ENERGY BRACED INSULATED CANTILEVERS 132 – 220 kV

BONOMI

moving energy since 1928

BONOMI ENERGY

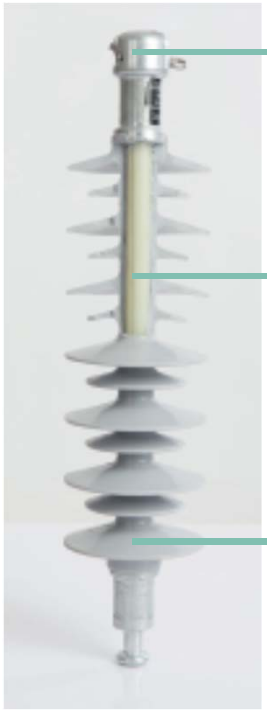
references since 2000

INDEX

FOCUS ON OUR PRODUCTION

HOW OUR INSULATORS ARE MADE

In the **1950s Rebosio** is among the first companies in Europe to introduce **Teflon** for the production of insulators, as an alternative to ceramics and glass. In the 1960s and 1970s **significant investments were made in research and development** to **improve the material**, while in the 1980s Rebosio strengthened with the standardization of the raw material: **HCR/LSR SILICONE**. Both these options are subjected to a high temperature vulcanization process (HTV). In the same period, Isoelectric also introduced the use of silicone for the production of insulators.



MECHANICAL CHARACTERISTICS

The high quality of the fiberglass core and of the terminals their correct sizing allow, through an adequate mechanical compression, to obtain an intimate contact that ensures the mechanical seals that is required by international standards.

ELECTRICAL CHARACTERISTICS

The high electrical performance of our insulators is given by three key factors, on which the technical energy office invests great attention:

- chemical stability of the cover;
- control of the electric field;
- hydrophobicity of the cover.

LONG DURATION

Our Isolflon-E insulators have been operating on various lines for over 40 years. We have tested some lots to determine their status after years of activity here are the results:

- the inspected insulators showed no mechanical or electrical changes;
- housing materials tend to regenerate from high environmental pollution;
- there was very high resistance to erosion and trace;
- the high quality of Bonomi's mixture allows the water repellent property of the insulator to be kept constant over time.

CONTINUOUS CONTROLS

We carry out continuous quality controls across the finished products and the raw materials according to the instructions of the Quality Plan.

COMPLETE TRACEABILITY

Certificate of origin of each raw material

Production parameters used during the process

Test effectuated during the production

Final acceptance test on the finished product

GRUPPO BONOMI — EB Rebosio S.r.l.
Progettazione e componenti per sistemi di trazione elettrica
Isolatori compositi
Società del Gruppo Bonomi

PRODUCTION CONTROL PLAN

PFC N° 2018-E0XXXX REV. 1.00

INT.REF. -	OF	17-dic-18		CUSTOME -		ORDER -	OF -
Issued by:	Date	Verified by:	Date	Sent to:	Date	Customer approval:	Date
R.MILANI	17/12/18	A.CAMPANELLA	17/12/18			-	

MANUFACTURER SITE	PRODUCT DESCRIPTION	INTERNAL DWG REV. OF	CUSTOMER DWG REV. OF
EB REBOSIO SRL	TENSION INSULATOR EBR DWG	E0XXXX	- - -

MANUFACTURE & CONTROL PHASE OF THE PROCESS	(*)	REFERRING DOCUMENTS: CONTRACTUAL DOCUM.	REFERRING DOCUMENTS: ACCEPTANCE CRITERIA	REFERRING DOCUMENTS: PROCEDURE AND INTERNAL DOCUM.	CONTROL/TEST: EQUIPMENT	CONTROL/TEST: 100%	CONTROL/TEST: SAMPLE	CONTROL/TEST: METOD	CONTROL PERFORMED BY: EB REBOSIO	(1)	CONTROL PERFORMED BY: CUSTOMER	(1)	OUTPUT RECORDING DOCUMENTS
1 CHECK IN ENTRANCE OF END-FITTINGS AND INSULATORS EQUIPMENT													
1.1 Control of congruency packing list - goods	I	PACKING LIST		IST 202	-	X		IST 202	LG WAREHOUSE				-
1.2 Control of congruency packing list - purchase order	I	PURCHASE ORDER			-	X							
1.3 Control of the origin certific.and/or supplier test report	I	REF. STANDARDS		IST 150	-	X		IST 150	CQ QUALITY CONTROL				ORIGIN CERTIF. APPROVED-TEST REP. SUPPLIER
1.4 Testing of goods entered inwards	I			DIS./PCQ T0XXXX	(3)		(3) every batch	PCQ					COMPUTER SYSTEM
2 CHECK IN ENTRANCE OF FIBERGLASS RODS													
2.1 Control of congruency packing list - goods	I	PACKING LIST		IST 202	-	X		IST 202	LG WAREHOUSE				-
2.2 Control of congruency packing list - purchase order	I	PURCHASE ORDER			-	X							
2.3 Control of the origin certific.and/or supplier test report	I	STF		IST 150	-	X		IST 150	CQ QUALITY CONTROL				ORIGIN CERTIF. APPROVED-TEST REP. SUPPLIER
2.4 Dielectric Rigidity following fiber direction	I	IEC 60243		PCQ BARRA V/R	Dielectric Rigidity tester		(3)	IST 156	CQ QUALITY CONTROL				COMPUTER SYSTEM
2.5 Dye penatration test	I	IEC 62217	§ 9.4.1		-		(3) every batch						
2.6 Mechanical compression test	I	-			Mechanical testing machine 200 kN		(3)						
2.7 Mechanical tensile test (max SML)	I	IEC 61109			Mechanical testing machine 1000 kN		(3)						
2.8 Bending Strength at Heating Conditions 90°C	I	-			Mechanical testing machine 200 kN		(3)						
2.9 Bending Strength at Heating Conditions 150°C	I	-			Digital Thermometer		(3)						
2.10 Stress corrosion test -Damage proof limit 96h (1 mol / 1HNO3 al 67% Stress)	I				Load cell		(3)						
2.11 Verification of dimensions	I	-			flexible meter Caliber		(3)						
3 CHECK IN ENTRANCE OF SILICON RUBBER, PRIMER													
3.1 Control of congruency packing list - goods	I	PACKING LIST		IST 202	-	X		IST 202	LG WAREHOUSE				-
3.2 Control of congruency packing list - purchase order	I	PURCHASE ORDER			-	X							
3.3 Control of the origin certific.and/or supplier test report	I	STF		IST 150	-	X		IST 150					ORIGIN CERTIF. APPROVED-TEST REP. SUPPLIER
3.4 Tracking strength	I	IEC 60587		PCQ SILICONE	Apparatus according to IEC 60587		(3)	IST 157	CQ QUALITY CONTROL				COMPUTER SYSTEM
3.5 Density	I	ISO 2781			Analytical Balance		(3)						
3.6 Hardness Shore A	I	IEC 62217			Hardness Tester (Shore A)		(3) 1 batch for supplier each month						
3.7 Verification of Tensile Strength	I/E	ISO 37					(3)						
3.8 Verification of Elongation at breaking	I/E	ISO 37			Mechanical testing machine 2 kN		(3)						
3.9 Verification of Tear Strength	I/E	ISO 34-1					(3)						
4 END-FITTINGS ASSEMBLING													
4.1 Assembling on F/W rod	I			DOT IST 250									COMPUTER SYSTEM
4.2 Control at the beginning of production	I				(4)		1° pcs.						
4.3 Tensile Mechanical Test at SML for beginning of production (2)	I				Mechanical testing machine 1000 kN		1° pcs.	IST 250	RPI INSULATOR DPT.				
4.4 Visual Check on line	I	IEC 61109	§ 13.2	DIS. E0XXXX	-	X							

