



中国船级社  
CHINA CLASSIFICATION SOCIETY

证书格式号/Form: W01.02-  
HB000031

工厂认可证书  
CERTIFICATE OF WORKS APPROVAL

证书编号/Certificate No. LD18W00002

兹证明本证书所述制造厂具备按照下列标准的要求生产本证书所列产品的能力和条件。

This is to certify that the manufacturer stated in the certificate meets the requirements of the standards listed below and is available with the ability and conditions to produce the products as described in the certificate.

制造厂/Manufacturer

Trelleborg Sealing Solutions Rotherham

Bradmarsh Business Park, Rotherham S60 1BX, United Kingdom

认可产品/Product Approved

船用轴承材料

MARINE BEARING MATERIAL

附加标志/Notations

无/Nil.

认可标准/Approval Standard

1. 中国船级社《材料与焊接规范》(2015)及其修改通报第1篇第1,2章  
Chapter 1 & 2, Part One of China Classification Society Rules for Materials and Welding 2015 and its Amendments

证书有效期至/ This Certificate is valid until

2022年4月9日 / Apr. 9, 2022

发证机构  
Issued by

中国船级社伦敦办事处  
CCS London Office

签发日期  
Date

2018年4月23日  
Apr. 23, 2018

本证书根据中国船级社《钢质海船入级规范》及有关程序规定签发。关于证书的有关规定见本证书背面的说明。当本证书包括多页纸张时，则所有证书页为一个整体，必须同时使用。每一页证书均须由本社盖章方为有效。证书复印件无效。任何单位和个人均不应摘录或节选本证书的部分内容。本认可证书不代表本社对个体产品质量的检验。有关各方对所持证书的真实性有疑问时，可以向本社检验机构咨询。  
This Certificate is issued pursuant to the Rules for Classification of Sea-going Steel Ships and related procedures of the Society. Refer to the back of the certificate for detailed requirements of the certificate. When the certificate consists of more than one page, all pages of the certificate are taken as a whole and are used simultaneously. No certificate page is valid without bearing the stamp of the Society and no copied form of the certificate is regarded as valid. Any part of the certificate is not to be extracted or abridged by any unit or individual in any form. This approval certificate does not constitute the inspection of the Society about the quality of the unit/batch product. Related parties who are doubted about the authenticity of the certificate may inquire of the Society or its offices

CCS  
中国船级社



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本地检验机构/CCS Local Office: 中国船级社伦敦办事处 CCS London Office 电话/Tel: 0044-20-77029751 传真/Fax: 0044-20-76809571



LD39813897  
N: 15676575

**产品明细/ Product Description**

船用轴承材料/Marine Bearing Material  
 型号/Type : Orkot TLM Marine  
 Orkot TXM Marine

材质/Materials : Thermosetting resin composition  
 reinforced with natural or woven  
 synthetic fibres incorporating  
 solid lubricants

压缩强度/Compress Intensity : See attached pages MPa

**批准的图纸和设计计算书/ Approved Drawings and Design Calculations**

图纸批准号/ Drawings Approval No. : LD18W00002

**产品认可试验报告/ Approval Test Report**

试验报告编号/Test Report No. : JK101/R3316  
 试验报告日期/Test Report Date : 1999-09-01  
 试验单位/ Laboratory : -  
 BMT Defence Services Ltd.

试验单位地址/ Test Address : -  
 210 Lower Bristol Road, Bath BA2 3DQ, UK

试验报告编号/Test Report No. : JD113  
 试验报告日期/Test Report Date : 1999-11-01  
 试验单位/ Laboratory : -  
 BMT Defence Services Limited

试验单位地址/ Test Address : -  
 Ministry of Defence (PE), ME112 Foxhill, Bath

试验报告编号/Test Report No. : 0101  
 试验报告日期/Test Report Date : 2000-11-20  
 试验单位/ Laboratory : -  
 Orkot Composites

试验单位地址/ Test Address : -  
 Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/Test Report No. : 0102  
 试验报告日期/Test Report Date : 2000-11-20  
 试验单位/ Laboratory : -  
 Orkot Composites

试验单位地址/ Test Address : -  
 Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/Test Report No. : 0103  
 试验报告日期/Test Report Date : 2000-11-20  
 试验单位/ Laboratory : -  
 Orkot Composites

