

Engineering System Integrity
Electrical Network Safety Rules

Engineering Specification
Electrical Distribution Unit

One Method of Safe Working

SP D 79041

**Insulated Sticks, Tools and
Equipment Used for work near or
on/within Exposed Electrical
Equipment – Inspection, Testing,
Care and Maintenance**

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Approved by: Associate Director
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Document control

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1 Purpose and Scope

This Specification sets out the inspection, testing, care and maintenance requirements for insulated sticks, tools and equipment used for work near or on/within exposed electrical equipment, such as, but not limited to, the following:

- operating sticks
- height measuring sticks
- cleaning poles
- measuring equipment
- Live Line Tool Rope Insulators

used on the Low and High Voltage AC, and 1500 Volt DC systems.

This Specification also sets out the responsibilities of Managers, Supervisors and employees along with the requirements for training.

This Specification is NOT applicable to:

- insulated tools and equipment used for High Voltage Live Working
- portable earthing equipment used for the High Voltage system, refer to *SP D 79043 Inspection and Care of Portable Earthing Equipment for the High Voltage System*
- portable rail connecting equipment used for 1500 Volt Overhead Wiring, refer to *SP D 79045 Inspection and Care of Portable Rail Connecting Equipment for 1500 Volt Overhead Wiring*.

2 Definitions

Refer to the **Electrical Safety Definitions** page available on the **RailSafe** site.

3 General

Insulated sticks, tools and equipment shall be maintained in accordance with this Specification, with consideration of the manufacturers' guidelines to ensure they are fit for their intended purpose and function. Records of purchases, repairs, inspections and tests are to be maintained.

4 Responsibility

4.1 Responsibility of Managers and Supervisors

Managers and Supervisors are responsible for ensuring that:

- a. All staff required to inspect and maintain insulated sticks, tools and equipment are competent in the required skills and are trained in accordance with Section 5.
- b. Managers, Supervisors, and Users are aware of their responsibilities for the regular inspection of such insulated sticks, tools and equipment.
- c. Management systems are in place to ensure that regular inspections, testing and maintenance of such insulated sticks, tools and equipment are carried out and recorded. Such management systems shall include:
 - periodic checks to ensure that the required inspection, testing and maintenance tasks are being undertaken as required
 - where periodic maintenance is to be undertaken by suppliers or manufacturers, arrangements are in place to ensure that the equipment is inspected, tested and/or maintained prior to the respective due dates.
- d. Insulated sticks, tools or equipment identified with a "Danger Do Not Use" tag is segregated and the tag is not removed until the item has been repaired or destroyed.

4.2 Responsibility of Employees

Employees are responsible for:

- a. carrying out their work in accordance with this Specification
- b. seeking guidance and/or supervision before attempting to carry out a task for which they have not demonstrated and maintained satisfactory competence
- c. ensuring the insulated sticks, tools or equipment are maintained in good condition and stored correctly after use.

5 Training

Persons inspecting, testing and maintaining insulated sticks tools and equipment shall be trained in carrying out the cleaning, inspection and maintenance described in this Specification.

Training may take place in the field or in a specialised training environment.

Persons in training shall be supervised by a person competent in the skill being learned.

NOTE

Where competency is not maintained through practice, the skill shall be revised and assessed prior to the person again being considered competent.

6 Hazards

A person:

- Cleaning badly damaged insulated stick components could be at risk of cutting their hand or have a protruding glass fibre penetrating the skin of the hand.
- Utilising voltage sources to verify insulation properties or voltage readings of test equipment may be at risk of electric shock.

NOTE

These hazards can be avoided by a thorough inspection before use.

7 Insulated Stick Identification

Complete Insulated Sticks, Tools and Equipment that have an existing label shall be maintained.

Prefix "IS" to be used, and a suffix used to identify each segment of the stick, e.g. "T" or "B" added to identify Top or Bottom stick section.

The insulated stick is to be clearly and indelibly labelled with an identifier as above with lettering at least 5 mm tall.

