

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Specifications for particular types of winding wires –
Part 0-8: General requirements – Polyester glass-fibre wound unvarnished
and fused, or resin or varnish impregnated, bare or enamelled rectangular
copper wire

[IEC 60317-0-8:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a->

Spécifications pour types particuliers de fils de bobinage –
Partie 0-8: Exigences générales – Fil de section rectangulaire en cuivre nu
ou émaillé, guipé de fibres de verre avec polyester fondues sans vernis, ou
imprégnées de résine ou de vernis



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22,000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67,000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Specifications for particular types of winding wires –
Part 0-8: General requirements – Polyester glass-fibre wound unvarnished
and fused, or resin or varnish impregnated, bare or enamelled rectangular
copper wire**

[IEC 60317-0-8:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-957f80109c3c/iec-60317-0-8:2019>

**Spécifications pour types particuliers de fils de bobinage –
Partie 0-8: Exigences générales – Fil de section rectangulaire en cuivre nu
ou émaillé, guipé de fibres de verre avec polyester fondues sans vernis, ou
imprégnées de résine ou de vernis**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.060.10

ISBN 978-2-8322-7204-6

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and general notes on tests and appearance.....	7
3.1 Terms and definition	7
3.2 General notes	8
3.2.1 Methods of test.....	8
3.2.2 Winding wire.....	9
3.3 Appearance	9
4 Dimensions.....	9
4.1 Conductor dimensions	9
4.2 Tolerance on conductor dimensions	12
4.3 Rounding of corners.....	12
4.4 Increase in dimensions due to the insulation	12
4.5 Overall dimensions	14
4.5.1 Nominal overall dimensions	14
4.5.2 Minimum overall dimensions	14
4.5.3 Maximum overall dimensions	14
5 Electrical resistance	14
6 Elongation	14
7 Springiness	14
8 Flexibility and adherence	15
8.1 Mandrel winding test.....	15
8.2 Adherence test.....	15
8.2.1 Fibre covered bare wires	15
8.2.2 Fibre covered enamelled wires	15
9 Heat shock	15
10 Cut-through	15
11 Resistance to abrasion	15
12 Resistance to solvents.....	15
13 Breakdown voltage	15
14 Continuity of insulation	16
15 Temperature index	16
16 Resistance to refrigerants.....	16
17 Solderability	16
18 Heat or solvent bonding.....	16
19 Dielectric dissipation factor.....	16
20 Resistance to transformer oil	16
21 Loss of mass	16
23 Pin hole test	17
30 Packaging	17

STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60317-0-8:2019](https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

Annex A (informative) Nominal cross-sectional areas for preferred and intermediate sizes	18
Bibliography.....	27
Table 1 – Nominal cross-sectional areas of preferred sizes.....	11
Table 2 – Conductor tolerances	12
Table 3 – Corner radii	12
Table 4 – Increase in dimensions.....	13
Table 5 – Elongation	14
Table 6 – Mandrel winding	15
Table 7 – Breakdown voltage.....	16
Table A.1 – Nominal cross-sectional areas	18

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60317-0-8:2019](https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –**Part 0-8: General requirements – Polyester glass-fibre
wound unvarnished and fused, or resin or varnish impregnated,
bare or enamelled rectangular copper wire**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60317-0-8 has been prepared by IEC technical committee 55: Winding wires.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) revision to the title of the standard indicating that the glass fibre covering is fused and unvarnished;
- b) revision to subclause 3.2 adding winding wire requirements for the fibrous covering and a list of covering classifications;

- c) revision to subclause 3.3 requirements for appearance;
- d) revision to subclause 8.2, adherence test requirements.

The text of this standard is based on the following documents:

FDIS	Report on voting
55/1784/FDIS	55/1796/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60317 series, published under the general title *Specifications for particular types of winding wires*, can be found on the IEC website.