试验单位地址/ Test Address : -  
 Bradmarsh Business Park, Rotherham, S60 1BX

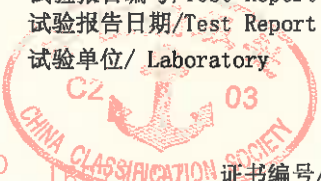
试验报告编号/Test Report No. : TR0164  
 试验报告日期/Test Report Date : 2006-01-30  
 试验单位/ Laboratory : -  
 Orkot Composites

试验单位地址/ Test Address : -  
 Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/Test Report No. : Wear13Q  
 试验报告日期/Test Report Date : 2008-04-17  
 试验单位/ Laboratory : -  
 Orkot Composites

试验单位地址/ Test Address : -  
 Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/Test Report No. : Wear18W  
 试验报告日期/Test Report Date : 2010-09-27  
 试验单位/ Laboratory : -  
 Orkot Composites



试验单位地址/ Test Address	:	-
试验报告编号/Test Report No.	:	Bradmarsh Business Park, Rotherham, S60 1BX
试验报告日期/Test Report Date	:	Test for CCS WA
试验单位/ Laboratory	:	2011-04-21
	:	-
	:	Orkot Composites
试验单位地址/ Test Address	:	-
试验报告编号/Test Report No.	:	Bradmarsh Business Park, Rotherham, S60 1BX
试验报告日期/Test Report Date	:	HRM 97 Audit Test
试验单位/ Laboratory	:	2014-05-06
	:	-
	:	Trelleborg Sealing Solutions Rotherham
试验单位地址/ Test Address	:	-
	:	Bradmarsh Business Park, Rotherham, South
	:	Yorkshire, UK

**产品适用范围/ Application of the Product**

See Others.

**认可保持条件/ Maintenance Requirements of Approval**

1. 工厂认可后, 如果图纸、技术文件、工艺规程有较大改变, 应征得本社同意。若改变涉及或影响到产品的设计、主要制造材料、关键工艺或产品的特性、特征, 则与特性有关的图纸和技术文件应经过本社审批, 并在检验机构认为必要时, 经本社检验人员到厂进行检查和见证有关试验, 其结果应能证实仍符合认可条件。

After works approval, if there are any major changes to the drawings, technical documents, specifications, prior consent should be obtained from the survey office of the Society. If the changes involve or affect product design, major construction materials, key workmanship or product characteristics and properties, drawings and technical documents related to properties are to be examined and approved by the Society and, where deemed necessary by the survey office, the surveyor to the Society will go to the manufacturer to inspect or witness relevant tests and the results of the tests should be able to demonstrate compliance with the approval conditions

2. 工厂的质量管理体系应保持有效运行, 并且与认可时一致。如果质量管理体系发生改变, 应经原体系认证机构审核并报本社批准。

The quality management system of the factory shall be ensure effective operation, and shall be the same as the situation of approval. If there are any changes to the quality management system, auditing of the original certification organization for quality management system and the society's approval shall be obtained

3. 工厂认可证书获得者应接受本社每年一次的定期审核, 定期审核日为认可证书期满之日对应的每一周年日, 检查工作可在定期审核日的前后三个月内进行。Those who have obtained the certificate of works approval shall receive periodical audit done by the Society on an annual basis. The date of periodical audit shall be each anniversary date which corresponds to the date of expiry of the relevant certificate and the periodical audit may be done within a time span of three months before and after the annual surveillance date.

4. 在认可证书有效期内, 本社检验人员可在未经事先通知的情况下对工厂的产品制造过程进行审核, 以验证产品的生产是否符合业经本社批准的图纸和文件。工厂应予以配合。

Within the validity of the approval certificate, the surveyor to the Society may pay unannounced audit to the manufacturing process of the product in order to confirm whether it is in compliance with the drawings and documents approved by the Society. The factory should provide an active cooperation and necessary for the surveyor.

5. 认可证书有效期内, 如果出现可能导致本社暂停或撤销认可的情况, 工厂应及时采取有效的纠正措施。

Within the validity of the approval certificate, if cases occur that may cause the Society to suspend or withdraw the certificate, the manufacturer should take corrective actions in a prompt and effective manner.