Example: ST-IS-12345T and ST-IS-12345B

An insulated stick dedicated for use on the 1500 Volt DC system requires additional wording on the label described above indicating "1500 Volt DC ONLY".

**Example: ST-IS-12345T 1500V DC ONLY and
ST-IS-12345B 1500V DC ONLY**

8 Care of Insulated Sticks, Tools and Equipment

All insulated sticks, tools equipment and all accessories shall be kept clean and dry.

Insulated stick or tool components shall not be laid directly on the ground or placed in a position where they can come into contact with other metal fittings or tools.

When equipment is to be used, it shall be removed from the carry/roll bag or box and either supported on a suitable tool rack, laid on a clean dry tarpaulin or left on their carry/roll bag or box.

Insulated sticks, tools and equipment shall always be transported in their carry/roll bag or box and in such a manner as to prevent mechanical damage or surface abrasion to the equipment from other tools and materials.

Insulated sticks, tools and equipment that are:

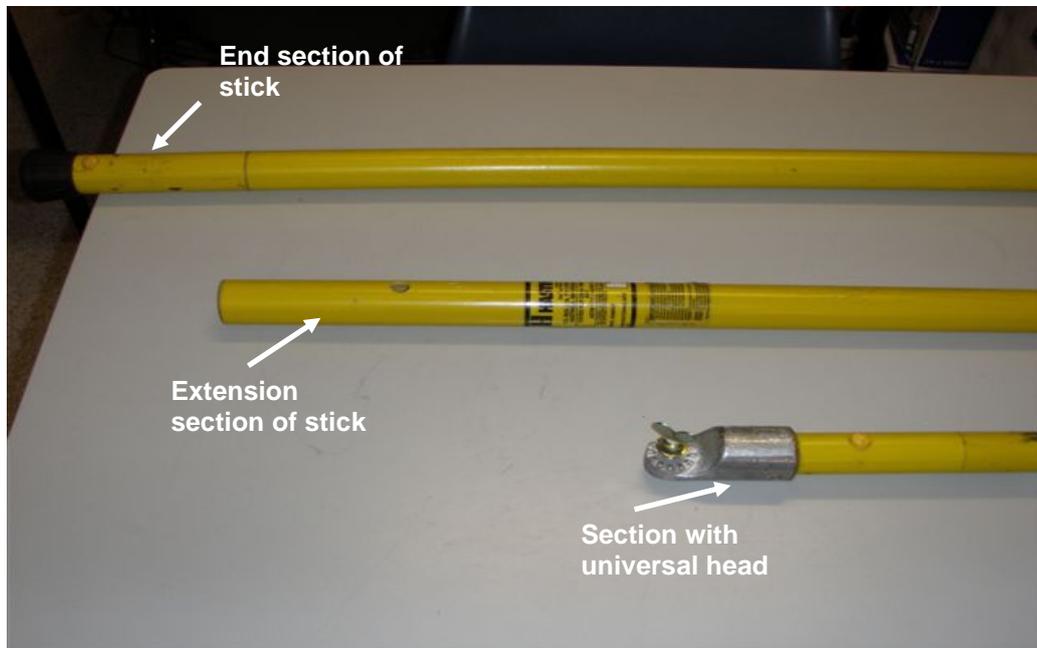
- damp shall be thoroughly dried
- wet e.g. saturated or having been immersed in water, shall be thoroughly dried and then subjected to the appropriate test of Section 12,

before being placed in the carry/roll bag or box.

Modifications shall not be made to any insulated stick, tool, equipment or their accessories.

