Base Load Power Hub (BLPH)

EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE – ELECTRICAL CABLE

Document Number: 1724001141-QC-DB-00007

Document Class: 2

03	02/04/2025	Accepted for Construction (AFC)	Fumagalli	Cucinotta	Messa
02	06/02/2025	Accepted for Construction (AFC)	Fumagalli	Cucinotta	Messa
01	14/01/2025	Issue for Review (IFR)	Fumagalli	Cucinotta	Messa
00	10/01/2025	Issue for Review (IFR)	Fumagalli	Cucinotta	Messa
Rev.	Date	Description	Prepared	Reviewed	Approved
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File: 1724001141-QC-DB-00007 rev.03

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)

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File: 1724001141-QC-DB-00007 rev.03

Base Load Power Hub (BLPH)

EQUIPMENT MANUFACTURERS RECORD BOOK (FINAL DOSSIER) INDEX

Document Number: 1724001141-QC-LIS-00006

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
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NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO S.p.A. Shipboard Lifting Quality Control Dept.	15/11/2024

Document Class: 2

02	11/11/2024	Accepted for Construction (AFC)	Fumagalli	Cucinotta	Messa
01	04/10/2024	Issue for Review (IFR)	Fumagalli	Cucinotta	Messa
00	02/07/2024	Issue for Review (IFR)	Fumagalli	Cucinotta	Messa
Rev.	Date	Description	Prepared	Reviewed	Approved

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File: 1724001141-QC-LIS-00006 rev.02

Revision / Change Log

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PART 1 – DESIGN DOSSIER

LIST

- Document register 1724001141-MD-LIS-00001 PAGE 7
- Cable drums schedule – electrical cables 1724001141-ELE-LIS-00004 PAGE 12
- ITP 1724001141-QC-ITP-00002 PAGE 16
- Packing, Transportation, Handling and Storage procedure 1724001141-QC-PRO-00008 PAGE 21

PROCEDURES AND SPECIFICATION

- Manufacturing and Testing procedures (FAT) 1724001141-QC-PRO-00005 PAGE 26
- Test Report and Declaration of Conformity PAGE 57

PART 2 – CERTIFICATION DOSSIER

PAGE 117

- Test record PAGE 118
- FAT reports (see Test record) / Material Certificates
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PART 1 - DESIGN DOSSIER

Base Load Power Hub (BLPH)

ELECTRICAL CABLES

SUPPLIER MASTER INFORMATION REGISTER

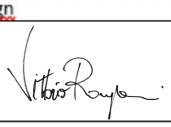
Document Number: 1724001141-MD-LIS-00001

Document Class: 3

ROSETTI MARINO

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Sign	Date
	03/07/2024

00	21/06/2024	Issue for Information (IFI)	FUMAGALLI	CUCINOTTA	BERETTA
Rev.	Date	Description	Prepared	Reviewed	Approved

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File: 1724001141-MD-LIS-00001 Rev.00

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4	References	X							
5	SMIR	X							

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SMIR - REGISTRO DOCUMENTI / *SMIR - SUPPLIER MASTER INFORMATION REGISTER*

	Ordine n°/*order nr.*	1724001141		Fornitore/*Supplier* :	FLEI SRL	
	data / *dated:*	07/06/2024		Codice F./ *S. Code:*		
	Commessa / *Job:*	123A90A		Indirizzo/ *address* :	VIA DE GASPERI, 82 20864 AGRATE BRIANZA (MB) MB	
	Descrizione / *Description*	ELECTRICAL CABLES		Persona di riferim./ *contact person:*	stefania.fumagalli@flei.it	
	Macrofase / *Phase*					

Pos.	Document nr. Client (1)	Doc Client Rev. (1)	Document nr. Internal	Document nr. Internal Rev. (2)	Document nr. Supplier (3)	Doc Supplier Rev. (3)	Titolo Documento / *Document title* (4)	Disciplina / *Discipline* (5)	Blocco Classe / *Class Block (6)*	Docum. Format (7)	first issue date (8)	Third Party Approval (I/A)	Design KEY Document	Document subject to liquidated damages	Document Approval (I/A)
							CONTROL DOCUMENTS								
1	1724001141-MD-LIS-00001	00	1724001141-MD-LIS-00001	00	SMIR01	00	SUPPLIER MASTER INDEX REGISTER (SMIR)- ELECTRICAL CABLES	ELE		A4	21/06/2024				I
							QUALITY DOCUMENTS								
2	1724001141-QC-ITP-00002	00	1724001141-QC-ITP-00002	00	ITP01	00	INSPECTION AND TEST PLAN (A4 sheets) - ELECTRICAL CABLES	QUA		A4	21/06/2024				A
							ENGINEERING DOCUMENTS								
3	1724001141-ELE-DS-00003	00	1724001141-ELE-DS-00003	00	DATA01	00	CABLE DATA SHEETS - ELECTRICAL CABLES	ELE		A4	21/06/2024		Y		I
4	1724001141-ELE-LIS-00004	00	1724001141-ELE-LIS-00004	00	SCHEDULE01	00	CABLE DRUMS SCHEDULE - ELECTRICAL CABLES	ELE		A4	21/06/2024				A
5	1724001141-QC-PRO-00005	00	1724001141-QC-PRO-00005	00	FAT01	00	FAT PROCEDURE - ELECTRICAL CABLES	QUA			30/06/2024				A
6	1724001141-QC-LIS-00006	00	1724001141-QC-LIS-00006	00	INDEX01	00	EQUIPMENT MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - ELECTRICAL CABLES	QUA		A4	30/06/2024				A
							CERTIFICATES (ref. to notes in the RDDS)								
7	1724001141-QC-DB-00007	00	1724001141-QC-DB-00007	00	BOOK01	00	EQUIPMENT MANUFACTURERS RECORD BOOK – COMPLETE - ELECTRICAL CABLES	CERT		A4	30/08/2024				A
							HANDLING, SHIPPING & SITE INSTALLATION								
8	1724001141-QC-PRO-00008	00	1724001141-QC-PRO-00008	00	PACKING01	00	PACKING SHIPPING HANDLING AND STORAGE PROCEDURES -ELECTRICAL CABLES	EXP		A4	20/07/2024				I

Notes:

(1) Numero documento Cliente
Document number assigned by final Client
(2) Numero documento interno
Document number internal
(3) Numero documento Fornitore (assegnato dal Fornitore)
Document number assigned by Supplier
(4) Assegnare il Titolo del documento (assegnato dal Fornitore)
Fill in the document title (to be assigned by Vendor)

(5) Specific are la disciplina (compilato da Rosetti)
Process, Piping; Electrical, Expediting, Inspection, Commissioning, Quality, ecc (to be filled by Rosetti)
(6) Blocco Classe: Specifica, Disegno, Report, Data Sheet, etc. (compilato da Rosetti)
Procedure, list, drawing, data sheet, etc. (to be filled by Rosetti)
(7) A4, A3, A1 (compilato dal Fornitore)
A4, A3, A1 (Supplier)
(8) Data prevista per l'emissione del documento (compilato dal Fornitore)
Foreseen date for the first issue (Supplier)

Base Load Power Hub (BLPH)

ELECTRICAL CABLES

CABLE DRUM SCHEDULE - ELECTRICAL CABLES

Document Number: 1724001141-ELE-LIS-00004

Document Class: 2

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Sign	Date
	15/10/2024

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02	27/09/2024	Accepted for Construction (AFC)	FUMAGALLI	CUCINOTTA	BERETTA
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Rev.	Date	Description	Prepared	Reviewed	Approved
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File: 1724001141-ELE-LIS-00004 Rev.03
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1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log / Hold List	X	X	X	X				
4	DRUM SCHEDULE	X	X	X	X				

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Pos. ORDER	quantità(km) quantity(km)	decrizione description	Insulation color
20	0,953	CU CL2/EPR/LSZH 1CX300 0,6/1KV GREY	BLACK
30	0,300	CU CL2/EPR/LSZH 1CX95 0,6/1KV GREY	BLACK
40	0,300	CU CL2/EPR/LSZH 4CX10 0,6/1KV GREY	BL/BR/GREY/BLUE
50	0,300	CU CL2/EPR/LSZH 3G10 0,6/1KV GREY	BR/BL/Y-G
60	1,561	CU CL2/EPR/LSZH 3G6 0,6/1KV GREY	BR/BL/Y-G
70	1,908	CU CL2/EPR/LSZH 3G2,5 0,6/1KV GREY	BR/BL/Y-G
80	0,561	CU CL2/EPR/LSZH 3G4 0,6/1KV GREY	BR/BL/Y-G
90	0,300	CU CL2/EPR/LSZH 4G16 0,6/1KV GREY	BL/BR/GREY/Y-G
100	0,300	CU CL2/EPR/LSZH 4G35 0,6/1KV GREY	BL/BR/GREY/Y-G
110	0,300	CU CL2/EPR/LSZH 4G4 0,6/1KV GREY	BL/BR/GREY/Y-G
120	0,768	CU CL2/EPR/LSZH 4G4_E 0,6/1KV GREY	BL/BR/BLUE/Y-G
130	0,300	CU CL2/EPR/LSZH 4G2,5_E 0,6/1KV GREY	BL/BR/BLUE/Y-G
140	0,300	CU CL2/EPR/LSZH 5G50 0,6/1KV GREY	BL/BR/GREY/BLUE/Y-G
150	0,300	CU CL2/EPR/LSZH 5G70 0,6/1KV GREY	BL/BR/GREY/BLUE/Y-G
160	0,328	CU CL2/EPR/LSZH 5G16 0,6/1KV GREY	BL/BR/GREY/BLUE/Y-G
170	0,300	CU CL2/EPR/LSZH 5G4 0,6/1KV GREY	BL/BR/GREY/BLUE/Y-G
180	0,328	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 2CX2,5 0,6/1KV ORANGE	RED/BLACK
190	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 3G16 0,6/1KV ORANGE	RED/BLACK/Y-G
200	1,497	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 3G2,5 0,6/1KV ORANGE	BR/BLUE/Y-G
210	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 3G6 0,6/1KV ORANGE	BR/BLUE/Y-G
220	0,528	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 4G4_E 0,6/1KV ORANGE	BL/BROW/BLUE/Y-G
230	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 4G2,5_E 0,6/1KV ORANGE	BL/BROW/BLUE/Y-G
240	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 2CX2,5 0,6/1KV ORANGE	BLACK NUMBERED (1-2)
250	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 1CX70 0,6/1KV ORANGE	RED
260	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 1CX70 0,6/1KV ORANGE	BLACK
270	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 1CX25 0,6/1KV ORANGE	RED
280	0,300	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 1CX25 0,6/1KV ORANGE	BLACK
290	0,300	CU CL2/LSZH TI7 1G150 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
300	0,807	CU CL2/LSZH TI7 1G95 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
310	0,300	CU CL2/LSZH TI7 1G35 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
320	1,500	CU CL2/LSZH TI7 1G16 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
330	0,500	CU CL2/LSZHTI7 1G10 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
340	2,000	CU CL2/LSZH TI7 1G6 450/750V YELLOW/GREEN	YELLOW WITH 2 GREEN ST
350	2,164	CU CL2/XLPE/LSZH 7X1,5_E 0,6/1KV GREY	BLACK NB FROM 1 TO 7
360	0,300	CU CL2/XLPE/LSZHCWB/LSZH 4CX4_E 0,6/1KV GREY	BLACK NB FROM 1 TO 4
370	0,599	CU/EPR/CTS/LSZHCWB/LSZH 1X70 6/10KV RED	NEUTRAL
370	0,082	CU/EPR/CTS/LSZHCWB/LSZH 1X70 6/10KV RED	NEUTRAL
370	0,040	CU/EPR/CTS/LSZHCWB/LSZH 1X70 6/10KV RED	NEUTRAL
380	0,373	CU/EPR/CTS/LSZHCWB/LSZH 1X150 6/10KV RED	NEUTRAL
390	0,358	CU CL2/MGT/EPR/LSZH/GSWB/LSZH 3G4 0,6/1KV ORANGE	BROWN/BLUE/Y-G
400	0,350	Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV 4CX4 GREY	BLACK NUMBERED (1-4)
410	0,300	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G4 ORANGE	BR/BL/Y-G
420	0,309	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G2,5_E GREY	BL/BR/BLUE/Y-G
430	2,500	CU/LSZH 450/750 V 1G16 YELLOW WITH TWO GREEN STRIPES	
440	1,000	CU/LSZH 450/750 V 1G10 YELLOW WITH TWO GREEN STRIPES	
450	2,000	CU/LSZH 450/750 V 1G6 YELLOW WITH TWO GREEN STRIPES	

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Sign	Date
ROSETTI MARINO SpA Stefano Lhuti Quality Control Dept.	**26-09-2024**

Base Load Power Hub (BLPH)

ELECTRICAL CABLES

INSPECTION AND TEST PLAN

Document Number: 1724001141-QC-ITP-00002

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
02	03/09/2024	Accepted for Construction (AFC)	CUCINOTTA	MESSA	BERETTA
01	04/07/2024	Accepted for Construction (AFC)	CUCINOTTA	MESSA	BERETTA
00	21/06/2024	Issue for Review (IFR)	CUCINOTTA	MESSA	BERETTA
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4	ITP	X	X	X					

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Via Alcide De Gasperi 82,
20864 Agrate Brianza (MB) - Italy
Phone 039 65 32 51 mail : shipping@flei.it

ISO 9001: 2015

Customer	ROSETTI MARINO	PO No.1724001141 123A90A	ITP No.: 12/2024 Rev.1	Date : 04 July 2024
Project	123A90A - Base Load Power Hub Platform			

INSPECTION TEST PLAN - Cables 0,6/1 Kv - Design Guidelines : iec 60092.353

SL. No	Test Characteristics	Sampling Plan	Type of Test	Ref. Doc. 1724001141-QC-ITP-00002	Instrument name	SUP	CTR	CPY	CA
						FLEI	ROSETTI MARINO	CROSSWIND	CERTIFYNG AUTHORITY
1	**GENERAL**								
1.1	Review of the purchase oredr	\	visual	Oredr	Document	T	R	R	
1.2	Data Sheets,Procedures approval check	\	visual	Data Sheets,Procedures	Document	T	R	R	
1.3	Check of the Quality Procedure	\	visual	Quality Procedure	Document	T	R	R	
2	**PROCUREMENT**								
2.1	Incoming material and certificates check	\	visual	compliance certificate-material supply documentation	order+data sheet+supply material data sheet	T	R	M	
3	**CHECK OF MATERIAL**								
3.1	Visual and dimensional check	10% OF THE ORDER	visual and dimensional	Data Sheets,test report including the real measure of external diameter value1,value 2	Digital Caliper-Profile Projector	T	W	W	
3.2	Check of proper material identification by tag/marking	10% OF THE ORDER	visual	tag/marking	visual	T	W	W	
3.3	Control of drums:quality of flanges,marking and labelling,cable designation,length,section,sizes and weight,observance of minimum curve radii,capping of terminations,packaging and protection against shocks	10% OF THE ORDER	visual	123A90A-DDL-EL-MR-20056	visual	T	W	W	
3.4	Check(after testing)that the ends of the cables shall be sealed by an approved method to prevent the ingress of moisture	spot	visual by photos	123A90A-DDL-EL-MR-20056	heat-shrinkable caps	T	W	M	
4	**USUAL NON-ELECTRICAL CHECK**								
4.1	Control of the nature and composition of conductors	10% OF THE ORDER	non-Electrical	Test Report	Test Report	T	W	M	
4.2	Mesurement of the thickness of the insulating material	10% OF THE ORDER	non-Electrical	Data sheet	Profile Projector	T	W	M	
4.3	Inspection of bedding and assembly	10% OF THE ORDER	non-Electrical	Data sheet	Data sheet+Test Report	T	W	M	
4.4	Measurement of inner sheath diameter (cable gland sizing)	10% OF THE ORDER	non-Electrical	Data sheet	Digital Caliper	T	W	M	
4.5	Measurement of the external sheath	10% OF THE ORDER	non-Electrical	Data sheet	Digital Caliper	T	W	M	
4.6	Verification of the nature,composition and thickness of the metallic armour	10% OF THE ORDER	non-Electrical	Data sheet	Digital Caliper	T	W	M	
4.7	Measurement of the external dimensions of the complete cable	10% OF THE ORDER	non-Electrical	Data sheet	Digital Caliper	T	W	M	

5	**TYPE TEST**								
5.1	Flame retardant test as per IEC 60332-3-22	\	non-Electrical	IEC 60332-22	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
5.2	Oxygen index tests as per ASTM D2863	\	non-Electrical	ASTM D2863	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
5.3	Smoke emission test as per IEC 61034-2	\	non-Electrical	IEC 61034-2	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
5.4	Fire resistance test as per IEC 60331-21	\	non-Electrical	IEC 60331-21	Fire resistant test apparatus,1,5 meter cable with accessories	T	R	R	R
5.5	Acid gas generation test as per IEC 60754-1/2	\	non-Electrical	IEC 60754-1/2	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
5.6	Trasmittance as per IEC 61034-2	\	non-Electrical	IEC 61034-2	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
6	**SPECIAL NON ELECTRICAL CHECKS TO BE CARRIED OUT ON A SAMPLE LENGTH OF CABLE**								
6.1	Check for flame retardant properties as per IEC 60332-3-22	\	non-Electrical	IEC 60332-22	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
6.2	Check for flame retardant properties as per IEC 60331-21	\	non-Electrical	IEC 60331-21	Fire resistant test apparatus,1,5 meter cable with accessories	T	R	R	R
6.3	Control of mechanical properties of insulating material	\	non-Electrical	IEC 60092-360	Test Report	T	R	R	R
6.4	Control of mechanical properties of external sheath	\	non-Electrical	IEC 60092-360	Test Report	T	R	R	R
6.5	Test of the anti-corrosion protective coating of the metallic armour	\	non-Electrical	IEC 60092-350	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
6.6	Bending Test	\	non-Electrical	IEC 60502 / IEC 60092-350	DECLARATION OF CONFORMITY	DECLARATION OF CONFORMITY	R	R	R
6.7	Hot set test	\	non-Electrical	IEC 60092-350	Test Report	T	R	R	R
7	ELECTRICAL TESTS								
7.1	Voltage test for cable 0,6/1 kv	10% OF THE ORDER	Electrical	Data sheet	15 kV HV Transformer	T	W	W	
7.2	Measurement of the electrical resistance of conductors	10% OF THE ORDER	Electrical	Data sheet (IEC 60228)	Multimeter	T	W	W	
7.3	Voltage test for cable Cu Cl.2/LSZH 450/750 V	\	Electrical	Data sheet	Test Report	T	R	R	
8	PACKING								
8.1	Packing & initial preservation inspection,marking and packing list check	spot	non-Electrical	123A90A-DDL-EL-MR-20056	visual	T	R	R	
9	FINAL DOCUMENTATION								
9.1	Final documentation and testing certificates review	\	non-Electrical	testing certificates	testing certificates	T	R	R	R
9.2	Final Inspection and final inspection release note (Data Book)	\	non-Electrical	Data book,release note	Data book,release note	30 days after shipping of goods	W	W	
9.3	Handling and storage of cables	\	non-Electrical	Handling and storage of cables by Flei	Handling and storage of cables by Flei	T	R	R	R

Type of Action :		Testing Authorities :
T	TEST	SUP → SUPPLIER
R	REVIEW	CTR → CONTRACTOR
W	WITNESS POINT	CPY → COMPANY
H	HOLD POINT	CA → CERTIFYNG AUTHORITY
M	MONITORING	

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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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Sign	Date
Vincent Zwaan	02/09/2024

Base Load Power Hub (BLPH)

PACKING, TRANSPORTATION, HANDLING, LAYING AND STORAGE OF CABLES

Document Number: 1724001141-QC-PRO-00008

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PACKING, TRANSPORTATION, HANDLING, LAYING AND STORAGE OF CABLES

The cables, whether they are armoured or unarmoured , are manufactured with some high quality materials allowing long storage handling transport and unreeling subject to the following recommendations.

1 – TRANSPORTATION HANDLING AND STORAGE OF THE DRUMS

1.1 – Storage

Cables can be stored, in usual, on site temperature limits: -15°C to +60°C. The cables drums must be appropriately wedged and stored in a vertical position (never laid on flange) on a flat, dry and solid ground and in a covered place (applicable only for export project). They must be protected to avoid any mechanical risk and exterior shocks.
The original wooden lags have to be kept until the cable unreeling to ensure a good protection of the cable. The both ends of the cable (inner and outer end) have to be watertight in order to avoid penetration of water or humidity inside the cables. Thermo retractable polyethylene caps must be installed on the both ends.

1.2 – Transportation and handling

The wooden drums must be always carried vertically. They must be fixed and properly chocked with care on the vehicle, on the wagon and on the ship, in order to avoid any exterior chocs.
The unloading and the different handling will be done carefully with lifting equipments.

- In case of handling with a crane, an axle is used in crossing the drum center, lifted from both ends by two slings. It must have a length equal, at least, to the width of the drum. It is prohibited to put the slings on the lags,
- In case of handling with a forklift truck, the drum is put vertically with care on the forks,

Never let a drum fall during all kind of unloading and do not place any weight on the drums.
When the cables drums are arriving on site, they must be properly checked. The good order of the lagging and of the ends caps of the cables (a breaking of a wooden lag could tear the outer sheath of the cable).

1.3 – Rolling direction

If a drum has to be rolled, for transportation, it must be rolled “only” in the direction indicated by an arrow pointed on the flange of the drum: “do not roll the drum in the opposite direction arrow of the drum”.

2 – LAYING OF THE CABLES

2.1 – Laying temperature

The cables can be pulled at a minimum outer temperature of: -5°C, but with a slow and regular speed (about 20 m/mm) without shock. It is always necessary, before unreeling, to store the cables for at least 24 hours in a warmed room (about +10°).

