CENELEC GUIDE 34

Guide to the drafting and use of harmonized and non-harmonized EMC standards

Edition 1, 2024-02

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Contents

Page

Foreword **5**
Introduction **6**
1 Scope **7**
2 Normative references **7**
3 Terms and definitions **7**
4 Types of EMC publications **9**
4.1 General 9
4.2 Basic EMC standards 10
4.2.1 Basic EMC standards for measurement and/or test purposes 10
4.2.2 Other types of basic EMC documents 11
4.3 Generic EMC standards 11
4.4 Product specific EMC standards 12
4.4.1 Product family EMC standards 12
4.4.2 Dedicated Product EMC standards 13
5 Electromagnetic phenomena considered in EMC standards. **13**
5.1 Phenomena relevant for electromagnetic emission 13
5.2 Phenomena relevant for electromagnetic immunity 13
5.2.1 General 13
5.2.2 Conducted low frequency phenomena 14
5.2.3 Radiated low frequency field phenomena (below 9 kHz) 14
5.2.4 Conducted high frequency phenomena 14
5.2.5 Radiated high frequency field phenomena (above and including 9 kHz) 14
5.2.6 Other phenomena 15
6 Particular aspects for the drafting of Harmonized EMC standards **15**
6.1 General 15
6.2 Obligations for Harmonized EMC standards 15
6.2.1 Pre-requisite 15
6.2.2 European foreword 15
6.2.3 Scope 16
6.2.4 Normative references 16
6.2.5 Definitions 17
6.2.6 Technical requirements 17
6.2.7 Annex ZA 17
6.2.8 Annex ZZ 18
6.2.9 Checklist for harmonized standards 18

6.3 Restrictions for Harmonized EMC standards 18
6.4 Coordinating role of CENELEC TC 210 for Harmonized EMC standards 19
6.5 Approval procedure for Harmonized EMC standards 20
7 Use of EMC standards for EMC conformity assessments 20
7.1 Criteria for the selection of EMC standards 20
7.2 Application of EMC standards for particular product families or products 21
7.3 Harmonized EMC standards cited in the OJEU under European Directives 24
Annex A (informative) **Low frequency emission requirements – State of the standardization ... 26**
A.1 Introduction 26
A.2 Standardization situation and evolution 26
A.3 Generic standards 27
Annex B (informative) **Additional information on references in EMC standards to other standards 28**
B.1 General 28
B.2 Prevailing references 28
B.3 Additional information on procedures used in CENELEC when international standards (e.g. IEC standards) are endorsed as European standards 28
Annex C (informative) **Multifunction equipment 30**
Annex D (informative) **Radio enabled products or combined equipment 31**
D.1 General 31
D.2 Terms and definitions 31
D.3 Guidelines for the inclusion of radio enabled products or combined equipment in EMC standards 32
Annex E (informative) **Guidelines on the preparation of Annexes ZZ for harmonized standards 33**
Bibliography 37

Foreword

This CENELEC Guide 34:2024 has been prepared by CENELEC Technical Committee CLC/TC 210, Electromagnetic Compatibility (EMC).

This first edition of CENELEC Guide 34 was approved by the CENELEC Technical Board on 2023-12-13. It supersedes CENELEC Guide 24:2009 (3rd edition) 'Electromagnetic Compatibility (EMC) Standardization for Product Committees concerned with apparatus' and CENELEC Guide 25:2009 (3rd edition) 'Guide on the use of standards for the implementation of the EMC Directive to apparatus'.

The main changes in relation to CENELEC Guide 24 and Guide 25 include the following:

1) Change of the Title;

2) In the Introduction, addition of information that the text of this Guide is based on the merging of Guide 24 and Guide 25, deletion of redundant information;

3) Re-structuring of the document by introduction of Clause 1 "Scope", Clause 2 "References", Clause 3 "Terms and definitions, Clause 4 "Types of EMC publications or standards, respectively", etc.;

4) Update of information, e.g. concerning the European EMC Directive and further inclusion of the Radio Equipment Directive;

5) Deletion of Clause 9;

6) Shift of definitions from Guide 24, Annex B and Guide 25, Annex B to new Clause 3 and addition of further definitions;

7) Removal of Annex B stemming from Guide 24 and of Annex B stemming from Guide 25;

8) Removal of Annex C stemming from Guide 24 as it seems that there was no application of this annex;

9) Addition of a new Annex D concerning radio enabled products / combined equipment;

10) Addition of a new Annex E containing guidance for the preparation of Annexes ZZ for harmonized European Standards;

11) Editorial improvements.

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, Türkiye and the United Kingdom.

Introduction

In Europe, Directive 2014/30/EU (EMC Directive (EMCD)) published 2014-03-29 is valid at the time of publication of this CENELEC Guide. This Directive contains essential requirements for the EMC of equipment, which it defines as apparatus and fixed installations.

NOTE 1 The essential requirements are set out in Annex I, 1(a) (emission) and 1(b) (immunity) of Directive 2014/30/EU.

In Europe, Directive 2014/53/EU (Radio Equipment Directive (RED)) published 2014-05-22 is also valid at the time of publication of this CENELEC Guide. This Directive contains essential requirements for radio equipment including EMC requirements.

NOTE 2 The essential requirements in the field of EMC are set out in Article 3.1(b) of Directive 2014/53/EU.

NOTE 3 Further essential, non-EMC requirements for radio equipment are contained in Article 3.1(a) (safety), Article 3.2 (efficient use of radio spectrum), Article 3.3 (miscellaneous) and Article 3.4 (Charging capabilities) of Directive 2014/53/EU.

The essential requirements of these Directives related to electromagnetic compatibility (EMC) can be divided into electromagnetic emission and immunity requirements.

EMC Directive 2014/30/EU, Article 13, states that equipment which is in conformity with harmonized standards or parts thereof whose references have been published in the Official Journal of the European Union (OJEU) shall be presumed to be in conformity with the essential requirements covered by these standards or parts thereof. The presumption of conformity is limited to the scope of the harmonized standard(s) applied and the relevant essential requirements covered by the harmonized standard(s). These harmonized standards can be regarded as tools that can be used for the declaration of conformity of a product with – here in the field of EMC – essential requirements of the EMC Directive or the Radio Equipment Directive (depending on which Directive the product falls under).

The European Commission has commissioned CEN, CENELEC and ETSI to draft harmonized standards for electromagnetic compatibility in support of the EMC Directive and its essential requirements.

The European Commission has also commissioned CEN, CENELEC and ETSI with the task of preparing the necessary harmonized standards for the implementation of the essential requirements of the Radio Equipment Directive in the field of EMC.

This first edition of CENELEC Guide 34 updates the guidance information of CENELEC Guides 24 and 25 with particular focus on the application of Directives 2014/30/EU (EMCD) and 2014/53/EU (RED) and merges the contents of both Guides.

It is recommended that this CENELEC Guide is read in conjunction with IEC Guide 107.

1 Scope

This CENELEC Guide establishes useful guidelines for the preparation and use of standards in the field of electromagnetic compatibility (EMC) in general, and in particular for the implementation of the EMC Directive and the Radio Equipment Directive (RED). This Guide is intended to be used by Technical Committees.

The purpose of this guide is to give advice on:

– the preparation of dedicated Product and Product Family Standards;

– the application of EMC Standards.

Certification aspects are not covered by this Guide.

NOTE Certification is the action by a third party demonstrating that adequate confidence is provided that a duly identified product, process or service is in conformity with a standard or with other normative documents.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161, in Directive 2014/30/EU and in EU Regulation 1025/2012 and the following apply. For facilitating the application of this Guide, the following definitions are repeated:

3.1
electromagnetic compatibility
EMC
ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment

[SOURCE: IEC 60050-161:1990, 161-01-07]

3.2
EMC Directive
EMCD
Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility

3.3
Radio Equipment Directive
RED
Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment

3.4
standard (in the sense of EU Regulation 1025/2012)
technical specification, adopted by a recognized standardization body, for repeated or continuous application, with which compliance is not compulsory, and which is one of the following:

(a) International standard means a standard adopted by an international standardization body;
(b) European standard means a standard adopted by a European standardization body;
(c) harmonized standard means a European standard adopted on the basis of a request made by the Commission for the application of Union harmonization legislation;
(d) national standard means a standard adopted by a national standardization body

[SOURCE: EU Regulation 1025/2012, Article 2 (1)]

3.5
harmonized standard
European standard adopted on the basis of a request made by the Commission for the application of Union harmonization legislation

[SOURCE: Regulation (EU) 1025/2012, Article 2 (1c)]

Note 1 to entry: See also 3.4.

3.6
Official Journal of the European Union
OJEU
Official Journal of the European Union

Note 1 to entry: Among other information of the European Union or the European Commission the references of the harmonized European standards are published in Category L publications of the OJEU.

3.7
date of applicability (in the OJEU)
date published in the OJEU in conjunction with the reference of a harmonized standard when a presumption of conformity with applicable (the) essential requirement(s) for products covered by the harmonized standard starts or started

3.8
date of withdrawal (in the OJEU)
<date of the end of the coexistence period> date when a presumption of conformity ends or ended as published in the OJEU in conjunction with a reference to a harmonized standard to which the withdrawal is deferred

Note 1 to entry: This definition should not be confused with the definition of the date of withdrawal according to CEN/CENELEC Internal Regulations Part 2:2020-07, 2.2.1.

