



## Railway Products Offer

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### Contacts

#### Your sedentary contact

##### **Evelyne Fleury**

Phone : +33(0)3 80 58 32 32

Fax : +33(0)3 80 58 32 92

[efleury@te.com](mailto:efleury@te.com)

#### Your salesman contact

##### **Pascal Seguin**

Phone : +33(0)6 08 71 07 34

[pseguin@te.com](mailto:pseguin@te.com)

### Interactive pdf document

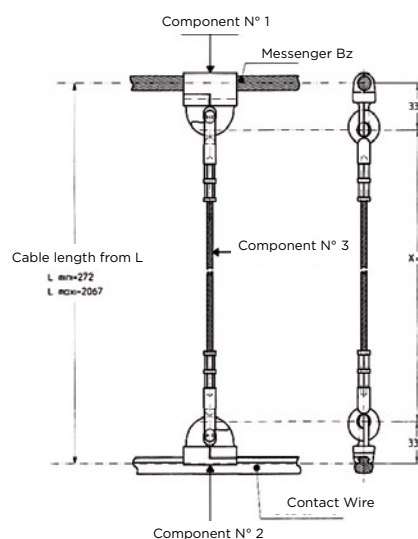
This document is designed to make you read faster and easier.  
Many links are scattered throughout every page, do not hesitate to use them.



## Chapter 1

# Connectors & Fittings

## Current Carrying Catenary Dropper


**SNCF**  
approved

### Product

This dropper provides a mechanical connection between the messenger and the contact wires. It distributes also the current along the catenary to avoid additional connection to supply the power.

Carrier dropper clamp  
Contact wire clamp

### Typical Application

Mechanical and electrical connection between messenger and contact wire

## Technical Characteristics

- SNCF approved
- 25 kV AC
- In accordance with NF C 66-800 and NFC 34-110-2
- Clamps are composed of:
  - Two half clamps to be connected on the catenary wires
  - One articulated eye lugs fitted on the half clamps to link both side of the dropper
  - One wire to make equipotential junction between half clamps and eye lugs
- Dropper clamps are made of Cupro-aluminium material
- Wire between dropper clamps is in copper alloy
- Different clamps versions are available to be in line with dimensions of catenary wires for messenger and contact wire shape (A or B for EN 50-149)
- Any cable lengths from 277 to 2077 mm
- **Patented product ref. WO 96/01747**
- Product specification available on request
- No bolts system which would cause tightening

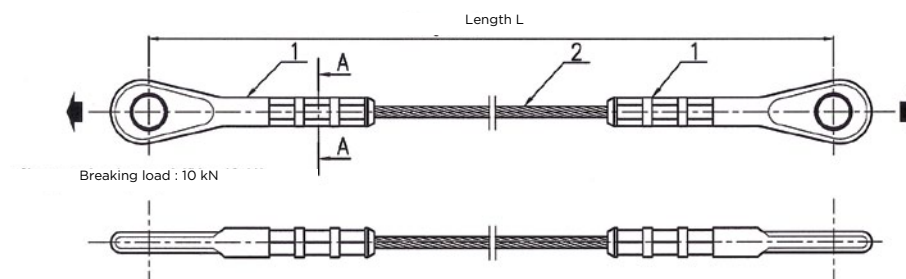
## Features and benefits

- and extra weight on the catenary
- ▶ **Easy and quick to install**
- Dismountable system on messenger and contact wire
- Articulated conducting tightening kit on upper and lower part
- Avoid the distribution connections
- Electrical ageing test
- Mechanical resistance under traction:
  - Cyclic mechanical strength (2 Mil. Cycles / 22 kg weight)
  - Mechanical oscillation test (5 Mil. Cycles)
- ▶ **Reliable and safe**
- Breaking load > 6000 N

## Manufacturing process

- Special semi-automatic machine
- 100% traction tested
- 100% cut to lengths
- Individual labelling with identification of length and position between two poles
- Possibility to deliver complete dropper as above picture or clamps for messenger and contact wires only without wire

## Suspension Assembly for anti-swinging Arm

**NEW**


### Product

This assembly provides a mechanical connection between the cantilever and the anti-swinging arm to keep a regular distance between them.

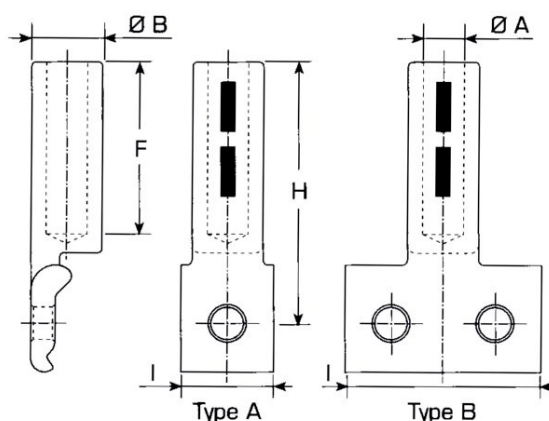
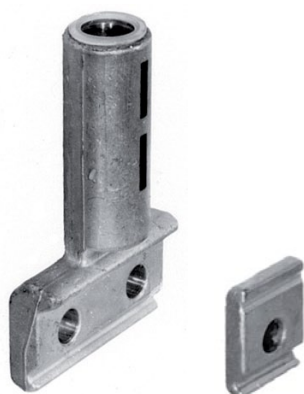
### Typical Application

Mechanical suspension of the anti-swinging arm

### Technical Characteristics

- Breaking load > 10 000 N
- End lugs are made in stainless steel
- Binding cable is in stainless steel
- Any cable length from 200 to 1700mm
- Possibility to deliver :
  1. Only the stainless steel lug
  2. The suspension assembly fully mounted and cut to define lengths in workshop according to installation order
    - special semi-automatic machine
    - 100% traction tested
    - 100% cut to length

## Branch tee and half clamp for contact wire


**SNCF**  
approved

### Product

Mechanical and electrical connection between a copper conductor and the contact wire.

### FC tee FC half clamp

### Typical Application

Branch connection on contact wire

### Technical Characteristics

- SNCF approved
  - In accordance with NFF 42-031
  - 1.5 kV DC – 25 kV AC
  - Good electrical contact
  - Reduced weight
  - Copper conductor crimped on FC Tee barrel
  - Crimp indent mark painted in black
  - Minimal breaking load: 4 000 N (except for 26mm<sup>2</sup> ; 2 000 N)
- **Note:** possibility to deliver these parts ready to install with screw and nut.