2.2 – Bending radius

During the unreeling, the bending radius shall be, at least, “twice the static bending radius (as specified in our technical data sheets)”

2.3 – **Pulling strength**

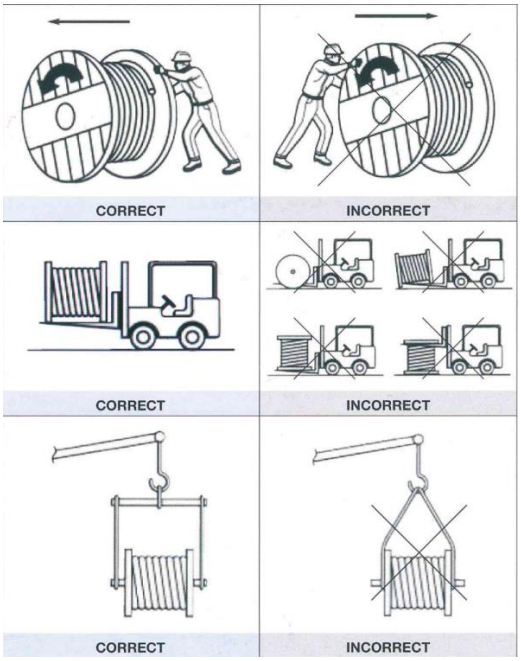
The pulling strengths exerted directly on the copper or aluminium cores of the cables should not exceed the values:

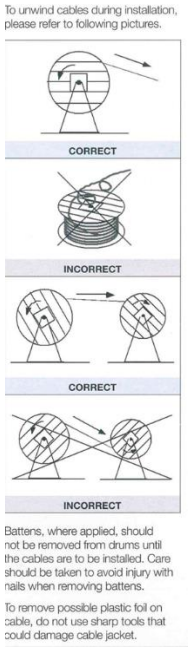
- 5 daN/mm² of cross section for copper conductors.
- 3 daN/mm² of cross section for aluminium conductors.

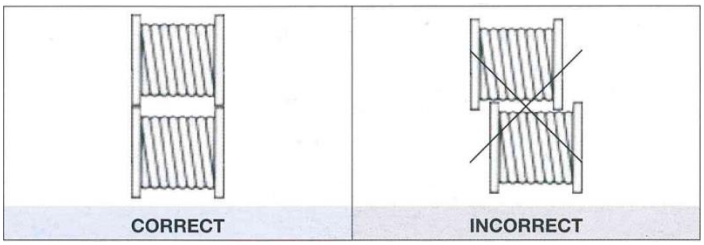
The pulling must be regular without shock and continuously checked by a dynamometer (especially in case of using a winch).

2.4 – **Cables unreeling**

The drum shall be settled on jacks by using a spindle through the central hole of the drum. The unreeling speed shall be monitored at a moment.
The cables must be unreeled "only in the opposite direction of the one indicated by an arrow" painted on the flange of the drum ("do not unreel the cable in the same direction of the arrow"). While unreeling, the cables shall not be twisted, waved or buckled.
The label, sticked on the flange, indicates the "correct unreeling method".
ANNEXE 1







Base Load Power Hub (BLPH)

ELECTRICAL CABLES

FAT PROCEDURE - ELECTRICAL CABLES

Document Number: 1724001141-QC-PRO-00005

Document Class: 2

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1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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		00	01	02	03				
1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log / Hold List	X	X	X	X				
4	FAT	X	X	X	X				

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Revision / Change Log

Rev.	Description
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FACTORY TEST PROCEDURES

450/750V Wires

POSITION FROM 290 TO 340 - FROM 430 TO 450

CONTENTS	TITLE N.
Test procedure for Conductor Resistance	1
Test procedure for High Voltage Test	2
Test Procedure for Spark Test on Insulation	3
Test Procedure for Conductor Examination	4
Test Procedure for Measurement of Thickness	5
Test Procedure for Over-all Diameter	6
Test Procedure for Insulation Resistance	7

1 – Title: Test Procedure for Conductor Resistance

1. TEST EQUIPMENT

1. Resistance measuring equipment - Micro Ohm meter

2. METHOD OF TESTING

- Remove sufficient length of the insulation from both end of the wire.
- The insulation of the conductor has to be removed about 30mm from the end of the cable.
- Connect the testing clamp of the resistomat to the both ends of the conductor.
- Adjust suitable range for the same required value.
- Adjust the cable temperature on the resistance-measuring unit for compensation at 20°C for manual measurement or connect the temperature sensor to the measuring unit for auto compensation.
- Calculate the observed resistance value per kilometers by using the following formula:

$$R = \frac{R_1 \times 1000}{L}$$

Where : R = Resistance per kilometers
R_1 = Measured Resistance
L = Length of the cable

3. REQUIREMENT

- As per data sheet.

Note : In the case of manual measurement, to calculate resistance at 20 deg.C, measured resistance at ambient temperature shall be multiplied by the temperature correction factor.

2 – Title: Test Procedure for High Voltage test

1. TEST EQUIPMENT

- HV transformer
- Water tank
- Timer chronometer

2. METHOD OF TESTING

2.1 Method of Testing

Minimum length of 10 meters has to be immersed in water tank for one hour and temperature of water tank (20±5)^{0}C . AC test voltage (49 to 61 Hz) shall be applied between the water and the conductor. The water shall be earthed.

2.2.1 High voltage Test

- Apply the 2.5 kV between conductor & to water for 5 minutes.

2.2.1.1 Requirement

- No breakdown of the insulation shall occur during the testing period

Note: the test will be performed if requested by the customer. Otherwise, we consider the spark test procedure to be valid.
Grade of voltage during extrusion according to IEC 62230

3 – Title: Test Procedure for Spark Test on Insulation

1. TEST EQUIPMENT

- Spark Tester

2. METHOD OF TESTING

- Spark test on insulation is subjected to a specified AC test voltage applied over the outer surface of insulation against conductor.
- The voltage shall be applied through out the length during manufacturing process.

- Test voltage shall be according to IEC 62230 (see Table 1)

3. REQUIREMENT

- No break down on insulation shall occur.

Table A.1 provides the test voltages that are recommended for cables that have voltages between 300 V e 3 000 V. The current to be applied to the electrodes can be AC, DC or HF
Recommended Minimum Voltages for Spark-Testing for Cables with Voltage (U0) between 300 V and 3000 V

Tabulated radial thickness of layer under test mm		Test voltage kV			
From	Up to	a.c.	d.c.	h.f.	Pulse
0	0,25	3	5	4	5
0,26	0,50	5	7	6	7
0,51	0,75	6	9	7	9
0,76	1,00	7	11	8	11
1,01	1,25	9	13	10 [a]	13
1,26	1,50	10	15	11 [a]	15
1,51	1,75	10	17	13 [a]	17
1,76	2,00	10	20	14 [a]	20
2,01	2,25	10	22	15 [a]	
2,26	2,50	10	24	17 [a]	
2,51	2,75	10	26	18 [a]	
2,76	3,00	10	28	20 [a]	

[a] h.f. voltage testing for layer thicknesses greater than 1,0 mm should be limited to frequencies between 500 Hz and 4 kHz.

Note: In each test report, the value (KV) set in spark tester is declared,according to the material thickness,during the production process and the related result :

EXAMPLE : insulation Thickness 1.0 mm

Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK

4 – Title: Test Procedure for Conductor examination

1. TEST EQUIPMENT

- Vernier Cliper

2. METHOD OF TESTING

- Take a sample have length of 30 cm approximately.
- The average of two measurements taken at right angles shall be taken as the diameter.
- Average of three measurements at different places shall be considered as the diameter.
- Measurement must be taken up to two decimal places to avoid any over usage of material
- Count the number of wires / strands in the conductor

3. REQUIREMENT

- As per IEC 60228

Table 2 – Class 2 stranded conductors for single-core and multi-core cables

1	2	3	4	5	6	7	8	9	10
Nominal cross-sectional area	Minimum number of wires in the conductor						Maximum resistance of conductor at 20°C		
	Circular		Circular compacted		Shaped		Annealed copper conductor		Aluminium or aluminium alloy conductor[c]
	Cu	Al	Cu	Al	Cu	Al	Plain wires	Metal-coated wires	
mm²							Ω/km	Ω/km	Ω/km
0,5	7	-	-	-	-	-	36,0	36,7	-
0,75	7	-	-	-	-	-	24,5	24,8	-
1,0	7	-	-	-	-	-	18,1	18,2	-
1,5	7	-	6	-	-	-	12,1	12,2	-
2,5	7	-	6	-	-	-	7,41	7,56	-
4	7	-	6	-	-	-	4,61	4,70	-
6	7	-	6	-	-	-	3,08	3,11	-
10	7	7	6	6	-	-	1,83	1,84	3,08
16	7	7	6	6	-	-	1,15	1,16	1,91
25	7	7	6	6	6	6	0,727	0,734	1,20
35	7	7	6	6	6	6	0,524	0,529	0,868
50	19	19	6	6	6	6	0,387	0,391	0,641
70	19	19	12	12	12	12	0,268	0,270	0,443
95	19	19	15	15	15	15	0,193	0,195	0,320
120	37	37	18	15	18	15	0,153	0,154	0,253
150	37	37	18	15	18	15	0,124	0,126	0,206
185	37	37	30	30	30	30	0,0991	0,100	0,164
240	37	37	34	30	34	30	0,0754	0,0762	0,125
300	61	61	34	30	34	30	0,0601	0,0607	0,100
400	61	61	53	53	53	53	0,0470	0,0475	0,0778
500	61	61	53	53	53	53	0,0366	0,0369	0,0605
630	91	91	53	53	53	53	0,0283	0,0286	0,0469
800	91	91	53	53	-	-	0,0221	0,0224	0,0367
1 000	91	91	53	53	-	-	0,0176	0,0177	0,0291
1 200	[b]						0,0151	0,0151	0,0247
1 400 [a]	[b]						0,0129	0,0129	0,0212
1 600	[b]						0,0113	0,0113	0,0186
1 800 [a]	[b]						0,0101	0,0101	0,0165
2 000	[b]						0,0090	0,0090	0,0149
2 500	[b]						0,0072	0,0072	0,0127

[a] These sizes are non-preferred. Other non-preferred sizes are recognized for some specialized applications but are not within the scope of this standard.

[b] The minimum number of wires for these sizes is not specified. These sizes may be constructed from 4, 5 or 6 equal segments (Milliken).

[c] For stranded aluminium alloy conductors having the same nominal cross-sectional area as an aluminium conductor the resistance value should be agreed between the manufacturer and the purchaser.

5 – Title: Test Procedure for Measurement of Thickness

1. TEST EQUIPMENT

- Profile Projector / vernier caliper

2. METHOD OF TESTING

- Prepare each test piece of insulation in the form of a thin slice along a place perpendicular to the axis of the conductor or cable.
- Place the test piece under the measuring equipment with the plane of the cut, perpendicular to the optical axis.
- Make six measurements at 60° to each other.
- If the inner profile of the sample is irregular or uneven take six readings radically at a position where the thickness is thinnest.
- Take the reading in millimeter to two decimal places if the thickness is greater than 0.50 mm and to three decimal places if the thickness is less than 0.50 mm.

3. REQUIREMENT

- As per relevant standards and as per data sheet

This case according to EN 50525.3.31

1	2	3	4	5	6
Numero e sezione nominale dei conduttori [a]	Classe del conduttore (EN 60228)	Spessore dell'isolante Valore prescritto	Diametro esterno medio		Resistenza di isolamento minima alla temperatura nominale
			Limite inferiore	Limite superiore	
mm^2		mm	mm	mm	MΩ.km
1,5	1	0,7	2,6	3,2	0,011
2,5	1	0,8	3,2	3,9	0,010
4	1	0,8	3,6	4,4	0,008 7
6	1	0,8	4,1	5,0	0,007 4
10	1	1,0	5,3	6,4	0,007 2
1,5	2	0,7	2,7	3,3	0,010
2,5	2	0,8	3,3	4,0	0,009 9
4	2	0,8	3,8	4,6	0,008 2
6	2	0,8	4,3	5,2	0,007 0
10	2	1,0	5,6	6,7	0,006 7
16	2	1,0	6,4	7,8	0,005 6
25	2	1,2	8,1	9,7	0,005 3
35	2	1,2	9,0	10,9	0,004 6
50	2	1,4	10,6	12,8	0,004 6
70	2	1,4	12,1	14,6	0,004 0
95	2	1,6	14,1	17,1	0,003 9
120	2	1,6	15,6	18,8	0,003 5
150	2	1,8	17,3	20,9	0,003 5
185	2	2,0	19,3	23,3	0,003 5
240	2	2,2	22,0	26,6	0,003 4
300	2	2,4	24,5	29,6	0,003 3
400	2	2,6	27,5	33,2	0,003 1
500	2	2,8	30,5	36,9	0,003 0
630	2	2,8	34,0	41,1	0,002 7
800	2	2,8	37,8	45,7	0,002 4
1 000	2	3,0	42,1	51,0	0,002 3

[a] Non tutti i tipi di cavi sono specificati in tutte le dimensioni indicate qui. Vedi l'articolo specifico della norma ed anche l'art. 1 della EN 50525-1.

6 – Title: Test Procedure for Measurement of Overall Diameter

1. TEST EQUIPMENT

Y Vernier Caliper

2. METHOD OF TESTING

Y Take a sample have length of 30 cm approximately from the completed wires.
Y The average of two measurements taken at right angles shall be taken as the diameter.
Y Average of three measurements at different places shall be considered as the diameter.
Y Measurement must be taken up to two decimal places to avoid any over usage of material

3. REQUIREMENT

Y As per relevant specifications and as per data sheet

This case according to EN 50525.3.31

1	2	3	4	5	6
Numero e sezione nominale dei conduttori [a]	Classe del conduttore (EN 60228)	Spessore dell'isolante Valore prescritto	Diametro esterno medio		Resistenza di isolamento minima alla temperatura nominale
			Limite inferiore	Limite superiore	
mm^2		mm	mm	mm	MΩ.km
1,5	1	0,7	2,6	3,2	0,011
2,5	1	0,8	3,2	3,9	0,010
4	1	0,8	3,6	4,4	0,008 7
6	1	0,8	4,1	5,0	0,007 4
10	1	1,0	5,3	6,4	0,007 2
1,5	2	0,7	2,7	3,3	0,010
2,5	2	0,8	3,3	4,0	0,009 9
4	2	0,8	3,8	4,6	0,008 2
6	2	0,8	4,3	5,2	0,007 0
10	2	1,0	5,6	6,7	0,006 7
16	2	1,0	6,4	7,8	0,005 6
25	2	1,2	8,1	9,7	0,005 3
35	2	1,2	9,0	10,9	0,004 6
50	2	1,4	10,6	12,8	0,004 6
70	2	1,4	12,1	14,6	0,004 0
95	2	1,6	14,1	17,1	0,003 9
120	2	1,6	15,6	18,8	0,003 5
150	2	1,8	17,3	20,9	0,003 5
185	2	2,0	19,3	23,3	0,003 5
240	2	2,2	22,0	26,6	0,003 4
300	2	2,4	24,5	29,6	0,003 3
400	2	2,6	27,5	33,2	0,003 1
500	2	2,8	30,5	36,9	0,003 0
630	2	2,8	34,0	41,1	0,002 7
800	2	2,8	37,8	45,7	0,002 4
1 000	2	3,0	42,1	51,0	0,002 3

[a] Non tutti i tipi di cavi sono specificati in tutte le dimensioni indicate qui. Vedi l'articolo specifico della norma ed anche l'art. 1 della EN 50525-1.

7 – Title: Test Procedure for Insulation Resistance

1. TEST EQUIPMENT

Y Megger

2. METHOD OF TESTING

Y Connect the ' + ' lead of the megger to core and ' - ' to water
Y Apply 500 V DC for 1 minute and measure the reading.

3. REQUIREMENT

Y Insulation resistance as per data sheets

Note: the test is to be considered as type test of the used material in order to define the value of the constant insulation Ki, to be used to state the value of insulation resistance of the other size of the cable. (tested on 10 mt length of cable type).

Table B.1 — Cables with rigid conductor (450/750 V)

1	2	3	4	5	6
Nominal cross-sectional area of conductors [a]	Class of conductor (EN 60228)	Thickness of insulation	Mean overall diameter		Minimum insulation resistance at rated temperature
		Specified value	Lower limit	Upper limit	
mm^2		mm	mm	mm	MΩ.km
1,5	1	0,7	2,6	3,2	0,011
2,5	1	0,8	3,2	3,9	0,010
4	1	0,8	3,6	4,4	0,008 7
6	1	0,8	4,1	5,0	0,007 4
10	1	1,0	5,3	6,4	0,007 2
1,5	2	0,7	2,7	3,3	0,010
2,5	2	0,8	3,3	4,0	0,009 9
4	2	0,8	3,8	4,6	0,008 2
6	2	0,8	4,3	5,2	0,007 0
10	2	1,0	5,6	6,7	0,006 7
16	2	1,0	6,4	7,8	0,005 6
25	2	1,2	8,1	9,7	0,005 3
35	2	1,2	9,0	10,9	0,004 6
50	2	1,4	10,6	12,8	0,004 6
70	2	1,4	12,1	14,6	0,004 0
95	2	1,6	14,1	17,1	0,003 9
120	2	1,6	15,6	18,8	0,003 5
150	2	1,8	17,3	20,9	0,003 5
185	2	2,0	19,3	23,3	0,003 5
240	2	2,2	22,0	26,6	0,003 4
300	2	2,4	24,5	29,6	0,003 3
400	2	2,6	27,5	33,2	0,003 1
500	2	2,8	30,5	36,9	0,003 0
630	2	2,8	34,0	41,1	0,002 7
800	2	2,8	37,8	45,7	0,002 4
1 000	2	3,0	42,1	51,0	0,002 3

[a] Not all cable types are specified in all the sizes given here. See the specific clause of the standard, and also of Clause 1 of EN 50525-1.

FACTORY TEST PROCEDURES

L.V.Electrical Power Cables 0,6/1KV

POS FROM 20 TO 280 - FROM 350 TO 390 - FROM 400 TO 420

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Test procedure for High Voltage Test	1
Test procedure for Spark Test on Insulation & Sheath	2
Test procedure for Conductor Resistance	3
Test procedure for Insulation Resistance	4
Test procedure for Conductor Examination	5
Test Procedure for Measurement of Thickness of Insulation and Sheaths	6
Test Procedure for Armour / Wire Measurement if provided	7
Test Procedure of diameter under armour and overall	8
Test Procedure for Hot Set Test	9
Fire Resistant & Flame Retardant	10

1 – Title: Test Procedure for High Voltage test

1. TEST EQUIPMENT

1. HV transformer
2. Timer Chronometer

2. METHOD OF TESTING

2.1 Method of Testing

→ Testing will be carried out at ambient temperature.
→ Remove sufficient length of outer jacket, armour and inner sheath from both end of the cable.
→ Connect the high voltage source to the conductor.
→ Connect metallic armour to the ground.
→ Test voltage shall be applied between conductor and metallic armour.

2.2 Low Voltage cables

2.2.1 High voltage Test

→ Apply the 3.5 kV between each conductor and between conductor and metallic armour for 5 minutes.

2.2.1.1 Requirement

→ No breakdown of the insulation shall occur during the testing period

2 – Title: Test Procedure for Spark Test on Insulation & Sheath

1. TEST EQUIPMENT

1. **Spark Tester**

2. METHOD OF TESTING

→ Spark test on insulation & sheath is subjected to a specific AC test voltage applied over the outer surface of insulation & sheath against conductor.
→ The voltage shall be applied through out the length during manufacture process.
→ Test voltage shall be according to IEC 62230 (see Table 1)

3. REQUIREMENT

→ No break down on insulation shall occurr.

Tabulated radial thickness of layer under test mm		Test voltage kV			
From	Up to	a.c.	d.c.	h.f.	Pulse
0	0,25	3	5	4	5
0,26	0,50	5	7	6	7
0,51	0,75	6	9	7	9
0,76	1,00	7	11	8	11
1,01	1,25	9	13	10 [a]	13
1,26	1,50	10	15	11 [a]	15
1,51	1,75	10	17	13 [a]	17
1,76	2,00	10	20	14 [a]	20
2,01	2,25	10	22	15 [a]	
2,26	2,50	10	24	17 [a]	
2,51	2,75	10	26	18 [a]	
2,76	3,00	10	28	20 [a]	

[a] h.f. voltage testing for layer thicknesses greater than 1,0 mm should be limited to frequencies between 500 Hz and 4 kHz.

3 – Title: Test Procedure for Conductor Resistance

1. TEST EQUIPMENT

1. Resistance measuring equipment - Micro Ohm meter.

2. METHOD OF TESTING

→ Remove sufficient length of the outer jacket, armour and inner sheath from both end of the cable.
→ The insulation of the conductor has to be removed about 30mm from the end of the cable.
→ Connect the testing clamp of the resistomat to the both ends of the conductor.
→ Adjust suitable range for the same required value.
→ Adjust the cable temperature on the resistance-measuring unit for compensation at 20°C for manual measurement or connect the temperature sensor to the measuring unit for auto compensation.
→ Calculate the observed resistance value per kilometers by using the following formula:

$$R = \frac{R_1 \times 1000}{L} \text{ (ohm/Km)}$$

Where : R = Resistance per kilometers
R_1 = Measured Resistance
L = Length of the cable

3. REQUIREMENT

→ As per relevant specification (IEC 60228).

Note : In the case of manual measurement, to calculate resistance at 20 deg.C, measured resistance at ambient temperature shall be multiplied by the temperature correction factor.

