PROTECTIVE DEVICES TO AVOID THE RISK OF BIRDS COLLIDING WITH POWER LINES AND OTHER BIRD-AID DEVICES

Version	Date	Description of the main changes
01	17/10/2023	First emission of “GSCC031 PROTECTIVE DEVICES TO AVOID THE RISK OF BIRDS COLLIDING WITH POWER LINES AND OTHER BIRD-AID DEVICES”
02	11/05/2026	Changing company logo

Contents

1 DOCUMENT AIMS AND APPLICATION AREA 3
2 RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL 3
3 UNITS IN CHARGE OF THE DOCUMENT 3
4 REFERENCES 3
5 ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY 3
6 DEFINITIONS AND ACRONYMS 4
7 DESCRIPTION 4
7.1 LIST OF COMPONENTS 4
7.2 APPLICABLE LAWS AND REFERENCE STANDARDS 4
7.3 SERVICE CONDITIONS 5
7.4 TECHNICAL CHARACTERISTICS 5
7.5 CONSTRUCTIVE CHARACTERISTICS 7
7.6 MARKING AND DESIGNATION 7
7.7 TESTING 7
7.8 TECHNICAL CONFORMITY ASSESSMENT 10
8 LOCAL SECTION 11

1 DOCUMENT AIMS AND APPLICATION AREA

The purpose of this document is to provide the technical requirements for the provision of material to safeguard bird life in the distribution networks of the client. In this document the materials are defined to avoid birds colliding with power lines giving more visibility to the line and other different materials which could help birds as special supports for them or material to distance them from the line. The protections also serve to ensure the proper functioning of the network.

This document shall be implemented and applied to the extent possible within the client company 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 drawing up the document:

- RETELE ELECTRICE ROMANIA: Engineering and Standardization/ Homologation and Standardization

Responsible for authorizing the document:

- RETELE ELECTRICE ROMANIA: Head of Network Operations unit;
- RETELE ELECTRICE ROMANIA: Head of Quality unit.

4 REFERENCES

- Human Rights Policy.
- Code of Ethics.
- Stop Work Policy;
- 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
- ILRE097 Technical Conformity Assessment.
- Contractual Requirements for Components and Materials Quality management.
- Barcode specification.

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

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

Acronyms and Key words	Description
Acceptable Quality Level (AQL)	The maximum percentage of malfunctions that can be detected during a sample inspection and can still be considered satisfactory
Low Voltage (LV)	Any set of nominal voltage levels in the range 0.5 to 1 kV AC or 120 to 1500 V DC
Medium Voltage (MV)	System with a nominal operative voltage between the phases higher than 1 kV to 35 kV included. NOTE: The boundary value between medium voltage and high voltage depends on local and historical circumstances or on common usage. Nevertheless, for internal standardization purposes, medium voltage is defined as a system with a nominal operative voltage between the phases higher than 1 kV to 35 kV included"
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 client distribution companies. This also includes the verification of conformity with respect to local applicable regulation and laws and possession of relevant requested certifications

Table 1 – Acronyms and keywords

7 DESCRIPTION

7.1 LIST OF COMPONENTS

Test Group	GS Type code	Serial number	Material	Description
A	GSCC031/11	685207		FLIGHT DIVERTER FOR BIRDS OF TYPE, Clamp 06-16mm
A	GSCC031/12	685208		FLIGHT DIVERTER FOR BIRDS OF TYPE, Clamp 010-70mm
Test Group	**GS Type codede tip**	**Serial number**	**Material**	**Description**
D	GSCC031/18	688301	Steel	Stork nest
B	GSCC031/25	270059	Plastic	Polymer disc for bird protection
D	GSCC031/26	270061	Wood	House for Bird
D	GSCC031/27	270060	Aluminum sheet	Falcon’s nest
F	GSCC031/28	270062	Plastic or fiber	Bird seat support

Table 2 - List of components, main characteristics

7.2 APPLICABLE LAWS AND REFERENCE STANDARDS

7.2.1. Local Standards

- NTE007/08/00 Normative for the design and execution of electrical cable networks.