Pag.1 di 2

GRUPPO BONOMI — EB Rebosio S.r.l.
Progettazione e componenti per sistemi di trazione elettrica
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PRODUCTION CONTROL PLAN

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5 SHEDDED HOUSING MOULDING													
5.1 Primerization	I			DOT - IST 260									COMPUTER SYSTEM
5.2 Moulding of the shedded housing	I												
5.3 Control at the beginning of production	I				(4)		1° pcs.	IST 260	RPI INSULATOR DPT.				
5.4 Check of adesion	I				-		1 pc. each shift						
5.5 Verification of silicon rubber thickness on rod	I			DIS. E0XXXX	Ultrasonic Device		2 pcs. each shift						
5.6 Verification of silicon rubber compactness (absence bubbles)	I						1 pc. each hour						
5.4 Visual Check on line	I	IEC 61109	§ 13.2		-	X							
6 END-FITTINGS COMPRESSION													
6.1 Compression of the end-fittings	I			DOT IST 250									COMPUTER SYSTEM
6.2 Control at the beginning of production	I				(4)		1° pcs.	IST 250	RPI INSULATOR DPT.				
6.3 Visual Check on line	I	IEC 61109	§ 13.2		-	X							
6.4 Tensile Mechanical Test at SML	I				Mechanical testing machine 1000 kN		1% for batch ≤300pcs. 0,5% for batch>300pcs.						
7 INDIVIDUAL CHECK, LABELLING													
7.1 Tensile Mechanical Test at 0,5xSML	I	IEC 61109	§ 13.1	DOT IST 270	Mechanical testing machine 1000 kN	X		IST 270	RPI INSULATOR DPT.				COMPUTER SYSTEM
7.2 Visual Check	I	IEC 61109	§ 13.2		-	X							
7.3 Labelling-Marking	I	IEC 61109	§ 5.	DIS. E0XXXX	-								
8 SAMPLE TESTS													
8.1 Identification of isolators	I	IEC 61109	-	IST 280	-		1 se n<50 2 se 50<n<300 CEI EN 61109 se n>300	PCQ IST 280	CQ QUALITY CONTROL				TEST REPORT
8.2 Visual examination	I		§ 12.2		-								
8.3 Verification of dimensions	I		§ 12.2		flexible meter Caliber go/not go gauge								
8.4 Verification of the looking sistem (2)	I		§ 12.3		Mechanical testing machine 2 kN								
8.5 Verification of the SML	I		§ 12.4		Mechanical testing machine 1000 kN								
8.6 Galvanizing test	I		§ 12.5	DIS./PCQ E0XXXX	Thickness tester								
9 PACKING	I			IST 290									
10 FINAL INSPECTION	I			-									-

NB.: This planning document does not present the results of the tests. The results of tests performed during various stages of control mentioned in the PFC are recorded in documents at the last column in the PFC and are available at the EB Rebosio Srl.
PCQ= Quality Control Plan - DIS = Drawing - IST=Work Instruction - DOT= Production Order
check & verification underlined aren't prescribed by IEC61109 (additional check)
(*) I = internal phase - E = phase performed outside

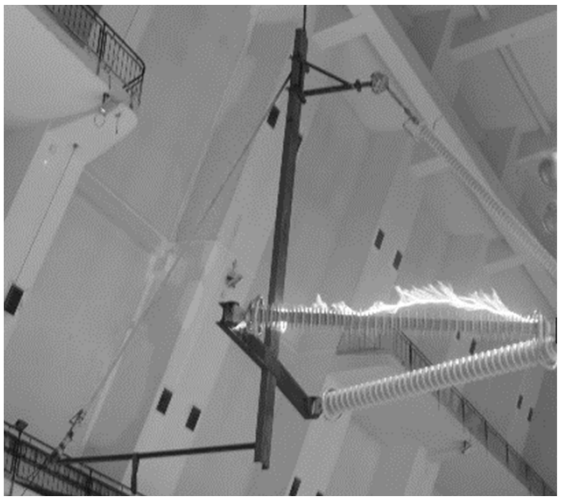
(1) W= Witness; H= Hold Point
(2) if aplicable
(3) as prescribed by internal PCQ
(4) as prescribed by IST 220

*Additional tests we lead even if they are not required by regulations

RED ELECTRICA DE ESPAÑA

Over 1,300 energy braced insulated cantilevers – single and double

Bonomi, through the Spanish distributor Disace Energía, has supplied **more than 1,300 132 kV energy braced insulated cantilevers for T&D (both single and double)** which have been installed on the island of **Fuerteventura, Spain**.
The project, that ended in May 2018, was the result of a close consultancy driven cooperation between **Bonomi**, our distributor and **Red Electrica De España**, the electricity company responsible for the project.



Wet power frequency voltage test led by EGU

Together we evaluated **specific leakage distance** to be applied to all provided insulators (50mm each kV) to ensure greater insulation performances and highlight the strong climate resistance of our products in the Canary Islands which is a land where there are **strong winds and high levels of air salinity**.

Bonomi’s braced insulated cantilevers on some trellis in Fuerteventura, Spain

TESTS AND TECHNICAL DESIGNS

EGU HV Laboratory a.s.

E G U – H V Laboratory a. s., Podnikatelská 267, 190 11 Praha 9, Běchovice

HIGH VOLTAGE TESTING LABORATORY

Accredited testing laboratory No.: 1029
Accredited by Czech Accreditation Institute
according to ČSN EN ISO/IEC 17025:2005

L 1029

TEST REPORT No.:
10696/A/17

CUSTOMER:	EB Rebosio S.r.L. Via Carso 49 24040 Madone Italy
TEST OBJECT:	Braced line post assembly
TYPE SPECIFICATION:	N/A
TEST STANDARDS:	IEC 60383-2 Ed.1:1993, IEC 60060-1 Ed.3:2010

Michal Novotný	Jan Bolech	Jan Lachman, Ph.D.
Test engineer	**Head of High Voltage Testing Laboratory**	**Director of EGU - HV Laboratory a. s.**