Table 2 – Class 2 stranded conductors for single-core and multi-core cables

1	2	3	4	5	6	7	8	9	10
Nominal cross-sectional area	Minimum number of wires in the conductor						Maximum resistance of conductor at 20°C		
	Circular		Circular compacted		Shaped		Annealed copper conductor		Aluminium or aluminium alloy conductor[c]
	Cu	Al	Cu	Al	Cu	Al	Plain wires	Metal-coated wires	
mm²							Ω/km	Ω/km	Ω/km
0,5	7	-	-	-	-	-	36,0	36,7	-
0,75	7	-	-	-	-	-	24,5	24,8	-
1,0	7	-	-	-	-	-	18,1	18,2	-
1,5	7	-	6	-	-	-	12,1	12,2	-
2,5	7	-	6	-	-	-	7,41	7,56	-
4	7	-	6	-	-	-	4,61	4,70	-
6	7	-	6	-	-	-	3,08	3,11	-
10	7	7	6	6	-	-	1,83	1,84	3,08
16	7	7	6	6	-	-	1,15	1,16	1,91
25	7	7	6	6	6	6	0,727	0,734	1,20
35	7	7	6	6	6	6	0,524	0,529	0,868
50	19	19	6	6	6	6	0,387	0,391	0,641
70	19	19	12	12	12	12	0,268	0,270	0,443
95	19	19	15	15	15	15	0,193	0,195	0,320
120	37	37	18	15	18	15	0,153	0,154	0,253
150	37	37	18	15	18	15	0,124	0,126	0,206
185	37	37	30	30	30	30	0,0991	0,100	0,164
240	37	37	34	30	34	30	0,0754	0,0762	0,125
300	61	61	34	30	34	30	0,0601	0,0607	0,100
400	61	61	53	53	53	53	0,0470	0,0475	0,0778
500	61	61	53	53	53	53	0,0366	0,0369	0,0605
630	91	91	53	53	53	53	0,0283	0,0286	0,0469
800	91	91	53	53	-	-	0,0221	0,0224	0,0367
1 000	91	91	53	53	-	-	0,0176	0,0177	0,0291
1 200	[b]						0,0151	0,0151	0,0247
1 400 [a]	[b]						0,0129	0,0129	0,0212
1 600	[b]						0,0113	0,0113	0,0186
1 800 [a]	[b]						0,0101	0,0101	0,0165
2 000	[b]						0,0090	0,0090	0,0149
2 500	[b]						0,0072	0,0072	0,0127

[a] These sizes are non-preferred. Other non-preferred sizes are recognized for some specialized applications but are not within the scope of this standard.

[b] The minimum number of wires for these sizes is not specified. These sizes may be constructed from 4, 5 or 6 equal segments (Milliken).

[c] For stranded aluminium alloy conductors having the same nominal cross-sectional area as an aluminium conductor the resistance value should be agreed between the manufacturer and the purchaser.

4 – Title: Test Procedure for Insulation Resistance

1. TEST EQUIPMENT

1 . Megger

2. METHOD OF TESTING

→ Connect the ' + ' lead of the megger to core and ' - ' lead to all other cores, metallic screen & armour.
→ Apply 500 V DC for 1 minute and measure the reading.

→ Calculate the observed insulation resistance value per kilometers by using the Following formula:

Ri = R1x L (MohmxKm)

Where Ri : Insulation resistance x kilometers
R1: Measured resistance Megaohm
L : Length of the cable kilometers

3. REQUIREMENT

→ Insulation resistance as per data sheet

Note: In the case of manual measurement, to calculate resistance at 20 deg.C, measured insulation resistance at ambient temperature shall be multiplied by the temperature correction factor of insulation material

Table 3 – Electrical requirements of insulation compounds

Designation of the insulating compound	EPR	HEPR	XLPE	HF90	S 95
Insulation resistance constant Ki (MΩ.km) (see 7.2 of IEC 60092-350:—)					
– at 20 °C, minimum,	3 670	3 670	3 670	550	1 850
– at maximum operating temperature, minimum.	3,67	3,67	3,67	0,55	1,85
Volume resistivity ρ(Ω.cm) (see 7.2 of IEC 60092-350:—)					
– at 20 °C, minimum,	$1,0 \times 10^{15}$	$1,0 \times 10^{15}$	$1,0 \times 10^{15}$	$1,5 \times 10^{14}$	$5,0 \times 10^{13}$
– at maximum operating temperature, minimum.	$1,0 \times 10^{12}$	$1,0 \times 10^{12}$	$1,0 \times 10^{12}$	$1,5 \times 10^{11}$	$5,0 \times 10^{10}$

5 – Title: Test Procedure for Conductor examination

1. TEST EQUIPMENT

1. Vernier Cliper

2. METHOD OF TESTING

- → Take a sample have length of 30 cm approximately.
- → The average of two measurements taken at right angles shall be taken as the diameter.
- → Average of three measurements at different places shall be considered as the diameter.
- → Measurement must be taken up to two decimal places to avoid any over usage of material
- → Count the number of wires / strands in the conductor

3. REQUIREMENT

- → As per IEC 60228.

Table 2 – Class 2 stranded conductors for single-core and multi-core cables

1	2	3	4	5	6	7	8	9	10
Nominal cross-sectional area	Minimum number of wires in the conductor						Maximum resistance of conductor at 20°C		
	Circular		Circular compacted		Shaped		Annealed copper conductor		Aluminium or aluminium alloy conductor[c]
	Cu	Al	Cu	Al	Cu	Al	Plain wires	Metal-coated wires	
mm²							Ω/km	Ω/km	Ω/km
0,5	7	-	-	-	-	-	36,0	36,7	-
0,75	7	-	-	-	-	-	24,5	24,8	-
1,0	7	-	-	-	-	-	18,1	18,2	-
1,5	7	-	6	-	-	-	12,1	12,2	-
2,5	7	-	6	-	-	-	7,41	7,56	-
4	7	-	6	-	-	-	4,61	4,70	-
6	7	-	6	-	-	-	3,08	3,11	-
10	7	7	6	6	-	-	1,83	1,84	3,08
16	7	7	6	6	-	-	1,15	1,16	1,91
25	7	7	6	6	6	6	0,727	0,734	1,20
35	7	7	6	6	6	6	0,524	0,529	0,868
50	19	19	6	6	6	6	0,387	0,391	0,641
70	19	19	12	12	12	12	0,268	0,270	0,443
95	19	19	15	15	15	15	0,193	0,195	0,320
120	37	37	18	15	18	15	0,153	0,154	0,253
150	37	37	18	15	18	15	0,124	0,126	0,206
185	37	37	30	30	30	30	0,0991	0,100	0,164
240	37	37	34	30	34	30	0,0754	0,0762	0,125
300	61	61	34	30	34	30	0,0601	0,0607	0,100
400	61	61	53	53	53	53	0,0470	0,0475	0,0778
500	61	61	53	53	53	53	0,0366	0,0369	0,0605
630	91	91	53	53	53	53	0,0283	0,0286	0,0469
800	91	91	53	53	-	-	0,0221	0,0224	0,0367
1 000	91	91	53	53	-	-	0,0176	0,0177	0,0291
1 200	[b]						0,0151	0,0151	0,0247
1 400 [a]	[b]						0,0129	0,0129	0,0212
1 600	[b]						0,0113	0,0113	0,0186
1 800 [a]	[b]						0,0101	0,0101	0,0165
2 000	[b]						0,0090	0,0090	0,0149
2 500	[b]						0,0072	0,0072	0,0127

[a] These sizes are non-preferred. Other non-preferred sizes are recognized for some specialized applications but are not within the scope of this standard.

[b] The minimum number of wires for these sizes is not specified. These sizes may be constructed from 4, 5 or 6 equal segments (Milliken).

[c] For stranded aluminium alloy conductors having the same nominal cross-sectional area as an aluminium conductor the resistance value should be agreed between the manufacturer and the purchaser.

6 – Title: Test Procedure for Measurement of Thickness of Insulation and Sheaths

1. TEST EQUIPMENT

1. Profile Projector / Vernier caliper

2. METHOD OF TESTING

→ Prepare each test piece of insulation and sheaths in the form of a thin slice along a place perpendicular to the axis of the conductor or cable.
→ Place the test piece under the measuring equipment with the plane of the cut, perpendicular to the optical axis.
→ Make six measurements at 60° to each other.
→ If the inner profile of the sample is irregular or uneven take six readings radically at a position where the thickness is thinnest.
→ Take the reading in millimeter to two decimal places if the thickness is greater than 0.50 mm and to three decimal places if the thickness is less than 0.50 mm.
→ For the sheath direct over the insulation cores the number of readings shall be the same number of cores but limited to six measurements points.

3. REQUIREMENT

→ As per data sheet.
Data Sheets approved available during FAT.

7 – Title: Test Procedure for Armour / Wire Measurement

1. TEST EQUIPMENT

1. Micrometer

2. METHOD OF TESTING

→ Take a sample have length of 30cm approximately.
→ The average of two measurement taken at right angles shall be taken as the diameter of wire / width & Thickness of tape.
→ Average of three measurements at different places shall be considered as the diameter of wire / width & thickness of tape.
→ Measurement must be taken up two decimal places to avoid any over usage of material

3. REQUIREMENT

→ As per relevant data sheet.
Data Sheets approved available during FAT.

8 – Title: Test Procedure of diameter under armour and overall

1. TEST EQUIPMENT

1. Vernier caliper

2. METHOD OF TESTING

→ Take a sample have length of 30 cm approximately.
→ The average of two measurements taken at right angles shall be taken as the diameter
→ Average of three measurements at different places shall be considered as the diameter
→ Measurement must be taken up to two decimal places to avoid any over usage of material

3. REQUIREMENT

→ As per relevant specification and data sheet.
Data Sheets approved available during FAT.

4.7 Inner sheath

4.7.1 Material

The inner sheath material shall be selected from one of those listed in IEC 60092-360. The sheathing compound selected shall be compatible with the cable components with which it is in contact and compatible with the operating temperature of the cable.

4.7.2 Application

The inner sheath shall be extruded in one or more closely adherent layers. The inner sheath shall form a compact and homogeneous body and shall be so applied that it fits closely onto the underlying components.

It shall be possible to remove the inner sheath without damaging the underlying insulation and/or screen(s).

4.7.3 Thickness of inner sheath

The thickness of the inner sheath for each size and type of cable shall be as specified in the applicable product standard.

Unless specified in the applicable product standard, the thickness at any point may be less than the specified value, providing the difference does not exceed 0,1 mm + 15 % of the specified value for sheaths applied on a smooth cylindrical surface, or 0,2 mm + 20 % of the specified value for sheaths applied on an irregular cylindrical surface.

The thickness of any tape(s) under or over the inner sheath shall not be included in the measurement of the thickness of the inner sheath.

4.8 Metal braid armour

4.8.1 Material

The metal braid armour shall be made of zinc-coated (galvanized) steel wires complying with the galvanizing test specified in 8.12 and ISO 7989-2, or copper, metal-coated copper or copper-alloy wires.

For high voltage cables described in IEC 60092-354, the use of double steel tape armour and round or flat steel wire armour are permitted. For further guidance on construction, see IEC 60502-2.

4.8.2 Application

The "coverage density" of the braid shall be such that the weight of the braid is at least 90 % of the weight of a tube of the same metal, having an internal diameter equal to the calculated internal diameter under the braid and a thickness equal to the nominal diameter of the wires forming the braid.

The diameter under the braid is calculated with the fictitious method given in Annex A.

NOTE An alternative method for evaluating the "coverage density" of symmetrical braids is given by the following formula giving the "filling factor", F:

$$F = \frac{NPd}{\sin\alpha} \text{ or } \quad (mnd/2\pi D)\ (1 + \pi^2 D^2/L^2)^{1/2}$$

Where

α: is the slope angle between the cable axis and the braid wires;

d: is the diameter of braid wire;

N: is the number of wires per carrier;

P: is the number of picks per millimetre;

m: is the total number of spindles;

n: is the total number of ends per spindle;

D is the mean diameter of the braid;

L is the lay length of the braiding wire.

The corresponding "coverage density", expressed as a percentage, is given by the formula:

$$G = \frac{\pi}{2} \cdot F \cdot 100$$

The coverage density G of (90 %) is reached for a value of filling factor F of 0,573.

4.9 Outer sheath

4.9.1 Material

The sheath shall be selected from one of those listed in IEC 60092-360. The sheathing compound selected shall be compatible with the cable components with which it is in contact and compatible with the operating temperature of the cable.

4.9.2 Application

The outer sheath shall be extruded in one or more closely adherent layers. The outer sheath shall form a compact and homogeneous body and shall be so applied that it fits closely onto the underlying components.

It shall be possible to remove the outer sheath without damaging the underlying insulation and/or screen(s).

4.9.3 Thickness of outer sheath

The thickness of sheath for each size and type of cable shall be as specified in the applicable product standard.

Unless specified in the applicable product standard, the thickness at any point may be less than the specified value if any, providing the difference does not exceed 0,1 mm + 15 % of the specified value for sheaths applied on a smooth cylindrical surface, or 0,2 mm + 20 % of the specified value for sheaths applied on an irregular cylindrical surface.

9 – Title: Test Procedure for Hot Set Test

1. TEST EQUIPMENT

1 Heating Oven.
2 Calibrated weights
3 Sample holding fixture
4 Caliper
5 Timer

2. METHOD OF TESTING

→ Prepare dumbbell test pieces from XLPE insulation with thickness 0.8 to 2.00mm.
→ Mark 20 mm gauge length in the center of the dumbbell. (L_1).
→ Suspend the sample in the oven with a weight of 20 N/cm2 at 200°C for 15 minutes.
→ After the test duration of 15 minutes measure the length between the marks. (L_2)
→ Calculate the elongation, in percentage, under load as follows

$$\frac{L_2 - L_1}{L_1} \times 100$$

→ Remove the load from the test piece and keep in oven at same temperature for 5 minutes.
→ After 5 minutes, remove the sample from oven and allow to cool to room temperature.
→ After the sample attained to room temperature measure the lengths between the marks. (L3)
→ Calculate the elongation, in percentage, without load as follows

$$\frac{L_3 - L_1}{L_1} \times 100$$

3. REQUIREMENT

→ The elongation without load shall not be more than 15%
→ The elongation under load shall not be more than 175%

10 – Title: Test Procedure for Flame Retardant & Fire Resistant

1. SCOPE OF TEST

This test procedure details the test methods to check if cable will pass test for Flame retardant & or Fire Resistant

2. NORMATIVE REFERENCE

IEC 60332.1.2 - IEC 60332.3.22 Flame retardant
IEC 60331.21 Fire Resistant

3. TEST EQUIPMENT

According to IEC 60332.1.2 for Flame Retardant

TEST EQUIPMENT

- A suitable three-sided metallic screen, with open front and closed top and bottom. The base shall be non-metallic
- A clamp suitable to fix the test sample of cables
- One gas burner

TEST SAMPLE

The test sample shall be a piece of the finished cable of cable 600 + - 25 mm long

FLAME CONDITION

When propane is used, the burner being regulated to give a flame approximately 175 mm Long with an inner blue cone approximately 55 mm long

TEST PROCEDURE

The sample shall be clamped at each end to position it vertically in the middle of a three-sided metallic screen and shall be adjusted so that the bottom of sample is approximately 50 mm from the base of the metallic screen.
The axis of the burner shall be at an angle of 45° to the axis of the sample.
The flame is applied for a continuos period of T seconds derived from Table 1:

Table 1 – Time for flame application

Overall diameter of test piece [a] mm	Time for flame application [b] s
$D \leq 25$	60 ± 2
$25 < D \leq 50$	120 ± 2
$50 < D \leq 75$	240 ± 2
$D > 75$	480 ± 2

[a] Where non-circular cables (for example, flat-form constructions) are to be tested, the circumference shall be measured and used to calculate an equivalent diameter, as if the cable were circular.

[b] For flat cables having a ratio of major to minor axis greater than 17:1, the flame application time remains under consideration.

TEST EVALUATION CRITERIA

After the burning has ceased, the surface of sample shall be wiped clean and the charred of affected portion shall not have reached 50 mm of the lower edge of the top clamp.

According to IEC 60331.21 For Fire Resistant

TEST EQUIPMENT

- A suitable chamber, of minimum volume 10 m³
- A source of heat comprising a horizontally mounted ribbon burner
- A sample supporting systems
- A test wall equipped with thermocouples for verification of the source of heat
- A continuity checking arrangement
- Fuses

TEST SAMPLE

A cable sample at least 4.5m long shall be available from the cable length for test. Each individual test specimen to be tested shall be a piece of cable, taken from the cable sample,
not less than 1200 mm long shall have approximately 100 mm of sheath or outer coverings removed at each end.
At each end of the cable, each conductor shall be suitably prepared for electrical connections, and the exposed conductors shall be spread apart to avoid contact with each other.

TEST CONDITIONS

- Flow rate (at reference conditions of 1 bar and 20°C)
- Propane: (5,0 ± 0,25) litres/minute
- Air: (80 ± 5) litres/minute
- Test temperature: 750 °C
- Voltage applied between the cores: 1000 V a.c.

TEST PROCEDURE

The test specimen shall be held horizontally by means of suitable supports at each end and securely clamped to prevent movement.
The middle portion of the test specimen shall be supported by two metal rings placed approximately 300 mm; these, as well as any other metal parts of the supporting systems, shall be earthed.
At the transformer end of the test sample, ground the neutral conductor and any protective conductors. Any metal screens, drain wire or metallic layer shall be interconnected and grounded. Where a metallic sheath, armour or screen acts as a neutral or protective conductor, it shall be connected as for a neutral or protective conductor.
Each phase conductor is connected to a separate phase of the transformer output by a 2A fuse.
For multicores ≥4, multipairs, and multitriads cables, the conductors have to be divided in groups and each group has to be connected to a separate phase of the transformer output with a 2 A fuse or circuit-breaker with equivalent characteristics in each phase.

Ignite the burner and adjust the propane and air flow rates to those obtained during the verification procedure (see IEC 60331-11).
Switch on the electricity supply and adjust the voltage to the rated voltage of the cable (subject to a minimum voltage of 100 V a.c.), i.e. the test voltage between conductors shall equal the rated voltage between conductors and the test voltage from conductors to earth shall equal the rated voltage from conductor to earth. In the case of single-core cables the voltage shall be applied between the conductor and the earthed supporting apparatus and earthed metallic covering, if present.
The test shall continue for the flame application for 3 hours, if not otherwise specified. After that the flame shall be extinguished but the cable sample shall remain energized for a further 15 min. The total test duration shall be the flame application time together with the 15 min cooling period.

