

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

CONTENTS

1.	DOCUMENT AIMS AND APPLICATION AREA.....	3
1.1	RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL	3
2.	DOCUMENT VERSION MANAGEMENT	3
3.	UNITS IN CHARGE OF THE DOCUMENT	4
4.	REFERENCES	4
5.	ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY	4
6.	DEFINITIONS AND ACRONYMS	4
7.	DESCRIPTION	5
7.1	LIST OF COMPONENTS	5
7.2	APPLICABLE LAWS, REFERENCE STANDARD AND LIST OF REPLACED STANDARDS	8
7.3	TERMINOLOGY	9
7.4	RAW MATERIALS OF WIRES	10
7.4.1.	Zinc-Coated (Galvanized) Steel Core Wires	10
7.4.2.	Aluminum-Coated (Aluminized) Steel Core Wires.....	10
7.4.3.	Aluminum Wires.....	10
7.4.4.	Aluminum-Alloy Wires.....	10
7.4.5.	Copper wires.....	10
7.5	TECHNICAL FEATURES	11
7.5.1.	Surface.....	11
7.5.2.	Conductor diameter	11
7.5.3.	Stranding.....	11
7.5.4.	Joints.....	11
7.5.5.	Mass per unit of length	12
7.5.6.	Rated tensile strength.....	12
7.5.7.	Electrical resistance	12
7.6	CONSTRUCTION CHARACTERISTICS.....	12
7.6.1.	Aluminum Conductors, Zinc-Coated-Steel Reinforced.....	12
7.6.2.	Aluminum Conductors, Aluminum-Coated-Steel Reinforced	12
7.6.3.	Alloy-aluminum conductors.....	13
7.6.4.	Copper conductors	13
7.6.5.	Greases	13
7.7	TESTING	13
7.7.1.	Type Tests	13
7.7.2.	Sample Tests	15

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

7.8	SUPPLY REQUIREMENTS.....	15
7.8.1.	Packing and marking	16
7.8.2.	Length tolerance	16
7.9	LOCAL SECTIONS.....	16
7.9.1.	LOCAL SECTION A – AMERICA: Argentina, Brasil, Chile, Colombia and Perú.	16
7.9.2.	LOCAL SECTION B – ESPAÑA: e-distribución redes digitales.	22
8.	ANNEX.....	23
	ANNEX A – TECHNICAL CHECK LIST	23
	ANNEX B – GLOBAL TYPE CODES	25
	ANNEX C – COMMON LIST	28

THE HEAD OF NETWORK COMPONENTS
Maurizio Mazzotti

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

1. DOCUMENT AIMS AND APPLICATION AREA

The aim of this document is to provide technical requirements for the supply of round wires concentric –lay-stranded bare conductors to be used in the High and Medium Voltage overhead electrical lines of the Enel Group Distribution Companies, listed below:

Country	Distribution Company
Argentina	Edesur
Brasil	Enel Distribuição Rio Enel Distribuição Ceará Enel Distribuição Goiás Enel Distribuição São Paulo
Chile	Enel Distribución Chile
Colombia	Codensa
España	e-distribución
Italia	e-distribuzione
Perú	Enel Distribución Perú
Romania	Enel Distribuție Banat Enel Distribuție Dobrogea Enel Distribuție Muntenia

Table 1 - Distribution Companies

1.1 RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL

This document applies to both Enel Global Infrastructure and Networks Srl Company and to Infrastructure and Networks Business Line perimeter when each Company does not have to issue further documents.

2. DOCUMENT VERSION MANAGEMENT

Version	Date	Main changes description
4	06/07/2021	Issuing of "Global Infrastructure and Networks - GSC003 Concentric-Lay-Stranded Bare Conductors" technical specification

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

3. UNITS IN CHARGE OF THE DOCUMENT

Responsible for drawing up the document:

- Global Infrastructure and Networks: Engineering and Construction / Network Components.

Responsible for authorizing the document:

- Global Infrastructure and Networks: Head of Engineering and Construction unit
- Global Infrastructure and Networks: Head of Health, Safety, Environment and Quality unit.

4. REFERENCES

- Code of Ethics of Enel Group;
- Enel Human Right Policy;
- The Enel Group Zero Tolerance of Corruption (ZTC) Plan;
- Organization and management model as per Legislative Decree No. 231/2001;
- RACI Handbook Infrastructure and Networks no. 06;
- Enel Global Compliance Program (EGCP);
- Integrated Policy of Quality, Health and Safety, Environment and anti-Bribery;

5. ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY

Value Chain/Process Area: Networks Management

Macro Process: Materials management

Process: Network Components Standardization

6. DEFINITIONS AND ACRONYMS

Acronym and Key words	Description
Manufacturer Product	Component manufactured by a Supplier in accordance with a technical specification

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Technical Conformity Assessment (TCA)	A “conformity assessment” ¹ with respect to “specified requirements” ² consists in functional, dimensional, constructional and test characteristics required for a product (or a series of products) and quoted in technical specifications and quality requirements issued by Enel Group distribution companies. This also includes the verification of conformity with respect to local applicable regulation and laws and possession of relevant requested certifications
--	--

7. DESCRIPTION

This standard specifies the electrical and mechanical characteristics and test requirements that must be accomplished by concentric lay stranded bare conductors made from round wires for use as overhead electrical conductors by the utilities mentioned above.

7.1 LIST OF COMPONENTS

This standard includes round wire concentric lay bare overhead electrical conductors stranded in alternate directions, with or without grease, of one of the following types:

- Type ACSR: Concentric-lay-stranded hard drawn aluminum conductors, zinc-coated-steel reinforced.
Aluminum wires: AL1 (EN60889) or 1350-H19 (ASTM B230).
Zinc coated steel wires: ST1A (EN50189) or Class A (ASTM B498)
- Type ACSR/AW: Concentric-lay-stranded hard drawn aluminum conductors, aluminum-coated-steel reinforced.
Aluminum wires: AL1 (EN60889) or 1350-H19 (ASTM B230).
Aluminum clad steel wires: A20SA (EN61232) or Class AW3 (High Strength) (ASTM B502)
- Type AAAC: Concentric-lay-stranded aluminum alloy conductors
Aluminum wires: AL3 (EN50183) or 6201-T81 (ASTM B398).
- Type CC: Conductors made from round medium-hard copper wires as indicated on ASTM B8 or UNE207015.

The list of conductors with the main requirements, which is an integral part of the present document, is reported in the GS Type Code List attached. In the following tables are shown a brief of these requirements:

¹ Definition 2.1 of ISO/IEC 17000

² Definition 3.1 of ISO/IEC 17000

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

GS Type Code	Standard	Old Designation	Denomination EN 50182	Denomination GSC003	Al. wires		Steel wires		Total diameter (mm)	DC Resistance 20°C (Ω/km)	Grease (Yes/No)
					Nº (Un.)	Diam. (mm)	Nº (Un.)	Diam. (mm)			
GSC003/01	ASTM B232	Swan	21-AL1/4-ST1A	ACSR 25	6	2,12	1	2,12	6,36	1,3203	No
GSC003/08	IRAM 2187-I	25/4	24-AL1/4-ST1A	ACSR 28(G)	6	2,25	1	2,25	6,75	1,1721	Yes
GSC003/02	ASTM B232	Sparrow	34-AL1/6-ST1A	ACSR 39	6	2,67	1	2,67	8,01	0,8324	No
GSC003/11#	EN-50182	LA-56	47-AL1/8-ST1A	ACSR 55	6	3,15	1	3,15	9,45	0,598	No
GSC003/42	EN-50182	-	48-AL1/8-ST1A	ACSR 56	6	3,2	1	3,2	9,6	0,5795	No
GSC003/09	EN-50182	50/8	48-AL1/8-ST1A	ACSR 56(G)	6	3,2	1	3,2	9,6	0,5795	Yes
GSC003/03	ASTM B232	Raven	54-AL1/9-ST1A	ACSR 62	6	3,37	1	3,37	10,11	0,5225	No
GSC003/04#	ASTM B232	Quail	67-AL1/11-ST1A	ACSR 79	6	3,78	1	3,78	11,34	0,4153	No
GSC003/43#	EN-50182	-	70-AL1/11-ST1A	ACSR 81	26	1,85	7	1,44	11,72	0,4034	No
GSC003/77	ASTM B232	Petrel	52-AL1/30-ST1A	ACSR 82	12	2,34	7	2,34	11,7	0,5147	No
GSC003/47	ASTM B232	Leghorn	68-AL1/40-ST1A	ACSR 108	12	2,69	7	2,69	13,45	0,3895	No
GSC003/44	EN-50182	-	94-AL1/15-ST1A	ACSR 110	26	2,15	7	1,67	13,61	0,2987	No
GSC003/10	EN-50182	95/15	94-AL1/15-ST1A	ACSR 110(G)	26	2,15	7	1,67	13,61	0,2987	Yes
GSC003/14#	EN-50182	LA-110	94-AL1/22-ST1A	ACSR 116	30	2	7	2	14	0,2964	No
GSC003/05#	ASTM B232	Penguin	107-AL1/18-ST1A	ACSR 125	6	4,77	1	4,77	14,31	0,2608	No
GSC003/45	EN-50182	-	122-AL1/20-ST1A	ACSR 141	26	2,44	7	1,9	15,46	0,2319	No
GSC003/78	ASTM B232	Dotterel	89-AL1/52-ST1A	ACSR 142	12	3,08	7	3,08	15,4	0,2971	No
GSC003/46	EN-50182	-	128-AL1/21-ST1A	ACSR 149	26	2,5	7	1,95	15,85	0,2209	No
GSC003/06#	ASTM B232	Partridge	135-AL1/22-ST1A	ACSR 157	26	2,57	7	2	16,28	0,2091	No
GSC003/79	ASTM B232	Cochin	107-AL1/62-ST1A	ACSR 169	12	3,37	7	3,37	16,85	0,2482	No
GSC003/53	EN-50182	0101-0440	149-AL1/24-ST1A	ACSR 173	26	2,7	7	2,1	17,1	0,1894	No
GSC003/95	EN-50182	0101-0440	149-AL1/24-ST1A	ACSR 173(G)	26	2,7	7	2,1	17,1	0,1894	Yes
GSC003/17#	EN-50182	LA-180	147-AL1/34-ST1A	ACSR 182	30	2,5	7	2,5	17,5	0,1897	No
GSC003/07#	ASTM B232	Linnet	171-AL1/28-ST1A	ACSR 198	26	2,89	7	2,25	18,31	0,1653	No
GSC003/96	EN-50182	-	184-AL1/30-ST1A	ACSR 214(G)	26	3,00	7	2,33	19,0	0,1535	Yes
GSC003/54#	EN-50182	LA-280 (Hawk)	242-AL1/39-ST1A	ACSR 281	26	3,44	7	2,68	21,8	0,1167	No
GSC003/98	EN-50182	LA-280 (Hawk)	242-AL1/39-ST1A	ACSR 281(G)	26	3,44	7	2,68	21,8	0,1167	Yes
GSC003/48	ASTM B232	Osprey	282-AL1/16-ST1A	ACSR 298	18	4,47	1	4,47	22,35	0,1011	No
GSC003/80	ASTM B232	Dove	283-AL1/46-ST1A	ACSR 329	26	3,72	7	2,89	23,55	0,0998	No
GSC003/55	EN-50182	Peacock 605	306-AL1/40-ST1A	ACSR 346	24	4,03	7	2,69	24,19	0,0925	No
GSC003/56	EN-50182	0101-0264	304-AL1/49-ST1A	ACSR 354	26	3,86	7	3	24,44	0,0927	No
GSC003/97	EN-50182	0101-0264	304-AL1/49-ST1A	ACSR 354(G)	26	3,86	7	3	24,44	0,0927	Yes
GSC003/49	ASTM B232	Grosbeak	322-AL1/50-ST1A	ACSR 372	26	3,97	7	3,01	24,91	0,0878	No
GSC003/57#	EN-50182	LA-380 (Gull)	337-AL1/44-ST1A	ACSR 381	54	2,82	7	2,82	25,38	0,0842	No
GSC003/58#	EN-50182	LA-455 (Condor)	402-AL1/52-ST1A	ACSR 454	54	3,08	7	3,08	27,72	0,0706	No
GSC003/50	ASTM B232	Drake	403-AL1/65-ST1A	ACSR 468	26	4,44	7	3,45	28,11	0,0701	No
GSC003/51	ASTM B232	Rail	484-AL1/34-ST1A	ACSR 517	45	3,7	7	2,47	29,61	0,0592	No
GSC003/59#	EN-50182	LA-545 (Cardinal)	485-AL1/63-ST1A	ACSR 547	54	3,38	7	3,38	30,42	0,0586	No
GSC003/99	EN-50182	LA-545 (Cardinal)	485-AL1/63-ST1A	ACSR 547(G)	54	3,38	7	3,38	30,42	0,0586	Yes
GSC003/60	EN-50182	Plover 900	727-AL1/97-ST1A	ACSR 824	54	4,14	19	2,55	37,59	0,039	No

