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## Technical Specification for Low and Medium Voltage cables and Overhead Lines

### Revision History

Revision	Date	Comment	Reviewed by
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## **1. General**

This technical specification is valid for low voltage cables of rated voltage 0.6/1.0(1.2), medium voltage cables of rated voltages 6/10(12) and 12/20(24), covered conductors for overhead lines of rated voltage 12/20(24) kV, control cables and Earth wires.

## **2. Standard**

Cables must meet national regulations and applicable standards. Dimensions of cable drums according to SS 84 28 01.

## **3. Testing**

Routine and sample testing shall be done according to specified standard. Test protocols shall be delivered upon request.

Type tests of each voltage level and each insulation system and 2-year long duration test (when applicable) shall have been carried out according to appropriate CENELEC standard during the last 5 years. Protocols shall be included with the bid.

If the supplier uses aluminium as metallic screen they should specify how they have performed the test showing that the design will meet long term duration corrosion resistance and refer to appropriate standard if applicable.

## **4. Marking**

Marking according to specified standard by printing, indenting or embossing on the outer surface of the cable (not tape within cable or on insulation core).

## **5. Documentation**

Each offered cable type shall be described by a product sheet or equivalent including at least: standard, simple description of construction, diameter of conductor, diameter over insulation, total diameter, weight, delivery length, drum and drum weight.

## 6. Power cables of rated voltage 0.6/1.0(1.2) kV

Common design requirements

Standard	SS 424 14 18
Rated voltage	0,6/1 kV
Insulation material	XLPE
Outer sheath colour	Black

### 6.1. Four- and five-core cable, for fixed installation outdoor (SE-N1XE or equivalent design)

In addition to common design requirements 6

Conductor cross section	Copper: 10 and 16 mm <sup>2</sup> Aluminium: 25, 50, 95, 150 and 240 mm <sup>2</sup>
Outer sheath material	PE

### 6.2. Four- and five-core cable, for fixed installation in and outdoor, halogen-free

In addition to common design requirements 6

Conductor cross section	Copper: 10 and 16 mm <sup>2</sup> Aluminium: 25, 50, 95, 150 and 240 mm <sup>2</sup>
CPR Class	D <sub>ca</sub> -s2,d2 or higher

### 6.3. Four-core cable with concentric conductor, for fixed installation in and outdoor, halogen-free

In addition to common design requirements 6

Conductor cross section	Aluminium: 4x50/29, 4x95/57, 4x150/88 and 4x240/146 mm <sup>2</sup>
CPR Class	D <sub>ca</sub> -s2,d2 or higher

## 6.4. Four-core cable for fixed installation in and outdoor, halogen-free

In addition to common design requirements 6

Conductor cross section	Aluminium: 25, 50, 95, 150 and 240 mm <sup>2</sup>
CPR Class	B2ca-s1,d1,a2 or higher
Use	In tunnels and fire sensitive installations

## 7. Self-supporting four-core aerial cable of rated voltage 0.6/1 kV

Design requirements

Standard	SS 424 14 26
Rated voltage	0,6/1 kV
Conductor material	Aluminium, stranded, round.
Insulation material	Extruded weather-resistant PE, colour black and yellow.
Core identification	Acc. to method D in standard.
Cross Section	50 and 95 mm <sup>2</sup>
Note	The cable shall be self-supporting for use in aerial lines. Double isolated (ALUS-D or equivalent design)

## 8. Power cables of rated voltages 6/10(12) to 12/20(24) kV

Common design requirements

Standard	SS 424 14 16
Rated voltage	6/10(12) or 12/20(24) kV
Conductor material	Aluminium or copper
Conductor type	Round, stranded, longitudinal water tight according to standard.
Insulation material	XLPE
Metallic screen	Aluminium* or copper *Note additional requirements 3.Testing
Outer sheath colour	Black

### 8.1. Three-core cable for fixed installation outdoor in soil, pipes and water. Suitable for ploughing

In addition to common design requirements 8

Conductor cross section	50, 95, 150, 240 and 300 mm <sup>2</sup>
Water tightness	The cable shall be longitudinally and radial watertight. A metal barrier shall be included in the screen cross section.
Outer sheath material	PE
Use	The cable shall be suitable for ploughing.