TEST EVALUATION CRITERIA

The criteria for determining the point of failure shall be as follows:
. the voltage is not maintained during the test duration, as indicated by fuse failure
. a conductor rupture during the test duration, as indicated by the lamp extinguishing

FLEI s.r.l.
Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

DECLARATION OF CONFORMITY
DICHIARAZIONE DI CONFORMITA'
DÉCLARATION DE CONFORMITÉ

CLIENTE:
CUSTOMER :
KUNDE:
ACHETEUR:

ROSETTI MARINO

ORDINE:
PURCHASE ORDER :
AUFTRAG:
COMMANDE:

1724001141 123A90A

DESCRIZIONE CAVO:
CABLE DESCRIPTION :
BESCHREIBURG KABLE.
DESCRIPTION CABLE:

SEE PACKING LIST

TIPO E QUANTITA':
TYPE AND QUANTITY :
MENGE:
TYPE ET QUANTITE':

SEE PACKING LIST

Con il presente si attesta che sono state eseguite le prove di collaudo del materiale fornito a fronte dell'ordine di acquisto da Voi conferitoci. Visto l'esito delle prove suddette, si certifica che il materiale in oggetto è conforme alle seguenti prescrizioni:
We declare we tested the material we are supplying to you with reference to the purchase order You granted us. On the basis of the results of the tests, we are certifying that the material in object comply with the following regulations:
Wir erklären hiermit, dass die Prüfungen in Übereinstimmung mit den bestellten Waren durchgeführt wurden. Wir bescheinigen daher, dass die oben genannten Waren mit den folgenden Normen übereinstimmen:
Nous déclarons par la présente que des tests ont été effectués sur l'équipement fourni dans le cadre de votre bon de commande. Sur la base des résultats de ces essais, nous certifions que le matériel en question répond aux exigences suivantes :

[X]	**VOSTRE SPECIFICHE** YOUR SPECIFICATIONS IHRE ANGABE VOTRE SPECIFICATIONS	SPECIFICATIONS INCLUDED IN THE ORDER
[X]	**NORME** STANDARDS NORME STANDARDS	IEC 60092.353 – EN 50525.3.31 IEC 60331.21 – IEC 60332.1.2 – IEC 60332.3.22 IEC 60754.1/2 – IEC 61034.2
[X]	**ALLEGATI** ATTACHEMENTS ANLAGE ANNEXES	TEST REPORT No.: 845÷881/2024

DATE 26/07/2024

ON BEHALF OF... CROSSWIND
DATE 26/7/24 W R

Quality Control : Giovanni Cucinotta

FLEI s.r.l. Quality Control

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

DECLARATION OF CONFORMITY
DICHIARAZIONE DI CONFORMITA'
DÉCLARATION DE CONFORMITÉ

CLIENTE:
CUSTOMER :
KUNDE:
ACHETEUR:

ROSETTI MARINO

ORDINE:
PURCHASE ORDER :
AUFTRAG:
COMMANDE:

1724001141 123A90A REV.1

DESCRIZIONE CAVO:
CABLE DESCRIPTION :
BESCHREIBURG KABLE.
DESCRIPTION CABLE:

SEE PACKING LIST

TIPO E QUANTITA':
TYPE AND QUANTITY :
MENGE:
TYPE ET QUANTITE':

SEE PACKING LIST

Con il presente si attesta che sono state eseguite le prove di collaudo del materiale fornito a fronte dell'ordine di acquisto da Voi conferitoci. Visto l'esito delle prove suddette, si certifica che il materiale in oggetto è conforme alle seguenti prescrizioni:
We declare we tested the material we are supplying to you with reference to the purchase order You granted us. On the basis of the results of the tests, we are certifying that the material in object comply with the following regulations:
Wir erklären hiermit, dass die Prüfungen in Übereinstimmung mit den bestellten Waren durchgeführt wurden. Wir bescheinigen daher, dass die oben genannten Waren mit den folgenden Normen übereinstimmen:
Nous déclarons par la présente que des tests ont été effectués sur l'équipement fourni dans le cadre de votre bon de commande. Sur la base des résultats de ces essais, nous certifions que le matériel en question répond aux exigences suivantes :

X	**VOSTRE SPECIFICHE** YOUR SPECIFICATIONS IHRE ANGABE VOTRE SPECIFICATIONS	SPECIFICATIONS INCLUDED IN THE ORDER
X	**NORME** STANDARDS NORME STANDARDS	IEC 60092.350 - IEC 60092.353 – EN 50525.3.31 IEC 60331.21 – IEC 60332.1.2 – IEC 60332.3.22 IEC 60754.1/2 – IEC 61034.2 – ASTM D2863
X	**ALLEGATI** ATTACHEMENTS ANLAGE ANNEXES	TEST REPORT No.: 1088÷1091/2024

DATE 20/09/2024

Quality Control : Giovanni Cucinotta

FLEI s.r.l. Quality Control

FLEI s.r.l.
Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

DECLARATION OF CONFORMITY
DICHIARAZIONE DI CONFORMITA'
DÉCLARATION DE CONFORMITÉ

CLIENTE:
CUSTOMER :
KUNDE:
ACHETEUR:

ROSETTI MARINO

ORDINE:
PURCHASE ORDER :
AUFTRAG:
COMMANDE:

1724001141 123A90A REV.2

DESCRIZIONE CAVO:
CABLE DESCRIPTION :
BESCHREIBURG KABLE.
DESCRIPTION CABLE:

SEE PACKING LIST

TIPO E QUANTITA':
TYPE AND QUANTITY :
MENGE:
TYPE ET QUANTITE':

SEE PACKING LIST

Con il presente si attesta che sono state eseguite le prove di collaudo del materiale fornito a fronte dell'ordine di acquisto da Voi conferitoci. Visto l'esito delle prove suddette, si certifica che il materiale in oggetto è conforme alle seguenti prescrizioni:
We declare we tested the material we are supplying to you with reference to the purchase order You granted us. On the basis of the results of the tests, we are certifying that the material in object comply with the following regulations:
Wir erklären hiermit, dass die Prüfungen in Übereinstimmung mit den bestellten Waren durchgeführt wurden. Wir bescheinigen daher, dass die oben genannten Waren mit den folgenden Normen übereinstimmen:
Nous déclarons par la présente que des tests ont été effectués sur l'équipement fourni dans le cadre de votre bon de commande. Sur la base des résultats de ces essais, nous certifions que le matériel en question répond aux exigences suivantes :

X	**VOSTRE SPECIFICHE** YOUR SPECIFICATIONS IHRE ANGABE VOTRE SPECIFICATIONS	SPECIFICATIONS INCLUDED IN THE ORDER
X	**NORME** STANDARDS NORME STANDARDS	EN 50525.3.31 IEC 60332.1.2 – IEC 60332.3.22 IEC 60754.1/2 – IEC 61034.2 - ASTM D2863
X	**ALLEGATI** ATTACHEMENTS ANLAGE ANNEXES	TEST REPORT No.: 1349÷1352/2024

DATE 22/10/2024

Quality Control : Giovanni Cucinotta

FLEI s.r.l. Quality Control

FLEI s.r.l.
Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

DECLARATION OF CONFORMITY
DICHIARAZIONE DI CONFORMITA'
DÉCLARATION DE CONFORMITÉ

CLIENTE:
CUSTOMER :
KUNDE:
ACHETEUR:

ROSETTI MARINO

ORDINE:
PURCHASE ORDER :
AUFTRAG:
COMMANDE:

1724001141 123A90A REV.3

DESCRIZIONE CAVO:
CABLE DESCRIPTION :
BESCHREIBURG KABLE.
DESCRIPTION CABLE:

SEE PACKING LIST

TIPO E QUANTITA':
TYPE AND QUANTITY :
MENGE:
TYPE ET QUANTITE':

SEE PACKING LIST

Con il presente si attesta che sono state eseguite le prove di collaudo del materiale fornito a fronte dell'ordine di acquisto da Voi conferitoci. Visto l'esito delle prove suddette, si certifica che il materiale in oggetto è conforme alle seguenti prescrizioni:
We declare we tested the material we are supplying to you with reference to the purchase order You granted us. On the basis of the results of the tests, we are certifying that the material in object comply with the following regulations:
Wir erklären hiermit, dass die Prüfungen in Übereinstimmung mit den bestellten Waren durchgeführt wurden. Wir bescheinigen daher, dass die oben genannten Waren mit den folgenden Normen übereinstimmen:
Nous déclarons par la présente que des tests ont été effectués sur l'équipement fourni dans le cadre de votre bon de commande. Sur la base des résultats de ces essais, nous certifions que le matériel en question répond aux exigences suivantes :

X	**VOSTRE SPECIFICHE** YOUR SPECIFICATIONS IHRE ANGABE VOTRE SPECIFICATIONS	SPECIFICATIONS INCLUDED IN THE ORDER
X	**NORME** STANDARDS NORME STANDARDS	EN 50525.3.31 IEC 60332.1.2 – IEC 60332.3.22 IEC 60754.1/2 – IEC 61034.2 - ASTM D2863
X	**ALLEGATI** ATTACHEMENTS ANLAGE ANNEXES	TEST REPORT No.: 1592-1593/2024

DATE 20/12/2024

Quality Control : Giovanni Cucinotta

FLEI s.r.l. Quality Control

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 845 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	20
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 1CX300 - L.V. POWER CABLE - Flame Retardant	Job card	520/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	971									
Drum No.	16-1584									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228	Diametro Nominale Nominal Diameter	21,0 mm	21,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black		Spessore Nominale Nominal Thickness	2,4 mm	2,4 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour / Grey	Spessore Medio Average Thickness	1,6 mm	2,0 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	29,4	29,9 ÷ 30,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz / Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,0601	< 0,0593	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	330	> 4110	Tra conduttori / Acqua Between Cores / Water	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	16 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CLIENT
DATE 30/7/24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 846 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	30
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 1CX95 - L.V. POWER CABLE - Flame Retardant	Job card	521/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	308		
Drum No.	08-196		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228	Diametro Nominale Nominal Diameter	11,3 mm	11,3 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black		Spessore Nominale Nominal Thickness	1,6 mm	1,65 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360	Colore Colour	Grey		Spessore Medio Average Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%		mm	17,3	17,4 ÷ 17,7
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX95 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,193	0,187
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	400	4136

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Acqua Between Cores / Water	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. Carlo Rovida
DATE 30/7/24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 847 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	40
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4CX10 - L.V. POWER CABLE - Flame Retardant	Job card	522/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	309		
Drum No.	08-199		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	16,7	17,6
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,3	20,4 ÷ 21,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX10 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,79
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	630	> 5562

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSWIND
DATE 29/7/24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 848 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	50
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G10 - L.V. POWER CABLE - Flame Retardant	Job card	523/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	303									
Drum No.	08-198									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,1	15,0
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,7	18,0 ÷ 18,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G10 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,74
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	630	> 4714

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS N / W A
DATE 30/7/24 W R

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Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 849 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	60
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G6 - L.V. POWER CABLE - Flame Retardant	Job card	524/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1590									
Drum No.	12-1574									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,2	13,2
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,6	15,8 ÷ 16,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G6 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 3,03
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	770	> 9094

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. C.R.S. MARINO
DATE. 27.7.24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 850 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	70
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G2,5 - L.V. POWER CABLE - Flame Retardant	Job card	525/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	1963		
Drum No.	12-1580		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	10,6	10,6
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	13,0	13,2 ÷ 13,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,22
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 16214

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CASSIANO
DATE 26/7/24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 851 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	80
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G4 - L.V. POWER CABLE - Flame Retardant	Job card	526/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	574		
Drum No.	08-195		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,9	12,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,3	14,9 ÷ 15,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,53
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 5992

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Crossing
DATE 30/7/24

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 852 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	90
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G16 - L.V. POWER CABLE - Flame Retardant	Job card	527/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	307									
Drum No.	09-7185									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,3 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	19,1	19,9
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,4 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	21,9	22,8 ÷ 23,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G16 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,13
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	530	> 2820

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI M.
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 853 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	100
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G35 - L.V. POWER CABLE - Flame Retardant	Job card	528/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	304									
Drum No.	10-4937									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,2 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	24,4	26,1
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,5 mm	1,7 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	27,4	28,8 ÷ 29,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G35 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,520
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	> 2979

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS WIND
DATE 20/7/24 W R V

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 854 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	110
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G4 - L.V. POWER CABLE - Flame Retardant	Job card	529/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	303		
Drum No.	07-595		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,1	13,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,6 ÷ 15,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,58
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 10056

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
	x	CODIFICATION I 02	TYPE : MULTIMETER
	x	CODIFICATION I 03	TYPE : MEGAOHMETER
		CODIFICATION I 12	TYPE : LCR METER
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER
	x	CODIFICATION II 56	TYPE : PROFILE READER

CODIFICATION I 05

TYPE : HIGH VOLTAGE TEST BENCH

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. ROSETTI MARINO
DATE. 26/7/24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 855 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	120
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G4_E - L.V. POWER CABLE - Flame Retardant	Job card	530/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	770									
Drum No.	10-4944									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,1	13
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,2 ÷ 15,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,58
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 7484

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS WIND
DATE 26/7/24 W.B.

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	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 856 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	130
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G2,5_E - L.V. POWER CABLE - Flame Retardant	Job card	531/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	300									
Drum No.	07-594									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,7
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,0	14,3 ÷ 14,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,38
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 7800

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CRAWFORD
DATE 29/7/24 WR

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 857 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	140
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G50 - L.V. POWER CABLE - Flame Retardant	Job card	532/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	300									
Drum No.	12-1562									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	8,0 mm	8,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,2 mm	Diametro Diameter	tolerance ± 10%	mm	31,6	32,5
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,7 mm	2,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	35,0	36,9 ÷ 37,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G50 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,387	< 0,373
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	> 6042

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	12 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Cristian Wind
DATE 29/7/24 W R

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Mod. 8.2.8

REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 858 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	150
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G70 - L.V. POWER CABLE - Flame Retardant	Job card	533/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	302		
Drum No.	14-1546		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,2 mm	Diametro Diameter	tolerance ± 10%	mm	35,9	37,3
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,8 mm	2,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	39,5	41,2 ÷ 42,9
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G70 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	< 0,263
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	410	> 4263

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	13 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI M.
DATE 22/7/24 W. R.

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 859 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	160
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G16 - L.V. POWER CABLE - Flame Retardant	Job card	534/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	333		
Drum No.	10-4936		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	21,2	21,9
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	24,0	24,8 ÷ 25,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G16 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,13
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	530	> 4900

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSWIND
DATE 2-7/7/24

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 860 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	170
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G4 - L.V. POWER CABLE - Flame Retardant	Job card	535/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	302									
Drum No.	08-197									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,4	14,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,0 ÷ 17,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,60
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	910	> 5904

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. PROSIMUS
DATE 26/7/24 W.R

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 861 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	180
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 2CX2,5 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	536/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	332									
Drum No.	08-194									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red - Black			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11	11
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,8	15,0 ÷ 15,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 2CX2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,31	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 3320	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Cressi
DATE 30/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 862 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	190
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G16 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	537/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	308		
Drum No.	10-4929		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red - Black - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,4 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	19,2	19,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,6 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	23,6	24,0 ÷ 24,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G16 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,11
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	460	> 3944

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CUSTOMER
DATE 30/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 863 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	200
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G2,5 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	538/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	1517		
Drum No.	12-1579		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,7	11,7
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,8 ÷ 16,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS				Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤		7,41	< 7,37
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥		940	> 3900

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSCOM N.V.
DATE 20/12/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 864 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	210
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G6 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	539/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	08-189		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,3	14,7
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	18,3	18,9 ÷ 19,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G6 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 3,05
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 8175

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05	
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH	
	CODIFICATION I 12	TYPE : LCR METER		
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER		
x	CODIFICATION II 56	TYPE : PROFILE READER		

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF
DATE 20/12/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 865 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	220
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 4G4_E L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	540/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	536									
Drum No.	10-4939									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,3	15,6
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	18,3	19,8 ÷ 20,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,59
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 4025

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS MARINO
DATE 26/7/24 W.K

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Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 866 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	230
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 4G2,5_E L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	541/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	08-192		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	12,8	13,1
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	16,8	17,1 ÷ 17,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,39
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 5850

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 867 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	240
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 2CX2,5 CONTROL CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	542/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	302		
Drum No.	07-591		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black Numbered from 1 to 2			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11	11
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,8	15,0 ÷ 15,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 2CX2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,38
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 3000

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF (PROSECCO IN)
DATE. 26/7/24 W.R

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Mod. 8.2.8 — REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 868 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	250
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX70 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	543/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	301		
Drum No.	08-191		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,3	15,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,5 mm	1,9 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,5	20,1 ÷ 20,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX70 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	0,263
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	380	< 5661

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... CASSIOPEA
DATE... 26/7/24

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 869 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	260
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX70 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	544/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	08-190		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black			Spessore Nominale Nominal Thickness	1,4 mm	1,7 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,3	15,2
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,5 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,5	20,0 ÷ 20,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX70 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	0,264
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	380	7946

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. CROSSAIR
DATE. 29/7/24

Foglio: Page: 25 / 37

Mod. 8.2.8 — REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 870 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	270
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX25 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	545/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	07-592		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,9 mm	5,9 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red			Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,2	11,0
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,0	15,5 ÷ 15,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX25 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,727	0,721	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	2178	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CARNIVINO
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 871 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	280
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX25 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	546/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	07-593		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,9 mm	5,9 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black			Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,2	11,2
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,0	15,0 ÷ 15,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX25 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,727	0,720
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	2971

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05	
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH	
	CODIFICATION I 12	TYPE : LCR METER		
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER		
x	CODIFICATION II 56	TYPE : PROFILE READER		

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSSETTI MARINO
DATE 30/7/24

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REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 872 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	290
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G150 - PE CABLE - Flame Retardant	Job card	547/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	08-177		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	14,1 mm	14,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,8 mm	1,9 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		17,7	17,8 ÷ 18,0
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G150 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,124	< 0,118
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Spark Test Isolamento IEC 62230 Insulation Spark Test	13 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. Rosetti Marino
DATE 20/7/26

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
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FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 873 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	300
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G95 - PE CABLE - Flame Retardant	Job card	548/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	817									
Drum No.	10-4925									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	11,3 mm	11,3 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,6 mm	1,7 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	14,5	14,6 ÷ 14,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G95 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,193	< 0,187
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CASTOLIN
DATE 26/7/24

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	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 874 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	310
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G35 - PE CABLE - Flame Retardant	Job card	549/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	06-2868		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		9,3	9,5 ÷ 9,7
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G35 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,520
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Rosetti Marino
DATE 30/11/24 W R

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 875 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	320
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G16 - PE CABLE - Flame Retardant	Job card	550/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	1541		
Drum No.	07-583		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		7,1	7,4 ÷ 7,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G16 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,11
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSWIN
DATE 22/7/24 WR

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 876 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	330
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G10 - PE CABLE - Flame Retardant	Job card	551/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	515		
Drum No.	06-2869		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%		mm	6,1	6,2 ÷ 6,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G10 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,78
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 877 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	340
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G6 - PE CABLE - Flame Retardant	Job card	552/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2060		
Drum No.	06-2867		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	0,8 mm	1,0 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		4,8	5,0 ÷ 5,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G6 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 2,96
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 878 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	350
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH 0,6/1 KV 7CX1,5 - CONTROL CABLE - Flame Retardant	Job card	553/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2186		
Drum No.	12-1561		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	1,6 mm	1,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 7)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Cordatura Overall Wrapping	plastic tape helically wound 40x0,025 mm					% copertura % coverage	100	> 100
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,1	11,2
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	13,5	13,9 ÷ 14,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	12,1	< 11,8
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1000	> 38408

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... RINA
DATE 27/7/26 W R

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 879 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	360
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV 4CX4 CONTROL CABLE - SCREENED - Flame Retardant	Job card	554/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	07-589		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 4)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	12,1
Armatura Armouring	Copper Wire Braid (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,4	15,8 ÷ 16,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,50
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 9159

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... CROSETTI MARINO
DATE 30/12/24

Foglio: Page: 35 / 37

Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 880 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	390
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G4 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	555/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	362		
Drum No.	08-183		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13	13,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,3 ÷ 17,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,48
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 4128

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05	
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH	
	CODIFICATION I 12	TYPE : LCR METER		
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER		
x	CODIFICATION II 56	TYPE : PROFILE READER		

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 20/12/24 W.R.

Foglio: Page: 36 / 37

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 881 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev Tested	From 20 to 390

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1 / IEC 60092.360

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION XLPE	REQUIRED	**TESTED**
TENSILE STRENGHT	>12,5 N/mm²	16 N/mm²
ELONGATION AT BREAK	> 200 %	474%
AFTER AGEING (135° C x 168 hours)		
TENSILE STRENGHT	+/- 25 %	14,75 N/mm² (-7,8%)
ELONGATION AT BREAK	+/- 25 %	-9% (431,3%)
HOT SET TEST (200°C x 15 min.)	175%	75%
INSULATION EPR	**REQUIRED**	**TESTED**
TENSILE STRENGHT	> 8,5 N/mm²	11,2 N/mm²
ELONGATION AT BREAK	> 200%	>633 %
AFTER AGEING (150°C X 168 hours)		
TENSILE STRENGHT	+/- 30%	11,9 N/mmq (+6,2%)
ELONGATION AT BREAK	+/-30%	619% (-2,2%)
HOT SET TEST 250°CX15 min. MAX.ELONGATION UNDER LOAD	<175%	88%
HOT SET TEST(250°) MAX.PERMANENT ELONGATON	<15	Tested 5%
OVERALL SHEATH LSZH type SHF1	REQUIRED	**TESTED**
TENSILE STRENGHT	>9 N/MMQ	12,5 N/mm²
ELONGATION AT BREAK	> 120 %	160%
AFTER AGEING (110° C x 168 hours)		
TENSILE STRENGHT	+/- 30 %	13,6% (+9%)
ELONGATION AT BREAK	+/- 30 %	145% (-9%)

TYPE TESTS	**TESTED**
FIRE RESISTANT TEST (IEC 60331.21)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.1.2)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.22)	COMPLIANCE DECLARATION
ACID GAS GENERATION (IEC 60754.1/2)	COMPLIANCE DECLARATION
SMOKE DENSITY/LIGHT TRANSMITTANCE (IEC 61034.2 LT ≥ 60%)	COMPLIANCE DECLARATION
UV RESISTANCE TEST UL 2556 ex UL 1581 section 1200	COMPLIANCE DECLARATION

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 26/07/2024 Date:	Il collaudatore:Giovanni Cucinotta *Quality Control:*	Il Collaudatore: *Customer Quality Control:*	Foglio: Page: 37 / 37
	FLEI s.r.l. Quality Control	ON BEHALF OF CROSS WIND DATE 29/7/24 W.R.	

Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

CONTROLCAVI INDUSTRIA S.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465**

OPERATOR

LABORATORY MANAGER

INSPECTOR

ON BEHALF OF...

DATE 26/2/24

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= ISO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172														
LENGTH m	1528														
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2023 QA 36265**

OPERATOR

LABORATORY MANAGER

INSPECTOR

ON BEHALF OF CROSSLINX

DATE 20/12/24 W.R

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl - Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
Tel. +39 02 97255817 - Fax +39 02 97255754 - E-mail: cci@cableservice.com
UNITÀ PRODUTTIVA: S.S. Casilina, km 78,600 - 03013 FERENTINO (FR)
Tel. +39 0775 271494 r.a. - Fax +39 0775 271489
Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 - ISO 14001
ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 *DATED* 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	**16-P00025I**														
LENGTH m	**514**														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	IINNER --	OUTER --

CABLE COMPONENT	***TEST / CHECK***	***INSTRUMENT CCI code***	***UNIT***	***REQUIRED***	***RESULT***
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR

TEST DEPARTMENT

INSPECTOR

ON BEHALF OF. CCI Cable Service Srl

DATE. 27/7/24

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 599 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= ISO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172														
LENGTH m	1528														
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR° PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR° (meter marking) 2023 QA 36265**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 5 .. ..

