm wear**