7.2.2. International standards

- IEC 60243 “Dielectric strength”
- ISO 2859-1 “Sampling procedures for inspection by attributes. Part 1: Sampling plans for inspection lot by lot, tabulated according to acceptable quality limit (AQL)”
- Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) - Part 1: Cables for rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV
- ISO 868 “Plastics and ebonite. Determination of indentation hardness using a durometer (Shore hardness)”
- IEC 60243-1 “Dielectric strength of insulating materials. Test methods. Part 1: Industrial frequency testing”
- IEC 60695-2-11 “Fire hazard testing. Part 2-11: Glow wire test method. Flammability tests for finished products”

- IEC 60811-403 “Electrical and fiber optic cables. Test methods for non-metallic materials. Part 403: Miscellaneous tests. Ozone resistance tests on elastomeric compounds”
- IEC 60811-501 “Electrical and fiber-optic cables. Test methods for non-metallic materials. Part 501: Mechanical tests. Tests to determine the mechanical properties of insulation and sheathing mixtures”
- HD 605 “Electrical Cables. Additional test methods”

7.2.3. Replaced standards

FT-188_MAT

FT-358_MAT

7.3 SERVICE CONDITIONS

7.3.1. General service conditions

As per IEC 60721-2-1.

7.4 TECHNICAL CHARACTERISTICS

7.4.1. Protection types and equipment

The material defined to protect bird life covered in this specification is included in two groups as described in Table 3.

TIP	DESCRIPTION
I	Material for making the lines more visible.
II	Other structural materials as nests, supports or anti-perching devices to help birds.

Table 3 – Protection material description

Type I includes all materials that help birds make the overhead lines more visible, by signaling the network infrastructure.

Type II includes other materials that help birds keep their distance from the conductive parts of the network infrastructure, by providing secure support or avoiding them to be on the overhead line.



Figure 1 - Falcon nest Type II

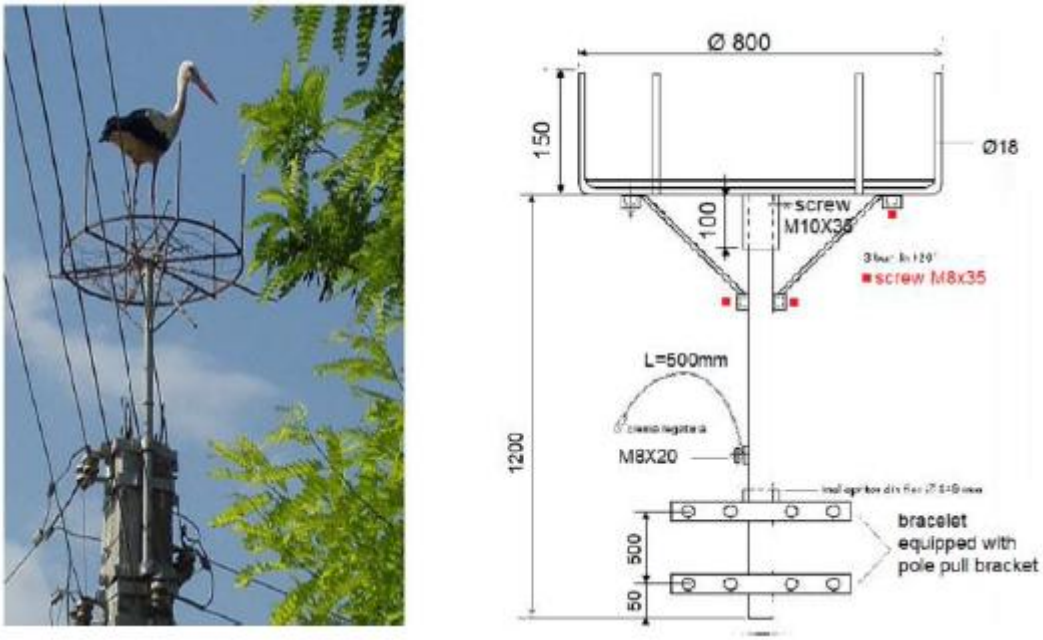


Figure 2 - Stork nest support Type II.



Figure 3 - Anti-collision spiral Type I.

