

English version

**Evaluation of electromagnetic fields
around power transformers**

Evaluation
des champs électromagnétiques
autour des transformateurs de puissance

Bewertung
von elektromagnetischen Feldern
in der Umgebung
von Leistungstransformatoren

This Technical Report was approved by CENELEC on 2006-01-14.

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CENELEC

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

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Foreword

This Technical Report was prepared by Technical Committee CENELEC TC 14, Power Transformers.

The text of the draft was circulated for vote in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 and was approved by CENELEC as CLC/TR 50453 on 2006-01-14.

This Technical Report supersedes R014-001:1999.

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Contents

	page
Introduction	4
1 Scope.....	5
2 References.....	5
3 Definitions	5
4 Emission.....	6
4.1 Radiated emission.....	6
4.2 Conducted emission.....	6
5 Immunity.....	7
5.1 Radiated disturbances	7
5.2 Conducted disturbances	7
Annex A (informative) Method of calculation of power frequency magnetic field.....	8
Annex B (informative) Method of calculation of power frequency electric field.....	11
Bibliography.....	13

Introduction

EMC is covered by three kinds of standardisation documents:

- Basic Standards:

Basic Standards are mainly informative documents covering disturbance phenomena, disturbance levels and test and measurement techniques. For example, EN 61000/IEC 61000 is a Basic Standard.

- Generic Standards:

Generic Standards are intended to cover a range of products for which no Product Standard exists. For example, EN 61000-3 and EN 61000-4, EN 61000-1 and EN 61000-2 are Generic Standards.

- Product Standards:

Product Standards are intended to deal with a specific family of electrical or electronic equipment.

Power transformers however, are considered as passive equipment and as such, the above referenced documents are not applicable.

This Technical Report is intended to give guidance on EMC phenomena associated with power transformers.

1 Scope

This Report provides guidance for the evaluation of electromagnetic fields around power transformers.

This Report applies to power transformers covered by EN 60076 series with the following characteristics:

- apparent rating P : $5 \text{ kVA} \leq P \leq 1\,000 \text{ MVA}$
- insulating level, according to EN 60076-3:
 - high voltage winding: U_m from 7,2 kV to 525 kV
 - low voltage winding: U_m up to 525 kV

Reactors are excluded from the present Report.

Continuous conducted and radiated emissions are considered for power transformers operating under nominal working conditions of voltage and current.

Fault conditions and low occurrence transient events, such as

- short-circuits,
- lightning and switching transients,
- overloads (inrush currents, etc.),
- overvoltages,
- tap-changer operations,

are not considered as normal working conditions.

Immunity conditions are considered to ensure the power transformer operates as intended in its normal working environment. The immunity capability of the power transformer is considered for steady state and transient working conditions.

2 References

The following referenced documents are indispensable for the application 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 60076	series	Power transformers (IEC 60076 series)
EN 61000	series	Electromagnetic compatibility (IEC 61000 series)
IEC 60050-161	1990	International Electrotechnical Vocabulary Chapter 161: Electromagnetic Compatibility

3 Definitions

The definitions quoted in IEC 60050-161, in EN 60076 series as well as those mentioned in the above referenced standards apply.