



SLOVENSKI STANDARD

SIST EN 50708-2-6:2022

01-november-2022

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

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

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Transformatorji. Dušilke

Transformers. Reactors

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English Version

Power transformers - Additional European requirements - Part 2-6: Medium power transformers - Non-conventional magnetic steel technology

Transformateurs de puissance - Exigences européennes supplémentaires - Partie 2-6: Transformateurs de moyenne puissance - Technologie à acier magnétique non conventionnel

Leistungstransformatoren - Zusätzliche europäische Anforderungen - Teil 2-6: Mittelleistungstransformatoren - Nicht konventionelle Technologien

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Comité Européen de Normalisation Electrotechnique
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EN 50708-2-6:2022 (E)

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European foreword

This document (EN 50708-2-6:2022) has been prepared by CLC/TC 14 “Power transformers”.

The following dates are fixed:

- latest date by which this document has to be (dop) 2023-07-25
implemented at national level by publication of
an identical national standard or by
endorsement
- latest date by which the national standards (dow) 2025-07-25
conflicting with this document have to be
withdrawn

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.

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EN 50708-2-6:2022 (E)**Introduction**

This part of the EN 50708 series deals with the energy performance of non-conventional technology Medium Power Transformers.

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

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

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. 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.

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1 Scope

This document defines the energy performance of non-conventional technology Medium Power Transformers in compliance with EN 50708-1-1.

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 50708 (all parts), *Power transformers — Additional European requirements*

EN 50708-1-1, *Power transformers — Additional European requirements — Part 1-1 Common part*

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

EN 60076-1, *Power transformers — Part 1: General (IEC 60076-1)*

EN 60076-3, *Power transformers — Part 3: Insulation levels, dielectric tests and external clearances in air (IEC 60076-3)*

EN 60076-5, *Power transformers — Part 5: Ability to withstand short-circuit (IEC 60076-5)*

EN IEC 60076-11, *Power transformers — Part 11: Dry-type transformers (IEC 60076-11)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in 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 <https://www.electropedia.org/>

3.1

non-conventional magnetic steel technology

magnetic steel technology different from those with a crystalline structure and compliant with EN 50708-2-1

Note 1 to entry: The amorphous steel technology is a non-Conventional magnetic steel technology.

Note 2 to entry: The amorphous steel is described in IEC 60404-8-11.

4 Service conditions

Refer to EN 60076-1.

5 Rating and general requirements

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

NOTE Commission Regulation (EU) No 548/2014 of 21 May 2014 and its amendment No 2019/1783 of 1 October 2019 does not include specific energy performance requirements for non-conventional technology transformers.

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The following tables give the no-load losses for liquid immersed and dry type transformers in the scope of this standard. The levels of load losses are given in the EN 50708-2-1.

Table 1 —No-load losses, for liquid immersed transformers

Rated power	P₀
kVA	W
≤ 25	35
50	45
100	75
160	105
250	150
315	180
400	220
500	260
630	300
800	330
1 000	390
1 250	480
1 600	600
2 000	730
2 500	880
3 150	1 100

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Table 2 — No-load losses for dry-type transformers

Rated power	P₀
kVA	W
≤ 50	115
100	160
160	230
250	300
400	430
630	630
800	750
1 000	890
1 250	1 035
1 600	1 265
2 000	1 495
2 500	1 780
3 150	2 185

The sound power levels can be specified by the purchaser or by agreement between the manufacturer and the purchaser.

6 Rating plate

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

7 Tolerances

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

8 Additional tests for non-conventional technology

The additional requirements for tests are given in EN 50708-1-1 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 installation on the network, manufacturers shall be able to prove their reliability in the long term by a short circuit withstand test or by providing 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 and radial 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 apply:

- 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 IEC 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 of EN 50708.

10 Capitalization of losses

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

11 Transformers overhaul

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

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Bibliography

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

EN IEC 60076-22-7, *Power transformers — Part 22-7: Power transformer and reactor fittings — Accessories and fittings*

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

IEC 60404-8-11:2018, *Magnetic materials — Part 8-11: Specifications for individual materials — Fe-based amorphous strip delivered in the semi-processed state*

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