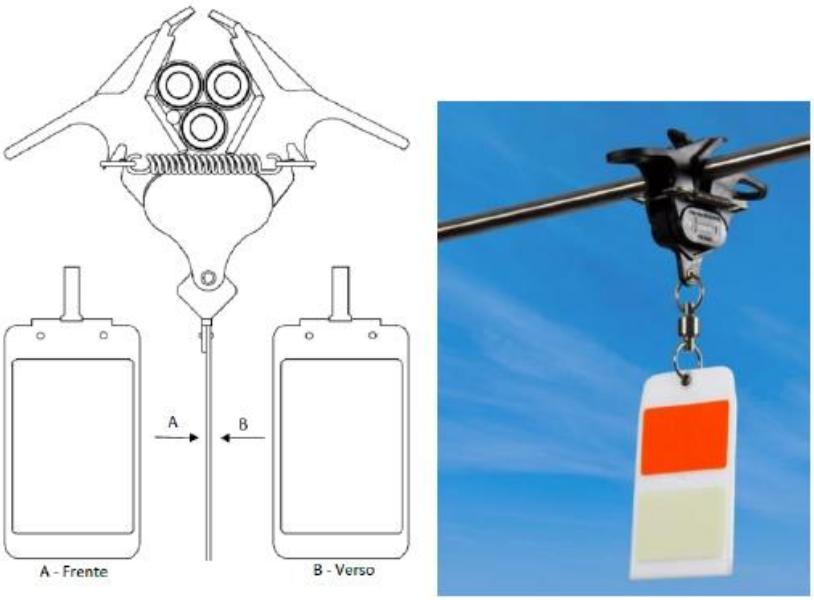


Figure 4 - Flight diverter Type I.

Note: Figures are for illustrative purposes only.

7.5 CONSTRUCTIVE CHARACTERISTICS

Birds face two threat factors related to the presence of power lines: the risk of electrocution and the risk of collision against overhead cables. Daily movements and seasonal migrations follow migration routes, routes determined by landscape factors such as forest edges, riverbeds, or mountain passes.

Birds characterized by high weights in relation to wingspan, such as Galliformes, and species with migratory behavior are at greatest risk of collision, which occurs mainly in the central areas of the span where the birds do not have reference points of the supports to avoid the conductors. The materials described in this specification make it possible to limit the danger of collision by making overhead conductors more visible.

7.5.1. Description of types

Type I includes all devices to make power lines more visible, such as:

- Anti-collision spiral: this material serves to protect birds from colliding with overhead cables. It is installed in the center of a span to give greater visibility and is made of UV-resistant plastic. (Figure 3).
- Flight diverters: this material serves to protect the birds from the second threat to which they are exposed, this is, collision with overhead cables. They are made of plastic material suitable for installation in atmospheric conditions, close to the sea, with metal parts highly resistant to corrosion and UV rays (Figure 4).

Type II includes different devices for protection and welfare of birds, such as:

- Falcon's nest: this accessory is made of sheet aluminum and is placed as far as possible in the upper third of the electric poles with the entrance face south or east, but this depends on the area local characteristics. These houses provide greater comfort for the birds and avoid direct contact between the live power line, the nest and Falcons (Figure 1).
- Stork nest support: used to position and raise the stork nest 1m above the pole on which it is installed, this support avoids direct contact between the live power line, the nest and the stork (Figure 2).
- Bird Stands: This stand made of fiberglass-reinforced polyester with a weatherproof and UV-resistant coating provides a safe resting place for birds while ensuring appropriate distances from electrical components.

They can be installed on top of utility poles, horizontal switches and cross-arms of medium voltage networks (Figure 5). For the dimensions of these devices, please refer to local section.

7.6 MARKING AND DESIGNATION

7.6.1. Designation

Each electrical material must be marked with the following wording:

- The name of the manufacturer
- The name and product code given by the manufacturer
- The maximum system voltage in which an insulating sleeve can be used
- Date of manufacture
- Serial and batch number
- For diverters and spiral: Maximum conductor cross-section to which the insulating sleeve can be applied

7.6.2. Marking

The marking must be indelible, easily legible and carried out by engraving or in relief above the surface of the outer sheath in a continuous way. Client will evaluate the solution for each type of material.

7.7 TESTING

7.7.1. Type test

Type tests should be performed before supplying the material covered by this standard to demonstrate satisfactory performance characteristics to meet the intended application.

