



MARINE DIVISION

Certificate number: 20018/B0 BV

File number: ACE 01/086/06

Product code: 2501H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**TWENTSCHE KABELFABRIEK BV**  
HAAKSBERGEN - NETHERLANDS

*for the type of product*

### CABLES (LOW VOLTAGE)

0.6/1 kV - Power cables  
MarineLine, MarineLine+ and MarineFlex  
(YZp & YOZp Types)

#### Requirements:

BUREAU VERITAS Rules for the Classification of Steel Ships.

IEC 60092-350/351/359/353, IEC 60228, IEC 60332-1, IEC 60332-3-22 Cat.A, IEC 60331-21, IEC 60754-1/2, IEC 61034-1/2.

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 30 Jan 2018**

**For BUREAU VERITAS,**

At BV ROTTERDAM, on 30 Jan 2013,

Erwin Poortvliet



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION:

**MarineLine**, **MarineLine+** and **MarineFlex** are flame retardant, low smoke and halogen free Marine and Offshore Power cables.

#### **1.1 - Specifications:**

Rated voltage: 0.6/1 kV according to IEC 60092-353  
 Temperature class: 90°C  
 Flame retardant: IEC 60332-1 and IEC 60332-3-22 Cat. A  
 Fire resistant: IEC 60331-21 (FR Type only)  
 Halogen Free: IEC 60754-1/2  
 Low Smoke: IEC 61034-1/2

#### **1.2 - Construction:**

Conductor: Plain annealed copper - Class 2 or Class 5 (MarineFlex)  
 Fire protection: Mica tape (FR Type only)  
 Insulation: Halogen Free Cross-Linked PolyEthylene - HF XLPE  
 Filler: Halogen Free compound - SHF1 (MarineLine+ & MarineFlex) or None - Foil (MarineLine)  
 Braid: Copper wires braid (YOZp Type) or None (YZp Type)  
 Outer Sheath: Halogen Free Thermoplastic Compound - SHF1

#### **1.3 - Product Range:**

| Type                                   | Number of Core | Cross-Sect. (mm <sup>2</sup> ) | Remarks  |
|--|----------------|--------------------------------|--|
| <b>MarineLine</b><br>YZp & YOZp Types  | 1              | 1 to 240                       | Flame Retardant according to 60332-1 & 60332-3-22 Cat.A<br>Fire Resistant according to IEC 60331-21 (FR Type only)<br>Class 2 conductor<br>Foil      |
|  | 2              | 1 to 35                        |  |
|  | 3              | 1 to 240                       |  |
|  | 4              | 1 to 16                        |  |
|  | 5 to 19        | 1 & 1.5                        |  |
| <b>MarineLine+</b><br>YZp & YOZp Types | 1              | 1 to 240                       | Flame Retardant according to 60332-1 & 60332-3-22 Cat.A<br>Fire Resistant according to IEC 60331-21 (FR Type only)<br>Class 2 conductor<br>HF filler |
|  | 2              | 1 to 35                        |  |
|  | 3              | 1 to 240                       |  |
|  | 4              | 1 to 16                        |  |
|  | 5              | 1 & 1.5                        |  |
| <b>MarineFlex</b><br>YZp & YOZp Types  | 1              | 1 to 240                       | Flame Retardant according to 60332-1 & 60332-3-22 Cat.A<br>Fire Resistant according to IEC 60331-21 (FR Type only)<br>Class 5 conductor<br>HF filler |
|  | 2              | 1 to 35                        |  |
|  | 3              | 1 to 240                       |  |

### 2. DOCUMENTS AND DRAWINGS:

#### **Twentsche KabelFabriek:**

Letter / Document No. 06008145 dated 26-07-2007.  
 Data Sheets - Low Voltage Marine-Cables dated July 26, 2007.

**BUREAU VERITAS:** Type Approval Certificates N° 06361/C0 dated 20/04/2006 and N° 13119/A1 dated 20/04/2006.

### 3. TEST REPORTS:

#### **ISQ:**

Test report N° 01/9861958 dated 07/10/02  
 Test report N° 02/9861958 dated 07/10/02  
 Test report N° 8431409 dated 05/11/01  
 Test report N° 9861958 dated 14/10/02  
 Test report N° 01/8755104 dated 2004-09-06.

#### **Twentsche KabelFabriek:**

Flame retardant test reports dated 18/09 and 01/10 2002  
 Certificates. N°s: 2616531, 2616523, 2616535, 2616524, 2616525  
 Test reports N° 231 & 233 dated 15/10/02 & 17/10/02  
 Test report N° 301 dated 03/09/2004  
 Fire performance testing according to IEC 60332-3-22 Cat.A, Test Reports No. 2007-001 dated 11 February 2007, No. 2007-002 dated 11 February 2007 and No. 2007-003 dated 06 June 2007.  
 Fire performance testing according to IEC 60332-1, Test Reports No. 2007-204 dated 10-10-2007, No. 2007-205 dated 04-10-2007 and No. 2007-206 dated 04-10-2007.

**BUREAU VERITAS:**

Report of Inspection No. 2149RTD04REV1 dated 21/07/2004 (Fire resistance tests according to IEC 60331).

**4. APPLICATION / LIMITATION:**

4.1 - BUREAU VERITAS Rules for the Classification of Steel Ships.

4.2 - Approval valid for units having to comply with IMO Resolution A649 (The "MODU Code").

**5. PRODUCTION SURVEY REQUIREMENTS:**

5.1 - The **MarineLine**, **MarineLine+** and **MarineFlex** cables are to be supplied by **TWENTSCHE KABELFABRIEK BV** in compliance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320.

5.3 - **TWENTSCHE KABELFABRIEK BV** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products:

**TWENTSCHE KABELFABRIEK BV**  
**Spinnerstraat 15**  
**Postbus 6**  
**7480 AA HAAKSBERGEN**  
**NETHERLANDS**

**TWENTSCHE KABELFABRIEK BV**  
**Kwinkweerd 3**  
**7240 AA LOCHEM**  
**NETHERLANDS**

**6. MARKING OF PRODUCT:**

The cable shall be marked on the surface outer sheath, in a durable legible and visible manner, with the following information through the length of cable:

- Voltage grade, Cable symbol and Temperature Class
- Applicable standard(s) to flame retardant and fire resistance if any
- Number of conductors and conductor size
- Manufacturer's name or trade mark, Year of manufacture.

**7. OTHERS:**

7.1 - This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the cables at any time and that:

**TWENTSCHE KABELFABRIEK BV**  
**Spinnerstraat 15**  
**Postbus 6**  
**7480 AA HAAKSBERGEN**  
**NETHERLANDS**

will accept full responsibility for informing shipbuilders, ship-owners or their sub-contractors of the proper methods of use and general maintenance of the cables and the conditions of this approval.

7.2 - This certificate supersedes the Type Approval Certificates N° 20018/A0 BV issued on 27/11/2007 by the Society.

\*\*\* END OF CERTIFICATE \*\*\*