

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Data transmission cables and systems**

with type designation(s)

**Coaxial cable Type RG 6 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 11 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 59 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 59 Flex Marin SHF1 or SHF MUD Armoured**

Issued to

**APS Cables & Connectors Oy
Rovaniemi, Finland**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Coaxial cable 75 Ohm. Armoured.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-10-12**This Certificate is valid until **2023-10-11**.for **DNV GL**DNV GL local station: **Helsinki**Approval Engineer: **Ivar Bull**

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Marta Alonso Pontes
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

Coaxial cable Type RG 6 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 11 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 59 Marin SHF1 or SHF MUD Armoured,
Coaxial cable Type RG 59 Flex Marin SHF1 or SHF MUD Armoured

Type RG 6 Marin 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	Braid made of Galvanized Steel Wire, Tinned Copper Wire or Bronze Wire
2 nd sheath	SHF1 or cross linked thermoplastic (MUD Resistant)

Type RG 11 Marin 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	Braid made of Galvanized Steel Wire, Tinned Copper Wire or Bronze Wire
2 nd sheath	SHF1 or cross linked thermoplastic (MUD Resistant)

Type RG 59 Marin Armoured MIL-C-17F Standard

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

Construction		
Inner Conductor	Copperweld 0,58 mm	Plain copper 7 x 0,20mm
Insulation	Low density polyethylene	Low density polyethylene
Shield	Aluminium+Polyester+Aluminium tape	Aluminium + polyester + Aluminium tape
1st outer conductor		
2 nd outer conductor	Plain copper	Plain copper
Inner sheath	SHF1	Halogen free thermoplastic SHF1
Armour	Braid made of Galvanized Steel Wire, Tinned Copper Wire or Bronze Wire	Braid made of Galvanized Steel Wire, Tinned Copper Wire or Bronze Wire
2 nd sheath	SHF1 or cross linked thermoplastic (MUD Resistant)	SHF1 or cross linked thermoplastic (MUD Resistant)

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

Manufactured by:

DNV GL Id. 10310952
SHF MUD applied by DNV GL Id. 10024443.

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

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 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation 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	2013-07 2013-09	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 6 AU Marine SHF1 or SHF MUD ARMoured – DNV GL – IEC 60332-3-24 – <batch no.>
– <meter marking>

APS FINLAND –RG11 AU Marine SHF1 or SHF MUD ARMoured – DNV GL– IEC 60332-3-24 – <batch no.>
– <meter marking>

APS FINLAND – RG59 BU Marine SHF1 or SHF MUD ARMoured – DNV GL – IEC 60332-3-24 – <batch no.> – <meter marking>

APS FINLAND – RG59 Flex Marine SHF1 or SHF MUD ARMoured – DNV GL – IEC 60332-3-24 – <batch no.> – <meter marking>

Job Id: **262.1-029785-1**
Certificate No: **TAE0000374**

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.

END OF CERTIFICATE