

Australian/New Zealand Standard™

**Limits and methods of measurement of
radio disturbance characteristics of
electrical lighting and similar equipment
(CISPR 15:2000, MOD)**



Standards Australia



STANDARDS
NEW ZEALAND
PUBLISHED BY THE STANDARDS SOCIETY OF NEW ZEALAND

AS/NZS CISPR 15:2002

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TE-003, Electromagnetic Interference. It was approved on behalf of the Council of Standards Australia on 26 November 2001 and on behalf of the Council of Standards New Zealand on 19 February 2002. It was published on 13 March 2002.

The following interests are represented on Committee TE-003:

Australian Broadcasting Authority
Australian Chamber of Commerce and Industry
Australian Communications Authority
Australian Competent Bodies Association Secretariat
Australian Electrical and Electronic Manufacturers Association
Australian Information Industry Association
Australian Subscription Television and Radio Association
Cable & Wireless Optus
Commonwealth Scientific and Industrial Research Organization
Consumer Electronics Suppliers Association
Department of Defence, Australia
Electrical Compliance Testing Association
Federation of Australian Commercial TV Stations
Institution of Engineers, Australia
Ministry of Economic Development (New Zealand)
Society of Automotive Engineers, Australasia
Telstra Corporation
The IREE Society
Wireless Institute Australia

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

Australian/New Zealand Standard™

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15:2000, MOD)

Originated as AS/NZS 4051:1992.
Previous edition AS/NZS 4051:1994.
Jointly revised and redesignated as AS/NZS CISPR 15:2002.

COPYRIGHT

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 4274 2

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Interference to supersede AS/NZS 4051:1998.

The objective of this Standard is to specify limits and methods of tests for the measurement of radio disturbance characteristics of electrical lighting and similar equipment. The frequency range covered is 9 kHz to 400 GHz.

This Standard has been reproduced from CISPR 15:2000, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*, and some modifications to requirements have been made to reflect local conditions.

Variations to the CISPR document are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies IEC tables, figures and passages of text which, for the purposes of this Australian/New Zealand Standard, are deleted. Where Australian/New Zealand tables, figures or passages of text are added, each is set in its proper place and identified by shading (example). Modifications for Australian and New Zealand conditions are given in Table 2a, *Disturbance voltage limits at mains terminals* and Table 3, *Radiated electromagnetic disturbance limits*.

In this Standard, the following print types are used:

- requirements proper: in arial type;
- *test specifications: in italic type;*
- explanatory matter: in smaller arial type.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this standard' should read 'this Australian/New Zealand Standard'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

The term 'normative' has been used in this Standard to define the application of the annex to which it applies. A 'normative' annex is an integral part of a Standard.

CONTENTS

Clause	<i>Page</i>
1 Scope.....	1
2 Normative references	2
3 Definitions	2
4 Limits	2
4.1 Frequency ranges.....	2
4.2 Insertion loss	3
4.3 Disturbance voltages	3
4.4 Radiated electromagnetic disturbances.....	4
5 Application of the limits	5
5.1 General	5
5.2 Indoor luminaires	5
5.3 Independent auxiliaries exclusively for use with lighting equipment.....	6
5.4 Self-ballasted lamps	8
5.5 Outdoor lighting appliances	8
5.6 UV and IR radiation appliances.....	9
5.7 Transport lighting.....	10
5.8 Neon and other advertising signs.....	10
5.9 Self-contained emergency lighting luminaires	10
5.10 Replaceable starters for fluorescent lamps	11
6 Operating conditions for lighting equipment.....	11
6.1 General	11
6.2 Lighting equipment	11
6.3 Supply voltage and frequency.....	11
6.4 Ambient conditions	11
6.5 Lamps	12
6.6 Replaceable starters.....	12
7 Method of insertion loss measurement.....	12
7.1 Circuits for the measurement of insertion loss	12
7.2 Measuring arrangement and procedure.....	13
7.3 Luminaire	14
7.4 Measurement procedure	14
8 Method of measurement of disturbance voltages	15
8.1 Measuring arrangement and procedure.....	15
8.2 Indoor and outdoor luminaires	15
8.3 Independent light regulating devices.....	16
8.4 Independent transformers and convertors for incandescent lamps	16
8.5 Independent ballasts for fluorescent and other discharge lamps	16
8.6 Self-ballasted lamps and semi-luminaires	17
8.7 UV and IR radiation appliances.....	17
8.8 Self-contained emergency lighting luminaires	17
8.9 Independent starters and igniters for fluorescent and other discharge lamps	18
9 Method of measurement of radiated electromagnetic disturbances	18
9.1 Measuring arrangement and procedure.....	18
9.2 Indoor and outdoor luminaires	18
9.3 Independent convertors for incandescent lamps	18
9.4 Independent ballasts for fluorescent and other discharge lamps	18
9.5 Self-ballasted lamps and semi-luminaires	18
9.6 UV and IR radiation appliances.....	18
9.7 Self-contained emergency lighting luminaires	19