When the design, materials or manufacturing process are changed (which might affect the performance characteristics of the material), the relevant tests shall be repeated.

n°	Test	Description / Note
1	**Verification of constructive characteristics**	According to this specification
2	**Shape and dimensions**	As described in local section
3	**Marking**	According to this specification
Test Group A		
1	**Temperature test**	IEC 60068-1 Test A e 60068-2 Test B
2	**Solar radiation test**	ISO4892-2
3	**Wind and dust test**	ISO4892-2
4	**Salt spray test combined with humidity**	ISO 9227
5	**Fluorescent color test**	ASTM E 991
6	**Retroreflection Coefficient Test**	ASTM E-810
7	**Quality testing of reflective film adhesives**	ASTM D 4956
Test Group B		
1	**Galvanized thickness**	ISO 1461, 6.1 and 6.2.
Test Group C		
1	**Tensile test**	According to this specification 7.7.1.1
2	**Electrical insulation test of a single spiral**	According to this specification 7.7.1.1
3	**Electrical insulation test of two spirals**	According to this specification 7.7.1.1
4	**Mechanical test**	According to this specification 7.7.1.1
Grupa de test D		
1	**Mechanical test**	According to this specification 7.7.1.2
Grupa de test E		
1	**Accelerated ageing test**	ASTM G154
Grupa de test F		
Mechanical test	According to this specification 7.7.1.3	

Table 4 - Type tests list.

7.7.1.1. Description of the Group C tests:

1) Tensile test

With the spiral mounted on the rope, a force of 5 daN is applied to one end for 1 minute. The spiral must not slip. Subsequently, the applied force increases until it slips. The value of the force required for this must not be less than 25 daN.

2) Electrical insulation test of a single spiral

A coil is mounted on its cable and fixed to an elastic support. Another fixed cable with the same characteristics without a spiral is placed at 70 cm. The fixed cable (phase) and the cable with elastic band (earth) are connected at 70 kV. The last cable is moved 1.2 m (force approx. 17 daN) and released abruptly so that the coil hits the parallel cable. The test is repeated 10 times, and no arcing or electrical contortion must occur at any point of the assembly.

3) Electrical insulation test of two spirals

Same test as in 2), the difference being that two spirals are mounted next to each other. The voltage to be applied is now 80 kV and after 10 tests there must be no twisting or arcing at any point in the assembly. NOTE: This test is a live test and appropriate safety precautions must be taken.

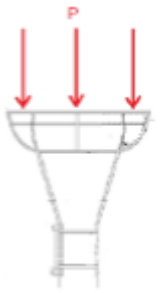
4) Mechanical test

A spiral is mounted on its cable connected and tensioned to the test structure a 25 kg pendulum is positioned to make 10 impacts of 250 joules on the spiral. The spiral must not show any cracks or breaks.

7.7.1.2. Description of the Group D tests:

1) Mechanical test

Apply the test load (equal to the load requested, 500 kg, with a security coefficient of 1.5, 750 kg) loading progressively from 0 to 100% in a period of 5 min as maximum.



Load steps

Load steps: 25%, 50%, 75%, 90% and 100%. The material shall support the load at 100% for 1 minute.

Then, remove the load gradually.

Acceptance Criteria

Passed the time with the load, no permanent deformation shall be seen.

7.7.1.3. Description of the Group F tests:



1) Mechanical Test

Apply the test load (equal to the load requested, 20 kg, with a security coefficient of 2, 40 kg) loading progressively from 0 to 100% in a period of 5 min as maximum.

Load steps

Sag shall be measured at the following load steps: 25%, 50%, 75%, 90% and 100%. The material shall support the load at 100% for 1 minute.

Then, remove the load progressively and measure the residual sag at the end.

Acceptance Criteria

Passed the time with the load, no permanent deformation shall be seen.

7.7.2. Acceptance tests

The aim of the Acceptance Tests is to verify the conformity of the products to the standards defined in this document and to the prototype approved during the TCA, whose characteristics and type test results are set out in the TCA Dossier which must be made available to the Inspector during the FAT (Factory Acceptance Tests).

Acceptance tests must be performed before the delivery and must be carried out at the Supplier's plants or laboratory approved by client.