Table 2 - Type ACSR: Aluminum Conductors, Galvanized Steel Reinforced

to be used in the construction of new lines

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

GS Type Code	Standard	Old Designation	Denomination EN 50182	Denomination GSC003	Al. wires		Steel wires		Total diameter (mm)	DC Resistance 20°C (Ω/km)	Grease (Yes/No)
					Nº (Un.)	Diam. (mm)	Nº (Un.)	Diam. (mm)			
GSC003/12#	EN-50182	LARL-56	47-AL1/8-A20SA	ACSR/AW 55	6	3,15	1	3,15	9,45	0,5802	No
GSC003/81	EN-50182	LARL-56	47-AL1/8-A20SA	ACSR/AW 55(G)	6	3,15	1	3,15	9,45	0,5802	Yes
GSC003/92#	EN-50182	LARL-78	67-AL1/11-A20SA	ACSR/AW 79	6	3,78	1	3,78	11,34	0,403	No
GSC003/13	EN-50182	LARL-78	67-AL1/11-A20SA	ACSR/AW 79(G)	6	3,78	1	3,78	11,34	0,403	Yes
GSC003/102#	EN-50182	LARL-125E	107-AL1/18-A20SA	ACSR/AW 125	6	4,77	1	4,77	14,31	0,2531	No
GSC003/15	EN-50182	LARL-125E	107-AL1/18-A20SA	ACSR/AW 125(G)	6	4,77	1	4,77	14,31	0,2531	Yes
GSC003/103	EN-50182	LARL-145E	117-AL1/31-A20SA	ACSR/AW 148	15	3,15	4	3,15	15,75	0,2264	No
GSC003/16	EN-50182	LARL-145E	117-AL1/31-A20SA	ACSR/AW 148(G)	15	3,15	4	3,15	15,75	0,2264	Yes
GSC003/41#	EN-50182	-	128-AL1/21-A20SA	ACSR/AW 149	26	2,5	7	1,95	15,85	0,2144	No
GSC003/52	EN-50182	-	128-AL1/21-A20SA	ACSR/AW 149(G)	26	2,5	7	1,95	15,85	0,2144	Yes
GSC003/61#	EN-50182	Partridge	135-AL1/22-A20SA	ACSR/AW 157	26	2,57	7	2	16,28	0,203	No
GSC003/104#	EN-50182	LARL-180	147-AL1/34-A20SA	ACSR/AW 182	30	2,5	7	2,5	17,5	0,1819	No
GSC003/18	EN-50182	LARL-180	147-AL1/34-A20SA	ACSR/AW 182(G)	30	2,5	7	2,5	17,5	0,1819	Yes
GSC003/62#	EN-50182	LARL-280-Hawk	242-AL1/39-A20SA	ACSR/AW 281	26	3,44	7	2,68	21,8	0,1133	No
GSC003/105	EN-50182	-	283-AL1/46-A20SA	ACSR/AW 329	26	3,72	7	3,89	23,55	0,0969	No
GSC003/63#	EN-50182	LARL-380-Gull	337-AL1/44-A20SA	ACSR/AW 381	54	2,82	7	2,82	25,38	0,0822	No
GSC003/64#	EN-50182	LARL-455-Condor	402-AL1/52-A20SA	ACSR/AW 454	54	3,08	7	3,08	27,72	0,0689	No
GSC003/65#	EN-50182	Cardinal	485-AL1/63-A20SA	ACSR/AW 547	54	3,38	7	3,38	30,42	0,0572	No
GSC003/100	EN-50182	Curlew	525-AL1/68-A20SA	ACSR/AW 594	54	3,52	7	3,52	31,68	0,0528	No

Table 3 - Type ACSR/AW: Aluminum Conductors, Aluminum-Clad Steel Reinforced

GS Type Code	Standard	Old Designation	Denomination EN 50182	Denomination GSC003	Al. wires		Total Area (mm²)	Total diameter (mm)	DC Resistance 20°C (Ω/km)	Grease (Yes/No)
					Nº (Un.)	Diam. (mm)				
GSC003/19	ASTM B399	-	25-AL3	AAAC 25	7	2,13	24,94	6,39	1,3313	No
GSC003/82	ASTM B399	-	25-AL3	AAAC 25 (G)	7	2,13	24,94	6,39	1,3313	Yes
GSC003/20	ASTM B399	-	50-AL3	AAAC 50	7	3,02	50,14	9,06	0,6623	No
GSC003/83	ASTM B399	-	50-AL3	AAAC 50 (G)	7	3,02	50,14	9,06	0,6623	Yes
GSC003/22	ASTM B399	-	67-AL3	AAAC 67 (G)	7	3,5	67,35	10,5	0,4931	Yes
GSC003/21	ASTM B399	-	70-AL3	AAAC 70	19	2,17	70,27	10,85	0,4753	No
GSC003/84	ASTM B399	-	70-AL3	AAAC 70 (G)	19	2,17	70,27	10,85	0,4753	Yes
GSC003/23	ASTM B399	-	120-AL3	AAAC 120	19	2,83	119,51	14,15	0,2795	No
GSC003/85	ASTM B399	-	120-AL3	AAAC 120 (G)	19	2,83	119,51	14,15	0,2795	Yes
GSC003/32	EN-50182	D145	148-AL3	AAAC 148	19	3,15	148,07	15,75	0,2256	No
GSC003/24	ASTM B399	-	161-AL3	AAAC 161	19	3,28	160,54	16,4	0,208	No
GSC003/86	ASTM B399	-	161-AL3	AAAC 161 (G)	19	3,28	160,54	16,4	0,208	Yes
GSC003/66	EN-50182	D180	188-AL3	AAAC 188	19	3,55	188,06	17,75	0,1776	No
GSC003/25	ASTM B399	-	200-AL3	AAAC 200	19	3,66	199,90	18,3	0,1671	No
GSC003/87	ASTM B399	-	200-AL3	AAAC 200 (G)	19	3,66	199,90	18,3	0,1671	Yes
GSC003/26	ASTM B399	-	236-AL3	AAAC 236 (G)	37	2,85	236,04	19,95	0,142	Yes
GSC003/27	ASTM B399	-	240-AL3	AAAC 240	61	2,24	240,39	20,16	0,1399	No
GSC003/67	EN-50182	D280	279-AL3	AAAC 279	37	3,1	279,26	21,7	0,12	No
GSC003/68	ASTM B399	304	303-AL3	AAAC 303 (G)	37	3,23	303,18	22,61	0,1106	Yes
GSC003/28	ASTM B399	-	315-AL3	AAAC 315	37	3,29	314,55	23,03	0,1066	No

to be used in the construction of new lines

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

GS Type Code	Standard	Old Designation	Denomination EN 50182	Denomination GSC003	Al. wires		Total Area (mm ²)	Total diameter (mm)	DC Resistance 20°C (Ω/km)	Grease (Yes/No)
					Nº (Un.)	Diam. (mm)				
GSC003/88	ASTM B399	-	315-AL3	AAAC 315 (G)	37	3,29	314,55	23,03	0,1066	Yes
GSC003/69	EN-50182	D380	381-AL3	AAAC 381	61	2,82	380,99	25,38	0,0883	No
GSC003/29	ASTM B399	-	400-AL3	AAAC 400	37	3,71	399,98	25,97	0,0838	No
GSC003/89	ASTM B399	-	400-AL3	AAAC 400 (G)	37	3,71	399,98	25,97	0,0838	Yes
GSC003/70	EN-50182	D450	454-AL3	AAAC 454	61	3,08	454,49	27,72	0,074	No
GSC003/71	ASTM B399	490	500-AL3	AAAC 500 (G) 61H	31	3,23	499,83	29,07	0,0673	Yes
GSC003/30	ASTM B399	-	500-AL3	AAAC 500	37	4,15	500,48	29,05	0,067	No
GSC003/90	ASTM B399	-	500-AL3	AAAC 500 (G)	37	4,15	500,48	29,05	0,067	Yes
GSC003/101	ASTM B399	-	607-AL3	AAAC 607 (G)	61	3,56	607,18	32,04	0,0554	Yes
GSC003/31	ASTM B399	-	631-AL3	AAAC 631	37	4,66	631,05	32,62	0,0531	No
GSC003/91	ASTM B399	-	631-AL3	AAAC 631 (G)	37	4,66	631,05	32,62	0,0531	Yes
GSC003/72	EN-50182	680	681-AL3	AAAC 681	61	3,77	680,93	33,93	0,0494	No

