Trifurcating transition joints for MV tripolar oil impregnated paper insulated cables to extruded cables.

Version	Main changes description
0	First emission
1	Company logo update

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1.DOCUMENT AIMS AND APPLICATION AREA

This Standard applies to 12/20(24) kV special joints to connect existing three-pole impregnated paper insulated cables for Medium Voltage, both collectively lead-shielded cable or separately lead-sheathed cable, to unipolar cables with extruded insulation (bundled or not), both full and reduced insulating thickness, with copper wires or aluminum tape screen (commonly called “trifurcating transition joints”).
This document shall be implemented and applied to the extent possible within the Rețele electrice România and in compliance with any applicable laws, regulations and governance rules, including any stock exchange and unbundling-relevant provisions, which in any case prevail over the provisions contained in this document.

2.RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL

This document doesn’t require implementation of further documents.

3.UNITS IN CHARGE OF THE DOCUMENT

Responsible for the preparation of the document:
- Inginerie și standardizare / Omologare și standardizare

Responsible for the authorization of the document:
- Network Operations Directorate

4.REFERENCES

- Integrated Policy for Quality, Health and Safety, Environment, anti-Bribery and Information security;
- ISO 9001- Quality Management System – Requirements;
- ISO 14001 - Environmental Management System - Requirements with guidance for use;
- ISO 45001 - Occupational Health and Safety Management System - Requirements with guidance for use;
- ISO 37001 - Anti-bribery Management System - Requirements with guidance for use;
- ISO 27001 - Information Security Management System – Requirements
- Packaging, transport and delivery requirements rev. 2
- The Code of Ethics;
- Zero Corruption Tolerance Plan (ZTC);
- Human Rights Policy;

5.ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY

Value Chain/Process Area: Engineering and Construction
Macro Process: Devices and components development
Process: Standard Catalog Management

6.DEFINITIONS AND ACRONYMS

Acronym and Key words	Description
Manufacturer Product	Component manufactured by a Supplier in accordance with a technical specification
Technical Conformity Assessment (TCA)	A “conformity assessment” with respect to “specified requirements” consists in functional, dimensional, constructional and test characteristics required for a product (or a series of products) and quoted in technical specifications and quality requirements issued by Rețele electrice România. This also includes the verification of conformity with respect to local applicable regulation and laws and possession of relevant requested certifications.
Type A documentation	Not confidential documents used for product manufacturing and management from which it is possible to verify the product conformity to all technical specification requirements, directly or indirectly.

6.1.REFERENCE STANDARDS

Reference documents listed below (amendments included) shall be the edition in-force at the contract date.
- ISO/IEC 17000 Conformity assessment – Vocabulary and general principles
- ISO/IEC 17020 General criteria for the operation of various types of bodies performing inspection
- ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories
- ISO/IEC 17050-1 Conformity assessment - Supplier’s declaration of conformity - Part 1: General requirements (ISO/IEC 17050-1:2004, corrected version 2007-06-15)

- ISO/IEC 17050-2 Conformity assessment - Supplier's declaration of conformity - Part 2: Supporting documentation (ISO/IEC 17050-2:2004)
- ISO/IEC 17065 Conformity assessment – Requirements for bodies certifying products, processes and services

6.2.TECHNICAL DEFINITIONS

See Cenelec HD 629-2.

7.DESCRIPTION

7.1.LIST OF COMPONENTS

Type code	Distribution Company and Country	Type	Material code	Oil imp paper insulated cable, unipolar cross section [mm²]	Extruded insulated cable, cross section [mm²]	Rated voltage U0/U (Um) [kV]	Shrink technology allowed
GSCC029/15	R.E.R- Romania	I	271057	50	70/185	12/20 (24)	cold (*)
GSCC029/17	R.E.R- Romania	I	271048	95/240	70/185	12/20 (24)	cold (*)
GSCC029/19	R.E.R- Romania	I	271076	25/70	70/120	12/20 (24)	heat
GSCC029/21	R.E.R- Romania	I	271077	95/240	95/185	12/20 (24)	heat