3.9
industrial, scientific and medical (ISM) applications (of radio frequency energy)
ISM applications (of radio frequency energy)
operation of equipment or appliances designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications

Note 1 to entry: Typical applications are the production of physical, biological, or chemical effects such as heating, ionization of gases, mechanical vibrations, hair removal, acceleration of charged particles. A non-exhaustive list of examples is given in EN IEC 55011, Annex A.

[SOURCE: ITU Radio Regulations Volume 1: 2012 – Chapter I, Definition 1.15]

[SOURCE: EN IEC 55011, Definition 3.13]

3.10
ISM RF equipment and appliances
equipment or appliances designed to generate and/or use locally radio-frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications and information technology and other applications covered by other CISPR publications

Note 1 to entry: The abbreviation “ISM RF” is used for such equipment or appliances only.

[SOURCE: EN IEC 55011, Definition 3.14]

4 Types of EMC publications

4.1 General

EMC standards are divided into the following categories:

a) Basic EMC standards;

b) Generic EMC standards;

c) Product family EMC standards;

d) Product EMC standards.

NOTE 1 The standards classifications given above are not in line with IEC Guide 108 which deals with horizontal standards and defines the terms Generic and Basic Standards, however they are in line with the existing IEC Guide 107 which applies to EMC standards. The standards classifications will be re-considered if a modification of the relevant definitions in IEC Guide 107 is made.

A short description of the principal content of these categories of EMC standards is given below. Detailed information can be found in IEC Guide 107.

NOTE 2 There are also other types of publications dealing with EMC issues, such as Technical Specifications (TS), Technical Reports (TR), Publicly Available Specifications (PAS).

Table 1 gives an overview of the categories of standards, their principal content and aims.

Table 1 — Structure, content and purpose of EMC standards

Type	Content	Purpose
Basic [a]	- Measurement and test methods - Instrumentation - Test set-up - Recommended ranges of test levels (immunity) - No limits - No specific performance criteria	- To be referenced in other documents, e.g. Generic, Product family and Product EMC Standards - Not sufficient for conformance testing on its own
Generic	- Precise and essential requirements (limits, test levels) for all products intended for use in the relevant environment, e.g. residential, commercial, light industry, industry - Referring to Basic EMC Standards for measurement/test methods (no repetition of content, however additional information may be given if necessary) - General performance criteria for the immunity testing of products - General operating conditions	- Co-ordination for the requirements given in Product (Family) EMC Standards - Conformance testing of products for which no dedicated Product family or Product EMC Standard exists (if published in the OJEU)
Product family	- EMC requirements for a family of products - Performance criteria for immunity testing more detailed - Specific test set-up, etc. - Referring to Basic EMC Standards for measurements/tests (no repetition of content, however additional information may be given if necessary) - Specific product (family) operating conditions	- Conformance testing of products - Offered for publication in the OJEU - Precedence over Generic EMC Standards but to be co-ordinated with them
Product	– Same as for Product family EMC standards but more specific	- Same as for Product family EMC standards but more specific - Offered for publication in the OJEU - Product standards covering electromagnetic emission requirements are seldom justified. See also 4.4.2.
In other types of publications reference should also be made to Basic EMC standards for tests and measurements.		

4.2 Basic EMC standards

4.2.1 Basic EMC standards for measurement and/or test purposes

Basic EMC standards give the fundamental principles, concepts, terminology, technical characteristics and/or test procedures for the achievement of EMC. They should be used as reference documents by technical/product committees. In the context of this guide, Basic EMC standards have the same status as horizontal publications.

Basic EMC standards for immunity may include ranges of test levels for the specific electromagnetic phenomenon with respect to the characteristics of measuring equipment or measuring methods.

However, Basic EMC standards shall not include prescribed limits and shall not contain detailed performance criteria.

Basic EMC standards are not intended for citation in the Official Journal of the European Union (OJEU).

4.2.2 Other types of basic EMC documents

Other types of Basic EMC publications, e.g. technical specifications, technical reports, etc., relating to other aspects may be identified as “basic”, if they describe fundamental elements of EMC. For example, they may concern:

– Description and classification of the electromagnetic environment; they can include ranges of environmental and/or compatibility levels, thus constituting an important basis for establishing emission limits and immunity test levels, e.g. EN IEC 61000-2-2, EN 61000-2-4, IEC TR 61000-2-5;

– Guidelines on mitigation measures, e.g. IEC TR 61000-5 series.

4.3 Generic EMC standards

Generic EMC standards are designed to apply, for a defined electromagnetic environment, to products for which no dedicated Product family or Product EMC standards exist. They specify a set of essential requirements (e.g. limits, test levels in combination with appropriate test procedures). The Generic Immunity Standards also specify generalized performance criteria applicable to products operating in the relevant electromagnetic environment.

Generic EMC standards should not include detailed test and measurement methods or test instrumentation but refer to Basic EMC standards for that purpose. Generic EMC standards may contain, when necessary, additional information (e.g. choice of one method where several methods are included in a Basic EMC standard). See also 6.2.

Generic immunity standards specify a limited number of essential EMC tests, with the objective of achieving a technical/economic optimum, thus avoiding excessive test requirements that lead to overtesting.

These limited test requirements do not preclude that equipment shall be designed so that it operates normally in its intended EMC environment when exposed to the disturbing phenomena specified within this environment.

Generic immunity standards also include those performance criteria of general application which are associated with specific test levels.

Generic EMC standards should be used when no corresponding Product family or Product EMC standard(s) exist. For example, the following sentence is included in the scope of relevant Generic EMC standards:

“This generic EMC emission standard is to be used where no applicable product or product family EMC emission standard is available.” (IEC 61000-6-4:2018, Clause 1)

or

“This generic EMC immunity standard is applicable if no relevant dedicated product or product family EMC immunity standard exists.” (IEC 61000-6-1:2016, Clause 1 and IEC 61000-6-2:2016, Clause 1).

In addition, Generic EMC standards play an essential role in the co-ordination of Product family and Product EMC standards. If product committees prepare Product EMC standards, they shall consult the essential requirements, etc. given in the Generic EMC standards.

For requirements and information that should be avoided in harmonized standards, see 6.3.

4.4 Product specific EMC standards

4.4.1 Product family EMC standards

The scopes of such standards shall indicate the particular product family concerned. A product family, from an EMC point of view, is a group of similar products for which the same standard(s) can be applied.

NOTE 1 A product family covers products with differing functions, but having some common general characteristics (e.g. connection to the public low voltage network). The borderline with dedicated products can sometimes be imprecise as families can be very broad or narrow.

NOTE 2 In addition it is probably necessary to indicate how to apply the standard to the product family or product (specific test set-up and procedure if needed).

Product family EMC standards can, for example, be prepared for the following reasons:

a) more detailed description, specific functional requirements, specific operating conditions, etc.;

b) to address specific environments;

c) to address phenomena not considered in the Generic standards.

Product family standards define specific EMC requirements (immunity and/or emission) and precise tests for the products within their scopes.

Product family EMC standards should preferably be structured in the same way as Generic EMC standards.

In particular, the following items shall be considered:

a) Definition of the type of product(s) covered by the Product family EMC standard.

   NOTE 3 It is important that the product family (families) covered by the scope are very clearly defined.

b) Normative reference to Basic EMC standards: they should not include detailed descriptions of the measurement or test methods and the measurement or test instrumentation. In exceptional and justified cases, specific test methods or deviations from the test methods specified in the Basic EMC standards may be necessary. Test methods should be described in detail only for those phenomena not covered by Basic EMC standards. See also 6.2.4.

c) In the field of immunity, inclusion of more specific and detailed performance criteria than given in the Generic EMC standards. Product committees shall define product specific criteria for immunity tests using the generalized performance criteria (defined in the relevant Generic EMC standard) as a basis.

d) Inclusion of all additional information necessary for the reproducible testing of the products within the scope of the Product family EMC standard, the definition and description of the operating conditions for the product, the applicable electromagnetic environment and the particular phenomena to be considered.

e) Coordination of the tests and limits included with those given in the relevant Generic EMC standards. If a deviation from the relevant Generic standard(s) is needed, it shall be fully justified and the rationale shall be given in the Product family EMC standard, e.g. in an informative annex of the standard. Deviations may concern the phenomena considered, additional tests or other test levels. The justification shall explain how the level of protection is achieved and thus the essential requirements are fulfilled despite the deviation from the requirements of the generic standard.

CENELEC/TC 210 in its overall EMC co-ordination role should be given the opportunity to comment on the proposed justification prior to the finalization of the Product family EMC standard. See also 6.4.

For requirements and information that should be avoided in harmonized standards, see 6.3.

Product family EMC standards take precedence over Generic EMC standards, either partially or totally according to the EMC domains covered.

4.4.2 Dedicated Product EMC standards

Product EMC standards relate to a specific type of product for which specific conditions shall be considered. The same criteria as defined for Product family EMC standards apply to Product EMC standards.

EMC requirements, instead of constituting separate standards, are frequently included within general-purpose standards dedicated to specific (dedicated) products within their scopes. EMC clauses within these general-purpose standards shall be separated and clearly identified. However, it is preferred to prepare separate EMC standards.