**认可后的产品检验方式/ Module of Product Inspection after Works Approval**

按照规范只认可不进行产品检验的产品/The product approved only in term of the rules:

认可后的产品检验由制造厂按本社批准的产品检验计划进行检验, 经检验合格后由制造厂签发合格证明, 并连同该产品的本社认可证书复印件一并交付用户, 制造厂对产品符合公约、法规、本社规范和本社认可的标准规定负责。

After approval, product inspection should be carried out by the Manufacturer in accordance with the product inspection scheme approved by the Society. Upon satisfactory inspection, and the Quality Certificate issued by the Manufacturer should be provided to the purchaser together with the copy of the approval certificate issued by the Society. The manufacturer should take responsibility for the product being in compliance with the convention, statutory regulation, the Society rules and the standard accepted by the Society.

**对于原材料和零部件的检验要求/ Inspection Requirements for Materials and Components**

产品如下原材料和零部件应由本社认可的制造厂生产/The following materials and components of the product should be manufactured by the factory approved by the Society:

无/Nil



产品如下原材料和零部件应经本社检验/The following materials and components of the product should be inspected by the Society:  
无/Nil

产品如下原材料和零部件的制造厂清单, 经本社批准方可变更/The list of manufacturer for the following materials and components of the product should not be changed without the Society's approval:  
无/Nil

**免责声明/Statement of Responsibility**

本社的认可不影响、替代与本社授权或检验无关的各方对上述工厂的认可和发证, 并且不对与本社授权或检验无关的各方负责, 不承担其未经应允而承认、接受本社认可所导致的法律和经济责任。

The approval of the Society does not affect and replace any approval and certification of the manufacturer by any parties that bear no relation with this Society's authorization or survey and

therefore takes no responsibility for these parties. The Society does not undertake any legal and

economic liabilities arising from accepting this Society's certificate without prior permission from

this Society.

**其他/Others**

本证书由原工厂认可证书(No. LD14W00002)换新并替代原证书。  
This certificate is renewed from and supersedes the previous Works Approval Certificate No. LD14W00002.

These bearings are to be fitted in accordance with the manufacturer's manual.

1. For use as water lubricated stern tube bearing with ratio of length/diameter not less than 2:1.
2. For use as non-lubricated rubber bearing against steel, maximum surface pressure:15MPa(Orkot TLM Marine) and 10MPa(Orkot TXM Marine).
3. For use as water or oil lubricated bearing against steel, maximum surface pressure:12.5MPa(Orkot TLM Marine) and 20MPa(Orkot TXM Marine).

本社已审核了产品厂无石棉声明, 但本社的审核不免除产品厂按照合同关系向订货方保证产品无石棉的责任。  
The declaration of asbestos-free submitted by manufacturer has been reviewed by the Society. However, liability of the manufacturer to guarantee the products are asbestos-free to purchaser under contract will not be exempted.



\*\*\*\*\*本证书正文完/ End of Text\*\*\*\*\*

注: 本证书含有附页, 共1页

Note: The certificate is attached with 1 additional page(s)



03  
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### Material Properties

Properties	Unit	TLM Marine	TXM Marine
<b>Compressive strength</b> Normal to laminate Parallel to Laminate	N/mm <sup>2</sup>	300	280
		90	90
<b>Tensile strength</b>	N/mm <sup>2</sup>	60	55
<b>Flexural strength</b>	N/mm <sup>2</sup>	65	65
<b>Elastic modulus</b> Bending Tensile	10 <sup>4</sup> *N/mm <sup>2</sup>	0.19	0.18
		0.32	0.32
<b>Shear strength</b>	N/mm <sup>2</sup>	80	80
<b>Impact strength</b> (ISO 179/1987 Charpy Impact Unnotched) Normal to Laminate	KJ/m <sup>2</sup>	120	120
<b>Hardness-Rockwell M</b>		90	90
<b>Density</b>	g/cm <sup>3</sup>	1.25	1.25
<b>Swell in water, % of wall thickness</b>	%	< 0.1	< 0.1
<b>Operating temperature</b> Range for normal use without special precautions Max. operating temperature Min. operating temperature	°C		
		-30/65	-30/65
		130	130
		-150	-150
<b>Thermal Expansion Coefficient</b> 20-100°C per °C * 10 <sup>-5</sup> Normal to laminate Perpendicular to laminate	10 <sup>-5</sup> *°C		
		9-10	9-10
		5-6	5-6
<b>Sliding Properties</b> Typical coefficient of friction running dry against a corrosion resistant surface such as stainless steel. Bearing pressure 15MPa		0.13-0.18	0.05-0.10

For all the more detailed information, please refer to manufacturer's manual.