Table 1 - List of Components

(*) Outer cover could also be accepted in heat shrink technology screen cross section for all codes, for the thickness of the shield of 25 mm2

7.2.APPLICABLE LAWS AND REFERENCE STANDARDS

7.2.1.International standard

Unless otherwise specified the following standards applies:

- EN 50181 Plug-in type bushings above 1 kV up to 52 kV and from 250 A to 2,50 kA for equipment other than liquid filled transformers.
- HD 629.2 S2 Test requirements for accessories for use on power cables of rated voltage from 3,6/6(7,2) kV up to 20,8/36(42) kV Part 2: Cables with impregnated paper insulation
- IEC 61238-1 Compression and mechanical connectors for power cables - Part 1: Test methods and requirements
- IEC 61442 Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)
- IEC 60587 Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure.
- IEC 62262 Electrical insulating materials used under severe ambient conditions - Test methods for evaluating resistance to tracking and erosion
- IEC 60695-11-10 Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods
- IEC 60721-2-1 Classification of environmental conditions - Part 2-1: Environmental conditions appearing in nature - Temperature and humidity.
- ISO IEC 17067 Conformity assessment — Fundamentals of product certification and guidelines for product certification schemes.

7.2.2.Standards

- GSC001 "Underground Medium Voltage Cables".
- ILRE097 Technical Conformity Assessment".
- Barcode specification
- Legea securității și sănătății în muncă nr.319/2006, cu modificările și completările ulterioare.
- Ordonanța de Urgență nr. 195/22.12.2005 privind protecția mediului, cu toate modificările și completările în vigoare.
- Legea nr. 211/25.11.2011 privind regimul deșeurilor.
- H.G. 1037/03.11.2010 privind deșeurile de echipamente electrice și electronice.
- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006.
- Directive 2004/108/EC electromagnetic compatibility.
- HN 33-E-03

7.2.3.Replaced local standards

- DJ4394, DJ4395

7.3.SERVICE CONDITIONS

7.3.1.General service conditions

- IEC 60721-2-1.

7.3.2.Specific service conditions

Not apply.

8.TECHNICAL CHARACTERISTICS

8.1.Type of joints

• Type I: Used for the connection of three-pole collectively lead-shielded oil impregnated paper insulated cables and unipolar extruded insulated cables
• Type II: Used for the connection of three-pole separately lead-sheathed oil impregnated paper insulated cables and unipolar extruded insulated cables
See Figure 1 for an illustrative design.

8.2.Electrical and dimensional characteristics

Rated voltage Uo/U (Um) (kV)	**12/20(24)**
Rated power frequency withstand voltage (kV) *	50
Rated impulse withstand voltage (kV) **	125
Rated short time withstand current in the conductor (kA)	According to HD629-2 (IEC 61442)
Rated short time (0,5 s[a]) withstand current in the screen (kA)	5[b];10[c]
NOTE (see Table 1): (*)Rated power frequency withstand voltage for Type I is 38 kV (**) rated impulse withstand voltage for Type I is 95 kV a: For all cables the rated short time is 1 sec, b: for 25 mm^2 joint screen c: for 50 mm^2 joint screen	

Table 2 - Electrical characteristics

Rated voltage of the joint *Uo/U (Um)* (kV)	**12/20(24)**
Distribution Company (Country)	Rated voltage of the cables ***Uo**/U (U**m**)* (kV)
Rețele Electrice România	12/20(24)

Table 3 - Rated voltage of the cables

With reference to Figure 1, overall dimensions of joints are defined in Table 4:

Rated voltage *Uo/U (Um)* (kV)	**12/20(24)**
Maximum length L (mm)	1200
Maximum diameter D (mm)	300