Table 4 - Type AAAC: All Aluminum-Alloy Conductors

GS Type Code	Standard	Old Designation	Denominat. EN 207015	Denominat. GSC003	Copper wires		Total Area (mm ²)	Total diameter (mm)	DC Resistance 20°C (Ω/km)	Grease (Yes/No)	Direction of Lay (external lay)
					Nº (Un.)	Diam. (mm)					
GSC003/33	ASTM B8	25	-	CC 23	7	2,06	23,33	6,18	0,795	No	Left(S)
GSC003/34	ASTM B8	35	-	CC 34	7	2,5	34,36	7,5	0,538	No	Left(S)
GSC003/37	UNE-207015	-	C 35	CC 35	7	2,52	34,91	7,56	0,529	No	Right(Z)
GSC003/38	UNE-207015	-	C 50 E	CC 49	7	3	49,48	9	0,372	No	Right(Z)
GSC003/35	ASTM B8	70	-	CC 67	19	2,12	67,07	10,6	0,276	No	Left(S)
GSC003/39	UNE-207015	-	C 70	CC 70	19	2,17	70,27	10,85	0,268	No	Right(Z)
GSC003/36	ASTM B8	95	-	CC 93	19	2,5	93,27	12,5	0,198	No	Left(S)
GSC003/40	UNE-207015	-	C 95	CC 95	19	2,52	94,76	12,6	0,196	No	Right(Z)
GSC003/94	ASTM B8	500	C 500	CC 500	61	3,23	499,83	29,07	0,0366	No	Left(S)
GSC003/93	ASTM B8	1000	-	CC 1015	127	3,19	1015,02	41,47	0,018	No	Left(S)

Table 5 - Type CC: Copper Conductors, Medium-Hard Temper
7.2 APPLICABLE LAWS, REFERENCE STANDARD AND LIST OF REPLACED STANDARDS

The list of reference standards used to develop this specification and that shall be used as test method are mentioned below in this document. There shall be used the edition in-force at the contract date.

ASTM B2 Standard specification for medium-hard-drawn copper wire.

ASTM B8 Standard specification for concentric-lay-stranded copper conductors, hard medium-hard, or soft.

ASTM B230 Standard Specification for Aluminum 1350-H19 Wire for Electrical Purposes.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

ASTM B232	Standard Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR).
ASTM B398	Standard Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes.
ASTM B399	Standard Specification for Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors.
ASTM B498	Standard Specification for Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR).
ASTM B500	Standard Specification for Metallic Coated Stranded Steel Core for Aluminum Conductors, Steel Reinforced (ACSR).
EN 50182	Conductors for overhead lines - Round wire concentric lay stranded conductors
EN 50183	Conductors for overhead lines — Aluminium-magnesium-silicon alloy wires
EN 50189	Conductors for overhead lines — Zinc coated steel wires
EN 50326	Conductors for overhead lines - Characteristics of greases.
EN 60889	Hard-drawn aluminium wire for overhead line conductors.
EN 61232	Aluminium-clad steel wires for electrical purposes.
EN 61394	Overhead lines - Requirements for greases for aluminium, aluminium alloy and steel bare conductors
IEC 60050-466	International Electrotechnical Vocabulary (IEV) - Part 466: Overhead lines
IEC-TR 61597	Overhead electrical conductors - Calculation methods for stranded bare conductors
UNE 207015	Conductores desnudos de cobre cableados para líneas eléctricas aéreas.

7.3 TERMINOLOGY

In addition to IEC 60050-466 terminology, the following ones shall be noted:

Direction of lay: The direction of lay is defined as right-hand or left-hand. With right-hand lay, the wires conform to the direction of the central part of the letter Z when the conductor is held vertically. With left-hand lay, the wires conform to the direction of the central part of letter S when the conductor is held vertically.

Lay ratio: means the ratio of the axial length of one complete turn of the helix formed by the the wire of a stranded conductor to the external diameter of the corresponding layer of wires.

Nominal: the name or identifying value of a measurable property by which a conductor or component of a conductor is identified and to which tolerance are applied. Nominal values should be target values.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Wire: a filament of draw metal having a constant circular cross-section.

Rated Tensile Strength: sum of the tensile strength of all wires considering the rupture load of the weakest wire.

7.4 RAW MATERIALS OF WIRES

The following sections provides general information about the raw material of wires considered in this Global Standard.

7.4.1. Zinc-Coated (Galvanized) Steel Core Wires

Zinc-Coated (Galvanized) Steel Core Wires used for mechanical reinforcement in the manufacture of aluminum conductors, must be manufactured with the requirements of the standards EN50189 (Type ST1A) or ASTM B498 (Class A).

7.4.2. Aluminum-Coated (Aluminized) Steel Core Wires

Aluminum-Coated (Aluminized) Steel Core Wires used for mechanical reinforcement in the manufacture of aluminum conductors, must be manufactured with the requirements of the EN 61232 ("20SA" class and "A" type) or ASTM B502 (wires Class AW3 -High Strength).

7.4.3. Aluminum Wires

Aluminum wires used to assemble the bare conductors considered in this Global Standard shall be made of pure aluminum, manufacture under the standards EN 60889, or aluminum 1350-H19, manufacture under the standard ASTM B230.

7.4.4. Aluminum-Alloy Wires

Aluminum-alloy wires used to assemble the bare conductors considered in this Global Standard shall be made of 6201-T81 aluminum-alloy under the standard ASTM B398 or identified as AL3 under the standard Norma EN 50183.

7.4.5. Copper wires

Copper wires shall be uncoated, under the standards ASTM B2 or UNE 207015.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors**Application Areas**Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

7.5 TECHNICAL FEATURES**7.5.1.Surface**

The surface of the conductor shall be free from all imperfections visible to the unaided eye (normal corrective lenses accepted), such as nicks, indentations, etc., not consistent with good commercial practice.

7.5.2.Conductor diameter

The diameter of the conductor shall not vary from the nominal values more than the limits indicated in the referenced standards.

7.5.3.Stranding

All wires of the conductor shall be concentrically stranded.

The wires in each layer shall be closely stranded around the underlying layer of wires.

The direction of lay shall be reversed in successive layers.

The directions of lay of the outer layer shall be “right-hand” (Z) for conductors type ACSR, ACSR/AW and AAAC.

The direction of lay of the outer layer for copper conductor shall be “right-hand” or “left-hand”, as indicated in the GS Type List.

7.5.4.Joints

Conductors with only one steel wire, shall not be made any joints after heat treatment of wires or rods. There shall be no joints of any kind made in the zinc-coated or aluminum-coated steel core wire or wires during stranding.

Before stranding, no more than one joint shall be accepted in the aluminum wires per length of conductor. During stranding, no wire welds shall be made for the purpose of achieving the required conductor length. Joints are permitted in aluminum or copper wires unavoidably broken during stranding, provided such breaks are not associated with either inherently defective wire or with the use of short lengths of wires. Joints shall conform to the geometry of original wire, i.e., joints shall be dressed smoothly with a diameter equal to that of the parent wires and shall not be kinked. Joints shall not be made in the finished copper wires composing conductors of seven wires or less.

Joints in wires shall not be closer than 15 m from a joint in the same wire or in any other wire of the completed conductor. The quantity of joints per length shall not be greater than values indicated in the standards of reference.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors**Application Areas**Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Joints shall be made by electric butt welding, electric butt cold upset welding or cold pressure welding and other approved methods. These joints shall be made in accordance with good commercial practice. The first type of joints shall be electrically annealed for approximately 250 mm on both sides of the weld.

7.5.5. Mass per unit of length

The mass per unit length of the conductor shall be calculated using densities, stranding increments and cross-sectional areas of all kind of wires. The mass per unit length of the conductor without grease shall not vary from its nominal value by more than $\pm 2\%$.

The mass per unit length of the grease on greased conductors shall not vary from its nominal value by more than $\pm 20\%$.

7.5.6. Rated tensile strength

Rated tensile strength are result of sum of the tensile strength of all wires that compose the conductor, as indicated in the referenced standards shown in the GS Type Code List.

7.5.7. Electrical resistance

The electrical DC resistance at 20 °C of a conductor, expressed in Ω / km and with three decimals, is calculated using the value of the resistivity of the wires used.

7.6 CONSTRUCTION CHARACTERISTICS

The following sections provides the description of the conductors in function of the wires use to assemble them. The Standards use to manufacture the conductors are indicated in the Common List and in the section 7.2.

7.6.1. Aluminum Conductors, Zinc-Coated-Steel Reinforced

Aluminum conductors, coated-steel reinforced are assembled with aluminum wires (see 5.1.3) in the external layers and zinc-coated (galvanized) steel core wires in the internal layers (see 5.1.1).

Manufactured as indicated on EN 50182 or ASTM B232.

7.6.2. Aluminum Conductors, Aluminum-Coated-Steel Reinforced

Aluminum conductors, aluminum-coated-steel reinforced are assembled with aluminum wires (see 5.1.3) in the external layers and aluminum-coated (Aluminized) steel core wires in the internal layers (see 5.1.2).

Manufactured as indicated on EN 50182 or ASTM B549.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

7.6.3. Alloy-aluminum conductors

The alloy-aluminum conductors shall be assembled with alloy-aluminum wires, as indicated in the section 5.1.4. and manufactured as indicated on EN 50182 or ASTM B399.

7.6.4. Copper conductors

The uncompressed copper conductors shall be assembled with copper wire, as indicated in the section 5.1.5. and manufactures as indicates on ASTM B8 or UNE207015.

7.6.5. Greases

The Concentric-Lay-Stranded Aluminum Conductors, Aluminum-Coated-Steel Reinforced and Alloy-Aluminum Conductors could be provided with or without greases, applied to the both internal or external layers (see Figure 1), as indicated in the GS Type Code List.

The grease shall be chemically neutral with respect to aluminum, zinc and steel, free of impurities, uniform throughout of the length of the conductor and cold applied (Type A). It must have the characteristics described in the standards EN 50326 or IEC 61394 for a designation 30A125. and the stability under short-circuit must be tested with 250 °C for 1,5 seconds.

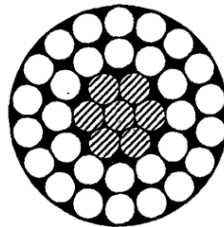


Figure 1 - Greased Conductors

The volume and mass of the grease shall be calculated as indicated on Annex B in EN-50182. Special conditions other than that could be specified on Local Sections or specific orders.

7.7 TESTING

7.7.1.Type Tests

Type test shall be carried out over conductors considered in this Global Standard in order to verify its main characteristics that depended mainly on its design.

Each manufacture shall make these tests once for a new design or manufacturing process of conductor and then subsequently repeated only when the design or manufacturing process is changed. The type test

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

shall be analyzed by the purchaser using the requirements of this Global Standard and requirements of Technical Conformity Assessment (TCA) procedures.

Type tests of wires and conductors of type ACSR, ACSR/AW and AAAC shall be carried out as the procedures of EN50182 and are shown in the table below. Additional test could be indicated in Local Section.