Copies: 1+1 Pages: 10 Date: 2017-09-13

Klokner Institute CTU in Prague *Tel: +420 224 353 537*

CZECH TECHNICAL UNIVERSITY IN PRAGUE

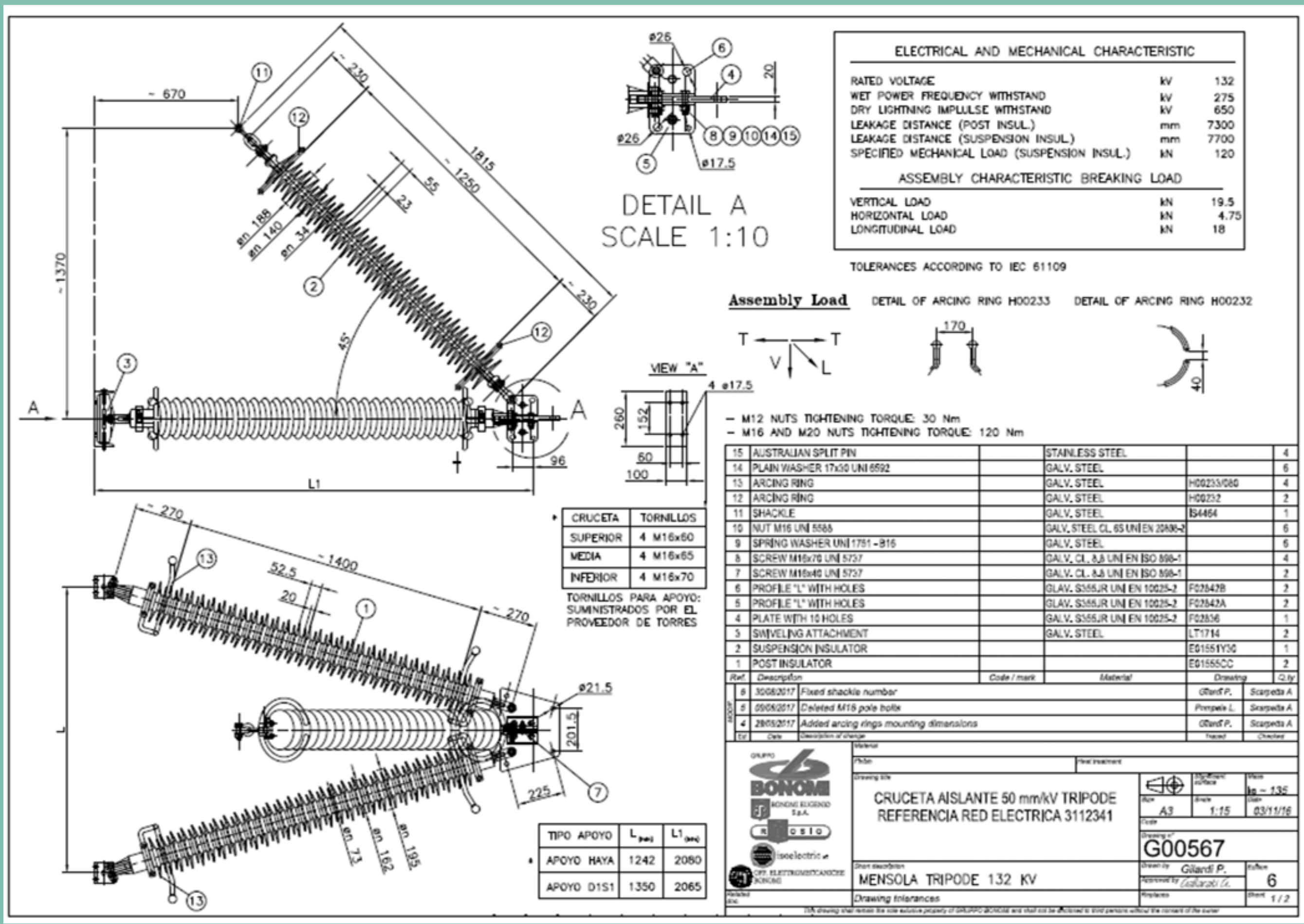
Klokner Institute

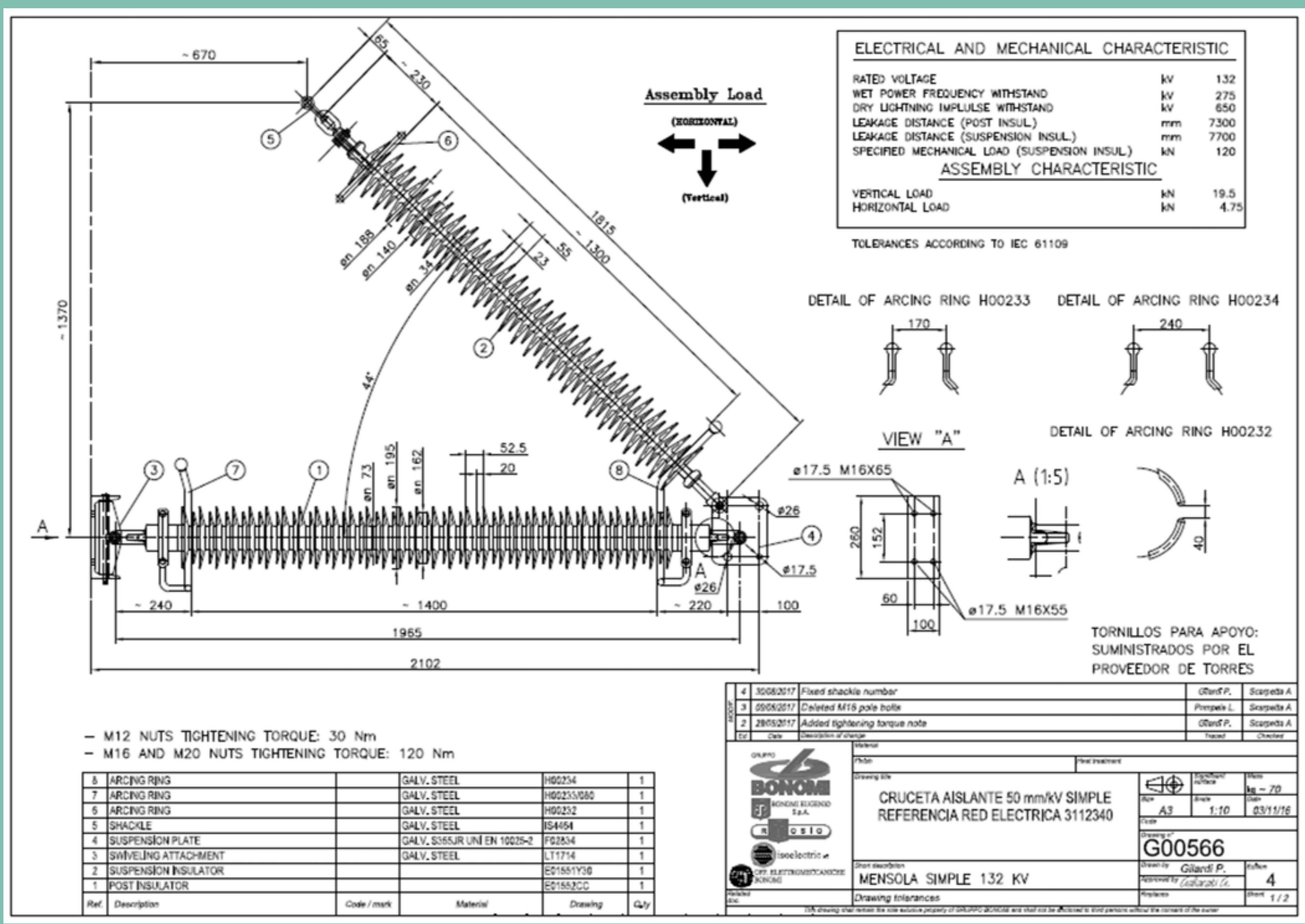
Šolínova 7, 166 08 Prague 6

Czech Republic

Test report

Number of report	:	146/16/EXPO
Date	:	9th December 2016
Number of pages	:	11
Order No.	:	16 00 J 152
Customer	:	EB Rebosio Srl - Gruppo Bonomi Isolatori e accessori per linee elettriche e ferroviarie Via Carso, 49 - 24040 Madone(BG ITALY
Subject of test	:	Tensile test of Braced Line Post Assembly 132 kV
Manufacturer	:	EB Rebosio Srl - Gruppo Bonomi
Drawing No.	:	G00556, ED. 4
Test standard	:	customer specification
Copies/No. of copy	:	4/(1) 2 3 4
Responsible engineer	:	Tomáš Jaterka
Co-operation	:	Michal Křesťan, MSc.
Head of laboratory	:	Jiří Kolísko, Ass. Prof., Ph.D., MSc.
Director of KI CTU	:	Jiří Kolísko, Ass. Prof., Ph.D., MSc.


ELECTRICAL AND MECHANICAL CHARACTERISTIC
RATED VOLTAGE kV 132
WET POWER FREQUENCY WITHSTAND kV 275
DRY LIGHTNING IMPULSE WITHSTAND kV 650
LEAKAGE DISTANCE (POST INSUL.) mm 7300
LEAKAGE DISTANCE (SUSPENSION INSUL.) mm 7700
SPECIFIED MECHANICAL LOAD (SUSPENSION INSUL.) kN 120
ASSEMBLY CHARACTERISTIC BREAKING LOAD
VERTICAL LOAD kN 19.5
HORIZONTAL LOAD kN 4.75
LONGITUDINAL LOAD kN 18
TOLERANCES ACCORDING TO IEC 61109
DETAIL A
SCALE 1:10
Assembly Load
DETAIL OF ARCING RING H00233
DETAIL OF ARCING RING H00232
VIEW "A"
– M12 NUTS TIGHTENING TORQUE: 30 Nm
– M16 AND M20 NUTS TIGHTENING TORQUE: 120 Nm
CRUCETA TORNILLOS
SUPERIOR 4 M16x60
MEDIA 4 M16x65
INFERIOR 4 M16x70
TORNILLOS PARA APOYO: SUMINISTRADOS POR EL PROVEEDOR DE TORRES
TIPO APOYO L L1
APOYO HAYA 1242 2080
APOYO D1S1 1350 2065
15 AUSTRALIAN SPLIT PIN STAINLESS STEEL 4
14 PLAIN WASHER 17x30 UNI 6592 GALV. STEEL 6
13 ARCING RING GALV. STEEL H00233/080 4
12 ARCING RING GALV. STEEL H00232 2
11 SHACKLE GALV. STEEL IS4464 1
10 NUT M16 UNI 5588 6
9 SPRING WASHER UNI 1751 - B16 GALV. STEEL 6
8 SCREW M16x70 UNI 5737 4
7 SCREW M16x40 UNI 5737 2
6 PROFILE "L" WITH HOLES F02842B 2
5 PROFILE "L" WITH HOLES F02842A 2
4 PLATE WITH 10 HOLES F02836 1
3 SWIVELING ATTACHMENT GALV. STEEL LT1714 2
2 SUSPENSION INSULATOR E01551Y30 1
1 POST INSULATOR E01555CC 2
CRUCETA AISLANTE 50 mm/kV TRIPODE
REFERENCIA RED ELECTRICA 3112341
G00567
MENSOLA TRIPODE 132 KV
BONOMI


ELECTRICAL AND MECHANICAL CHARACTERISTIC
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DRY LIGHTNING IMPULSE WITHSTAND kV 650
LEAKAGE DISTANCE (POST INSUL.) mm 7300
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SPECIFIED MECHANICAL LOAD (SUSPENSION INSUL.) kN 120