Table 4 - Overall dimensions

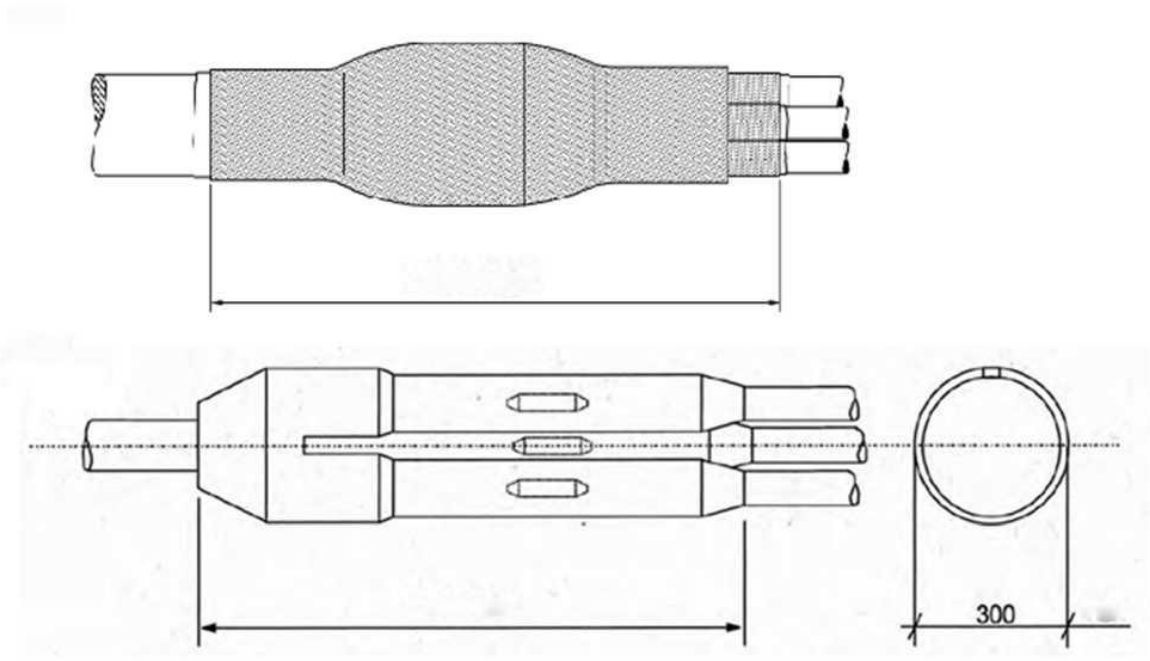


Figure 1 - Maximum dimensions (mm)

9.CONSTRUCTION CHARACTERISTICS

9.1.General characteristics

9.1.1.Shrink technology

Both shrink technologies, cold and heat, are included in this Standard, but in table 1 it is precised the shrink technology for each code.

9.1.2.Resistance to corrosion, infiltrations, moisture and dust

The external protection sheath of the joint shall be of insulating material resistant to agents found in soil; the use of tapes, paints, enamels or similar materials is not considered sufficient to ensure the level of protection required. The joint shall be watertight in order to prevent water penetration during the operation. Furthermore, it shall also be designed to prevent the longitudinal migration of water along the cable screens. Note that joints can be installed in transformer chambers or inspection wells, located below ground level, and they will be subjected sometimes to submerged operation under a water column of up to 3 meters.

9.1.3.Resistance to fire

The main insulating housing (see 7.5.2.3) shall be resistant to fire.

9.1.4.Heating

All the materials that make up the joint shall withstand the heating conditions expected during operation, without having an adverse effect on their proper functioning of the joint or the cable.

9.1.5.Materials compatibility

All the component parts of the joint shall be made from materials that can be in contact with each other and with the parts that make up the cable, without having an adverse effect on their proper functioning. Greases and sealing compounds, if any, shall be neutral in relation to the materials with which they are in contact along all the joint life and shall remain stable in contact with air.

9.2.Trifurcating transition joint

The transition joints for tripolar oil impregnated paper insulated cable to unipolar extruded insulated cables are composed by the following elements:

1. Shear bolt connector
2. Component to control the electric field
3. Main insulating housing
4. Semiconducting layer
5. Metallic screen
6. External protective sheath for each phase
7. Greases and sealing compounds
8. External protective and sealing sheath for the trifurcation

The design of the transition trifurcating joint shall allow the continuity of the cable, restored layer by layer.
Note: It could be considered solutions where items 3 (main insulating house) and 4 (semiconducting layer) are built in a single piece or even a solution where all the above elements, except item 1 (shear bolt connector), item 7 (greases and sealing compounds) and item 8 (external protective sheath for the trifurcation), could be preassembled on a single body (pre-assembled joint body). This body should be designed to allow a tolerance on the positioning during the installation of ± 1 cm, with respect to the correct position indicated in the installing instructions. These single unipolar pre-assembled bodies should be mounted preferably on a self-ejecting support, being also accepted spiral supports.

