

# Electricity Specification 400P1

Issue 2      June 2021

## Insulating Patch Material



## Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<b>Issue 2</b> <b>June 2021</b>	<p>Restructure and reformatting of Model Electricity Specification. This 2021 issue constitutes a complete revision and re-issue of Model Electricity Specification in its entirety.</p> <p>Prepared by: P. Howell Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director</p>

## Contents

1	Definitions	4
2	General Requirements for Approvals and Testing	4
	2.1 Product not to be Changed	4
	2.2 Electricity North West Technical Approval	4
	2.3 Quality Assurance	5
	2.4 Formulation	5
	2.5 Identification Markings	5
	2.6 Minimum Life Expectancy	6
	2.7 Product Conformity	6
	2.8 Confirmation of Conformance	6
3	Requirements for Type and Routine Testing	6
	3.1 Requirement for Type Tests at Suppliers Premises	6
	3.2 Requirement for Routine Tests at the Supplier's Premises	6
4	Technical Requirements	6
	4.1 Scope	6
	4.2 General	7
	4.3 Technical Requirements	7
	4.4 Mechanical Properties	7
	4.5 Measurement of Thickness	7
5	Documents Referenced	9
6	Keywords	9
	Appendix A – List of Materials	10
	Appendix B – Conformance Declaration	11

All Rights Reserved

The copyright of this document, which contains information of a proprietary nature, is vested in Electricity North West Limited. The contents of this document may not be used for purposes other than that for which it has been supplied and may not be reproduced, either wholly or in part, in any way whatsoever. It may not be used by, or its contents divulged to, any other person whatsoever without the prior written permission of Electricity North West Limited.

## 1 Definitions

<b>Contract</b>	The agreement between Electricity North West and the Contractor for the execution of the Works including therein all documents to which reference may properly be made in order to ascertain the rights and obligations of the parties under the said agreement.
<b>Contractor</b>	The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West.
<b>Engineer</b>	Electricity North West Technical Services Manager or his successor or such person specifically nominated on his behalf.
<b>Specification</b>	The Specification and schedules (if any) agreed by the parties for the purpose of the Contract.
<b>Tenderer</b>	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender.

## 2 General Requirements for Approvals and Testing

### 2.1 Product not to be Changed

No change in the product, packaging or labelling shall be made after Approval has been granted without prior notice to the Electricity North West Overhead Line Circuits Manager, and receipt of a written agreement to the proposed change from the Electricity North West Overhead Line Circuits Manager.

### 2.2 Electricity North West Technical Approval

The Tenderer shall submit, with this Tender, proposals for testing which will demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, compliance with this Specification. Such tests shall be carried out without expense to Electricity North West.

Alternatively, technical reports and other data may be submitted that the Tenderer considers will demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Overhead Line Circuits Manager but will not be unreasonably withheld.

Approval shall be 'factory specific' and is not transferable to another factory without the written Approval of the Electricity North West Overhead Line Circuits Manager.

The Supplier and product shall comply with all the relevant requirements of Electricity North West documents EPD311 and CP311.

## 2.3 Quality Assurance

The Tenderer shall confirm whether or not Approval is held in accordance with a quality assurance scheme accredited under ISO 9000. If not, the Tenderer shall submit a statement of the quality assurance procedures employed to control the quality of the product, including the performance of Suppliers and Sub-Contractors.

The right is reserved for the repeat of such tests, from time to time, that the Electricity North West Overhead Line Circuits Manager may deem to be reasonably necessary to demonstrate continued compliance with the Specification.

The Tenderer shall submit, with the Tender, a list of tests and inspections which are carried out on the product prior to despatch which shall demonstrate, to the satisfaction of the Electricity North West Overhead Line Circuits Manager, fitness for installation and service.

The Tenderer shall provide free of charge to Electricity North West such samples as may, in the opinion of the Electricity North West Overhead Line Circuits Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Overhead Line Circuits Manager will confirm the requirement for samples at the time of Tendering.

The right is reserved for inspections to be made of Tenderer's facilities, from time to time, as deemed reasonably necessary by the Electricity North West Overhead Line Circuits Manager to ensure compliance with this Specification and any Contract of which it forms a part.

The Tenderer shall submit, with the Tender, such details of product packaging disposal, as will enable Electricity North West to comply with the requirements of BS EN ISO 14001 - Environmental Management Systems.

## 2.4 Formulation

The Tenderer shall submit, with the Tender, such details of the formulation and use of the product and associated substances as will enable Electricity North West to comply with the obligations of the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulations 2002, in the use, storage and disposal of the product. The Tenderer may stipulate, prior to submission of such information, that it is to remain confidential, and the Electricity North West Overhead Line Circuits Manager will, if requested, confirm agreement to this prior to receipt of the information.