The acceptance tests depending on the type of material and the corresponding sampling are listed in the following Table 5.

n°	Test	Test Group	Description / Note
1	Visual inspection	All	Visual verification of compliance with the requirements set out in paragraphs 7.5. & 8 and with the approved prototype during the TCA process (see TCA dossier).
2	Marking Check		Visual verification of the presence and conformity of markings with the requirements of Section 7.6. and the approved prototype during the TCA process (see TCA dossier)
3	Accessories Check		Verification of the presence, conformity and completeness of any accessory kits if any included in the approved prototype during the TCA process (see TCA dossier)
4	Packaging & GS Type barecode		Verification of compliance with the specifications referred to in the contract, if any, and with the approved prototype during the TCA process (see TCA dossier).
5	Mechanical Test	C, D and F	Verification of the tensile or breaking load of the component according to the approved prototype during the TCA process (see table 4).

Table 5 - List of acceptance tests.

7.7.2.1. During the acceptance tests performed autonomously by the supplier:

The supplier must perform all tests listed in Table 7 with the following sampling criteria, 15% of the lot with a minimum of 3 pieces and a maximum of 15 pieces considering that:

- The quantities are always referred to each type of material code prepared for testing.
- The acceptance number will be always 0, and the rejection number will be always 1;

The costs of rejected materials will be charged to the supplier.
The reports of the tests carried out shall be made available in case of repetition of the acceptance tests at the presence of an Inspector.
Tests performed during the production process on semi-finished products may also be considered valid, as acceptance test, if:

- The tests are performed as required by the relevant technical specifications and technical standards.
- The sampling plans adopted by the Supplier are following the aforementioned ones;
- The performed test results are properly recorded.
- The supplier demonstrates that the components/materials features don't vary during further production phases after the test.

In this case, the Mechanical Test (n°5) must be performed only on 1 sample for each material code, but, in case of a negative result, repeated on 2 further samples.

7.7.2.2. During the repetition of the acceptance tests at the presence of the client or designated inspector:

In this case all the tests listed in Table 7 shall be carried out on a sample chosen randomly from the lot already successfully tested by the supplier with the following reduced sampling criteria, 10% of the lot with a minimum of 2 pieces and a maximum of 10 pieces considering that:

- The quantities are always referred to each type of material code prepared for testing.
- The acceptance number will be always 0, and the rejection number will be always 1;

The costs of rejected materials will be charged to the supplier.
In this case, the Mechanical Test (n°5) must be performed only on 1 sample for each material code, but, in case of a negative result, repeated on 1 further sample.