9.2.1.Shear bolt connector

The electrical continuity of the cables shall be made through a shear bolt connector compliant with IEC 61238-1, Class A. The connector shall include the shear bolts and shall be made of tin-plated aluminum alloy suitable for both aluminum and copper conductors.
No additional hole (e.g., for inspection) shall be made. The shear bolts shall be made to break inside their holes, assuring that no spike of any projection of material remain on the connector surface.
The connectors shall have a central lock and shall assure the correct positioning of the conductors in the same axis of the connector using adapters (for the smaller section in the prescribed range).
The external surface of the connectors shall not have sharp edges, spikes, or deformities.
Connectors must be designed and constructed so that, when properly installed, the electrical resistance of the connection is not greater than the equivalent resistance of the reference conductor.
It is allowed to use greases to improve the electrical contact between the connector and the cable conductors and avoid corrosion. The design of screw cavities protection shall be so that no material is dispersed inside the joint during the cold shrinking operation and/or in the installation.
After the installation, the entire connector shall be protected with a suitable cover or tape with a smooth surface to prevent damages to the joint (e.g., for residual spikes of screws).
The connector shall be designed according to the dimensions of the cables to be connected.

9.2.2.Component to control the electric field

It shall be applied on the connector, on the insulation of the cables and connected to the outer semi-conductive screens of the cables.

9.2.3.Main insulating housing for each single phase

The main insulating housing shall be made preferably of one single layer and shall ensure, after shrinking, a minimum total thickness of 6 mm (12/20 kV).

9.2.4.Semiconducting layer

Painted or coated semiconducting layers are not allowed.

9.2.5.Metallic Screen

The electrical continuity of the metallic screens of the cables shall be made by a solution combining a braid and copper tape or means of a copper stocking guaranteeing the minimum sections reported in Table 1.
It shall be compatible with lead, aluminum tape and copper wire cable screens.
a) Cables with aluminum tape screen
In the case of cables with aluminum tape screen, the connection with the screen shall be made by means of a plate of tin-plated hard copper with a tin coating having minimum thickness of 0,5 µm. The plate shall be as shown in the Figure 3 and shall be bent on a cylinder of diameter 25±2 mm; the convex side of the plate shall include 65 asperities, arranged as shown in the Figure 3. These asperities shall have a particular shape (see example in Figure 3) in order to allow piercing the aluminum tape, to obtain a satisfactory contact with the screen, and to partly penetrate the outer thermoplastic sheath of the cable, to prevent movement or removal of the device.

The edge and the internal side of the plate shall be free of sharp or rough parts, in particular in the lower side in contact with the semiconductive layer of the cable.
The lower side going under the aluminum tape shall have no protruding edge (an example is shown in Figure 3) but a small, rounded edge lower than the asperities.
As far as possible, the dimensions of the aluminum tape screen are as described here. The Supplier can only modify the measurements for use on cables of smaller and larger cross-sections, in which the dimensions do not allow a correct installation. The proposal will be checked during the TCA process by Rețele Electrice România.