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 40 AND 82 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 5 07-16. doc

SUPPLIER'S STOCK CABLE. SEE POSITION 380 OF THE PACKING LIST - 373 METERS

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl - Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
Tel. +39 02 97255817 - Fax +39 02 97255754 - E-mail: cci@cableservice.com
UNITÀ PRODUTTIVA: S.S. Casilina, km 78,600 - 03013 FERENTINO (FR)
Tel. +39 0775 271494 r.a. - Fax +39 0775 271489
Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION DNV ISO 9001 - ISO 14001 ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 *DATED* 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	**16-P00025I**														
LENGTH m	**514**														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	***TEST / CHECK***	***INSTRUMENT CCI code***	***UNIT***	***REQUIRED***	***RESULT***
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR TEST DEPARTMENT INSPECTOR





CCI Medium Voltage certificate Rev 5 07-16. doc

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1088 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	400
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV 4CX4 CONTROL CABLE - SCREENED - Flame Retardant	Job card	720/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	07-573		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 4)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,9
Armatura Armouring	Copper Wire Braid (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,4	15,9 ÷ 16,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,55	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 5300	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 1 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1089 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	410
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G4 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	721/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	08-166		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13	13
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,0 ÷ 17,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,53	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 3300	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 2 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1090 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	420
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G2,5_E - L.V. POWER CABLE - Flame Retardant	Job card	722/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	309		
Drum No.	07-572		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,5
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,9 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,0	15,0 ÷ 15,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,15	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 10800	Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 3 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1091 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev Tested	From 400 to 420

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1 / IEC 60092.360

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION XLPE	REQUIRED	**TESTED**
TENSILE STRENGHT	>12,5 N/mm²	17,28 N/mm²
ELONGATION AT BREAK	> 200 %	548%
AFTER AGEING (135° C x 168 hours)		
TENSILE STRENGHT	+/- 25 %	16,22 N/mm² (-6,1%)
ELONGATION AT BREAK	+/- 25 %	-10% (493,2%)
HOT SET TEST (200°C x 15 min.)	175%	75%
INSULATION EPR	**REQUIRED**	**TESTED**
TENSILE STRENGHT	> 8,5 N/mm²	13,6 N/mm²
ELONGATION AT BREAK	> 200%	>601 %
AFTER AGEING (150°C X 168 hours)		
TENSILE STRENGHT	+/- 30%	12,9 N/mmq (-5,3%)
ELONGATION AT BREAK	+/-30%	570,9% (-5%)
HOT SET TEST 250°CX15 min. MAX.ELONGATION UNDER LOAD	<175%	82%
HOT SET TEST(250°) MAX.PERMANENT ELONGATON	<15	Tested 5%
OVERALL SHEATH LSZH type SHF1	REQUIRED	**TESTED**
TENSILE STRENGHT	>9 N/MMQ	13,4 N/mm²
ELONGATION AT BREAK	> 120 %	188%
AFTER AGEING (110° C x 168 hours)		
TENSILE STRENGHT	+/- 30 %	12,4% (-7,6%)
ELONGATION AT BREAK	+/- 30 %	172,9% (-8%)

TYPE TESTS	**TESTED**
FIRE RESISTANT TEST (IEC 60331.21)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.1.2)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.22)	COMPLIANCE DECLARATION
ACID GAS GENERATION (IEC 60754.1/2)	COMPLIANCE DECLARATION
SMOKE DENSITY/LIGHT TRANSMITTANCE (IEC 61034.2 LT ≥ 60%)	COMPLIANCE DECLARATION
UV RESISTANCE TEST UL 2556 ex UL 1581 section 1200	COMPLIANCE DECLARATION

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 20/09/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 4 / 4

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1349 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	430
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G16 PE CABLE - Flame Retardant	Job card	824/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2568		
Drum No.	09-7152		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		7,1	7,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G16 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,07
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Tra conduttori / Acqua Between Cores / water	2,5x5	OK	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 1 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1350 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	440
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G10 PE CABLE - Flame Retardant	Job card	825/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1030									
Drum No.	06-2794									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,05 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	6,1	6,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G10 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,77
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Tra conduttori / Acqua Between Cores / water	2,5x5	OK	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 2 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1351 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	450
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G6 PE CABLE - Flame Retardant	Job card	826/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2058		
Drum No.	06-2792		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	0,8 mm	0,85 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	4,8	4,9
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G6 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 2,99
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Tra conduttori / Acqua Between Cores / water	2,5x5	OK	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 3 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1352 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Pos.	From 430 to 450

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION LSOH,TI7	REQUIRED	**TESTED**
TENSILE STRENGHT	>10 N/mm²	17,12 N/mm²
ELONGATION AT BREAK	> 125 %	576%
AFTER AGEING (80° C x 168 hours)		
TENSILE STRENGHT	+/- 20 %	(-6,5%) 16 N/mm²
ELONGATION AT BREAK	+/- 20 %	-8% (529,9%)
HOT SET TEST (200°C x 15 min.)	175%	70%

TYPE TESTS	**TESTED**
NO-Flame propagation test IEC 60332.1.2	OK : PASS
NO-Fire propagation test IEC 60332.24.C	COMPLIANCE DECLARATION
LowEmission of Toxic/Corrosive Gas test IEC 60754.1 (HCl ≤ 0,5%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET
Low Emission of Opaque Smoke test IEC 61034.2 (LT ≥ 40%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 22/10/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 4 / 4

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 599 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= BSO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172													
LENGTH m	1528													
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2023 QA 36265**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 6 .. ..

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 40 AND 82 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 5 07-16. doc

SUPPLIER'S STOCK CABLE. SEE POSITION 380 OF THE PACKING LIST - 373 METERS

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl · Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
Tel. +39 02 97255817 - Fax +39 02 97255754 - E-mail: cci@cableservice.com
UNITÀ PRODUTTIVA: S.S. Casilina, km 78,600 - 03013 FERENTINO (FR)
Tel. +39 0775 271494 r.a. - Fax +39 0775 271489
Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 · ISO 14001
ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 *DATED* 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	**16-P00025I**														
LENGTH m	**514**														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	***TEST / CHECK***	***INSTRUMENT CCI code***	***UNIT***	***REQUIRED***	***RESULT***
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR TEST DEPARTMENT INSPECTOR





CCI Medium Voltage certificate Rev 5 07-16. doc

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1592 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV3
		Item/Rev	460
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G35 PE CABLE - Flame Retardant	Job card	1115/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	309									
Drum No.	06-2735									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228		Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes			Spessore Nominale Nominal Thickness	1,2 mm	1,45 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	9,3	9,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G35 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,517	Tra conduttori / Acqua Between Cores / water	2,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100	Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	**CODIFICATION I 02**	**TYPE : MULTIMETER**	**CODIFICATION I 05**
	x	**CODIFICATION I 03**	**TYPE : MEGAOHMETER**	
		CODIFICATION I 12	**TYPE : LCR METER**	**TYPE : HIGH VOLTAGE TEST BENCH**
	x	**CODIFICATION II 11**	**TYPE : DIGITAL CALIPER**	
	x	**CODIFICATION II 56**	**TYPE : PROFILE READER**	

Data: 20/12/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page:
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Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1593 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV3
		Item/Rev	460

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION LSOH,TI7	REQUIRED	**TESTED**
TENSILE STRENGHT	>10 N/mm²	17,7 N/mm²
ELONGATION AT BREAK	> 125 %	502%
AFTER AGEING (80° C x 168 hours)		
TENSILE STRENGHT	+/- 20 %	(-4,9%) 16,8 N/mm²
ELONGATION AT BREAK	+/- 20 %	-10% (452%)
HOT SET TEST (200°C x 15 min.)	175%	70%

TYPE TESTS	**TESTED**
NO-Flame propagation test IEC 60332.1.2	OK : PASS
NO-Fire propagation test IEC 60332.24.C	COMPLIANCE DECLARATION
LowEmission of Toxic/Corrosive Gas test IEC 60754.1 (HCl ≤ 0,5%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET
Low Emission of Opaque Smoke test IEC 61034.2 (LT ≥ 40%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 20/12/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 2 / 2

PART 2 - CERTIFICATION DOSSIER

- TEST RECORD - FAT REPORT
- IRN

FLEI s.r.l.
Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

DECLARATION OF CONFORMITY
DICHIARAZIONE DI CONFORMITA'
DÉCLARATION DE CONFORMITÉ

CLIENTE:
CUSTOMER :
KUNDE:
ACHETEUR:

ROSETTI MARINO

ORDINE:
PURCHASE ORDER :
AUFTRAG:
COMMANDE:

1724001141 123A90A

DESCRIZIONE CAVO:
CABLE DESCRIPTION :
BESCHREIBURG KABLE.
DESCRIPTION CABLE:

SEE PACKING LIST

TIPO E QUANTITA':
TYPE AND QUANTITY :
MENGE:
TYPE ET QUANTITE':

SEE PACKING LIST

Con il presente si attesta che sono state eseguite le prove di collaudo del materiale fornito a fronte dell'ordine di acquisto da Voi conferitoci. Visto l'esito delle prove suddette, si certifica che il materiale in oggetto è conforme alle seguenti prescrizioni:
We declare we tested the material we are supplying to you with reference to the purchase order You granted us. On the basis of the results of the tests, we are certifying that the material in object comply with the following regulations:
Wir erklären hiermit, dass die Prüfungen in Übereinstimmung mit den bestellten Waren durchgeführt wurden. Wir bescheinigen daher, dass die oben genannten Waren mit den folgenden Normen übereinstimmen:
Nous déclarons par la présente que des tests ont été effectués sur l'équipement fourni dans le cadre de votre bon de commande. Sur la base des résultats de ces essais, nous certifions que le matériel en question répond aux exigences suivantes :

[X]	**VOSTRE SPECIFICHE** YOUR SPECIFICATIONS IHRE ANGABE VOTRE SPECIFICATIONS	SPECIFICATIONS INCLUDED IN THE ORDER
[X]	**NORME** STANDARDS NORME STANDARDS	IEC 60092.353 – EN 50525.3.31 IEC 60331.21 – IEC 60332.1.2 – IEC 60332.3.22 IEC 60754.1/2 – IEC 61034.2
[X]	**ALLEGATI** ATTACHEMENTS ANLAGE ANNEXES	TEST REPORT No.: 845÷881/2024

DATE 26/07/2024

ON BEHALF OF... CROSSWIND
DATE 26/7/24 W R

Quality Control : Giovanni Cucinotta

FLEI s.r.l. Quality Control

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 845 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	20
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 1CX300 - L.V. POWER CABLE - Flame Retardant	Job card	520/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	971									
Drum No.	16-1584									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228	Diametro Nominale Nominal Diameter	21,0 mm	21,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black		Spessore Nominale Nominal Thickness	2,4 mm	2,4 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour / Grey	Spessore Medio Average Thickness	1,6 mm	2,0 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	29,4	29,9 ÷ 30,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,0601	< 0,0593	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	330	> 4110	Tra conduttori / Acqua Between Cores / Water	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	16 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CLIENT
DATE 30/7/24 W R

Foglio: Page: 1 / 37

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 846 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	30
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 1CX95 - L.V. POWER CABLE - Flame Retardant	Job card	521/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	308		
Drum No.	08-196		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228	Diametro Nominale Nominal Diameter	11,3 mm	11,3 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black		Spessore Nominale Nominal Thickness	1,6 mm	1,65 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360	Colore Colour	Grey		Spessore Medio Average Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%		mm	17,3	17,4 ÷ 17,7
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX95 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,193	0,187
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	400	4136

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Acqua Between Cores / Water	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. Rosetti Marino
DATE 30/7/24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 847 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	40
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4CX10 - L.V. POWER CABLE - Flame Retardant	Job card	522/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	309		
Drum No.	08-199		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	16,7	17,6
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,3	20,4 ÷ 21,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX10 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,79
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	630	> 5562

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSWIND
DATE 29/7/24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 848 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	50
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G10 - L.V. POWER CABLE - Flame Retardant	Job card	523/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	303		
Drum No.	08-198		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,1	15,0
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,7	18,0 ÷ 18,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G10 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,74
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	630	> 4714

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS N/ W A
DATE 30/7/24 W R

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	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 849 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	60
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G6 - L.V. POWER CABLE - Flame Retardant	Job card	524/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1590									
Drum No.	12-1574									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,2	13,2
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,6	15,8 ÷ 16,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G6 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 3,03
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	770	> 9094

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. C.R.S. MARINO
DATE. 27.12.24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 850 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	70
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G2,5 - L.V. POWER CABLE - Flame Retardant	Job card	525/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1963									
Drum No.	12-1580									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	10,6	10,6
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	13,0	13,2 ÷ 13,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,22
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 16214

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CASSIANO
DATE 26/7/24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 851 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	80
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 3G4 - L.V. POWER CABLE - Flame Retardant	Job card	526/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	574		
Drum No.	08-195		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,9	12,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,3	14,9 ÷ 15,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,53
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 5992

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Crossing
DATE 26/7/24 W

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 852 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	90
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G16 - L.V. POWER CABLE - Flame Retardant	Job card	527/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	307		
Drum No.	09-7185		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,3 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	19,1	19,9
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,4 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	21,9	22,8 ÷ 23,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G16 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,13
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	530	> 2820

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 853 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	100
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G35 - L.V. POWER CABLE - Flame Retardant	Job card	528/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	304									
Drum No.	10-4937									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,2 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	24,4	26,1
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,5 mm	1,7 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	27,4	28,8 ÷ 29,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G35 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,520
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	> 2979

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS WIND
DATE 20/7/24 W R V

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 854 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	110
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G4 - L.V. POWER CABLE - Flame Retardant	Job card	529/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	303		
Drum No.	07-595		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,1	13,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,6 ÷ 15,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,58
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 10056

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
	x	CODIFICATION I 02	TYPE : MULTIMETER
	x	CODIFICATION I 03	TYPE : MEGAOHMETER
		CODIFICATION I 12	TYPE : LCR METER
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER
	x	CODIFICATION II 56	TYPE : PROFILE READER

CODIFICATION I 05

TYPE : HIGH VOLTAGE TEST BENCH

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. ROSETTI MARINO
DATE. 26/7/24 W R

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 855 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	120
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G4_E - L.V. POWER CABLE - Flame Retardant	Job card	530/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	770									
Drum No.	10-4944									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13,1	13
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,2 ÷ 15,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,58
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 7484

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSS WIND
DATE 26/7/24 W.B.

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Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 856 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	130
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G2,5_E - L.V. POWER CABLE - Flame Retardant	Job card	531/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	300									
Drum No.	07-594									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,7
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,0	14,3 ÷ 14,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,38
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 7800

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CRAWFORD
DATE 29/7/24 WR

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 857 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	140
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G50 - L.V. POWER CABLE - Flame Retardant	Job card	532/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	300									
Drum No.	12-1562									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	8,0 mm	8,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,2 mm	Diametro Diameter	tolerance ± 10%	mm	31,6	32,5
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,7 mm	2,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	35,0	36,9 ÷ 37,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G50 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,387	< 0,373
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	> 6042

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	12 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Cust. with
DATE 30/7/24 W R

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 858 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	150
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G70 - L.V. POWER CABLE - Flame Retardant	Job card	533/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	302		
Drum No.	14-1546		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,2 mm	Diametro Diameter	tolerance ± 10%	mm	35,9	37,3
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,8 mm	2,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	39,5	41,2 ÷ 42,9
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G70 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	< 0,263
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	410	> 4263

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	13 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI M.
DATE 22/7/24 W. R.

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 859 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	160
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G16 - L.V. POWER CABLE - Flame Retardant	Job card	534/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	333		
Drum No.	10-4936		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	21,2	21,9
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	24,0	24,8 ÷ 25,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G16 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,13
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	530	> 4900

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CRDWIND
DATE 2-17/24 W.R

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Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 860 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	170
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 5G4 - L.V. POWER CABLE - Flame Retardant	Job card	535/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	302									
Drum No.	08-197									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Grey - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,4	14,4
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,3 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,0 ÷ 17,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 5G4 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,60
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	910	> 5904

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. ROSETTI MARINO
DATE 26/7/24

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REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 861 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	180
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 2CX2,5 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	536/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	332		
Drum No.	08-194		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red - Black			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11	11
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,8	15,0 ÷ 15,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 2CX2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,31	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 3320	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF Rosetti Marino
DATE 30/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 862 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	190
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G16 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	537/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	308		
Drum No.	10-4929		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red - Black - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,4 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	19,2	19,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,6 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	23,6	24,0 ÷ 24,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G16 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,11
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	460	> 3944

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF C.
DATE 30/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 863 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	200
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G2,5 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	538/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	1517		
Drum No.	12-1579		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,7	11,7
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,5	15,8 ÷ 16,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS				Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤		7,41	< 7,37
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥		940	> 3900

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSCOM NS
DATE 20/12/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 864 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	210
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G6 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	539/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	08-189		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,3	14,7
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	18,3	18,9 ÷ 19,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G6 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 3,05
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 8175

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05	
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH	
	CODIFICATION I 12	TYPE : LCR METER		
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER		
x	CODIFICATION II 56	TYPE : PROFILE READER		

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ...
DATE 20/7/24 ...

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 865 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	220

Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 4G4_E L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	540/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	536									
Drum No.	10-4939									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	14,3	15,6
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	18,3	19,8 ÷ 20,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,59
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 4025

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROMOLOY
DATE 26/7/24 W.K

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 866 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	230
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 4G2,5_E L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	541/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	08-192		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	12,8	13,1
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	16,8	17,1 ÷ 17,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,39
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 5850

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 867 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	240
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 2CX2,5 CONTROL CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	542/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	302		
Drum No.	07-591		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black Numbered from 1 to 2			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11	11
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,8	15,0 ÷ 15,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 2CX2,5 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,38
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	940	> 3000

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF (PROFICOIN)
DATE. 26/7/24 W.R

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Mod. 8.2.8

REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 868 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	250
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX70 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	543/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	301		
Drum No.	08-191		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red			Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,3	15,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,5 mm	1,9 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,5	20,1 ÷ 20,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX70 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	0,263
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	380	< 5661

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date:

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... CARRIWIND
DATE... 26/7/24 W.R.

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI S.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 869 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	260
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX70 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	544/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	08-190		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	9,6 mm	9,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black			Spessore Nominale Nominal Thickness	1,4 mm	1,7 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	15,3	15,2
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,5 mm	1,8 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	19,5	20,0 ÷ 20,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX70 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,268	0,264
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	380	7946

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI S.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF...
DATE... 29/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 870 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	270
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX25 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	545/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	07-592		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,9 mm	5,9 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Red			Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,2	11,0
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,6 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,0	15,5 ÷ 15,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX25 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,727	0,721	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	2178	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CRISTOFORO MARINO
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 871 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	280
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 1CX25 DC POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	546/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	07-593		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	5,9 mm	5,9 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Black			Spessore Nominale Nominal Thickness	1,2 mm	1,2 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,2	11,2
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,0	15,0 ÷ 15,5
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 1CX25 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,727	0,720
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	480	2971

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSSETTI MARINO
DATE 30/7/24

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FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 872 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	290
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G150 - PE CABLE - Flame Retardant	Job card	547/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	08-177		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	14,1 mm	14,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,8 mm	1,9 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		17,7	17,8 ÷ 18,0
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G150 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,124	< 0,118
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Spark Test Isolamento IEC 62230 Insulation Spark Test	13 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. Rosetti Marino
DATE 26/7/24

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Mod. 8.2.8

REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 873 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	300
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G95 - PE CABLE - Flame Retardant	Job card	548/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	817		
Drum No.	10-4925		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	11,3 mm	11,3 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,6 mm	1,7 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		14,5	14,6 ÷ 14,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G95 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,193	< 0,187
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Spark Test Isolamento IEC 62230 Insulation Spark Test	12 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CASTOLIN
DATE 26/7/24

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	REV.3 Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 874 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	310
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G35 - PE CABLE - Flame Retardant	Job card	549/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	306		
Drum No.	06-2868		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		9,3	9,5 ÷ 9,7
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G35 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,520
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF. Rosetti Marino
DATE. 30/11/24

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 875 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	320
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G16 - PE CABLE - Flame Retardant	Job card	550/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1541									
Drum No.	07-583									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,2 mm
Diametro esterno Overall Diameter				Diametro Diameter tolerance ± 10%	mm	7,1	7,4 ÷ 7,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G16 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,11
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF CROSSWIND
DATE 22/7/24 WR

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 876 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	330
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G10 - PE CABLE - Flame Retardant	Job card	551/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	515		
Drum No.	06-2869		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		6,1	6,2 ÷ 6,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G10 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,78
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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REV.2 Data 13/03/18 — Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 — Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 877 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	340
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G6 - PE CABLE - Flame Retardant	Job card	552/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	2060									
Drum No.	06-2867									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	0,8 mm	1,0 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	4,8	5,0 ÷ 5,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G6 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 2,96
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 26/7/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 878 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	350
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH 0,6/1 KV 7CX1,5 - CONTROL CABLE - Flame Retardant	Job card	553/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2186		
Drum No.	12-1561		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	1,6 mm	1,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 7)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Cordatura Overall Wrapping	plastic tape helically wound 40x0,025 mm					% copertura % coverage	100	> 100
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,1	11,2
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	13,5	13,9 ÷ 14,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	12,1	< 11,8
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1000	> 38408

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... RINA
DATE 27/7/26 W R

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	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 879 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	360
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV 4CX4 CONTROL CABLE - SCREENED - Flame Retardant	Job card	554/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	07-589		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 4)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	12,1
Armatura Armouring	Copper Wire Braid (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,4	15,8 ÷ 16,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,50	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 9159	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 26/07/2024
Date: _____

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF... CROSETTI MARINO
DATE 30/12/24

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 880 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev	390
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G4 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	555/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	362		
Drum No.	08-183		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13	13,5
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,4 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,3 ÷ 17,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,48
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 4128

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05	
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH	
	CODIFICATION I 12	TYPE : LCR METER		
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER		
x	CODIFICATION II 56	TYPE : PROFILE READER		

Data: 26/07/2024
Date: _____

Il collaudatore: Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

ON BEHALF OF ROSETTI MARINO
DATE 20/12/24 W.R.