In particular, in relation to emission requirements, if a particular product is covered by a Product family standard, the preparation of a dedicated Product standard is rarely justified. Deviations from the specified emission limits is allowed only in exceptional cases and shall be justified, e.g. if a particular environment allows an increase of an emission limit. Product EMC standards are therefore in some cases justifiably different from Product family and Generic standards; however, they should be coordinated with them.

CENELEC/TC 210 in its overall EMC co-ordination role should be given the opportunity to comment on the proposed justification prior to the finalization of the Product EMC standard. See also 6.4.

Product specific functional characteristics should be taken into account when determining the product's immunity requirements. Dedicated Product EMC standards or clauses should give precise performance criteria.

For requirements and information that should be avoided in harmonized standards, see 6.3.

5 Electromagnetic phenomena considered in EMC standards.

5.1 Phenomena relevant for electromagnetic emission

It has been found sufficient for ensuring EMC that the following phenomena or effects are considered when formulating emission requirements (limits) in Generic, Product family and Product EMC standards:

– harmonic and interharmonic currents;

– voltage fluctuations/flicker;

– low frequency electric fields (0 Hz to 9 kHz, e.g. 16,7 Hz, 50 Hz);

– low frequency magnetic fields (0 Hz to 9 kHz, e.g. 16,7 Hz, 50 Hz);

– conducted disturbances (> 9 kHz) for the protection of radio reception and/or other EMC purposes;

– radiated disturbances (> 9 kHz) for the protection of radio reception and/or other EMC purposes.

NOTE 1 Radio-interference emission limits may provide an indirect limitation of transients.

NOTE 2 The consideration of the phenomena may lead to no requirement for testing if the drafting committee concludes that risk of EM incompatibilities of the EUT is negligible considering the representative coupling path and potential victims in the EUT’s environment.

In the future, additional or other phenomena may be considered for emission requirements.

5.2 Phenomena relevant for electromagnetic immunity

5.2.1 General

It has been found to be sufficient for ensuring EMC that the phenomena or effects described in 5.2.2 to 5.2.6 are considered when defining immunity requirements (limits) in Generic, Product family and Product EMC Standards.

Detailed information concerning the electromagnetic phenomena mentioned above can be found in IEC TR 61000-2-5.

In the future, additional or other phenomena may be considered for immunity requirements.

NOTE The consideration of the phenomena may lead to no requirement for testing if the drafting committee concludes that risk of electromagnetic incompatibilities of the EUT is negligible considering the representative coupling path and potential sources in the EUT's environment.

5.2.2 Conducted low frequency phenomena

– Slow variations of the supply voltage;

– harmonics, interharmonics;

– signalling on the mains supply;

– conducted common mode disturbances between 0 Hz and 150 kHz on the mains supply;

– conducted differential mode disturbances between 2 kHz and 150 kHz on the mains supply;

– voltage fluctuations;

– voltage dips and interruptions;

– voltage unbalance;

– power frequency variations;

– induced low frequency voltages;

– DC current or voltage in AC networks.

5.2.3 Radiated low frequency field phenomena (below 9 kHz)

– Electric fields;

– magnetic fields:

  - continuous;
  - transient.

NOTE Electric and magnetic fields can be continuous or transient, far field or near field.

5.2.4 Conducted high frequency phenomena

– Induced voltages or currents:

  - continuous waves;
  - modulated waves;

– unidirectional transients:

  - e.g. electrical fast transients/burst;
  - e.g. surges;

– oscillatory transients.

NOTE Unidirectional and oscillatory transients can be single or repetitive.

5.2.5 Radiated high frequency field phenomena (above and including 9 kHz)

– Magnetic fields;

– electric fields;

– electromagnetic fields:

– continuous waves;

– modulated waves;

– transients.

NOTE Transients can be single or repetitive.

5.2.6 Other phenomena

– Electrostatic discharge (ESD).

6 Particular aspects for the drafting of Harmonized EMC standards

6.1 General

Harmonized EMC standards are drafted under a standardization request (mandate) of the European Commission. Such standards are intended to be cited in the Official Journal of the European Union. When a harmonized standard is cited in the official journal of the European Union, the compliance of a product with such a standard leads to the presumption of conformity with the essential requirement(s) of the Directive that is (are) covered by the standard.

This legally binding presumption of conformity implies some obligations and restrictions in the drafting of the harmonized standard in addition to the usual CEN/CENELEC Internal Regulation Part 3 and other guides to ensure a sufficient level of legal certainty.

Therefore, the acceptance for citation of a standard is now subject to assessment and approval by the HAS (EMCD and/or RED) consultant and the European Commission services. The European Commission may decide to accept a standard for citation, accept it for citation with restrictions mentioned in the Official Journal, or simply reject it for citation.

Sub-clauses 6.2 and 6.3 provide additional requirements that technical committees need to apply when drafting a Harmonized EMC standard.

6.2 Obligations for Harmonized EMC standards

6.2.1 Pre-requisite

The standard shall be based on a standardization request of the European Commission (EC) and the relevant standardization request (mandate) shall be mentioned in the data sheet of the standardization project.

The standard shall be prepared according to the rules of the relevant standardization organization for the preparation of standards and adopted by the National Committees. See CEN/CENELEC Internal Regulations Part 3.

Furthermore, the following document provides guidance to Technical Bodies and Working Groups on horizontal aspects to be considered when preparing EN IEC harmonized standards:

Drafting EN IEC standards for citation in the OJEU (cenelec.eu)

6.2.2 European foreword

A European foreword shall be present in a harmonized standard.

When the standard is a revision of a previous edition, the European foreword shall summarize the main changes in the new edition of the standard.

The standardization request (mandate) shall be referred to in Annex ZZ and shall not be mentioned in the European foreword.

6.2.3 Scope

The scope shall allow the user of the standard to identify the products or product families that fall into the scope of the standard, i.e. the scope shall be concise and clear.

NOTE At the time of the publication of this guide, the scopes of the Generic standards are considered too vague for future citation in the Official Journal.

The scope shall be consistent with the content of the standard.

6.2.4 Normative references

The different types of EMC publications (see Clause 4) presuppose a hierarchy of standards and an extensive use of references to other EMC standards. For example, Generic EMC standards and Product (family) standards shall refer to Basic EMC standards without reproducing the details, but can contain additional requirements and/or information, if necessary. It is therefore required to define clearly the principles to which such references underly.

References to other documents shall be done according to the relevant CENELEC rules (CEN/CENELEC Internal Regulations Part 3 and CENELEC Guide 10). For documents that are intended for citation in the OJEU, the relevant rules for harmonized standards shall also be observed.

In principle, it is acceptable to refer in a document (e.g. standard) to other documents in the following two ways:

a) References should be done only to approved (and published) documents, e.g. published by ISO, IEC, CEN, CENELEC, ETSI, ITU-R, ITU-T. For references to Basic EMC standards, dated references shall be used. Where the document contains an Annex ZA (in the case where CENELEC documents, e.g. standards, are based on international documents) it is the prevailing procedure regarding the use of references. The specific edition of the referenced EN is the reference to be followed.

   References shall be normative and dated. Informative and undated references in harmonized standards are only allowed for referenced documents that are not linked to an essential requirement of a European Directive.

   The references should be up to date as far as possible.

b) A normative or informative reference to a draft or final draft (e.g. IEC CDV or FDIS, CENELEC prEN or FprEN) is described as risky in CEN CENELEC Internal Regulations Part 3, sub-clause 10.5 and therefore strongly discouraged. However, if there is a necessity to make such a reference (e.g. a reference in a draft of a standard which is part of a series to the draft of another standard of the same series) this should be based on a careful decision.

   NOTE It should be noted that according to the HAS Consultant Assessment System (which started in October 2022) the assessment result can be a conditional compliance in the case of a document that is part of a series of standards and contains a reference to a draft of another standard of the same series.

Any cross reference to a normative reference in the core text of the standard shall be done to specific clauses or subclauses ('generic' references should be avoided), however, in exceptional cases it can be that the entire text of the normative reference shall be applied in full.

The clauses and/or sub-clauses of the normative references cited in the Harmonized EMC standard are also part of the assessment of the HAS consultant and the European Commission services. The same additional requirements as for the harmonized standard itself apply to such parts of a normative reference. If any content of the normative reference is not in line with these additional requirements, a text (e.g. a note) should be added in the harmonized standard to correct or clarify the problematic content of the normative reference.

The following statement from the Vademecum on European Standardisation, Part 3, Paragraph 2.8.3 (Guidance for selecting normative references in harmonised standards) shall also be taken into account: “Legal acts can never be used as a normative reference” completed by the following footnote 13: “Only informative references to legal acts are possible, e.g. in an informative annex (see Section 2.8.4).”

Additional information is given in Annex B.

Reference is also made to the CEN/CENELEC guidance on normative references in harmonized standards available at the following link:
https://boss.cenelec.eu/media/BOSS%20CENELEC/ref/guidance_normative_references_hens.pdf

6.2.5 Definitions

In addition to the rules given in the CEN/CENELEC Internal Regulations, definitions shall also be consistent with the definitions given in the relevant EU legislation. For any definitions that are not consistent with the latter, the European foreword and Annex ZZ shall indicate the differences to the relevant EU legislation.

