AS/NZS 3760:2003
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

In-service safety inspection and testing of electrical equipment

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Australasian Lighting Industry Association
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Australian Electrical and Electronic Manufacturers 'Association
Australian National University
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-036 In-service Testing of Electrical Equipment, to supersede AS/NZS 3760:2001.

The in-service safety inspection and testing requirements in this Standard do not cover testing for the design and approval of equipment (which is covered separately in other Standards).

Changes to AS/NZS 3760:2001 incorporated in this Standard include the following:

(a) The environment for frequency of inspection and test has been revised to be more usage based, rather than specific site based;

(b) Customized solutions based on risk assessment are now allowed;

(c) The “Responsible Person” has been defined and the qualifications of a “Competent Person” clarified by notes;

(d) Guidelines to the knowledge of electrical principles with which a Competent Person is likely to be familiar have been added as an Informative Appendix, applicable in New Zealand only;

(e) Additional definitions have been formulated;

(e) The inspection and test responsibilities of the hirer and hiree are now stated and the inspection, test and tag intervals for the hirer clarified;

(f) 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 philosophy of the document is to provide an inspection and testing regime capable of implementation with only simple instrumentation, and performed by a person not necessarily having formal qualifications or registration, but who has the necessary practical and theoretical skills, acquired through training, qualification, experience or a combination of these, to correctly undertake the tasks prescribed by this Standard.

The methodology of the inspection and testing process is defined. The frequency of repetition of that process is determined not by the equipment type, but by examination of the environment in which the equipment is used or working in. For indicative purposes a number of environments are provided with associated inspection/testing frequencies prescribed. These are based on the perception of the level of hazard and the degree of abuse to which the equipment is typically exposed. However, there will usually be multiple sub-environments within any location and the inspecting/testing frequency will be arrived at by an assessment of the actual environment in which the equipment is placed or used.

Introduced in this edition is the possibility of allocating the frequency of inspection/testing by undertaking, implementing and documenting a risk assessment.

The test and tag intervals prescribed for hire equipment are aligned with the intervals for environments such as construction and demolition sites.

This version incorporates Amendment No 1, August 2005, and those areas where changes have been made, are indicated by a vertical line in the margin.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard

In-service safety inspection and testing of electrical equipment

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard specifies procedures for the safety inspection and testing of low voltage single phase and poly-phase (e.g. nominal 240V and 415V) electrical equipment, connected to the electrical supply by a flexible cord and/or connecting device, which is new equipment placed into service for the first time, is already in-service, has been serviced or repaired, is returning to service from a second-hand sale, or is available for hire. A1

Typical examples of equipment are:

(a) Portable, hand-held and stationary appliances, designed for connection to the low voltage supply by a flexible cord;

(b) Cord extension sets and outlet devices (also known as electrical portable outlet devices, EPODs or power boards);

(c) Flexible cords connected to fixed equipment in hostile environments;

(d) Portable isolation transformers (includes power adaptor/plug-pack, both of the transformer and switch-mode type);

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

(f) Commercial and industrial battery chargers;

(g) Portable and transportable 415V heavy duty tools such as high pressure washers and concrete grinders.

1.1.1 This Standard does not apply to electrical equipment (such as suspended light fittings), at a height of 2.5m or greater above the ground, floor or platform, where there is not a reasonable chance of a person touching the equipment and, at the same time, coming into contact with earth or any conducting medium which may be in electrical contact with earth or through which a circuit may be completed to earth.

1.1.2 This Standard does not apply to equipment which would need to be dismantled to perform the inspection and tests specified in this Standard.

NOTE If, for some reason outside the scope of this Standard, equipment must be dismantled to verify safety, this action must be performed by a technically qualified person.

1.1.3 Functional checks are not considered part of a safety evaluation and therefore not included in this Standard.

1.1.4 This Standard only applies to equipment in-service at a place of work or public place, or offered for hire.

NOTE For example, this Standard does not apply to demonstration stock in retail or wholesale outlets.

1.1.5 This Standard does not apply to fixed or stationary equipment connected to wiring that forms part of the electrical installation and falls within the scope of AS/NZS 3000.

1.1.6 This Standard does not apply to equipment whose nature is that of a medical device as defined in AS/NZS 3551. A1

1.2 GENERAL

Equipment needs to be subjected to regular inspection and testing to detect obvious damage, wear or other conditions which might render it unsafe. Equipment shall not be dismantled to perform inspection and testing.

NOTE All a.c. voltage and current values referenced are expressed in root mean square (r.m.s) values.

1.2.1 New equipment

1.2.1.1 In Australia, when the equipment is new, the supplier is deemed responsible for the initial electrical safety of the new equipment. New equipment need not be inspected or tested. The owner or Responsible Person shall regard it as compliant and ensure it is tagged in accordance with Clause 2.4.2. A1

NOTE This clause is drawn to the attention of owners of computer and office equipment, who may arrange for the tagging action to be undertaken by their in-house Competent Person.

1.2.1.2 In New Zealand, the equipment shall be inspected, tested and tagged on entry to service.

1.2.2 In-service equipment

Equipment already in-service shall be inspected and tested at intervals specified in Section 2.

1.2.3 Fixed or stationary equipment

Fixed or stationary equipment connected by fixed cable or flexible cord:

(a) Which is not flexed in normal use or exposed to damage nor is in a hostile environment, is not normally considered to represent a hazard sufficient to warrant routine in-service electrical safety testing. Accordingly, the testing of such equipment is not required by this Standard;

(b) Where the flexible cable or cord is flexed on equipment which is moved for restocking, maintenance, cleaning, etc., is considered to require in-service testing.

1.2.4 Hire equipment

1.2.4.1 Responsibility for hire equipment at the commencement of hire

(a) New equipment from the supplier shall enter service in the hire industry in accordance with Clause 1.2.1;

(b) The hirer has the responsibility to ensure that hired equipment complies with the requirements of this Standard at the commencement of hire;

(c) Hirers may combine the function of the tag specified in Clause 2.4.2 and their in-house “Ready for hire” tag, by colour-coding it to comply with Clause 2.4.2.

1.2.4.2 Responsibility for hire equipment during hire

Responsibility for testing, inspection and tagging passes to the hiree. The appropriate time interval to re-test shall be derived from Table 4, by assessing the environment in which the equipment is utilized.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1674.2	Safety in welding and allied processes - Electrical
60529	Degrees of protection provided by enclosures (IP Code) A1
AS/NZS	
3001	Electrical installations –Re-locatable premises (including caravans and tents) and their site installations
3002	Electrical installations – Shows and carnivals
3003	Electrical installations – Patient treatment areas of hospitals and medical and dental practices and dialysing locations
3004	Electrical installations – Marinas and pleasure craft at low voltage
3012	Electrical installations – Construction and demolition sites
3100	Approval and test specification – General requirements for electrical equipment
3112	Approval and test specification - Plugs and socket-outlets
3190	Approval and test specification –Residual current devices (current-operated earth-leakage devices)
3191	Approval and test specification - Electric flexible cords
3199	Approval and test specification for cord extension sets
3350.1	Safety of household and similar electrical appliances - General requirements
3551	Technical management programs for medical devices
4249	Electrical safety practices – Film, video and television sites
4360	Risk management
ISO 9000 Series	Quality management and quality assurance Standards

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply:

1.4.1 Accessible earthed parts

(a) Accessible earthed parts are a conductive part of electrical equipment, required to be connected to a protective earth, which:

(i) Is separated from live parts by basic insulation; and

(ii) Can be touched with the jointed test finger as specified in AS 60529; and A1

(iii) Is not a live part but can become live if basic insulation fails.

NOTE The neutral wire shall also be considered a live part.

(b) The term accessible earthed parts does not apply to the following:

(i) Live parts;

(ii) Parts separated from live parts by double insulation or reinforced insulation, or by other metal parts themselves earthed or having double insulation or reinforced insulation;

(iii) Metal nameplates, screw-heads, covers or plates, and their means of fixing, which cannot become live in the event of failure of insulation of live parts, or be exposed to arcing contact with live parts;

NOTE 'Failure of insulation' in this context is taken to include accidental bridging of an insulating gap by metal, or partially conducting material, such as carbon dust or moisture, as well as electrical breakdown.

