Orkot®
TLM & TXM
Marine Bearings
**A Global Approach**

Trelleborg Sealing Solutions is a world-leading manufacturer and supplier of bearings and bearing materials to the shipping and marine industries.

Supported by an extensive global network of manufacturing plants, agents and distributors, we are able to offer the highest levels of quality and service associated with a leading global company.

Part of the Trelleborg group of companies, Orkot® Marine Bearings has been active within the marine and shipping industry for over 25 years.

Apart from marine bearings, Trelleborg offers a broad variety of products for on-shore machinery and other equipment. The product range includes orings, static, static and rotary seals, wear rings, scrapers, bearings and custom made elastomer and plastic parts.

**TLM Marine Characteristics**

Orkot® TLM Marine is an advanced reinforced polymer material consisting of polyethylene terephthalate material giving a bearing material without a metal backing layer.

Orkot® TLM Marine has proved especially effective in eliminating stick-slip problems normally associated with these operational environments.

- Technical assistance with bearing installations.
- Full technical backup and support throughout the service life of the bearing.
- 24 hour emergency support.

This extensive service support is complemented by a comprehensive range of technical documentation and the Orkot® Marine Bearing Calculations program.

**World Wide Web**

For more information on Orkot® marine products and applications, you will also be able to view and download certificates, literature and other documents. [www.orkotmarine.com](http://www.orkotmarine.com)

Find a distributor on the Orkot® Marine Web site. You will also be able to view and download certificates, literature and other documents. Please look under www.tss.trelleborg.com or www.orkotmarine.com.

World Wide Availability

Calculation program.

- Approval certificates can be viewed and downloaded from our websites.

- Technical assistance with bearing installations.

- Full technical backup and support throughout the service life of the bearing.

- 24 hour emergency support.

- This extensive service support is complemented by a comprehensive range of technical documentation and the Orkot® Marine Bearing Calculations program.

**Quality & Classification**

Orkot® TXM Marine material blocks have been shrimp tested over 30 years via our world wide distributors networks. In addition, we can manufacture specific sizes in both tube and sheet form within 24 hours and we supply a full range of finished machined products quality and economically.

**World Wide Availability**

[World Wide Availability](http://www.tss.trelleborg.com)

[Quality & Classification](http://www.tss.trelleborg.com)

**Mechanical Properties**

<table>
<thead>
<tr>
<th>TLM Marine metric</th>
<th>TLM Marine inch</th>
<th>TXM Marine metric</th>
<th>TXM Marine inch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compressive Strength</strong></td>
<td>1000 N/mm²</td>
<td>145000 lbs/in²</td>
<td>1000 N/mm²</td>
</tr>
<tr>
<td><strong>Tensile Strength</strong></td>
<td>150 N/mm²</td>
<td>2175 lbs/in²</td>
<td>150 N/mm²</td>
</tr>
<tr>
<td><strong>Impact Strength</strong></td>
<td>100 J/m²</td>
<td>0.062 KJ/in²</td>
<td>100 J/m²</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>1.2 Kg/dm³</td>
<td>39.6 lbs/cu.in</td>
<td>1.2 Kg/dm³</td>
</tr>
</tbody>
</table>

**Typical coefficients of friction running dry against a corrosion resistant material:**

- Parallel to Laminate: 0.1%
- Normal to Laminate: 0.1%
- Shear Strength: 80 N/mm², 1600 lbs/in²
- Tensile Strength: 60 N/mm², 8700 lbs/in²
- Charpy Impact Unnotched: 90 J, 90 ft-lbs
- Swell in water, % of wall thickness normal to sliding surface: 0.1%

**Thermal Expansion Coefficient**

- Normal to Laminate: 20 – 100 °C (per °C x 10⁻⁵)

**Swell in Water**

- Swell in water, % of wall thickness normal to sliding surface:
  - 20 – 100 °C (per °C x 10⁻⁵)
Orkot® Marine Bearings has a broad experience and highly skilled engineers who offer a full and complete service tailored to your specific requirements. Some aspects of this service are:

- Recommendations on adapting our bearings to specific environmental and operational conditions.
- Calculation of bearing clearance for internal or site machining.
- Technical assistance with bearing installations.
- Full technical backup and support throughout the service life of the bearing.
- 24 hour emergency support.

This extensive support service is complimented by a comprehensive range of technical documentation and the Orkot® Marine Bearing Calculation program.