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REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 881 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A
		Item/Rev Tested	From 20 to 390

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1 / IEC 60092.360

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION XLPE	REQUIRED	**TESTED**
TENSILE STRENGHT	>12,5 N/mm²	16 N/mm²
ELONGATION AT BREAK	> 200 %	474%
AFTER AGEING (135° C x 168 hours)		
TENSILE STRENGHT	+/- 25 %	14,75 N/mm² (-7,8%)
ELONGATION AT BREAK	+/- 25 %	-9% (431,3%)
HOT SET TEST (200°C x 15 min.)	175%	75%
INSULATION EPR	**REQUIRED**	**TESTED**
TENSILE STRENGHT	> 8,5 N/mm²	11,2 N/mm²
ELONGATION AT BREAK	> 200%	>633 %
AFTER AGEING (150°C X 168 hours)		
TENSILE STRENGHT	+/- 30%	11,9 N/mmq (+6,2%)
ELONGATION AT BREAK	+/-30%	619% (-2,2%)
HOT SET TEST 250°CX15 min. MAX.ELONGATION UNDER LOAD	<175%	88%
HOT SET TEST(250°) MAX.PERMANENT ELONGATON	<15	Tested 5%
OVERALL SHEATH LSZH type SHF1	REQUIRED	**TESTED**
TENSILE STRENGHT	>9 N/MMQ	12,5 N/mm²
ELONGATION AT BREAK	> 120 %	160%
AFTER AGEING (110° C x 168 hours)		
TENSILE STRENGHT	+/- 30 %	13,6% (+9%)
ELONGATION AT BREAK	+/- 30 %	145% (-9%)

TYPE TESTS	**TESTED**
FIRE RESISTANT TEST (IEC 60331.21)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.1.2)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.22)	COMPLIANCE DECLARATION
ACID GAS GENERATION (IEC 60754.1/2)	COMPLIANCE DECLARATION
SMOKE DENSITY/LIGHT TRANSMITTANCE (IEC 61034.2 LT ≥ 60%)	COMPLIANCE DECLARATION
UV RESISTANCE TEST UL 2556 ex UL 1581 section 1200	COMPLIANCE DECLARATION

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 26/07/2024 Date:	Il collaudatore:Giovanni Cucinotta *Quality Control:*	Il Collaudatore: *Customer Quality Control:*	Foglio: Page: 37 / 37
	FLEI s.r.l. Quality Control	ON BEHALF OF CROSS WIND DATE 29/7/24 W.R.	

Mod. 8.2.8	REV.2	Data 13/03/18	Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023	Aggiornamento lista strumenti

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 599 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= ISO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172														
LENGTH m	1528														
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2023 QA 36265**

OPERATOR LABORATORY MANAGER INSPECTOR

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 40 AND 82 METERS

CONTROLCAVI INDUSTRIA s.r.l.
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Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 5 07-16. doc

SUPPLIER'S STOCK CABLE. SEE POSITION 380 OF THE PACKING LIST - 373 METERS

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl - Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
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Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION DNV ISO 9001 - ISO 14001 ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 *DATED* 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	**16-P00025I**														
LENGTH m	**514**														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	***TEST / CHECK***	***INSTRUMENT CCI code***	***UNIT***	***REQUIRED***	***RESULT***
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR TEST DEPARTMENT INSPECTOR





CCI Medium Voltage certificate Rev 5 07-16. doc

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Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465**

OPERATOR

LABORATORY MANAGER

INSPECTOR

ON BEHALF OF CLIENT

DATE 26/2/24 W.O.

CONTROLCAVI INDUSTRIA s.r.l.
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Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= ISO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172													
LENGTH m	1528													
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2023 QA 36265**

OPERATOR

LABORATORY MANAGER

INSPECTOR

ON BEHALF OF CROSSLINX

DATE 20/12/24 W.R

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl - Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
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Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 - ISO 14001
ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 *DATED* 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	**16-P00025I**														
LENGTH m	**514**														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	IINNER --	OUTER --

CABLE COMPONENT	***TEST / CHECK***	***INSTRUMENT CCI code***	***UNIT***	***REQUIRED***	***RESULT***
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR

TEST DEPARTMENT

INSPECTOR

ON BEHALF OF. CCI Cable Service Srl

DATE 22/7/24

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1088 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	400
Tipo di cavo e sezione Cable type and section	Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV 4CX4 CONTROL CABLE - SCREENED - Flame Retardant	Job card	720/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	305		
Drum No.	07-573		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	XLPE compound, quality to IEC 60092.360	Colore Colour	Black NUMBERED (from 1 to 4)			Spessore Nominale Nominal Thickness	0,7 mm	0,8 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,9
Armatura Armouring	Copper Wire Braid (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,3 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	15,4	15,9 ÷ 16,4
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,55	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	690	> 5300	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 1 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1089 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	410
Tipo di cavo e sezione Cable type and section	Cu Cl.2/MGT/EPR/LSZH/GSWB/LSZH 0,6/1 KV 3G4 L.V. POWER CABLE - Fire Resistant & Flame Retardant - ARMOURED	Job card	721/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	300		
Drum No.	08-166		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,6 mm	2,6 mm
Isolamento Insulation	Mica/Glass Tape (MGT) plus EPR compound, quality to IEC 60092.360	Colore Colour	Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,1 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	13	13
Armatura Armouring	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)				Nominal Wire Diameter	mm	0,3 mm	0,3 mm
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Orange	Spessore Nominale Nominal Thickness	1,4 mm	1,5 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	17,0	17,0 ÷ 17,6
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 3G4 SQMM - MGT/EPR/LSZH/GSWB/LSZH - 0,6/1 KV - IEC 60331.21 - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested	PROVE DI TENSIONE VOLTAGE TEST Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	4,61	< 4,53	Tra conduttori Between conductors	3,5x5	OK
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	790	> 3300	Tra conduttori / Armatura Between Cores / Armour	3,5x5	OK
					Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
					Spark test guaina IEC 62230 Sheath Spark Test	10 KV	OK
					TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
	CODIFICATION I 12	TYPE : LCR METER	
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 2 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l. — IMQ CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015 — IQNET RECOGNIZED CERTIFICATION

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1090 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev	420
Tipo di cavo e sezione Cable type and section	Cu Cl.2/EPR/LSZH 0,6/1 KV 4G2,5_E - L.V. POWER CABLE - Flame Retardant	Job card	722/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	309		
Drum No.	07-572		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS							Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	IEC 60228		Diametro Nominale Nominal Diameter	2,0 mm	2,0 mm
Isolamento Insulation	EPR compound, quality to IEC 60092.360	Colore Colour	Black - Brown - Blue - Yellow/Green			Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Guaina interna Inner Sheath	Extruded LSZH compound - Black	Spessore Medio Average Thickness	1,0 mm	Diametro Diameter	tolerance ± 10%	mm	11,6	11,5
Guaina esterna *Overall sheath*	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type SHF1 to IEC 60092.360			Colore Colour	Grey	Spessore Nominale Nominal Thickness	1,2 mm	1,9 mm
Diametro esterno Overall Diameter				Diametro Diameter	tolerance ± 10%	mm	14,0	15,0 ÷ 15,3
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 1000V - 4G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING							

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	7,41	< 7,15
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	1100	> 10800

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori Between conductors	3,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
Spark test guaina IEC 62230 Sheath Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	TYPE : HIGH VOLTAGE TEST BENCH
		CODIFICATION I 12	TYPE : LCR METER	
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/09/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 3 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1091 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV1
		Item/Rev Tested	From 400 to 420

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1 / IEC 60092.360

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION XLPE	REQUIRED	**TESTED**
TENSILE STRENGHT	>12,5 N/mm²	17,28 N/mm²
ELONGATION AT BREAK	> 200 %	548%
AFTER AGEING (135° C x 168 hours)		
TENSILE STRENGHT	+/- 25 %	16,22 N/mm² (-6,1%)
ELONGATION AT BREAK	+/- 25 %	-10% (493,2%)
HOT SET TEST (200°C x 15 min.)	175%	75%
INSULATION EPR	**REQUIRED**	**TESTED**
TENSILE STRENGHT	> 8,5 N/mm²	13,6 N/mm²
ELONGATION AT BREAK	> 200%	>601 %
AFTER AGEING (150°C X 168 hours)		
TENSILE STRENGHT	+/- 30%	12,9 N/mmq (-5,3%)
ELONGATION AT BREAK	+/-30%	570,9% (-5%)
HOT SET TEST 250°CX15 min. MAX.ELONGATION UNDER LOAD	<175%	82%
HOT SET TEST(250°) MAX.PERMANENT ELONGATON	<15	Tested 5%
OVERALL SHEATH LSZH type SHF1	REQUIRED	**TESTED**
TENSILE STRENGHT	>9 N/MMQ	13,4 N/mm²
ELONGATION AT BREAK	> 120 %	188%
AFTER AGEING (110° C x 168 hours)		
TENSILE STRENGHT	+/- 30 %	12,4% (-7,6%)
ELONGATION AT BREAK	+/- 30 %	172,9% (-8%)

TYPE TESTS	**TESTED**
FIRE RESISTANT TEST (IEC 60331.21)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.1.2)	OK : PASS
FLAME RETARDANT TEST (IEC 60332.22)	COMPLIANCE DECLARATION
ACID GAS GENERATION (IEC 60754.1/2)	COMPLIANCE DECLARATION
SMOKE DENSITY/LIGHT TRANSMITTANCE (IEC 61034.2 LT ≥ 60%)	COMPLIANCE DECLARATION
UV RESISTANCE TEST UL 2556 ex UL 1581 section 1200	COMPLIANCE DECLARATION

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 20/09/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 4 / 4

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1349 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	430
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G16 PE CABLE - Flame Retardant	Job card	824/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2568		
Drum No.	09-7152		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	5,1 mm	5,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,0 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		7,1	7,1
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G16 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,15	< 1,07
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST		
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori / Acqua Between Cores / water	2,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 1 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1350 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	440
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G10 PE CABLE - Flame Retardant	Job card	825/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	1030									
Drum No.	06-2794									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	4,1 mm	4,1 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,0 mm	1,05 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	6,1	6,2
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G10 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	1,83	< 1,77
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Tra conduttori / Acqua Between Cores / water	2,5x5	OK	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 2 / 4

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1351 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Item/Rev	450
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G6 PE CABLE - Flame Retardant	Job card	826/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		
Length mt.	2058		
Drum No.	06-2792		

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	3,2 mm	3,2 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	0,8 mm	0,85 mm
Diametro esterno Overall Diameter		Diametro Diameter	tolerance ± 10%	mm		4,8	4,9
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G6 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	3,08	< 2,99
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result	
Tra conduttori / Acqua Between Cores / water	2,5x5	OK	
Spark Test Isolamento IEC 62230 Insulation Spark Test	7 KV	OK	
TEST DI CONTINUITA' CONTINUITY TEST		OK	

INSTRUMENT LIST			
x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
x	CODIFICATION I 03	TYPE : MEGAOHMETER	
	CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 22/10/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 3 / 4

Mod. 8.2.8		
	REV.2	Data 13/03/18 — Aggiornamento ISO 9001:2015
	REV.3	Data 20/12/2023 — Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1352 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV2
		Pos.	From 430 to 450

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION LSOH,TI7	REQUIRED	**TESTED**
TENSILE STRENGHT	>10 N/mm²	17,12 N/mm²
ELONGATION AT BREAK	> 125 %	576%
AFTER AGEING (80° C x 168 hours)		
TENSILE STRENGHT	+/- 20 %	(-6,5%) 16 N/mm²
ELONGATION AT BREAK	+/- 20 %	-8% (529,9%)
HOT SET TEST (200°C x 15 min.)	175%	70%

TYPE TESTS	**TESTED**
NO-Flame propagation test IEC 60332.1.2	OK : PASS
NO-Fire propagation test IEC 60332.24.C	COMPLIANCE DECLARATION
LowEmission of Toxic/Corrosive Gas test IEC 60754.1 (HCl ≤ 0,5%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET
Low Emission of Opaque Smoke test IEC 61034.2 (LT ≥ 40%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 22/10/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 4 / 4

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 599 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL
= ISO 9001:2015 =
= 14001:2015 =
= BSO 45001:2018 =

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 36265

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	36265
CS	220363/22
date	05/04/23
sheet	1 / 1
Td 20230304	

CUSTOMER	BATT CABLES plc
ORDER	PO J4739 DATED 16/12/22
CUSTOMER REF.	STOCK No.: 14167 ITEM E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1800-P00172															
LENGTH m	1528															
Ends Meter Marking	INNER 00000	OUTER 01528	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --		

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,269
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 745	> 745
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,83
INSULATION	average thickness	D003	mm	≥ 3,4	3,45
	minimum thickness	D003	mm	≥ 2,96	3,10
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,87
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	*Copper tape 30x0,10 mm*	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,00
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,40
	minimum thickness	D003	mm	≥ 1,32	2,10
	diameter	D070	mm	--	30,20
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2023 QA 36265**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 6 .. ..

SUPPLIER'S STOCK CABLE. SEE POSITION 370 OF THE PACKING LIST - 40 AND 82 METERS

CONTROLCAVI INDUSTRIA s.r.l.
Stabilimento e Uffici: S.S. Casilina, Km 78,600 - 03013 FERENTINO (FR)
Tel. 0775.271494 r.a. - Fax 0775.271489 - e-mail: cci@cableservice.it
N. Mecc.: MI 253563 - P.IVA 11807440158 - C.F. 01871520605 - Cap. Soc. € 624.000 i. v.
Iscrizione Registro Imprese di Milano N. 712666/1996 - R.E.A. Milano N. 1496880
Sede Legale: Strada Provinciale 117 - 20010 Bernate Ticino (MI)

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA DNV GL

MEDIUM VOLTAGE CABLES

FINAL TESTS CERTIFICATE

N° 31465

CABLE	XAI
CONSTRUCTION	1 x 70 mm²
VOLTAGE RATE	6 / 10 kV

QA	31465
CS	190319/19
date	24/03/2020
sheet	1 / 1
Td 090320	

CUSTOMER	BATT CABLES PLC
ORDER	PO H8379 DATED 11/11/19
CUSTOMER REF.	STOCK : 14167 LINE E
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22 Cat A

DRUM N°	1400-N00163		1400-X00789											
LENGTH m	759		760											
Ends Meter Marking	INNER 00000	OUTER 00759	INNER 00761	OUTER 01521	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –	INNER –	OUTER –

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,270	0,264
ARMOUR	electrical resistance @ 20°C	E146	Ω/km	--	--
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min.	No breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 746	> 746
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failures
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flex tinned annealed copper (cl.2)	
	construction (n x d)	D005	mm	352 x 0,52	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,80
INSULATION	average thickness	D003	mm	≥ 3,4	3,80
	minimum thickness	D003	mm	≥ 2,96	3,5
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,75
CORE IDENTIFICATION	Insulation	--	--	OFF-WHITE	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Copper tape 30x0,10 mm	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,50	1,90
	diameter	D003	mm	--	24,40
EMC PROTECTION (if any)	visual inspection	--	--	--	
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 1,90	2,05
	minimum thickness	D003	mm	≥ 1,32	2,00
	diameter	D070	mm	--	29,80
	colour	--	--	RED	

MARKING	**CCI - XAI 6/10 kV 1x70 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR® (meter marking) 2020 QA 31465**

OPERATOR LABORATORY MANAGER INSPECTOR

CCI Medium Voltage certificate Rev 5 07-16. doc

SUPPLIER'S STOCK CABLE. SEE POSITION 380 OF THE PACKING LIST - 373 METERS

CABLESERVICE
CCI
Control Cavi Industria

CCI Cable Service Srl · Unico Socio
SEDE LEGALE E UFFICI: Via Loc. Ex Casello Autostrada n. 4 - 20010 BERNATE TICINO (MI)
Tel. +39 02 97255817 - Fax +39 02 97255754 - E-mail: cci@cableservice.com
UNITÀ PRODUTTIVA: S.S. Casilina, km 78,600 - 03013 FERENTINO (FR)
Tel. +39 0775 271494 r.a. - Fax +39 0775 271489
Partita IVA, Codice Fiscale, Registro Imprese di Milano n. 04947340156 Cap. Soc. € 650.000 i.v.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 · ISO 14001
ISO 45001

MV CABLES

FINAL TESTS CERTIFICATE

N° 038111 / 240326

CABLE	**XAI**
CONSTRUCTION	**1 x 150 mm²**
VOLTAGE RATE	**6/10 kV**

QA	**038111**
CS	000009/24
date	24/05/24
sheet	1 / 1
Td 20242105	

CUSTOMER	BATT CABLES plc
ORDER	K0087 DATED 11/01/24
CUSTOMER REF.	STOCK: 14136 LINE: G
SPECIFICATIONS	IEC 60092.354 IEC 60332.3.22. Cat A

DRUM N°	16-P00025I														
LENGTH m	514														
Ends Meter Marking	INNER 00000	OUTER 00514	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	INNER --	OUTER --	

CABLE COMPONENT	TEST / CHECK	INSTRUMENT CCI code	UNIT	REQUIRED	RESULT
ROUTINE TESTS on complete cable					
CONDUCTOR	electrical resistance @ 20°C	E146	Ω/km	≤ 0,126	0,124
INSULATION	A.C voltage test	E025 / E138	kV x time	21 x 5 min	no breakdown
	insulation resistance @ 20°C	E150	MΩ x km	≥ 567	> 567
	partial discharge test	E106 / E140	pC	≤ 5	0
OUTER SHEATH (armoured only)	D.C. voltage test (continuous on line)	E156 / E157	V	4500	no failure
SAMPLE TESTS Cable construction and dimensional checks					
CONDUCTOR	visual inspection	--	--	Flexible tinned annealed copper (Cl2)	
	construction (n x d)	D005	mm	776 x 0,51	
SEMICONDUCTIVE LAYER	thickness	D003	mm	≥ 0,70	0,72
INSULATION	average thickness	D003	mm	≥ 3,40	3,65
	minimum thickness	D003	mm	≥ 2,96	3,40
SEMICONDUCTIVE LAYER	thickness	D003	Mm	≥ 0,7	0,90
CORE IDENTIFICATION	Insulation	--	--	off-white	
	tapes (coloured or numbered)	--	--	--	
CORE SCREEN	visual inspection	--	--	Cu plain tape 40x0,10	
FLAMEBAR® PROTECTION	visual inspection	--	--	Fibre glass tape(s) overlapped 50%	
INNER SHEATH	average thickness	D003	mm	≥ 1,5	1,90
	diameter	D003	mm	--	28,60
EMC PROTECTION (if any)	visual inspection	--	--		
ARMOUR	wire diameter	D005	mm	0,30	0,30
	coverage	--	%	≥ 90	> 90
OUTER SHEATH	average thickness	D003	mm	≥ 2,10	2,40
	minimum thickness	D003	mm	≥ 1,48	2,20
	diameter	D070	mm	--	35,20
	colour	--	--	RED	

MARKING	**CCI XAI 6/10 KV 1X150 mm² IEC 60092.354 / 60332.3.22 Cat A FLAMEBAR (meter marking) 2024 QA 38111**

OPERATOR TEST DEPARTMENT INSPECTOR

CCI Medium Voltage certificate Rev 5 07-16. doc

FLEI s.r.l.

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1592 / 2024

TEST REPORT: Testing document No.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV3
		Item/Rev	460
Tipo di cavo e sezione Cable type and section	Cu Cl.2/LSZH 450/750 V 1G35 PE CABLE - Flame Retardant	Job card	1115/2024
Norma di riferimento Ref. Standard/customer spec.	IEC 60332.1.2 - IEC 60332.3.22		

Length mt.	309									
Drum No.	06-2735									

CARATTERISTICHE TECNICHE CONSTRUCTION CHARACTERISTICS						Richiesto Required	Riscontrato Tested
Conduttore Conductor	STRANDED COMPACTED plain/bare annealed copper wires	Classe Class	2	EN/IEC 60228	Diametro Nominale Nominal Diameter	6,9 mm	6,9 mm
Isolamento Insulation	LSZH compound, TI7 quality	Colore Colour	Yellow with 2 Green stripes		Spessore Nominale Nominal Thickness	1,2 mm	1,45 mm
Diametro esterno Overall Diameter				Diametro Diameter / tolerance ± 10%	mm	9,3	9,8
Marcatura Marking/Printing	FLEI - ELECTRIC CABLE - 450/750 V - 1G35 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 - 2024 - CE PROGRESSIVE METER LENGTH PRINTING						

CARATTERISTICHE ELETTRICHE ELECTRICAL CHARACTERISTICS			Richiesto Required	Riscontrato Tested
Resistenza conduttore Conductor resistance	Ω/km a 20°C	≤	0,524	< 0,517
Resistenza isolamento a 500V Insulation resistance at 500V	MΩ x km@20°C	≥	10	> 100

PROVE DI TENSIONE VOLTAGE TEST			
Test eseguito in C.A. a 50 Hz Test performed in A.C. at 50 Hz	KV x min.	Risultato Result
Tra conduttori / Acqua Between Cores / water	2,5x5	OK
Spark Test Isolamento IEC 62230 Insulation Spark Test	9 KV	OK
TEST DI CONTINUITA' CONTINUITY TEST		OK

INSTRUMENT LIST				
	x	CODIFICATION I 02	TYPE : MULTIMETER	CODIFICATION I 05
	x	CODIFICATION I 03	TYPE : MEGAOHMETER	
		CODIFICATION I 12	TYPE : LCR METER	TYPE : HIGH VOLTAGE TEST BENCH
	x	CODIFICATION II 11	TYPE : DIGITAL CALIPER	
	x	CODIFICATION II 56	TYPE : PROFILE READER	

Data: 20/12/2024
Date:

Il collaudatore:Giovanni Cucinotta
Quality Control

FLEI s.r.l. Quality Control

Il Collaudatore del Cliente:
Customer Quality Control:

Foglio: Page: 1 / 2

Mod. 8.2.8

REV.2 Data 13/03/18 Aggiornamento ISO 9001:2015
REV.3 Data 20/12/2023 Aggiornamento lista strumenti

Via A. De Gasperi 82 Agrate Brianza – (MB) Italy

ATTESTATO DI COLLAUDO N° 1593 / 2024

TEST REPORT: Testing document Nr.