6.2.6 Technical requirements

In case of a standard covering more than just EMC aspects (wider scope than purely EMC), the normative elements in response to the standardization request shall be properly separated from other normative elements.

The Harmonized EMC standard shall provide an added value to the normative reference (e.g. Basic EMC standard). The added value is ensured if at least one of these elements is provided:

- product specific EUT operating mode during the test;
- product specific EUT performance criteria and/or performance level;
- product specific limits;
- product specific test method.

EXAMPLE An EN containing only a statement such as “EN 55032 and EN 55035 apply” as the EMC requirement cannot be considered as a Harmonized EMC standard.

In principle, the Harmonized EMC standard shall cover all relevant essential requirements that are part of the standardization request. However, if the scope of the standard is limited to only a part of these essential requirements then only these essential requirements are covered.

The technical requirements shall be as clear and precise as possible, meaning that the application of the requirement should not be subject to any kind of interpretation by the user of the standard.

The requirements of the Harmonized EMC standard shall specify appropriate and verifiable measures for mitigation of EMC risk (as far as possible performance based). As a basic principle, these requirements shall be based on an assessment considering a level of protection that corresponds to the state of the art as given in the latest edition(s) of the relevant Generic EMC standard(s) and more comprehensive standards (e.g. which deal with all types of ports except exotic variants). Refer also to Clause 5 describing the electromagnetic phenomena to be considered in the assessment.

Therefore, emission requirements (if relevant) shall be equivalent to or more appropriate than those in the standards already acknowledged as describing the state of the art. Similarly, immunity requirements (if relevant), including performance criteria, shall be equivalent to or more appropriate than those in the standards already acknowledged as describing the state of the art.

Furthermore, EMC standards shall specify parameters that have an impact on the measurement or test accuracy (e.g. cable layout, power source characteristics, wave shapes, EUT set-up, etc.) and/or guidelines to improve the test accuracy (i.e. test repeatability and reproducibility).

All clauses in support of the standardization request shall be normative.

6.2.7 Annex ZA

Harmonized EMC standards which are adopted from an International Standard (from ISO or IEC) shall have an Annex ZA providing the correspondence of the International standards (from ISO or IEC) with the corresponding European Standards (from CEN or CENELEC).

See also CEN/CENELEC Internal Regulations Part 3, 15.5.3 and Annex ZA.

6.2.8 Annex ZZ

The Harmonized EMC standard shall have an Annex ZZ which details the correspondence between the European Standard and the essential requirements set out in the relevant European Directive, e.g. 2014/30/EU (EMCD) or 2014/53/EU (RED) in the field of EMC.

Annex ZZ can be provided later as a separate Amendment to the standard, however the existence of this Annex is required for the citation of the harmonized standard in the OJEU.

Additional information is given in Annex E.

6.2.9 Checklist for harmonized standards

A checklist for harmonized standards needs to be filled out prior to submission of a draft to the HAS consultant assessment to ensure the proper application of the additional requirements for harmonized standards.

The checklist is available at:

https://boss.cenelec.eu/media/BOSS%20CENELEC/formtemp/checklist_hens_2023.docx

6.3 Restrictions for Harmonized EMC standards

The content of the Harmonized EMC standard shall not:

– be in conflict with the EU legislation or amend legislative definitions or provisions;

– interpret parts of the EU legislation which are not part of the standardization request;

– repeat legal requirements as part of its normative requirements.

The content of the Harmonized EMC standard shall follow the neutrality principle (i.e. it shall be technology neutral). Therefore, the standard shall not contain requirements or obligations on or between economic operators.

The following types of statements (requirements and information) shall be avoided in Harmonized EMC standards:

1) Statements referring to the role of national authorities in general, for example indicating that national authorities may relax the standards requirements, ignore them or make them more severe;

2) Statements concerning the legal responsibilities or legal roles of parties involved (manufacturers, operators, authorities etc.);

3) Statements referring to sales restrictions, legal sanctions, obligations for entering the market, ban of sales, contractual arrangements/relations between parties;

4) Statements imposing obligations, for example an obligation to perform tests in locations defined by non-technical parameters, such as manufacturers' premises or third-party laboratories;

   NOTE 1 Only technical requirements may be imposed on test locations.

5) Requirements for user manuals or instructions to be provided by the manufacturer or for the marking of products;

   NOTE 2 Such requirements are covered by the relevant Directive directly (EMCD, articles 7(7) and 18; RED, article 10 (8)), and are not part of the standardization request provided by the European Commission to CEN and/or CENELEC;

6) Statements related to cases of dispute, such as "In case of dispute, the method used by the manufacturer shall be used";

7) Statements including dates of application;

NOTE 3 If a Technical Committee finds it useful to give advice in such matters, it should be done in separate documents and not included in the text of harmonized standards.

8) Statements introducing provisional limits, test levels, measurement or test methods, performance criteria or other requirements (e.g. “as defined by the manufacturer”);

NOTE 4 The term “intended use” is usually tolerated in Harmonized EMC standard as long as the use of this term does not contradict the legal requirement of the European Directive.

9) Measurement uncertainty and accuracy. Nevertheless, guidance about how to calculate and apply measurement uncertainty may be included in an informative annex of a Harmonized EMC standard;

10) Limits conditioned to the application of a statistical method (e.g. for mass-produced equipment).

NOTE 5 European Standard EN 50715 covers statistical considerations in the determination of EMC compliance of mass-produced products. This standard may be used standalone for such considerations. Nevertheless, it cannot be referenced in a Harmonized EMC standard.

In addition, related to the presumption of conformity with the essential requirement(s) of a Directive, alternative test and measurement methods for the same purpose should be avoided, unless evidence exists that all methods give an equivalent provision of presumption of conformity with the essential requirement(s) as established methods. In this case, alternative methods are regarded as sufficient for the establishment of a presumption of conformity with essential requirements. If such evidence does not exist, a reference method shall be selected (in line with CEN/CENELEC Internal Regulations Part 3, sub-clause 18.5.5).

It cannot be excluded that further aspects will be identified in the future. Relevant developments and decisions at European level should therefore be observed.

6.4 Coordinating role of CENELEC TC 210 for Harmonized EMC standards

The task of co-ordination of the Product (family) EMC standards has been delegated to CENELEC TC 210 due to the horizontal function of this Technical Committee in the field of EMC standardization within CENELEC.

It is the task of CENELEC TC 210 to ensure the coherence of EMC standards by adopting internal procedures comprising two main responsibilities:

– to check Product EMC standards during their preparation by product committees;

– to give recommendations to CENELEC with regard to the citation of Harmonized EMC standards in the Official Journal of the European Union.

The review of standards by CENELEC TC 210 covers only technical aspects of those standards, and points of principle (such as limits, new test methods, etc.), while detailed comments are given by the National Committees.

NOTE 1 In the field of standards that are prepared at IEC level and adopted by CENELEC as European Standards, the review process will already be done at IEC level. In particular, the Advisory Committee on Electromagnetic Compatibility (ACEC) of the IEC has established a review procedure for drafts of such IEC documents that contain EMC requirements. In such cases, there is no need to duplicate this process within CENELEC. At CENELEC level, this procedure is mainly necessary for homegrown standards and common modifications.

NOTE 2 The review activity of CENELEC TC 210 should not be confused with the assessments done by HAS Consultants.

6.5 Approval procedure for Harmonized EMC standards

In addition to the rules in the CEN/CENELEC Internal Regulations that apply for the approval of European Standards (EN), certain requirements or conditions shall be fulfilled by those standards which are intended to be recognized as harmonized standards that are appropriate for the implementation of one or more essential requirements of a European Directive and are intended to be regarded as candidates for citation in the OJEU. The CENELEC “Matrix of responsibilities for the development in CENELEC of European Standards to be offered for OJEU citation” provides detailed information about the tasks during the approval of the harmonized standard. This matrix is available at:

https://boss.cenelec.eu/media/matrix_responsibilities_harmonizedeniec.pdf

In particular:

– The standard shall have a positive assessment (no negative assessment) by the HAS Consultant.

NOTE 1 The result of an assessment by a HAS Consultant can be positive, negative or conditional. The latter is only used for draft standards that are part of a series of standards and contain normative references to other draft standards of the same series. In this case, the normative reference to a draft shall be changed into a normative reference to the final published standard as soon as possible.

NOTE 2 Assessments of the HAS Consultant will be forwarded to the Technical Committee which is responsible for the draft standard, with a request for processing. Assessments will only be done at a draft stage of the standard (IEC CD, CDV or FDIS in the case of the IEC CENELEC parallel procedure, CENELEC prEN or FprEN in the case of homegrown standards).

– The standard shall be offered by CENELEC to the European Commission (EC).

– The standard shall be accepted by the responsible service(s) of the European Commission that is/are responsible/involved in the process of citation of harmonized standards in the OJEU.

7 Use of EMC standards for EMC conformity assessments

7.1 Criteria for the selection of EMC standards

In certain cases, the selection of an EMC document, e.g. a Product family or dedicated Product standard, for application to a particular product may be difficult.

The following basic principles should be used as a guidance for the selection of appropriate standards:

1) The scopes of the Product family or dedicated Product standards specify their applicability to individual products. The scopes of the standards should therefore be considered carefully, with all their implications.

