



MARINE DIVISION

Certificate number: 33493/A0 BV

File number: ACE1/821/1

Product code: 2505H

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

Caledonia Cables Ltd.

Jinan Shandong - CHINA

for the type of product

INSTRUMENTATION AND COMMUNICATION CABLES

Models BFOU, RFOU & UTP/FTP series

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships

IEC 60092-350/351/376/359, IEC 60228, IEC 60331-21, IEC 60332-1, IEC, 60332-3-22 Cat.A, 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: 08 Nov 2018

For BUREAU VERITAS,

At BV SHANGHAI, on 08 Nov 2013,

Jennifer Zhang



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:

Instrumentation and communication cables for Marine applications.

1.1 - Specification:

| | |
|------------------|---|
| Rated voltage: | 150/250 V, 600V (BFOU(c)-C/P type only) |
| Temperature | 90°C, for instrumentation cables 70°C, for transmission cables |
| Flame retardant: | IEC 60332-1-2 & IEC 60332-3-22 Cat.A |
| Fire resistant: | IEC 60331-21 (BFOU type only) |
| Halogen free: | IEC 60754-1/2 |
| Low smoke: | IEC 61034-2 |

1.2 - Instrumentation cable construction:

| | |
|-----------------------|---|
| Conductor: | Tinned stranded copper conductor (Class 2) |
| Fire resisting layer: | Mica tape (BFOU type only) |
| Insulation: | EPR, XLPE (BFOU(c)-C/P type only) |
| Screen: | Individual Cu/polyester tape or AL/polyester tape [(i) type only] Overall Cu/polyester tape or AL/polyester tape [(o) type only] |
| Inner covering: | Halogen free compound |
| Armour: | Tinner copper wire braid |
| Outer sheath: | SHF2 |

1.3 - Transmission cable construction:

| | |
|---------------|--|
| Conductor: | Stranded copper conductor (Class 2) |
| Insulation: | HDPE |
| Screen: | Individual aluminium tape, with tinned copper drain wire (U/FTP, S/FTP) Overall aluminium tape, with tinned copper drain wire (F/UTP, SF/UTP) |
| Inner sheath: | SHF1 |
| Armour: | Copper wire braid |
| Outer sheath: | SHF1, SHF2 |

1.4 - Range:

| Instrumentation cable type | Number of cores | Cross-sect. area (mm ²) |
|------------------------------|------------------------|-------------------------------------|
| BFOU(i) & BFOU(c) | 1P to 12P 1T to 12T | 0.75 to 2.5 |
| RFOU(i) & RFOU(c) | 1P to 12P 1T to 12T | 0.75 to 2.5 |
| BFOU(c)-C/P | 1 to 12 | 1.5 to 16 |

| Transmission cable type | Cross-sect. area | Frequency (MHZ) |
|---|------------------|-----------------|
| Cat 5e U/UTP, F/UTP, U/FTP, SF/UTP, S/FTP | 24AWG & 26AWG | 1 to 100 |
| Cat 6 U/UTP, F/UTP, U/FTP, SF/UTP, S/FTP | 24AWG & 26AWG | 1 to 250 |
| Cat 6A U/UTP, U/FTP, S/FTP | 26AWG | 1 to 500 |
| Cat 7 U/FTP, S/FTP | 26AWG | 1 to 600 |

2. DOCUMENTS AND DRAWINGS:

Caledonian data sheet N°PI80973 V01.2013.

3. TEST REPORTS:

China National Center:

- Tests report N°CT12-4632, dated 2012.11.02.
- Tests report N°CT10-0549, dated 2010.03.22.
- Tests report N°CT09-3775, dated 2010.03.22.
- Tests report N°CT13-0920-1, dated 2013.05.03.
- Tests report N°CT13-0920-2, dated 2013.05.03.

4. APPLICATION / LIMITATION:

BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.

5. PRODUCTION SURVEY REQUIREMENTS:

5.1 - The above products are to be supplied by **Caledonia Cables Ltd.** in compliance with the type described in this certificate.

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

5.3 - **Caledonia Cables Ltd.** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products:

**Caledonia Cables Ltd.
No.36 Heping Road, Lixia District,
Jinan City, Shandong Province, China
Jinan Shandong
CHINA**

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:

- 1) - Voltage grade.
- 2) - Cable symbol and temperature class.
- 3) - Number of conductors and conductor size.
- 4) - Applicable standard(s) to flame retardant and fire resistance if any
- 5) - Manufacturer's name or trade mark.
- 6) - Year of manufacture.

7. OTHERS:

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that **Caledonia Cables Ltd.**, will accept full responsibility for informing shipbuilders, shipowners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.

*** END OF CERTIFICATE ***