**World Wide Web**

Visit our website for general and technical information on Orkot® marine products and applications. You will also be able to view and download certificates, literature and other documents.

www.tss.trelleborg.com

For information on Trelleborg's entire portfolio of sealing & bearing solutions please look under www.tss.trelleborg.com

World Wide Availability

Orkot® TLM Marine stock tubes can be shipped same day via our worldwide distribution network. In addition, we can manufacture specific sizes in both tube and sheet form within 24 hours and can supply a full range of finished machined products quickly and economically.

### Mechanical Properties

<table>
<thead>
<tr>
<th></th>
<th>TLM Marine mm</th>
<th>TLM Marine inch</th>
<th>TXM Marine mm</th>
<th>TXM Marine inch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Density</strong></td>
<td>1.3 g/cm³</td>
<td>0.047 lbs/in³</td>
<td>1.3 g/cm³</td>
<td>0.047 lbs/in³</td>
</tr>
<tr>
<td><strong>Flexural Strength</strong></td>
<td>60 N/mm²</td>
<td>8700 lbs/in²</td>
<td>55 N/mm²</td>
<td>8000 lbs/in²</td>
</tr>
<tr>
<td><strong>Tensile Strength</strong></td>
<td>60 N/mm²</td>
<td>8700 lbs/in²</td>
<td>55 N/mm²</td>
<td>8000 lbs/in²</td>
</tr>
<tr>
<td><strong>Charpy Impact Unnotched</strong></td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td><strong>Thermal Expansion Coefficient</strong></td>
<td>15N/mm²</td>
<td>2175 lbs/in²</td>
<td>10N/mm²</td>
<td>1500 lbs/in²</td>
</tr>
<tr>
<td><strong>Sword Strength</strong></td>
<td>40 N/mm²</td>
<td>5900 lbs/in²</td>
<td>35 N/mm²</td>
<td>5200 lbs/in²</td>
</tr>
<tr>
<td><strong>Torsion Strength</strong></td>
<td>150 N/mm²</td>
<td>9500 lbs/in²</td>
<td>150 N/mm²</td>
<td>10000 lbs/in²</td>
</tr>
<tr>
<td><strong>Absorbed Energy at Break</strong></td>
<td>5 J</td>
<td>3.0 ft-lb</td>
<td>5 J</td>
<td>3.0 ft-lb</td>
</tr>
</tbody>
</table>

### Quality & Classification

Orkot® Marine Bearings are approved by all major marine classification societies including: Lloyds, DNV, ABS, GL, BV and NKK. Copies of our approval certificates can be viewed or downloaded from our websites.

### World Wide Web

You can register on Trelleborg’s site to receive technical information on Orkot® marine products and applications. You will also be able to view and download certificates, literature and other documents.

www.tss.trelleborg.com

For information on Trelleborg’s entire portfolio of sealing & bearing solutions please look under www.tss.trelleborg.com

### TLM Marine Characteristics

Orkot® TLM Marine is a reinforced medium weave polymer material (sometimes called polyglycolide polymer) using a unique manufacturing process that provides high concentration of PTFE in the sliding area. Orkot® TLM Marine incorporates a PTFE layer at the axial edge of the bearing, which is backed by the well known polymer Orkot®. The PTFE layer gives a high homogeneous bearing material without a metal backing layer.

In areas where the running conditions are dry, Orkot® TLM Marine provides particularly effective frictional behavior whether sliding in contact with stainless steel. Bearing Pressure

### TXM Marine Characteristics

Orkot® TXM Marine is a reinforced medium weave polymer material (sometimes called polyglycolide polymer) using a unique manufacturing process that provides high concentration of PTFE in the sliding area. Orkot® TXM Marine incorporates a PTFE layer at the axial edge of the bearing, which is backed by the well known polymer Orkot®. The PTFE layer gives a high homogeneous bearing material without a metal backing layer.

In areas where the running conditions are dry, Orkot® TLM Marine provides particularly effective frictional behavior whether sliding in contact with stainless steel. Bearing Pressure

### Service and Support

Orkot® Marine Bearings has a broad experience and highly skilled engineers who offer a full and complete service tailored to your specific requirements. Some aspects of this service are:

- Recommendations on adapting our bearings to specific environmental and operational conditions.
- Calculation of bearing clearance for internal or site machining.
- Technical assistance with bearing installations.
- Full technical backup and support throughout the service life of the bearing.
- 24 hour emergency support.