The numbering of clauses in this standard is not continuous from Clauses 21 through 30 in order to reserve space for possible future wire requirements prior to those for wire packaging.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

INTRODUCTION

This Part of IEC 60317 forms an element of a series of standards which deals with insulated wires used for windings in electrical equipment. The set of standards has three series describing:

- 1) *Winding wires – Test methods* (IEC 60851);
- 2) *Specifications for particular types of winding wires* (IEC 60317);
- 3) *Packaging of winding wires* (IEC 60264).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60317-0-8:2019](https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 0-8: General requirements – Polyester glass-fibre wound unvarnished and fused, or resin or varnish impregnated, bare or enamelled rectangular copper wire

1 Scope

This part of IEC 60317 specifies the general requirements of polyester glass-fibre wound fused, unvarnished, or resin or varnish impregnated bare, or grade 1 or grade 2 or enamelled rectangular copper winding wires.

The range of nominal conductor dimensions is given in 4.1 and in the relevant specification sheet.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60851 (all parts), *Winding wires – Test methods*

[IEC 60317-0-8:2019](#)

ISO 3, *Preferred numbers – Series of preferred numbers*

<https://standards.iteh.ai/catalog/standards/sis/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

3 Terms, definitions and general notes on tests and appearance

3.1 Terms and definition

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1 coating

material which is deposited on a conductor or wire by a suitable means and then dried and/or cured

3.1.2 conductor

bare metal after removal of the insulation

3.1.3 covering

material which is wound, wrapped or braided around a bare or insulated conductor

**3.1.4
crack**

opening in the insulation which exposes the conductor to view at the stated magnification

**3.1.5
enamelled wire**

wire coated with an insulation of cured resin

**3.1.6
fused**

state of polyester fibres after having been melted then re-solidified for support/adherence of glass fibres

**3.1.7
grade**

range of thickness of the insulation of a wire

**3.1.8
insulation**

coating or covering on the conductor with the specific function of withstanding voltage

**3.1.9
nominal conductor dimension**

designation of the conductor size in accordance with IEC 60317 (all parts)

**3.1.10
normal vision**

20/20 vision, with corrective lenses, if necessary

**3.1.11
winding wire**

wire used for winding a coil to provide a magnetic field

**3.1.12
wire**

conductor coated or covered with an insulation

3.2 General notes**3.2.1 Methods of test**

All methods of test to be used for this document are given in the IEC 60851 series.

The clause numbers used in this document are identical with the respective test numbers in the IEC 60851 series.

In case of inconsistencies between the IEC 60851 series and this document, IEC 60317-0-8 shall prevail.

Where no specific range of nominal conductor dimensions is given for a test, the test applies to all nominal conductor dimensions covered by the specification sheet.

Unless otherwise specified, all tests shall be carried out at a temperature from 15 °C to 40 °C and a relative humidity from 25 % to 75 %. Before measurements are made, the specimens shall be preconditioned under these atmospheric conditions for a time sufficient to allow the specimens to reach stability.

The wire to be tested shall be removed from the packaging in such a way that the wire will not be subjected to tension or unnecessary bends. Before each test, sufficient wire should be discarded to ensure that any damaged wire is not included in the test specimens.

3.2.2 Winding wire

The fibre covering shall consist of a combination of polyester and glass fibres. The glass fibres shall be electrical-grade continuous-filament glass yarn. The polyester fibre shall be a high-grade yarn resulting from the linear polymerization of ethylene glycol and terephthalic acid. The maximum content by weight of polyester fibre in the yarn shall not exceed 50 %.

The coating shall be characterized by the following different grades of thickness:

- PG1, bare conductor with 1 layer of polyester glass fibre or 2 layers of finer polyester glass fibres that together, comply with the dimensional requirements in Table 1;
- PG2, bare conductor with 2 layers of polyester glass fibre;
- Grade 1 PG1, enamelled grade 1 (grade 1) with 1 layer of polyester glass fibre (PG1);
- Grade 1 PG2, enamelled grade 1 (grade 1) with 2 layers of polyester glass fibre (PG2);
- Grade 2 PG1, enamelled grade 2 (grade 2) with 1 layer of polyester glass fibre (PG1);
- Grade 2 PG2, enamelled grade 2 (grade 2) with 2 layers of polyester glass fibre (PG2).