(iv) Parts within an enclosure, the cover of which requires the use of a tool for its removal;

NOTE A key is not considered to be a tool except where special circumstances prevail, e.g. the use of the key is restricted to technical service personnel having an appropriate level of electro-technical training.

(v) Parts within equipment, the configuration and mass of which are such that the parts are not accessible during normal use and movement of the equipment.

NOTE Non-metallic material which is conductive to a degree which may contribute to a hazardous condition arising shall be deemed to be an accessible earthed part, subject to the above provisions.

1.4.2 Accessible unearthed parts

Accessible unearthed parts shall be all external parts that are not connected to the protective earthing conductor and are separated from live parts by double insulation or reinforced insulation, and includes parts used to support the equipment in operation.

1.4.3 Class I equipment (basic insulated, protectively earthed equipment)

Equipment in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution, in that conductive accessible parts are connected to the protective earthing conductor in the fixed wiring of the installation in such a way that those accessible parts cannot become live in the event of a failure of the basic insulation.

NOTE 1 Class I equipment may have parts with double insulation or parts operating at extra-low voltage.

NOTE 2 This provision includes a protective earthing conductor as part of the flexible cord or cable for equipment intended for use with a flexible cord or cable

1.4.4 Class II equipment (double insulated equipment)

Equipment in which protection against electric shock does not rely on basic insulation only, but in which an extra layer of insulation (called "supplementary insulation") is provided to give double insulation, there being no provision for protective earthing or reliance upon installation conditions. This equipment is generally manufactured with a non-conductive (insulated) enclosure, and is marked either with the words 'DOUBLE INSULATED' or with the symbol ⧈ to allow easy identification.

NOTE Class II equipment may also be manufactured with metal enclosures which are double insulated from live parts.

1.4.5 Competent Person

A Competent Person is one who the Responsible Person ensures has the necessary practical and theoretical skills, acquired through training, qualification, experience or a combination of these, to correctly undertake the tasks prescribed by this Standard.

NOTE 1 A Competent Person is not required to be a registered or licensed electrical practitioner.

NOTE 2 Competency levels may need to be updated following technological advances in both the testing instrumentation available and the equipment being examined.

NOTE 3 It is expected that the Competent Person shall:

(i) Be able to use test equipment safely and effectively;

(ii) Have an understanding of the dangers of electricity, leading to an appreciation of the need for inspection and testing;

(iii) Have an understanding of the construction of Class I and Class II equipment, and of the terms: basic, reinforced and double insulation, protective earth and earth continuity, insulation resistance and earth leakage current;

(iv) Have an understanding of the application and requirements of this Standard;

(v) Have an understanding of the relevant legislative requirements appropriate for the jurisdiction they are operating within.

NOTE 4 Guidelines to the knowledge of electrical principles with which a Competent Person is likely to be familiar are listed in Appendix J, an Informative Appendix, applicable to New Zealand only

1.4.6 Cord set

An assembly of a plug intended for connection to a mains outlet socket, a sheathed flexible cord and a cord extension socket, or appliance connector.

NOTE 1 This includes extension leads and detachable leads supplying power to the equipment.

NOTE 2 An example of a cord set is shown in Appendix F.

1.4.7 Electric portable outlet device (Power boards and EPODs)

A device, other than a cord set, having a single means of connection to a low voltage supply, and one or more outlet facilities. It may incorporate a reeling or coiling arrangement.

1.4.8 Fixed equipment

Equipment which is fastened to a support, secured in position or otherwise, due to its size and mass, located in a specific location.

NOTE Adhesives are not recognized as a means of fastening fixed equipment to a support unless specifically allowed in another Standard.

1.4.9 Hire

A hire situation is created when the Hirer provides electrical equipment, to a person or entity external to the Hirer's organization, which passes out of the control of the Hirer. A situation where equipment is supplied and operated by the Hirer is not considered to constitute a Hire.

1.4.10 Hiree

The person or business, which receives the equipment from the hirer.

1.4.11 Hirer

The person or business which offers the equipment for hire.

1.4.12 Hostile environment

One wherein the equipment or appliance is normally subjected to events or operating conditions likely to result in damage to the equipment or a reduction in its expected life span. This includes, but is not limited to physical abuse, exposure to moisture, heat, vibration, corrosive chemicals, and dust.

1.4.13 Insulation

One or a combination of the following:

(a) *Basic insulation*
The insulation applied to live parts to provide basic protection against electric shock;

NOTE 1 Basic insulation does not necessarily include insulation used exclusively for functional purposes.

NOTE 2 Basic insulation was previously known as single insulation.

(b) *Supplementary insulation*
An independent insulation, applied in addition to the basic insulation, in order to ensure protection against electric shock in the event of a failure of the basic insulation;

(c) *Double insulation*
Insulation comprising both basic insulation and supplementary insulation;

(d) *Reinforced insulation*
A single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation, under conditions specified in this Standard.

NOTE The term 'insulation system' does not imply that the insulation must be one homogenous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

1.4.14 Isolating transformer

A transformer, the input winding of which is electrically separated from the output winding by an insulation at least equivalent to double insulation or reinforced insulation.

1.4.15 Live parts

Live Parts include live supply conductors and all parts which are electrically connected to the line supply conductors. The protective earth is not a Live Part.

1.4.16 May

Indicates the existence of an option.

1.4.17 Portable equipment

Equipment which is moved while in operation, or an appliance which can be easily moved from one place to another while connected to the supply

1.4.18 Power Pack (extra low voltage power supply unit)

Commonly known as plug pack, power supply unit (PSU), extra low voltage power supply unit or a.c. adaptor.

1.4.19 Residual current device (RCD)

A mechanical switching device designed to make, carry and break currents under normal service conditions, and to cause the opening of the contacts when the residual current attains a given value under specified conditions.

RCDs are classified in AS/NZS 3190 according to their rated residual current as follows:

(a) Type I : ≤ 10 mA

(b) Type II : > 10 mA ≤ 30 mA

1.4.20 Responsible Person

The Responsible Person shall be considered as the owner of the premises, or the electrical equipment, or an employer, who has a legal responsibility under the occupational health and safety legislation or the relevant regulatory jurisdiction, for the safety of electrical equipment falling within the scope of this Standard.

1.4.21 Shall

Indicates a statement is mandatory.

1.4.22 Should

Indicates a statement is preferred as indicating good practice, but is not mandatory.

1.4.23 Stationary equipment

An appliance having a mass exceeding 18 kg and not provided with a carrying handle(s).

1.4.24 Supply flexible cord

A flexible cable or cord, for supply purposes, which has one end connected to a plug with pins designed to engage with a socket outlet, and the other end either :

(a) connected to terminals within the equipment; or

(b) fitted with a connector designed to engage with an appliance inlet fitted to the equipment.

1.4.25 Voltage

Differences of potential, normally existing between conductors and between conductors and earth as follows:

(a) Extra-low voltage (ELV) – not exceeding 50 V a.c. or 120 V ripple free d.c.;

(b) Low voltage (LV) – exceeding extra-low voltage, but not exceeding 1000 V a.c. or 1500 V d.c.;

(c) High voltage (HV) – exceeding low voltage.

SECTION 2 INSPECTIONS AND TESTS

2. GENERAL

Experience has shown that greater than 90 % of defects are detectable by visual inspection. Therefore, equipment shall be visually inspected, physically checked and tested in accordance with this Section.

The frequency of repetition of that process is determined not by the equipment type, but by examination of the environment in which the equipment is used or working in.

For indicative purposes a number of environments (as shown in column (a) of Table 4) are provided with associated inspection/testing frequencies prescribed. These are based on the perception of the level of hazard and the degree of abuse to which the equipment is typically exposed.

However, there will usually be multiple sub-environments within any location and the inspecting/testing frequency will be arrived at by an assessment of the actual environment in which the equipment is placed or used.

2.1 FREQUENCY OF INSPECTION AND TESTS

Electrical equipment shall be inspected and tested:

(a) At intervals specified in Table 4 (a tolerance of two weeks is acceptable);

NOTE Regulatory authorities, other Standards, workplace safety requirements or manufacturers' instructions may specify shorter intervals appropriate to particular industries or specific types of equipment.

(b) Before return to service after a repair or servicing, which could have affected the electrical safety of the equipment.

(c) Before return to service from a second-hand sale, to ensure the equipment is safe.