Type Tests		Clause EN50182
Conductor	- surface condition	6.4.1
	- diameter	6.4.2
	- inertness	6.4.3
	- lay ratio and direction of lay	6.4.4
	- number and type of wires	6.4.5
	- mass per unit length	6.4.6
	- stress-strain curve	6.4.7
	- tensile breaking strength	6.4.8
	- stringing test	6.4.9
Aluminium wires	diameter	6.5.2
	- tensile strength	6.5.2
	- elongation ⁽¹⁾	6.5.2
	- resistivity	6.5.2
	- wrapping test	6.5.2
	- welding	6.5.3
Zinc coated Steel wires	- diameter	6.5.2
	- tensile strength	6.5.2
	- stress at 1 % extension	6.5.2
	- elongation or torsion test	6.5.2
	- wrapping test	6.5.2
	- mass of zinc	6.5.2
	- zinc dip test	6.5.2
	- adhesion of zinc coating	6.5.2
Aluminium-clad Steel wires	- diameter	6.5.2
	- tensile strength	6.5.2
	- stress at 1 % extension	6.5.2
	- elongation	6.5.2
	- torsion	6.5.2
	- cladding thickness/uniformity	6.5.2
	- resistivity	6.5.2
Grease	- mass per unit length	6.6.1
	- drop point (high temperature stability)	6.6.2

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Type Tests	Clause EN50182
⁽¹⁾ Elongation test for AL1 wires is not required	

Table 6 - Type Tests for Aluminum Conductors

Type tests for copper conductors, type CC, shall be carried out as the procedures of UNE207015 and are shown in the table below. Additional test could be indicated in Local Section.

Type Tests		Clause UNE207015
Conductor	- surface condition	7.2.1
	- diameter	6.8
	- number and type of wires	6.8
	- lay ratio and direction of lay	7.2.2
	- tensile breaking strength	7.2.3
	- electrical resistance	7.2.4
	- mass per unit length	7.2.5
Copper wires	- hard copper	5
	- diameter	7.1.1
	- elongation	7.1.2
	- alternative bends	7.1.3
	- torsion	7.1.4
	- resistivity	7.1.5
	- welding	6.4

Table 7 - Type Tests for Copper Conductors
7.7.2. Sample Tests

Sample test shall be carried out to guarantee the quality of conductors and compliance with the requirements of this standard.

The list of sample tests of wires and conductors are shown in the Local Section and shall be carried out as the procedures of referenced standards.

7.8 SUPPLY REQUIREMENTS

Unless otherwise specified, each drum shall contain one continuous length of conductor.

The conductor shall be suitably protected against possible damages resulting from handling and transportation of each spool. The reel shall be protected with staves or similar protection.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

The reel shall be capable to support the weight of the conductor both during and after transport, by truck, crane movements or forklift truck, without causing damage to the conductor.

The drum bore shall be capable to support the weight of the conductor and respect the minimum bend radio.

The drum shall be loaded and unloaded by crane capable to support its weight.

The ends of the conductor length must be internally secured to the spools, leaving both ends accessible through the use of an internal helix or reel on each spool.

Specific characteristics are detailed in Local Section.

7.8.1. Packing and marking

Each reel shall be identified with an indelible and easily legible mark on the external faces, as indicated in the Local Section.

7.8.2. Length tolerance

The admitted tolerance for a size is equal to $\pm 5\%$ of the length indicated in the order. The equipment used to measure the length of the conductor shall be accurate to $\pm 1\%$.

7.9 LOCAL SECTIONS
7.9.1.LOCAL SECTION A – AMERICA: Argentina, Brasil, Chile, Colombia and Perú.

ITEM	TITLE	DESCRIPTION
7.2	International Standards	<u>Enel Distribuição Rio (Brasil), Enel Distribuição Ceará (Brasil), Enel Distribución Chile), Codensa(Colombia), Enel Distribución Perú.</u> • ASTM B398: Standard Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes. • ASTM B399: Standard Specification for Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors. • ASTM B230: Standard Specification for Aluminum 1350-H19 Wire for Electrical Purposes. • ASTM B232: Standard Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR). • ASTM B498: Standard Specification for Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR). • ASTM B500: Standard Specification for Metallic Coated Stranded Steel Core for Aluminum Conductors, Steel Reinforced (ACSR). • ASTM B2: Standard specification for médium-hard-drawn copper wire. • ASTM B8: Standard specification for concentric-lay-stranded copper conductors, hard médium-hard, or soft. Para Enel distribución Perú en el caso de conductores ACSR/AW • EN-50182 : Conductores para líneas eléctricas aéreas. Conductores de alambres redondos cableados en capas concéntricas.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

		• EN 60889: Alambre de aluminio duro para Conductores de líneas aéreas de transporte de energía eléctrica. • EN 61232: Alambres de acero recubiertos de aluminio para usos eléctricos. • EN 50326: Conductores para líneas eléctricas aéreas. Características de los productos de protección (grasas).
	List of replaced Standards	<u>Enel Distribuição Rio (Brasil), Enel Distribuição Ceará (Brasil), Chilectra (Chile), Codensa(Colombia), Enel distribución Perú, Edesur(Argentina)</u> • E-MT-003: Especificación Técnica de Conductores desnudos para líneas aéreas de tensión hasta 36 kV. • E-LT-001 CONDUCTORES DESNDOS PARA LÍNEAS AÉREAS DE ALTA TENSIÓN
	Local Standards	<u>Edesur(Argentina)</u> • IRAM 2187-I: Conductores de aluminio y de aleación de aluminio con alma de acero de resistencia mecánica normal para líneas aéreas de energía. <u>Codensa (Colombia).</u> • <u>RETIE: Reglamento Técnico de Instalaciones Eléctricas.</u>
7.4.5	Copper Wires	<u>Enel Distribuição Rio (Brasil), Chilectra (Chile),Codensa (Colombia), Enel Distribuição Ceará (Brasil), Enel distribución Perú, Edesur (Argentina).</u> Copper wires shall be medium-hard temper, uncoated, under the standards ASTM B2.
7.6.5	Greases	<u>Enel Distribuição Rio (Brasil), Chilectra (Chile), Enel Distribuição Ceará (Brasil), Enel distribución Perú, Edesur (Argentina).</u> Shall be applied the standard IEC- 61089 y standards EN 50326 or IEC 61394. <u>Enel Distribuição Rio (Brasil).</u> Conductors shall be provided with greases, applied to the internal layers as indicated in the Common List. <u>Enel distribución Perú.</u> MT conductors shall be provided with greases, applied to the both internal or external layers as indicated in the Common List. AT conductors shall be provided with greases, applied to the internal layers. <u>Codensa (Colombia).</u> It is not required greases for conductors.
7.5.3	Stranding	<u>Enel Distribuição Rio (Brasil), Enel Distribuição Ceará (Brasil), Chilectra (Chile), Codensa(Colombia), Enel distribución Perú, Edesur(Argentina)</u> The directions of lay of the external layer shall be "left-hand" to copper conductors.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

7.7.1	Type Test	<u>Enel Distribuição Rio (Brasil), Enel Distribuição Ceará (Brasil), Chilectra (Chile), Codensa(Colombia), Enel distribución Perú, Edesur(Argentina)</u> • Surface Condition • Overall Diameter • Number and type of wires • Cross section area • Mass per unit length • Rated tensile strength • Elongation • Joints • Electrical resistance • Lay ratio and direction of lay • Grease temperature characteristics For Edesur consider the standard IRAM-2187-I
7.7.2	Sample Test	<u>Enel Distribuição Rio (Brasil), Enel Distribuição Ceará (Brasil), Chilectra (Chile), Codensa(Colombia), Enel distribución Perú, Edesur(Argentina)</u> • Number and type of wires • Cross section area • Lay ratio and direction of lay • Mass per unit length • Rated tensile strength (wires) • Electrical resistance (wires) • Grease temperature characteristics The acceptance level shall be determined according to the procedure described in standard IEC 60410 considering AQL 1,5%, level II, simple sampling. For Edesur consider the standard IRAM-2187-I For Peru: -para conductores Aluminum Conductors, Aluminum-Coated-Steel Reinforced de acuerdo a lo señalado en la tabla del ítem 6.1 de la Sección Local. -para los conductores de aleación de aluminio deberán tener en consideración lo siguientes: • Las pruebas serán de acuerdo a lo detallado en el ítem b) del numeral 6.6.2 de la norma IEC 61089. • La prueba de resistencia eléctrica será de acuerdo a la IEC 60468 • Un análisis químico de los elementos constitutivos del alambón de aleación de aluminio elegida al azar. • Análisis metalográfico de los alambres y el conductor cableado antes y luego de ser sometido a envejecimiento artificial • El fabricante entregará copia del certificado del análisis químico del alambón, realizado por el fabricante en el lugar de origen respectivo del lote.
7.8	Conditions of supply	<u>Enel Distribuição Rio (Brasil), Chilectra (Chile), Codensa (Colombia), Enel Distribuição Ceará (Brasil), Enel distribución Perú, Edesur (Argentina).</u> The cable shall be delivered by the manufacturer on a wooden or metal spool, which will not be returned, as per maximum and minimum dimensions indicated in Table 4 and in accordance with Figure 2. In order to use the reel in a spooling machine, the reel shall be supplied with two holes spaced at 50 cm, equidistant and aligned with central hole.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

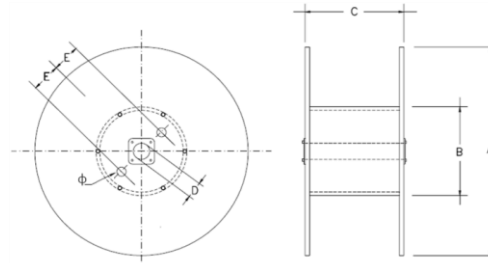
Business Line: *Infrastructure & Networks*


Figure 2 – Reel

A(1) mm	B mm	C(1) mm	D(2) mm	E mm	Φ(mm)
1730	(3)	1120	80	(4)	50

Table 4 – Dimensions of reel

Notes:

- (1) Maximum value
- (2) Minimum value
- (3) Twice of the minimum bend ratio of conductor used to transport , as indicated by the manufacturer.
- (4) 300 ó 180 mm , according to the type of reel.

The wooden spools shall be treated according to the international requirements for the control of plant disease, avoiding the compounds "Pentachlorophenol" and "Creosote". The treatment must include, at least: highly toxic to xylophagous organisms, high penetration and holding power, chemical stability, non-corrosive substances to metals nor should they affect the physical characteristics of wood.

Each reel shall be protected with a plastic coat than avoids the corrosion of the conductor.

The total length of the cable supplied may not be less than that requested in the purchase order and shall not be longer by any more than 1%.

The maximum gross weight of the packaged spool must not exceed 2500 kg.