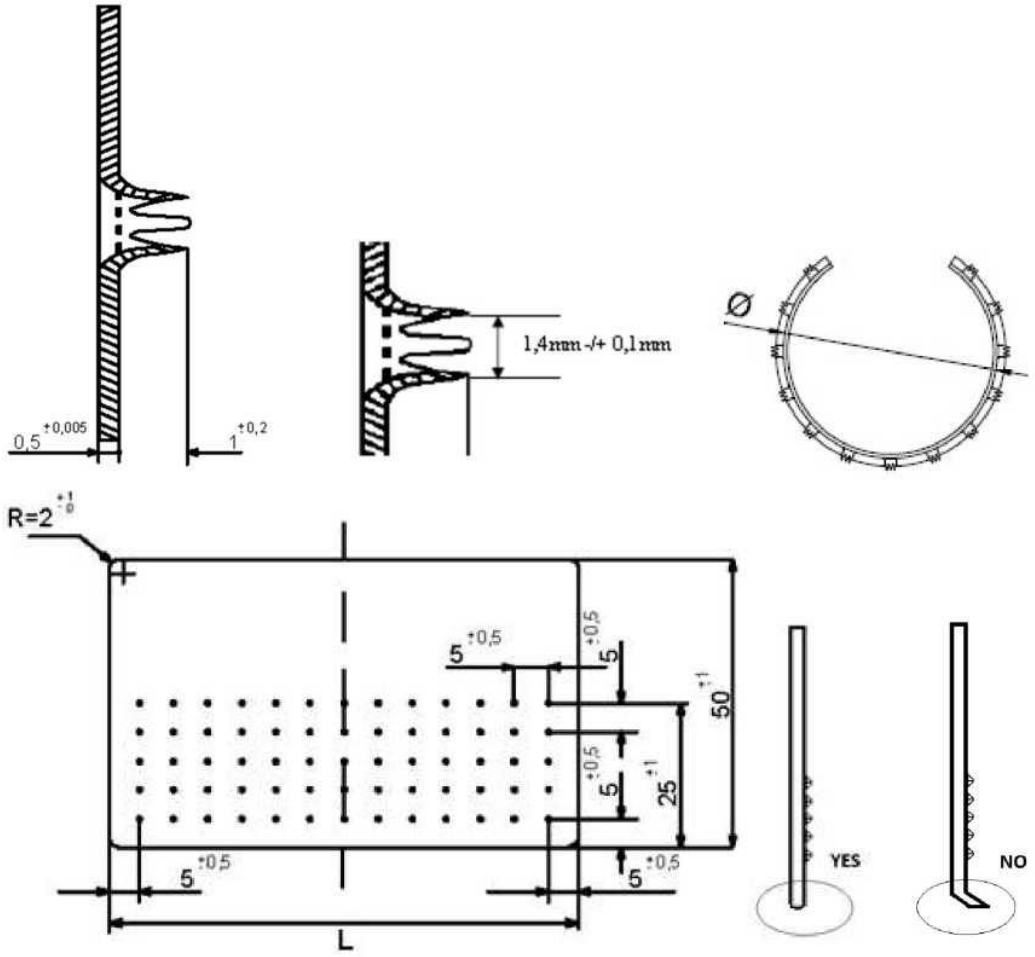


Figure – Detail of rectangular plate for aluminum tape screen connection

b) Cables with copper wires screen
In the case of cables with copper wire screen, the copper wires of the metallic screen of the cable shall be fold back over the cable outer sheath and secured by means of a constant force compression system.
c) Tripolar oil impregnated paper insulated cable with lead-shielding
For Type I (collectively lead-shielded cable), the three braids used in each transition joint of the trifurcation shall be joined to the collective lead shiel by means of a constant force compression system or equivalent.
For Type II (separately lead-sheathed cable), the system to ensure the metallic screen continuity shall consider a constant force compression system for each phase or equivalent. In case this tripolar cable has also an additional collective lead sheath, each individual lead sheath shall be joined to the collective lead sheath by means of a system combining additional braids, copper wire and constant force compressive elements or equivalent method.
d) Constant force compression system
Electrical continuity of the screens of the cables and the metallic screen of the joint may be achieved using austenitic steel constant force springs or another equivalent method.

9.2.6.External protective sheath for each phase and for the trifurcation

The external protective sheath shall ensure the mechanical protection and sealing of each individual joint from each phase , and it shall also protect the trifurcation zone, avoiding water, moisture, and other

elements to penetrate in the joint and in the cable. It could be formed by different parts to afford the complete sealing.