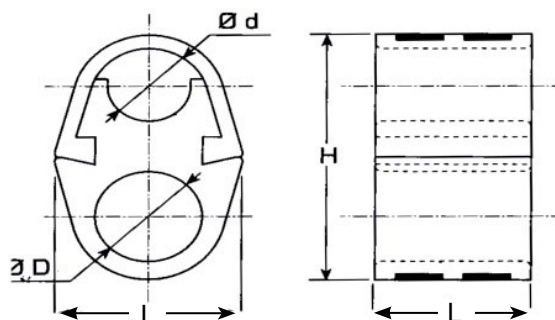
### FC tee

Designation	TCPN	SNCF Symbol	Cable to be connected	Type	Tools	Dimension (mm)				
						A	B	F	H	I
<b>FC TEE</b> <b>107-120-150/26</b>	709368-1	0.880.6821	Annealed Cu 26mm <sup>2</sup>	A	SH16	7.9	18.5	40	73	31
<b>FC TEE</b> <b>107-120-150/ 104.5-145.8</b>	709370-1	0.880.6823	Annealed Cu 104.5mm <sup>2</sup> or hard Cu 145.8mm <sup>2</sup>	B	SH20.4	17	25	55	87	65
<b>FC TEE</b> <b>107-120-150/ 147-164</b>	709371-1	0.880.6824	Annealed Cu 147mm <sup>2</sup> or 164mm <sup>2</sup>	B		19	26	55	87	65

### FC half clamp

Designation	TCPN	SNCF Symbol	Contact wire
<b>FC Clamp / Bride FC</b>	709372-1	0.880.6828	107-120-150mm <sup>2</sup>

## Branch connectors


**SNCF**  
approved

### Product

Crimped connector to make mechanical and electrical branch between one end of a bare copper conductor to an intermediate point on a main bare copper conductor.

### DPH 7 for copper type

### Typical Application

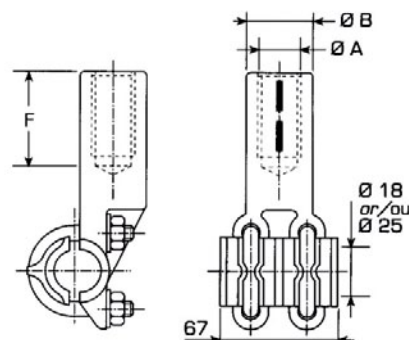
To branch two catenary wires.

### Technical Characteristics

- SNCF approved
- Comply with NFF 42-031
- 1.5kV DC – 25 kV AC
- No tightening torque problem
- Good electrical contact
- Reduced weight
- Crimp indent mark painted in black
- L dimension can be adapted on request

Designation	TCPN	SNCF Symbol	Tools	Dimension (mm)				
				H	L	I	D	d
<b>DPH7 65.4/26</b>	708985-1	7.880.4021	SV29	33.8	25	26	7.9	11
<b>DPH7 65.4/95</b>	716575-1	-	SV42	47.8	30	32	13.5	11
<b>DPH7 65.4/104.5-145.8</b>	708966-1	7.880.4022	SV42	47.8	30	32	16.3	11
<b>DPH7 65.4/147-164</b>	708966-2	7.880.4023	SV42	47.8	30	32	19.1	11
<b>DPH7 70/70</b>	1756095-1	-	SV42	47.8	30	32	11.5	11
<b>DPH7 95/95-104 B164</b>	719933-1	-	SV42	47.8	30	32	13	13.6
<b>DPH7 95/185</b>	719934-1	-	SV42	47.8	30	32	18.5	13.6
<b>DPH7 116.2/147-164</b>	789475-1	7.880.4024	SV42	47.8	30	32	19.1	15

## Copper branch tee



**SNCF**  
approved

### Product

Connection between a copper catenary conductor and a bare copper bar.

### RAC T7

### Typical Application

Connection on bare copper rod

### Technical Characteristics

- In accordance with NFF 42-031
- 1.5 kV DC - 25 kV AC
- Bolted connection on bare copper rod side
- Crimped connection on catenary conductor side
- Dia. A greased and blanked with protection cap
- Crimp indent marks painted in black
- **Note:** Standard products are delivered without stirrups and nuts. For export projects, we can also provide branch tee equipped with stirrups and nuts

### Manufacturing process

Designation	TCPN	SNCF Symbol	Tools	Branch Origin	Bar or cable to be connected	Dimension (mm)			
						A*	B	F	*or M
RAC T7 B18 104-145.8	1429258-1	-	SH 20.4	Cu bar Ø 18 mm	Annealed copper cable 104.5mm² or hard copper 145.8mm²	17	25	55	-
	1756422-1	With stirrups and nuts							
RAC T7 B18 147-164	1429258-2	-			Annealed copper cable 147mm² or 164mm²	19	26	55	-
	1756422-2	With stirrups and nuts							
RAC T7 B18 240-261.5	1429258-3	-	SH 29		Annealed copper cable 240mm² or hard copper 261.5mm²	22	34.2	65	-
	1756422-3	With stirrups and nuts							
RAC T7 B18 B18	1429258-4	-	SH 25		Copper bar Ø 18 mm	19.5*	30	55	M22 or G5/8
	1756422-4	With stirrups and nuts							
RAC T7 B25 104-145.8	1429258-5	-	SH 20.4	Cu bar Ø 25 mm	Annealed copper cable 104.5mm² or hard copper 145.8mm²	17	25	55	-
	1756485-1	With stirrups and nuts							
RAC T7 B25 147-164	1429258-6	-			Annealed copper cable 147mm² or 164mm²	19	26	55	-
	1756485-2	With stirrups and nuts							
RAC T7 B25 240-261.5	1429258-7	-	SH 29		Annealed copper cable 240mm² or hard copper 261.5mm²	22	34.2	65	-
	1756485-3	With stirrups and nuts							

► **Note:** For specific wire dimension, please contact us.

## Paralell Groove Clamps



### Product

This range of connectors is designed to connect two parallel conductors in order to do a derivation of a secondary conductor, or to close a loop of one conductor.

3 Types of connectors :

- Aluminium clamps
- Copper clamps
- Bimetallic clamps

### Option

Can be equipped of shearhead bolts.