2.1.1 To allow the flexibility to devise a customized solution for particular circumstances, organizations with sufficient expertise and resource may substitute other periods than those indicated in Table 4, after conducting a documented risk assessment, undertaken in accordance with the process specified in AS/NZS 4360, and taking into consideration any relevant legislative requirements or guidelines.

2.1.1.1 The risk assessment option provided in Clause 2.1.1 does not apply to equipment offered for hire.

NOTE This exclusion has been made as the hirer has no control over the end use of the equipment and therefore a risk assessment could not be conducted by the hirer.

2.2 PERSONNEL

The inspection and testing tasks specified in this Standard shall be carried out by a Competent Person as defined in Clause 1.4.5.

2.3 INSPECTION AND TESTING

2.3.1 General

Where applicable, in-service testing and inspection shall include:

(a) An external inspection of the equipment and the connecting facilities (e.g. supply flexible cord);

(b) Protective earth continuity tests for Class I equipment, power boards and cord sets;

(c) Insulation testing, which may be achieved by measuring insulation resistance, or leakage current;

(d) Confirmation of the correct polarity of live connections in cord sets with re-wireable plugs and cord extension sockets.

2.3.2 Inspection

The following equipment checks shall be made by visual and physical inspection of all equipment:

(a) Check for obvious damage or defects in the accessories, connectors, plugs or extension outlet sockets; and for discoloration that may indicate exposure to heat, chemicals or moisture;

NOTE For low voltage portable equipment and cord extension sets fitted with AS/NZS 3112 type (flat pin) plugs and extension sockets, the use of clear backed or integrally moulded (non re-wireable) plugs, and cord extension sockets is recommended. Clear backed plugs and sockets facilitate the easy inspection of the effectiveness of the sheath grip.

(b) Check that flexible cords are effectively anchored to equipment, plugs and cord extension sockets;

NOTE This inspection, including flexing and straining at points of entry and clamping points by the application of reasonable combination of push/pull and rotary movements, may detect broken strands or loose connections. It may be conveniently performed in conjunction with the continuity test to Clause 2.3.3.1.

(c) Check for damage to flexible cords that:

(i) The inner cores of flexible supply cords are not exposed or twisted; and

(ii) The external sheaths are not cut, abraded, twisted, or damaged to such an extent that the insulation of the inner cores is visible; and

(ii) Unprotected conductors or the use of banding insulation tape are not in evidence.

NOTE 1 Carefully running the supply cord through the hand will often detect internal damage such as twisted conductors or broken core filling.

NOTE 2 Connecting the plugs/sockets of extension leads together helps to confirm that the terminals have not spread.

(d) For portable outlet devices (power boards), check that the warning indicating the maximum load to be connected to the device is intact and legible;

(e) Check that any operating controls are in good working order i.e. that they are secure, aligned and appropriately identified;

(f) Check that covers, guards, and the like are secured in the manner intended by the manufacturer or supplier;

(g) Check that ventilation inlets and exhausts are unobstructed;

(h) The pins of insulated pin plugs should be inspected for damage to the insulation of the pins, and, if fitted, the shroud on cord extension sockets .

2.3.3 Testing

The purpose of testing is to detect the unobservable faults not found by the visual inspection process, and forms an integral part of the inspection/testing process.

2.3.3.1 Earthing continuity

To ensure that the resistance of the protective conductor is sufficiently low to ensure operation of the circuit protecting the equipment, all Class I equipment, tested in accordance with Appendix A:

(a) With accessible earthed parts: shall have the continuity of the protective earthing conductor from the plug earth pin to the accessible earthed parts checked;

(b) Without accessible earthed parts: such as cord extension sets, outlet devices and portable residual current devices, (PRCDs) shall have checked the continuity of the protective earth conductor from the earth pin of the connector plug to the earth socket/contact of the outlet(s).

Such equipment shall have a measured resistance of the protective earth circuit, or the earthing conductor of an extension cord or appliance cord set, which does not exceed 1Ω.

NOTE This test is best undertaken during inspection performed under Clause 2.3.2(b).

2.3.3.2 Testing of insulation

Equipment shall be tested:

(a) with a leakage current test performed at rated voltage with values not exceeding those specified in Table 1; or

> **WARNING** – When performing leakage current tests with the equipment energized, the protective earth conductor may be live and present a shock hazard.

(b) alternatively, measure insulation resistance in accordance with Appendix B at 500 V d.c. or alternatively, to avoid the equipment apparently failing the test because the metal oxide varistors (MOVs), or electro-magnetic interference (EMI) suppression has triggered, for equipment containing voltage limiting devices such as MOVs, or EMI suppression, at 250 V d.c. The insulation resistance between components of the equipment shall be as specified in Table 2.

NOTE Insulation resistance tests shall be performed with the switch in the "on" position. If the equipment must be energized to close or operate a switching device, then a leakage current test shall be performed.

2.3.3.2.1 Where equipment contains, by design, resistors installed between live conductors and earth, values of insulation resistance not less than the effective value of the resistors are acceptable provided the manufacturer can prove that the resistors are part of the design.

2.3.3.2.2 The insulation resistance of RCDs with functional earth (FE) connections shall be not less than 0.1MΩ. Alternatively, portable RCDs which require the supply to be closed, and units with an FE connection may be tested for leakage current with a maximum value allowed being 2.5 mA. (A functional earth is a connection with earth to ensure the correct normal operation of the RCD).

TABLE 1 - Leakage current limits

Equipment	Leakage test	Maximum leakage mA
Class I	Measure the current flowing in the protective earth conductor	5
Class II	Measure the current flowing between accessible unearthed metal and earth	1
Portable RCDs with functional earth	Measure the current flowing in the functional earth conductor	2.5
Cord extension sets, portable outlets and portable RCDs	Measure the current flowing in the protective earth conductor	1

TABLE 2 - Insulation resistance limits

Equipment	Insulation test	Minimum insulation resistance MΩ
Class I	Measure between live parts and accessible earthed parts.	1.0
Class II	With live and neutral conductors electrically connected, measure between live parts and any accessible metal parts.	1.0
Portable RCDs with functional earth	Measure between live parts and the functional earthing conductor	0.1
Cord sets, portable outlets and portable RCDs	Measure between live parts and the protective earthing conductor	1.0
Mineral insulated metal sheath heating elements	Measure between live parts and accessible earthed parts.	0.01

2.3.3.3 Testing of plug packs, power supply units (PSUs), portable isolation transformers and power packs

Testing shall be performed between the following components as appropriate:

(a) Live supply conductors and accessible earthed parts of the Class I transformer or enclosing case;

(b) Live supply conductors and accessible earthed parts of Class II transformers or enclosing case;

(c) Live supply conductors and the connections from the transformer output (secondary) winding;

(d) Connections from the transformer output (secondary) winding and earthed accessible earthed parts. This test is not applicable for equipment with ELV output which is connected to earth directly or by a resistive component.

2.3.3.3.1 The insulation resistance between appropriate components specified above shall be not less than 1 MΩ.

2.3.3.4 Test for operation of RCDs

RCDs shall be tested in accordance with Appendix D.

NOTE 1 The test for operating time using a.c. for Type A RCDs (a.c. and d.c. pulse sensitive) is acceptable as d.c. calibration is linked to a.c. calibration and verified by type test.

NOTE 2 Portable RCDs which are permanently wired to terminals in equipment may be tested by push button only, observing the operating time, which should be “without undue delay”. In case of doubt, use an external timer circuit, capable of detecting the test current start and finish, to measure disconnect time of not more than 150 ms for a 30 mA unit, and 40 ms for a 10 mA unit. (The test button current is assumed to be 200% x rated residual current).

2.3.3.4.1 The maximum tripping time for RCDs measured in accordance with Appendix D, shall not exceed the values shown in Table 3.

TABLE 3 - Maximum tripping times

RCD type	Test current a.c. mA	Maximum tripping time ms
Type I	10	40
Type II	30	300

2.3.3.5 Polarity of re-wireable plugs and cord extension sockets

The correct polarity of the individual wires in re-wireable plugs and cord extension sockets is shown below and additional details of older and overseas schemes are provided in Appendix F. The frequency of test is provided in column (h) of Table 4.

(a) Plugs:

The order (polarity) of the pins of a three pin flat pin plug, to their connections, shall be Earth (radial pin – green/yellow wire), Neutral (light blue wire) and then Active (brown wire), in a clockwise direction, when viewed from the front of the plug looking at the pins.

