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LIABLE TO ALTERATION DO NOT USE AS A STANDARD

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AS/NZS 3820:20XX

Essential safety requirements for electrical equipment
STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Committee QR-012- Conformance Marking to Regulatory Requirements,

DRAFT
Australian/New Zealand Standard
Revision of AS/NZS 3820:2009
Essential safety requirements for electrical equipment

Comment on the proposal is invited from persons and organizations concerned with this subject. Comments can be submitted electronically via the Standards New Zealand website http://www.standards.govt.nz/developing-standards/comment-on-draft-standards/

Alternatively, please contact bev.harniss@mbie.govt.nz for a comment form in Word format.

Attention is drawn to the fact that this document is a draft standard only and is liable to alteration in the light of comment received. It is not to be regarded as an Australian/New Zealand Standard until finally issued as such by Standards Australia and Standards New Zealand.
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This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee QR-012, Conformance Marking to Regulatory Requirements to supersede AS/NZS 3820:2009 12 months from the date of publication.

The objective of this Standard is to provide a set of outcome-oriented criteria for the safety of electrical equipment before being placed on the market. For electrical equipment that is required to be approved/certified/registered by electrical safety legislation before being placed on the market, there are specific regulatory requirements additional to the requirements given in this Standard.

This Standard is intended to be consistent with the criteria of the European Union low voltage directive.

In the preparation of this Standard, consideration was given to the following publications and acknowledgment is made of the assistance received:

- European Union low voltage directive 2014/35/EU on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

This Standard is not a substitute for Standards that set out objective safety requirements based on testing. Rather it provides a high-level generic description of the safety outcomes to be achieved and is intended to assist in providing a basis for regulatory uniformity. Specific product Standards provide measurable criteria that are regarded as ensuring that the outcomes described in this Standard will be met.

Whilst compliance to this standard may be claimed by declaration, supporting documentation (such as certification or test reports or appropriate engineering assessments) is expected to be available if requested by a government electrical safety regulator. Certification or test reports must reference a relevant standard (or standards) that have the electrical equipment in question within their scope and any other reports for additional risks identified applicable to the electrical equipment that may not be covered by the general relevant standards. Where no one standard or standards cover the electrical equipment within its scope, or cover the risks identified or likely, reports to test standards and additional reports beyond test standards may be required.

Claimed compliance to requirements of this standard would be null and void in the event of incidents occurring due to design or manufacturing failure or due to being used in a manner not excluded by the instructions for use (even after installation in accordance with the instructions) or during use of the electrical equipment, regardless of any supporting documentation supplied at time of declaration of compliance. Refer also to clause 5.1.

This revision replaces the 2009 edition of AS/NZS 3820 to make it more compatible with the current safety regulatory requirements in Australia and New Zealand. It also includes consequential editorial changes.

The terms ‘normative’ and ‘informative’ are 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, whereas an ‘informative’ appendix is only for information and guidance.

Words in bold in the text are defined in clause 3.
1 SCOPE

This standard applies to electrical equipment designed for use with a supply or output voltage not exceeding 1000 Volts for alternating current and 1500 Volts for direct current, and intended for the purposes of generation, conversion, transmission, distribution or utilisation of electricity.

This Standard sets out requirements for electrical equipment, to ensure that electrical equipment is constructed in accordance with good engineering practice in regard to safety such that it does not endanger the safety of persons (particularly children, the elderly and people with disabilities), domestic animals or property, when properly installed and maintained and used in applications for which it was made.

Medical electrical equipment and electrical equipment used in hazardous areas are subject to essential safety requirements in addition to those included in this standard.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS 3112 Approval and test specification—Plugs and socket-outlets
AS/NZS 60335.1 Household and similar electrical appliances – Safety – Part 1: General requirements

3 DEFINITIONS

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

3.1 electrical equipment
switch gear, control gear, accessories, appliances, luminaires and fittings used for such purposes as generation, conversion, storage, transmission, distribution or utilization of electrical energy.

3.2 direct contact
contact of persons or animals with a conductor that in normal circumstances is live.

3.3 electric toy
product designed or clearly intended for use in play by children under 14 years old and having at least one function dependent on electricity.

3.4 indirect contact
contact of persons or animals with a conductive part that is not normally live, but has become live due to fault conditions, insulation failure or other accidental circumstances.

3.5 relevant standard
The relevant standard or standards (if any) for a type of electrical equipment is—
For Australia

(a) if there is a Standards Australia or joint Standards Australia and Standards New Zealand standard that applies specifically to the type—that standard; or

(b) if there is not a Standards Australia or joint Standards Australia and Standards New Zealand standard that applies specifically to the type and there is an IEC standard that applies specifically to the type—the IEC standard.