### Bimetallic Al/cu Range

Catalogue Number	TCPN	Conductor Cross Section mm2			Conductor diameter mm		Bolts	*TT N.m.	Weight/100 pieces (kg)
		AAC	ACSR	Cu	Al	Cu			
3909	1-1198999-9	16- 70	16/2,5-70/12	6- 50	5,1-11,7	2,75-9,0	M 8	20	11,0
To discover our whole range of products, please contact us.									
3920	1199953-5	16- 95	16/2,5-70/12	1,5-10	5,1-12,5	1,4-4,1	M820	20	6,0

### Copper Range

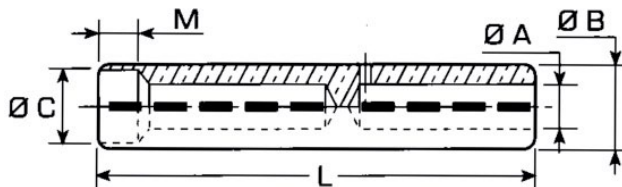
Catalogue Number	TCPN	Conductor Cross Section mm2			Conductor diameter mm		Bolts	*TT N.m.	Weight/100 pieces (kg)
		AAC	ACSR	Cu	Al	Cu			
3005	7-1199008-3	-	-	2,5-16	-	1,8-5,1	M 5	5	2,8
To discover our whole range of products, please contact us.									
3032	8-1199000-9	-	-	16-150	-	5,1-15,7	M 10	35	43,0

### Aluminium Range

Catalogue Number	TCPN	Conductor Cross Section mm2			Conductor diameter mm		Bolts	*TT N.m.	Weight/100 pieces (kg)
		AAC	ACSR	Cu	Al	Cu			
3588	3-1198997-5	16-50	16/2,5-35/6	-	5,1-9,0	-	M 8	20	9,5
To discover our whole range of products, please contact us.									
3554	9-1199010-1	35-240	35/6-210/35	-	7,5-20,2	-	M 10	40	67,2

\* TT = Tightening Torque N.m.

## Copper Crimped Sleeve for bare and protected wire


**SNCF**  
approved

### Product

Mechanical and electrical connection to join a protected copper conductor to a bare copper conductor. Full tension application

**J... U-P / N**

### Typical Application

Sleeve to join two copper conductors of equal section

### Technical Characteristics

- SNCF approved
- In accordance with NFF 42-031
- 1.5 kV DC - 25 kV AC
- No tightening torque problem
- Good electrical contact
- Reduced weight
- Crimp indent mark painted in black
- Hole greased and blanked by cap
- Full tension: 95 % of conductors breaking load

### Two copper to same section, one protected, one bare

Designation	TCPN	SNCF Symbol	Connection to be made		Tools	Dimension (mm)				
			Protected cable	Bare cable		A*	B	C	L	M
<b>J 65 U-P/N</b>	709047-1	0.883.0851	Bz 65	Bz 65	SH25	12	29.5	26.5	160	20
<b>J116.2 U-P/N</b>	709294-1	0.883.0855	Bz 116.2	Bz 116.2	SH32	15	36	31	235	18

► **Note:** for other applications (Aluminium cables, other cables cross sections, anchoring sleeve...), please contact us.

## Crimped Bimetallic Sleeve



### Product

Non-tensioned sleeve for mechanical and electrical connection to join a copper to an aluminium conductor.

**XGX**

### Typical Application

Sleeve to join copper to aluminium conductors

### Technical Characteristics

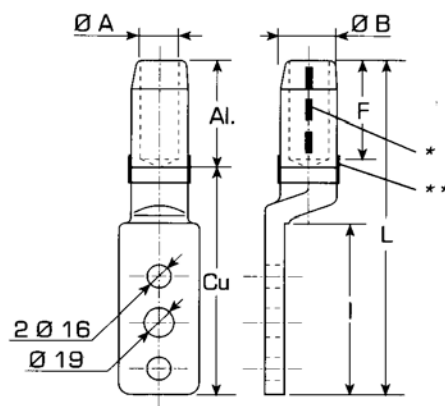
- In accordance with NFF 42-031
- 1.5 kV DC – 25 kV AC
- No tightening torque problem
- Good electrical contact
- Reduced weight
- Crimp indent mark painted in black
- Hole greased and blanked by cap

Two copper to same section, one protected, one bare

Designation	TCPN	Connection to be made		Tools	Dimension (mm)				
		Al cable	Bare cable		A	B	C	D	L
<b>XGX 228 / 104.5-145.8</b>	709035-1	228	104.5 or 145.8	SH28.5	21	34	17	25	158
				SH20.4					
<b>XGX 228 / 147-164</b>	709035-2	228	147 or 164	SH28.5	21	34	19	26	158
				SH20.4					
				SH20.4					
<b>XGX 375 / 240-261.5</b>	709335-1	375.6	240 or 261.5	SH34.5	27	41	22	34.2	172

► **Note:** for specific wire dimension, please contact us.

## Bimetallic Lug



### Product

Bimetallic lug for connection between an aluminium conductor to a copper palm.

**XDX**

### Typical Application

Electrical connection on apparatus.

### Technical Characteristics

- In accordance with NFF 42 031
- 1.5 k DC – 25 kV AC
- Hexagonal crimped connection
- No tightening torque problem
- Good electrical contact
- Reduced weight
- Crimp indent marks painted in black
- Minimal breaking load: 4 000 N

### Two copper to same section, one protected, one bare

Designation	TCPN	Bar or cable to be connected	Tools	Dimension (mm)				
				A	B	F	L	I
<b>XDX 228</b>	708988-1	Al/Alu 228mm <sup>2</sup>	SH 28.5	21	34	85	229	50
<b>XDX 238</b>	707909-1	Al/Alu 238mm <sup>2</sup>		21.5	34	85	229	50
<b>XDX 288</b>	707909-2	Al/Alu 288mm <sup>2</sup>		23.5	34	85	229	50
<b>XDX 336</b>	707909-3	Al/Alu 336mm <sup>2</sup>		25.2	34	85	229	50

► **Note:** for specific wire cross section, please contact us.



## Chapter 2

# Surge Arresters

## Bowthorpe EMP Transmission Surge Arrester



HSRAP6



HSRCP36



MCA1-36

### Product

Polymeric and porcelain surge arresters. Low, Medium and High voltage. We offer surge arresters for medium voltage power distribution systems which are designed to reliably protect your valuable

assets from overvoltage. They withstand severe outdoor exposure over long operating lifetimes and help maintain service reliability in both overhead and underground installations.