(b) Cord extension sockets:

The order (polarity) of the socket apertures of a three pin flat pin socket, to their connections, shall be Earth (radial pin – green/yellow wire), Active (brown wire) and then Neutral (light blue wire), in a clockwise direction, when viewed from the front of the socket looking at the apertures.

NOTE Wire insulation colour options are provided in AS/NZS 3191.

2.4 ACTION RESULTING FROM INSPECTION AND TESTING

2.4.1 Non-compliant equipment

Where in-service inspection or testing identifies equipment which fails to comply with the criteria given in this Standard, the equipment shall be appropriately labeled to indicate that the equipment requires remedial action and warn against further use, and withdrawn from service. The choice of remedial action, disposal or other corrective action shall be determined by the owner or the person responsible for the safety of the site.

2.4.2 Compliant equipment

Following testing, compliant equipment shall be fitted with a durable, non-reusable, non metallic tag or other indicator. Special equipment shall not be required to identify the equipment.

NOTE This shall not preclude tags from also bearing a code to facilitate electronic data collection.

2.4.2.1 The tag, which may be colour coded to identify the period in which the test was performed, shall include:

(a) The name of the person or company who performed the tests; and

(b) the test or inspection date, and may also include a re-test date.

NOTE 1 Some Regulatory Authorities or other Standards, such as AS/NZS 3012 and the AS/NZS ISO 9000 series, may require other inspection and test records to be kept.

NOTE 2 AS/NZS 4249 and AS/NZS 3012 provide guidance on one method of colour coding. Alternative methods are acceptable.

NOTE 3 Australian regulators, as listed in Appendix H, may require colour coding which complies with their particular State legislation.

2.4.2.2 Where a tag does not include information required under Clause 2.4.2.1 (a) and (b), then records shall be available on site for audit, on the next working day.

NOTE Such equipment should be marked or labeled to facilitate its ready identification from the use of such records.

2.5 DOCUMENTATION REQUIREMENTS

2.5.1 Where records of test and inspection are kept, the following should be recorded:

(a) A register of all equipment;

(b) A record of formal inspection and tests;

(c) A repair register;

(d) A record of all faulty equipment showing details of services or corrective actions.

NOTE 1 Electrical and/or occupational health and safety regulators may require documentation to be kept in some or all cases.

NOTE 2 Where organizations perform voluntary additional inspections and tests, records of such should be kept.

2.5.2 Where records are kept, they should be retained for seven years, or such period as required by the specific regulations

2.5.3 Where a risk assessment has been performed in accordance with Clause 2.1.1, all documentation shall be retained for seven years or such period as may be required by the relevant Regulator.

TABLE 4

Testing and inspection intervals for electrical equipment

(CAUTION: This page must be read in conjunction with the Standard as a whole, and particularly Clause 2.1)

Type of environment and/or equipment	Interval between inspection and tests						
	Class of equipment		Residual Current Devices (RCDs)				Cord sets and power boards
			Push-button test - by user		Operating time and push-button test		
	Class I (protectively earthed)	Class II (double insulated)	Portable	Fixed	Portable	Fixed	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1 Factories, workshops, places of work or repair, manufacturing, assembly, maintenance or fabrication	6 months	12 months	Daily, or before every use, whichever is the longer	6 months	12 months	12 months	6 months
2 Environment where the equipment or supply flexible cord is subject to flexing in normal use OR is open to abuse OR is in a hostile environment	12 months	12 months	3 months	6 months	12 months	12 months	12 months
3 Environment where the equipment or supply cord is NOT subject to flexing in normal use and is NOT open to abuse and is NOT in a hostile environment	5 years	5 years	3 months	6 months	2 years	2 years	5 years
4 Residential type areas of: hotels, residential institutions, motels, boarding houses, halls, hostels accommodation houses, and the like	2 years	2 years	6 months	6 months	2 years	2 years	2 years

Type of environment and/or equipment	Interval between inspection and tests						
	Class of equipment		Residual Current Devices (RCDs)				Cord sets and power boards
	Class I (protectively earthed)	Class II (double insulated)	Push-button test - by user		Operating time and push-button test		
			Portable	Fixed	Portable	Fixed	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
5 Equipment used for commercial cleaning	6 months	12 months	3 months	N/A	12 months	N/A	12 months
6 Hire Equipment: Inspection	Prior to hire		Including push-button test by hirer prior to hire		N/A	N/A	Prior to hire
Test and tag	3 months		N/A		3 months	12 months	3 months
7 Repaired, serviced and second-hand equipment	After repair or service which could affect electrical safety, or on reintroduction to service.						

NOTE 1 The actual sub-environment in which the equipment is located determines the row for the environment to be used in Table 4. e.g. A computer in a non-hostile environment in an office within a factory would attract a test/inspection action in accordance with Row 3.

NOTE 2 Regulatory authorities, other Standards, workplace safety requirements or manufacturers' instructions may specify intervals appropriate to particular industries or specific types of equipment.

NOTE 3 RCDs in transportable equipment shall be regarded as portable RCDs.

NOTE 4 The following Standards refer only to the inspection and testing method of Clause 2.3 of this Standard, but not to the intervals of testing in Table 4 above. Refer to the appropriate Standards for specific test intervals:

AS 1674.2	Safety in welding and allied processes - Electrical
AS/NZS 3001	Electrical installations – Re-locatable premises (including caravans and tents) and their site installations
AS/NZS 3002	Electrical installations – Shows and carnivals
AS/NZS 3003	Electrical installations –Patient treatment areas of hospitals and medical and dental practices and dialysing locations
AS/NZS 3004	Electrical installations –Marinas and pleasure craft at low voltage
AS/NZS 3012	Electrical installations –Construction and demolition sites
AS/NZS 4249	Electrical safety practices – Film, video and television sites

APPENDIX A

TEST OF EARTHING CONTINUITY

(Normative)

A1 GENERAL

The test of earthing continuity resistance shall be conducted to Clause 2.3.3.1 during in-service testing of all Class I equipment. The test shall include flexing and straining at points of entry and clamping points by the application of reasonable combination of push/pull and rotary movements. This may detect broken strands or loose connections.

A2 INSTRUMENTATION

An ohmmeter of accuracy Class 5 or better, or equipment tester (portable appliance tester or PAT) shall be used.

NOTE 1 Class 5 denotes an accuracy of 5 % full scale deflection.

NOTE 2 For "in-service" testing, either of the following are acceptable:

(a) an ohmmeter; or

(b) a PAT with one of the following test characteristics:

(i) 12 V maximum, test current in the range 100 to 200 mA (commonly known as an "earth continuity" test); or

(ii) 12 V maximum, test current of 10 A (commonly known as a "routine test"). The test duration is limited to the maximum time required for measurement; or

(iii) 12 V maximum, at 1.5 times the rated current of the appliance or 25 A, whichever is the greater (commonly known as a "type test"). The test duration is limited to the maximum time required for measurement.

A3 TEST CONDITIONS

(a) Earthing continuity resistance shall be measured between any accessible earthed parts, including rotating metal parts, and the earth pin of the plug.

The resistance shall not exceed 1 Ω.

(b) For cord extension sets, portable outlet devices, and portable RCDs, the resistance between the earthing connections of the plug and sockets shall be measured.

The resistance shall not exceed 1 Ω.

NOTE 1 Figure A1 shows one method of testing resistance.

NOTE 2 For the definition of accessible earthed parts refer to Clause 1.4.1.

NOTE 3 Values measured (with the appliance cord included), are usually found to comply with a value of less than 0.5Ω.

