



NSAI
Standards

Irish Standard
I.S. EN 50708-1-1:2020&AC:2020-12

Power transformers - Additional European requirements: Part 1-1: Common part - General requirements

I.S. EN 50708-1-1:2020&AC:2020-12

Incorporating amendments/corrigenda/National Annexes issued since publication:

EN 50708-1-1:2020/AC:2020-12

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I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

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National Foreword

I.S. EN 50708-1-1:2020&AC:2020-12 is the adopted Irish version of the European Document EN 50708-1-1:2020, Power transformers - Additional European requirements: Part 1-1: Common part - General requirements

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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Corrigendum to EN 50708-1-1:2020

English version

In 5.2, add the following note after the first paragraph:

"NOTE All requirements given in this standard series (EN 50708) are for a rated frequency of 50 Hz, except another frequency is specified in the text or tables of the stated standard series."

In 5.3.4 e), replace "EN 50708-2-1:2020, Table 3 and Table 4;" with "EN 50708-2-1:2020;"

Replace the title of 7.1 with "Tolerance during acceptance tests".

In B.2, replace the third paragraph:

"The capitalization values represent the avoided costs associated with the marginal kW of Iron and Copper losses saved, so that if for branding or other reasons companies wished to reduce transformer losses further in a cost effective and transparent manner, two quotes should be sought, one for Transformer design using capitalized losses and the second for a similar design but with (say) 10 % less losses."

with

"The capitalization values represent the avoided costs associated with the marginal kW of no-load losses and load losses saved, so that if for branding or other reasons companies wished to reduce transformer losses further in a cost effective and transparent manner, two quotes should be sought, one for Transformer design using capitalized losses and the second for a similar design but with (say) 10 % less losses."

In B.3.3, replace the last three paragraphs with the following:

"The B factor (€/kW of Load Loss) represents the value today of the total load losses saved over the lifetime of the transformer. Unlike no load losses, the load losses are highly dependent on how heavily the transformer is loaded and over how long a period, with the load losses increasing dramatically with transformer loading (proportional to the square of the load). So a transformer with 400 identical customers will not have twice the load losses of a transformer with 200 customers, but will actually have four times the losses.

Following the same logic as for no-load losses, a purchaser would be willing to spend anything up to B €/kW on extra costs in improving the transformer, because as long as this extra investment is less than B, there is a positive gain to be made. However there are declining returns with increasing investment so that at some stage the benefits from the extra investment cost more than the losses saved, at which stage no further investment is economic. At this point the value of the load losses saved is balanced by the extra transformer investment cost per kW, and this value is B €/kW.

In practical terms this means that for transformers with heavy loads (e.g. Industrial /commercial loads, urban areas), load losses will be predominant and will give a strong return on investment; whereas on transformers with low loads (rural transformers) a very poor return on load losses would be made, and no-load losses are predominant."

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EUROPEAN STANDARD

EN 50708-1-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2020

ICS 29.180

Supersedes EN 50588-1:2017 (PART), EN 50629:2015 (PART) and all of its amendments and corrigenda (if any)

English Version

Power transformers - Additional European requirements: Part 1-1: Common part - General requirements

Transformateurs de puissance - Exigences européennes supplémentaires : Partie 1 - Partie commune

To be completed

This European Standard was approved by CENELEC on 2019-10-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 50708-1-1:2020 (E)

European foreword

This document (EN 50708-1-1:2020) has been prepared by CLC/TC 14, "Power transformers".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-11-22
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2023-05-22

This document supersedes EN 50588-1:2017 and EN 50629:2015 and all of their amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of Commission Regulation (EC).

For the relationship with the Commission Regulation (EC) see informative Annex ZZ, which is an integral part of this document.

Introduction

The EN 50708 series, “Power transformers – Additional European requirements” has been prepared by CENELEC TC 14 to address specific European requirements of power transformers related EU Regulations and local practices.

Technical requirements set by the EN 50708 series supplement, modify or replace certain requirements of the other EN standards derived from equivalent IEC international standards.

This series contains general requirements on energy performance, accessories, fittings, tests, mechanical requirements etc. structured as follows:

- Part 1 series - Common requirements;
- Part 2 series - Medium power transformers;
- Part 3 series - Large power transformers.

The EN 50708-X parts with X greater than 1 contain particular requirements for a different category of transformers or transformer applications which are based on the requirements of the general parts of EN 50708-1-1.

The EN 50708-X parts should be considered in conjunction with the requirements of the general part.

The particular requirements of these subparts of EN 50708 supplement, modify or replace certain requirements of the general parts of EN 50708-1-1 and/or EN 50708-1-X being valid at the time of publication of this part. The absence of references to the exclusion of a part or a clause of a general part means that the corresponding clauses of the general part are applicable (undated reference).

Requirements of other -X parts with X greater than 1 being eventually relevant for cases covered by this part also apply. This part may therefore also supplement, modify or replace certain of these requirements valid at the time of publication of this document.

The main clause numbering of each subpart follows the pattern and corresponding references of EN 50708-1-1. The numbers following the particular number of this part are those of the corresponding parts, or clauses of the other parts of the EN 50708 series, valid at the time of publication of this part, as indicated in the normative references of this document (dated reference).

In the case where new or amended general parts with modified numbering were published after the subpart was issued, the clause numbers referring to a general part in subparts might no longer align with the latest edition of the general part. Dated references should be observed.

It is acknowledged that environmental requirements including energy in the use phase are a significant aspect that can be addressed through product design. As the material content increases to improve energy performance, it is advisable to make a proper life cycle assessment including recycling of the extra raw material and the overall energy used to produce and transport transformers. Some guidelines are given in EN 60076-1.

EN 50708-1-1:2020 (E)

1 Scope

This document is part of the EN 50708 series which applies to transformers in compliance with EN 60076-1.

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

EN 50329:2003, *Railway applications - Fixed installations - Traction transformers*

EN 50708-2-1:2020, *Power transformers - Additional European requirements: Part 2-1 Medium power transformer - General requirements*

EN 50708-3-1:2020, *Power transformers - Additional European requirements: Part 3-1 Large power transformer - General requirements*

EN 60076 (all parts), *Power transformers (IEC 60076 series)*

EN 60310:2016, *Railway applications - Traction transformers and inductors on board rolling Stock (IEC 60310)*

EN 61378-1:2011, *Convertor transformers - Part 1: Transformers for industrial applications (IEC 61378-1:2011)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 60076-1:2011 and the following 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

medium power transformer

MPT

power transformer with all windings having a rated power lower than or equal to 3 150 kVA, and highest voltage for equipment greater than 1,1 kV and lower than or equal to 36 kV

Note 1 to entry: The definitions of power transformer and winding are given in EN 60076-1.

Note 2 to entry: The national practice of the Czech Republic could require the use of the highest voltages for equipment in AC three-phase systems of 38,5 kV instead of 36 kV and 25 kV instead of 24 kV. These units have a rated power lower than or equal to 3 150 kVA:

- with $U_m = 38,5$ kV are considered as $U_m = 36$ kV (ref. to EN 50708-2-1:2020);
- with $U_m = 25$ kV are considered as $U_m = 24$ kV (ref. to EN 50708-2-1:2020).

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