LV UNDERGROUND CABLES

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Revision	Data	List of modifications
00	04/04/2019	First emission
01	13/06/2019	Common list update
02	04/2021	Introduction Copper Conductors for Special applications

INDEX

1 SCOPE

This addendum of the Global Standard GSC002 rev. 5 specifies the requirements applicable to e-distribuzione (Italy), e-distributie (Romania), -Enel Distribuição São Paulo. They are specified in this document with reference to the same paragraph number of GSC002 rev. 5

4 CABLES CLASSIFICATION

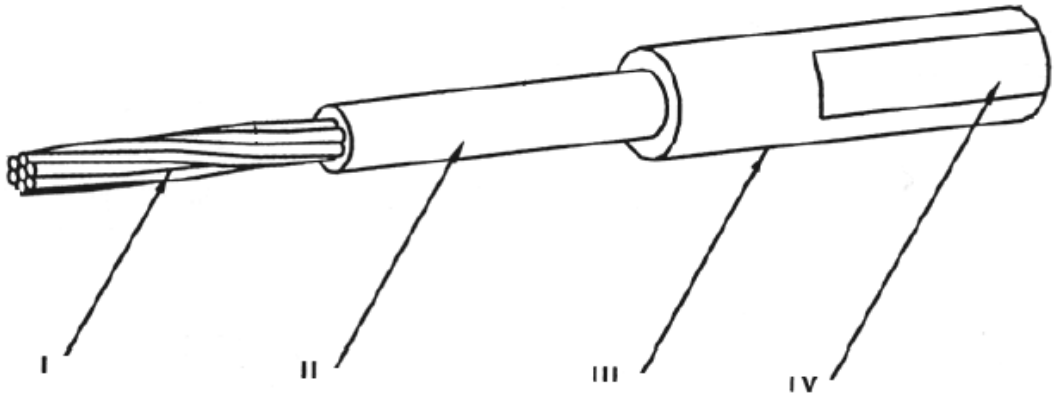
The typical layout of a single core cable is shown in Figure 1.

The different parts of the cables are depicted in section 5.

In Table 1 Types of cables specified in this document are briefly depicted.

TYPE	DESCRIPTION
III	Unipolar cable with copper conductor, cross-linked polyethylene insulation (XLPE) and polyolefin (PO) outer sheath. Class E_{ca} according to EN 50575*
*Only European cables	

Table 1 Types of cables



I – Conductor
II – Insulation
III – Outer Sheath
IV – Marking

Figure 1: Schematic drawing of Type I cables

Note: Figures are for illustrative purposes only.

5 DESIGN AND MANUFACTURING

5.1 Conductor

For Type III cables the copper conductors shall be stranded compacted circular class 2, complying all the features specified herein and in standard IEC 60228.

Copper purity shall not be less than 99,9 %.

In Table 2 copper conductors main features are depicted.

Nominal cross-section [mm^2]	Minimum number of wires	Diameter of conductors [mm]		Maximum resistance of conductor at 20°C [Ω/km]
		Minimum	Maximum	
150	18	13,7	15,0	0,124
240	34	17,6	19,2	0,0754

Table 2 Copper conductors characteristics according to IEC 60228.

LOCAL SECTION A - e-distribuzione (Italy) and e-distributie (Romania)

ITEM	TITLE	DESCRIPTION
5.6.1	Cable designation	e-distribuzione (Italy), e-distributie (Romania) The cable designation shall be the following: • Stranded compacted circular Copper conductors: **R** • Cross-linked polyethylene insulation: **E4** • Polyolefin sheath: **E** • Assigned voltage of the cable expressed in kV: Uo/U • Nominal cross-section of the conductor Example: **RE4E-0,6/1 kV 150**
5.6.2	Marking	e-distribuzione (Italy), e-distributie (Romania) The marking must be indelible, easily legible and carried out by engraving or in relief on the sheath. The distance between the end of the mark and the beginning of the next identical mark does not exceed 550 mm. The cable marking shall contain: • Property name: **e-distribuzione or e-distributie Banat, e-distributie Dobrogea, e-distributie Muntenia** • Cable designation: see 5.6.2 • Reaction to fire class (**Eca**) • Manufacturer name or trademark: **XXXXX** • Identification of the production plant with a different letter of the alphabet: **B** • Project index: to choose exponentially (**00**, 01, 02, 03).This index must be modified with every construction variation of the single core (phase or neutral). • Year and month of manufacturing (**2017 12**): It could be marked over a different generatrix (position) in relation to the other parameters as long as the maximum step of 1 meter is respected. In such case ink stamping could be used. • Metric marking It is put only on the core sheath of "PHASE 1" in the multipolar cables with visible helix. The inscription can be put on a cable surface other than that of the other inscriptions and it can also be made with ink. • Core identification (**FASE X) for Type II**: to be placed on the sheath of each core. It shall bet be repeated at least every 100 mm in the intervals between two subsequent series of inscriptions. The inscription shall be repeated with a step no greater than 100mm on a cable surface other than that of the inscriptions.Core identification could be made with ink.

