

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric cables – Calculation of the current rating –
Part 1-1: Current rating equations (100 % load factor) and calculation of losses –
General**

**Câbles électriques – Calcul du courant admissible –
Partie 1-1: Equations de l'intensité du courant admissible
(facteur de charge 100 %) et calcul des pertes – Généralités**



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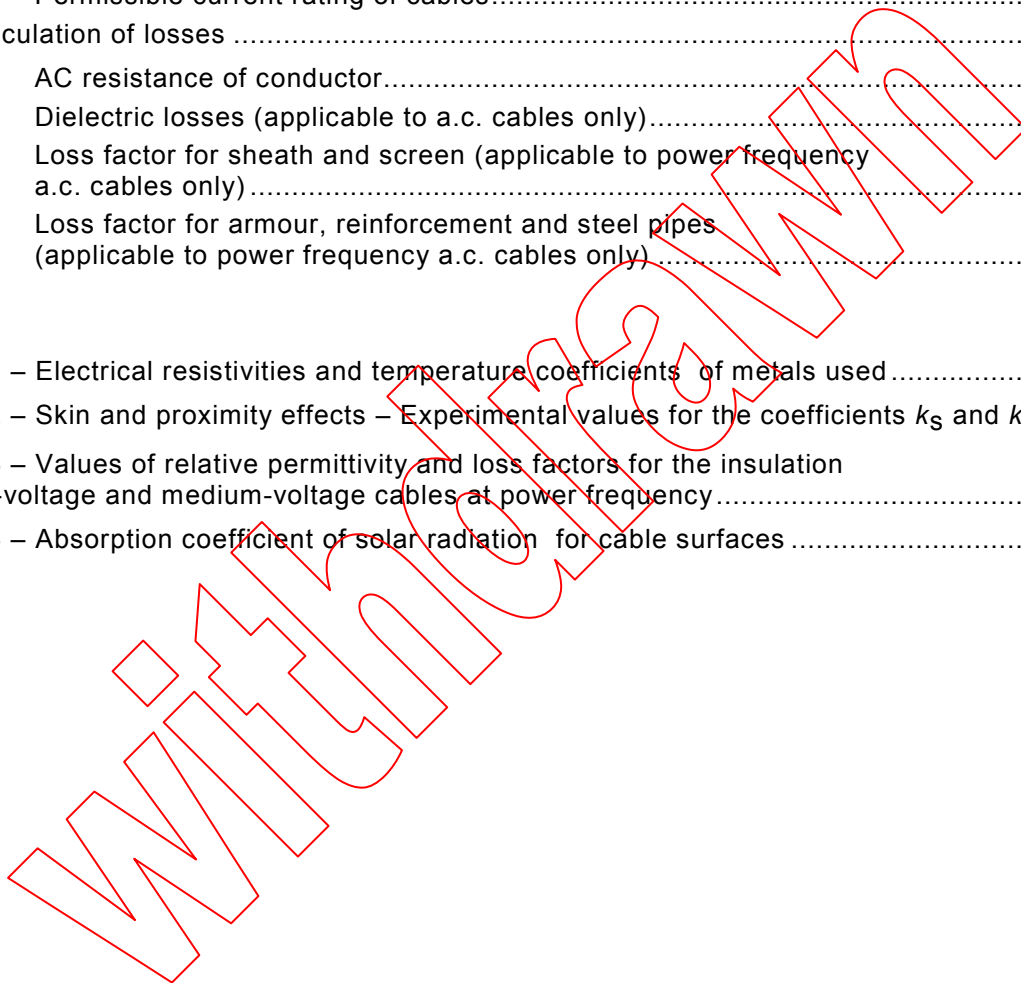
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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 General.....	6
1.1 Scope.....	6
1.2 Normative references	6
1.3 Symbols	7
1.4 Permissible current rating of cables.....	10
2 Calculation of losses	13
2.1 AC resistance of conductor.....	13
2.2 Dielectric losses (applicable to a.c. cables only).....	16
2.3 Loss factor for sheath and screen (applicable to power frequency a.c. cables only).....	16
2.4 Loss factor for armour, reinforcement and steel pipes (applicable to power frequency a.c. cables only).....	25
Table 1 – Electrical resistivities and temperature coefficients of metals used.....	30
Table 2 – Skin and proximity effects – Experimental values for the coefficients k_s and k_p	31
Table 3 – Values of relative permittivity and loss factors for the insulation of high-voltage and medium-voltage cables at power frequency.....	32
Table 4 – Absorption coefficient of solar radiation for cable surfaces	33



INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC CABLES –
CALCULATION OF THE CURRENT RATING –****Part 1-1: Current rating equations (100 % load factor)
and calculation of losses – General**

FOREWORD

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International Standard IEC 60287-1-1 has been prepared by IEC technical committee 20: Electric cables.

This second edition cancels and replaces the first edition published in 1994, Amendment 1 (1995) and Amendment 2 (2001) The document 20/780/FDIS, circulated to the National Committees as Amendment 3, led to the publication of this new edition.

The text of this standard is based on the first edition, its Amendments 1 and 2, and the following documents:

FDIS	Report on voting
20/851/FDIS	20/867/RVD

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

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

A list of all parts of the IEC 60287 series, published under the general title: *Electric cables – Calculation of the current rating*, can be found on the IEC website.

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

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

Withdrawn

INTRODUCTION

This Part 1-1 contains formulae for the quantities R , W_d , λ_1 and λ_2 .

It contains methods for calculating the permissible current rating of cables from details of the permissible temperature rise, conductor resistance, losses and thermal resistivities.

Formulae for the calculation of losses are also given.

The formulae in this standard contain quantities which vary with cable design and materials used. The values given in the tables are either internationally agreed, for example, electrical resistivities and resistance temperature coefficients, or are those which are generally accepted in practice, for example, thermal resistivities and permittivities of materials. In this latter category, some of the values given are not characteristic of the quality of new cables but are considered to apply to cables after a long period of use. In order that uniform and comparable results may be obtained, the current ratings should be calculated with the values given in this standard. However, where it is known with certainty that other values are more appropriate to the materials and design, then these may be used, and the corresponding current rating declared in addition, provided that the different values are quoted.

Quantities related to the operating conditions of cables are liable to vary considerably from one country to another. For instance, with respect to the ambient temperature and soil thermal resistivity, the values are governed in various countries by different considerations. Superficial comparisons between the values used in the various countries may lead to erroneous conclusions if they are not based on common criteria: for example, there may be different expectations for the life of the cables, and in some countries design is based on maximum values of soil thermal resistivity, whereas in others average values are used. Particularly, in the case of soil thermal resistivity, it is well known that this quantity is very sensitive to soil moisture content and may vary significantly with time, depending on the soil type, the topographical and meteorological conditions, and the cable loading.

The following procedure for choosing the values for the various parameters should, therefore, be adopted.

Numerical values should preferably be based on results of suitable measurements. Often such results are already included in national specifications as recommended values, so that the calculation may be based on these values generally used in the country in question; a survey of such values is given in Part 3-1.

A suggested list of the information required to select the appropriate type of cable is given in Part 3-1.