NPS/001/019 – Technical Specification for Low Voltage Conductor Shrouding Materials

1. Purpose

This document details the requirements for conductor shrouding for use on low voltage distribution network of Northern Powergrid.

This document supersedes the following documents, all copies of which should be destroyed.

Document Reference	Document Title	Version	Published Date
NPS/001/019	Technical Specification for Low Voltage Conductor Shrouding Materials	7.0	July 2021

2. Scope

This document specifies the performance criterion for temporary third-party protective. The products covered include insulated sheeting material and split tubing. Test requirements are specified in ENATS 43-103– Low Voltage Overhead Line Shrouding Material.

The following appendices form part of this technical specification:

- Appendix 1 - Schedule of Items
- Appendix 2 - Logistical Requirements
- Appendix 3 - Self Certification Conformance Declaration
- Appendix 4 - Technical Information Checklist

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3. Technical Requirements

3.1. General

Low voltage overhead line conductor shrouding shall be manufactured and tested in accordance with Energy Networks Association Technical Specification (ENATS) 43-103 Issue 3: 2016. This shall be suitable for use as temporary shrouding providing third party.

3.1.1. Temporary Shrouding

Shrouding may be in the form of sheeting, pre-formed shrouds, or split tubing. It shall be designed to operate throughout the temperature range -20°C and +70°C and remain attached to the conductor during adverse weather conditions. Products shall meet the performance criteria and type test requirements of ENATS 43-103 sections 5 and 6.

Temporary shrouding shall be “Hi Visibility” and remain colourfast during its service life.

3.2. Split Tubes

Split tubes are designed to remain attached to conductors in all weather conditions. It shall be suitable for use on mains and service overhead lines with an operating voltage not exceed 1000V. The mechanical and electrical properties shall be retained through the temperature range of –20°C and +70°C. It shall be manufactured free from cracks, holes, foreign bodies, or other physical defects liable to adversely affect its performance under service conditions.

Split tubing shall have an internal diameter of approximately 32mm and 22mm, supplied in manageable lengths (preferred length 3 meters) and designed to allow the joining multiple lengths together.

3.3. Sheet Material

Sheet material products shall be designed to cover LV overhead line fittings and connections and meet the same technical requirements as split tubes. They shall be supplied in a roll or range of sizes designed to allow the insulation of general pole and service arrangements.

3.4. Markings

Low voltage shrouding materials shall be marked as detailed in section 5.3 of ENATS 43-103.

3.5. Type Testing

Products shall meet the performance criteria and type test requirements of ENATS 43-103 sections 5 and 6. The tests applicable for shrouding and split tubes are tabulated in ENATS 43-103 Table D.2.

4. References

The products described within this specification shall comply with the latest versions of the relevant International Standards, British Standard Specifications, and all relevant Energy Network Association Technical Specifications (ENATS) current at the time of supply.

4.1. External Documentation

Reference	Title
ENATS 43-08 Issue 5 - 2019	Overhead Line Clearances
ENATS 43-103 Issue 4: 2024	Low Voltage Overhead Line Shrouding materials

4.2. Internal Documentation

Reference	Title
None	

4.3. Amendments from Previous Version

Reference	Description
3.1.2 Permanent Shrouding	Section removed as permanent shrouding is no longer used for long term proximity solutions.
Appendix 1 Schedule of Requirements	Permanent shrouding removed
6. Authority of Issue	Updated

5. Definitions

Term	Definition
None	

6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Joe McAndrew	Finance Co-Ordinator	08/05/2024

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period.

Standard CDS review of 3 years?	Non-Standard Review Period & Reason	
No	Period: 5 years	Reason: To align with contract period
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Steve Salkeld	Policy and Standards Engineer	24/06/2024

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Aaron Chung	Policy and Standards Engineer	09/05/2024

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Paul Black	Head of System Engineering	03/06/2024

Appendix 1 – Schedule of Requirements

Commodity Code	Description
321096	Shrouding: Temporary for Low Voltage Overhead Line Conductor up to 32mm Diameter: Supplied In 3-Metre Lengths.
321088	Shrouding: Temporary for Low Voltage Overhead Line Conductor up to 22mm Diameter: Supplied In 3-Metre Lengths.
265774	Shrouding: Temporary for Low Voltage Overhead Line 35mm to 120mm ABC: Supplied In 3-Metre Lengths.
265778	ABC Proximity Shrouding for Third Party Working. High Visibility Split Tubing Suitable for 35mm to 120mm 4 and 5-Core ABC
265538	Insulating Shrouding Roll (10m x 1m)

Appendix 2 – Logistical Requirements

To enable Northern Powergrid to store the product(s) in accordance with the manufacturer's recommendations the suppliers should provide details of the recommended storage environment with respect to each product type.