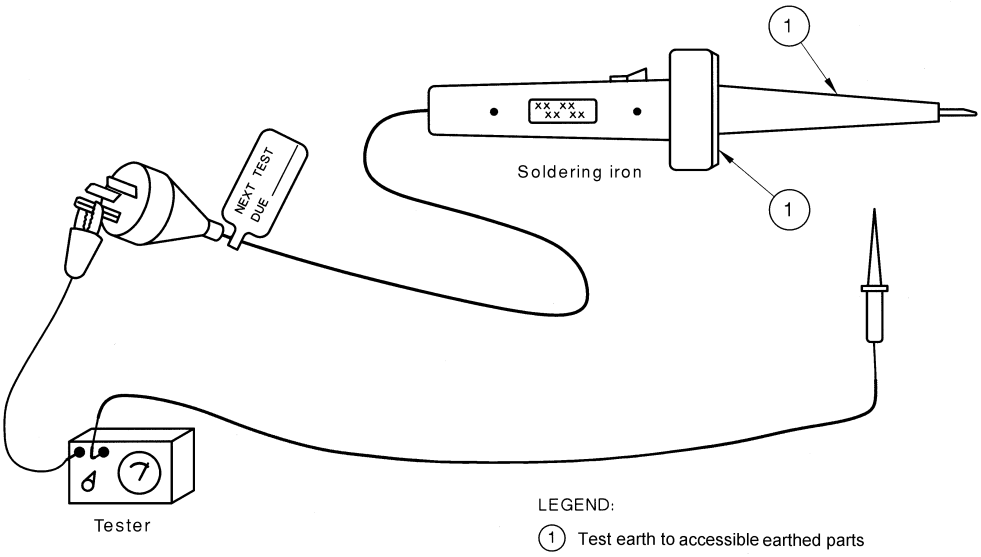


Figure A1 – Measurement of the earth continuity resistance between accessible earthed parts and the earth pin of the mains plug

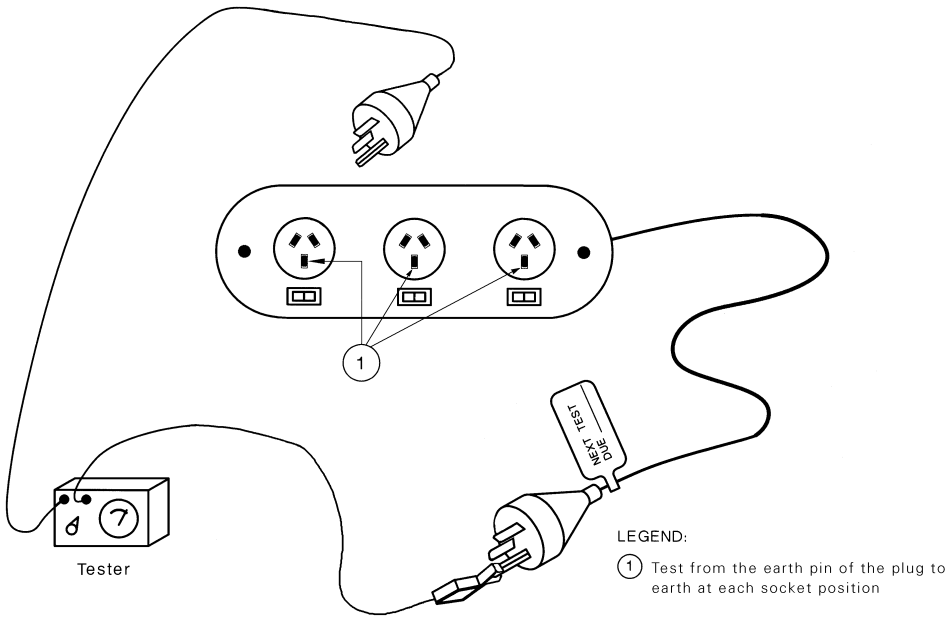


Figure A2 – Measurement of the earthing continuity resistance between the supply conductor and the earthing contacts of a power board

APPENDIX B
INSULATION TESTING

(Normative)

B1 GENERAL

Insulation resistance between live parts and accessible earthed parts measured to Clause 2.3.3.2 by measurement of the leakage or by measurement of the resistance value. Values compliant are given in Table 1 and Table 2.

B2 INSTRUMENTATION AND METHOD

B2.1 Leakage current

Measurement of the current in Class I equipment protective earth conductor can be carried out whilst the equipment is operating by:

(a) a direct reading meter in the protective earth wire circuit of the test equipment; or

(b) a clamp meter in conjunction with special cord set where the protective earth conductor can be safely separated for measurement, or

(c) a Portable Appliance Tester incorporating a leakage current measurement facility.

The meter must be capable of recording 5 mA ± 5 %.

> **WARNING** – When performing leakage current tests with the equipment energized, the protective earth conductor may be live and present a shock hazard. Safety is enhanced if the item under test is powered via a RCD. This leakage current test cannot be made using an isolating transformer because the secondary windings are insulated from earth and the earth pin of the socket and hence there is no return path for any leakage current.

B2.2 Insulation resistance

An insulation resistance meter or PAT is required with the following characteristics:

(a) A measuring circuit isolated from earth;

(b) Nominal measuring voltage is 500 V d.c. (250 V d.c. may be used for equipment containing MOVs/EMI filtering);

> NOTE For guidance on the requirements of insulation measuring equipment, refer to AS/NZS 3000 (i.e. maintain terminal voltage within + 20% and – 10% when measuring a resistance of 1 MΩ).

(c) Accuracy of Class 5 or better.

> NOTE Class 5 denotes an accuracy of 5 %, full scale deflection.

B3 TEST CONDITIONS

> NOTE A live part is a conductor or conductive part intended to be energized in normal use, including the neutral conductor. The protective earth conductor is not a live part.

B3.1 Class I equipment – Live parts to accessible earthed metal parts

Leakage current tests are performed with the equipment energized. The leakage current for appliances is not to exceed 5 mA, except that a PRCD must not exceed 2.5 mA.

Insulation resistance tests shall be performed with the switch in the ‘on’ position, the equipment de-energized, and the live supply conductors joined together. The resistance shall be not less than 1 MΩ, or for RCDs with an FE connection, 0.1 MΩ.

If the equipment must be energized to close or operate a switching device, then a leakage current test shall be performed.

NOTE 1 Figure B1 shows the testing of insulation resistance of accessible earthed parts.

NOTE 2 Accessible earthed parts are defined in Clause 1.4.1 and are required to be earthed.

B3.2 Class II equipment – Live parts to accessible unearthed parts

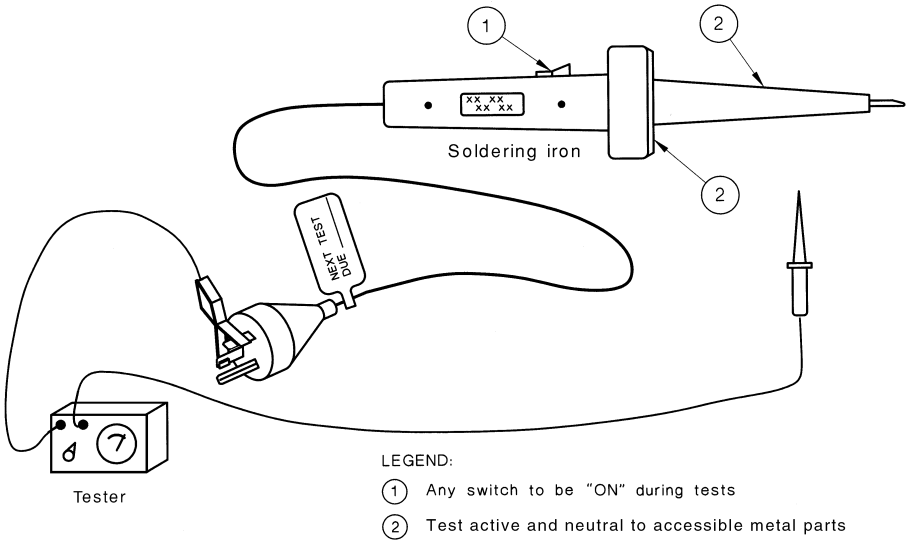
Insulation resistance is measured between the live supply conductors connected together electrically, and external unearthed metal parts, with the mains switch/selector on the equipment in the 'ON' position. The resistance shall be not less than 1 MΩ.

NOTE Figure B2 shows testing of insulation resistance of external metal parts.

