Electricity Specification 400P1

Issue 1    May 1993

Insulating Patch Material

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Approved for issue by the Technical Policy Panel

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<tr>
<td>18/05/93</td>
<td>First Issue</td>
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<td>Prepared by: RLD</td>
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<td>Approved by the Standards Steering Group and signed on its behalf by:</td>
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Prepared by: RLD

Approved by the Standards Steering Group and signed on its behalf by:
INSULATING PATCH MATERIAL

1. GENERAL REQUIREMENTS FOR APPROVALS AND TESTING

1.1 Definitions

1.1.1 Contract: 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 said agreement.

1.1.2 Contractor: The person or persons, firm or company, including personal representative, successors and permitted assigns, whose tender has been accepted by Electricity North West.

1.1.3 Engineer: Electricity North West Technical Services Manager or his successor or such person specifically nominated on his behalf.

1.1.4 Specification: The Specification and schedules (if any) agreed by the parties for the purpose of the Contract.

1.1.5 Tenderer: The person or persons, firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a tender.

1.2 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 Engineer, in writing, to the proposed change.

1.3 Electricity North West Technical Approval

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

1.3.2 Alternatively, the Tenderer may submit technical reports and other data that he considers will demonstrate, to the satisfaction of the Engineer, compliance with this specification. Acceptance of this evidence shall be at the discretion of the Engineer but will not be unreasonably withheld.

1.4 Quality Assurance

1.4.1 The Tenderer shall confirm whether or not approval is held in accordance with the provisions of either the ESI Quality Assurance Registration Scheme or with BS 5750. If not, he 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.

1.4.2 The right is reserved for the Engineer to require, from time to time, the repeat of such tests as he may deem to be reasonably necessary to demonstrate continued compliance with the Specification.

1.4.3 The Tenderer shall submit, with his 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 Engineer, fitness for installation and service.
1.4.4 The Tenderer shall provide free of charge to Electricity North West such samples as may, in the opinion of the Engineer, be reasonably required for inspection and/or retention as quality control samples. The Engineer will confirm the requirement for samples at the time of Tendering.

1.4.5 The right is reserved for the Engineer to make, from time to time, such inspections of the Tenderer’s facilities as he may deem to be reasonably necessary to ensure compliance with this Specification and any Contract of which it forms a part.

1.4.6 The Tenderer shall submit, with his Tender, such details of product packaging disposal, as will enable Electricity North West to comply with the requirements of BS 7750:1992 - Environmental Management Systems.

1.5 Formulation

The Tenderer shall submit, with his 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 1998, in the use, storage and disposal of the product. The Tenderer may stipulate, prior to submission of such information, that he requires it to remain confidential and the Engineer will, if requested, confirm his agreement to this prior to receipt of the information.

1.6 Identification Markings

1.6.1 The Tenderer shall submit, with his 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 Engineer.

1.6.2 The Tenderer shall submit, with his 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 products supplied with a gross weight over 1kg. The forms and content of such markings shall be subject to the approval of the Engineer.

1.7 Manufacturers Already Approved.

Clauses 1.3.1, 1.3.2, 1.4.1, 1.4.3, 1.4.4, 1.5 and 1.6 will be waived in the case of products already approved.

2. TECHNICAL PARTICULARS

2.1 Scope

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

BS 903: Part 0: 1990 “Introduction”.


BS 903: Part A5: 1974 “Determination of Tension Set”.


BS 903: Part C4: 1983 “Determination of Electric Strength”.

BS 903: Part A36: 1988 “Preparation of Samples and Test Pieces”.


BS 5350 “Methods of Test for Adhesives”.

2.3 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.

Colour Black / Brown / White
Overall Thickness 2.00mm – 0.15mm + 0.20mm
Insulation Thickness 1.30mm – 0.10mm + 0.15mm
Tensile Strength 20 Kgs / 25.4mm width min
% Elongation 150% min – 400% max
Length 7.3m
Width 115mm +/- 3mm

2.4 Technical Requirements

2.4.1 Dielectric Strength

The material shall have a minimum dielectric strength of 8kV/mm. Test procedure BS 903: Part C4: 1983 Determination of Electric Strength. See also BS 2782: Part 2: Methods 220 and 221: 1983.

2.4.2 Temperature Range

The material shall be capable of application and continuous operation with unimpaired properties over the temperature range of 10°C to +90°C. Test procedure BS 903: Part A19: 1986 Heat Resistance and Accelerated Ageing.

2.5 Mechanical Properties

It has been found necessary from experience to specify certain mechanical properties as follows:

2.5.1 The thickness at any point shall not be less than 1.65mm. The average thickness, measured in accordance with the procedure described in Para 2.7, shall not be less than 1.85mm
2.5.2 The tensile strength shall not be less than 9kg / 25mm width when measured without the backing sheet. Test procedures BS 903: Part A2: 1989 Determination of Tension Set.

2.5.3 The elongation shall not be less than 200% without breakage when measured without the backing sheet. Test procedures as 2.5.2.

2.5.4 The adhesive should be tested in accordance with BS 5350 Method of Test for Adhesive.

2.6 Molten Solder Splash Resistance

A sample 115mm x 150mm of the material shall have approximately 50cc of molten solder at 350°C poured onto it. The properties specified in 2.4 and 2.5 shall not be affected by this procedure.

2.7 Measurement of Thickness

2.7.1 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 at least 10 x magnification. The equipment shall have a accuracy of 0.01mm.

2.7.2 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.

2.7.3 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.
2.7.4 Results

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

(a) Positions 1 and 5:
   Not less than 1.65mm

(b) Positions 2, 3 and 4:
   The average of three thicknesses, calculated to 2 decimal places, shall be not less than 1.85mm.
APPENDIX A

LIST OF CONSUMABLES

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>COMMODITY CODE No.</th>
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<td>Patch insulating 1.65mm including backing (Cr sheet 115mm x 7.3mm)</td>
<td>168386</td>
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