### 8.2. Three-core cable for fixed installation in- and out-door in pipes, soil and water, halogen-free

In addition to common design requirements 8

Conductor cross section	50, 95, 150, 240 and 300 mm <sup>2</sup>
Water tightness	A metal barrier shall be included in the screen cross section.
CPR Class	D <sub>ca</sub> -s2,d2 or higher

### 8.3. Three-core cable for fixed installation in tunnels and fire sensitive installations, halogen-free

In addition to common design requirements 8

Conductor cross section	240 and 300 mm <sup>2</sup>
Metallic screen	Copper wires
CPR Class	B2 <sub>ca</sub> -s1,d1,a2 or higher
Use	In tunnels and fire sensitive installations

### 8.4. One-core for fixed installation in- and out-door in pipes, soil and water, halogen-free

In addition to common design requirements 8

Conductor cross section	240, 300 mm <sup>2</sup>
CPR Class	D <sub>ca</sub> -s2,d2 or higher

### 8.5. One-core for fixed installation outdoor in pipes, soil and water

In addition to common design requirements 8

Conductor cross section	630 mm <sup>2</sup>
Water tightness	The cable shall be longitudinally and radial watertight. A metal barrier shall be included in the screen cross section.
Outer sheath material	PE

### 8.5. One-core cable for fixed installation in- and out-door in pipes, soil and water, halogen-free

In addition to common design requirements 8

Conductor cross section	630 mm <sup>2</sup>
Metallic screen	Copper wires
CPR Class	B2 <sub>ca</sub> -s1,d1,a2 or higher
Use	In fire sensitive installations

## 8.7. Three-core cable fixed installation outdoor in air (self-supporting for use in aerial lines), pipes, soil and water

In addition to common design requirements 8

Conductor cross section	CU: 10 mm <sup>2</sup> AL: 70 and 95 mm <sup>2</sup>
Water tightness	A metal barrier shall be included in the screen cross section.
Outer sheath colour	Black
Use	Self-supporting for use in aerial lines

## 9. Sea cable with watertight design for fixed installation in larger lakes, coastal areas and shipping lanes

General design requirements

Standard in applicable parts	SS 424 14 16, SS 424 14 17, IEC 60502-2, SS-EN 10257-2
Conductor	Solid sector-shaped or stranded aluminium or copper conductor.
Rated voltage	6/10(12) or 12/20(24) kV
Insulation	XLPE
Metallic screen	Copper wires. Counter-helix of copper tape is acceptable
Water tightness	The cable shall be longitudinally and radial watertight. Copper Clad Aluminium tape adhesive to the outer sheath shall be used.
Separation Sheath	PE
Amour	Zinc or zinc alloy coated non-alloy steel wire for armouring. Minimum diameter 3,15 mm
Outer sheath	PE. Colour: Black.
Cross Section	-



## 10. Covered conductors for overhead lines of rated voltage 12/20(24) kV

Design requirements

Standard	EN 50397-1, EN 50182
Rated voltage	12/20(24) kV
Conductor	Round, stranded, longitudinally water tight
Insulation	PE, thickness acc. to EN 50397, colour black.
Conductor cross section	FeAl: 62 and 99 mm <sup>2</sup> ALMgSI: 159 and 241 mm <sup>2</sup>
Note	BLL

## 11. Earth wire

Design requirements

Standard	SS-EN 60228, class 2, verified according to section 7.
Conductor	Copper
Cross Section	25, 35 and 50 mm <sup>2</sup>

## 12. Control cable for fixed installation in- and out-door in pipes, soil and water, halogen-free

Design requirements

Standard	SS 424 03 21
Rated voltage	300/500 V
Conductor	Copper 27x1,5 mm <sup>2</sup>
CPR Class	Dca-s2,d2 or higher
Note	EQFR or equivalent design