B3.3 Conductors in flexible cords

For cord extension sets and portable outlet devices, the insulation resistance shall be measured between live supply conductors connected together electrically, and the earthing conductor, with the mains switch/selector for the equipment in the 'ON' position. The resistance shall be not less than 1 MΩ. When internal components may affect test values obtained, attention is drawn to Clause 2.3.3.2 (b)

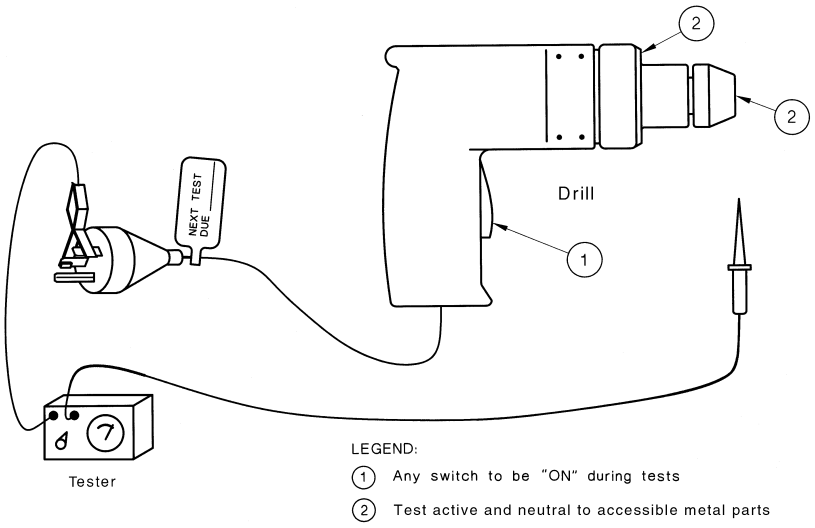
NOTE Figure B3 shows testing of a power board.



A1

Figure B1 – Measurement of the insulation resistance between live supply conductors and accessible metal parts of typical Class I Appliances

A1



A1

Figure B2 – Measurement of the insulation resistance between live supply conductors and external metal parts of a typical Class II appliance

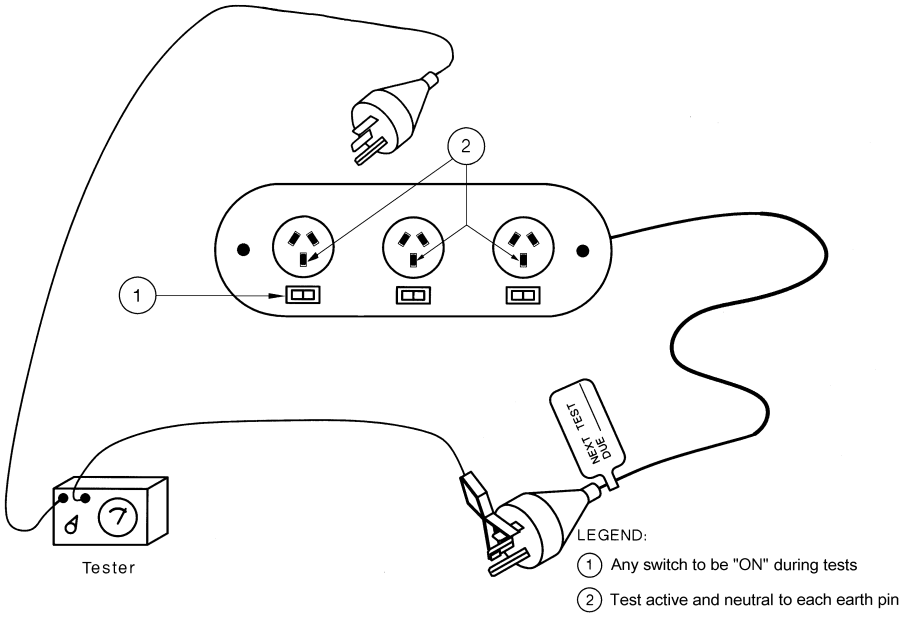


Figure B3 – Measurement of the insulation resistance of a power board

APPENDIX C

INSULATION RESISTANCE TESTING OF PORTABLE ISOLATING TRANSFORMERS

(Normative)

C1 GENERAL

Insulation resistance is measured on portable safety isolating transformers to Clause 2.3.3.3.

C2 INSTRUMENTATION

An insulation resistance meter or PAT is required with the following characteristics:

(a) A measuring circuit isolated from earth;

(b) Nominal measuring voltage 500 V d.c;

(c) Accuracy Class 5 or better.

NOTE 1 Class 5 denotes an accuracy of 5 %, full scale deflection.

NOTE 2 For guidance on the requirements of insulation measuring equipment refer to AS/NZS 3000, i.e. maintain terminal voltage within + 20% and – 10% when measuring a resistance of 1 MΩ.

C3 TEST CONDITIONS

Insulation resistance shall be not less than 1 MΩ and shall be measured between:

(a) Live supply conductors and accessible earthed parts of a Class I transformer or enclosing case;

NOTE A method is shown in Figure C1.

(b) Live supply conductors and accessible earthed parts of Class II transformers or enclosing case;

NOTE A method is shown in Figure C1.

(c) Live supply conductors and the connections from the transformer output (secondary) winding;

NOTE A method is shown in Figure C2.

(d) The connections from the transformer output (secondary) winding and accessible earthed parts.

NOTE A method is shown in Figure C3.

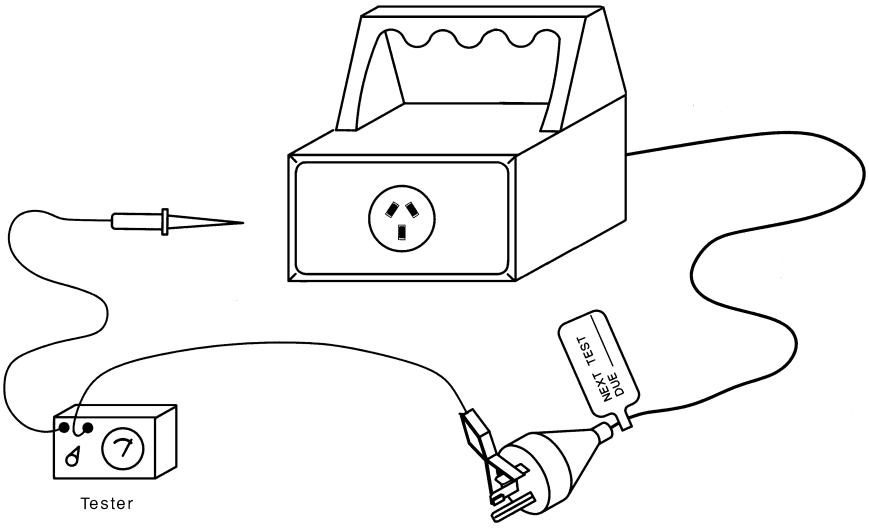


Figure C1 – Measurement of the insulation resistance between live supply conductors to a portable isolation transformer and accessible earthed parts

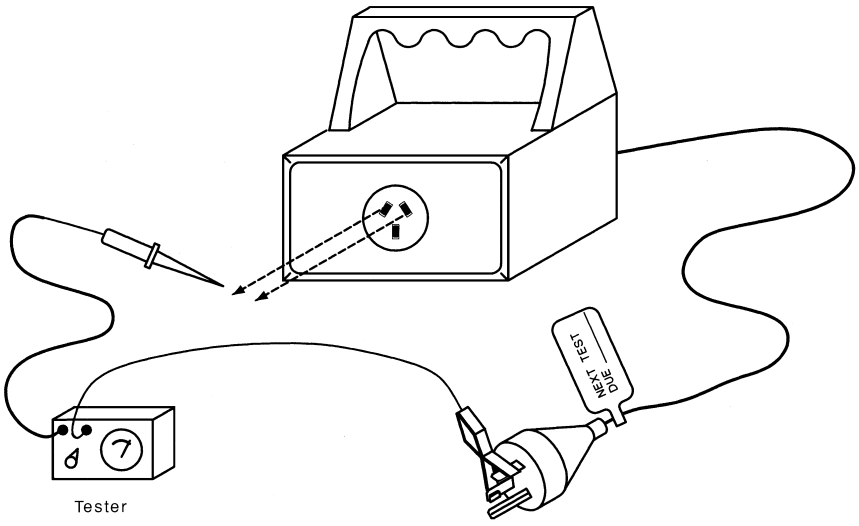


Figure C2 – Measurment of the insulation resistance between live supply conductors and the portable isolation transformer output (secondary) winding