### HSRAP6 technical Characteristics

- Metal oxide arrester (ZnO)
- Polymeric Housing
- Outdoor application
- IEC 60099-4
- Nominal discharge current: 10 kA
- Line discharge class 2
- High current impulse 4/10 Qs: 100 kA
- Energy Capability: 4.5 kJ/kV at  $U_r$  according to IEC 60099-4
- (Clause 8.4.2 table 5 & 8.5.5)

### HSRCP36 technical Characteristics

- Metal oxide arrester (ZnO)
- Polymeric Housing
- IEC 60099-4
- Nominal discharge current: 10 kA
- Line discharge class 2
- High current impulse 4/10 Qs: 100 kA
- Energy Capability: 4.5 kJ/kV at  $U_r$  according to IEC 60099-4
- (Clause 8.4.2 table 5 & 8.5.5)

### MCA1-36 technical Characteristics

- Metal oxide arrester (ZnO)
- Porcelain Housing
- Outdoor application
- IEC 60099-4
- Nominal discharge current: 10 kA
- Line discharge class 3
- High current impulse 4/10 Qs: 100 kA
- Energy Capability: 8.75 kJ/kV at  $U_r$  according to IEC 60099-4
- (Clause 8.4.2 table 5 & 8.5.5)
- Surge Arrester Characteristics



To discover our whole range of products, please contact us.





## Chapter 3

# Polymeric Insulators

## Polymeric insulators



**Anchorage**  
SNCF - 200472



**Anchorage**  
SNCF - 200478



**Top tube**  
SNCF - 200475



**Top tube**  
SNCF - 200515



**Cantilever**  
SNCF - 200477



**Cantilever**  
SNCF - 200499



**Feeder**  
SNCF - 200484



**Support**  
SNCF - 200401

### Product

Polymeric insulators for overhead contact line, post and substation. Polymeric insulators are based on Raychem's 30 years experience in the field of crosslinked polymers for medium and high voltage applications.

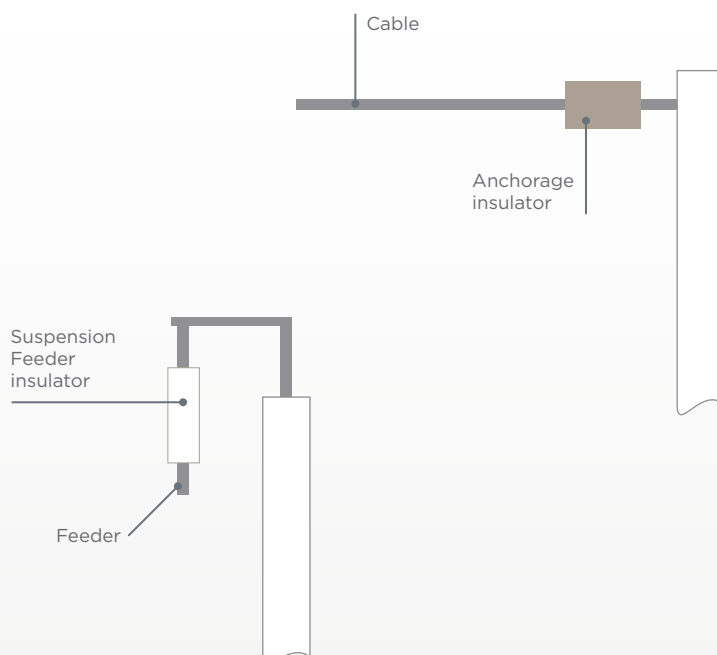
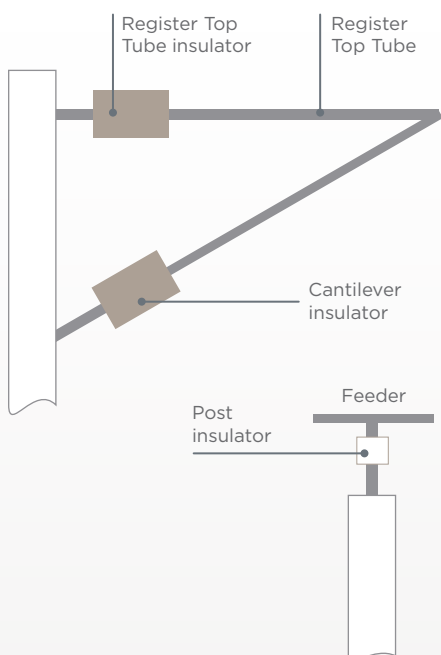
They consist in a polymeric housing over pultruded fibreglass rod to which galvanized steel or aluminium end fittings are attached. Housing materials in either ethylene vinyl acetate (EVA) or silicone are available depending on customer's preferences and application.

### Technical Characteristics

- SNCF approved
- In accordance with NFF 42-031
- 1.5 kV DC – 25 kV AC

**SNCF**  
approved

Insulator Designation	Customer P/N	Customer Ref	TCPN
<b>Anchorage</b>	SNCF 0.883.0175	SNCF 200472	CR2697-000
<b>Reinforced anchorage</b>	SNCF 0.883.0356	SNCF 200478	CR4955-000
<b>Top tube 28</b>	SNCF 0.883.0313	SNCF 200475	CR2698-000
<b>Top tube 49</b>	SNCF 0.883.0176	SNCF 200515	CR2699-000
<b>Cantilever tube 49</b>	SNCF 0.883.0315	SNCF 200477	CR2703-000
<b>Cantilever tube- tube 49</b>	SNCF 0.883.0316	SNCF 200499	CR2701-000
<b>Suspension feeder</b>	SNCF 0.883.0357	SNCF 200484	CR2693-000
<b>Support 1500 Volts cc</b>	SNCF 0.883.0607	SNCF 000401	CR2695-000





## Chapter 4

# Raysulate

## Raychem Insulation Enhancement System

Specific  
product on  
customer's  
request

TE Connectivity has used its experience from utilities and substations to provide a range of specialist cold applied retrofit products that can help prevent flashovers, outages and circuit breaker operations on the rail network. By insulating either the live equipment or earth planes from problems caused by

wildlife, vegetation or airborne debris at areas of reduced clearance network reliability can be greatly improved. The range of covers, barriers and sheets are easily installed and are suitable for 25kV applications.

### The complete retrofit system

The Raychem Insulation Enhancement

System includes products for substations and overhead lines, for distribution and transmission applications. All products in the insulation enhancement system use our crosslinking polymer technology that has given our electrical products superior performance and reliability for over 35 years.

