



MARINE DIVISION

Certificate number: 23116/A0 BV

File number: ACE 12/845/2

Product code: 2884H

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

ELEKTRA
WARSZAWA - POLAND

for the type of product

HEATING CABLES / TAPES

Type of Product:
DM S Series & MD S Series

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships

IEC 61423-1/2, IEC 60811, IEC 60332-1, EN 50267-2-1/2, EN 50366, EN 60335-1, EN 60335-2-96.

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: 05 Aug 2015

For BUREAU VERITAS,

At BV GDANSK, on 05 Aug 2010,

Janusz Urban



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 :

ELEKTRA DM S Heating Cables and **ELEKTRA MD S Heating Mats**.

1.1 - DM S Series (EN 60335-1)

1.1.1 - Technical Specifications:

Rated voltage (V):	230
Max Operating Temp. (°C):	105
Resistance Range (Ohm/m):	70 to 0.125
Nominal Power Rating (W/m):	10
Flame retardant:	IEC 60332-1
Halogen Free:	EN 50267-2-1/2(Outer Sheath only)

1.1.2 - Construction heating cables:

Conductor:	Resistance wires strand
Insulation:	FEP + XLPE insulation
Braid:	Copper Binder
Outer Sheath:	Halogen free thermoplastic polymer

1.1.3 - Product Range:

Series	Type of product	Resistance (Ohm/m)	Length (m)	Power Rating (W)
10 W/m - 230 V	DM S 10/90 to DM S 10/2050	70,38 to 0,125	9 to 205	90 to 2050

1.2 - MD S Series (EN 60335-2-96)

1.2.1 - Technical Specifications:

Rated voltage (V):	230
Max Operating Temp. (°C):	105
Resistance Range (Ohm/m):	29,7 to 0.196
Nominal Power Rating (W/m ²):	100 & 160.
Flame retardant:	IEC 60332-1
Halogen Free:	EN 50267-2-1/2(Outer Sheath only)

1.2.2 - Construction heating cables:

Conductor:	Resistance wires strand
Insulation:	FEP + XLPE insulation
Braid:	Copper Binder
Outer Sheath:	Halogen free thermoplastic polymer

1.2.3 - Product Range:

Series	Type of product	Resistance (Ohm/m)	Surface (m ²)	Power Rating (W)
100 W/m ² - 230 V	MD S 100/1,0 to MD S 100/12,0	29,7 to 0.304	1,00 to 12,00	100 to 1200
160 W/m ² - 230 V	MD S 160/1,0 to MD S 160/10,0	24,6 to 0.196	1,00 to 10,00	160 to 1600

2. DOCUMENTS AND DRAWINGS :

ELEKTRA: Technical Data Sheets (Type of product DM S Series & MD S Series).

Fainplast: Technical Data Sheet - Compound HF 018/13 dated Feb 2009.

Dyneon Fluorothermoplastics FEP 6322 Technical Information

3. TEST REPORTS :

BBJ Testing Laboratory:

Test Report No. LP-10.191 dated 2010.06.08 (IEC 61423-1)

PREDOM-OBR:

Test Report No. BS-2/020/B/A/07 dated 2007-02-28 (EN 50366)

Test Report No. BS-2/19/B/A/07 dated 2007-02-28 (EN 60335-1).

4. APPLICATION / LIMITATION :

According to BV Rules for the Classification of Steel Ships and IEC60092 series.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The DM S Heating Cables & MD S Heating Mats are to be manufactured, examined and tested by **ELEKTRA, WARSZAWA - POLAND** in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - Production sites are to be recognized by Bureau Veritas as per NR320 for HBV products. To this end **ELEKTRA, WARSZAWA - POLAND** has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 - **ELEKTRA, WARSZAWA - POLAND** has declared to Bureau Veritas that the type of product described in this certificate are manufactured at the following production site:

**ELEKTRA
ul. Marynarska 14
02-674 WARSZAWA
POLAND**

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) - Rated Voltage.
- 2) - Cable symbol and max. operating temperature.
- 3) - Applicable standard(s) to flame retardant.
- 4) - Manufacturer's name or trade mark.
- 5) - 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 cables at any time, and that:

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POLAND**

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

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