DNV·GL

Certificate No:
TAE00001S0

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Heating Cable

with type designation(s)
2000 series high temperature heating cable

Issued to
Heat Trace Products LLC
Leominster MA, United States

is found to comply with
Det Norske Veritas' Rules for Classification of Ships and Mobile Offshore Units

Application :

Self regulating high temperature heating cable. Power output depending on temperature. Inner sheath. Optional braid and outer sheath. Optional monitor wires.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Voltage (V)	**120Vor 240 V**
Temp. class	**T2 (300°C)**
Power [W/m] @ref. temp.	**16, 33, 49, 66, 83, 99 @10°C**
Ex area	**Yes**

Issued at **Høvik** on **2017-02-13**
This Certificate is valid until **2019-06-30**.
DNV GL local station: **New York**

for **DNV GL**

Approval Engineer: **Ivar Bull**

Andreas Kristoffersen
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Job Id: **262.1-016623-2**
Certificate No: **TAE00001S0**

Product description

2000 series heating cable

Conductors:	2 parallel bus wires: Nickel plated copper
Heating Conductor Element:	Carbon filled fluorpolymer
Sheath:	FEP fluorpolymer
Braid:	Tinned copper or stainless steel braid
Outer Sheath:	(Optional) FEP fluorpolymer

Type designation	Supply voltage (V)	Minimum Output at 10 °C (W/m)
2005-1	120	~ 16
2010-1	120	~ 33
2015-1	120	~ 49
2020-1	120	~ 66
2025-1	120	~ 83
2030-1	120	~ 99
2005-2	240	~ 15
2010-2	240	~ 30
2015-2	240	~ 45
2020-2	240	~ 66
2025-2	240	~ 83
2030-2	240	~ 99

Application/Limitation

Installation has to be done in accordance with manufacturer installation instruction.
Circuits which supply trace and surface heating shall be supplied with an earth fault circuit breaker. Normally the trip current shall be 30mA.

Type Approval documentation

Tests carried out

Heat cables shall be tested according to DNV GL Standard for Certification No. 2.9
Tested according to IEC 60079-30-1

5.1.2 Dielectric test
5.1.3 Electrical insulation resistance test
5.1.4 Flammability test
5.1.5 Impact test
5.1.6 Deformation test
5.1.7 Cold bend test
5.1.8 Water resistance test
5.1.9 Integral components resistance to water test
5.1.10 Verification of rated output
5.1.11 Thermal stability of electrical insulating material
5.1.12 Thermal safety requirements
5.1.13 Determination of maximum sheath temperature
5.1.13.2 Systems approach, design verification method
5.1.13.3 Product classification approach
5.1.14 Verification of start-up current
5.1.15 Verification of the electrical resistance of metallic covering

Marking of product

Heat Trace Products LLC – 2000 series heating cable – Power output ___W/m @10 °C – Mechanical classification – Rated voltage ___V – Week/Year - Ex e IIC T2 Gb

Periodical assessment

The scope of the Periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:
- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at renewal only.

END OF CERTIFICATE