### Raychem Medium Voltage Line Cover "MVLC"



Provides insulation for catenary, drop-pers and associated conductors against contact with trees, birds, wildlife or even vandalism. Simple fast wrap around installation. Flame Retardant version available rated up to 40kV.

### Raychem Bus Connection Insulating Covers "BCIC"



BCIC preformed covers are available for any trackside equipment connections. Standard covers can be easily modified to suit almost any connection arrangement. Installation is easy with no need to disconnect busbar.

### "I" Beam insulation cover "IBIC"



Provides an insulating platform above Twin or Single contact wires. Used in tunnels, under bridges or in stations where there is reduced clearance. Attaches to contact wire with industry standard clamps.

### Raychem Bus Insulator Squirrel Guard "BISG"



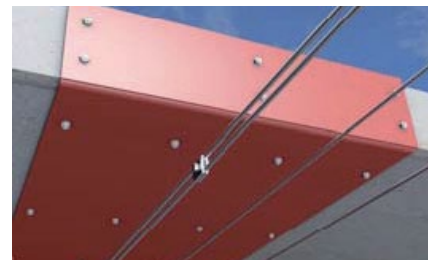
Can be mounted horizontally or vertically on any MV insulator or bushing, to prevent wildlife bridging phase to ground. Designed to eliminate accidental flashover on trackside substations and all associated equipment.

### Raychem Under Bridge Arm Cover "UBAC"



A range of covers to insulate the end fitting of horizontal insulators in tunnels and under bridges.

### Raychem Rigid Red Barrier Board, 3mm "RRBB"



A tough insulating board that can be secured to the underside of structures to insulate them from live equipment where there are reduced clearances. Raychem RRBB can be easily cut, drilled or formed on site to allow fitting to complex structures.



**Chapter 5**  
Toolings

## Crimping Head

## Special Tool for Dropper installation


**SNCF**  
approved

## Product

220 kN Crimping head for catenary connectors.

**V22U**

## Typical Application

Crimping head for catenary connectors



## Product

Reinforced 220 kN Crimping head for intensive use in workshop (droppers).

**V22U R**

## Typical Application

Crimping head for intensive use


**SNCF**  
approved

## Product

This tool has been specifically developed to install or remove on NEW LINES the connection dropper clamps for contact wire.

**SIMAGRIF**

## Typical Application

Crimping head for catenary connectors

## Technical Characteristics

- SNCF approved
- 10,000 cycles type tested according to NF C 33-090.4
- Can be fitted with hexagonal or oval dies for all the catenary connectors
- Threaded type coupler (1/2 valve A) or quick ball coupler (CM 15) for connection to the hydraulic source through hose
- Equipped with a special handle
- Wide hydraulic pumps to be connected to the head :
  - SIMAFLEX, hand pump
  - SOLHYFLEX, foot pump
  - AUTOPUMP, battery operated pump
  - GEH, electrical pump

Designation	TCPN
<b>V22U + A</b>	707911-1
<b>V22U + CM115</b>	707911-3
<b>V22U handle</b>	708660-1

► **Note:** for dies to be fitted with this tool, please contact us.

## Technical Characteristics

- Tested for 50,000 cycles according to NF C 33-090.4,
- Up to 300,000 crimping capacity
- To be fitted with the current dies SNCF homologated
- Mobile part for die is identical to V22U standard version
- To be equipped either with 1/2 threaded coupler A or fast quick ball coupler CM115

Designation	TCPN	Coupler Type
<b>V22U R + A</b>	1701214-1	1/2 valve type A
<b>V22U R + CM 115</b>	1701214-2	Quick ball CM 115

► **Note:** for dies to be fitted with this tool, please contact us.

## Technical Characteristics

- SNCF approved
- Adapted for contact wire 107, 120 and 150 mm<sup>2</sup>
- Low effort & strength (<30daN)
- Force obtained on the clamps (around 500 daN)
- Light (<2kg) and compact (dim. 270x240x50 mm)
- Prevent from damaging the contact wire
- Replace the use of hammer. The quality of the connection is therefore better with the SIMAGRIF

Designation	TCPN
<b>SIMAGRIF tool</b>	1429804-1
<b>Metallic Carrying case</b>	1574334-2

► **Note:** already sold in France, Belgium, UK.

## Hydraulic Electrical Pump

## Hydraulic Battery Operated Pump



**SNCF**  
approved



**SNCF**  
approved

### Product

Electro-hydraulic handed unit with operating speed 230 V - 50 Hz, 0.55 kW.  
Compatible with all crimping heads and cable cutters in our range.

**GEH 700 / 0.5 C**

### Product

Portable hydraulic unit with integrated battery of 24 V - 3 A/h.  
Compatible with all crimping heads and cable-cutters in our range up to the V22U.

**AUTOPUMP 700/0.3**

### Typical Application

Hydraulic unit to supply crimping head

### Typical Application

Hydraulic unit to supply crimping head

## Technical Characteristics

- SNCF approved
- Pressure : 700 bar (10 000 PSI)
- 230 V / 50 Hz single phase
- Flow rate : 0.5l/mn
- Able to do heavy duty works
- Unit weight is around 26 kg
- Dimensions LxWxh : 410x240x362 mm
- Protection level : IP 66.7
- Possibility to offer a 12 meter hose flexible
- Distributor block equipped with an electro-valve with manual override
- Pressure switch for regulating operating pressure from 0 to 730 bar
- Hydraulic unit with pump and motor submerged in the tank
- Can be equipped with hydraulic coupler (B screw or CF quick ball types) at the end of the hose
- Resistant steel outer case to protect all vulnerable components.

## Technical Characteristics

- SNCF approved
- Pressure : 700 bar (40 000 PSI)
- Rate of flow : 0.3 L/min
- Battery : Ni/cd 24 V - 3 A/h
- Protection level : IP 56 in compliance with NF EN 60529
- 100 cycles are possible before to recharge the battery
- Recharging of the battery in less than 30 min
- Unit weight : 14.5 kg
- LxWxh : 340x200x316 mm
- Remote control module
- Manual override of electrovalve
- Possibility to offer a 12 meter hose flexible
- Can be equipped with hydraulic coupler (B screw or CF quick ball types) at the end of the hose
- Resistant steel outer case to protect all vulnerable components.

## Hydraulic Hand Tool : SIMABLOC C120+



### Product

Manual hydraulic press to crimp a wide range of connectors.