7.8 TECHNICAL CONFORMITY ASSESSMENT

7.8.1. General conditions

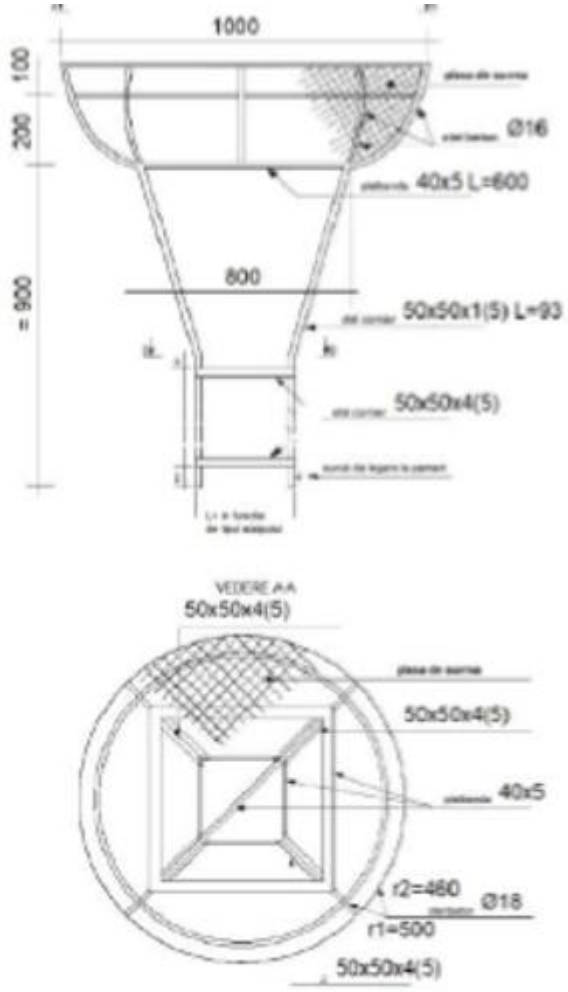
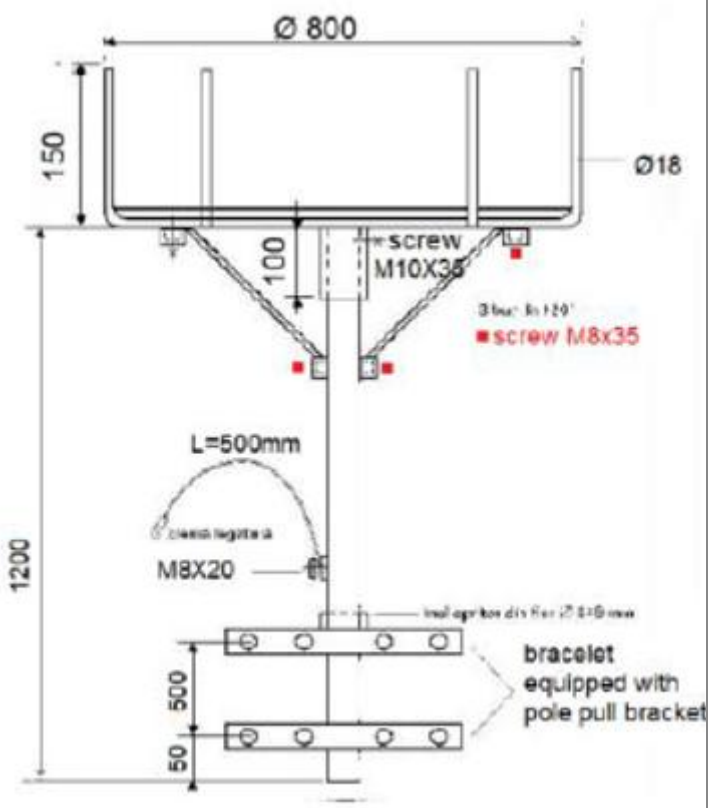
The manufacturer shall provide personnel and equipment necessary to carry out type tests and acceptance tests described herein. Otherwise, the supplier could hire the service to a laboratory previously accepted by the customer and assume the cost. The product shall comply with the requirements of ILRE097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

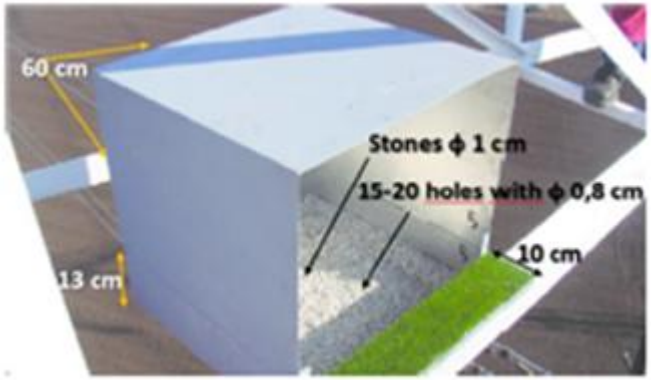
7.8.2. Acknowledgement of TCA for previous revision of the standard.

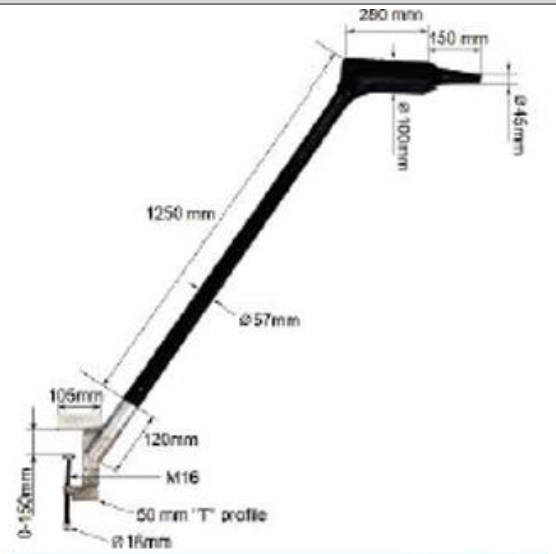
Products with TCA in force under the local standards will be recognized as homologated material for the present technical specification.
The client therefore, reserves the right to check that the conditions of supply, the type codes, the country codes etc. shall comply with the requirements of this technical specification.

