

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)

Type RG 58 Marine SHF1 without armour, Type RG213 Marine SHF1 without armour, Type RG214 Marine SHF1 without armour

Issued to

AP Solutions Oy
Rovaniemi Lappi, Finland

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
IEC 60332-3-24 (2009-02)
IEC 60754-1 (2011-11)
IEC61034-1/2 (2005-04/2005-04)

Application :

Coaxial cable 50 Ohm. Unarmoured.

Flame retardant in bunch Cat C. Halogen free. Low smoke.

Type

Type RG 58 Marine SHF1 without armour
Type RG213 Marine SHF1 without armour
Type RG214 Marine SHF1 without armour

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-06-26**

DNV GL local station: **Milan**

for **DNV GL**

Approval Engineer: **Ivar Bull**

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Marit Laumann
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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **E-13447**
File No: **827.50**
Job Id: **262.1-017409-1**

Product description

Type RG 58 Marine SHF1 without armour,
Type RG213 Marine SHF1 without armour,
Type RG214 Marine SHF1 without armour

Type RG 58 Marine SHF1 without armour

| | |
|-----------------|------------------------------------|
| Construction | |
| Inner Conductor | Tinned Copper 19x 0,18mm |
| Insulation | Low density polyethylene |
| Shield | Aluminium+Polyester+Aluminium tape |
| Outer conductor | Tinned copper braid |
| Sheath | SHF1 |
| Outer diameter | 8,0±0,2 mm |

Type RG213 Marine SHF1 without armour

| | |
|-----------------|------------------------------------|
| Construction | |
| Inner Conductor | Plain copper 7x0,75mm |
| Insulation | Low density polyethylene |
| Shield | Aluminium+Polyester+Aluminium tape |
| Outer conductor | Tinned copper braid |
| Sheath | SHF1 |
| Outer diameter | 10,30±0,18 mm |

Type RG214 Marine SHF1 without armour

| | |
|---------------------------------|------------------------------------|
| Construction | |
| Inner Conductor | Silvered copper 7x0,75mm |
| Insulation | Low density polyethylene |
| Shield | Aluminium+Polyester+Aluminium tape |
| 1st outer conductor | Silvered copper braid |
| 2 nd outer conductor | Silvered copper braid |
| Sheath | SHF1 |
| Outer diameter | 10,80±0,18mm |

For electrical data and transmission properties, please refer to relevant datasheets.

Manufactured by

DNV Id. 10310952

Application/Limitation

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

Type Approval documentation

Datasheet Type RG 58 Marine MIL -C17F SHF1 without armour , dated May 22 2013
Type RG213 Marine M17/074 SHF1 without armour , dated May 22 2013
Type RG214 Marine M17/75 SHF1 without armour , dated May 22 2013

Test reports: 2014.2301/05 dated 23.01.2014
2014.2301/09 dated 23.01.2014

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2014.2301/11 dated 23.01.2014

Tests carried out

| Standard | Release | General description | Limitation |
|-----------------------|---------|---|---|
| IEC 60096-0-1 Ed 3 | 2012 | Radio frequency cables Part 0-1: Guide to the design of detail specifications Coaxial cables | |
| IEC 60092-359 | 1999-08 | Sheathing materials for shipboard power and telecommunication cables | |
| IEC 60332-3-24 | 2009-02 | Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C | Bunch test Category C |
| IEC 60754-2 | 2011-11 | Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity | Halogen free: pH > 4,3 Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2005-04 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements | Low smoke Light transmittance >60% |

Marking of product

APS Finland –RG 58 CU Marin SHF1 - DNV – IEC 60332-3-24 – <batch no.> - <meter marking>
APS Finland –RG 58 CU Marin SHF1 - DNV – IEC 60332-3-24 – <batch no.> - <meter marking>
APS Finland –RG 214 U Marin SHF1 – DNV – IEC 60332-3-24 – <batch no.> – <meter marking>

Periodical assessment

The scope of the Periodical assessment 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 Routine tests (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
- Ensure traceability between manufacturer's product marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE