

Australian/New Zealand Standard[®]

Winding wires

**Part 1: Enamelled round copper
winding wires**

AS/NZS 1194.1:1996

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL/3, Electric Wires and Cables. It was approved on behalf of the Council of Standards Australia on 21 February 1996 and on behalf of the Council of Standards New Zealand on 15 May 1996. It was published on 5 September 1996.

The following interests are represented on Committee EL/3:

Australian Electrical and Electronic Manufacturers Association
Department of Defence, Australia
Electrical regulatory authorities
Electricity Supply Association of Australia
Ministry of Commerce, New Zealand
New Zealand Electrical Contractors Association
New Zealand Electrical and Electronic Manufacturers Federation
Office of Energy, N.S.W.
Railways of Australia Committee
Testing interests

Review of Standards. To keep abreast of progress in industry, Joint Australian/New Zealand Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Joint Standards and related publications will be found in the Standards Australia and Standards New Zealand Catalogue of Publications; this information is supplemented each month by the magazines 'The Australian Standard' and 'Standards New Zealand', which subscribing members receive, and which give details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Joint Standards, addressed to the head office of either Standards Australia or Standards New Zealand, are welcomed. Notification of any inaccuracy or ambiguity found in a Joint Australian/New Zealand Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

Australian/New Zealand Standard[®]

Winding wires

**Part 1: Enamelled round copper
winding wires**

PUBLISHED JOINTLY BY:

STANDARDS AUSTRALIA
1 The Crescent,
Homebush NSW 2140 Australia

STANDARDS NEW ZEALAND
Level 10, Standards House,
155 The Terrace,
Wellington 6001 New Zealand

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/3 on Electric Wires and Cables to supersede, in part, AS 1194.1—1984 and NZS/AS 1194.1—1984, *Winding wires*, Part 1: *Enamelled round copper winding wires*. This Standard is part of a series, the other parts being:

AS/NZS

- 1194.2 Enamelled rectangular copper winding wires
- 1194.3 Enamelled round aluminium winding wires
- 1194.4 Enamelled rectangular aluminium winding wires
- 1194.5 Test methods

Requirements and tests are equal or superior to those specified in IEC 317, *Specifications for particular types of winding wires* and IEC 851, *Methods of test for winding wires*. Acknowledgment is made of the assistance received from these documents.

This Standard differs from the 1984 edition as follows:

- (a) Test methods have been transferred to a new Part 5.
- (b) Colour coding for labels has been deleted.
- (c) Category of tests has been deleted.
- (d) Wires >0.100 and ≤ 0.250 mm in diameter have been transferred from Table 2.8 to 2.9 and the breakdown voltages have been adjusted.
- (e) Mandrel diameters for flexibility, adherence and heat shock tests have been brought into line with IEC tables.
- (f) Requirements have been changed to match refrigerants in current use.
- (g) Wire overall diameters and increases due to insulation have been brought into line with IEC values.
- (h) A springiness test for conductor diameters greater than 1.6 mm and a temperature index test have been added.
- (i) The resistance to refrigerants test for PVA enamelled wire and the test for completeness of cure have been deleted.

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, whereas an 'informative' appendix is only for information and guidance.

© Copyright — STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Users of Standards are reminded that copyright subsists in all Standards Australia and Standards New Zealand publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia or Standards New Zealand may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia or Standards New Zealand. Permission may be conditional on an appropriate royalty payment. Australian requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia. New Zealand requests should be directed to Standards New Zealand.

Up to 10 percent of the technical content pages of a Standard may be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia or Standards New Zealand.

Inclusion of copyright material in computer software programs is also permitted without royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia or Standards New Zealand at any time.

CONTENTS

| | <i>Page</i> |
|--------------------------------------------------------------------------------------------------------------|-------------|
| SECTION 1 SCOPE AND GENERAL | |
| 1.1 SCOPE | 4 |
| 1.2 REFERENCED DOCUMENTS | 4 |
| 1.3 DEFINITIONS | 4 |
| SECTION 2 REQUIREMENTS | |
| 2.1 GENERAL | 5 |
| 2.2 CONDUCTORS | 5 |
| 2.3 ENAMEL COVERING | 5 |
| 2.4 LUBRICANT | 5 |
| 2.5 TEST METHODS | 5 |
| SECTION 3 PACKAGING AND LABELLING | |
| 3.1 PACKAGING | 27 |
| 3.2 LABELLING | 27 |
| APPENDICES | |
| A INTERNATIONAL STANDARDS OF RESISTANCE FOR COPPER | 28 |
| B NON-PREFERRED ENAMELLED ROUND COPPER WINDING WIRES (INCLUDING ENAMELLED WIRE WITH BOND LAYER) | 29 |
| C METHOD FOR THE CALCULATION OF LINEAR RESISTANCE | 31 |
| D CONDUCTOR RESISTANCE | 33 |
| E ABBREVIATION OF ENAMEL NAMES | 35 |
| F ADDITIONAL REQUIREMENTS FOR NON-PREFERRED ENAMELLED ROUND COPPER WINDING WIRES | 36 |

Originated in Australia as part of AS C21—1926.

Originated in New Zealand as NZS/AS 1194.1—1984.

Previous Australian edition AS 1194.1—1984.

Jointly revised and designated in part as AS/NZS 1194.1:1996.

Incorporating:

Amdt 1—1997

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Winding wires**

Part 1: Enamelled round copper winding wires

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard applies to enamelled round copper winding wires intended to be used for windings of electrical equipment.

It specifies dimensions and material requirements for the conductor and enamelled covering.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

2737 Copper drawing stock

AS/NZS

1194 Winding wires

1194.5 Part 5: Test methods

IEC

28 International standard of resistance for copper

172 Test procedure for the determination of the temperature index of enamelled winding wires

1.3 DEFINITIONS For the purpose of this Standard the definitions below apply.

1.3.1 Conductor—the bare metal remaining after removal of all covering.

1.3.2 Crack—an opening in the enamel covering which exposes the conductor to view at the stated magnification.

1.3.3 Grade of enamel—an expression used to designate the thickness of enamel covering. It is used in the form Grade 1, Grade 2 and Grade 3, the higher grade numbers designating thicker enamels.

1.3.4 Increase in diameter due to enamel—the difference between the overall diameter of the wire and the measured diameter of the conductor.

1.3.5 Increase in diameter due to enamel plus bond layer—the difference between the overall diameter of the wire and the measured diameter of the conductor.

1.3.6 Loss of adhesion—the absence of bond between the enamel and the conductor as exhibited by relative movement between the two.

1.3.7 Overall diameter of wire—the diameter of the wire measured across the final layer of covering.

1.3.8 Temperature index—the number corresponding to the temperature in degrees Celsius derived from the thermal endurance graph at 20 000 h as calculated in IEC 172.

NOTE: The temperature index requirement based on an extrapolated life of 20 000 h relates to enamelled wires tested unvarnished and not as part of an insulation system. The temperature in degrees Celsius corresponding to the temperature index is not necessarily that at which it is recommended that the wire be operated and this will depend on many factors, including the type of equipment involved.

1.3.9 Wire—the conductor complete with all covering.

This is a free preview. Purchase the entire publication at the link below:

AS/NZS 1194.1 : 1996 : EN PDF

-
- ⊙ Looking for additional Standards? Visit SAI Global Infostore
 - ⊙ Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-

Need to speak with a Customer Service Representative - Contact Us