ASSEMBLY CHARACTERISTIC
VERTICAL LOAD kN 19.5
HORIZONTAL LOAD kN 4.75
TOLERANCES ACCORDING TO IEC 61109
Assembly Load
(HORIZONTAL)
(Vertical)
DETAIL OF ARCING RING H00233
DETAIL OF ARCING RING H00234
DETAIL OF ARCING RING H00232
VIEW "A"
A (1:5)
ø17.5 M16X65
ø17.5 M16X55
TORNILLOS PARA APOYO: SUMINISTRADOS POR EL PROVEEDOR DE TORRES
– M12 NUTS TIGHTENING TORQUE: 30 Nm
– M16 AND M20 NUTS TIGHTENING TORQUE: 120 Nm
8 ARCING RING GALV. STEEL H00234 1
7 ARCING RING GALV. STEEL H00233/080 1
6 ARCING RING GALV. STEEL H00232 1
5 SHACKLE GALV. STEEL IS4464 1
4 SUSPENSION PLATE GALV. S355JR UNI EN 10025-2 F02834 1
3 SWIVELING ATTACHMENT GALV. STEEL LT1714 1
2 SUSPENSION INSULATOR E01551Y30 1
1 POST INSULATOR E01552CC 1
CRUCETA AISLANTE 50 mm/kV SIMPLE
REFERENCIA RED ELECTRICA 3112340
G00566
MENSOLA SIMPLE 132 KV
BONOMI

TERNA SPA ITALY

Over 500 energy braced insulated cantilevers – double

Terna S.p.A. is a transmission system operator (TSO) based in Rome, Italy. It operates through Terna Rete Italia, that manages the Italian transmission grid and Terna Plus which is in charge of new business opportunities and non-traditional activities in Italy and abroad. With around 98% of the Italian high-voltage power transmission grid, Terna is the first independent electricity transmission grid operator in Europe and one of **Bonomi**'s most important customers.
Since 2000 we have actually **supplied more than 500 220 kV double energy braced insulated cantilevers** to be installed all over Italy and Europe.

Bonomi’s braced insulated cantilevers on some Terna’s trellis in Italy

REFERENCES AND TECHNICAL DESIGNS

Terna Rete Italia
TERNA GROUP
Direzione Acquisti e Appalti
Sede legale Terna Rete Italia SpA - Viale Egidio Galbani, 70 - 00156 Roma - Italia
Tel. +39 0683138111
Reg. Imprese Roma, C.F. e P.I. 11799181000 R.E.A. 1328587
Cap. Soc. 120.000,00 Euro interamente versato - Socio Unico
Direzione e Coordinamento di Terna SpA

TO WHOM IT MAY CONCERN

Rome, April 20th 2017

Object: PERFORMANCE CERTIFICATION

We declare that EB REBOSIO srl, with registered office in Montichiari (BS) via A. Mercanti 17 n.25018, has supplied over the last five years insulators made of composite material 150, 220 and 380 kV under the contracts number:

- 6000001869 of 9/7/2013
- 6000001995 of 25/3/2014
- 6000002097 of 26/11/2014
- 6000002230 of 19/10/2015
- 6000002231 of 19/10/2015

We certify that the above insulators have been installed throughout the national territory to our satisfaction without the presence of any criticality.

