SLOVENSKI STANDARD
oSIST prEN 50708-2-6:2020

01-oktober-2020

Močnostni transformatorji - Dodatne evropske zahteve - 2-6. del: Srednji močnostni transformatorji - Nekonvencionalne tehnologije

Power transformers - Additional European requirements: Part 2-6 Medium power transformers - Non conventional technologies

Transformateurs de puissance - Exigences européennes supplémentaires : Partie 2-6 Transformateurs de moyenne puissance - Technologies non conventionnelles

Ta slovenski standard je istoveten z: prEN 50708-2-6

ICS:

29.180	Transformatorji. Dušilke	Transformers. Reactors

oSIST prEN 50708-2-6:2020 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 50708-2-6

August 2020

ICS

English Version

Power transformers - Additional European requirements: Part 2-6 Medium power transformers - Non conventional technologies

Transformateurs de puissance - Exigences européennes supplémentaires : Partie 2-6 Transformateurs de moyenne puissance - Technologies non conventionnelles

To be completed

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2020-10-30.

It has been drawn up by CLC/TC 14.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

Contents

European foreword

This document (prEN 50708-2-6:2020) has been prepared by CLC/TC 14 “Power transformers”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

Introduction

This document defines the rules for the assessment of energy performance to ensure the product conformity to the Commission Regulation (EU) No 548/2014 of 21 May 2014 and its amendment No 2019/1783 of 1 October 2019.

Regulation leads to have a minimum level of energy performances of power transformers.

NOTE In the document, the term Regulation refers to the Commission Regulation (EU) No 548/2014 of 21 May 2014 and its amendment No 2019/1783 of 1 October 2019.

For the purpose of this document, the requirements of the general EN 50708-1-1:2020 apply.

This document contains particular requirements for specific transformers or transformer applications, which are based on the requirements of the general EN 50708-1-1:2020.

This document should be considered in conjunction with the requirements of the general parts.

The particular requirements of the different sub parts of EN 50708 supplement, modify or replace certain requirements of the general parts of EN 50708-1 and/or EN 50708-1-X being valid at the time of publication of this document. 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 document also apply. This document could 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 part follows the pattern and corresponding references of EN 50708-1-1:2020. The numbers following the particular number of this document 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 document.

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

1 Scope

The scope of this document is to define the energy performance of non-conventional technology Medium Power Transformers in compliance with EN 50708-1-1:2020.

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 50708-1-1:2020, *Power transformers - Additional European requirements: Part 1-1: Common part - General requirements*

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

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the EN 50708 series and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
conventional technology
transformers designed with conventional magnetic steel with a crystalline structure and grain orientation

3.2
non-conventional technology
transformers that are different from those defined in. 3.1 and compliant with EN 50708-2-1

4 Service conditions

EN 60076-1 applies.

5 Rating and general requirements

EN 50708-2-1 applies unless otherwise stated in this document.

The following table give the maximum level of losses for liquid immersed and dry type transformers for non-conventional technology.

81 **Table 1 — Losses, short circuit impedance and sound power level for liquid immersed**
82 **transformers**

Rated power	P_0	TIER1 P_k	TIER2 P_k	L_{WA}	*Short-circuit Impedance*
kVA	W	W	W	dB(A)	%
≤ 25	35	900	600	37	4
50	45	1 100	750	39	4
100	75	1 750	1 250	41	4
160	105	2 350	1 750	44	4
250	150	3 250	2 350	47	4
315	180	3 900	2 800	49	4
400	220	4 600	3 250	50	4
500	260	5 500	3 900	51	4
630	300	6 500	4 600	52	4 or 6
800	330	8 400	6 000	53	6
1 000	390	10 500	7 600	55	6
1 250	480	11 000	9 500	56	6
1 600	600	14 000	12 000	58	6
2 000	730	18 000	15 000	60	6
2 500	880	22 000	18 500	63	6
3 150	1 100	27 500	23 000	64	6

83 **Table 2 — Losses, short circuit impedance and sound power levels for dry-type transformers**

Rated power	P_0	TIER1 P_k	TIER2 P_k	L_{WA}	*Short-circuit Impedance*
kVA	W	W	W	dB(A)	%
≤ 50	115	1 500	1 700	49	6
100	160	1 800	2 050	51	6
160	230	2 600	2 900	54	6
250	300	3 400	3 800	57	6
400	430	4 500	5 500	60	6
630	630	7 100	7 600	62	6
800	750	8 000	8 000	64	6
1 000	890	9 000	9 000	65	6
1 250	1 035	11 000	11 000	67	6
1 600	1 265	13 000	13 000	68	6
2 000	1 495	16 000	16 000	70	6
2 500	1 780	19 000	19 000	71	6

3 150	2 185	22 000	22 000	74	6

The sound power levels, given in the tables are maximum values when specified. The sound power levels can be specified by the purchaser or by agreement between manufacturer and purchaser for different values.

6 Rating plate

The additional requirements for rating plate are given in EN 50708-1-1:2020.

7 Tolerances

The additional requirements for tolerances are given in EN 50708-1-1:2020.

8 Tests

The additional requirements for tests are given in EN 50708-1-1:2020 or in relevant parts.

The non-conventional technology can be designed with material known or under development.

In order to ensure reliability for transformers based on non-conventional technology, before to install on the network, manufacturers shall be able to prove their reliability at a long term by a short circuit withstand test and provide certificates of this test for similar transformers (see EN 60076-5 rules).

The rules in EN 60076-5 regarding similarity between transformers and related to absorbed power, axial forces and winding stresses at short circuit shall be applied to determine the validity of the test.

The procedure of test shall be as prescribed by EN 60076-1, EN 60076-3 and EN 60076-5, in particular, the following requirements:

All the routine tests, including dielectric tests at 100 % of the prescribed test value (see EN 60076-3), shall be repeated. A lightning impulse test shall be performed at this stage.

In order to consider the transformer as having passed the short-circuit test, the conditions indicated in EN 60076-1 and EN 60076-11 shall be fulfilled.

In addition to EN 60076-5 criteria the values of measured no load loss before and after the short circuit test shall not deviate by more than 12 %. This measurement shall be done in the same laboratory.

The value of no-load loss measured after the short circuit test is to check the validity of the short circuit test. The measured values at the end of the test shall be compliant with the Table 1 or 2 of this document.

9 Accessories and fittings

List of accessories and fittings are under development in relevant parts.

10 Capitalization of losses

The additional requirements for capitalization of losses are given in EN 50708-1-1:2020.

11 Transformers overhaul

The additional requirements for transformers overhaul are given in EN 50708-1-1:2020.

Bibliography

IEC/TR 60616:1978, *Terminals and tapping markings for power transformers*