Cliente Customer	ROSETTI MARINO	ORDINE N° Order No.	1724001141 123A90A REV3
		Item/Rev	460

Norma di riferimento *Ref. Standard/customer spec:*	IEC 60502.1

MATERIAL CERTIFICATE

MECHANICAL TEST

INSULATION LSOH,TI7	REQUIRED	**TESTED**
TENSILE STRENGHT	>10 N/mm²	17,7 N/mm²
ELONGATION AT BREAK	> 125 %	502%
AFTER AGEING (80° C x 168 hours)		
TENSILE STRENGHT	+/- 20 %	(-4,9%) 16,8 N/mm²
ELONGATION AT BREAK	+/- 20 %	-10% (452%)
HOT SET TEST (200°C x 15 min.)	175%	70%

TYPE TESTS	**TESTED**
NO-Flame propagation test IEC 60332.1.2	OK : PASS
NO-Fire propagation test IEC 60332.24.C	COMPLIANCE DECLARATION
LowEmission of Toxic/Corrosive Gas test IEC 60754.1 (HCl ≤ 0,5%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET
Low Emission of Opaque Smoke test IEC 61034.2 (LT ≥ 40%)	COMPLIANCE DECLARATION+MATERIAL SUPPLIER DATA SHEET

INSTRUMENT LIST	CODIFICATION I 04	TYPE : TENSOR CHECK PROFILE (DINAMOMETER)	
Data: 20/12/2024 Date:	Il collaudatore:Giovanni Cucinotta Quality Control	Il Collaudatore del Cliente: Customer Quality Control:	Foglio: Page: 2 / 2

COPPER CONDUCTOR

• Fili - Trefoli - Corde - Piattine e barre di rame
• Catodi e pani rame
• Rottami e semilavorati metalli non ferrosi

AFFINAZIONE E TRAFILERIA DI ARLUNO S.R.L.

CAP. VERS. € 260.000,00 - C.C.I.A.A. MILANO REA 887717 - COD. FISC.-PART. IVA 01831360159
REGISTRO IMPRESE MILANO 88851/161555/3933/5

20010 ARLUNO (Milano) - Via Montenero, 39 - Tel. 02 9017557-8 - Fax 02 9017558
E-mail: info@traf-arluno.it - http: www.traf-arluno.it

Spett. le Flei

Arluno, 01/07/2024

Quality statement (EN 10204 2.2)

DDT N° 975

Semi-finished copper goods furnished to your company comply with UNI EN 1977:2013 - ASTM B 49 17 and EN 13602:2013 regulation.

Resistivity:	0,01759
Conductivity:	101 %

CHEMICAL COMPOSITION

Cu	99,974	Pb	0,0013
Se	0,0008	Sn	0,0009
Te	0,0008	Ni	0,0008
Bi	0,0001	Fe	0,0035
Co	0,0001	Si	0,001
Mn	0	Zn	0,0001
Sb	0,0005	Ag	0,011
As	0,0011	S	0,004

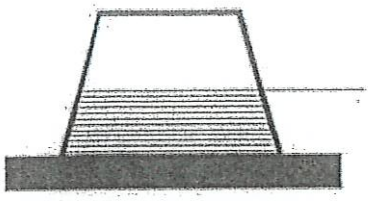
FLEI S.r.l. Quality Control

Elongation:	23-24 %
Tensile strenght:	≥ Kg. 22/mm²

Best regards,

Affinazione e Trafileria di Arluno

COPPER CONDUCTOR



- Fili - Trefoli - Corde - Piattine e barre di rame
- Catodi e pani rame
- Rottami e semilavorati metalli non ferrosi

AFFINAZIONE E TRAFILERIA DI ARLUNO S.R.L.

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E-mail: info@traf-arluno.it - http: www.traf-arluno.it

Spett. le Flei

Arluno, DDT 895

Quality statement (EN 10204 2.2)

Semi-finished copper goods furnished to your company comply with UNI EN 1977:2013 - ASTM B 49 17 and EN 13602:2013 regulation.

Resistivity:	0,01759
Conductivity:	101 %

CHEMICAL COMPOSITION

FLEI s.r.l. Quality Control

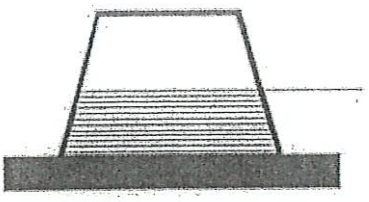
Cu	99,974	Pb	0,0013
Se	0,0008	Sn	0,0009
Te	0,0008	Ni	0,0008
Bi	0,0001	Fe	0,0035
Co	0,0001	Si	0,001
Mn	0	Zn	0,0001
Sb	0,0005	Ag	0,011
As	0,0011	S	0,004

Elongation:	23-24 %
Tensile strenght:	≥ Kg. 22/mm²

Best regards,

Affinazione e Trafileria di Arluno

COPPER CONDUCTOR



- Fili - Trefoli - Corde - Piattine e barre di rame
- Catodi e pani rame
- Rottami e semilavorati metalli non ferrosi

AFFINAZIONE E TRAFILERIA DI ARLUNO S.R.L.

CAP. VERS. € 260.000,00 - C.C.I.A.A. MILANO REA 887717 - COD. FISC.-PART. IVA 01831360159
REGISTRO IMPRESE MILANO 88851/161555/3933/5

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E-mail: info@traf-arluno.it - http: www.traf-arluno.it

Spett. le Flei

Arluno, 16/2M DDT 832

Quality statement (EN 10204 2.2)

Semi-finished copper goods furnished to your company comply with UNI EN 1977:2013 - ASTM B 49 17 and EN 13602:2013 regulation.

Resistivity:	0,01759
Conductivity:	101 %

CHEMICAL COMPOSITION

Cu	99,974	Pb	0,0013
Se	0,0008	Sn	0,0009
Te	0,0008	Ni	0,0008
Bi	0,0001	Fe	0,0035
Co	0,0001	Si	0,001
Mn	0	Zn	0,0001
Sb	0,0005	Ag	0,011
As	0,0011	S	0,004

AFV s.r.l.
Quality Control

Elongation:	23-24 %
Tensile strenght:	≥ Kg. 22/mm²

Best regards,

Affinazione e Trafileria di Arluno

COPPER CONDUCTOR

AFFINAZIONE E TRAFILERIA DI ARLUNO S.R.L.

CAP. VERS. € 260.000,00 - C.C.I.A.A. MILANO REA 887717 - COD. FISC.-PART. IVA 01831360159
REGISTRO IMPRESE MILANO 88851/161555/3933/5

20010 ARLUNO (Milano) - Via Montenero, 39 - Tel. 02 9017557-8 - Fax 02 9017558
E-mail: info@traf-arluno.it - http: www.traf-arluno.it

- Fili - Trefoli - Corde - Piattine e barre di rame
- Catodi e pani rame
- Rottami e semilavorati metalli non ferrosi

Spett. le Flei

Arluno,

DDT 687

Quality statement (EN 10204 2.2)

Semi-finished copper goods furnished to your company comply with UNI EN 1977:2013 - ASTM B 49 17 and EN 13602:2013 regulation.

Resistivity:	0,01759
Conductivity:	101 %

CHEMICAL COMPOSITION

Cu	99,974	Pb	0,0013
Se	0,0008	Sn	0,0009
Te	0,0008	Ni	0,0008
Bi	0,0001	Fe	0,0035
Co	0,0001	Si	0,001
Mn	0	Zn	0,0001
Sb	0,0005	Ag	0,011
As	0,0011	S	0,004

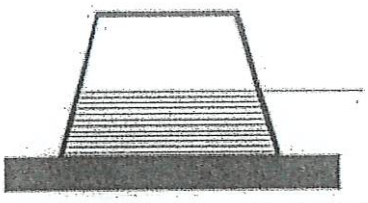
FLSI s.r.l.
Quality Control

Elongation:	23-24 %
Tensile strenght:	≥ Kg. 22/mm²

Best regards,

Affinazione e Trafileria di Arluno

COPPER CONDUCTOR



- Fili - Trefoli - Corde - Piattine e barre di rame
- Catodi e pani rame
- Rottami e semilavorati metalli non ferrosi

AFFINAZIONE E TRAFILERIA DI ARLUNO S.R.L.

CAP. VERS. € 260.000,00 - C.C.I.A.A. MILANO REA 887717 - COD. FISC.-PART. IVA 01831360159
REGISTRO IMPRESE MILANO 88851/161555/3933/5

20010 ARLUNO (Milano) - Via Montenero, 39 - Tel. 02 9017557-8 - Fax 02 9017558
E-mail: info@traf-arluno.it - http: www.traf-arluno.it

Spett. le Flei

Arluno,

Quality statement (EN 10204 2.2) DDT n° 336

Semi-finished copper goods furnished to your company comply with UNI EN 1977:2013 - ASTM B 49 17 and EN 13602:2013 regulation.

Resistivity:	0,01759
Conductivity:	101 %

CHEMICAL COMPOSITION

Cu	99,974	Pb	0,0013
Se	0,0008	Sn	0,0009
Te	0,0008	Ni	0,0008
Bi	0,0001	Fe	0,0035
Co	0,0001	Si	0,001
Mn	0	Zn	0,0001
Sb	0,0005	Ag	0,011
As	0,0011	S	0,004

FLEI s.r.l.
Quality Control

Elongation:	23-24 %
Tensile strenght:	≥ Kg. 22/mm²

Best regards,

Affinazione e Trafileria di Arluno

COPPER CONDUCTOR

ELTECH Via della Tecnica, 19 Montecchio Maggiore (VI)	**Rapporto di prova – Test report** **EN 10204 – "type 2.2"** **include Dichiarazione di Conformità** **EN 1655 – tipo "C"**	**N° 1548/24**

Codice Prodotto ***Product Code***	260R				
Descrizione ***Description***	Filo singolo di rame nudo – Ø 2,600 mm Single, bare copper wire – Ø 2,600 mm				
Ordine di lavoro n° ***Inner lot n°***	1548	**Del** ***Date***	29/05/2024		
Ordine cliente n° ***Customer order n°***	144	**Del** ***Date***	29/05/2024		
Quantità consegnata vedi ***Delivered amount*** *see*	**D.d.t. n°** ***Document n°***	466	**Del** ***Date***	13/06/2024	
Cliente ***Customer***	FLEI SRL				

I prodotti a cui si riferisce la presente dichiarazione rispondono alle condizioni e ai requisiti del committente, nonché alla descrizione, al quantitativo e alla specifica concordati.

The products listed above are complying with the customer's conditions and requirements, the descriptions, the amount and the agreed standards, too.

A cura di RQ / *Edited by the Quality Manager*

Descrizione / *Description*	**Valori prescritti** **Required values**	**Valori riscontrati / Obtained values** Campione A *Sample A*	Campione B *Sample B*
Diametro medio / *Mean diameter*	2,600mm	2,599 mm	/
Tolleranza sul diametro / *Tolerance*	± 0,015 mm		/
Spessore stagno / *Tin thickness (*)*	µm ± 15 %	/	/
Allungamento / *Elongation*	≥ 29 % (**)	37 %	/
Uniformità di stagnatura / *Continuity of tin coating*	1° met. CEI 20–13	/	/
Aderenza alla stagnatura / *Adhesion of tin coating*	ASTM B33 par. 6.5	/	/
☐ Carico di rottura / *Tensile strenght*	N/mm² min. 200	/	/
☐ Resistenza elettrica / *Electrical resistance*	Ω mm² / m ≤ 0,01751	/	/

(*) Misura effettuata con strumento Couloscope S Fischer secondo procedura interna IQ PRD 03
Measure carried out with instrument Couloscope S Fischer according to inner procedure IQ PRD 03
(**) Prova secondo ISO 6892-1:2016 B100 _ Prelievo campione posizione verticale inizio cesto / fine infustatura
Test according to ISO 6892-1: 2016 B100_ sample taken in vertical position at steel basket beginning / end of winding

FLEI s.r.l. Quality Control

Campioni utilizzati / *Samples used*

Camp. A **Sample A**	Cesto n° Basket n°	4434	Del *Date*	12/06/24	Impianto *Plant*	SB	Coil n°	02/6982
Camp. B **Sample B**	Cesto n° Basket n°	/	Del *Date*	/	Impianto *Plant*	/	Coil n°	/

Certificato di Qualità del rame: ***Copper Quality Certificate:***	☐ **Allegato** **Enclosed**

Questi prodotti sono stati ottenuti nell'ambito di un sistema di gestione qualità certificato secondo la norma ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

These products have been obtained under a certified quality system in compliance with the requirements of the standard ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

AZIENDA CON
SISTEMA DI GESTIONE QUALITA'
CERTIFICATO DA DNV
ISO 9001

Responsabile Qualità ***Quality manager***	**Roberto Dal Lago**	**Data** **Date**	13/06/2024

COPPER CONDUCTOR

ELTECH Via della Tecnica, 19 Montecchio Maggiore (VI)	**Rapporto di prova – Test report** **EN 10204 – "type 2.2"** **include Dichiarazione di Conformità** **EN 1655 – tipo "C"**	**N° 1549/24**

Codice Prodotto ***Product Code***	220R				
Descrizione ***Description***	Filo singolo di rame nudo – Ø 2,200 mm Single, bare copper wire – Ø 2,200 mm				
Ordine di lavoro n° ***Inner lot n°***	1549	**Del** ***Date***	29/05/2024		
Ordine cliente n° ***Customer order n°***	144	**Del** ***Date***	29/05/2024		
Quantità consegnata vedi ***Delivered amount*** *see*	**D.d.t. n°** ***Document n°***	466	**Del** ***Date***	13/06/2024	
Cliente ***Customer***	FLEI SRL				

I prodotti a cui si riferisce la presente dichiarazione rispondono alle condizioni e ai requisiti del committente, nonché alla descrizione, al quantitativo e alla specifica concordati.

The products listed above are complying with the customer's conditions and requirements, the descriptions, the amount and the agreed standards, too.

A cura di RQ / *Edited by the Quality Manager*

Descrizione / *Description*	**Valori prescritti** **Required values**	**Valori riscontrati / Obtained values** Campione A *Sample A*	Campione B *Sample B*
Diametro medio / *Mean diameter*	2,200mm	2,228 mm	/
Tolleranza sul diametro / *Tolerance*	± 0,030 mm		/
Spessore stagno / *Tin thickness (*)*	µm ± 15 %	/	/
Allungamento / *Elongation*	≥ 29 % (**)	32 %	/
Uniformità di stagnatura / *Continuity of tin coating*	1° met. CEI 20–13	/	/
Aderenza alla stagnatura / *Adhesion of tin coating*	ASTM B33 par. 6.5	/	/
☐ Carico di rottura / *Tensile strenght*	N/mm² min. 200	/	/
☐ Resistenza elettrica / *Electrical resistance*	Ω mm² / m ≤ 0,01751	/	/

(*) Misura effettuata con strumento Couloscope S Fischer secondo procedura interna IQ PRD 03
Measure carried out with instrument Couloscope S Fischer according to inner procedure IQ PRD 03
(**) Prova secondo ISO 6892-1:2016 B100_ Prelievo campione posizione verticale inizio cesto / fine infustatura
Test according to ISO 6892-1: 2016 B100_ sample taken in vertical position at steel basket beginning / end of winding

Campioni utilizzati / *Samples used*

Camp. A **Sample A**	Cesto n° Basket n°	4429	Del *Date*	11/06/24	Impianto *Plant*	SB	Coil n°	02/6984
Camp. B **Sample B**	Cesto n° Basket n°	/	Del *Date*	/	Impianto *Plant*	/	Coil n°	/

Certificato di Qualità del rame:
Copper Quality Certificate:
☐ **Allegato**
Enclosed

Questi prodotti sono stati ottenuti nell'ambito di un sistema di gestione qualità certificato secondo la norma ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

These products have been obtained under a certified quality system in compliance with the requirements of the standard ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

AZIENDA CON
SISTEMA DI GESTIONE QUALITA'
CERTIFICATO DA DNV
ISO 9001

Responsabile Qualità ***Quality manager***	**Roberto Dal Lago**	**Data** **Date**	13/06/2024

COPPER CONDUCTOR

ELTECH Via della Tecnica, 19 Montecchio Maggiore (VI)	**Rapporto di prova – Test report** **EN 10204 – "type 2.2"** **include Dichiarazione di Conformità** **EN 1655 – tipo "C"**	**N° 1110/24**

Codice Prodotto ***Product Code***	220R			
Descrizione ***Description***	Filo singolo di rame nudo – Ø 2,200 mm Single, bare copper wire – Ø 2,200 mm			
Ordine di lavoro n° ***Inner lot n°***	1110	**Del** ***Date***	17/04/2024	
Ordine cliente n° ***Customer order n°***	90	**Del** ***Date***	17/04/2024	
Quantità consegnata vedi ***Delivered amount*** *see*	**D.d.t. n°** ***Document n°*** 372	**Del** ***Date***	09/05/2024	
Cliente ***Customer***	FLEI SRL			

I prodotti a cui si riferisce la presente dichiarazione rispondono alle condizioni e ai requisiti del committente, nonché alla descrizione, al quantitativo e alla specifica concordati.

The products listed above are complying with the customer's conditions and requirements, the descriptions, the amount and the agreed standards, too.

A cura di RQ / *Edited by the Quality Manager*

Descrizione / *Description*	**Valori prescritti** **Required values**	**Valori riscontrati / Obtained values** Campione A *Sample A*	Campione B *Sample B*
Diametro medio / *Mean diameter*	2,200mm	2,2152 mm	/
Tolleranza sul diametro / *Tolerance*	± 0,015 mm		/
Spessore stagno / *Tin thickness (*)*	µm ± 15 %	/	/
Allungamento / *Elongation*	≥ 29 % (**)	39 %	/
Uniformità di stagnatura / *Continuity of tin coating*	1° met. CEI 20–13	/	/
Aderenza alla stagnatura / *Adhesion of tin coating*	ASTM B33 par. 6.5	/	/
☐ Carico di rottura / *Tensile strenght*	N/mm² min. 200	/	/
☐ Resistenza elettrica / *Electrical resistance*	Ω mm² / m ≤ 0,01751	/	/

(*) Misura effettuata con strumento Couloscope S Fischer secondo procedura interna IQ PRD 03
Measure carried out with instrument Couloscope S Fischer according to inner procedure IQ PRD 03
(**) Prova secondo ISO 6892-1:2016 B100 _ Prelievo campione posizione verticale inizio cesto / fine infustatura
Test according to ISO 6892-1: 2016 B100_ sample taken in vertical position at steel basket beginning / end of winding

Campioni utilizzati / *Samples used*

Camp. A **Sample A**	Cesto n° Basket n°	3519	Del *Date*	08/05/24	Impianto *Plant*	SB	Coil n°	02/4177
Camp. B **Sample B**	Cesto n° Basket n°	/	Del *Date*	/	Impianto *Plant*	/	Coil n°	/

Certificato di Qualità del rame:
Copper Quality Certificate:

☐ **Allegato**
Enclosed

FLEI s.r.l. Quality Control

Questi prodotti sono stati ottenuti nell'ambito di un sistema di gestione qualità certificato secondo la norma ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

These products have been obtained under a certified quality system in compliance with the requirements of the standard ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

AZIENDA CON
SISTEMA DI GESTIONE QUALITA'
CERTIFICATO DA DNV
ISO 9001

Responsabile Qualità ***Quality manager***	**Roberto Dal Lago**	**Data** **Date**	09/05/2024

COPPER CONDUCTOR

ELTECH Via della Tecnica, 19 Montecchio Maggiore (VI)	**Rapporto di prova – Test report** **EN 10204 – "type 2.2"** **include Dichiarazione di Conformità** **EN 1655 – tipo "C"**	**N° 1109/24**

Codice Prodotto ***Product Code***	260R			
Descrizione ***Description***	Filo singolo di rame nudo – Ø 2,600 mm Single, bare copper wire – Ø 2,600 mm			
Ordine di lavoro n° ***Inner lot n°***	1109	**Del** ***Date***	17/04/2024	
Ordine cliente n° ***Customer order n°***	90	**Del** ***Date***	17/04/2024	
Quantità consegnata vedi ***Delivered amount*** *see*	**D.d.t. n°** ***Document n°***	372	**Del** ***Date***	09/05/2024
Cliente ***Customer***	FLEI SRL			

I prodotti a cui si riferisce la presente dichiarazione rispondono alle condizioni e ai requisiti del committente, nonché alla descrizione, al quantitativo e alla specifica concordati.

The products listed above are complying with the customer's conditions and requirements, the descriptions, the amount and the agreed standards, too.