When reference is made to a winding wire according to a standard of the IEC 60317 series, the following information is given in the description:

- reference to IEC specification;
- nominal conductor dimensions in millimetres (width × thickness);
- grade.

EXAMPLE IEC 60317-60 – 4,00 × 1,00 Grade 2 PG1
<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492cc106/iec-60317-0-8-2019>

3.3 Appearance

The fibrous covering shall be essentially smooth and uniform as agreed upon between customer and supplier in accordance with good commercial practice, and free from physical damage and foreign material when examined with normal vision, as wound on the original spool or reel. Fibres shall be bound to the underlying enamelled or bare wire.

NOTE Evidence of physical damage includes gashes, broken fibre strands, and the like.

4 Dimensions

4.1 Conductor dimensions

The dimensions for widths and thicknesses of conductors of winding wires with rectangular cross-section recommended in this part of IEC 60317 shall be in accordance with Table 1, and are taken from the R 20 series according to ISO 3.

Preferred sizes are combinations of width and thickness both according to the R 20 and R 40 series.

Intermediate sizes are combinations of width or thickness according to the R 20 series with the other dimension according to the R 40 series.

This part of IEC 60317 covers:

- widths from 2,00 mm up to and including 16,00 mm;
- thicknesses from 0,80 mm up to and including 5,60 mm.

For thickness over 5,60 mm up to and including 10 mm and for widths over 16 mm up to and including 25 mm where, for technical reasons, additional sizes may be needed, the R 40 series shall be used. The ratio width/thickness shall be within the specified limits and combinations of R 40 and R 40 are not allowed in the case of additional sizes.

The ratio width/thickness shall be greater than or equal to 1,4:1 and shall not exceed 8:1.

The actual values of dimensions are given in Table 1.

The nominal cross-sectional areas for preferred sizes are given in Table 1 and the nominal cross-sectional areas for intermediate sizes are given in Table A.1 of Annex A.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 60317-0-8:2019](https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019)

<https://standards.iteh.ai/catalog/standards/sist/c66768f8-567a-41d1-b57a-8551492ce106/iec-60317-0-8-2019>

Table 1 – Nominal cross-sectional areas of preferred sizes

Thickness mm	Width																		
	0,80	0,90	1,00	1,12	1,25	1,40	1,60	1,80	2,00	2,24	2,50	2,80	3,15	3,55	4,00	4,50	5,00	5,60	
	Corner radius (0,5 mm*)																		
	Corner radius (0,65 mm*)																		
	Corner radius (0,80 mm*)																		
2,00	1,463	1,626	1,785	2,025	2,285	2,585	2,910	3,285	3,785	4,137									
2,24	1,655	1,842	2,205	2,294	2,582	2,921	3,369												
2,50	1,863	2,076	2,285	2,585	2,910	3,285	3,785	4,137											
2,80	2,103	2,346	2,585	2,921	3,285	3,705	4,265	4,677	5,237										
3,15	2,383	2,661	2,935	3,313	3,723	4,195	4,825	5,307	5,937	6,693									
3,55	2,703	3,021	3,335	3,761	4,223	4,755	5,465	6,027	6,737	7,589	8,326								
4,00	3,063	3,426	3,785	4,265	4,785	5,385	6,185	6,831	7,637	8,597	9,451	10,65							
4,50	3,463	3,876	4,285	4,825	5,410	6,085	6,85	7,737	8,631	9,717	10,70	12,05	13,63						
5,00	3,863	4,326	4,785	5,385	6,035	6,785	7,785	8,637	9,637	10,84	12,18	13,45	15,20	17,20					
5,60	4,363	4,866	5,385	6,057	6,785	7,625	8,745	9,717	10,84	12,18	13,45	15,13	17,09	19,33	21,54				
6,30	4,903	5,496	6,085	6,841	7,660	8,605	9,865	10,98	12,24	13,75	15,20	17,09	19,30	21,82	24,34	27,49			
7,10		6,216	6,885	7,737	8,660	9,725	11,15	12,42	13,84	15,54	17,20	19,33	21,82	24,66	27,54	31,09	34,64		
8,00			7,785	8,745	9,785	10,99	12,59	14,04	15,64	17,56	19,45	21,85	24,65	27,85	31,14	35,14	39,14	43,94	
9,00				9,865	11,04	12,39	14,19	15,84	17,64	19,80	21,95	24,65	27,80	31,40	35,14	39,64	44,14	49,54	
10,0					12,29	13,79	15,79	17,64	19,64	22,04	24,45	27,45	30,95	34,95	39,14	44,14	49,14	55,14	
11,2						15,47	17,71	19,80	22,04	24,79	27,46	30,81	34,73	39,21	43,94	49,54	55,14	61,86	
12,5	Not recommended						19,79	22,14	24,64	27,64	30,70	34,45	38,83	43,83	49,14	55,39	61,64	69,14	
14,0								24,84	27,64	31,00	34,45	38,65	43,55	49,15	55,14	62,14	69,14	77,54	
16,0									31,64	35,48	39,45	44,25	49,85	56,25	63,14	71,14	79,14	88,74	