## 2.5 Identification Markings

The Tenderer shall submit, with the Tender, details of markings which it is proposed to apply to the product or packaging to identify manufacturing batches or items. The forms and content of such markings shall be subject to the Approval of the Electricity North West Overhead Line Circuits Manager and shall in all cases include the Electricity North West approved description and commodity code number.

The Tenderer shall submit, with the Tender, such details of marking gross weight on components, assemblies and packages, as will enable Electricity North West to comply with the Health and Safety Manual Handling

Operation Regulations 1992, for components, assemblies and packages supplied with a gross weight over 1kg. The forms and content of such markings shall be subject to the Approval of the Electricity North West Overhead Line Circuits Manager.

## 2.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 60 years.

## 2.7 Product Conformity

Preference will be given to those Suppliers who can provide suitable product conformity certification to a recognised or specified standard, or an equivalent certification.

## 2.8 Confirmation of Conformance

The Tenderer shall complete the conformance declaration sheets in Appendix A. Failure to complete these declaration sheets may result in an unacceptable bid.

# 3 Requirements for Type and Routine Testing

The Electricity North West Circuits Policy Manager shall set out the requirement of the following tests to be carried out by the Supplier at the Supplier's cost.

## 3.1 Requirement for Type Tests at Suppliers Premises

These are a series of one-off type tests, which are carried out to ensure the satisfactory performance of the product design, under extremes of operating stresses, and of endurance, as may be appropriate, to be determined by the Electricity North West Circuits Policy Manager.

Section 4.3 describes the required Type Tests.

## 3.2 Requirement for Routine Tests at the Supplier's Premises

These tests may be required to be carried out on every individual unit or component, as specified, or at some regular frequency to be determined by the Electricity North West Circuits Policy Manager

The results of these tests may be required to be supplied to Electricity North West with each unit purchased or retained for inspection, at a period to be determined by the Electricity North West Circuits Policy Manager.

Section 4.4 and 4.5 describe the required Routine Tests.

# 4 Technical Requirements

## 4.1 Scope

This Specification covers the supply of Insulating Patch Material used to provide temporary or permanent insulation of bare connectors used during live LV jointing.

## 4.2 General

Material is required to provide temporary insulation for bare connectors used during live LV jointing on underground cables.

The material shall comprise of a sheet of self-adhesive synthetic vulcanised elastomeric material supplied on a textile backing with general characteristics as follows ;

Colour	Black / Blue / White
Overall Thickness	1.70mm to 2.25mm
Insulation Thickness	1.5mm minimum
Length on roll	7.3m
Width(s) of roll	115mm or 230mm +/- 3mm

## 4.3 Technical Requirements

### 4.3.1 Dielectric Strength

The material shall have a minimum dielectric strength of 8kV when tested to BS 903: Part C4: 1983 Determination of Electric Strength.

### 4.3.2 Temperature Range

The material shall be capable of application and continuous operation with unimpaired properties over the temperature range of 10<sup>0</sup> C to +90<sup>0</sup>C when tested to BS 903: Part A19: 1986 Heat Resistance and Accelerated Ageing.

## 4.4 Mechanical Properties

The thickness at any point shall not be less than 1.5mm. The average thickness, measured shall not be less than 1.65mm.

The tensile strength shall not be less than 80N / 25mm width when measured without the backing sheet when tested to BS 903: Part A2: 1989 Determination of Tension Set.

The elongation shall not be less than 200% without breakage when measured without the backing sheet.

The minimum strength for adhesion to itself is 18N when tested in accordance with BS 5350 Method of Test for Adhesive.