Yours faithfully

Senior Manager
Purchasing & Sourcing
Overhead and cable line
Giuseppina SCACCIA SCARAFONI

SGS

Spett.le
EB Rebosio S.r.l.
Via Carso n° 49
24040 Madone (BG)

C. Att.ne: Sig. Giovanni Giobbe

Milano, 20 Giugno 2019

Ns. Rif. 19.16463

Oggetto: Certificazione di prodotto degli isolatori compositi per distanziatori Interfase tipo J20 (documento TERNA LIN_00000J20 Rev. 00 del 27/07/2018)

Con la presente Vi confermiamo che le prove legate alla certificazione degli isolatori per distanziatori interfase tipo J20 (rif. documento TERNA LIN_00000J20 Rev. 00 del 27/07/2018 e lettera TERNA /P2019-0010411 – 07/02/2019), previste dalle seguenti specifiche:

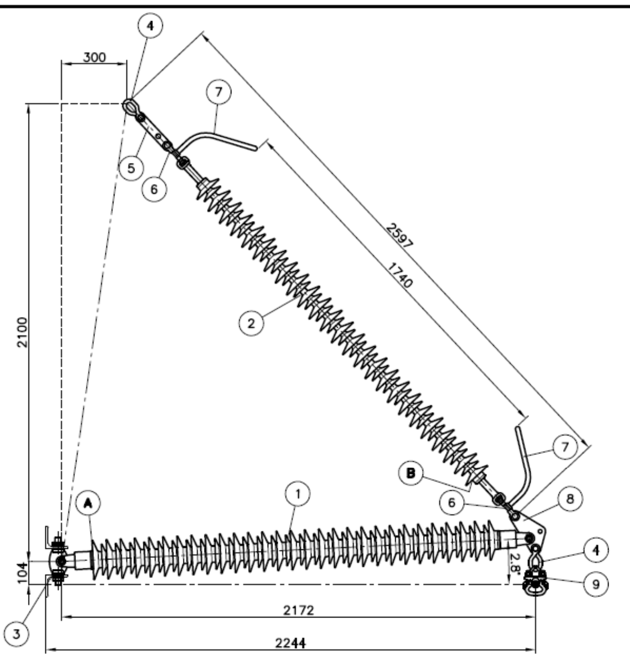
- TERNA LIN_00000J20 Rev. 00 del 27/07/2018
- TERNA LIN_00000J39 Rev. 00 del 24/04/2013
- TERNA PT500ST Rev. 02 del 21/11/2007
- Comunicazione TERNA/P2019/0044045-19/06/2019

sono state completate, come da programma temporale EB REBOSIO del Gennaio 2019 e successiva integrazione del Maggio 2019, con esito positivo e a complemento del Dossier di certificazione sarà emesso il relativo Certificato di Conformità

Cogliamo l'occasione per inviare cordiali saluti.

SGS Italia S.p.A.
Industrial Services
On behalf of Business Manager

A. Zani



	PUNTONE POS. 1	TIRANTE POS. 2
– TENSIONE DI TENUTA AD IMPULSO ____ kV	1065	1065
– TENSIONE DI TENUTA A 50 Hz SOTTOPIOGGIA ____ kV	550	550
– LINEA DI FUGA ____ mm	6320	5725
– DISTANZA D'ARCO ____ mm	1925	1885
– DISTANZA ISOLANTE ____ mm	1855	1854
– CARICO MECCANICO SPECIFICATO (CMS) CEI 61109 ____ mm	210	120
– CARICO DI ROTTURA A COMPRESSIONE ____ mm	60	–

– MINIMA DISTANZA TRA LE PARTI METALLICHE A–B ____ mm 1825

POS. N°	DESCRIZIONE	MATERIALE	DISEGNO	N° PEZZI
9	MORSETTO DI SOSPENSIONE	501/1		1
8	BILANCIERE	450/1		1
7	DISPOSITIVO DI GUARDIA A RACCHETTA	483		2
6	RACCORDO FORCELLA BOTTONE		H00129	2
5	PROLUNGA DIRITTA	421/8		1
4	BRIDA A 90°	402		2
3	PERNO PER ATTACCHI OSCILLANTI	608/1		1
2	ISOLATORE TIRANTE		E00625W	1
1	ISOLATORE PUNTONE		E00831BB	1

MODIF. 1 2 3 4 5 6

IL PRESENTE DISEGNO E' DI PROPRIETA' DELLA EB Rebosio S.r.l. A NORMA DI LEGGE NON PUO' ESSERE RIPRODOTTO O COMUNICATO A TERZI

REBOSIO — EB Rebosio S.r.l.

PESO kg | SCALA 1:15 | DATA 13/12/00

DISEGN. PAGANO

CONTR. M.Pasta

SOSTITUISCE DIS. Sc4469

SOSTITUITO DA DIS.

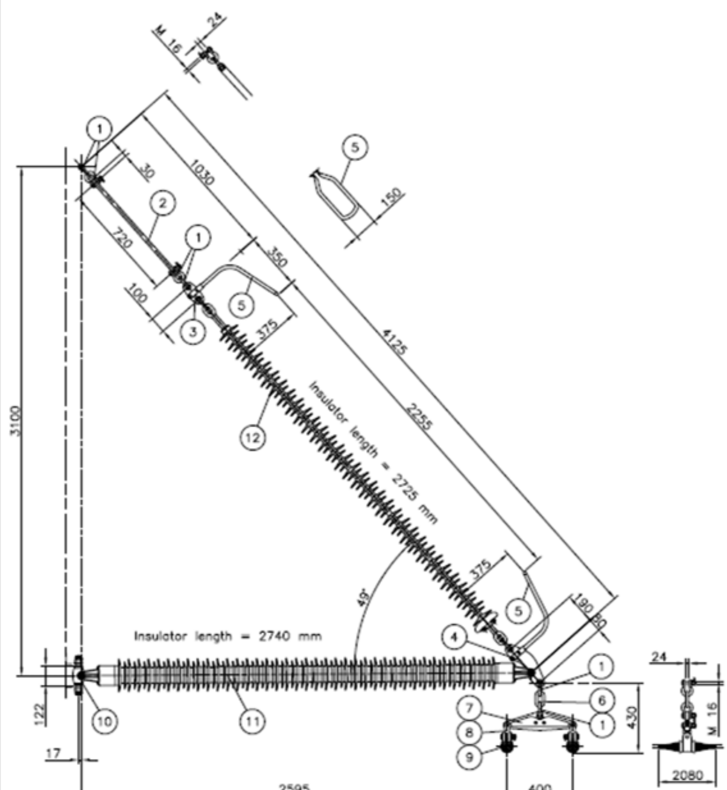
LINEE COMPATTE A 220 kV

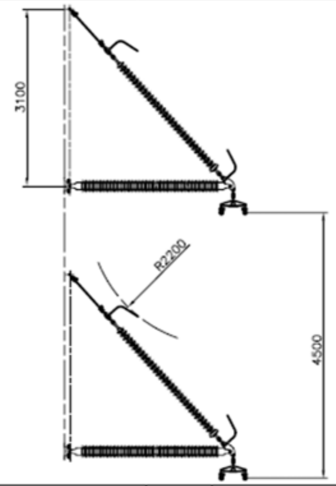
ARMAMENTO PER MENSOLA ISOLANTE IN COMPOSITO CON TIRANTE SEMPLICE CONDUTTORE Ø 20÷24