Codensa (Colombia)

In additional to above specified, for Codensa the manufacturers shall to attach the RETIE certification in the first supply.

Para Peru:

Para los conductores de aleación de aluminio de las secciones 304mm², 491 mm² y 608 mm² se indicará las dimensiones de las bobinas y las longitudes de los conductores en las órdenes de compra.

8.8.1

Packing and Marking

Enel Distribuição Rio (Brasil), Chilectra (Chile), Codensa (Colombia), Enel Distribuição Ceará (Brasil), Enel distribución Perú, Edesur (Argentina).

The spools must:

Indicate the correct rolling direction with an arrow on its side.

Have a stainless steel plate for its identification on each side, each one of which must include at least the following information, in the language of the country where it will be used (Spanish or Portuguese):

- Name of the manufacturer
- Country of origin of the item
- ENEL GROUP
- Purchase Order N°
- Conductor caliber (en mm²)
- Number of the spool within the delivered batch.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

		• Net weight and gross weight in kg. • Cable type • Cable length, in meters. <u>For Perú:</u> A plate/label (stainless or polyethylene) shall be applied in both flanges and shall have the following information (in Spanish): 1) Enel Distribución Peru 2) Name of the manufacturer 3) Country of origin of the item 4) Country code 5) Description of item 6) Cable type 7) Conductor caliber (mm²) 8) Year and month of manufacture 9) Number of the spool within the delivered batch. 10) Cable length, in meters. 11) Manufacture standard 12) Purchase Order N° 13) Net weight and gross weight in kg. 14) Weight of the coil in kg 15) Weight of one meter of cable in kg 16) Coil dimension in mm Note: The plate/label used shall be resistant to UV ray, tearing, chemical substances. The dimension will be at least: Height: 230 mm Width: 140 mm. The size of the letters should be: Width: 4.5 mm; Height: 10 mm. An example is given in the following figure.
--	--	--

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

		NOMBRE DEL PROVEEDOR	
	Cliente		
	Fabricante		
	País de Origen		
	Código de País		
	Descripción		
	Mes/Año de Producción		
	Matricula de Carrete		
	Punta Inicial		
	Punta Final		
	Cantidad (m)		
	Sección del Conductor (mm2)	Fase:	
	Tipo de Cable / Aislamiento		
	Norma de Fabricación		
	Tensión Uo/U (Umax)		
	Orden de Compra		
	Peso Neto (kg)		
	Peso metro de cable		
	Peso de carrete (kg)		
	Dimensiones de carrete		
	Peso Bruto (kg)		

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*
7.9.2.LOCAL SECTION B – ESPAÑA: e-distribución redes digitales.

ITEM	TITLE	DESCRIPTION																																			
7.2	International Standards	• IEC 60050-466: Vocabulario electrotécnico internacional. Líneas aéreas. • EN 50182: Conductores para líneas eléctricas aéreas. Conductores de alambres redondos cableados en capas concéntricas. • EN 50183: Conductores para líneas eléctricas aéreas. Alambres en aleación de aluminio-magnesio-silicio. • EN 50189: Conductores para líneas eléctricas aéreas. Alambres de acero galvanizado. • EN 60889: Alambre de aluminio duro para Conductores de líneas aéreas de transporte de energía eléctrica. • EN 61232: Alambres de acero recubiertos de aluminio para usos eléctricos. • EN 50326: Conductores para líneas eléctricas aéreas. Características de los productos de protección (grasas).																																			
	List of replaced Standards	• Norma GE AND010: Conductores desnudos para líneas eléctricas aéreas de media tensión hasta 30kV.																																			
	Local Standards	• UNE 20003: Cobre-tipo recocido e industrial, para aplicaciones eléctricas. • UNE 21045: Bobinas de madera destinadas a conductores desnudos para conductores de líneas eléctricas aéreas. • UNE 207015: Conductores desnudos de cobre duro cableados para líneas eléctricas aéreas. • UNE 21044: Planes de muestreo y criterios de aceptación y rechazo en la recepción de cables desnudos para conductores de l íneas eléctricas aéreas																																			
7.6.5	Greases	The weight of the grease per km of each aluminum conductors, aluminum-coated-steel reinforced in this standard is indicated in following Table: <table><tr><th>DESIGNACIÓN</th><th>VOLUMEN GRASA</th><th>DENSIDAD GRASA</th><th>FACTOR DE</th><th>MASA GRASA</th></tr><tr><td>según EN 50182</td><td>“Vg” (cm³/km)</td><td>“δ” (g/cm³)</td><td>RELLENO</td><td>(kg/km)</td></tr><tr><td>47-AL1/ 8-A20SA</td><td>15586,23</td><td>0,87</td><td>0,8</td><td>10,85</td></tr><tr><td>67- AL1/ 11-A20SA</td><td>21732,91</td><td>0,87</td><td>0,8</td><td>15,13</td></tr><tr><td>107-AL1/ 18-A20SA</td><td>35740,17</td><td>0,87</td><td>0,8</td><td>24,88</td></tr><tr><td>119-AL1/ 28-A20SA</td><td>46758,68</td><td>0,87</td><td>0,8</td><td>32,54</td></tr><tr><td>147-AL1/ 34-A20SA</td><td>58904,86</td><td>0,87</td><td>0,8</td><td>41,00</td></tr></table> The weight of the grease shall not vary more than ±20% from the values shown in this table.	DESIGNACIÓN	VOLUMEN GRASA	DENSIDAD GRASA	FACTOR DE	MASA GRASA	según EN 50182	“Vg” (cm³/km)	“δ” (g/cm³)	RELLENO	(kg/km)	47-AL1/ 8-A20SA	15586,23	0,87	0,8	10,85	67- AL1/ 11-A20SA	21732,91	0,87	0,8	15,13	107-AL1/ 18-A20SA	35740,17	0,87	0,8	24,88	119-AL1/ 28-A20SA	46758,68	0,87	0,8	32,54	147-AL1/ 34-A20SA	58904,86	0,87	0,8	41,00
DESIGNACIÓN	VOLUMEN GRASA	DENSIDAD GRASA	FACTOR DE	MASA GRASA																																	
según EN 50182	“Vg” (cm³/km)	“δ” (g/cm³)	RELLENO	(kg/km)																																	
47-AL1/ 8-A20SA	15586,23	0,87	0,8	10,85																																	
67- AL1/ 11-A20SA	21732,91	0,87	0,8	15,13																																	
107-AL1/ 18-A20SA	35740,17	0,87	0,8	24,88																																	
119-AL1/ 28-A20SA	46758,68	0,87	0,8	32,54																																	
147-AL1/ 34-A20SA	58904,86	0,87	0,8	41,00																																	
7.5.3	Stranding	The directions of lay of the external layer shall be “right-hand” to copper conductors.																																			

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

8. ANNEX

ANNEX A – TECHNICAL CHECK LIST

To be provided in the technical offer during tenders:

Item	Description	Unit	Required values	Ofered values
1	GENERAL INFORMATION			
1.1	Supplier Name	-		
1.2	Suplier CUI			
1.3	Factory	-		
1.4	Location of factory	-		
2	MAIN FEATURES			
2.1	Distribution Company and Country	-		
2.2	Country Code	-		
2.3	GS Type Code	-		
2.4	Type	-		
2.5	Code Word	-		
2.6	International standard of reference	-		
2.7	Designation	-		
3	CONDUCTOR PROPERTIES			
3.1	Total diameter	[mm]		
3.2	Core diameter	[mm]		
3.3	Total section	[mm ²]		
3.4	Core section	[mm ²]		
3.5	Mass	[kg/km]		
3.6	DC Resistance at 20°C	[Ω/ km]		
3.7	AC Resistance at 75°C	[Ω/ km]		
3.8	Rated tensile Strength	[daN]		
3.9	Modulus of elasticity	[KN/mm ²]		
3.10	Coefficient of linear expansion	[10 ⁻⁶ /°C]		
4	CONDUCTOR FORMATION			
4.1	Construction	-		
4.2	Number of wires	-		
4.3	Number of layers			
4.4	Aluminium	-		
4.4.1	designation	-		

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Item	Description	Unit	Required values	Offered values
4.4.2	wires number	-		
4.4.3	wire diameter	[mm]		
4.4.4	section	[mm ²]		
4.4.5	mass	[kg/km]		
4.5	Steel	-		
4.5.1	designation	-		
4.5.2	wires number	-		
4.5.3	wire diameter	[mm]		
4.5.4	section	[mm ²]		
4.5.5	mass	[kg/km]		
4.6	Copper	-		
4.6.1	designation	-		
4.6.2	wires number	-		
4.6.3	wire diameter	[mm]		
4.6.4	section	[mm ²]		
4.6.5	mass	[kg/km]		
4.7	Direction of lay of external layer	-		
5	GREASE			
5.1	Designation of grease	-		
5.2	Comercial Code	-		
5.3	Density	[kg/m ³]		
5.4	Layers in which is applied	-		
5.5	Fill factor	[%]		
5.6	Mass of grease	[kg/km]		
6	AMPACITY as IEC TR 61597 (Ta: 25°C; Wind speed: 0,6 m/s; Solar radiation: 1 kW/m²)			
6.1	Absorptivity	-		
6.2	Emissivity	-		
6.3	Ampacity Tc=50°C (ΔT=25°C)	[A]		
6.4	Ampacity Tc=70°C (ΔT=45°C)	[A]		
6.5	Ampacity Tc=75°C (ΔT=50°C)	[A]		
6.6	Ampacity Tc=80°C (ΔT=55°C)	[A]		
6.7	Ampacity Tc=85°C (ΔT=60°C)	[A]		
7	TCA			
7.1	There is an active TCA for this reference	YES/NO		
7.2	In case 7.1 answer is YES, indicate TCA Code	-		

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

Item	Description	Unit	Required values	Offered values
8	COMMENTS			
8.1	Any exception to what is required in GSC003	-		
8.2	Additional comments	-		