9.2.7.Greases and sealing compounds

Sealing compounds are not allowed, except those:
- To seal the whole joint,
- To protect the junction of the metallic screens.
- To seal the junction of the three phases of the tripolar cable
- To seal the oil impregnated insulated cable as described below

Greases are not allowed, except those:
- Over the main insulation of the cable and over the connector

Greases and sealing compounds shall have no electrical functions for the assembling of the joints but only provide mechanical and/or sealing features. Note that the greases shall remain neutral in relation with the materials in contact, as described before, along the whole life of the joint.

a) Oil sealing system for oil impregnated paper insulated cable

In order to contain the impregnating insulating oil, a cold shrink sealing tube shall be preferably provided for each phase of the tripolar oil impregnated paper insulated cable. Additional compounds or tapes are allowed only for sealing paper edges towards the connector and/or the lead sheath. Solutions based exclusively on tapes or others shall be evaluated.

9.3.PREPARATION OF THE CABLE

The preparation of the cables to be jointed shall follow the recommendations of the procedure stablished in the data sheet of the joint. The dimensions for the preparation shall be according to manufacturer's design (when possible, the dimensions for this preparation shall be according to the requirements of GSCC004).

9.4.CONTENT OF THE KIT

All the necessary elements and accessories to install the transition joint on-field shall be included, namely:
- 3 (three) kits of field control, main insulation housing with semiconductive layer and screen connection (see 9.2)
- 3 (three) shear bolt connector (see 9.2.1)
- 3 (three) shear bolt connector cover (see 9.2.1)
- 1 (one) external protective sheath (see 9.2.6)
- Greases and sealing compounds (see 9.2.7)
- Accessories for cleaning.
- Plastic bag for collecting residual materials of installation.
- List of materials.
- Identification label (see 11.3.2)
- Installation instructions and templates (see 11.4)
- Other materials, tools, and accessories (according to supplier's design)
- 3 (three) oil sealing cold shrink tube.
- Warning sheet, indicating the expiration date.
- Measurement rule to verify the preparation of the cables

10.TESTING

10.1.General

Tests are classified into:
- Type tests
- Acceptance tests

They shall be carried out according to HD 629-2 S2.
The connectors shall be tested according to IEC 61238-1, class A.
Tests shall be performed using oil insulated paper cables for tripolar oil impregnated insulated cable.

10.2.Type test

For each material code, type tests shall be carried out on samples installed cables with the maximum section indicated in Table 1, respectively for Uo/U (Um) 12/20(24) kV.

NOTE: If the tripolar oil impregnated paper insulated cable specified in Table 1 is not available, the tests shall be carried out using the most similar cable, with the same cross-section but with extruded insulation.
Type tests shall be carried out at the maximum rated voltage level prescribed for the joints (i.e., 12/20(24) kV).
The connectors shall be tested both for their maximum and minimum section, according to IEC 61238-1, class A.
The Supplier shall declare the resistance to fire of the main insulating housing according to IEC 60695-11-10 or another equivalent standard.

10.3.EXPIRATION TEST

(Optional)
An expiration test shall be performed in order to verify the capability of the joint to maintain its properties during its life according to the expiry date declared by the manufacturer.
The test shall be performed of a new joint and on a joint of the same lot aged 7 days at 65°C in oven in expanded stage (to simulate 2 years of storage at 35°C of mean temperature).
After ageing, the new joint and the aged joint are put in expanded stage at +5°C during 24h. After that cooling phase, the joints are installed on the minimum cross-section cables of their reference range and the loops are immediately immersed in cold water at 0/+5°C.
Then, the following test sequence is applied:

Test	table 4 of HD 629-2
Partial discharge measurement	n/a
Lightning impulse voltage test	X (test n°11)
Power-frequency voltage tests	X (test n°2)
Partial discharge measurement	n/a
Visual inspection of water penetration	X

Table 6

10.4.ROBUSTNESS TEST

It shall be performed according to the French standard HN 33-E-03 with the following particularities:
The assessment criteria to pass the test is given in HN 33-E-03, except for the classification level which is not applied. However, the index “Evolution of the average breakdown values" must be calculated according to paragraph 5.1.3.2 of the standard.
The test shall be performed on the maximum cross-section in the reference range with the criteria given in 7.8.2. The extension of compliance from maximum section to minimum section in the reference range is according to the criteria given in 7.8.2.5.

