

Australian/New Zealand Standard™

Radiofrequency fields

**Part 2: Principles and methods of
measurement and computation—3 kHz
to 300 GHz**



AS/NZS 2772.2:2016

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The following are represented on Committee TE-007:

Australian Centre for Radiofrequency Bioeffects Research
Australian Communications and Media Authority
Australian Industry Group
Australian Mobile Telecommunications Association
Australian Radiation Protection and Nuclear Safety Agency
Communications, Electrical and Plumbing Union—Electrical Trades Division
Department of Defence (Australian Government)
Electrical Compliance Testing Association
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-007, Human Exposure to Electromagnetic Fields, to supersede AS/NZS 2772.2:2011.

This Standard incorporates Amendment No. 1 (September 2018). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of the Standard is to specify commonly accepted processes for assessing compliance with the exposure limits of radiofrequency (RF) safety standards such as ARPANSA Standard RPS3 and New Zealand Standard NZS 2772.1. It includes methodologies for reliably assessing human exposures to radiofrequency electromagnetic fields by measurement or computation, which form part of any compliance assessment.

Significant changes incorporated in this edition include the following:

- (a) Calculation, reporting and application of uncertainty in RF exposure assessments.
- (b) Guidance on spatial averaging provided along with instrumentation selection and calibration for new technologies, such as 4G.
- (c) A review of the harmonization with other international standards, and new case studies relating to Wi-Fi and smart meters.

A1 | Amendment 1 to this Standard incorporates SAR assessment methods for radiocommunication base stations.

The term 'informative' has been used in this Standard to define the application of the appendices to which it applies. An 'informative' appendix is only for information and guidance.

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FOREWORD

The reliable evaluation of radiofrequency (RF) electric and magnetic field exposures and the subsequent assessment of compliance with relevant RF safety exposure standards are complex and specialized tasks. Users of this Standard should be aware that a full understanding of its content requires a well-developed knowledge of RF field theory and practice, and the potential hazards associated with exposure to RF fields. It also requires knowledge of the limitations of the measurement techniques, instrumentation and computational methods used.

For safety compliance assessments, the assessor should be aware of the exposure limits set out in the relevant RF safety standards such as ARPANSA Standard RPS3 or New Zealand Standard NZS 2772.1, and be in possession of appropriate skills, knowledge and understanding. Notwithstanding these requirements, this Standard will also be of use to anyone wishing to better inform themselves in this area.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for, and provides guidance on, assessing compliance with the exposure limits of radiofrequency (RF) safety standards such as ARPANSA Standard RPS3 or New Zealand Standard NZS 2772.1. This includes methodologies for making an assessment (by measurement or computation) of human exposure to ambient RF fields and induced body currents in the frequency range of 3 kHz to 300 GHz.

A1 | This Standard also sets out processes for calculating the basic restrictions' quantities (such as specific absorption rate (SAR) and induced current density) in the relevant standards and addresses SAR measurement.

This Standard provides appropriate methodologies for measurement techniques and instrumentation selection, computational techniques and the determination of the uncertainty of exposure assessments and its use in assessing compliance with applicable exposure limits.

The assessment methodologies provided in this Standard may be applied for all types of RF exposure situations including exposure to —

- (a) leakage fields;
- (b) radiated fields; and
- (c) reactive fields.

NOTE: Leakage fields generally imply unintentional leakage of energy, whereas radiated fields are considered primarily to be intentionally radiated RF fields. Reactive fields are present in the immediate vicinity of all sources or re-radiating objects.

A1 | This Standard is applicable to the compliance assessment of RF exposures from most kinds of RF sources including—

- (i) broadcast installations;
- (ii) radiocommunication base stations and facilities;
- (iii) radar installations;
- (iv) medical applications such as diathermy machines;
- (v) industrial applications, including RF welders, heaters and induction heaters;
- (vi) wireless charging devices; and
- (vii) scientific applications.

Advice and examples describing approaches to the assessment of reference level/basic restriction quantities are presented in Appendices H through to L.