2) The intended (or primary) use or function of the equipment determines which EMC standard(s) may apply. However, it should be noted that some standards cover so-called multifunction equipment. For multifunction equipment, it may be necessary to comply with more than one EMC standard for emission and/or immunity. See Annex C for further information.

EXAMPLE For the application of standards, a washing machine, whatever microprocessor modules are used in it, remains a household equipment and therefore EN IEC 55014-1 applies for radio frequency emission and EN IEC 55014-2 applies for immunity. Furthermore, a washing machine with integrated microprocessor remains in the scope of European Directive 2014/30/EU (EMCD). In this case, the relevant Harmonized EMC standards listed in the OJEU under the EMCD provide a presumption of conformity with the essential EMC requirements of that Directive.

However, if the washing machine is equipped with a radio module, it is regarded as radio equipment according to the European Directive 2014/53/EU (RED) and therefore falls into its scope. In this case, the relevant Harmonized EMC standards listed in the OJEU under the RED provide a presumption of conformity with the essential EMC requirements of the RED.

3) Particular interface modules in a well-defined equipment (e.g. washing machine) may have to comply with additional requirements that are not included in the normally applicable Product (family) standards for the complete product. In this case, the interface module (separated or not from the equipment) shall comply with these additional requirements valid for the port corresponding to the interface module only.

4) An increasing number of products will be equipped with a wireless power transfer (WPT) function. If the EMC standard that applies to equipment of the same kind, but without containing a WPT function, also contains requirements for such equipment with WPT function this standard remains valid for the relevant equipment. However, it depends on the WPT function if it contains an additional radio communication function. If this is so, the equipment falls into the scope of European Directive 2014/53/EU (RED) and the relevant Harmonized EMC standards listed in the OJEU under the RED provide a presumption of conformity with the essential EMC requirements of the RED.

   If the WPT function does not contain an additional radio communication function, the relevant equipment falls into the scope of European Directive 2014/30/EU (EMCD). In this case, the relevant Harmonized EMC standards listed in the OJEU under the EMCD provide a presumption of conformity with the essential requirements of the EMC Directive.

   See Annex D for further information.

5) EN IEC 61000-3-2, EN IEC 61000-3-3, EN IEC 61000-3-11 and EN IEC 61000-3-12 apply to the product families within their scope. This is independent of how any other standard includes requirements related to the phenomena covered by these standards. EN IEC 61000-3-2, EN IEC 61000-3-3, EN IEC 61000-3-11 and EN IEC 61000-3-12 cannot be made inapplicable by other standards.

6) Despite these general principles, problems related to the selection of (the) appropriate standard(s) may still occur that are difficult to solve.

For demonstration of compliance with EMC requirements by using EMC standards it is often necessary to comply with more than one standard. This is because some EMC standards do not cover the whole set of essential requirements covered by the EMC Directive. They may cover only low frequency conducted emissions (e.g. EN IEC 61000-3-2, EN IEC 61000-3-3, EN IEC 61000-3-11, EN IEC 61000-3-12), radio-frequency conducted and radiated emission (e.g. EN IEC 55011, EN IEC 55014-1, EN IEC 55015, EN IEC 55032, etc.) or immunity (e.g. EN IEC 55014-2, EN 55035, EN IEC 61547, etc.).

When dedicated Product standards cover emission or immunity, normally the directly corresponding Product family standard(s) does not apply, except when referred to in the dedicated applicable Product standards.

In the absence of appropriate Product standards, e.g. Product-family or dedicated Product standards, the Generic EMC standards shall be applied.

Generic and Product (family) standards contain requirements for products if the test is done using equipment and methods as described in the Basic EMC standards which are referenced within them. A declaration of conformity only needs to list the Generic and/or Product (family) standard(s) that have been applied.

7.2 Application of EMC standards for particular product families or products

To assist users concerned with aspects of conformity with the EMC requirements, e.g. given in the EMCD or the RED, the following non-exhaustive Table 2 shows, for some examples of typical equipment, standards that cover essential EMC requirements. All standards in one row of the table shall be applied to demonstrate presumption of conformity with the essential EMC requirements for the particular equipment.

This table reflects the situation at the date of publication of this CENELEC Guide. It will be updated in subsequent editions of the Guide, if necessary.

Table 2 — Examples for the application of EMC standards for product families/products
(non-exhaustive)

Product (family)	Standards covering essential requirements			
	Emission			Immunity
	Harmonics [1)]	Voltage fluctuations [1)]	Radio-interference	
Household appliances and portable tools	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 55014-1 [2)]	EN 55014-2
Lighting equipment and similar equipment	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 55015 [9)]	EN IEC 61547
Multimedia equipment including: – Information Technology (IT) equipment – Telecommunication terminal equipment – Sound and television broadcast receivers, other and video audio equipment and associated equipment – Professional audio and video equipment and lighting control equipment for entertainment and similar purposes	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 55032	EN 55035 (all multimedia equipment)
Mains signalling equipment [8)]	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 50065-1	EN 50065-2-1 EN 50065-2-2 EN 50065-2-3
Powerline communication apparatus	EN 61000-3-2	EN 61000-3-3	EN 50561-1	EN 50412-2-1
Industrial, scientific and medical (ISM) equipment	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 55011	EN 61000-6-2
Industrial equipment in general (not connected to the public low-voltage network)	_ [3)]	_ [3)]	EN 61000-6-4	EN 61000-6-2
Railway, Railway applications	EN 61000-3-2 or EN 61000-3-12 [3)]	EN 61000-3-3 or EN 61000-3-11 [3)]	EN 50121 series	EN 50121 series
Electricity meters	–	–	EN 50470-1	EN 50470-1
Static meters for active energy (Classes 1 and 2)	–	–	EN 62053-21	EN 62053-21
Static meters for active energy (Classes 0,1S, 0,2 S and 0,5 S)	–	–	EN 62053-22	EN 62053-22
Electronic ripple control receivers	–	–	EN 62054-11	EN 62054-11

Product (family)	Standards covering essential requirements			
	Emission			Immunity
	Harmonics [1]	Voltage fluctuations [1]	Radio-interference	
Electricity metering equipment - Tariff and load control equipment	–	–	EN 62052-21	EN 62052-21
Marine navigational equipment	–	–	EN 60945	EN 60945
Automatic electrical controls for household and similar use [7]	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 60730-1 and specific parts of EN 60730 series as appropriate [5]	EN 60730-1 and specific parts of EN 60730 series as appropriate [5]
Household electronic switches for fixed installations [7]	EN IEC 60669-2-1, EN 61000-3-2	EN IEC 60669-2-1, EN 61000-3-3	EN IEC 60669-2-1	EN IEC 60669-2-1
Induction watt-hour meters	–	–	–	EN 60521
Programmable controllers (industry)	–	–	EN 61000-6-4	EN 61131-2
Low-voltage switchgear and controlgear [7]	–	–	EN 60947-1 and specific parts of EN 60947 series as appropriate [6]	EN 60947-1 and specific parts of EN 60947 series as appropriate [6]
Alarm systems	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	EN 61000-6-3	EN 50130-4
Uninterruptible power systems (UPS)	EN IEC 62040-2	EN IEC 62040-2	EN IEC 62040-2	EN IEC 62040-2
Arc welding equipment	EN IEC 60974-10	EN IEC 60974-10	EN IEC 60974-10	EN IEC 60974-10
Residual current operated protective devices for household use	–	–	EN IEC 61543	EN IEC 61543
Adjustable speed power drives	EN IEC 61800-3, EN 61000-3-2	EN IEC 61800-3, EN 61000-3-3	EN IEC 61800-3	EN IEC 61800-3
Equipment for measurement, control and laboratory use	EN 61326-1 and specific parts as appropriate	EN 61326-1 and specific parts as appropriate	EN 61326-1 and specific parts of EN 61326 series as appropriate	EN 61326-1 and specific parts of EN 61326-series as appropriate
Radio-communication equipment and systems	EN 61000-3-2 or EN 61000-3-12	EN 61000-3-3 or EN 61000-3-11	Relevant ETSI standard in the ETSI EN 301489 series	Relevant ETSI standard in the ETSI EN 301489 series
Telecommunication network equipment	EN 61000-3-2 or EN 61000-3-12 [10]	EN 61000-3-3 or EN 61000-3-11 [10]	ETSI EN 300386	ETSI EN 300386

A dash (–) indicated in Columns 2 to 4 means either that as far as it is known, the requirement (related to the relevant electromagnetic phenomenon) does not apply to that (family of) product(s), or that at present the standards do not include any requirements.

It does not preclude that equipment should be designed to meet the normal EMC environment including EMC compatibility levels on the supply system.

Particular notes:

1) Only for equipment intended for connection to public low-voltage (LV) networks.

2) For microwave ovens and other appliances for domestic use designed to use or radiate radio-frequency energy for the treatment of material, for inspection/analysis purposes, or for the transfer of electromagnetic energy, EN IEC 55011 applies instead of EN IEC 55014-1.

3) Only for railway applications that are intended for connection to the public low-voltage supply network. Not applicable for e.g. the train itself or equipment installed on board of trains.

4) No limits in standards for equipment connected to private LV networks, but installation restrictions by supply authorities may apply (see Annex A).