10.5.ADDITIONAL TYPE TESTS

For each material code, the extension of compliance from maximum section to minimum section in the reference range shall be verified on a cable having the minimum diameter over insulation (or lower) specified in Table 1, by carrying out all the additional tests prescribed by HD629-2 S2 table 9 taking into account that test No. 4 must be performed, additionally to prescribed conditions, also by subjecting the samples to 63 cycles in water to be performed according to HD629-2, table 4, No. 6. Additional type tests shall be carried out at the maximum rated voltage level prescribed for the joint (i.e., 12/20(24) kV).

10.6.Acceptance Tests

For each material code, acceptance tests shall be carried out using the smallest cable section (see Table 1 for reference) for each rated voltage of the cable according to Table 3 (e.g., 270127 shall be tested on a 95 mm2 –12/20(24) kV extruded cable and 25 mm2 –12/20(24) kV paper cable).
NOTE: if the tripolar oil impregnated paper insulated cable specified in table 1 is not available, the tests shall be carried out using the same cable used during the homologation process (TCA)
During the acceptance tests performed autonomously by the supplier: The supplier must perform all tests listed in Table 8 with the sampling criteria indicated in Table 7.
The reports of the tests carried out and the tested samples shall be made available in case of repetition of the acceptance tests at the presence of the Rețele Electrice România or designated inspector.
During the repetition of the acceptance tests at the presence of the Rețele Electrice România or designated inspector: The same tests listed in Table 8 performed autonomously by the supplier must be repeated on a sample chosen at random from the batch already successfully tested applying the sampling criteria indicated in Table 7.

Sample	Batch (units)		
Type	≤ 50 units	> 50 and ≤ 1200	> 1200
A	2 samples	5 samples	10 samples
B	1 sample	2 samples	3 samples
C	1 sample	2 samples	5 samples
D	1 sample	1 sample	2 samples

Table 7 Samples for acceptance Tests

In all cases:
- The quantities are always referred to each type of material code prepared for testing
- The acceptance number will be 0, and the rejection number will be 1
- On the scheduled acceptance testing date, the supplier shall prepare the cables, stripped as required by the assembly instructions of joints being tested. This will facilitate the joint assembly and reduce the testing time, which benefits both parties

All the tests to be performed and the relative sampling are listed in the following table:

Test	Sampling during execution by Supplier	Sampling during repetition by R.E.R	Note
1.Visual check, Accessory manufacturing specifications check and joint marking	A	C	Verification of correspondence to the approved prototype (dimensions, completeness of the accessory kit, presence and correctness of identification labels and joint marking, packaging, and barcodes).
2. Nominal tightening torque check	B	D	The nominal tightening torque of shear bolts specified by the manufacturer shall always be verified with a torque spanner even when the joint can't be made.
2. Accessory assembly check	B	D	Check the assembly according to the approved manual. For each material code, acceptance tests shall be carried out using the smallest cable section (see Table 1 for reference) for each rated voltage of the cable according to Table 3.
3. Power-frequency withstand test	B	D	Required values according to table N° 2 and test description according to IEC-61442.

Table 8 Acceptance Tests

11.CONDITIONS OF SUPPLY

11.1.Warranty

The manufacturer shall guarantee that the trifurcating transition joints are supplied to meet all requirements of this technical specification.
The joints shall be warranted against manufacturing defects for a period of 2 years.

11.2.Labelling

The joint must bear the following information:
a) name of the manufacturer;
b) maximum voltage Um in kV
c) year and month of manufacture (e.g.: 15/2);

In particular, this information shall be placed on the external sheath of the joint by means of indelible and permanent screen printing or an equivalent method accepted by Rețele Electrice România

11.3.Packaging

Joints shall be supplied in individual packages which shall bear the following information:
- Material code.
- Name of the manufacturer.
- Type of joint (e.g., trifurcating transition heat shrink joint);
- Type of cables for which the accessory is intended, section and conductor material allowed (aluminum/copper).
- Year and month of packaging.

