

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Lightweight Electric Cable**

with type designation(s)

**High temperature instrumentation and thermocouple cables, unarmoured PFA**

Issued to

**SAMI SPA****Liscate MI, MI, Italy**

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft****Application :****Special high temperature cable designed for gas turbines and combustion engines.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Rated voltage (kV) 300/600/1000V****Temp. class (°C) 260**Issued at **Høvik** on **2019-07-02**This Certificate is valid until **2024-06-18**.DNV GL local station: **Milan**for **DNV GL**Approval Engineer: **Ivar Bull**

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**Trond Sjøvåg**  
**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.



## Product description

Type: High temperature instrumentation and thermocouple cables

Conductors: Nickel coated copper (NCC) or thermocouple extension alloy (Kx, Tx or Jx)  
Core insulation: PFA  
Braiding (OS): Stranded nickel coated copper (when required)  
Outer sheath: PFA (for shielded OS cable only)

| Number of cores x<br>conductor cross-section<br>mm <sup>2</sup> | Type<br>designation                                      |
|-----------------------------------------------------------------|----------------------------------------------------------|
| 1 x 1.50                                                        | 1 x 1.50 mm <sup>2</sup> 600 V                           |
| 1 x 2,50                                                        | 1 x 2,50 mm <sup>2</sup> 600 V                           |
| 1 x 4.00                                                        | 1 x 4.00 mm <sup>2</sup> 600 V                           |
| 1 x 6                                                           | 1 x 6 mm <sup>2</sup> 600 V                              |
| 1 x 10                                                          | 1 x 10 mm <sup>2</sup> 600 V                             |
| 1 x 16                                                          | 1 x 16 mm <sup>2</sup> 600 V                             |
| 1 x 25                                                          | 1 x 25 mm <sup>2</sup> 600 V                             |
| 1 x 35                                                          | 1 x 35 mm <sup>2</sup> 600 V                             |
| 1 x 50                                                          | 1 x 50 mm <sup>2</sup> 600 V                             |
|                                                                 |                                                          |
| 1 x 6                                                           | 1 x 6 mm <sup>2</sup> 1000 V                             |
| 1 x 16                                                          | 1 x 16 mm <sup>2</sup> 1000 V                            |
| 1 x 25                                                          | 1 x 25 mm <sup>2</sup> 1000 V                            |
| 1 x 35                                                          | 1 x 35 mm <sup>2</sup> 1000 V                            |
|                                                                 |                                                          |
| 2 x 1.50                                                        | 2 x 1.50 mm <sup>2</sup> OS 600 V                        |
| 2 x 2.50                                                        | 2 x 2.50 mm <sup>2</sup> OS 600 V                        |
|                                                                 |                                                          |
| 1 x 18 AWG (1,00 mm <sup>2</sup> )                              | 1 x 18 AWG (1,00 mm <sup>2</sup> ) mm <sup>2</sup> 600 V |
| 1 x 16 AWG                                                      | 1 x 16 AWG 600 V                                         |
| 1 x 14 AWG                                                      | 1 x 14 AWG 600 V                                         |
| 1 x 12 AWG                                                      | 1 x 12 AWG 600 V                                         |
| 1 x 10 AWG                                                      | 1 x 10 AWG 600 V                                         |
| 1 x 6 AWG                                                       | 1 x 6 AWG 600 V                                          |
| 1 x 4 AWG                                                       | 1 x 4 AWG 600 V                                          |
|                                                                 |                                                          |
| 2 x 20 AWG                                                      | 2 x 20 AWG OS 600 V                                      |
| 2 x 18 AWG (1.00 mm <sup>2</sup> )                              | 2 x 18 AWG (1.00 mm <sup>2</sup> ) OS 600 V              |
| 2 x 16 AWG                                                      | 2 x 16 AWG OS 600 V                                      |
| 2 x 14 AWG                                                      | 2 x 14 AWG OS 600 V                                      |
| 2 x 12 AWG                                                      | 2 x 12 AWG OS 600 V                                      |
|                                                                 |                                                          |
| 2 x 18 AWG (1.00 mm <sup>2</sup> )                              | 2 x 18 AWG (1.00 mm <sup>2</sup> ) OS 600 V Kx           |
| 2 x 18 AWG (1.00 mm <sup>2</sup> )                              | 2 x 18 AWG (1.00 mm <sup>2</sup> ) OS 600 V Jx           |
| 2 x 18 AWG (1.00 mm <sup>2</sup> )                              | 2 x 18 AWG (1.00 mm <sup>2</sup> ) OS 600 V Tx           |

Job Id: **262.1-014224-2**  
Certificate No: **TAE00003JV**

|                                    |                                             |
|------------------------------------|---------------------------------------------|
| 2 x 16 AWG                         | 2 x 16 AWG OS 300 V Kx                      |
| 2 x 16 AWG                         | 2 x 16 AWG OS 300 V Jx                      |
| 2 x 16 AWG                         | 2 x 16 AWG OS 300 V Tx                      |
|                                    |                                             |
| 2 x 1.50                           | 2 x 1.50 mm <sup>2</sup> OS 600 V Kx        |
| 2 x 1.50                           | 2 x 1.50 mm <sup>2</sup> OS 600 V Jx        |
| 2 x 1.50                           | 2 x 1.50 mm <sup>2</sup> OS 600 V Tx        |
| 3 x 1,50                           | 3 x 1,50 mm <sup>2</sup> OS 600 V           |
| 3 x 2,50                           | 3 x 2,50 mm <sup>2</sup> OS 600 V           |
|                                    |                                             |
| 4 x 1,50                           | 4 x 1,50 mm <sup>2</sup> OS 600 V           |
| 4 x 2.50                           | 4 x 2.50 mm <sup>2</sup> OS 600 V           |
|                                    |                                             |
| 3 x 20 AWG                         | 3 x 20 AWG OS 600 V                         |
| 3 x 18 AWG (1.00 mm <sup>2</sup> ) | 3 x 18 AWG (1.00 mm <sup>2</sup> ) OS 600 V |
|                                    |                                             |
| 4 x 18 AWG (1,00 mm <sup>2</sup> ) | 4 x 18 AWG (1,00 mm <sup>2</sup> ) OS 600 V |
| 2 x 2 x 0.35 mm <sup>2</sup>       | 2 x 2 x 0.35 mm <sup>2</sup> IS OS 600 V    |

### Application/Limitation

Special high temperature cable designed for gas turbines and combustion engines.

### Type Approval documentation

#### Tests carried out

| Standard      | Release | General description                                                                       | Limitation      |
|---------------|---------|-------------------------------------------------------------------------------------------|-----------------|
| DNVGL-CP-0400 | 2015-12 | Lightweight electric cables                                                               | Relevant parts. |
|               | 2013-01 | Complete cable has passed accelerated ageing test                                         | 20.000h @280°C. |
| 09CA36125     | 2010-02 | Underwriters Laboratories qualification reports according to UL 758 and CSA C.22.2 N. 210 |                 |

### Marking of product

SAMI SPA – Type designation – 300 V or 600 V or 1000V – Batch n°

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### **Periodical assessment**

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

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall 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.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.