9 Cleaning and Maintenance

Different sections of an insulated operating stick are shown in the photo below:



- Before and after use and at inspections, the insulated universal head section, extension sections and insulated sections of sticks, tools equipment and accessories shall be wiped clean with a cloth. For items used on the High Voltage and 1500 Voltage system the cloth shall be silicon impregnated.
- Whenever the insulated stick assembly or insulated sections of tools and equipment are contaminated by moisture and conductive materials, they shall be cleaned and the surface finish restored in accordance with the manufacturers' recommendations to retard future contamination.
- The finish of the insulated stick, tool equipment and accessories shall be free of cracks, surface damage or mechanical defects.
- Surface damage to the insulated stick assembly or insulated sections of tools and equipment, such as chips and deep scratches that expose the glass fibres shall be repaired as soon as they are noticed and the surface finish restored in accordance with the manufacturers' recommendations.
- All tools, equipment and accessories shall be examined for loose bolts, connections or rivets, damaged or worn parts and cleaned and lubricated when necessary in accordance with manufacturers' instructions.
- Tool rolls, carry bags and/or boxes shall be kept clean, dry and free of oil or other chemical contaminants to ensure the integrity of the contained equipment. Contaminated tool rolls, carry bags or boxes shall be effectively cleaned or replaced.

10 Inspection of Equipment - General

10.1 Records

Managers, supervisors and employees identified as being responsible for the inspection, testing and maintenance of insulated sticks, tools and equipment shall maintain records for all items covered by this Specification for which they are responsible.

Records shall be kept for:

- a. item description and registered number where applicable
- b. all purchases
- c. all repairs
- d. date of routine Check/Test/Inspection (other than user inspections)
- e. the inspection or test and the result
- f. the due date for the next inspection or test
- g. date and method of disposal.

Such records shall be kept until 12 months after the item is permanently removed from service.

10.2 Schedule

The scheduled inspection and tests shall be undertaken irrespective of any other inspection or test carried out on the equipment.

Where an inspection is specified "before use", the inspection shall be performed before each use, irrespective of any other inspection that may have been previously been carried out on the same day or shift, by the same user.

If the responsibility for an item of equipment is changed, care shall be taken to ensure that the intervals between periodic inspections or test for that item does not exceed those set out in this Specification.

10.3 Segregation of Defective Items

If in the course of inspection or testing an item is found to be defective, it shall immediately be removed from service. The person removing the item from service shall affix a "DANGER- DO NOT USE" tag to the item. The tag shall describe the defect of concern.

The supervisor shall then decide if the item is to be repaired or destroyed.

Items that cannot be repaired shall be destroyed or disabled so they cannot be used.

The item shall not be used or re-issued for use until it has been repaired and successfully re-tested or re-inspected.

WARNING

The "DANGER - DO NOT USE" tag shall not be removed before the defective item has been repaired or destroyed.

11 Inspections of Insulated Sticks, Tools and Equipment

11.1 Before Use Inspection

Each time before use, insulated sticks, tools, equipment and accessories shall be dry, wiped clean with a cloth and visually inspected for:

- signs of overstressing, cracking, sharp protrusions, fibers or damage to the protective surface/finish
- couplings are functioning properly
- legibility of warning labels, voltage rating and test dates
- currency of last test.

NOTE

For items used on the High Voltage and 1500 Voltage system the cloth shall be silicon impregnated.

The before-use inspection shall be carried out on all insulated sticks, tools, equipment and accessories. The finish of the insulated stick, tool, equipment or accessory shall be free of cracks, surface damage or mechanical defects.

11.1.1 Universal Head Section and Extension Sections

Insulated sticks and extension sections shall be examined before use to ensure that they are satisfactory for their intended use and warning labels, voltage rating and test dates where applicable are current and legible.

The insulated stick and extension sections shall be inspected for signs of cracking or damage to the protective finish and the metal fittings examined for signs of excessive wear and other visible damage. Special attention shall be paid to metal fittings or tools permanently attached to the sticks.

11.1.2 Tools and Accessories

All tools and accessories shall be examined for loose bolts, connections, or rivets, damaged or worn parts. Particular attention shall be paid to metal fittings associated with attaching tools to ensure the metal fittings are secure.

11.2 Routine Inspections (Three Monthly) of High Voltage and 1500 Volt insulated sticks, tools, equipment and accessories

All High Voltage and 1500 Volt insulated sticks, tools, equipment and accessories shall be visually inspected as described in Section 11.1, and cleaned at intervals not exceeding 3 months, regardless of any other inspections.

All High Voltage and 1500 Volt insulated sticks and associated components shall be wiped clean with a silicon impregnated cloth after inspection.

12 Routine Tests

12.1 General

Insulated sticks, tools, equipment and accessories are subjected to an annual certification and where relevant Calibration test to ensure that they are still fit for the purpose intended. Refer to *SP D 79039 Electrical Tools and Test Equipment*.

Each insulating section, item tool, equipment or accessory shall be:

- provided with a test certificate which states that it has passed the test
- marked with a 'Calibration/Tested' label indicating; date tested, due date and tested by.

Only the most recent 'Calibration/Tested' label shall be displayed on each insulating section or item.

These tests shall be undertaken at intervals not exceeding 12 months, irrespective of any other inspections or tests. Insulated sticks, tools, equipment and accessories shall not be used if the calibration/tested due date has passed.

NOTE

Before conducting the tests of Sections 12.2, 12.3 or 12.4 the insulated stick, tool, equipment or accessory shall be successfully subjected to the “Before Use Inspection” of Section 11.1.

12.2 Integrity Test for insulated items used near or on/within the High Voltage AC system

Each insulating section of an insulated stick assembly, tool or equipment and insulated accessories shall be subjected to minimum power-frequency voltage withstand test of 45kV per 300 millimetres for a period of one minute.

During the test the leakage current shall be constant and not exceed 100 microamps on any tested section.

The power frequency voltage withstand test are to be conducted by either the manufacturer or alternatively a NATA accredited laboratory/calibration provider. Results of such tests are to be traceable to the relevant National Standards, generally done via recording of results in a NATA endorsed test certificate.

12.3 Integrity Test for insulated items used near or on/within the 1500 Volt DC system

Dedicated insulated stick assemblies, tools (such as cleaning poles used near the 1500 Volt DC OHW) or equipment and insulated accessories for use on the 1500 Volt DC system shall be subjected to a 5 kV DC insulation resistance test applied across the entire length of the stick for 1 minute. The insulation resistance measured shall not be less than 50 M-Ohm.

Insulation resistance tests can be performed by a National Association of Testing Authorities (NATA) accredited laboratory/calibration provider or a competent electrical

person utilising test equipment that is “in calibration” and traceable back to national standards.

NOTE

Insulation resistance testing instructions are detailed in D2013/80872 Inspection and Testing of Insulated Sticks, Tools and Equipment used for work On, Near Exposed 1500V OHW or Equipment.

WARNING

Insulated sticks, tools and equipment dedicated for use on 1500V DC OHW system only shall be clearly marked in accordance with Section 7.

12.4 Calibration Test

Measuring equipment shall be tested for correct indication and operation. Measuring equipment shall be subjected to calibration tests to verify that the equipment is within manufacturer’s specifications and any applicable standards, i.e. display/readings are accurate, concise and repeatable.

Voltage detectors or phasing units shall be tested, where applicable, for correct:

- threshold voltage operation on all ranges
- visual and/or audible operation
- operation of the self test function.

Calibration tests are to be conducted by either the manufacturer or alternatively a NATA accredited laboratory/calibration provider. Results of such tests are to be traceable to the relevant National Standards, generally done via recording of results in a NATA endorsed test certificate.

13 Replacement of Equipment

Replacement parts and accessories shall be acquired from the original manufacturers.

Standard universal heads and extension section from different manufacturers shall not be mixed to form an assembly.

14 Reference documents

D2013/80872 Inspection and Testing of Insulated Sticks, Tools and Equipment used for work On, Near Exposed 1500V OHW or Equipment

SP D 79039 Electrical Tools and Test Equipment

SP D 79043 Inspection and Care of Portable Earthing Equipment for the High Voltage System

SP D 79045 Inspection and Care of Portable Rail Connecting Equipment for 1500 Volt Overhead Wiring