- Progressive identification number assigned by the manufacturer (or serial number).
- Barcode (see 11.3.1)
- Production batch number.
- Identification abbreviation.
- Maximum voltage Um in kV;
- Expiry date (year/month) of the materials.

Furthermore, the packages shall contain a self-adhesive label with the following information:
- manufacturer identification code (CUI);
- material code;
- year and month of manufacture (e.g.: 15/2);
- progressive identification number (assigned by the manufacturer);
- barcode see 11.3.1)

Shipping (of several individual packages) shall meet the requirements of the packaging in compliance with GUI 101 specifications.

11.3.1.Barcode

The characteristics of the barcode are listed in Barcode specification

11.3.2.Identification label

It shall include blank fields to be filled after installation:
Name: ……
Date: ……
Company: ……

11.4.Installation instructions and templates

The instruction for the preparation of the cable shall be written in compliance with the technical data sheet of the joint manufacturer; The technical specification DJ4580 also applies.
Accessory assembly instructions shall be written on A4 paper, and the various stages of construction of the joint shall be illustrated by photographs or diagrams in color.
Templates shall be included for the following types of cables:
- Extruded cables with aluminum tape screen
- Extruded cables with copper wires screen
- Paper insulated cable

Furthermore, for processing steps that require the use of a special tool, the description of these operations shall be accompanied by material code/type code for the tool and a color photograph.
Additionally, a QR code shall be included for each step of the installation instructions to provide a web-link to demonstration videos and tutorials on the related joint. The videos shall be in the local language of the Country of delivery.
Installing instruction and templates shall be in Romanian and shall be approved by Rețele Electrice România.

12.TECHNICAL CONFORMITY ASSESSMENT

12.1.General conditions

The manufacturer shall provide personnel and equipment necessary to carry out type tests and acceptance tests described herein. Otherwise, the supplier could hire the service to a laboratory previously accepted by the customer and assume the cost. The product shall comply with the requirements of ILRE097 regarding the Technical Conformity Assessment.
The equipment should be properly calibrated by a laboratory certified or approved by the client. The manufacturer shall possess daily calibration certificates (to turn over) at the time of inspection.

12.2.Acknowledgement of TCA for previous revision of the standard.

Products with TCA in force under the previous local standards from Rețele Electrice România will be recognized as homologated material for the present technical specification. Rețele Electrice România, therefore, reserves the right to check that the conditions of supply, contents of the kit, type codes, country codes, manuals, labels, etc., shall comply with the requirements of this technical specification.

13.ANNEX

13.1.TECHNICAL CHECK-LIST EXAMPLE

The following chart indicates the minimum technical information that suppliers shall provide.

Item	Description	Unit	Required	Offered
1	GENERAL INFORMATION			
1.1	Supplier	-		
1.2	Factory	-		
1.3	Supplier Product Designation	-		
2	MAIN FEATURES			
2.1	Distribution Company and Country	-		
2.2	Country Code	-		
2.3	Type Code			
2.4	Type I or II	-		
2.5	Rated voltage U0/U (Um)	(kV)		
2.6	Rated power frequency withstand voltage	(kV)		
2.7	Rated impulse withstand voltage			
2.8	Rated short time withstand current in the conductor			
2.9	Rated short time (0,5 s) withstand current in the screen.			
2.10	Maximum length L	(mm)		
2.11	Maximum diameter D	(mm)		
2.12	Shrink Technology			
2.13	Resistance to fire			
2.14	Type of connector			
2.15	Copper stocking cross section	(mm2)		
2.16	Cable section	(mm2)		
2.17	Min/max diameter over insulation extruded cable	(mm)		
2.18	Maximum external diameter of shear bolts connector:	(mm)		
2.18.1	Minimum internal diameter of shear bolts connector	(mm)		
2.18.2	Number of screws of shear bolts connector			
2.18.3	Minimum total thickness over the connector of main insulating housing after shrinking	(mm)		
The "L" and “D” dimensions, as defined in figure 1.				