For New Zealand

if there is a joint Standards Australia and Standards New Zealand standard or a standard listed in the schedules to the Electricity Safety Regulations or an IEC standard that applies specifically to the type—that standard. If there are New Zealand only variations to any of these standards then these must be satisfied.

3.6 supplier

person or entity who takes responsibility for putting the product on the market.

4 SAFETY REQUIREMENTS

4.1 General conditions

Electrical equipment shall comply with the following criteria:

(a) The essential characteristics, the recognition and observance of which will enable electrical equipment to be used safely and in applications for which it was made, shall be marked in English on the electrical equipment, or, if this is not possible, on an accompanying notice. Such characteristics shall include the rated voltage and frequency.

NOTE The purpose of this requirement is to ensure that the user of the electrical equipment has all necessary safety information. The expression ‘used safely’ would include assembly, installation and maintenance of the electrical equipment. Information may be marked on the electrical equipment (important for any safety warnings), provided on the packaging (for example, where the danger relates to not following assembly instructions), or in user information provided with the electrical equipment (for example, assembly, maintenance and operation instructions).

(b) A means of identifying the supplier shall be clearly marked on the electrical equipment or, where that is not practicable, on the packaging or user information accompanying the electrical equipment.

NOTE The means of identifying the supplier should be such that an interested person can identify and contact the supplier, either directly from the information provided, or indirectly via information that is publicly available. Such means of identification may include—

(i) Business name and business address (other than a post office box number) in each country of sale (Australia and/or New Zealand);

(ii) Registered business name (Australia and/or New Zealand);

(iii) Australian Company Number (ACN), for products sold only in Australia;

(iv) Australian Business Number (ABN), for products sold only in Australia;

(v) New Zealand Company Number, for products sold only in New Zealand; and

(vi) Trademark registered in each country of sale (Australia and/or New Zealand);

(c) The electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled, installed and connected.

(d) The electrical equipment shall be so designed and manufactured as to ensure that protection against the dangers set out in Clauses 4.2 and 4.3 is assured, providing the electrical equipment is used in applications for which it was made and is adequately maintained.

NOTE The expression ‘used in applications for which it was made’ would be considered to include foreseeable environmental conditions and foreseeable misuse. Also, where electrical equipment is for location in restricted access areas (i.e. not generally accessible to the public), it may be assumed that the electrical equipment is only accessible to service personnel.

4.2 Protection against hazards arising from electrical equipment

Electrical equipment shall comply with the following criteria:
(a) Persons and domestic animals shall be adequately protected against danger of physical injury or other harm which might be caused by direct contact or indirect contact.

NOTE For example, protection against direct contact may be achieved by insulation of conductors or by their inaccessibility within enclosures. Protection against indirect contact may be achieved by automatic disconnection of the supply in the event of a fault likely to cause a dangerous current to flow through a person in contact with exposed conductive parts. Other safety measures may also be suitable. Electrical equipment classified as a class 0 appliance or a class 0I appliance, as defined in AS/NZS 60335.1, are deemed not to satisfy this requirement.

(b) Operation of the electrical equipment shall not result in temperatures, arcs or radiation (including microwave emissions, magnetic fields, Infrared, UV-A, UV-B, UV-C radiation and radiation from lasers and intense light sources) that would cause a danger.

NOTE The extent to which a danger exists needs to be considered in relation to the nature of the electrical equipment and its use. Some electrical equipment will normally operate at high temperatures (for example, heating, cooking or lighting electrical equipment), or represent a physical danger. Item (b) does not apply to the extent that if the electrical equipment is normally used to produce such a result, this is a normally accepted risk in the use of such electrical equipment.

(c) Persons and domestic animals shall be adequately protected against non-electrical dangers caused by the electrical equipment that are revealed by experience.

NOTE Examples of potential dangers are sharp edges, unexpected starting or stopping of the electrical equipment, failure to stop if a dangerous situation arises, chemical, fire or explosion hazards that might arise from operation of the electrical equipment, instability, vibration, falling or ejected objects.

(d) Insulation shall be suitable for foreseeable conditions.

NOTE The choice of insulation should be based on the electrical, mechanical, chemical and physical stresses to which the insulation is likely to be subject in foreseeable use of the electrical equipment.

4.3 Protection against hazards caused by external influences on electrical equipment

Electrical equipment shall comply with the following criteria:

(a) The electrical equipment shall meet the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered.

NOTE For example, the design of tools and similar electrical equipment, which may be used outdoors, should take account of more adverse conditions of use than would apply to indoor electrical equipment. If the electrical equipment is not for fixed or hand-held use, it should be sufficiently stable to remain in a specific position.