### SIMABLOC C120+

### Typical Application

For hexagonal crimping

### Technical Characteristics

- Used for hexagonal crimping of the following connectors:
  - Grounding : "C" connector, from C10 to C50
  - Rolling stock : CTN - MJTN, from 10 to 120 mm<sup>2</sup>
  - LV-MV bare overhead line for connectors up to 228mm<sup>2</sup>
- Use 12SE dies and 12R for rounding
- Rotating head up to 320° with hydraulic pressure off, and tool indexing
- Movable arm activating the piston and, by rotation, allowing the piston back at the end of the crimping operation
- Quick advance
- High pressure safety valve
- Output force : 130 kN
- Weight : 5.8 kg
- Dimension 550x155x75mm
- Steel case : 630x190x100mm / 6 kg

Designation	TCPN	RPN
<b>SIMABLOC C120+</b>	789083-1	055956-000
<b>SIMABLOC C120+ with CARRYING CASE</b>	789083-3	289542-000
<b>CARRYING CASE</b>	1306206-1	121534-000

## Hydraulic Crimping Tool with rechargeable battery



### Product

Hydraulic “one” hand tool for crimping connectors from 6 to 300 mm<sup>2</sup>.

### AUTOPRESS C120

### Typical Application

Crimping tool for rolling stock and bare line

### Technical Characteristics

- Used for indentation or hexagonal crimping of the following connectors:
  - Grounding : “C” connector, from C10 to C50
  - DIN 46235 : copper lugs & sleeves, from 10 to 240 mm<sup>2</sup>
  - Rolling stock : CTN – MJTN, from 10 to 120 mm<sup>2</sup>
  - LV-MV bare overhead line : connectors from 7 to 228mm<sup>2</sup>
- Use 12SE dies like SIMABLOC C120+
- Operates with 14.4V rechargeable battery using new technology avoids all memory effect
- Two chargers are available: 15 min and 1 hour
- Dimension : 325x80x250 mm
- Ram course : > 26 mm
- Output force : 130 kN
- Weight : 6.85 kg
- Hydraulic system with two speeds for a quick crimping : 12.5 sec on 185mm<sup>2</sup>
- Electronic speed control in the trigger
- Open “C” head, rotation up to 320° with hydraulic pressure off
- Automatic release with an audible “click” when force of 130 kN is reached. Return of piston by release trigger.
- Light indicator gives the charge level, shows the end of the crimping, and the need for maintenance each 15 000 cycles
- Packed in metallic carrying case with thermoformed housings for the accessories

Designation	TCPN	RPN
<b>AUTOPRESS C120</b> with 60 min charger + one battery and metallic carrying case	1701440-1	F41407-000
<b>AUTOPRESS C120</b> with 15 min charger + one battery	1701440-3	E30826-000
<b>Battery 14.4V NiMh</b>	1701694-1	E31031-000
<b>60 min charger</b>	719415-1	122902-000
<b>15 min charger</b>	719416-1	219712-000



## Chapter 6

# Heatshrinkable

## Heatshrinkable tubing

### WCSM



#### Product

Thick-wall, heat-shrinkable tubing for general electrical insulation and sealing purposes. The tubing is weathering and UV-resistant and adhesive coated

#### Technical Characteristics

<b>Temperature range</b>	- 40°C to +90°C
<b>Dielectric strength</b>	14 kV/mm
<b>Colour</b>	black
<b>Delivery form</b>	adhesive coated, 1 m cut lengths

### FCSM



#### Product

Thick-wall, flexible and flame-retarded, heat-shrinkable tubing for general electrical insulation and sealing purposes. The tubing is weathering and UV-resistant.

#### Technical Characteristics

<b>Temperature range</b>	- 40°C to +140°C (uncoated)
	- 40°C to + 90°C (coated)
<b>Dielectric strength</b>	13 kV/mm
<b>Color</b>	black
<b>Delivery form</b>	A/U = uncoated on spools
	1000/U = uncoated, 1 m cut lengths
	1000/S = adhesive coated, 1 m cut lengths

### MWTM



#### Product

Medium-wall, heat-shrinkable tubing for general electrical insulation, sealing and corrosion protection purposes. The tubing is weathering and UV-resistant.

#### Technical Characteristics

<b>Temperature range</b>	- 40°C to +120°C (uncoated)
	- 40°C to + 90°C (coated)
<b>Dielectric strength</b>	14 kV/mm
<b>Color</b>	black
<b>Delivery form</b>	A/U = uncoated on spools
	1000/U = uncoated, 1 m cut lengths
	1000/S = adhesive coated, 1 m cut lengths

### DCPT



#### Product

Dual colour (yellow, green), thin-wall, heat-shrinkable tubing for marking and protection of grounding wires, cables and busbars. The tubing is weathering and UV-resistant.

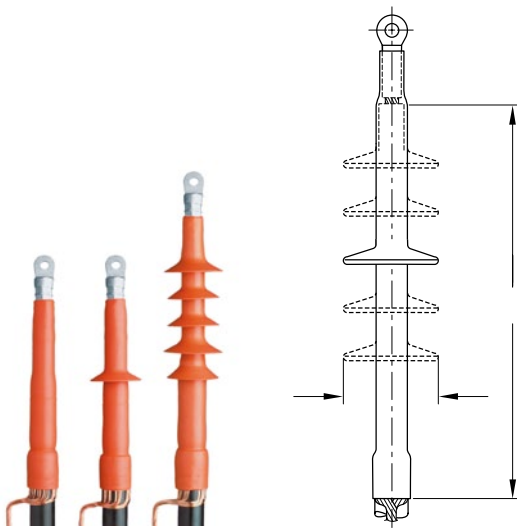
#### Technical Characteristics

<b>Temperature range</b>	- 40°C to +135°C
<b>Dielectric strength</b>	14 kV/mm
<b>Color</b>	green/yellow
<b>Delivery form</b>	uncoated on spools

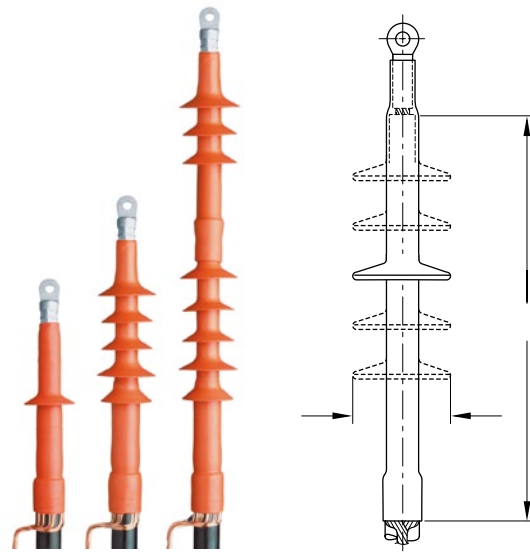
## Chapter 7

# Cable Accessories

## Indoor termination



## Outdoor termination



### Product

For screened, 1-core polymeric insulated cables with wire screen 10 kV, 15 kV, 20 kV, and 52 kV

## Cable

The termination is designed for 10, 15, 20 and 35 kV screened single core plastic insulated cables with wire screen. For example: NA2XS2Y, YHAKXS, XUHAKXS,

AXEKVCEY, CXEKVCEY, N(A)2XSY, XHE 49, XHP 48, EHP 48, N(A)2XS(F)2Y.