DIS.N° G00143

MENSOLA ISOLANTE ____ 220kV

EDIZIONE 0





Ref.	Description	Code / mark	Material	Drawing	Q.ty
12	EYE - EYE INSULATOR WITH GRADING RING			G00289EE	1
11	LINE POST INSULATOR			E01048LL	1
10	SWIVEL		STEEL	4541/1	1
9	ARMOUR GRIP SUSPENSION CLAMP		AL. ALLOY+STEEL+NEOPRENE	GSA-30,42	2
8	CLEVIS - TONGUE		STEEL	5033	2
7	YOKE		STEEL	7247/3	1
6	CHAIN LINK		STEEL	6165	1
5	ARCING DEVICE		STEEL	2728-M/20/19-A	2
4	PLATE		STEEL	9592	1
3	PLATE		STEEL	9591	1
2	EXTENSION LINK		STEEL	4509/720	1
1	SHACKLE		STEEL	4464/E	8

Ed.	Date	Description of change	Traced	Checked
0	19/05/2008	First issue	Gilardi P.	M. Pasta

GRUPPO BONOMI — BONOMI EUGENIO S.p.A. — REBOSIO

Drawing title: 220 kV TRASMISSION LINE

BRACED LINE POST ASSEMBLY

Size A3 | Scale 1:20 | Date 16/05/2008 | Mass kg

Drawing n° G00290

Drawn by Gallarati G. | Edition 0

Approved by P.anta

Endesa

Drawing tollerances

Sheet - / -

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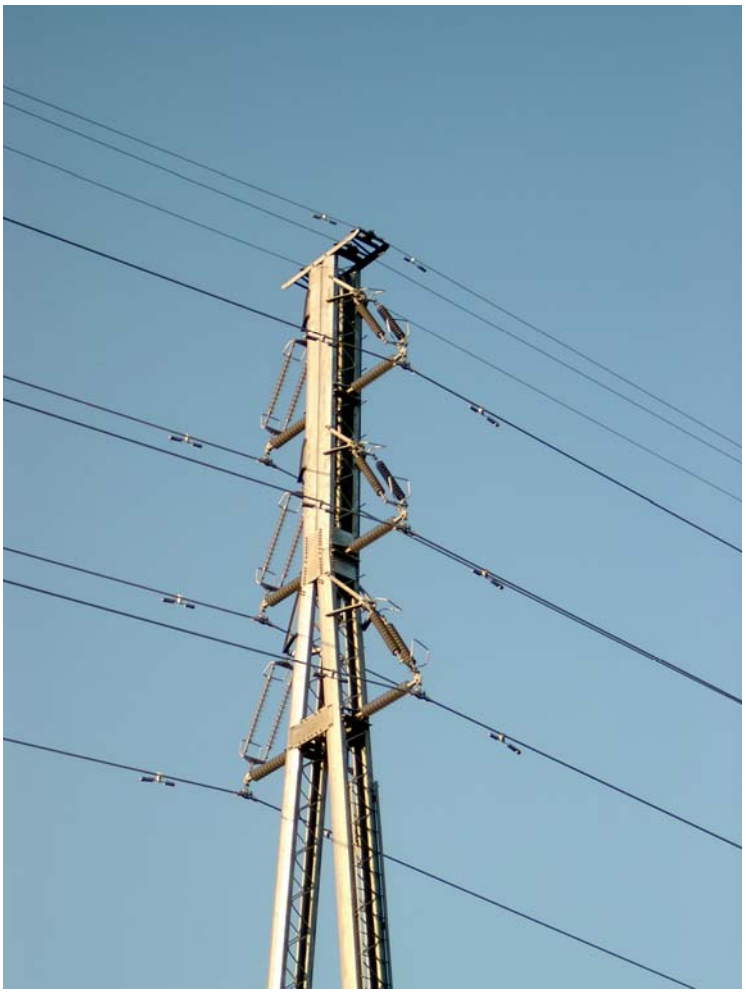
RFI ITALY

Over 1,000 energy braced insulated cantilevers
single and double | normal and anti-salt insulation

Rete Ferroviaria Italiana (RFI) is the Italian railway infrastructure manager and owner of Italy's railway network. It provides electrification, signalling, maintenance and other services for the railway network.
Bonomi have been dealing with the **electrification process of Italian railways** since the very beginning: that is why RFI represents today a very prestigious client for our Group.
Since 2000 we have been supplying to RFI more than **1,000 150 kV energy braced insulated cantilevers** which have been used to electrify the most modern Italian routes.



Our energy braced insulated cantilevers installed on some trellies in Italy

Bonomi's braced insulated cantilevers on some trellis along Italian Railways

REFERENCES AND TESTS

RFI
RETE FERROVIARIA ITALIANA
GRUPPO FERROVIE DELLO STATO ITALIANE

Direzione Tecnica
Standard Tecnologici e Sperimentali
Standard Energia
Il Responsabile

Oggetto: **Referenze "Gruppo Bonomi di Montichiari (BS).**

Hereby I declares that **BONOMI EUGENIO Spa - EB REBOSIO Srl** (Companies of GRUPPO BONOMI) is our usual supplier for supplying of material for overhead contact lines as:

- Droppers and clamp for droppers;
- Cantilevers (Aluminium Type);
- Tensioning devices with Pulleys;
- Composite insulators and components for section insulators.

The products are installed on RFI network since several years and their products performed until today has been successful.
The above products are also located in areas with wide variety of climatic conditions and industrial areas with both clean and polluted atmosphere.