* Nominal thickness.

NOTE Dimensions according to R 20 series are printed in larger type.

4.2 Tolerance on conductor dimensions

The conductor dimensions shall not differ from the nominal values by more than the tolerance given in Table 2.

Table 2 – Conductor tolerances

Nominal width or thickness of the conductor mm		Tolerance mm
Over	Up to and including	
–	3,15	± 0,030
3,15	6,30	± 0,050
6,30	12,50	± 0,070
12,50	16,00	± 0,100

4.3 Rounding of corners

The arc shall merge smoothly into the flat surfaces of the conductor and the strip shall be free from sharp, rough and projecting edges. The conductor shall have corner radii complying with Table 3. The specified radii shall be maintained within ±25 %.

Table 3 – Corner radii
(standards.iteh.ai)

Nominal thickness of the conductor mm		Corner radius mm
Over	Up to and including	
–	1,00	0,5 nominal thickness
1,00	1,60	0,50*
1,60	2,24	0,65**
2,24	3,55	0,80
3,55	5,60	1,00

If agreed between purchaser and supplier, the corner radii for wires with a width greater than 4,8 mm may be:

* 0,5 mm nominal thickness
** 0,8 mm

4.4 Increase in dimensions due to the insulation

The increase in width or thickness due to the insulation shall be as specified in Table 4.

Table 4 – Increase in dimensions

Nominal width of the conductor mm		Increase in dimensions mm																	
		Polyester-glass fibre covering over bare conductor (PG1)			Double covering (PG2)			Single covering (grade 1 PG1)			Double covering (grade 1 PG2)			Single covering (grade 2 PG1)			Double covering (grade 2 PG2)		
Over	Up to and incl.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
–	3,15	0,08	0,12	0,16	0,19	0,25	0,31	0,14	0,21	0,27	0,25	0,34	0,42	0,20	0,27	0,33	0,31	0,40	0,48
3,15	6,30	0,10	0,14	0,18	0,21	0,28	0,35	0,16	0,23	0,29	0,27	0,37	0,46	0,22	0,29	0,35	0,33	0,43	0,52
6,30	12,50	0,11	0,16	0,21	0,22	0,30	0,38	0,17	0,25	0,32	0,28	0,39	0,49	0,23	0,31	0,38	0,34	0,45	0,55
12,50	16,00	0,12	0,18	0,24	0,24	0,32	0,40	0,18	0,27	0,35	0,30	0,41	0,51	0,24	0,33	0,41	0,36	0,47	0,57

The maximum increase in thickness or width due to the insulation may be exceeded, provided the overall thickness or width of the insulated wire does not exceed the sum of the maximum thickness or width of the bare wire plus the maximum increase in dimension given in the table above.

NOTE The minimum increases in dimensions apply only to the increase in thickness.