(b) The electrical equipment shall be resistant to non-mechanical influences in environmental conditions in such a way that persons, domestic animals and property are not endangered.

NOTE For example, electrical equipment likely to be used near water should have the appropriate degree of protection against entry of water.

(c) The electrical equipment shall not endanger persons, domestic animals or property in conditions of overload.

4.4 Specific requirements for electric toys

Electric toys shall not be powered by electricity exceeding 24 V and the voltage of their accessible parts shall not exceed 24 V.

Internal voltages shall not exceed 24 V unless it is ensured that the voltage and the current combination generated do not lead to any risk or harmful electric shock, even when the electric toy is broken.

Electric toys may be supplied from a separate power supply. The power supply shall have an input voltage not exceeding 250 V a.c. and have double insulation characteristics with a SELV secondary voltage not exceeding 24 V a.c. or d.c. and having a rated output not exceeding 200 VA and rated output current not exceeding 10 A.

4.5 Specific requirements for the plug portion of electrical equipment with integral pins

The plug portion of electrical equipment, as defined in AS/NZS 3112, fitted with integral pins for insertion into a socket-outlet shall comply with the requirements of AS/NZS 3112.

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5 COMPLIANCE

5.1 Compliance

A supplier, shall demonstrate compliance with Clause 4 by the following:

- Compliance to the relevant standard with documentation specified in clause 5.2(e); or
- A technical construction file with documentation as specified in Clause 5.2 that shows compliance equal to or better than the requirements in the relevant standard; or
- If there is no relevant standard for the type of electrical equipment, compliance with Clause 4 shall be demonstrated with documentation specified in Clause 5.2, including a list of the standards applied in full or in part and the reasons why they were applied, and descriptions of the solutions adopted to satisfy the safety aspects of this Standard.

Compliance with Clause 4 may not be recognized if, for example—

- There is a shortcoming in the relevant standard;
- There is an inappropriate application of the relevant standard; or

NOTE A representative but not exclusive list of relevant safety Standards is given in Appendix B.

- There is a failure to comply with good engineering practice as referred to in Clause 1

NOTE Further guidance to suppliers is provided in Appendix A.

5.2 Technical documentation

Where required under 5.1, technical documentation is needed to be able to assess the conformity of the electrical equipment to the requirements of this Standard. It shall, as far as relevant for such an assessment, cover the design, manufacture and operation of the electrical equipment. It shall include—

(a) A general description of the electrical equipment including photographs;
(b) Conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits;
(c) Descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the electrical equipment;
(d) Results of design calculations made, examinations and risk assessments carried out;
(e) Test reports or in lieu of test reports, certificates issued by an Australian or New Zealand regulatory authority or an entity recognised by the Australian or New Zealand regulatory authorities; or
(f) Test reports or documentation to show compliance with clause 4;
(g) Application and details of routine tests and other processes to ensure on-going compliance to the relevant standard for the manufactured electrical equipment.

NOTE: Information relating to test report formats can be found in IECEE OPERATIONAL DOCUMENT IECEE OD-2020 “TRF – Development, maintenance and use”
Appendix A
(informative)

Guidance for suppliers

Suppliers may use independent third parties to assist in the assessment of compliance with clause 4.

Independent third parties may include:

(a) Government electrical safety regulators;

(b) Joint Accreditation System of Australia and New Zealand (JAS-ANZ) accredited third party certification bodies;

(c) A laboratory accredited by one of the following:

(i) National Association of Testing Authorities (NATA) or International Accreditation New Zealand (IANZ) or a body with which NATA or IANZ has a mutual recognition agreement;

(ii) The IECEE CB Scheme, which is the scheme for mutual recognition of the results of testing (CB Scheme) administered by the IEC system for conformity testing to Standards for safety of electrical equipment (the IECEE). See also Internet address http://www.iecee.org;

(d) Government electrical safety regulator accredited certification bodies.
Appendix B
(informative)

List of representative relevant standards on electrical and electronic product safety

The following list is representative only. For other applicable Australian and New Zealand Standards, refer to the web sites or catalogues of the relevant Standards body.

AS/NZS
3100 Approval and test specification—General requirements for electrical equipment (series)
60065 Audio, video and similar electronic apparatus—Safety requirements
60335 Household and similar electrical appliances—Safety (series)
60598 Luminaires (series)
60745 Hand-held motor-operated electric tools—Safety (series)
60950.1 Information technology equipment—Safety—Part 1: General requirements
61558 Safety of power transformers, power supplies, reactors and similar products (series)
62841 Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery (series)
62368 Audio/video, information and communication technology equipment – Part 1: safety requirements

NOTE AS/NZS 4417.2 lists applicable standards for a range of regulated electrical equipment.