5) Relevant dedicated product standards (particular parts) (series EN 60730-2 to EN 60730-x) apply in conjunction with the general part (EN 60730-1).

6) Relevant dedicated product standards (particular parts) (series EN 60947-2 to EN 60947-x) apply in conjunction with the general part (EN 60947-1).

7) The EMC Directive applies insofar as these products are equipment or components within the scope of the EMC Directive.

8) For residential, commercial and light industrial environments, EN 50065-2-1 may be used. For industrial environments, EN 50065-2-2 may be used. For equipment used by electricity suppliers and distributors, EN 50065-2-3 may be used.

9) Requirements for lighting equipment which uses RF energy in ISM frequency bands for the purpose of exciting material into a state where it emits light are contained in EN 55011. Requirements for all other lighting equipment are contained in EN IEC 55015.

10) Only for telecommunication network equipment that are intended for connection to the public low-voltage supply network.

7.3 Harmonized EMC standards cited in the OJEU under European Directives

Conformity with the harmonized standards or parts thereof the references of which have been published in the Official Journal of the European Union (OJEU) provides a presumption of conformity with essential requirements set out in the relevant Directive which are covered by these standards or parts thereof (electromagnetic emission and/or immunity).

The system for publication of the references of harmonized standards for electromagnetic compatibility in support of Directive 2014/30/EU in the Official Journal of the European Union (OJEU) has been modified. Previously, the complete list of harmonized standards whose references have been published in the OJEU (e.g. under the EMC Directive) was published at regular intervals within Category C (for Communication) of the OJEU. Under the new system, the implementing decisions (citation of harmonized standards) are now published in Category L (for Legislation) of the OJEU whereby the information is given in the following format:

– The references of harmonized standards for electromagnetic compatibility drafted in support of the EMC Directive (EMCD), the Radio Equipment Directive (RED) or other Directive(s) are listed in an Annex of the relevant OJEU. These standards can be applied and lead to a presumption of conformity with the essential requirements of the relevant Directive at the date of publication of the OJEU.

– The references of harmonized standards for electromagnetic compatibility drafted in support of the EMC Directive (EMCD), the Radio Equipment Directive (RED) or other Directive(s) which are to be withdrawn out of the OJEU are listed in a further Annex of the same OJEU. These standards are withdrawn in relation to the implementation of the relevant Directive whereby the withdrawal is deferred to a date of withdrawal which is also published in the same OJEU for the withdrawn harmonized standard. This allows users of the standard(s) to have a transition period for adaption to the requirements of the new standard(s).

NOTE Due to the publication in category L of the OJEU the citation in the OJEU has legislative effect.

Publications of Category L and C of the OJEU can be found at:

https://eur-lex.europa.eu/oj/direct-access.html

A complete list of harmonized standards that are applicable in order to establish a presumption of conformity with essential requirements set out in the EMC Directive is published for information purposes on the website of the European Commission. The complete list can be found at:

https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards_en

Harmonized EMC standards may be used to demonstrate compliance with all essential requirements (these include, if applicable, low-frequency as well as high-frequency phenomena, conducted as well as radiated phenomena, emission as well as immunity) or may be used to cover only a part of the essential requirements. Where harmonized standards are not available or available harmonized standards are not applied, or are not fully applied, the technical documentation required by Annex II of the Directive shall include descriptions of the solutions adopted to meet the essential requirements of this Directive, including a list of other relevant technical specifications applied.

The same principles as described above also apply for standards intended for citation in the OJEU under the Radio Equipment Directive (RED).

Annex A
(informative)

Low frequency emission requirements – State of the standardization

A.1 Introduction

Some information and explanations are given below in relation to the state of the standardization in the case of the low-frequency emission requirements and limits for equipment.

The development of standards and recommendations covering phenomena, such as harmonics and voltage fluctuations injected or produced on the power supply by equipment connected to power supply systems, concerns distribution network operators (DNO), manufacturers, network agencies, installers and users of equipment.

A.2 Standardization situation and evolution

Three different cases are clearly distinguished in the present situation. They reflect the consensus that has been prevailing for some time when treating the different situations concerning limitations of harmonics and voltage fluctuations in the power supply.

a) *Low-power equipment rated at less than 75 A per phase and intended for direct connection to the public low-voltage supply system*

This category covers a broad range of widely used equipment. Limits and/or requirements are specified in harmonized standards for harmonic current injection and for current fluctuations leading to voltage fluctuations.

Conformity with these standards can be evaluated at the manufacturing stage under well-defined conditions. This is of major importance for the manufacturer, since equipment that is in conformity with harmonized standards is presumed to comply with the essential requirements of the EMC Directive.

The harmonized standards EN IEC 61000-3-2 and EN IEC 61000-3-3, EN IEC 61000-3-11 and EN IEC 61000-3-12 cover all equipment with a current rating equal to or less than 16 A or 75 A, respectively, and intended for direct connection to public low-voltage supply systems.

It should be noted that at the time of publication of this Guide limits for the limitation of harmonic currents produced by professional equipment above 1 000 W are not given in EN IEC 61000-3-2. Therefore, no limits apply for such equipment until a relevant revision of or amendment to EN IEC 61000-3-2 is prepared and adopted with a corresponding implementation date.

EN IEC 61000-3-11 covers requirements for the limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with a rated current not greater than 75 A and which is subject to conditional connection (as defined in the standard).

EN IEC 61000-3-12 covers requirements for the limitation of harmonics for equipment rated between 16 A and 75 A per phase.

b) *Equipment with rated current above 75 A and intended for direct connection to the public supply systems*

For this type of equipment, it is considered that harmonized standards will probably not be prepared in the future and that only guidelines or Technical Reports are issued by the standardization bodies. These documents may be used by agreement between distribution network operators (DNO) and their direct customers.

c) *Equipment intended for connection to the public medium voltage (or high voltage) supply network (industrial loads)*

For such equipment, it is considered that it is difficult to define limits which are independent of the final location or installation of the equipment. If limits in a strict sense were to be defined, it is expected that they would refer to installations (and thus be location dependent) and not refer to equipment at the manufacturing stage.

Technical Reports IEC TR 61000-3-6 and IEC TR 61000-3-7 prepared by IEC SC 77A cover the emission of harmonics and voltage fluctuations caused by industrial loads connected at medium or high voltage level to the public network.

The basic approach used in these documents is that of flexible guidelines in several stages intended for use by distribution network operators (DNO), installers and users of equipment during their efforts to reach a common and co-ordinated solution.

No harmonized standards are available or applicable to give presumption of conformity to the EMC Directive for such equipment.

A.3 Generic standards

Although only the generic emission standards for the residential, commercial and light industrial environments endorse the requirements and limits of EN IEC 61000-3-2, EN IEC 61000-3-3, EN IEC 61000-3-11 and EN IEC 61000-3-12 for the limitation of harmonic currents and voltage fluctuations/flicker, these four standards apply to all products within their scope and are not overruled by other (generic, product family or product) standards.

Annex B
(informative)

Additional information on references in EMC standards to other standards

B.1 General

Generic, Product family and Product EMC standards shall reference to Basic EMC standards for the test and measurement methods to be applied within the standard.

B.2 Prevailing references

References to other standards are sometimes done at several places in a standard. Where the standard is an EN that adopts an International standard, Annex ZA is included to show the references to the relevant edition of the EN that shall be applied.

The precise references to the EN edition(s) of the standard(s) indicated in the right hand columns of normative Annex ZA prevail over those references indicated in any other part of the standard to determine the dated or undated character of the *referenced* standard, and where applicable, the specific date of the standard and its amendments, if any.

In standards developed only by CENELEC, the indications given in the clause ‘Normative references” prevail to define the dated or undated character of a *referenced* standard.

NOTE One possible exception to this general rule can arise in case of a very specific dated reference to a specific clause, paragraph or table of a *referenced* standard in the clauses of a standard.

Where dated references are employed, product committees are expected to perform a review of these references as part of the reviewing process for their standards.

In some cases, a harmonized standard may reference by dated reference to another harmonized standard, each standard being listed in the OJEU. In such cases, the specific edition of the referenced EN is to be applied. This follows the principle that the primary standard provides the requirements for the equipment, and hence presumption of conformity in respect of the EMCD and/or RED as described in Annex ZZ of that standard (see Annex E for more information about Annex ZZ). See also B.3 e) for the specific example where standards are based on international documents.

B.3 Additional information on procedures used in CENELEC when international standards (e.g. IEC standards) are endorsed as European standards

a) When there is no directly corresponding CEN or CENELEC edition of a referenced international standard (e.g. from IEC or ISO), the international standard is quoted unchanged in Annex ZA without a corresponding EN in the right column. In this case, the referenced IEC document has to be used.