Clause	<i>Page</i>
10 Interpretation of CISPR radio disturbance limits.....	19
10.1 Significance of a CISPR limit	19
10.2 Tests	19
10.3 Statistical method of evaluation	19
10.4 Banning of sales.....	20
 Annex A (normative) Electrical and constructional requirements for the low-capacitance balance-to-unbalance transformer.....	 33
 Figure 1 Insertion loss measurement on linear and U-type fluorescent lamp luminaires	 21
Figure 2 Insertion loss measurement on circular fluorescent lamp luminaires	22
Figure 3 Insertion loss measurement on luminaires for single-capped fluorescent lamps with integrated starter	23
Figure 4a Configuration of linear and U-type dummy lamps.....	24
Figure 4b Configuration of circular dummy lamps	25
Figure 4c Dummy lamp for 15 mm fluorescent lamps	26
Figure 4d Dummy lamp for 15 mm single-capped fluorescent lamps.....	27
Figure 4e Dummy lamp for single-capped fluorescent lamps, linear-shaped, twin tube, tube diameter 12 mm.....	28
Figure 4f Dummy lamp for single-capped fluorescent lamps, linear-shaped, quad tube, diameter 12 mm	29
Figure 5 Measuring arrangements for an independent light regulating device, transformer or convertor	30
Figure 6a Luminaires	31
Figure 6b Independent ballasts for fluorescent and other discharge lamps	31
Figure 6c Self-ballasted lamps	31
Figure 6 Measuring arrangements	31
Figure 7 Conical metal housing for self-ballasted fluorescent lamps	32
Figure A.1 Isolation test configuration.....	34
Figure A.2a Balance-to-unbalance transformer circuit.....	35
Figure A.2b Details of transformer core construction	36
Figure A.2c Details of transformer core construction	36
Figure A.2d Construction of transformer	37
 Table 1 – Minimum values of insertion loss.....	 3
Table 2a – Disturbance voltage limits at mains terminals	4
Table 2b – Disturbance voltage limits at load and control terminals.....	4
Table 3 – Radiated electromagnetic disturbance limits.....	5
Table 4 – Sample size and corresponding <i>k</i> factor in a non-central t-distribution.....	19

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15:2000, MOD)**

1 Scope

This standard applies to the emission (radiated and conducted) of radiofrequency disturbances from:

- all lighting equipment with a primary function of generating and/or distributing light intended for illumination purposes, and intended either for connection to the low voltage electricity supply or for battery operation;
- the lighting part of multi-function equipment where one of the primary functions of this is illumination;
- independent auxiliaries exclusively for use with lighting equipment;
- UV and IR radiation equipment;
- neon advertising signs;
- street/flood lighting intended for outdoor use;
- transport lighting (installed in buses and trains).

Excluded from the scope of this standard are:

- lighting equipment operating in the ISM frequency bands (as defined in Resolution 63 (1979) of the ITU Radio Regulation);
- lighting equipment for aircraft and airports;
- apparatus for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other IEC or CISPR standards.

NOTE Examples are:

- built-in lighting devices in other equipment, for example scale illumination or neon devices;
- photocopiers;
- slide projectors;
- lighting equipment for road vehicles.

The frequency range covered is 9 kHz to 400 GHz.

Multi-function equipment which is subjected simultaneously to different clauses of this standard and/or other standards shall meet the provisions of each clause/standard with the relevant functions in operation.

The limits in this standard have been determined on a probabilistic basis to keep the suppression of disturbances within economically reasonable limits while still achieving an adequate level of radio protection and electromagnetic compatibility. In exceptional cases, additional provisions may be required.