

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)

Type RG 6 Marin SHF1 Armoured, Type RG 11 Marin SHF1 Armoured, Type RG 59 Marin SHF1 Armoured

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 75 Ohm. Armoured.

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

Type
Type RG 6 Marin SHF1 Armoured
Type RG 11 Marin SHF1 Armoured
Type RG 59 Marin SHF1 Armoured

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-13444**
File No: **827.50**
Job Id: **262.1-017409-1**

Product description

Type RG 6 Marin SHF1 Armoured,
Type RG 11 Marin SHF1 Armoured,
Type RG 59 Marin SHF1 Armoured

Type RG 6 Marin SHF1 Armoured MIL-C-17F standard

Construction	
Inner Conductor	Copperweld 0,72+0,025mm
Insulation	Low density polyethylene
Shield	Aluminium+Polyester+Aluminium tape
1st outer conductor	Silvered copper braid
2 nd outer conductor	Plain copper braid
Inner sheath	SHF1
Armour	Galvanized steel wire braid
2 nd sheath	SHF1
Outer diameter	11,50+0,4mm

Type RG 11 Marin SHF1 Armoured MIL-C-17F standard

Construction	
Inner Conductor	Tinned copper conductor 7x0,40mm
Insulation	Low density polyethylene
Shield	Aluminium+Polyester+Aluminium tape
1st outer conductor	Plain copper braid
2 nd outer conductor	Plain copper braid
Inner sheath	Halogen free thermoplastic
Armour	Galvanized steel wire braid
2 nd sheath	Halogen free thermoplastic
Outer diameter	13,70+0,4mm

Type RG 59 Marin SHF1 Armoured MIL-C-17F standard

Construction	
Inner Conductor	Copperweld 0,58 mm
Insulation	Low density polyethylene
Shield	Aluminium+Polyester+Aluminium tape
1st outer conductor	Silver coated copper
2 nd outer conductor	Plain copper
Inner sheath	SHF1
Armour	Galvanized steel wire braid
2 nd sheath	SHF1
Outer diameter	9,40+0,2 mm

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

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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 RG6 Marin SHF1 Armoured dated May 22 2013
Type RG11 Marin SHF1 Armoured dated May 22 2013
Type RG59 Marin SHF1 Armoured dated May 22 2013

Test reports: 2014.2301/02 dated 23.01.2014
2014.2301/04 dated 23.01.2014
2014.2301/08 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 – ww/yy –RG 6 Marine SHF1 ARMoured – DNV – IEC 60332-3-24 – <batch no.> - <meter marking>

APS Finland – ww/yy –RG11 AU Marine HF1 ARMoured – DNV – IEC 60332-3-24 – <batch no.> – <meter marking>


APS Finland – ww/yy – RG59 BU Marine SHF1 ARMoured – 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



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- 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