ANNEX B – GLOBAL TYPE CODES

GS Type Code	Denomination GSC003	Al. wires Nº / diam. Ud. / (mm)		Steel wires Nº / diam. Ud. / (mm)		Total Area (mm ²)	Total diameter (mm)	DC Resistance (Ω/km)	Mass per unit length (kg/km)	Rated strength (daN)	Coeff. Of linear expansion (x10 ⁻⁶)	Final Modulus of elasticity (kN/mm ²)	Grease (Yes/No)
GSC003/01	ACSR 25	6	2,12	1	2,12	24,71	6,36	1,3203	85,5	794	18,8	74,3	No
GSC003/08	ACSR 28 (G)	6	2,25	1	2,25	27,83	6,75	1,1721	96,3	895	18,8	74,3	Yes
GSC003/02	ACSR 39	6	2,67	1	2,67	39,19	8,01	0,8324	135,6	1.209	18,8	74,3	No
GSC003/11#	ACSR 55	6	3,15	1	3,15	54,55	9,45	0,598	188,8	1.629	18,8	74,3	No
GSC003/42	ACSR 56	6	3,2	1	3,2	56,30	9,6	0,5795	194,8	1.681	18,8	74,3	No
GSC003/09	ACSR 56 (G)	6	3,2	1	3,2	56,30	9,6	0,5795	194,8	1.681	18,8	74,3	Yes
GSC003/03	ACSR 62	6	3,37	1	3,37	62,44	10,11	0,5225	216,1	1.864	18,8	74,3	No
GSC003/04#	ACSR 79	6	3,78	1	3,78	78,55	11,34	0,4153	271,8	2.312	18,8	74,3	No
GSC003/43#	ACSR 81	26	1,85	7	1,44	81,29	11,72	0,4034	282,2	2.627	18,9	73,9	No
GSC003/77	ACSR 82	12	2,34	7	2,34	81,71	11,7	0,5147	377,9	4.335	15,3	104,7	No
GSC003/47	ACSR 108	12	2,69	7	2,69	107,98	13,45	0,3895	499,5	5.695	15,3	104,7	No
GSC003/44	ACSR 110	26	2,15	7	1,67	109,73	13,61	0,2987	380,6	3.493	18,9	73,9	No
GSC003/10	ACSR 110 (G)	26	2,15	7	1,67	109,73	13,61	0,2987	380,6	3.493	18,9	73,9	Yes
GSC003/14#	ACSR 116	30	2	7	2	116,24	14	0,2964	432,5	4.317	17,9	80,5	No
GSC003/05#	ACSR 125	6	4,77	1	4,77	125,09	14,31	0,2608	432,9	3.681	18,8	74,3	No
GSC003/45	ACSR 141	26	2,44	7	1,9	141,42	15,46	0,2319	491,0	4.450	18,9	73,9	No
GSC003/78	ACSR 142	12	3,08	7	3,08	141,56	15,4	0,2971	654,8	7.212	15,3	104,7	No
GSC003/46	ACSR 149	26	2,5	7	1,95	148,53	15,85	0,2209	516,0	4.679	18,8	74,0	No
GSC003/06#	ACSR 157	26	2,57	7	2	156,87	16,28	0,2091	544,5	4.866	18,9	73,9	No
GSC003/79	ACSR 169	12	3,37	7	3,37	169,47	16,85	0,2482	783,9	8.634	15,3	104,7	No
GSC003/53	ACSR 173	26	2,7	7	2,1	173,11	17,1	0,1894	600,8	5.367	18,9	73,9	No
GSC003/95	ACSR 173 (G)	26	2,7	7	2,1	173,11	17,1	0,1894	600,8	5.367	18,9	73,9	Yes
GSC003/17#	ACSR 182	30	2,5	7	2,5	181,62	17,5	0,1897	675,8	6.494	17,9	80,5	No
GSC003/07#	ACSR 198	26	2,89	7	2,25	198,39	18,31	0,1653	688,7	6.156	18,9	73,9	No
GSC003/96	ACSR 214 (G)	26	3,00	7	2,33	213,60	19,0	0,1535	741,0	6.522	18,9	73,8	Yes
GSC003/54#	ACSR 281	26	3,44	7	2,68	281,13	21,8	0,1167	976,2	8.489	18,9	74,0	No
GSC003/98	ACSR 281 (G)	26	3,44	7	2,68	281,13	21,8	0,1167	976,2	8.489	18,9	74,0	Yes
GSC003/48	ACSR 298	18	4,47	1	4,47	298,17	22,35	0,1011	899,5	6.246	21,1	62,1	No
GSC003/80	ACSR 329	26	3,72	7	2,89	328,50	23,55	0,0998	1139,6	9.756	18,9	73,9	No
GSC003/55	ACSR 346	24	4,03	7	2,69	345,92	24,19	0,0925	1156,2	9.433	19,4	70,5	No
GSC003/56	ACSR 354	26	3,86	7	3	353,74	24,44	0,0927	1227,3	10.509	18,9	73,9	No
GSC003/97	ACSR 354 (G)	26	3,86	7	3	353,74	24,44	0,0927	1227,3	10.509	18,9	73,9	Yes
GSC003/49	ACSR 372	26	3,97	7	3,01	371,65	24,91	0,0878	1278,4	10.629	19	73,1	No
GSC003/57#	ACSR 381	54	2,82	7	2,82	380,99	25,38	0,0842	1274,6	10.718	19,4	70,5	No

to be used in the construction of new lines

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

GS Type Code	Denomination GSC003	Al. wires Nº / diam. Ud. / (mm)		Steel wires Nº / diam. Ud. / (mm)		Total Area (mm ²)	Total diameter (mm)	DC Resistance (Ω/km)	Mass per unit length (kg/km)	Rated strength (daN)	Coeff. Of linear expansion (x10-6)	Final Modulus of elasticity (kN/mm ²)	Grease (Yes/No)
GSC003/58#	ACSR 454	54	3,08	7	3,08	454,49	27,72	0,0706	1520,5	12.375	19,4	70,5	No
GSC003/50	ACSR 468	26	4,44	7	3,45	468,00	28,11	0,0701	1623,6	13.639	18,9	73,9	No
GSC003/51	ACSR 517	45	3,7	7	2,47	517,39	29,61	0,0592	1599,3	11.565	20,8	63,8	No
GSC003/59#	ACSR 547	54	3,38	7	3,38	547,33	30,42	0,0586	1831,1	14.904	19,4	70,5	No
GSC003/99	ACSR 547 (G)	54	3,38	7	3,38	547,33	30,42	0,0586	1831,1	14.904	19,4	70,5	Yes
GSC003/60	ACSR 824	54	4,14	19	2,55	823,95	37,59	0,039	2770,1	22.693	19,4	70,9	No
GSC003/12#	ACSR/AW 55	6	3,15	1	3,15	54,55	9,45	0,5802	179,5	1.707	19,7	69,9	No
GSC003/81	ACSR/AW 55 (G)	6	3,15	1	3,15	54,55	9,45	0,5802	179,5	1.707	19,7	69,9	Yes
GSC003/92#	ACSR/AW 79	6	3,78	1	3,78	78,55	11,34	0,403	258,5	2.312	19,7	69,9	No
GSC003/13	ACSR/AW 79 (G)	6	3,78	1	3,78	78,55	11,34	0,403	258,5	2.312	19,7	69,9	Yes
GSC003/102#	ACSR/AW 125	6	4,77	1	4,77	125,09	14,31	0,2531	411,6	3.503	19,7	69,9	No
GSC003/15	ACSR/AW 125 (G)	6	4,77	1	4,77	125,09	14,31	0,2531	411,6	3.503	19,7	69,9	Yes
GSC003/103	ACSR/AW 148	15	3,15	4	3,15	148,07	15,75	0,2264	529,8	5.669	18,6	76,9	No
GSC003/16	ACSR/AW 148 (G)	15	3,15	4	3,15	148,07	15,75	0,2264	529,8	5.669	18,6	76,9	Yes
GSC003/41#	ACSR/AW 149	26	2,5	7	1,95	148,53	15,85	0,2144	491,0	4.742	19,8	69,6	No
GSC003/52	ACSR/AW 149 (G)	26	2,5	7	1,95	148,53	15,85	0,2144	491,0	4.742	19,8	69,6	Yes
GSC003/61#	ACSR/AW 157	26	2,57	7	2	156,87	16,28	0,203	518,2	4.932	19,8	69,6	No
GSC003/104#	ACSR/AW 182	30	2,5	7	2,5	181,62	17,5	0,1819	634,7	6.700	19	74,7	No
GSC003/18	ACSR/AW 182 (G)	30	2,5	7	2,5	181,62	17,5	0,1819	634,7	6.700	19	74,7	Yes
GSC003/62#	ACSR/AW 281	26	3,44	7	2,68	281,13	21,8	0,1133	929,0	8.726	19,8	69,6	No
GSC003/63#	ACSR/AW 381	54	2,82	7	2,82	380,99	25,38	0,0822	1222,3	10.980	20,3	66,9	No
GSC003/64#	ACSR/AW 454	54	3,08	7	3,08	454,49	27,72	0,0689	1458,1	12.897	20,3	66,9	No
GSC003/65#	ACSR/AW 547	54	3,38	7	3,38	547,33	30,42	0,0572	1756,0	15.406	20,3	66,9	No
GSC003/100	ACSR/AW 594	54	3,52	7	3,52	593,62	31,68	0,0528	1904,5	16.174	20,3	66,9	No
GSC003/19	AAAC 25	7	2,13	-	-	24,94	6,39	1,3313	68,1	735	23	63,30	No
GSC003/82	AAAC 25 (G)	7	2,13	-	-	24,94	6,39	1,3313	68,1	735	23	63,30	Yes
GSC003/20	AAAC 50	7	3,02	-	-	50,14	9,06	0,6623	136,9	1.479	23	63,30	No
GSC003/83	AAAC 50 (G)	7	3,02	-	-	50,14	9,06	0,6623	136,9	1.479	23	63,30	Yes
GSC003/22	AAAC 67 (G)	7	3,5	-	-	67,35	10,5	0,4931	183,9	1.986	23	63,30	Yes
GSC003/21	AAAC 70	19	2,17	-	-	70,27	10,85	0,4753	192,9	2.072	23	61,20	No
GSC003/84	AAAC 70 (G)	19	2,17	-	-	70,27	10,85	0,4753	192,9	2.072	23	61,20	Yes
GSC003/23	AAAC 120	19	2,83	-	-	119,51	14,15	0,2795	328,1	3.525	23	61,20	No
GSC003/85	AAAC 120 (G)	19	2,83	-	-	119,51	14,15	0,2795	328,1	3.525	23	61,20	Yes
GSC003/32	AAAC 148	19	3,15	-	-	148,07	15,75	0,2256	406,5	4.368	23	61,20	No
GSC003/24	AAAC 161	19	3,28	-	-	160,54	16,4	0,208	440,7	4.736	23	61,20	No
GSC003/86	AAAC 161 (G)	19	3,28	-	-	160,54	16,4	0,208	440,7	4.736	23	61,20	Yes
GSC003/66	AAAC 188	19	3,55	-	-	188,06	17,75	0,1776	516,3	5.547	23	61,20	No
GSC003/25	AAAC 200	19	3,66	-	-	199,90	18,3	0,1671	548,8	5.896	23	61,20	No
GSC003/87	AAAC 200 (G)	19	3,66	-	-	199,90	18,3	0,1671	548,8	5.896	23	61,20	Yes
GSC003/26	AAAC 236 (G)	37	2,85	-	-	236,04	19,95	0,142	650,2	6.963	23	58,90	Yes
GSC003/27	AAAC 240	61	2,24	-	-	240,39	20,16	0,1399	664,4	7.091	23	58,30	No
GSC003/67	AAAC 279	37	3,1	-	-	279,26	21,7	0,12	769,3	8.238	23	58,90	No
GSC003/68	AAAC 303 (G)	37	3,23	-	-	303,18	22,61	0,1106	835,2	8.943	23	58,90	Yes
GSC003/28	AAAC 315	37	3,29	-	-	314,55	23,03	0,1066	866,5	9.279	23	58,90	No
GSC003/88	AAAC 315 (G)	37	3,29	-	-	314,55	23,03	0,1066	866,5	9.279	23	58,90	Yes
GSC003/69	AAAC 381	61	2,82	-	-	380,99	25,38	0,0883	1053,0	11.239	23	58,30	No
GSC003/29	AAAC 400	37	3,71	-	-	399,98	25,97	0,0838	1101,9	11.799	23	58,90	No
GSC003/89	AAAC 400 (G)	37	3,71	-	-	399,98	25,97	0,0838	1101,9	11.799	23	58,90	Yes

