

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Low Voltage Cable**with type designation(s)
BU (i) S13/S107 & (c) S14/S108 250 V

Issued to

**Draka Norsk Kabel - part of the Prysmian Group
DRAMMEN, Norway**is found to comply with
**DNV GL rules for classification – Ships and offshore units
DNV GL class programme DNVGL-CP-0399 – Type approval – Electric cables****Application :****Instrumentation and communication.
Fire resistant.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL.****Voltage class (V) 250
Temp. class (°C) 90**This Certificate is valid until **2021-06-29**.Issued at **Høvik** on **2016-10-12**for **DNV GL**DNV GL local station: **Station Oslo Maritime and CAP**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.

Job Id: **262.1-002558-9**
 Certificate No: **TAE000015Z**
 Revision No: **1**

Product description

Instrument cable designed according to IEC 60092-376 and NEK 606 Ed5 2016.
 Type: BU (i) S13 / 107 & (c) S14 / S108 250 V *

Construction:

Conductors: Tinned, stranded copper
 Core insulation: Mica-tape helically applied + EPR
 Screen: Copper backed polyester tape w/tinned copper drain wire
 Outer sheath: SHF2 mud resistant according to IEC 60092-350 Annex F & Annex G.

* S13 and S14 is designed according to NEK TS 606 Ed4: 2009

Collective screen (c):

No of Elements:	Cross sectional area [mm ²]
2, 3, 4, 7, 8, 12, 16, 19, 24 pairs	0,75 1,5 2,5 mm ²
2, 3, 4, 7, 8, 12, 16, 19, 24 triples	0,75 1,5 2,5 mm ²
1 quad	0,75 1,5 2,5 mm ²

Individual screen (i):

No of Elements:	Cross sectional area [mm ²]
1, 2, 3, 4, 7, 8, 12, 16, 19, 24 pairs	0,75 1,5 2,5 mm ²
1, 2, 4, 6, 8, 12, 16, 19, 24 triples	0,75 1,5 2,5 mm ²

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331-21.

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	Issued	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 60331-21	1999-04	Tests for electric cables under fire conditions - Circuit integrity - Part 21: Procedures and requirements - Cables of rated voltage up to and including 0,6/1,0 kV	Minimum 120 min + 15 min cooling down time
IEC 60331-2	2009-05	Fire resistance / Circuit integrity - Test for method for fire with shock at emperature of at least 830°C for cables rated up to and including 0,6/1 kV	120 min. test @830°C + 15 min cool down

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Standard	Issued	General description	Limitation
IEC 60332-12	2004-07	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable	
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category A	Bunch test Category A
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables - Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS
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%
NEK TS606 Ed5	2016	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Brom. 70°C 56d. Oil based test fluid: EDC 95/11 70°C 56d

On special request:

IEC 60092-350	2008-02	Annex E: Procedure 8.9.1: Temperature requirements	Cold bend: -40°C Cold impact: -35°C
IEC 60331-21	1999-04	Tests for electric cables under fire conditions - Circuit integrity - Part 21: Procedures and requirements - Cables of rated voltage up to 0,6/1,0 kV	180 min. test 1000 °C

Marking of product

"meter" "year" "week" "DRAKA 01" "Part no" BU (i) S13 / S107 or (c) S14 / S108 - size - 150/250 V
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 IEC 60331-21 - IEC 60332-3-22 - IEC 60092-376 "Prod. Order no".

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) checked (if not available tests according to 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE