Australian/New Zealand Standard™

In-service safety inspection and testing of electrical equipment

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Australian/New Zealand Standard™

In-service safety inspection and testing of electrical equipment

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/36, *In-service Testing of Electrical Equipment*, to supersede AS/NZS 3760:2000.

The in-service safety inspection and testing requirements in this Standard do not cover testing for design and approval of equipment (which is covered separately in the AS/NZS 3100, AS 3300/NZS 6200 and AS/NZS 3350 series of Standards).

Changes to AS/NZS 3760:2000 include the following:

(a) Change to the "Scope" to clarify requirements for flexible cords on fixed equipment and to cover fixed RCDs.

(b) Revision of the "Foreword" and "Inspection and testing" to clarify that equipment does not require dismantling.

(c) Additions and changes to Table 2 to clarify cord requirements in office environments, add requirements in residential type areas, and add requirements for fixed RCDs.

(d) Numerous minor text changes.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard and subject to the same level of compliance as if it were in the body of the Standard, whereas an 'informative' appendix is provided for information and guidance, and may indicate good practice. Non-compliance with an informative appendix will not be seen as non-compliance with the Standard.

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FOREWORD

In-service testing is necessary for the safety of persons using the equipment and for the proper discharge of the obligations of employers and employees, as listed in legislation covering occupational health and safety matters. This Standard specifies in-service safety inspection and testing protocols and criteria that satisfy these obligations and provides a cost effective approach to safety without jeopardizing personnel safety or involving excessive equipment downtime.

The following requirements are necessary for the safety of persons using electrical equipment:

(a) Equipment needs to be designed and manufactured to appropriate safety standards.

(b) Equipment, without being dismantled, needs to be subjected to routine inspection and testing to detect obvious damage, wear or other conditions which might render it unsafe.

(c) Equipment identified as faulty needs to be withdrawn from service and referred for repair or disposal by expert personnel.

(d) Appropriate equipment needs to be used for each particular application.

(e) In specific cases, e.g. for use in confined spaces, equipment also needs to be used in accordance with an appropriate set of rules linking the type of work with the class of equipment and environmental safety facilities.

This Standard refers only to the matters in Items (b) and (c).

The following information provides some insight and background to the inspection and electrical testing requirements specified in this Standard and relevant regulatory codes.

PRINCIPLES OF CONSTRUCTION OF ELECTRICAL EQUIPMENT

Exposed metal parts of equipment operating from supply voltage must be prevented from becoming live in the event of insulation failure or the bypassing of insulation during the normal use of the equipment (e.g. through the ingress of conducting liquids or other conducting materials).

This protection may be provided by either one or both of the following:

(a) Provision of basic insulation between the exposed metal parts and the live parts, and earthing the exposed metal parts. Equipment in which some or all of the exposed metal parts require protective earthing, are basic insulated items which are also referred to as Class I equipment.

(b) Provision of double or reinforced insulation between the external metal parts and the live parts. Equipment in which none of the external metal parts require protective earthing, due to the provision of double or reinforced insulation, are double insulated items, also referred to as Class II equipment. This equipment is marked with the symbol ⧈ or with the words ‘DOUBLE INSULATED’.

PROTECTIVE EARTHING

The resistance to earth from protectively earthed parts in Class I equipment must be low enough to permit adequate fault current to flow to earth, thereby ensuring that the overcurrent protection device in the final sub-circuit (i.e. fixed wiring) opens quickly in the event of insulation failure.

The protective earthing conductor also ensures that any leakage current from the live parts within Class I equipment flows to earth via a low resistance path.

INSULATION RESISTANCE

Insulation resistance testing is intended to ensure the integrity of the insulation between live mains parts and exposed or external metal parts.

Accordingly, equipment must have its insulation resistance measured prior to commissioning, and at regular intervals during its service life to ensure that no degradation has occurred since manufacture, during transport or over its service life.

TEST EQUIPMENT

The equipment required to carry out the tests detailed in this Standard should be subjected to routine calibration to ensure its accuracy is maintained.

DOCUMENTATION

Records of maintenance, including tests, should be kept throughout the working life of the equipment. Such records are a useful management tool for reviewing the frequency of inspection and test, and ensuring that inspection and testing has been carried out.

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In-service safety inspection and testing of electrical equipment

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies procedures for the safety inspection and testing of electrical equipment; low voltage single phase and polyphase, which is to be entered into service for the first time, or which is already in-service, has been serviced, or is available for hire or resale (see Note 1).

Electrical equipment includes: (see Notes 2 and 3)

(a) Portable, hand held and stationary appliances, designed for connection to the low voltage supply by a flexible cord (see Note 4).

(b) Cord Extension Sets and Electrical Portable Outlet Devices (EPODs - power boards)

(c) Flexible cords connected to fixed equipment in certain environments (see Note 2).

(d) Portable isolation transformers.

(e) RCDs - Portable type (PRCD), socket outlet type and fixed switchboard type.

NOTES:

1 New equipment, being placed into service, requires written evidence of compliance to the relevant standard, or to this standard.

2 Fixed equipment is not normally considered to represent a hazard unless the flexible cord is subject to flexing in normal use or the whole equipment is open to abuse or is in a hostile environment, e.g. window mounted type room air conditioners are not considered to represent a hazard.

3 Specialised electronic equipment, e.g. portable computers, may sustain damage if not tested in accordance with the manufacturer's instructions. Accordingly advice should be sought from the manufacturer or agent before proceeding with in-service tests.

4 Inspection and test includes the flexible cord connected to equipment.

1.2 APPLICATION

This Standard is intended for use by those persons involved in the testing, maintenance, repair and use of electrical equipment in environments listed in column (a) of Table 2, which also includes some specific equipment types. While Clause 2.3 of this Standard specifies the method of inspection and