



Certificate No: TO.DEB.21-1200-01

TÜRK LOYDU

TYPE APPROVAL CERTIFICATE

This Certificate consists of 3 pages.

This is to certify that the

TİP 1: NAVY SHIP POWER CABLES

With type designations

UPNGG, UPNGG-FR, UPNGSG, UPNGSG-FR, UPNGSG-EMC

Manufactured by

ÜNTEL KABLOLARI SANAYİ VE TİCARET A.Ş.

Is found to comply with

**TÜRK LOYDU RULES CHAPTER E PART 105 JAN 2016, CHAPTER B PART 5 JULY 2019,
TURK LOYDU ASKERİ GEMİ KABLOLARI İÇİN TEST GEREKSİNİMLERİ**

Application : Tip 1, Power and lighting cables for naval ships
Design : Voltage class up to 1200 VAC & 1800 VDC and Temp. Class: 90°C
Sizes : Core Number: 1 to 33, Cross Section: 0,75 to 300 mm²
Address of Manufacturer : Demirciler Köyü, Makina OSB, 6. Cadde, No:4 , 41455, Dilovası
Kocaeli/TURKİYE
Place and date : İSTANBUL / 23.06.2021

Subject to the conditions referred to in the following pages, this certificate is valid until 22.06.2026

Emrah SÖĞÜTCÜ
New Building Division Manager



Product description : Power and lighting cables for naval and commercial ships with following properties:

Voltage ratings: 1200 VAC or 1800 VDC

Temperature Class: 90°C

Cables mentioned in this certificate are Tip 1 type cables in TL Askeri Gemi Kabloları için Test Gereksinimleri technical guideline.

Type Designation : Below type designations can be used

UPNGG: Halogen free non-screened power and lighting cables

UPNGG -FR: Halogen free non-screened power and lighting cables-FR

UPNGSG: Halogen free screened power and lighting cables

UPNGSG -FR: Halogen free screened power and lighting cables with fire resistant capability

UPNGSG -EMC: Halogen free screened power and lighting cables with EMC capability

-FR is used for fire resistivity

-EMC is used for electromagnetic compatibility

Materials used :

Conductor: Copper for electrical application

Material for Separator: Polyester foil or equivalent halogen free, low smoke, fire retardant type

Material for Insulation: Halogen free, cross linked material

Material for Covering of Cores: Halogen free elastic or plastic compound

Material for Screen: Copper for electrical applications and additional cover for EMC types

Material for Sheath: Halogen free, cross linked elastomeric compound

Material for Fire Resistivity: Fire resistive tape (Mica tape) around conductor (FR types)

Application/Limitation(Approval conditions):

- Following standards are used also; IEC 60092-350, 352, 360, IEC 60332-1-2, IEC 60332-3-22, IEC 60331-21 (FE 180) (Fire Resistant Types Only), EN 50147-1, MIL-STD 285 (for EMC)
- Bending radius of the cables are to be according to the manufacturer specifications.
- Core color codes and numbers are to be according to the related standards and/or manufacturer specification may change the color codes with permission of TL. Different core coding must be stated in the TL test certificate.

Documentation : Type tests reports (TL, ÜNTEL, TSE, VDE, and BOUN),
In service life test (20,000 h) and determination of temperature index test report

Test carried out (and results) : Below tests and QMS audit carried out and found satisfactory.

- 1- Visual inspection and dimensional controls
- 2- Construction and finishing control
- 3- Marking control
- 4- Print durability control
- 5- Mechanical controls;
 - Tensile strength and elongation tests (Insulation and sheath)
 - Abrasion test
 - Notch sensitivity test
 - Tear resistance test
- 6- Thermal effect tests;
 - Cold bend test ($d > 12,5$ mm), Coiling test at low temperature ($d \leq 2,5$ mm)
 - Hot set test
 - Shrinkage test
 - Heat shock test
- 7- Fire retardant tests (single cable and cable bunch)
- 8- Tensile strength and elongation change tests after aging treatment (Insulation, sheath and complete cable)

- 9- Ozone resistance test
- 10- Smoke density control
- 11- Electrical controls;
 - Conductor resistance test
 - High voltage test
 - Insulation resistance test (20°C and 90°C)
 - Electromagnetic compatibility test
 - Increase in AC capacitance test
- 12- Halogen content control, corrosivity of combustion gases and Fluorine content test
- 13- In service life control
- 14- Toxicity index control
- 15- Operation under fire condition (3h) test (Fire resistant types only)
- 16- Chemical resistance and oil resistance tests for sheath

Place of test carried out : ÜNTEL FACTORY

Marking of product: ÜNTEL, TL Type No, ÜNTEL Cable name, TL Guideline Name, Standards, Cable code, Number of cores, Cross section, Year of production, Lot number.



Yağız YILDIRIM
Surveyor

This certificate is subject to terms and conditions described below:

- Any significant change in design or construction may render this Certificate invalid. Type Approval Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to the equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and relevant international instruments that apply to it.