## 4.5 Measurement of Thickness

### 4.5.1 Apparatus

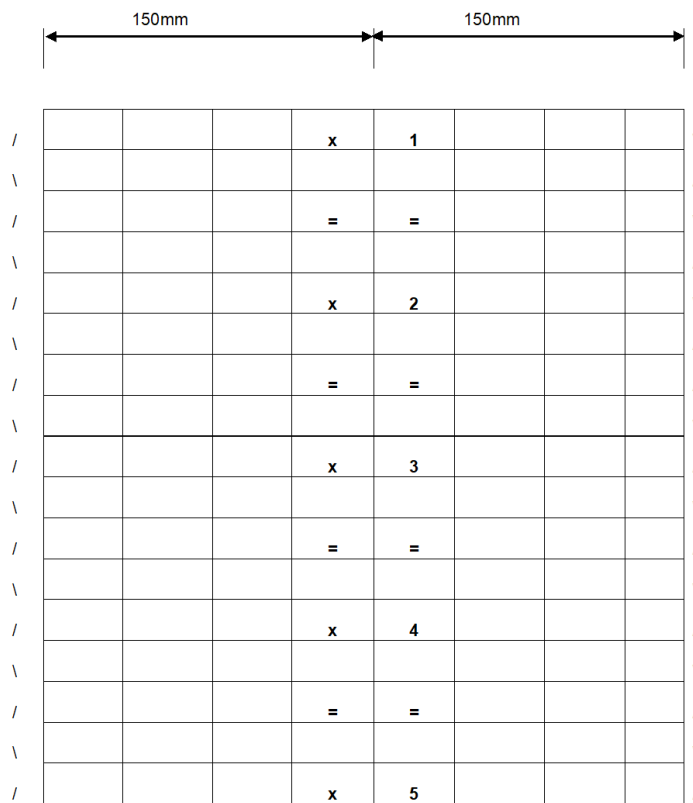
The thickness including the backing cloth shall be measured by means of a dial gauge. In cases of dispute a measuring microscope or a profile projector shall be used, each instrument being capable of a least 10 x magnification. The equipment shall have an accuracy of 0.01mm.

### 4.5.2 Sampling and Preparation

A 300mm long sample shall be taken from the beginning and the end of each roll. Each 300mm long sample shall be cut with a fine sharp blade into two 150mm long pieces. Only one 150mm test piece from the two original 300mm samples shall be retained for measurement of thickness of the tape.

### 4.5.3 Procedure

Place the test piece under the measuring equipment with the plane of the cut perpendicular to the optical axis. Make five measurements of thickness on each test piece at the position indicated on the sketch below, positions 1 and 5 being at opposite edges. Each measurement shall be to two decimal places.



### 4.5.4 Results

The thickness obtained from the five measurements shall comply with the following requirements:

- Positions 1 and 5: Not less than 1.50mm
- Position 2,3 and 4: The average of three thicknesses, calculated to 2 decimal places, shall be not less than 1.65mm.



## 5 Documents Referenced

DOCUMENTS REFERENCED	
BS 903: Part 0	1990 "Introduction"
BS 903: Part A2	1989 "Determination of Tensile Stress-Strain Properties"
BS 903: Part A5	1974 "Determination of Tension Set".
BS 903: Part A19	1986 "Heat Resistance and Accelerated Ageing".
BS 903: Part C4	1983 "Determination of Electric Strength".
BS 903: Part A36	1988 "Preparation of Samples and Test Pieces".
BS 2782: Part 2	Methods 220 and 221: 1983 "Determination of Electric Strength: Rapidly Applied Voltage Method". "Determination of Electric Strength: Step-by-step Method".
BS 5350	"Methods of Test for Adhesives".

## 6 Keywords

Insulating , Patch , Rubber , Low Voltage.

## Appendix A – List of Materials

ITEM DESCRIPTION	COMMODITY CODE
Insulating patch 848, blue 115mm x 7.3m	168386
Insulating patch 849, blue 230mm x 7.3m	168378

## Appendix B – Conformance Declaration

### SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

#### Conformance Declaration Codes:

<b>N/A =</b>	Clause is not applicable/appropriate to the product/service.
<b>C1 =</b>	The product/service conforms fully with the requirements of this clause.
<b>C2 =</b>	The product/service conforms partially with the requirements of this clause.
<b>C3 =</b>	The product/service does not conform to the requirements of this clause.
<b>C4 =</b>	The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

**Manufacturer:**

**Product/Service Description:**

**Product/Service Reference:**

**Name:**

**Company:**

**Signature:**

**SECTION-BY-SECTION CONFORMANCE**

Section	Section Topic	Conformance Declaration Code	Remarks * (must be completed if code is not C1)
2.1	Product not to be Changed		
2.2	Electricity North West Technical Approval		
2.3	Quality Assurance		
2.4	Formulation		
2.5	Identification Markings		
2.6	Minimum Life Expectancy		
2.7	Product Conformity		
2.8	Confirmation of Conformance		
3.1	Requirements for Type Tests at the Supplier's Premises		
3.2	Requirement for Routine Tests at the Supplier's Premises		
4.1	Scope		
4.2	General		
4.3.1	Dielectric Strength		
4.3.2	Temperature Range		
4.4	Mechanical Properties		

<b>4.5.1</b>	<b>Apparatus</b>		
<b>4.5.2</b>	<b>Sampling and Preparation</b>		
<b>4.5.3</b>	<b>Procedure</b>		
<b>4.5.4</b>	<b>Results</b>		

**Additional Notes:**