   NOTE 1 The reference to an international standard document can be dated or undated according to IEC choice. A problem related to the citation of a referenced international document in a referencing harmonized standard will arise if the reference to the international document is undated because undated normative references are not allowed for requirements in harmonized standards which are linked to essential requirements of a Directive.

b) When there is a directly corresponding edition of an EN to the *referenced* international standard and that international reference is dated, Annex ZA gives the indication of the corresponding CEN or CENELEC document (usually an EN without or with common modifications) with its date that applies in place of the referenced international document.

c) When there is a directly corresponding CEN or CENELEC document (mostly EN) to the international document and that international reference is undated, the Annex ZA gives the indication of the corresponding CENELEC document (usually an EN without or with common modifications) with its date that applies in place of the referenced international document.

d) In some Annexes ZA, the publication date (year) of the EN that shall be used is accompanied by a note indicating “valid edition at date of issue”. This remark provides information about the process the technical committee adopted in the selection of the reference standard and does not change the requirement that the specific edition (date) of the EN (and amendments if shown) indicated in the right hand columns applies.

e) In some cases, a harmonized standard (described as the “primary” standard below) may give a dated reference to another harmonized standard (for example EN 61000-6-4:2018 references to EN 55035:2015 for test methods). The referenced standard is listed in the OJEU in its own right, and the question arises as to whether the dated reference, or the date of cessation of presumption of conformity of the superseded standard (docopocoss) given in the OJEU list, should prevail.

   The principle to be followed is that the dates given in Annex ZA of the primary product/product family/generic standard prevail. The committee responsible for the primary harmonized standard sets the overall requirements, and this includes the specific editions of referenced standards to be used.

   The principle of the application of dated references is the same whether the referenced standard is a Basic standard or a Product family standard.

Annex C
(informative)

Multifunction equipment

Multifunction equipment can be considered as equipment that has a number of primary functions, or whose inherent operation is covered by more than one product standard.

Multifunction equipment which is subjected simultaneously to different clauses of the relevant standard and/or other standards shall be tested with each function operated in isolation, if this can be achieved without modifying the equipment internally. The equipment thus tested shall be deemed to have complied with the requirements of all clauses/standards when each function has satisfied the requirements of the relevant clause/standard dealing with that function.

For equipment for which it is not practical to test with each function operated in isolation, or where the isolation of a particular function would result in the equipment being unable to fulfil its primary function, the equipment shall be deemed to have complied only if it meets the provisions of each clause/standard with the necessary functions operative.

In any case, all clauses of the relevant standards shall be applied. Where limits cover the same frequency range or phenomena, the most stringent limits should be applied for emission and immunity. If the same test is covered by more than one standard, then this test needs to be performed only once, provided that all relevant operations are functional over the test period.

Additionally, all functions may be tested separately provided that the cumulative test data (i.e. adding up emission results, etc.) ensure that the overall product complies with the most stringent test limits for emission and immunity.

Where there is any conflict between the requirement in this annex, and a standard that applies to the equipment, the standard takes precedence.

Annex D
(informative)

Radio enabled products or combined equipment

D.1 General

In Europe, radio equipment falls into the scope of the Radio Equipment Directive (RED) 2014/53/EU. Such equipment also includes equipment that originally has no radio function but is additionally equipped with a radio communication or determination function. Such equipment is called radio enabled products or combined equipment. An example is a washing machine or a refrigerator that is equipped with a radio module.

D.2 Terms and definitions

For the purposes of this annex, the terms and definitions in Directive 2014/30/EU and in ETSI EN 303 446-1 and ETSI EN 303 446-2 as well as the following terms and definitions apply. For facilitating the application of this Guide the following definitions are repeated:

D.2.1
radio equipment (in the sense of the Radio Equipment Directive)
electrical or electronic product, which intentionally emits and/or receives radio waves for the purpose of radio communication and/or radio determination, or an electrical or electronic product which must be completed with an accessory, such as antenna, so as to intentionally emit and/or receive radio waves for the purpose of radio communication and/or radio determination

[SOURCE: Directive 2014/53/EU, Article 2 (1)]

D.2.2
radio communication (in the sense of the Radio Equipment Directive)
communication by means of radio waves

[SOURCE: Directive 2014/53/EU, Article 2 (2)]

D.2.3
radio determination (in the sense of the Radio Equipment Directive)
determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to those parameters, by means of the propagation properties of radio waves

[SOURCE: Directive 2014/53/EU, Article 2 (3)]

D.2.4
radio waves (in the sense of the Radio Equipment Directive)
electromagnetic waves of frequencies lower than 3 000 GHz, propagated in space without artificial guide

[SOURCE: Directive 2014/53/EU, Article 2 (4)]

D.2.5
combined equipment
equipment consisting of two or more products, at least one of which is radio communication or radio determination equipment and at least one of which is non-radio equipment

EXAMPLE A radio enabled washing machine, where the radio functionality is embedded by incorporating a radio module, which may be assessed separated from the host.

[SOURCE: ETSI EN 303 446-1:2019-10, 3.1]

D.2.6
integrated equipment
combined equipment which cannot be physically separated into radio and non-radio constituent products that can be assessed separately

EXAMPLE A radio enabled light bulb, where the radio functionality is completely incorporated on the printed circuit board (PCB) of the host appliance, and cannot be assessed separately from the host.

[SOURCE: ETSI EN 303 446-1:2019-10, 3.1]

D.2.7
radio module
piece of a radio equipment providing the radio function

[SOURCE: ETSI EN 303 446-1:2019-10, 3.1]

D.3 Guidelines for the inclusion of radio enabled products or combined equipment in EMC standards

At international level CISPR has considered guidelines for its product committees whose standards also include radio enabled products in their scopes. These guidelines should include a statement to be incorporated in the scopes of the relevant standards and a recommendation for the EMC test of radio enabled products. Furthermore, CISPR has considered guidelines for its product committees on how to treat intentional transmissions from a radio transmitter as defined by the ITU and any spurious emissions related to these intentional transmissions in their standards if these standards also include radio enabled products in their scopes.

Within CISPR, it is proposed that the following text is used in the scopes of relevant standards:

“Products which incorporate radio transmit/receive functions are included in the scope of this document.”

It shall be noted that it is not the intention to specify requirements for the radio function itself, its performance or characteristics. The intention is rather to allow the use of EMC product family standards for the conformity assessment of the non-radio part of combined equipment, i.e. of equipment containing radio and non-radio components.

Annex E
(informative)

Guidelines on the preparation of Annexes ZZ for harmonized standards

Harmonized standards shall contain an Annex ZZ indicating the relevant aspects (essential requirements) of European Directives that are covered by the standard. In general, EMC standards contain three categories of requirements: either emission requirements only or immunity requirements only or both emission and immunity requirements.

NOTE In standards issued by CEN the corresponding Annex is designated Annex ZA and in standards issued by ETSI it is designated Annex A. The form of Annex A used in ETSI standards is different to the form of Annex ZA used in CENELEC EN.

In this Annex, templates are provided for use by Technical Committees that are responsible for EMC standards which are offered to the European Commission for citation under the EMC or Radio Equipment Directives. For these standards (regarded as harmonized standards) the Annex ZZ shall be in accordance with the template valid at the time of publication of the standard. An Annex ZZ can be prepared and published together with the EN or later (after publication of the EN) as a separate Amendment (numbered with A10, A11, etc. as such an Amendment is regarded as a Homegrown document of CENELEC).

If a harmonized standard contains an Annex ZZ which is still in accordance with a previous template (which is no longer valid) or does not contain an Annex ZZ, then the Technical Committee responsible for the standard shall prepare a (new) Annex ZZ according to the valid template.

If the standard is only intended for citation under one Directive (e.g. EMCD, RED), it is sufficient to prepare one Annex ZZ related to the relevant Directive. This case is addressed in the following templates.

If the standard is intended for citation under more than one Directive (e.g. EMCD and RED) in the Official Journal of the European Union (OJEU), the whole Annex ZZ shall be divided into two Annexes for these Directives. In this case, the annexes should be numbered ZZ.1 and ZZ.2 or ZZA and ZZB. Annex ZZ.1 or ZZA usually deals with the requirements of the standard that correspond to essential requirements of the EMC Directive and Annex ZZ.2 or ZZB usually deals with the requirements of the standard that correspond to essential requirements of the RED.

Accordingly, the table in each Annex should be numbered ZZ.1, ZZ.2, etc. or ZZA, ZZB and the respective table number should also be mentioned in the paragraph immediately above the table.

Cases:

If the standard is intended to be listed under the EMC Directive and only contains emission requirements the following should be indicated in the left column “Essential requirements of Directive 2014/30/EU”:

Annex I. 1(a) electromagnetic compatibility), disturbances

If the standard is intended to be listed under the EMC Directive and only contains immunity requirements, the following should be indicated in the left column “Essential requirements of Directive 2014/30/EU”:

Annex I. 1(b) electromagnetic compatibility), immunity

If the standard is intended to be listed under the EMC Directive and contains emission and immunity requirements, both aspects should be indicated in the left column “Essential requirements of Directive 2014/30/EU” in separate lines.

If the standard is intended to be listed under the RED and only contains emission requirements, the following should be indicated in the left column “Essential requirements of Directive 2014/53/EU”:

Article 3.1(b), (electromagnetic compatibility), disturbances

If the standard is intended to be listed under the RED and only contains immunity requirements, the following should be indicated in the left column “Essential requirements of Directive 2014/53/EU”:

Article 3.1(b), (electromagnetic compatibility), immunity

If the standard is intended to be listed under the RED and contains emission and immunity requirements, both aspects should be indicated in the left column “Essential requirements of Directive 2014/53/EU” in separate lines.