to be used in the construction of new lines

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

GS Type Code	Denomination GSC003	Al. wires Nº / diam. Ud. / (mm)		Steel wires Nº / diam. Ud. / (mm)		Total Area (mm ²)	Total diameter (mm)	DC Resistance (Ω/km)	Mass per unit length (kg/km)	Rated strength (daN)	Coeff. Of linear expansion (x10-6)	Final Modulus of elasticity (kN/mm ²)	Grease (Yes/No)
GSC003/70	AAAC 454	61	3,08	-	-	454,49	27,72	0,074	1256,1	13.407	23	58,30	No
GSC003/71	AAAC 500 (G) 61H	61	3,23	-	-	499,83	29,07	0,0673	1381,4	14.745	23	58,30	Yes
GSC003/30	AAAC 500	37	4,15	-	-	500,48	29,05	0,067	1378,7	14.764	23	58,90	No
GSC003/90	AAAC 500 (G)	37	4,15	-	-	500,48	29,05	0,067	1378,7	14.764	23	58,90	Yes
GSC003/101	AAAC 607 (G)	61	3,56	-	-	607,18	32,04	0,0554	1678,1	17.911	23	58,30	Yes
GSC003/31	AAAC 631	37	4,66	-	-	631,05	32,62	0,0531	1738,4	18.615	23	58,90	No
GSC003/91	AAAC 631 (G)	37	4,66	-	-	631,05	32,62	0,0531	1738,4	18.615	23	58,90	Yes
GSC003/72	AAAC 681	61	3,77	-	-	680,93	33,93	0,0494	1881,9	20.087	23	58,30	No

GS Type Code	Denomination GSC003	Copper wires Nº / diam. Ud. / (mm)		Total Area (mm ²)	Total diameter (mm)	DC Resistance (Ω/km)	Mass per unit length (kg/km)	Coeff. Of linear expansion (x10-6)	Final Modulus of elasticity (kN/mm ²)	Grease (Yes/No)	Direction of Lay
GSC003/33	CC 23	7	2,06	23,33	6,18	0,795	212	17	105	No	Left(S)
GSC003/34	CC 34	7	2,5	34,36	7,5	0,538	312	17	105	No	Left(S)
GSC003/37	CC 35	7	2,52	34,91	7,56	0,529	317	17	105	No	Right(Z)
GSC003/38	CC 49	7	3	49,48	9	0,372	449	17	105	No	Right(Z)
GSC003/35	CC 67	19	2,12	67,07	10,6	0,276	612	17	105	No	Left(S)
GSC003/39	CC 70	19	2,17	70,27	10,85	0,268	641	17	105	No	Right(Z)
GSC003/36	CC 93	19	2,5	93,27	12,5	0,198	850	17	105	No	Left(S)
GSC003/40	CC 95	19	2,52	94,76	12,6	0,196	864	17	105	No	Right(Z)
GSC003/94	CC 500	61	3,23	499,83	29,07	0,0366	4586	17	105	No	Left(S)
GSC003/93	CC 1015	127	3,19	1015,02	41,47	0,018	9272	17	105	No	Left(S)

Values of DC Resistance, Mass per unit length, Rated Strength, Coefficient of linear expansion and Final Modulus of elasticity presented on the tables above are calculated values using the method indicated on relevant standard and IEC-TR 61597.

Nominal values specified on the local sections or a specific order could present some variation from the indicated values, with a deviation no greater than $\pm 2\%$ of the value indicated herein.

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*
ANNEX C – COMMON LIST

COMMON LIST				Rev.04 05/07/2021
GS Type Code	Code Words	Distribution Company and Country	Country Code	TAM Description
GSC003/08	ACSR 28 (G)	Edesur Argentina	0101-0374	CONDUCTOR DESNUDO AL-AO 25/4 MM ² LAMT
GSC003/09	ACSR 56 (G)	Edesur Argentina	0101-0254	CONDUCTOR DESN AL AO 50 8 MM2 LAMT
GSC003/10	ACSR 110 (G)	Edesur Argentina	0101-0255	CONDUCTOR DESN AL AO 95 15 MM2 LAMT
GSC003/23	AAAC 120	Edesur Argentina	0101-0257	CONDUCTOR DESN ALEAC AL120 MM2 LAMT
GSC003/11	ACSR 55	edistribución España	310071	CONDUCTOR 47AL1/8ST1A (COD.ANT.:LA-56)
GSC003/14	ACSR 116	edistribución España	310050	CONDUCTOR 94-AL1/22-ST1A(COD.ANT.LA-110)
GSC003/17	ACSR 182	edistribución España	310051	CONDUCTOR 147-AL1/34-ST1A(COD.ANT.LA-180)
GSC003/54	ACSR 281	edistribución España	310018	CABLE 242-AL1/39-ST1A (LA-280)
GSC003/57	ACSR 381	edistribución España	310019	CABLE 337-AL1/44-ST1A (LA-380)
GSC003/58	ACSR 454	edistribución España	310030	CABLE 402-AL1/52-ST1A (LA-455)
GSC003/59	ACSR 547	edistribución España	310080	CABLE 485-AL1/63-ST1A (LA-545)
GSC003/12	ACSR/AW 55	edistribución España	310041	CONDUCTOR 47AL1/8-A20SA(LARL-56)NO GRASA
GSC003/81	ACSR/AW 55 (G)	edistribución España	310025	CONDUCT. 47AL1/8-A20SA(LARL-56)ENGRASADO
GSC003/92	ACSR/AW 79	edistribución España	310029	CONDUCT. 67AL1/11-A20SA(LARL-78)NO GRASA
GSC003/13	ACSR/AW 79 (G)	edistribución España	310024	CONDUCT.67AL1/11-A20SA(LARL-78)ENGRASADO
GSC003/102	ACSR/AW 125	edistribución España	310028	COND. 107AL1/18-A20SA(LARL-125E)NO GRASA
GSC003/15	ACSR/AW 125 (G)	edistribución España	310023	COND.107AL1/18-A20SA(LARL-125E)ENGRASADO
GSC003/103	ACSR/AW 148	edistribución España	310027	COND. 117AL1/31-A20SA(LARL-145E)NO GRASA
GSC003/16	ACSR/AW 148 (G)	edistribución España	310022	COND.117AL1/31-A20SA(LARL-145E)ENGRASADO
GSC003/104	ACSR/AW 182	edistribución España	310026	CONDUC.147AL1/34-A20SA(LARL-180)NO GRASA
GSC003/18	ACSR/AW 182 (G)	edistribución España	310009	COND. 147AL1/34-A20SA(LARL-180)ENGRASADO
GSC003/62	ACSR/AW 281	edistribución España	310032	CABLE 242-AL1/39-A20SA (LARL HAWK)
GSC003/63	ACSR/AW 381	edistribución España	310033	CABLE 337-AL1/44-A20SA (LARL GULL)
GSC003/64	ACSR/AW 454	edistribución España	310034	CABLE 402-AL1/52-A20SA (LARL CONDOR)
GSC003/32	AAAC 148	edistribución España	160297	CONDUCTOR 148-AL3 (CODIGO ANTIGUO:D-145)
GSC003/66	AAAC 188	edistribución España	310014	CABLE 188-AL3 (D-180)
GSC003/67	AAAC 279	edistribución España	310015	CABLE 279-AL3 (D-280)
GSC003/69	AAAC 381	edistribución España	310016	CABLE 381-AL3 (D-400)
GSC003/70	AAAC 454	edistribución España	310017	CABLE 454-AL3 (D-450)
GSC003/37	CC 35	edistribución España	310059	CABLE LINEAS AÉREAS COBRE C35
GSC003/38	CC 49	edistribución España	310060	CABLE LINEAS AÉREAS COBRE C50E
GSC003/39	CC 70	edistribución España	310010	CABLE LINEAS AÉREAS COBRE C70
GSC003/40	CC 95	edistribución España	310061	CABLE LINEAS AÉREAS COBRE C95
GSC003/12	ACSR/AW 55	E-distribuzione Italia	317056	CORDA AL-AC DIAM 9,45 LINEE MT
GSC003/41	ACSR/AW 149	E-distribuzione Italia	317011	CORDA ALAC 150MMQ
GSC003/01	ACSR 25	Enel Brasil	310604	CABO,NU,CAA,CL.A,4AWG,SWAN,GSC003
GSC003/03	ACSR 62	Enel Brasil	310605	CABO,NU,CAA,CL.A,1/0AWG,RAVEN,GSC003
GSC003/04	ACSR 79	Enel Brasil	310889	CABO NU CAA 2/0 AWG 6/1F, QUAIL,GSC003
GSC003/77	ACSR 82	Enel Brasil	311103	CABO,NU,CAA,CL.B,101MCM,PETREL,GSC003
GSC003/77	ACSR 82	Enel Brasil	990306	CABO,NU,CAA,CL.B,101MCM,PETREL,GSC003
GSC003/47	ACSR 108	Enel Brasil	310774	CABO,NU,CAA,CL.B,134MCM,LEGHORN,GSC003
GSC003/05	ACSR 125	Enel Brasil	310651	CABO,NU,CAA,CL.A,4/0AWG,PENGUIN,GSC003
GSC003/78	ACSR 142	Enel Brasil	310030	CABO,NU,CAA,ACSR 142,GSC003/78
GSC003/06	ACSR 157	Enel Brasil	310652	CABO,NU,CAA,CL.A,266MCM,PARTRIDGE,GSC003