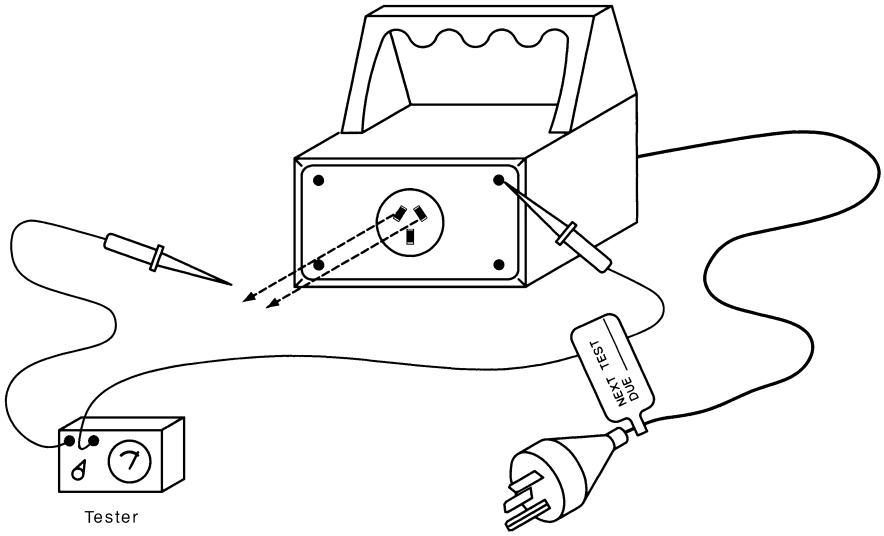


Figure C3 – Measurement of the insulation resistance between a portable isolation transformer (secondary) winding and accessible earthed parts

APPENDIX D

TEST FOR THE OPERATING TIME OF RCDs (RESIDUAL CURRENT DEVICES)

(Normative)

D1 GENERAL

D1.1 The operating time of RCDs shall be checked to Clause 2.3.3.4 with maximum values acceptable shown in Table 3.

D1.2 The following tests are not required by this Standard:

(a) Calibration sensitivity at slowly rising current;

(b) Non trip threshold (50 % rated sensitivity);

(c) d.c. pulse tests for type A. The test for operating time using a.c. for type A RCDs (a.c. and d.c. pulse half-wave sensitive) is acceptable as d.c. calibration is linked to a.c. calibration and verified by type test. The test for operating time, ensures that both type AC (sine wave a.c.) and type A have retained their type test calibration. A1

D2 INSTRUMENTATION

An RCD tester to apply rated tripping current ±5% and measure time with an accuracy dependent on the nominal tripping time as follows:

Tripping Time	Accuracy
40 ms	± 2 ms
300 ms	± 8 ms

D3 TEST CONDITIONS

A current, equal to the rated tripping current, shall be “suddenly” applied between active and protective earth and the operating time measured.

NOTE 1 Tests are applied by the instrument test button (suddenly applied). In case of doubt, a number of test operations, up to five, may be required.

NOTE 2 Some RCDs may have a different result (approximately 10 ms) depending on the point on wave of the test current. In case of doubt, the operating time at both 0^{O} and 180^{O} should be tested.

NOTE 3 Load leakage and stored energy can affect the result and increase the meter trip time indication. In case of doubt, all load on the circuit should be disconnected.

NOTE 4 A 240 V test meter, used on 230 V may give a low test current and correspondingly longer times. Ensure the correct rating and tolerance of the test instrument.

NOTE 5 Tests on three phase units are carried out on one phase only. In case of doubt, as the vector of the test current and the load leakage current are important, the load should be disconnected.

NOTE 6 The test from active to earth involves the complete earth fault loop and the resistance of the earth wire, or current flowing in the earth wire may affect results. In case of doubt, a bench test may be required.

NOTE 7 Portable RCDs which are permanently wired to terminals in equipment may be tested by push button only, and observing the operating time, which should be without undue delay. In case of doubt, use an external timer circuit, to detect the test current start and finish, and actually measure the disconnect time which should be not more than 150 ms for a 30 mA unit and 40 ms for a 10 mA unit. (The test button current is assumed to be 200 % x rated residual current).

APPENDIX E

INSULATION RESISTANCE TESTING OF A POWER PACK

(Normative)

E1 GENERAL

Insulation resistance is measured on power packs to Clause 2.3.3.3.

E2 INSTRUMENTATION

An insulation resistance meter, or PAT, is required with the following characteristics:

(a) A measuring circuit isolated from earth;

(b) Nominal measuring voltage 500 V d.c;

(c) Accuracy of Class 5 or better;

NOTE 1 Class 5 denotes an accuracy of 5 %, full scale deflection.

NOTE 2 For guidance on the requirements of insulation measuring equipment, refer to AS/NZS 3000, i.e. maintain terminal voltage within + 20 % and – 10 % when measuring a resistance of 1 MΩ.

E3 TEST CONDITIONS

Insulation resistance shall be measured between:

(a) live supply conductors electrically connected together, and accessible earthed parts of a Class I enclosing case; or

(b) live supply conductors and external metal parts of a Class II enclosing case; or

(c) live supply conductors and the connections from the output.

NOTE A method is shown in Figure E1.

E3.1 The insulation resistance measured shall be not less than 1 MΩ.

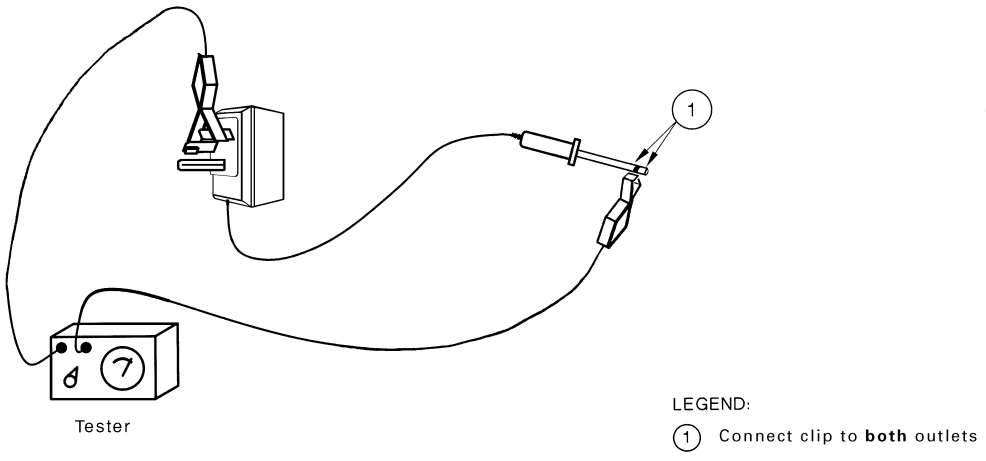


Figure E1 – Measurement of the insulation resistance of a power pack

APPENDIX F

POLARITY FOR EXTENSION CORDS AND IEC (appliance) CORDS

(Normative)

F1 Cord Sets with re-wireable plugs and/or sockets are to be checked for correct polarity of the wiring.

F2 The correct wiring for an IEC cord set is shown in Figure F1.

F3 The correct wiring for an extension cord set is shown in Figure F2.

F4 The recommended conductor colours for flexible cord sets are given in Table F1 in the "International" column. The other two columns are included for completeness, as older cord sets and imported cord sets constructed to differing schemes are still in use. Until confirmed, caution should be exercised, as the active conductor's insulation may not be brown.

WARNING When imported, plugs based on the USA scheme are frequently removed and replaced. Such cord sets should be treated with caution until the correct polarity is confirmed.

Table F1 - Conductor colours for flexible cord sets.