## Design of termination

The screen wires or the earth lead are embedded in sealing mastic. A stress control mastic patch is laid around the end of the screen cut. A highly elastic, non-tracking insulating tubing is slid over the core up to the end of the oversheath. Sealing mastic prevents any

moisture ingress at the cable lug. Kits with the modification code -L12 include mechanical lugs with a busbar connection hole for M12 connection bolts, with code -L16 for M16 bolts.

## Design of joints

Joint body, earthing system and re-jacketing pre-expanded on one holdout system. Single piece silicone rubber joint body with high mechanical expansion capability allows a wide application range. Electrical stress control of the screen cut area by integrated conductive geometrical stress cones. Electrical stress control of the connector area by an integrated screened connection area (Faraday cage). Well-known and easy-to-install holdout system. Short parking distance required. Easy-to-install joint system with short installation time. Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications. Mechanical shear bolt connector to IEC 61238-1 is supplied with the kit. Proven shield continuity concept.



## Chapter 8

# Earthing & Cable support clamps

## Crimp Connectors, C type



**EDF**  
approved

### Product

These crimp connectors are used to join or to branch copper conductors, in accordance with IEC 225.

### C connector

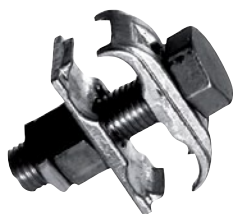
### Typical Application

For earthing and grounding connections

### Technical Characteristics

- Comply with requirements of IEEE 387 (84)
- Technically approved by EDF
- Made of pure electrolytic copper
- Tin coated
- Crimping realized directly on the body
- Can be used for joint or cross-linked connection
- Number of crimps to ensure a good tightening (x2)

### Other Products



Earthing Connector



Earthing Connector



Strap  
Stainless Steel Trap



Cable Support Clamps



BSM/B



Earthing Lug



Anchoring Clamp



Anchoring Clamp



Insulation Piercing  
Connector



BLMT



Wall-Faddle



Suspension Clamp



Pre-insulated Junction  
Sleeve



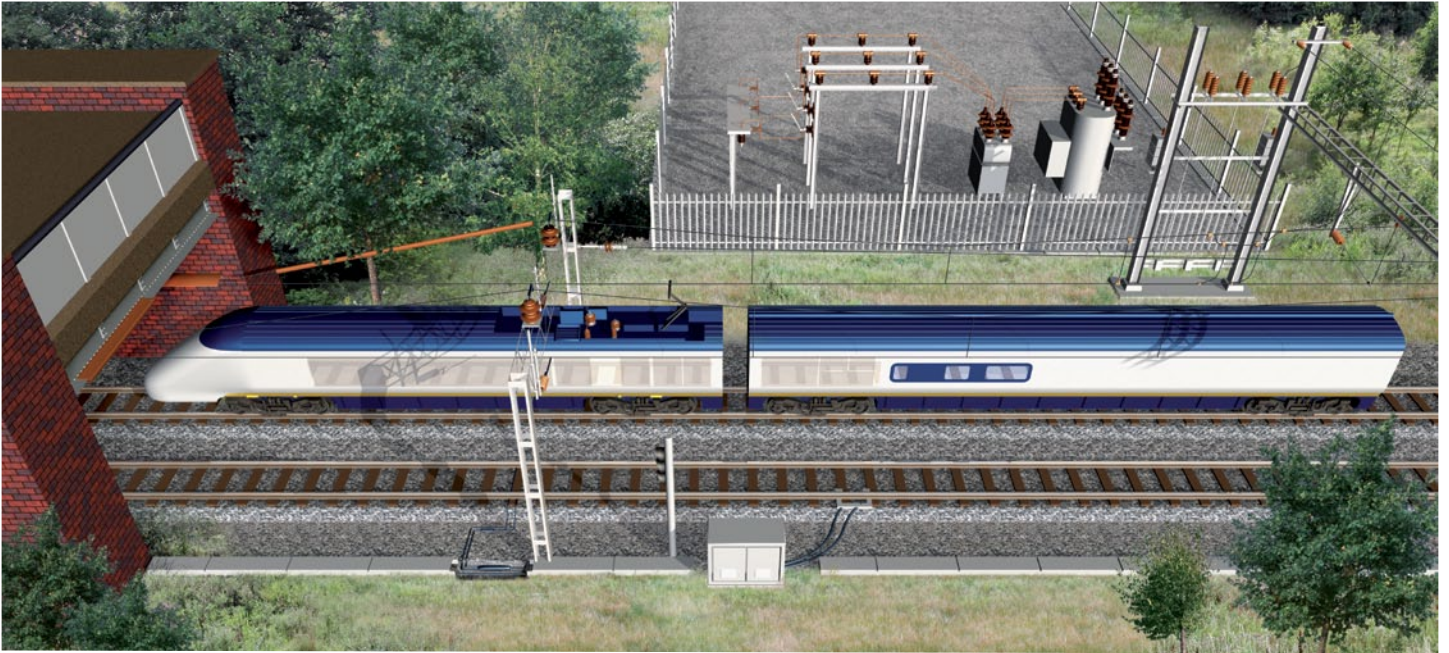
LINDAPTER



## Chapter 9

# Substations

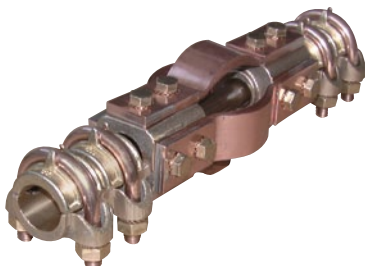
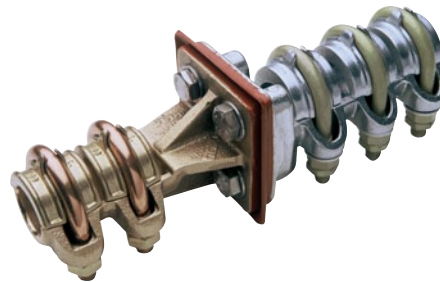
## Various Connectors for posts and Substations