This extensive support service is complimented by a comprehensive range of technical documentation and the Orkot® Marine Bearing Calculation program.
### TLM Marine Characteristics

Orkot® TLM Marine is an advanced reinforced medium weave polymer material that combines the flexibility and ease of manipulation with high compressive strength. The PTFE layer is several millimetres thick, ensuring tolerance to wear while maintaining its high compressive strength. The PTFE layer is backed by our well known polymer, Trelleborg塑胶, which is tolerant to wear, while maintaining its high compressive strength.

### TXM Marine Characteristics

Orkot® TXM Marine is an advanced reinforced medium weave polymer material that combines the flexibility and ease of manipulation with high compressive strength. The PTFE layer is several millimetres thick, ensuring tolerance to wear while maintaining its high compressive strength. The PTFE layer is backed by our well known polymer, Trelleborg塑胶, which is tolerant to wear, while maintaining its high compressive strength.

### World Wide Web

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[www.orkotmarine.com](http://www.orkotmarine.com)

For a demonstration on Orkot® Marine stock tubes or Orkot® marine products and applications, you will also be able to view and download certificates, literature and other documents.

### Quality & Classification

Orkot® TLM and TXM Marine is approved by all major marine classification societies including DNV, ABS, GL, LR and FKAB. Copies of our approval certificates can be viewed at our website, www.orkotmarine.com.

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<tr>
<td>Density</td>
<td>1.3 g/cm³</td>
<td>1.3470 lb/ft³</td>
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<td>Hardness - Rockwell C</td>
<td>30 - 60° C (per °C x 10⁻⁵)</td>
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### TSS_Orkot_Marine_Letter  14.11.2008  11:53 Uhr  Seite 4

Supported by an extensive global network of manufacturing plants, agents and distributors, Orkot® Marine Bearings and marine industries.

Orkot® TLM Marine proves especially effective.

bearings under light ballast conditions,

but can be press fitted or resin chopped as required.

normally freeze fitted using liquid nitrogen but can be press fitted or resin chopped as required.

no swell in water, providing dimensional stability. Orkot® TLM Marine tolerates solid lubricants. The material has exceptional wear resistance and virtually no swell in water, providing dimensional stability.

Orkot® Marine Bearings, is a world-leading manufacturer and supplier of bearing materials to the shipping and marine industries. Part of the Trelleborg group of companies, Orkot® Marine Bearings has been active within the marine and shipping industry for over 25 years.

Apart from Marine bearings, Trelleborg offers a broad variety of products for on-deck machinery and other equipment. The product range includes castings, tubes, linear and rotary seals, wear rings, bearings and custom made sintered and plastic parts.

Orkot® Marine Bearings has a core of experienced and highly qualified engineers who offer a full and complete service tailored to your specific requirements. Some aspects of this service are:

- Technical assistance with bearing installations.
- Full technical back-up and support throughout the service life of the bearing.
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This extensive support service is complemented by a comprehensive range of technical documentation and the Orkot® Marine Bearing Calculation program.

World Wide Availability

Orkot® TLM Marine stock tubes can be shipped same day via our world wide distribution network. In addition, we can manufacture specific sizes to suit your exact needs from within 24 hours. We carry a full range of Trelleborg manufactured products quickly and economically.

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Supported by an extensive global network of manufacturing plants, agents and distributors, we are able to offer the
Orkot® TLM & TXM Marine Bearings – Proven Benefits:

- Extensive stock available
- Classification approval for up to 15N/mm²
- Virtually no swell in water
- Environmentally friendly
- 24 hour turnaround for non-stock sizes
- Approved dry running capability
- Low coefficient of friction
- Tolerant to edge loading

Applications

Orkot® TLM & TXM Marine is used in a wide range of proven applications, including:

- Stabilizer bearings
- Water jacketed propeller shaft bearings
- Missile launcher bearings and guide strips
- Stock machinery bearings
- High strength synthetic fibre laminate bearings
- Offshore casing system bearings
- Steering and diving system bearings
- Sliding gear bearings
- Slow roller bearings
- Slippery pads
- Ball bearings and guide strips
- Non magnetic permeability materials for marine sanitation systems
- Dual lubrication
- Vane seal bearings

Contacts:

Trelleborg Sealing Solutions has two specialized business centers for Orkot® marine bearings.