8 LOCAL SECTION

Tip I				
COD MATERIAL	**GRUP TEST**	**DESCRIPTION**	**ELEMENTELE KITULUI**	**COMENTARIU**
685207	A	FLIGHT DIVERTER FOR BIRDS, Clamp type Ø 6÷16 mm		**Recommended installation distance:** 10 meters (30 feet) between diverters on the same conductor • Staggered mounting on adjacent conductors (see diagram)
685208	A	FLIGHT DIVERTER FOR BIRDS, Clamp type Ø 10÷70 mm		
Note: Figures are for illustrative purposes only.				

Tip II				
COD MATERIAL	**GRUP TEST**	**DESCRIPTION**	**ELEMENTELE KITULUI**	**COMENTARIU**
688301	D	Stork nest support		

Tip II				
COD MATERIAL	**GRUP TEST**	**DESCRIPTION**	**ELEMENTELE KITULUI**	**COMENTARIU**
270061	D	House for Birds		H=49 cm L=32,2 – 35,5 cm l=30,8 cm d= 6,4 cm Weight = 5,3 kg
270060	D	Falcon nest		The cages shall be made of aluminum sheets 2 - 2.5 mm thick and 60 x 60 x 60 cm wide, high and long. This artificial metal nest in the shape of a cube has a single opening. At the base of the opening there is a ledge made of aluminum sheet 13 cm wide (over 60 cm of wall) and 60 cm long, which in practice creates the nesting platform. The depth of the nesting platform must be 13 cm to be filled with approximately 3 cm of gravel. The aluminum plate forming the base of the nest must have 15-20 holes with a diameter of 8 mm for drainage. A wooden platform 60 cm long, 10 cm wide and at least 2 cm thick (perpendicular to the nest opening frame) is attached at the nest entrance, to which artificial grass (green plastic mat) of similar dimensions (60x10 cm) is attached. Artificial metal nests for the Danube falcon are placed only by personnel authorized by the electricity company on whose poles they work (Dobrogea). Nests must be placed as high as possible, in the upper third of the electricity poles. Generally, the entrance faces south or east, but this depends on the local characteristics of the area. In the case of high-voltage metal poles, it is preferable to place them on secondary fittings. The positioning of nests on electricity poles should be based on the recommendations of the electricity company, considering the applicable safety regulations.

Tip II				
COD MATERIAL	**GRUP TEST**	**DESCRIPTION**	**ELEMENTELE KITULUI**	**COMENTARIU**
270062	D	House for Birds		Lifespan > 25 years
270059	D	Falcon nest		

Note: Figures are for illustrative purposes only.

9. DESCRIPTIONA LISTELOR DE VERIFICARI

9.1 CHECK LIST TYPE I

No.	Description	Unit	Required
1	**GENERAL INFORMATION**		
1.1	Supplier	-	
1.2	CUI		
1.3	Qualified for FELC17		DA
1.4	Factory Address	-	Qualified Factory Address
2	**MAIN FEATURES**		
2.1	Standard		GSCC031
2.2	Country code	-	According to country
2.3	GS Type code “key type”		GSCC031/X
2.4	Nominal Voltage Uo/U (Umax)	[kV]	
2.5	Type I or Type II	-	Type I
2.6	Disposition		
3	**DESCRIPTION**		
3.1	Material	-	
3.2	The element to be protected		
3.3	Kit elements	-	
4	**DESIGN**		
4.1	Drawing or photo		

9.2 CHECK LIST TYPE II

No.	Description	Unit	Requiered
1	**GENERAL INFORMATION**		
1.1	Supplier	-	
1.2	CUI		
1.3	Qualified for FELC17		DA
1.4	Factory Address	-	Qualified Factory Address
2	**MAIN FEATURES**		
2.1	Standard		GSCC031
2.2	Country code	-	According to country
2.3	GS Type code “key type”		GSCC031/X
2.4	Nominal Voltage Uo/U (Umax)	[kV]	
2.5	Type I or Type II	-	Type II
2.6	Disposition		
3	**DESCRIPTION**		
3.1	Material	-	
3.2	The element to be protected		
3.3	Kit elements	-	
4	**DESIGN**		
4.1	Drawing or photo		