Best wishes

Claudio Spalvieri

Piazza della Croce Rossa, 1 - 00161 Roma
RFI Rete Ferroviaria Italiana S.p.A. - Gruppo Ferrovie dello Stato Italiane
Società soggetta alla direzione e coordinamento di Ferrovie dello Stato Italiane S.p.A.
a norma dell'art. 2497 sexies cod. civ. e D.Lgs. n. 112/2015
Sede legale: Piazza della Croce Rossa, 1 - 00161 Roma
Cap. Soc. euro 31.525.279.633,00
Iscritta al Registro delle Imprese di Roma
Cod. Fisc. 01585570581 e P. Iva 01008081006 – R.E.A. 758380

Pag. 1 di 1

EGÚ - HV LABORATORY
190 11 PRAGUE 9 - BECHOVICE

ACCREDITED TESTING LABORATORY No.: 1029

CUSTOMER:
ABB Sae Rebosio srl

ORDER NO:
990315

DATE OF TEST:
August 11th - November 3rd, 1999

TEST NO:
8514/D/99

TEST REPORT
No: 37012184/D

TEST OBJECT:	Composite Post Insulator
TYPE SPECIFICATION:	DRAWING No: E00764
MANUFACTURER:	ABB Sae Rebosio srl
TEST STANDARD:	IEC 1109: 1992, IEC 60-1:1989 ESB - PG404-S21

ACCREDITED TESTING LABORATORY EGÚ - HV LABORATORY PRAGUE No. 1029

HEAD OF THE TEST:
Václav Sklenička & Jonko Totev

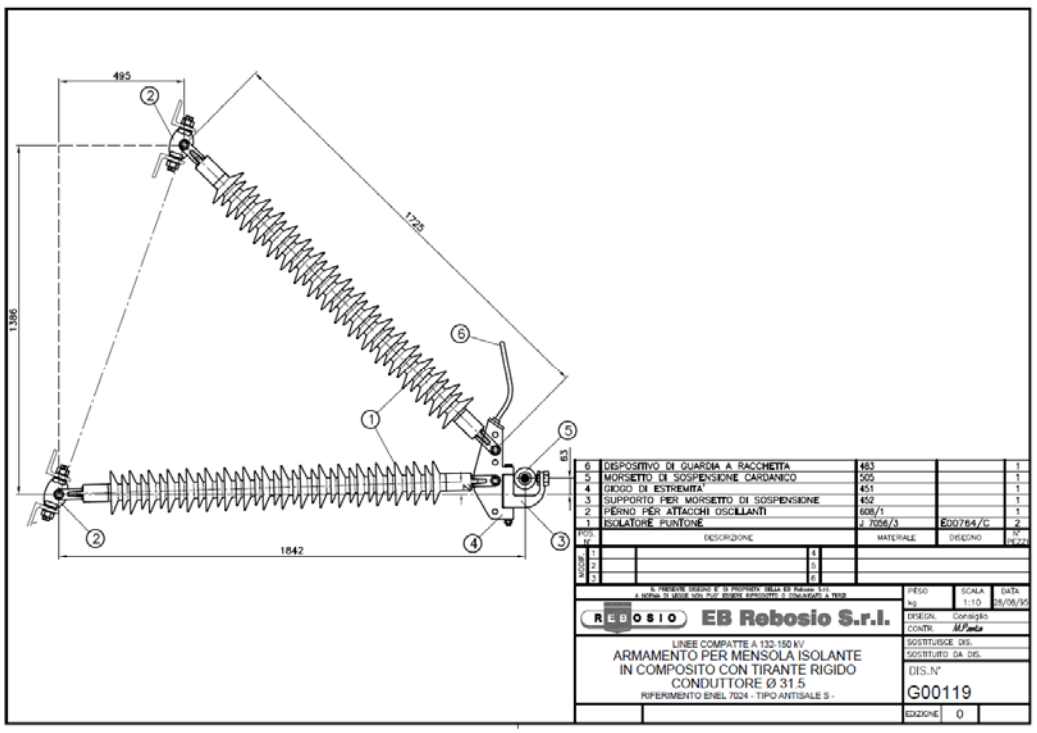
DIRECTOR OF HV LABORATORY:
Jaroslav Vokálek

COPIES: 4

PAGES: 24

Test report is determinated for service application only. Further use solely with approval of the customer. Test results relate only to the tests given in presented report and do not substitute any other documents
The report shall not be reproduced except in full without written approval of the testing laboratory.

In Prague 9 -Běchovice: December 10th, 1999



POS. N°	DESCRIZIONE	MATERIALE	DISEGNO	N° PEZZI
6	DISPOSITIVO DI GUARDIA A RACCHETTA	463		1
5	MORSETTO DI SOSPENSIONE CARDANICO	505		1
4	GIOGO DI ESTREMITA'	451		1
3	SUPPORTO PER MORSETTO DI SOSPENSIONE	452		1
2	PERNO PER ATTACCHI OSCILLANTI	608/1		1
1	ISOLATORE PUNTONE	J 7056/3	E00764/C	2

MODIFICHE: 1 18/04/96 MOD. LUNG. ISOL. TIRANTE DA 2104 IN 2115; 2 21.02.06 SPECIFICATO TIPO POSIZIONE 4

IL PRESENTE DISEGNO E' DI PROPRIETA' DELLA EB Rebosio S.r.l. A NORMA DI LEGGE NON PUO' ESSERE RIPRODOTTO O COMUNICATO A TERZI

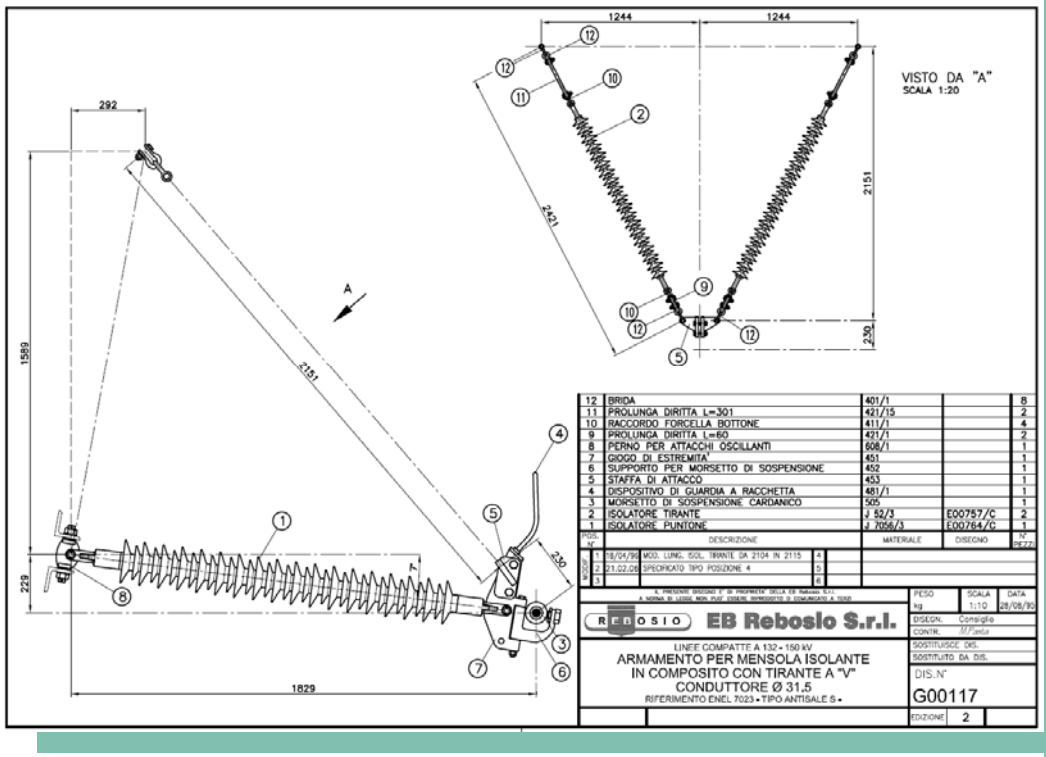
PESO kg | SCALA 1:10 | DATA 28/08/95

DISEGN. Consiglio
CONTR. M.Panta

EB Rebosio S.r.l.