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

COMMON LIST				Rev.04 05/07/2021
GS Type Code	Code Words	Distribution Company and Country	Country Code	TAM Description
GSC003/79	ACSR 169	Enel Brasil	310029	CABO,NU,ACSR 169,GSC003/79
GSC003/07	ACSR 198	Enel Brasil	310634	CABO,NU,CAA,CL.A,336MCM,LINNET,GSC003
GSC003/54	ACSR 281	Enel Brasil	311087	CABO,NU,CAA,CL.B,477MCM,HAWK,GSC003
GSC003/54	ACSR 281	Enel Brasil	310019	CABO,NU,CAA,477MCM,HAWK,B,GSC003
GSC003/48	ACSR 298	Enel Brasil	310031	CABO,NU,ACSR 298,GSC003/48
GSC003/80	ACSR 329	Enel Brasil	310540	CABO,NU,CAA,CL.B,556MCM,DOVE,GSC003
GSC003/49	ACSR 372	Enel Brasil	310908	CABO, ELETRICO NU AL CAA, 636 MCM 2
GSC003/57	ACSR 381	Enel Brasil	310026	CABO,NU,337-AL1/44-ST1A,GSC003/57
GSC003/58	ACSR 454	Enel Brasil	310024	CABO,NU,402-AL1/52-ST1A,GSC003/58
GSC003/50	ACSR 468	Enel Brasil	310913	CABO, ELETRICO NU AL CAA, 795 MCM 2,FP
GSC003/51	ACSR 517	Enel Brasil	310644	CABO,NU,CAA,CL.A,954MCM,RAIL,GSC003
GSC003/59	ACSR 547	Enel Brasil	310022	CABO,NU,485-AL1/63-ST1A,GSC003/59
GSC003/61	ACSR/AW 157	Enel Brasil	310021	CABO,NU,CAA,CL.A,266MCM,GSC003/61#
GSC003/62	ACSR/AW 281	Enel Brasil	310028	CABO,NU,242-AL1/39-A20SA,GSC003/62
GSC003/105	ACSR/AW 329	Enel Brasil	310020	CABO,NU,CAA,CL.B,556MCM,DOVE,GSC003/105
GSC003/63	ACSR/AW 381	Enel Brasil	310027	CABO,NU,337-AL1/44-A20SA,GSC003/63
GSC003/64	ACSR/AW 454	Enel Brasil	310025	CABO,NU,402-AL1/52-A20SA,GSC003/64
GSC003/65	ACSR/AW 547	Enel Brasil	310023	CABO,NU,ACSR/AW 547,GSC003/65#
GSC003/19	AAAC 25	Enel Brasil	310653	CONDUTOR LIGA AL 25MM-AAAC-7F-GSC-003
GSC003/82	AAAC 25 (G)	Enel Brasil	310636	COND LIGA AL NU ENGRAX AAAC25MM- GSC-003
GSC003/20	AAAC 50	Enel Brasil	310654	CONDUTOR LIGA AL 50MM-AAAC-7F-GSC-003
GSC003/83	AAAC 50 (G)	Enel Brasil	310434	COND LIGA AL NU ENGRAX AAAC50MM- GSC-003
GSC003/21	AAAC 70	Enel Brasil	311101	CABO,NU,CAL 70MM2,19F,GSC003
GSC003/84	AAAC 70 (G)	Enel Brasil	310633	COND LIGA AL NU ENGRAX AAAC70MM- GSC-003
GSC003/23	AAAC 120	Enel Brasil	310639	CABO,NU,CAL 120MM2,19F,GSC003
GSC003/24	AAAC 161	Enel Brasil	310650	CONDUTOR LIGA AL 160MM-AAAC-19F- GSC-003
GSC003/86	AAAC 161 (G)	Enel Brasil	310539	COND LIGA AL NU ENGRAX AAAC160MM GSC-003
GSC003/25	AAAC 200	Enel Brasil	310534	CONDUTOR LIGA AL 200MM-AAAC-19F- GSC-003
GSC003/87	AAAC 200 (G)	Enel Brasil	310646	COND LIGA AL NU ENGRAX AAAC200MM GSC-003
GSC003/28	AAAC 315	Enel Brasil	311096	CONDUTOR LIGA AL 315MM-AAAC-37F- GSC-003
GSC003/88	AAAC 315 (G)	Enel Brasil	252014	COND LIGA AL NU ENGRAX AAAC315MM GSC-003
GSC003/29	AAAC 400	Enel Brasil	311097	CONDUTOR LIGA AL 400MM-AAAC-37F- GSC-003
GSC003/30	AAAC 500	Enel Brasil	311098	CONDUTOR LIGA AL 500MM-AAAC-37F- GSC-003
GSC003/31	AAAC 631	Enel Brasil	311099	CONDUTOR LIGA AL 630MM-AAAC-37F- GSC-003
GSC003/33	CC 23	Enel Brasil	310566	CABO,CU NU, 25MM2,7F,MEIO-DURO,GSC003
GSC003/34	CC 34	Enel Brasil	310567	CABO COBRE NU 35MM2 M DURA CL2A
GSC003/35	CC 67	Enel Brasil	310568	CABO,CU NU, 70MM2,19F,MEIO-DURO,GSC003
GSC003/36	CC 93	Enel Brasil	310569	CABO,CU NU, 95MM2,19F,MEIO-DURO,GSC003
GSC003/04	ACSR 79	Enel Chile	310009	Conductor ACSR MT 78,6 mm2 Quail
GSC003/07	ACSR 198	Enel Chile	310010	Conductor ACSR MT 198,4 mm2 Linnet
GSC003/21	AAAC 70	Enel Chile	310152	CABLE AL DESN AAAC 70MM2 19H E-MT-003
GSC003/23	AAAC 120	Enel Chile	310153	CABLE AL DESN AAAC 120MM2 19H E-MT-003
GSC003/24	AAAC 161	Enel Chile	310017	Conduc AAAC 161-AL3 GSC003/24
GSC003/25	AAAC 200	Enel Chile	310016	Conduc AAAC 200-AL3 GSC003/25
GSC003/27	AAAC 240	Enel Chile	310154	CABLE AL DESN AAAC 240MM2 61H E-MT-003
GSC003/28	AAAC 315	Enel Chile	310015	Conduc AAAC 315-AL3 GSC003/28

Subject: Global Infrastructure and Networks GSC003 Concentric-Lay-Stranded Bare Conductors
Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Infrastructure & Networks*

COMMON LIST				Rev.04 05/07/2021
GS Type Code	Code Words	Distribution Company and Country	Country Code	TAM Description
GSC003/29	AAAC 400	Enel Chile	310014	Conduc AAAC 400-AL3 GSC003/29
GSC003/30	AAAC 500	Enel Chile	310013	Conduc AAAC 500-AL3 GSC003/30
GSC003/31	AAAC 631	Enel Chile	310012	Conduc AAAC 631-AL3 GSC003/31
GSC003/33	CC 23	Enel Chile	310129	CABLE CU DESN SEMIDURO 25MM2 7H
GSC003/34	CC 34	Enel Chile	310130	CABLE CU DESN SEMIDURO 35MM2 7H
GSC003/35	CC 67	Enel Chile	310131	CABLE CU DESN SEMIDUR 70MM2 19H GSC003
GSC003/94	CC 500	Enel Chile	310146	CABLE CU DESN SEMIDURO 500MM2 61H
GSC003/93	CC 1015	Enel Chile	310125	CABLE CU DESN SEMIDURO 1000MM2 127H
GSC003/02	ACSR 39	Enel Colombia	310415	CABLE 2 AWG ACSR DESNUDO
GSC003/03	ACSR 62	Enel Colombia	310412	CABLE 1/0 AWG ACSR DESNUDO
GSC003/04	ACSR 79	Enel Colombia	310417	CABLE 2/0 ACSR DESNUDO
GSC003/05	ACSR 125	Enel Colombia	310414	CABLE 4/0 AWG ACSR DESNUDO
GSC003/06	ACSR 157	Enel Colombia	310413	CABLE 266,8 MCM ACSR DESNUDO
GSC003/55	ACSR 346	Enel Colombia	310425	CABLE 605 KCM ACSR DESNUDO PEACOCKNORMA
GSC003/28	AAAC 315	Enel Colombia	310427	CABLE AAAC 315MM2, DESNUDO NOR E-LT-001
GSC003/13	ACSR/AW 79 (G)	Enel Peru	310407	ACSR/AW 79 (G)
GSC003/52	ACSR/AW 149 (G)	Enel Peru	310406	ACSR/AW 149 (G)
GSC003/18	ACSR/AW 182 (G)	Enel Peru	310405	ACSR/AW 182 (G)
GSC003/22	AAAC 67 (G)	Enel Peru	310376	CONDUCTOR DESN.AAAC. 7H. 70MM2-C/GRASA
GSC003/85	AAAC 120 (G)	Enel Peru	310377	CONDUCTOR DESN.AAAC.19H.120MM2-C/GRASA
GSC003/26	AAAC 236 (G)	Enel Peru	310378	CONDUCTOR DESN.AAAC.19H.240MM2-C/GRASA
GSC003/68	AAAC 303 (G)	Enel Peru	310379	CONDUCTOR DESN.AAAC.37H.304MM2-C/GRASA
GSC003/71	AAAC 500 (G)	Enel Peru	310380	CONDUCTOR DESN.AAAC.61H.490MM2-C/GRASA
GSC003/101	AAAC 607 (G)	Enel Peru	310373	CONDUCTOR DESN.AAAC.61H.608 MM2-C/GRASA
GSC003/42	ACSR 56	Enel Romania	631302	CONDUCTOR AL-OL NEIZOLAT 50/8MMP
GSC003/43	ACSR 81	Enel Romania	631303	CONDUCTOR AL-OL NEIZOLAT 70/12MMP
GSC003/44	ACSR 110	Enel Romania	631248	CONDUCTOR OL-AL.NORM. 95/15, PT.LEA
GSC003/45	ACSR 141	Enel Romania	631305	CONDUCTOR AL-OL NEIZOLAT 120/21MMP
GSC003/95	ACSR 173 (G)	Enel Romania	310011	Conductor OL-AL 149/24 mmp2 tip ACSR 173 (G) GSC003/95
GSC003/96	ACSR 214 (G)	Enel Romania	310012	Conductor OL-AL 184/30 mmp2 tip ACSR 214 (G) GSC003/96
GSC003/98	ACSR 281 (G)	Enel Romania	310013	Conductor OL-AL 242/39 mmp2 tip ACSR 281 (G) GSC003/98
GSC003/97	ACSR 354 (G)	Enel Romania	310014	Conductor OL-AL 304/49 mmp2 tip ACSR 354 (G) GSC003/97
GSC003/99	ACSR 547 (G)	Enel Romania	310015	Conductor OL-AL 485/63 mmp2 tip ACSR 547 (G) GSC003/99
GSC003/41	ACSR/AW 149	Enel Romania	310016	Conductor OL-AL 128 /21 mm2 tip ACSR/AW149 GSC003/41

Brasil 310033 CABO,NU,CAA/AW,CL.A,1/0AWG,RAVEN,GSC003/03

310429 GSC003/110 CABLE ACSR 1113 MCM BLUE JAY Colombia

310047 Colombia Conductores AAAC 681 GSC003/72

310052 Colombia Conductor ACSR 824 GSC003/60