Trelleborg Sealing Solutions Streamwood
1200 North Mannheim Street, Streamwood, IL 60107 USA
Tel: +1-312-499-9391 Fax: +1-312-499-8404
Email: tssusa@trelleborg.com

Trelleborg Sealing Solutions Streamwood Office
321 North Main Street, Streamwood, IL 60107 USA
Tel: +1-312-499-9391 Fax: +1-312-499-8404
Email: too@trelleborg.com

For information on Trelleborg’s entire portfolio of sealing & bearing solutions please look under www.tss.trelleborg.com

Your Partner for Sealing Technology

www.orkotmarine.com
LOCAL CONTACTS

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Belgium - Dion-Valmont (Luxembourg)
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+359 (0) 2 969 95 99

Croatia – Zagreb
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Macedonia, Serbia, Montenegro)
+385 (0) 1 24 56 387

Czech Republic - Rakovnik (Slovakia)
+420 313 529 111

Denmark – Copenhagen
+45 48 22 80 80

Finland – Vantaa (Estonia, Latvia)
+358 (0) 207 12 13 50

France - Maisons-Laffitte
+33 (0) 1 30 86 56 00

Germany - Stuttgart
+49 (0) 711 7864 0

Hungary – Budapes
+36 (0) 23 50 21 21

Italy – Livorno
+39 0586 22 6111

The Netherlands - Rotterdam
+31 (0) 10 29 22 111

Norway – Oslo
+47 22 64 60 80

Poland – Warsaw (Lithuania)
+48 (0) 22 863 30 11

Russia – Moscow
+7 495 627 57 22

Spain – Madrid (Portugal)
+34 (0) 91 71057 30

Sweden – Jönköping
+46 (0) 36 34 15 00

Switzerland – Crissier
+41 (0) 21 631 41 11

Turkey – Istanbul
+90 216 569 73 00

United Kingdom - Solihull (Eire, South Africa)
+44 (0) 121 744 1221

Aerospace Hub Europe, North
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Aerospace Hub Europe, South & West
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+33 (0) 1 30 86 56 00

Automotive Hub Europe
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AMERICAS

Americas Regional
+1 260 749 9631

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+55 12 3932 7600

Canada Central – Etobicoke, ON
+1 416 213 9444

Canada East – Montreal, QC
+1 514 284 1114

Canada West – Langley, BC
+1 604 539 0098

Mexico - Mexico City
+52 55 57 19 50 05

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+1 260 482 4050

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+1 615 800 8340

USA, Midwest - Schaumburg, IL
+1 630 539 5500

USA, Northern California - Fresno, CA
+1 559 449 6070

USA, Northwest - Portland, OR
+1 503 595 6565

USA, Southwest - Houston, TX
+1 713 461 3495

ASIA PACIFIC

Asia Pacific Regional
+65 6 577 1778

China – Hong Kong
+852 2366 9165

China – Shanghai
+86 (0) 21 6145 1830

India – Bangalore
+91 (0) 80 3372 9000

Japan – Tokyo
+81 (0) 3 5633 8008

Korea – Seoul
+82 (0) 2 761 3471

Malaysia - Kuala Lumpur
+60 (0) 3 90549266

Taiwan – Taichung
+086 4 2382 8886

Vietnam – Ho Chi Minh City
+84 8 6288 6407

Singapore and all other countries in South
and East Asia, Australasia
+65 6 577 1778

Aerospace Hub Airframe
+1 303 469 1357

Aerospace Hub Distribution & Engineering
+1 260 749 9631

Aerospace Hub East
+1 610 828 3209

Aerospace Hub West
+1 310 371 1025

Automotive Hub North America
+1 734 354 1250

Automotive Hub South America
+55 12 3932 7600

AFRICA, CENTRAL ASIA AND MIDDLE EAST

Africa & Iran (excluding South Africa (see UK))
+41 (0) 21 631 41 11

Central Asia (Armenia, Georgia, Kazakhstan,
Kyrgyzstan, Tajikistan, Uzbekistan)
+7 495 627 57 22

China – Shanghai
+86 (0) 21 6145 1830

Korea – Seoul
+82 (0) 2 761 3471

Malaysia - Kuala Lumpur
+60 (0) 3 90549266

Taiwan – Taichung
+886 4 2382 8886

Vietnam – Ho Chi Minh City
+84 8 6288 6407

Singapore and all other countries in South
and East Asia, Australasia
+65 6 577 1778

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Aerospace Hub Singapore
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Automotive Hub China
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Automotive Hub India
+91 (0) 80 3372 9200

Middle East and Gulf Region
+39 (0) 2 969 95 99
Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative engineered solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has local presence in over 40 countries around the world.