LOCAL SECTION A - e-distribuzione (Italy) and e-distributie (Romania)

ITEM	TITLE	DESCRIPTION
5.6.2	Marking	e-distribuzione (Italy), e-distributie (Romania) **Marking examples** a) Type III cables (1x150 mm^2) **e-distribuzione RE4E-0,6/1 kV 150 Eca XXXX B 01 2021 12 0000** **e-distributie RE4E-0,6/1 kV 150 Eca XXXX B 01 2021 12 0000**

LOCAL SECTION B - ENEL DISTRIBUIÇÃO SÃO PAULO

ITEM	TITLE	DESCRIPTION
5.6.1	Cable designation	• Conductor: 1) **N2XY**: copper conductor wires Stranded compacted circular (class 2) • Insulation: **XR**: cross-linked polyethylene • Outer sheath: **PO**: Polyolefin • Nominal cross-sectional area: **XXX mm²** • Rated voltage: **0,6/1(1,2) kV** Example: **N2XY-XR-PO 240mm² 0,6/1 (1,2) kV**
5.6.2	Marking	The marking must be indelible, easily legible and carried out by engraving or in relief on the sheath. The distance between the end of the mark and the beginning of the next identical mark does not exceed 550 mm. The cable marking shall contain • Name of Distribution Company: ENEL DISTRIBUIÇÃO SÃO PAULO • Name of the Manufacturer (NNN) • Cable designation (see 5.6.1) • Manufactured year and month (MM/YYYY) • Footage correlative / marking sequence (mm) • Maximum operating temperature • Markings with paint shall pass the adherence test. Examples: **ENEL DISTRIBUIÇÃO SÃO PAULO NNN N2XY-XR-PO 240mm² 0,6/1 (1,2) kV 09/2021 mm**

COMMON LIST OF MAIN REQUIREMENTS

GS Type Code	Distribution Company and Country	Country Code	Rated Voltage Uo/U [kV]	Cross-section [mm^2]	Type of Cable	Conductor material	Minimum Number of Wires of Conductor	Minimum conductor diameter [mm]	Maximum conductor diameter [mm]	Insulation Material	Insulation nominal thickness [mm]	Insulation minimum thickness [mm]	Sheath Material	Sheath nominal thickness [mm]	Sheath minimum thickness [mm]	Sheath Colour	Assembly	Neutral conductor
GSC002/013	ED-ITALY	330007	0.6/1.0	1x150	III	COPPER	18	13,7	15,0	XLPE	1,7	1,43	PO	1,5	1,175	Black	Unipolar	-
GSC002/014	ED-ITALY	330008	0.6/1.0	1x240	III	COPPER	34	17,6	19,2	XLPE	1,7	1,43	PO	1,5	1,175	Black	Unipolar	-
GSC002/013	ED-ROMANIA	330007	0.6/1.0	1x150	III	COPPER	18	13,7	15,0	XLPE	1,7	1,43	PO	1,5	1,175	Black	Unipolar	-
GSC002/014	ED-ROMANIA	330008	0.6/1.0	1x240	III	COPPER	34	17,6	19,2	XLPE	1,7	1,43	PO	1,5	1,175	Black	Unipolar	-
GSC002/014	SP-BRAZIL	323477	0.6/1.0	1x240	III	COPPER	34	17,6	19,2	XLPE	1,7	1,43	PO	1,5	1,175	Black	Unipolar	-