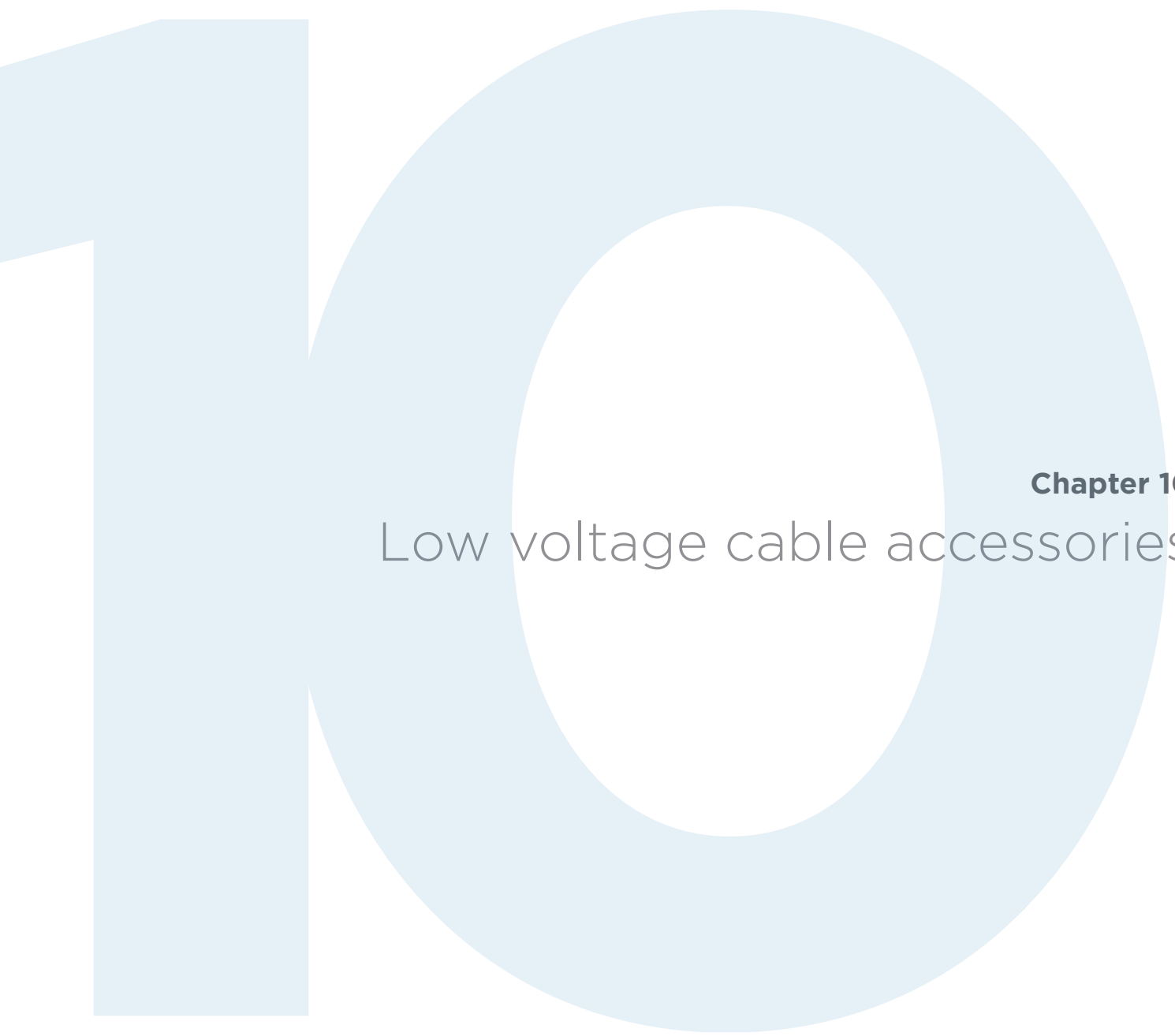


### High voltage connectors for Substations

Bronze connectors for copper conductors (cables or tubes) and bimetals. connectors for copper studs and aluminium or aluminium-alloy cables (bimetal. function is carried out in

our plants: a bimetal sheet is put between aluminium and bronze parts). This range is for use up to 220 kV.





**Chapter 10**

Low voltage cable accessories

## Current Carrying Catenary Dropper

### Gel sealing technology

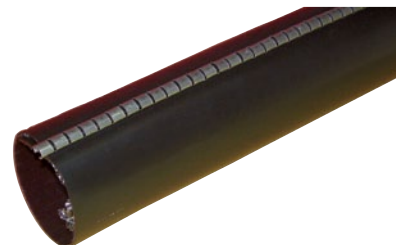
- Gel sealing technology
- Proprietary PowerGel technology for applications from  $-40^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$  continuous temperature with an unlimited shelf life.
- PowerGel is silicone embedded in a cross-linked silicone matrix.
- Combines the advantages of solid (elastic Memory) and liquid (wetting, conforms to surfaces) sealing materials.
- Extremely high elongation and elasticity, excellent ageing and dielectric properties.



### Poured resin boxes



### Heatshrinkable low voltage joints



# 11

## Chapter 11 References

## TE Connectivity Training Center

Two main activities of TE Connectivity Training Center are: training and certification. Personnel can be trained in low, medium and high voltage fields, tooling maintenance and Raysulate but also regarding specific customers' requests.

TE Connectivity Training Center is accredited to certify personnel entitled "underground electric link jointers" according to normative document. TE Connectivity fulfils the requirements of the standard or the guide NF EN ISO/CEI 17024 and Cofrac rules for activities of persons.

## Contact

### Geneviève JANICHON

Phone : +33(0)3 80 58 32 / Fax : +33(0)3 80 58 32 88  
gjanichon@te.com



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Tyco Electronics Simel S.A.S  
a TE Connectivity Ltd. Company  
TE Energy  
1 rue Paul Martin  
21220 Gevrey Chambertin/France

Phone: +33(0)3 80 58 32 00  
Fax: +33(0)3 80 34 10 15  
e-mail:simel@te.com

[energy.te.com](http://energy.te.com)