LINEE COMPATTE A 132-150 kV
ARMAMENTO PER MENSOLA ISOLANTE
IN COMPOSITO CON TIRANTE RIGIDO
CONDUTTORE Ø 31.5
RIFERIMENTO ENEL 7024 - TIPO ANTISALE S -

SOSTITUISCE DIS.
SOSTITUITO DA DIS.
DIS.N° G00119
EDIZIONE 0



POS. N°	DESCRIZIONE	MATERIALE	DISEGNO	N° PEZZI
12	BRIDA	401/1		8
11	PROLUNGA DIRITTA L=301	421/15		2
10	RACCORDO FORCELLA BOTTONE	411/1		4
9	PROLUNGA DIRITTA L=60	421/1		2
8	PERNO PER ATTACCHI OSCILLANTI	608/1		1
7	GIOGO DI ESTREMITA'	451		1
6	SUPPORTO PER MORSETTO DI SOSPENSIONE	452		1
5	STAFFA DI ATTACCO	453		1
4	DISPOSITIVO DI GUARDIA A RACCHETTA	461/1		1
3	MORSETTO DI SOSPENSIONE CARDANICO	505		1
2	ISOLATORE TIRANTE	J 52/3	E00757/C	2
1	ISOLATORE PUNTONE	J 7056/3	E00764/C	1

MODIFICHE: 1 18/04/96 MOD. LUNG. ISOL. TIRANTE DA 2104 IN 2115; 2 21.02.06 SPECIFICATO TIPO POSIZIONE 4

IL PRESENTE DISEGNO E' DI PROPRIETA' DELLA EB Rebosio S.r.l. A NORMA DI LEGGE NON PUO' ESSERE RIPRODOTTO O COMUNICATO A TERZI

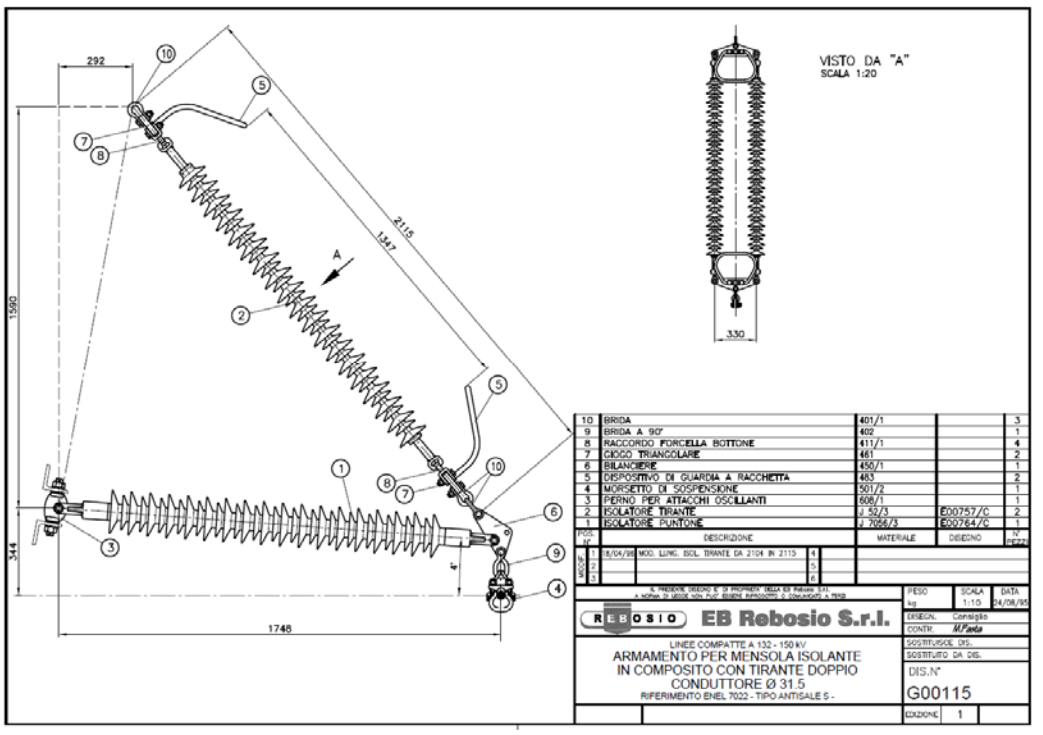
PESO kg | SCALA 1:10 | DATA 28/08/95

DISEGN. Consiglio
CONTR. M.Panta

EB Rebosio S.r.l.

LINEE COMPATTE A 132 - 150 kV
ARMAMENTO PER MENSOLA ISOLANTE
IN COMPOSITO CON TIRANTE A "V"
CONDUTTORE Ø 31,5
RIFERIMENTO ENEL 7023 - TIPO ANTISALE S -

SOSTITUISCE DIS.
SOSTITUITO DA DIS.
DIS.N° G00117
EDIZIONE 2



POS. N°	DESCRIZIONE	MATERIALE	DISEGNO	N° PEZZI
10	BRIDA	401/1		3
9	BRIDA A 90°	402		1
8	RACCORDO FORCELLA BOTTONE	411/1		4
7	GIOGO TRIANGOLARE	461		2
6	BILANCIERE	450/1		1
5	DISPOSITIVO DI GUARDIA A RACCHETTA	463		2
4	MORSETTO DI SOSPENSIONE	501/2		1
3	PERNO PER ATTACCHI OSCILLANTI	608/1		1
2	ISOLATORE TIRANTE	J 52/3	E00757/C	2
1	ISOLATORE PUNTONE	J 7056/3	E00764/C	1

MODIFICHE: 1 18/04/96 MOD. LUNG. ISOL. TIRANTE DA 2104 IN 2115

IL PRESENTE DISEGNO E' DI PROPRIETA' DELLA EB Rebosio S.r.l. A NORMA DI LEGGE NON PUO' ESSERE RIPRODOTTO O COMUNICATO A TERZI

PESO kg | SCALA 1:10 | DATA 04/08/95

DISEGN. Consiglio
CONTR. M.Panta

EB Rebosio S.r.l.

LINEE COMPATTE A 132 - 150 kV
ARMAMENTO PER MENSOLA ISOLANTE
IN COMPOSITO CON TIRANTE DOPPIO
CONDUTTORE Ø 31.5
RIFERIMENTO ENEL 7022 - TIPO ANTISALE S -

SOSTITUISCE DIS.
SOSTITUITO DA DIS.
DIS.N° G00115
EDIZIONE 1

OUR ENERGY REFERENCES

هيئة مياه وكهرباء أبوظبي
Abu Dhabi Water & Electricity Authority

Électricité Du Liban

الشركة العمانية لنقل الكهرباء ش.م.ع.م
OMAN ELECTRICITY TRANSMISSION COMPANY S.A.O.C

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Terna

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energisa

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Saudi Electricity Company

CEMIG

TEİAŞ

Notes

July 2019

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moving energy since 1928

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