A cura di RQ / *Edited by the Quality Manager*

Descrizione / *Description*	**Valori prescritti** **Required values**	**Valori riscontrati / Obtained values** Campione A *Sample A*	Campione B *Sample B*
Diametro medio / *Mean diameter*	2,600mm	2,6057 mm	/
Tolleranza sul diametro / *Tolerance*	± 0,015 mm		/
Spessore stagno / *Tin thickness (*)*	µm ± 15 %	/	/
Allungamento / *Elongation*	≥ 29 % (**)	40 %	/
Uniformità di stagnatura / *Continuity of tin coating*	1° met. CEI 20–13	/	/
Aderenza alla stagnatura / *Adhesion of tin coating*	ASTM B33 par. 6.5	/	/
☐ Carico di rottura / *Tensile strenght*	N/mm² min. 200	/	/
☐ Resistenza elettrica / *Electrical resistance*	Ω mm² / m ≤ 0,01751	/	/

(*) Misura effettuata con strumento Couloscope S Fischer secondo procedura interna IQ PRD 03
Measure carried out with instrument Couloscope S Fischer according to inner procedure IQ PRD 03
(**) Prova secondo ISO 6892-1:2016 B100 _ Prelievo campione posizione verticale inizio cesto / fine infustatura
Test according to ISO 6892-1: 2016 B100_ sample taken in vertical position at steel basket beginning / end of winding

Campioni utilizzati / *Samples used*

Camp. A **Sample A**	Cesto n° Basket n°	3514	Del *Date*	08/05/24	Impianto *Plant*	SB	Coil n°	02/4166
Camp. B **Sample B**	Cesto n° Basket n°	/	Del *Date*	/	Impianto *Plant*	/	Coil n°	/

Certificato di Qualità del rame: ***Copper Quality Certificate:***	☐ **Allegato** **Enclosed**

Questi prodotti sono stati ottenuti nell'ambito di un sistema di gestione qualità certificato secondo la norma ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

These products have been obtained under a certified quality system in compliance with the requirements of the standard ISO 9001:2015 (DNV GL n°: CERT–01066–96–AQ–VEN–SINCERT)

AZIENDA CON
SISTEMA DI GESTIONE QUALITA'
CERTIFICATO DA DNV
ISO 9001

Responsabile Qualità ***Quality manager***	Roberto Dal Lago	**Data** **Date**	09/05/2024

INSULATION MATERIAL

ORIGINAL

padanaplast

Finproject S.p.A. Società soggetta all'attività di direzione e coordinamento di Eni S.p.A.
Società con socio unico.
Sede legale: via Enrico Mattei, 68 - 43121 Marzolara (Marzolara) - ITALIA
C.F. - P.IVA 01744770437 - Capitale Sociale 18.500.000,00 € i.v.
BU Compounding - Stabilimento di Roccabianca
Strada Paganina, 3 - 43010 Roccabianca (Parma) - ITALIA - Tel. +39 0521 8261 / Fax +39 0521 870427
info@padanaplast.com - www.padanaplast.com

CERTIFICATE OF ANALYSIS

Insp. certificate "3.1" EN 10204

Customer	Customer Destination
FLEI S.R.L. VIA A.DE GASPERI , 82 20041 AGRATE BRIANZA MB ITALIA	FLEI S.R.L. VIA A.DE GASPERI , 82 20041 AGRATE BRIANZA MB ITALIA

Transport	828 / TO	**Batch number**	RI1201438013838
Delivery note	802 / DDT	**Order**	747 / ORD
Shipping date	05-04-2024	**Customer ref.**	76

POLIDIEMME G/400 IN SACCHI DA 25 KG SU PALETTA DA 1375 KG

Batch number RI1201438013838 **/ Quantity** **1.375,000 KG**

Characteristics	Units	Value	Specification	Method
MFI 190°C/2,16kg *	g/10min	1,5	0,6 - 1,7	MA01
Specific gravity	g/cm3	0,889	0,880 - 0,920	ASTM D792
Tensile Strenght *	N/mm2	19,8	>= 10,0	EN 60811
Elongation at break *	%	505	>= 250	EN 60811
H.S.T.250°C 20 N/cm2 all% *	%	55	<= 100	EN 60811
H.S.T. 250°C res%	%	0	-10 - 10	EN 60811
Production date	-	18-03-2024		

* MFI 190°C/2,16kg - (a) Test made on granules during production, without catalyst
* Tensile Strenght - (c) Test made on extruded cable (95% graft + 5% catalyst CT1) crosslinked in water 2 hours 95°C.
* Elongation at break - (c) Test made on extruded cable (95% graft + 5% catalyst CT1) crosslinked in water 2 hours 95°C.
* H.S.T.250°C 20 N/cm2 all% - (c) Test made on extruded cable (95% graft + 5% catalyst CT1) crosslinked in water 2 hours 95°C.

Apparent defects or non compliance with Padanaplast technical specifications, shall be communicated to Padanaplast within 8 days from receipt of the goods (ref. General conditions of sale)

FLEI s.r.l.
Quality Control

Supplier :

Finproject S.p.A. - BU Compounding - Stabilimento di Roccabianca
Società soggetta all'attività di direzione e coordinamento di Eni S.p.A.
Società con socio unico.
Strada Paganina 3, 43010 Roccabianca (Parma) - Italia
C.F. - P.IVA 01744770437 - Capitale Sociale 18.500.000,00 € i.v.

Approved by

Stefania Bolgarani
#Finproject S.p.A. - BU Compounding - Stabilimento di Roccabianca
Quality Control Laboratory Manager
Strada Paganina, 3
43010 Roccabianca (PR) Italy

INSULATION MAT. TYPE TI7 / INNER SHEATH

VIBIPLAST S.R.L.

CERTIFICATO DI ANALISI

INSPECTION CERTIFICATE (EN 10204-3.1)

DATA COMPILAZIONE : *COMPILATION DATE :* 05/06/24

CLIENTE : *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : *COLOUR :* ***NATURALE***

LOTTO N° : *LOT No. :* ***1572024***

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO *TEST*	METODO *METHOD*	UNITA' *UNIT*	PRESCRITTO / TOLLERANZA *VALUE / TOLERANCE*	RILEVATO *RESULT*	CONFORME A *IN ACCORDANCE WITH*
PESO SPECIFICO --- DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.54*	*Specifiche Vibiplast --- Vibiplast Specifications*

FLEI S.r.l. quality control

VIBIPLAST S.R.L.
CONTROLLO QUALITA' / *QUALITY CONTROL*

Vibiplast Laboratorio
Via Modigliani, 12 e 19
20022 - Castano Primo (MI) Italy
Tel. +39 0331 880354
E-mail : vibiplast@vibiplast.it

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INSULATION MAT. TYPE TI7 / INNER SHEATH

VIBIPLAST S.R.L.

CERTIFICATO DI ANALISI

INSPECTION CERTIFICATE (EN 10204-3.1)

DATA COMPILAZIONE : / *COMPILATION DATE :* 05/06/24

CLIENTE : / *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : / *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : / *COLOUR :* ***NATURALE***

LOTTO N° : / *LOT No. :* ***1572024***

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO / *TEST*	METODO / *METHOD*	UNITA' / *UNIT*	PRESCRITTO / TOLLERANZA — *VALUE / TOLERANCE*	RILEVATO / *RESULT*	CONFORME A / *IN ACCORDANCE WITH*
PESO SPECIFICO --- DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.54*	*Specifiche Vibiplast --- Vibiplast Specifications*

FLEI s.r.l. Quality Control

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INNER SHEATH

VIBIPLAST S.R.L.

CERTIFICATO DI ANALISI

INSPECTION CERTIFICATE (EN 10204-3.1)

DATA COMPILAZIONE : *COMPILATION DATE :* 10/06/24

CLIENTE : *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : *COLOUR :* *NERO*

LOTTO N° : *LOT No. :* *1622024*

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO *TEST*	METODO *METHOD*	UNITA' *UNIT*	PRESCRITTO / TOLLERANZA *VALUE / TOLERANCE*	RILEVATO *RESULT*	CONFORME A *IN ACCORDANCE WITH*
PESO SPECIFICO --- DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.53*	*Specifiche Vibiplast --- Vibiplast Specifications*

FLEI s.r.l. Quality Control

VIBIPLAST S.R.L.
CONTROLLO QUALITA' / *QUALITY CONTROL*

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E-mail : vibiplast@vibiplast.it

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ARMOUR

BIANCHINI INGENIERO
MACCAFERRI

A. Bianchini Ingeniero S.A.
Gran Vial, 8 - Pol. Ind. C.I.V
08170 - MONTORNÉS DE VALLÈS
(BARCELONA) - ESPAÑA

DECLARACION DE CONFORMIDAD
DECLARATION OF COMPLIANCE

Tipo 2.1 s/EN 10204
Type 2.1 acc. EN 10204

AENOR ER Empresa Registrada ER-0185/1995

IQNet CERTIFIED QUALITY SYSTEM

Cert. N°: 22832

Sold-to party	FLEI S.R.L.	Order	/ 3181425140 --- 49
Ship-to	FLEI S.R.L. VIA A. DE GASPERI 82 / 20864 AGRATE BRIANZA / IT	GI Doc. Date	8000365475 13/03/2024
Material	345752-WIRES ZND D0.30 SPL BB20	Dlv.qty	1080-KG

Nombre de Producto/*Product Name*: **ALAMBRE / *WIRE* ZN**
Tipo de Producto/*Product Type*: **Clase D – RECOCIDO/ *Class D - ANNEALED***

Se declara que los productos entregados en este pedido son conformes con las siguientes características:
It is declared that the products delivered in this order are in conformity with the following characteristics:

Caracteristica / *Characteristic*	**Valores / *Values***	**Norma / *Standard***
Diámetro del alambre *Steel wire diameter*	0,30±0,015 mm	EN 10218-2
Resistencia a la tracción del alambre *Wire tensile strength*	330-450 MPa	EN 10218-1
Alargamiento *Elongation*	≥ 15 %	EN 10218-1
Protección a la corrosión del alambre *Wire corrosión protection*	Galvanizado/Galvanized	EN 10244-2
Masa de recubrimiento alambre *Wire mass coating*	≥ 15 g/m² (Clase / *Class D*)	EN 10244-2

Composición química según normas: EN 16120-1, -2
Chemical composition according to standards: EN 16120-1, -2

C %	Mn %	Si %	P %	S %		
≤ 0,1	0,30 - 0,60	≤ 0,30	≤ 0,035	≤ 0,035		

A. BIANCHINI INGENIERO S.A. Gaviones Metálicos para Defensas Fluviales Gran Vial, 8 (C.I.V) MONTORNES DEL VALLES (BARCELONA)

Fdo. / *Sig.* Fortunato Nuño
Dpto. Calidad / *Quality Dept.*

OUTER SHEATH

VIBIPLAST S.R.L.

CERTIFICATO DI ANALISI

INSPECTION CERTIFICATE (EN 10204-3.1)

DATA COMPILAZIONE : / *COMPILATION DATE :* 19/06/24

CLIENTE : / *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : / *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : / *COLOUR :* ***ARANCIO 2003***

LOTTO N° : / *LOT No. :* ***1702024***

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO *TEST*	METODO *METHOD*	UNITA' *UNIT*	PRESCRITTO / TOLLERANZA *VALUE / TOLERANCE*	RILEVATO *RESULT*	CONFORME A *IN ACCORDANCE WITH*
PESO SPECIFICO ... DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.52*	*Specifiche Vibiplast ... Vibiplast Specifications*

VIBIPLAST S.R.L.
CONTROLLO QUALITA' / *QUALITY CONTROL*

Vibiplast Laboratorio
Via Modigliani, 12 e 19
20022 - Castano Primo (MI) Italy
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OUTER SHEATH

VIBIPLAST S.R.L.

CERTIFICATO DI ANALISI

INSPECTION CERTIFICATE (EN 10204-3.1)

DATA COMPILAZIONE : / *COMPILATION DATE :* 19/06/24

CLIENTE : / *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : / *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : / *COLOUR :* ***GRIGIO 7001***

LOTTO N° : / *LOT No. :* ***1702024***

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO *TEST*	METODO *METHOD*	UNITA' *UNIT*	PRESCRITTO / TOLLERANZA *VALUE / TOLERANCE*	RILEVATO *RESULT*	CONFORME A *IN ACCORDANCE WITH*
PESO SPECIFICO --- DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.52*	*Specifiche Vibiplast --- Vibiplast Specifications*

VIBIPLAST S.R.L.
CONTROLLO QUALITA' / *QUALITY CONTROL*

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OUTER SHEATH

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CERTIFICATO DI ANALISI

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CLIENTE : / *CUSTOMER :*
FLEI S.r.l.
VIA ALCIDE DE GASPERI, 82
20864 AGRATE BRIANZA (MB)

MATERIALE TIPO : / *MATERIAL TYPE :* *HL 312 / UV / TB*

COLORE : / *COLOUR :* ***ARANCIO 2003***

LOTTO N° : / *LOT No. :* ***1712024***

I VALORI RILEVATI DALLE NOSTRE PROVE DI CONTROLLO QUALITA' SONO I SEGUENTI :

THE VALUES MEASURED BY OUR QUALITY CONTROL TESTS ARE AS FOLLOWS :

PROVA TIPO *TEST*	METODO *METHOD*	UNITA' *UNIT*	PRESCRITTO / TOLLERANZA *VALUE / TOLERANCE*	RILEVATO *RESULT*	CONFORME A *IN ACCORDANCE WITH*
PESO SPECIFICO ... DENSITY	*CEI EN 60811-606*	*g/cm³*	*1.51 ± 0.03*	*1.52*	*Specifiche Vibiplast ... Vibiplast Specifications*

VIBIPLAST S.R.L.
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Mod. RQ-CQ-16/1 (15/02/21)

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ROSETTI MARINO	RELEASE NOTE	Nr. RN-1141-FLE-01	Sheet 1 of 1
		Date 17/09/2024	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
FLEI SRL	*1724001141*

Release Note	☐ FOR PAYMENT	☒ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.	

RELEASE NOTE FOR SHIPMENT

POS. Item	Q.TA' Quantity	DESCRIZIONE Description	Nr. TAG TAG No.	TIPO DI ISPEZIONE / Kind of Inspection	ESITO / Result
400	300m	Electrical Cable	ELECV35-4X4	NA	Positive
410	300m	Electrical Cable	ELECV38-3G4	NA	Positive
420	300m	Electrical Cable	ELECV12-4G2,5_E	NA	Positive

Warehouse open Monday to Friday From 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approv. Code*

PUNCH LIST: ☐ SI / *YES* VEDI PUNCH LIST ALLEGATA N° / *REFER TO ATTACHED PUNCH LIST N°*
☒ NO/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE ***/ PERFORMANCE or WARRANTY BOND expiration date check***
Estensione Fidejussione Richiesta *(Performance or Warranty Bond Extension of Validity required)*
☐ SI / *YES* ☐ NO/ *NO*
Acceptance Method: *Performance or Warranty Bond valid if actually delivery date it's not greater than two weeks from contractual delivery date.*

RELEASE NOTE

RISULTATO / *RESULT*	FORNITURA / *SUPPLY*	DISTRIBUZIONE A: / *DISTRIBUTION TO:*	
☒ POSITIVO / *POSITIVE*	☐ COMPLETA / *COMPLETE*	☒ Project Manager	☒ Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐ PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

Note:
Material related to Rev01 of subject PO, refer to PL SCAN_20240917_104205513

L' INCARICATO /*Person in charge* ROSETTI MARINO *Supply Management dept.*		IL RAPPR. DEL CLIENTE / *Client Representative*	IL FORNITORE /*Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Vincent Zwaan		N.A.	N.A.	N.A.

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

ROSETTI MARINO	RELEASE NOTE	Nr. RN-1141-FLE-02	Sheet 1 of 1
		Date 17/10/2024	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
FLEI SRL	*1724001141*

Release Note	☐ FOR PAYMENT	☒ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.	

RELEASE NOTE FOR SHIPMENT

POS. Item	Q.TA' Quantity	DESCRIZIONE Description	Nr. TAG TAG No.	TIPO DI ISPEZIONE / Kind of Inspection	ESITO / Result
430	2.500 m	EARTHING MATERIAL [ML]	ELECV31-1G16	NA	Positive
440	1.000 m	EARTHING MATERIAL [ML]	ELECV32-1G10	NA	Positive
450	2000 m	EARTHING MATERIAL [ML]	ELECV33-1G6	NA	Positive

Warehouse open Monday to Friday From 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approv. Code*

PUNCH LIST: ☐ SI / *YES* VEDI PUNCH LIST ALLEGATA N° / *REFER TO ATTACHED PUNCH LIST N°*
☒ NO/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE ***/ PERFORMANCE or WARRANTY BOND expiration date check***
Estensione Fidejussione Richiesta *(Performance or Warranty Bond Extension of Validity required)*
☐ SI / *YES* ☐ NO/ *NO*
Acceptance Method: *Performance or Warranty Bond valid if actually delivery date it's not greater than two weeks from contractual delivery date.*

RELEASE NOTE

RISULTATO / *RESULT*	FORNITURA / *SUPPLY*	DISTRIBUZIONE A: / *DISTRIBUTION TO:*	
☒ POSITIVO / *POSITIVE*	☐ COMPLETA / *COMPLETE*	☒ Project Manager	☒ Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐ PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

Note:
Material related to Rev02 of subject PO, refer to PL SCAN_20241017_101019303

L' INCARICATO /*Person in charge* ROSETTI MARINO *Supply Management dept.*		IL RAPPR. DEL CLIENTE / *Client Representative*	IL FORNITORE /*Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Vincent Zwaan		N.A.	N.A.	N.A.

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

ROSETTI MARINO	RELEASE NOTE	Nr. RN-1141-FLE-03	Sheet 1 of 1
		Date 05/11/2024	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
FLEI SRL	*1724001141*

Release Note	☒ FOR PAYMENT	☐ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.		DELIVERY INSTALLMENT
9.2.1	a)	**- 90% of the amount of each complete delivery lot of the PURCHASE ORDER at delivery of the GOODS, against presentation of supporting documentation (items i) through iii) above plus the release note of the GOODS certified by COMPANY's Supply Management Department).**

RELEASE NOTE FOR SHIPMENT

POS. Item	Q.TA' Quantity	DESCRIZIONE Description	Nr. TAG TAG No.	TIPO DI ISPEZIONE / Kind of Inspection	ESITO / Result

Warehouse open Monday to Friday From 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approv. Code*

PUNCH LIST: ☐ SI / *YES* VEDI PUNCH LIST ALLEGATA N° / *REFER TO ATTACHED PUNCH LIST N°*
☒ NO/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE / *PERFORMANCE or WARRANTY BOND expiration date check*
Estensione Fidejussione Richiesta *(Performance or Warranty Bond Extension of Validity required)*
☐ SI / *YES* ☐ NO/ *NO*
Acceptance Method: *Performance or Warranty Bond valid if actually delivery date it's not greater than two weeks from contractual delivery date.*

RELEASE NOTE

RISULTATO / *RESULT*	FORNITURA / *SUPPLY*	DISTRIBUZIONE A: / *DISTRIBUTION TO:*	
☒ POSITIVO / *POSITIVE*	☐ COMPLETA / *COMPLETE*	☒ Project Manager	☒ Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐ PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

Note:
Material delivered, documentation to be finalized for balance 10% of PO total amount

L' INCARICATO /*Person in charge* ROSETTI MARINO *Supply Management dept.*		IL RAPPR. DEL CLIENTE / *Client Representative*	IL FORNITORE /*Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Vincent Zwaan		N.A.	N.A.	N.A.

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*

ROSETTI MARINO	RELEASE NOTE	Nr. RN-1141-FLE-04	Sheet 1 of 1
		Date 19/12/2024	Rev. 00

PROGETTO *Project*	CLIENTE *Client*	COMMESSA *Job*
HOLLANDSE KUST NOORD WIND PARK	CROSSWIND	*123A90*

FORNITORE *Vendor*	NUMERO D' ORDINE *Purchase Order No.*
FLEI SRL	*1724001141*

Release Note	☐ FOR PAYMENT	☒ FOR SHIPMENT

RELEASE NOTE FOR PAYMENT

PO Art.	

RELEASE NOTE FOR SHIPMENT

POS. Item	Q.TA' Quantity	DESCRIZIONE Description	Nr. TAG TAG No.	TIPO DI ISPEZIONE / Kind of Inspection	ESITO / Result
460	300 m	EARTHING MATERIAL [ML]	ELECV30-1G35	NA	Positive

Warehouse open Monday to Friday From 08.00 to12.00 and from 13.00 to 17.00.
Contact Mr Rota +39 3451608099

DOCUMENTI APPLICABILI / *APPLICABLE DOCUMENTS*

POSIZIONE *Items*	TIPO DI DOCUMENTO *Type of Document*	NUMERO DI DOCUMENTO *Document Number*	Rev.	COD. DI APPROV. *Approv. Code*

PUNCH LIST: ☐ SI / *YES* VEDI PUNCH LIST ALLEGATA N° / *REFER TO ATTACHED PUNCH LIST N°*
☒ NO/ *NO*

CONTROLLO VALIDITA' FIDEJUSSIONE / *PERFORMANCE or WARRANTY BOND expiration date check*
Estensione Fidejussione Richiesta *(Performance or Warranty Bond Extension of Validity required)*
☐ SI / *YES* ☐ NO/ *NO*
Acceptance Method: *Performance or Warranty Bond valid if actually delivery date it's not greater than two weeks from contractual delivery date.*

RELEASE NOTE

RISULTATO / *RESULT*	FORNITURA / *SUPPLY*	DISTRIBUZIONE A: / *DISTRIBUTION TO:*	
☒ POSITIVO / *POSITIVE*	☐ COMPLETA / *COMPLETE*	☒ Project Manager	☒ Administration
☐ NEGATIVO / *NEGATIVE*	☐ PARZIALE / *PARTIAL*	☒ Project Quality Manager	☒ Project Eng-/Procurement Coord
☐ PUNTI PENDENTI / *PUNCH-LIST*	☒ ULTIMA / *FINAL*	☐ Warehouse	☐ Supplier

NOTE / *NOTES*

Note:
Material related to Rev03 of subject PO, PL: SCAN_20241219_100427166

L' INCARICATO /*Person in charge* ROSETTI MARINO *Supply Management dept.*		IL RAPPR. DEL CLIENTE / *Client Representative*	IL FORNITORE /*Vendor*	CONSTRUCTION MANAGER *Only requested for Punch List to be closed at Yard*
Nome Cognome *Name Surname*	**Firma** *Signature*			
Vincent Zwaan		N.A.	N.A.	N.A.

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO / *The present RELEASE NOTE does not relieve the Supplier of the responsibility of any possible defects and/or malfunctioning arising during the utilisation.*