Function	International	Superseded	USA
Active /Line	Brown	Red	Black
Neutral	Blue	Black	White
Earth	Green/Yellow	Green	Green

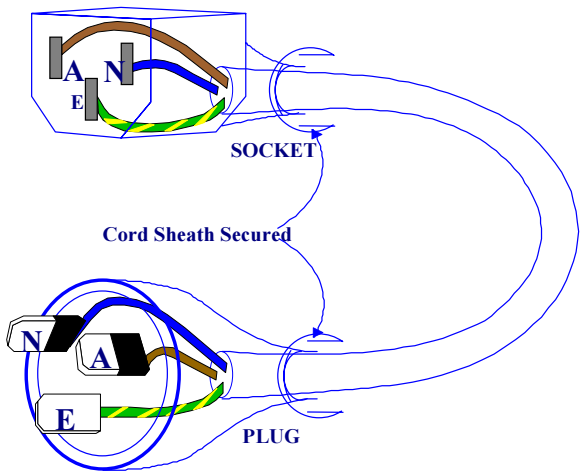


Figure F1 – IEC cord set

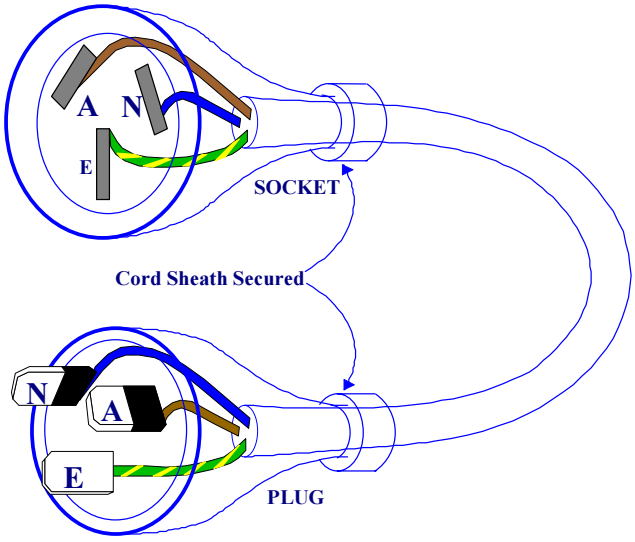


Figure F2 – Extension cord set

APPENDIX G

BACKGROUND

(Informative)

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

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.

G1 PRINCIPLES OF CONSTRUCTION OF ELECTRICAL EQUIPMENT

Accessible earthed 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 accessible earthed parts and the live parts, and earthing the accessible earthed parts. Equipment for which some or all of the accessible earthed parts require protective earthing, are basic insulated items, which are also referred to as Class I equipment.

NOTE Some electric drills have an external metal chuck, which may be double insulated from live parts. The nameplate marking may indicate this.

(b) Provision of double or reinforced insulation between the accessible earthed parts and the live parts. Equipment in which none of the accessible earthed 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 generally manufactured with a non-conductive (insulated) enclosure, and is marked either with the words 'DOUBLE INSULATED' or with the symbol  to allow easy identification.

NOTE This type of equipment cannot be tested for earth continuity or insulation resistance to earth. The insulation resistance can be measured between live parts and a flexible electrode (such as aluminum foil) wrapped over the insulation.

G2 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.

G3 INSULATION RESISTANCE

Insulation resistance testing is intended to ensure the integrity of the insulation between live mains parts and accessible 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.

G4 TEST EQUIPMENT

The equipment required to carry out the tests detailed in this Standard should be subjected to routine verification at regular intervals to ensure it is working correctly and its accuracy is maintained. A1

G5 DOCUMENTATION

Records of maintenance, including (but not limited to) 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 actions, and ensuring these actions have been carried out. It is recommended that such records be retained for not less than seven years.

APPENDIX H

REGULATORY APPLICATION OF THIS STANDARD

(Informative)

H1 GENERAL

Relevant regulatory authorities in the Australian States and Territories and in New Zealand may require compliance with this Standard under their various regulatory instruments.

The purpose of this Appendix is to provide contact details of the relevant authorities which enforce regulations relating to the in-service inspection and testing of electrical equipment in each of the Australian States and Territories and in New Zealand.

This information is accurate at the time of publication of this Standard. Users are advised to consult the relevant nominated regulatory authority for information current at the time of use.

H2 REGULATORY AUTHORITIES

New South Wales

WorkCover NSW
92-100 Donnison Street, Gosford.

Postal Address: Locked Bag 2906, Lisarow NSW 2252
Client Contact Centre, Phone: 13 10 50

Website: www.workcover.nsw.gov.au

Victoria

Victorian WorkCover Authority
Level 24, 222 Exhibition St
Melbourne 3000

WorkCover Advisory Service

Ph (03) 9641 1555
Fax (03) 9641 1222

Website: www.workcover.vic.gov.au

Queensland

Street Address: Electrical Safety Office
Department of Industrial Relations
Level 6, Neville Bonner Building
75 William Street
Brisbane Qld 4000

Postal Address: GPO Box 69
Brisbane Qld 4001

Telephone: (07) 3237 0220
Facsimile: (07) 3237 0229

Website: www.eso.qld.gov.au.

Australian Capital Territory

ACTPLA
Street Address: Central Office, Ground Floor, North,
Dame Pattie Menzies House,
16 Challis Street Dickson

Telephone: (02) 6207 1926
Fax: (02) 6207 1925

Website: www.actpla.act.gov.au

ACT Workcover
Street Address: Level 4 Eclipse House
197 London Circuit
Canberra City ACT 2601

Postal Address: PO Box 224
Civic Square ACT 2608

Telephone: (02) 6205 0200
Facsimile: (02) 6205 0336

Website: www.workcover.act.gov.au

Commonwealth OH&S regulator, Comcare
Street Address: Level 1,
14 Moore St
Canberra ACT 2600

Postal Address: GPO Box 9905

Canberra ACT 2601
Telephone: 1300 366 979
Facsimile: (02) 6257 5634

Website: www.comcare.gov.au

Tasmania

Workplace Standards Tasmania
Street Address: 30 Gordons Hill Rd,
Rosny Park 7018
Postal Address: PO Box 56
Rosny Park TAS 7018

Telephone: 1300 366 322
Facsimile:

Website: www.wsa.tas.gov.au

Northern Territory

Electrical Safety Office
Street address: Minerals House
66 The Esplanade
Darwin NT 0800

Postal Address: GPO Box 4821
Darwin NT 0801

Telephone: (08) 8999 5010
Facsimile: (08) 8999 6260

Website: www.deet.nt.gov.au/wha/pages/electrical

South Australia

Office of the Technical Regulator (SA)

Level 19 Wakefield House
30 Wakefield Street
Adelaide SA 5000

Telephone: (08) 8226 5500
Facsimile: (08) 8226 5523

Website: www.technicalregulator.sa.gov.au

Western Australia

Electrical Work is also subject to the terms of the Occupational Safety and Health Act 1984 and the Occupational Safety and Health Regulations 1996, which are administered by WorkSafe Western Australia.

Energy Safety Directorate
Street Address: West Leederville Office (Head Office)
20 Southport Street
WEST LEEDERVILLE, Western Australia 6007
Phone: (08) 9422 5200
Facsimile: (08) 9422 5244

Website: www.energysafety.wa.gov.au

Work Safe Western Australia
Street Address: 5th Floor, 1260 Hay Street
WEST PERTH WA 6005

Postal Address: PO Box 294
WEST PERTH WA 6872

Telephone: (08) 9327 8777
Facsimile: (08) 9321 8973

Website: www.safetyline.wa.gov.au

New Zealand

The Energy Safety Service of the Ministry Of Economic Development is the Electrical Safety Regulator in New Zealand.

Energy Safety Service
33 Bowen Street
Wellington
New Zealand

Postal Address: PO Box 1473
Wellington,
New Zealand.

Telephone: + 64 4 472 0030
Facsimile: + 64 4 460 1365

Website: www.ess.govt.nz

A P P E N D I X J

GUIDELINES ON THE ELECTRICAL KNOWLEDGE OF A COMPETENT PERSON

(Informative)

APPLICABLE TO NEW ZEALAND ONLY

This is an Informative Appendix, applicable in New Zealand only, and provided for information and guidance. Guidelines on the electrical knowledge and other principles with which a Competent Person is likely to be familiar are provided below on an indicative basis only.

IMPORTANT: This Appendix is under development, and in accordance with the principle of continual improvement of standards, comment on it is welcomed.

J1 - Basic electrical principles

- Introduction to electricity, AC and DC
- Electrical units: Amps, Ohms, Volts

J2 - Circuit protection

- Fuses
- Circuit breakers
- Residual current devices (RCDs)

J4 - Electrical safety

- Working with electricity
- Effects of current flow

J5 - Inspection and testing to this Standard

- Inclusions and exclusions
- Classes of equipment
- Types of insulation
- Protective earth operation
- Insulation resistance
- Leakage current

J6 - Applicable Regulations

AMENDMENT CONTROL SHEET

AS/NZS 3760:2003

Amendment No. 1

REVISED TEXT

SUMMARY: This amendment applies to Clauses 1.1, 1.2.1.1, 1.3, 1.4.1 (a) (ii), Appendix B Figure B1 Title, Appendix B Figure B1 Legend 2, Appendix B Figure B2 Legend 2, Appendix D1.2(c), Appendix G4, and inserts a new Clause 1.1.6.

Published on 3 August 2005.

NOTES

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