The supplier shall ensure that each item is suitably packaged ensuring it is "fit for service" prior to installation taking account of the potential for an outdoor storage environment. All packaging shall be sufficiently durable giving regard to the function, reasonable use, and contents of the packaging. Where steelwork sets are required they shall be supplied securely packaged together.

Palletised goods shall be supplied on standard 1200mm x 1000mm pallets.

Clearly legible, easily identifiable, durable, and unambiguous labelling shall be applied to each individual and where relevant multiple package of like products. Where product packages tendered are made up of sub packages, each sub package shall be marked. As a minimum requirement the following shall be included.

- Manufacturer's trademark or name
- Supplier's trademark or name
- Description of item
- Quantity
- Date of packaging and/or batch number
- Northern Powergrid product code
- Purchase order reference
- Weight

Appendix 3 – Self Certification Conformance Declaration

Low voltage shrouding covered by ENATS 41-103 shall comply with the latest issues of the relevant International and British Standards. ENATS 41-103 is intended to amplify and/or clarify the requirements of those Standards.

This check sheet identifies the clauses in ENATS 41-103 - Issue 3 and the clauses of the aforementioned Standards relevant to low voltage shrouding material. The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration codes.

Conformance declaration codes

N/A = Clause is not applicable/appropriate to the product
Cs1 = The test conforms fully with the requirements of this clause
Cs2 = The test conforms partially with the requirements of this clause
Cs3 = The test does not conform to the requirements of this clause
Cs4 = Test not performed, but alternative evidence/ technical case offered

Instructions for completion

- When Cs1 code is entered no remark is necessary
- When any other code is entered the reason for non-conformance shall be entered
- Prefix each remark with the relevant 'IEC' or 'ENATS' as appropriate

Manufacturer:

Product Reference:

Name:

Signature:

Date:

Required Shrouding Tests to ENATS 43-103 Issue 4: 2024			
Clause/Sub-clause	Requirement	Conformance Code	Remarks
5.4.1	Dimensions		
5.4.2	Marking durability		
5.4.3	Mechanical tests		
5.4.3.1 - Table 2	Tensile strength		
5.4.3.2	Mechanical puncture resistance		
5.4.3.2.1 - Table 2	High temperature mechanical puncture resistance		
5.4.3.2.2 - Table 2	Low temperature mechanical puncture resistance		
5.4.3.2.3	Ambient mechanical puncture resistance		
5.4.5	Water absorption		
5.4.6	Electrical tests		
5.4.6.1	Electrical breakdown – dry test		
5.4.6.2	Electrical withstand		
5.4.6.3	Electrical breakdown – prolonged immersion		
5.4.7.1	UV ageing test		
5.4.7.2	High temperature ageing		
5.4.8	Flame retardant		
5.4.9	Attachment		

Required Split Tube Tests to ENATS 43-103 Issue 4: 2024			
Clause/Sub-clause	Requirement	Conformance Code	Remarks
6.4.1	Dimensions		
6.4.2	Marking durability		
6.4.3	Mechanical tests		
6.4.3.1 - Table 2	Tensile strength		
6.4.3.2	Mechanical puncture resistance		
6.4.3.2.1- Table 2	High temperature mechanical puncture resistance		
6.4.3.2.2	Low temperature mechanical puncture resistance		
6.4.3.2.3	Ambient temperature mechanical puncture resistance		
6.4.3.3 - Table 2	Shrinkage Test		
6.4.3.4 - Table 2	Low temperature bending		
6.4.3.5 - Table 2	High temperature bending		
6.4.4	Water absorption		
6.4.5	Electrical tests		
6.4.5.1	Electrical breakdown – dry test		
6.4.5.2	Electrical withstand		
6.4.5.3	Electrical breakdown – prolonged immersion		
6.4.6	UV ageing		
6.4.7	Flame retardant		
6.4.8	Attachment		
6.4.9	Jointing security		

Appendix 4 - Technical Information Check List

The following information shall be provided by the supplier for review by Northern Powergrid. Additional information shall be provided if requested.

Requirement	Provided (Y/N)
Full product descriptions and part number/reference	
Appendix 3 – completed self certification conformance declaration	
Complete set of drawings for each item	
Type test evidence	
Manufacturing routine test plan	
Packaging information	
ISO:9001, ISO:14001 and ISO:18001 certificates	