The relevant clauses and/or sub-clauses of the standard that correspond to one or more essential requirements of a Directive are identified in the middle column “Clause(s)/sub-clause(s) of this EN”. It is the task of the relevant Technical Committee to identify all necessary clauses and/or sub-clauses within their standards that should be mentioned here. Clauses or sub-clauses which should be indicated should at least contain the specified limits or test levels, the associated measuring or test methods, the operating conditions and for immunity requirements the performance criteria. If some of these requirements are included in a clause or sub-clause by reference to other clauses and/or sub-clauses, these referenced clauses and/or sub-clauses need not be mentioned in the table in Annex ZZ. It is sufficient to indicate only the clauses and/or sub-clauses that contain these references and correspond to one or more essential requirements of a Directive.

Indications that are too general, too global or inaccurate, e.g. “entire standard”, “partially covered”, “clauses x to y”, etc. should be avoided.

Further remarks and/or notes can be given in the right column “Remarks / Notes”. These remarks and/or notes can inform the user of the standard about further conditions that should be taken into account when using the standard for the purpose of declaration of conformity with one or more essential requirements of a Directive. For example, in the “Remarks / Notes” column particular clauses and/or sub-clauses or requirements of the standard can be excluded that shall not be applied for the presumption of conformity with the Directive.

For information related to Annexes ZZ of European Standards which are already published, the user of this Guide is requested to contact CCMC or the Secretary of CLC/TC 210.

Annex ZZ
(informative)

Relationship between this European standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardization request as regards harmonized standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, 'M/552' / C(2016) 7641 final of 30.11.2016[1], to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Annex I of Directive 2014/30/EU [2014 OJ L96]

Essential requirements of Directive 2014/30/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
Annex I. 1 (a) (electromagnetic compatibility), disturbances		
Annex I. 1 (b) (electromagnetic compatibility), immunity		

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

[1] COMMISSION IMPLEMENTING DECISION C(2016) 7641 final of 30.11.2016 on a standardization request to the European Committee for Standardization, to the European Committee for Electrotechnical Standardization and to the European Telecommunications Standards Institute as regards harmonized standards in support of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility.

Annex ZZ
(informative)

Relationship between this European standard and the essential requirements of Directive 2014/53/EU [2014 OJ L153] aimed to be covered

This European standard has been prepared under the European Commission standardization request C(2015) 5376 final of 4.8.2015[2] ('M/536'), as regards harmonized standards in support of Directive 2014/53/EU relating to radio equipment, to provide one voluntary means of conforming to essential requirements of Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [2014 OJ L153].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Article 3 of Directive 2014/53/EU [2014 OJ L153]

Essential requirements of Directive 2014/53/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
Article 3 1(b) (electromagnetic compatibility), disturbances		
Article 3 1(b) (electromagnetic compatibility), immunity		

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

[2] COMMISSION IMPLEMENTING DECISION C(2015) 5376 final of 4.8.2015 on a standardization request to the European Committee for Electrotechnical Standardization and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment [2014 OJ L153].

Bibliography

CEN CENELEC Internal Regulations Part 2:2022, *Common Rules For Standardization Work*

CEN CENELEC Internal Regulations Part 3:2022-07, *Principles and rules for the structure and drafting of CEN and CENELEC documents*

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 *on the harmonisation of the laws of the Member States related to electromagnetic compatibility.* Official Journal of the European Union L96, of 2014-03-29, p. 79–106

Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 *on the harmonisation of the laws of the Member States related to the making available on the market of radio equipment and repealing Directive 1999/5/EC.* Official Journal of the European Union L153, of 2014-05-22, p. 62–106 as amended by Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 Official Journal of the European Union L212, of 2022-08-22, p. 1-122, and Directive 2022/2380 the European Parliament and of the Council of 23 November 2022 *amending Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment* Official Journal of the European Union L315 of 2022-12-07, p. 30-43.

EN 50065-1, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 1: General requirements, frequency bands and electromagnetic disturbances*

EN 50065-2-1, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 2-1: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 95 kHz to 148,5 kHz and intended for use in residential, commercial and light industrial environments*

EN 50065-2-2, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 2-2: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 95 kHz to 148,5 kHz and intended for use in industrial environments*

EN 50065-2-3, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 2-3: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 3 kHz to 95 kHz and intended for use by electricity suppliers and distributors*

EN 50121 (all parts), *Railway applications – Electromagnetic compatibility*

EN 50130-4, *Alarm systems – Part 4: Electromagnetic compatibility – Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems*

EN 50412-2-1, *Power line communication apparatus and systems used in low-voltage installations in the frequency range 1,6 MHz to 30 MHz – Part 2-1: Residential, commercial and industrial environment – Immunity requirements*

EN 50470-1, *Electricity metering equipment (a.c.) – Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C)*

EN 50561-1, *Powerline communication apparatus used in low-voltage installations – Radio disturbance characteristics – Limits and methods of measurement – Part 1: Apparatus for in-home use*

EN 50715, *Electromagnetic compatibility – Radio frequency emission – Statistical considerations in the determination of compliance for mass-produced products with requirements for unwanted radio frequency emission*

EN IEC 55011, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement (CISPR 11)*

EN IEC 55014-1, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission (CISPR 14-1)*

EN IEC 55014-2, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity – Product family standard (CISPR 14-2)*

EN IEC 55015, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15)*

EN IEC 55032, *Electromagnetic compatibility of multimedia equipment – Emission requirements (CISPR 32)*

EN 55035, *Electromagnetic compatibility of multimedia equipment – Immunity requirements (CISPR 35)*

EN 60521, *Class 0.5, 1 and 2 alternating current watthour meters (IEC 60521)*

EN IEC 60669-2-1, *Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements – Electronic control devices (IEC 60669-2-1)*

EN 60730-1, *Automatic electrical controls – Part 1: General requirements (IEC 60730-1)*

EN 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results (IEC 60945)*

EN 60947 (all parts), *Low-voltage switchgear and controlgear (IEC 60947)*

EN 60947-1, *Low-voltage switchgear and controlgear – Part 1: General rules (IEC 60947-1)*

EN IEC 60974-10, *Arc welding equipment – Part 10: Electromagnetic compatibility (EMC) requirements (IEC 60974-10)*

EN 61000-2-2, *Electromagnetic compatibility (EMC) – Part 2-2: Environment – Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems (IEC 61000-2-2)*

EN 61000-2-4, *Electromagnetic compatibility (EMC) – Part 2-4: Environment – Compatibility levels in industrial plants for low-frequency conducted disturbances (IEC 61000-2-4)*

IEC TR 61000-2-5, *Electromagnetic compatibility (EMC) – Part 2-5: Environment – Description and classification of electromagnetic environment*s

EN IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (IEC 61000-3-2)*

EN IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection (IEC 61000-3-3)*

EN IEC 61000-3-11, *Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection (IEC 61000-3-11)*

EN IEC 61000-3-12, *Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase (IEC 61000-3-12)*

IEC TR 61000-3-6, *Electromagnetic compatibility (EMC) – Part 3-6: Limits – Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems*

IEC TR 61000-3-7, *Electromagnetic compatibility (EMC) – Part 3-7: Limits – Assessment of emission limits for the connection of fluctuating installations to MV, HV and EHV power systems*

EN IEC 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments (IEC 61000-6-1)*

EN IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments (IEC 61000-6-2)*

EN IEC 61000-6-3, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for equipment in residential environments (IEC 61000-6-3)*

EN IEC 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments (IEC 61000-6-4)*

EN IEC 61000-6-8, *Electromagnetic compatibility (EMC) – Part 6-8: Generic standards – Emission standard for professional equipment in commercial and light-industrial locations (IEC 61000-6-8)*

IEC TR 61000-5-1, *Electromagnetic compatibility (EMC) – Part 5-1: Installation and mitigation guidelines – General considerations*

EN 61131-2, *Programmable controllers – Part 2: Equipment requirements and tests (IEC 61131-2)*

EN 61326 (all parts), *Electrical equipment for measurement, control and laboratory use – EMC requirements (IEC 61326)*

EN 61326-1, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements (IEC 61326-1)*

EN IEC 61543, *Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility (IEC 61543)*

EN IEC 61547, *Equipment for general lighting purposes – EMC immunity requirements (IEC 61547)*

EN IEC 61800-3, *Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods (IEC 61800-3)*

EN IEC 62040-2, *Uninterruptible power systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements (IEC 62040-2)*

EN 62052-21, *Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 21: Tariff and load control equipment (IEC 62052-21)*

EN IEC 62053-21, *Electricity metering equipment - Particular requirements - Part 21: Static meters for AC active energy (classes 0,5, 1 and 2) (IEC 62053-21)*

EN IEC 62053-22, *Electricity metering equipment - Particular requirements - Part 22: Static meters for AC active energy (classes 0,1S, 0,2S and 0,5S) (IEC 62053-22)*EN 60730 (all parts), *Automatic electrical controls (IEC 62053-22)*

EN 62054-11, *Electricity metering (a.c.) - Tariff and load control - Part 11: Particular requirements for electronic ripple control receivers (IEC 62054-11)*

EN 62054-21, *Electricity metering (a.c.) - Tariff and load control - Part 21: Particular requirements for time switches (IEC 62054-21)*

ETSI EN 300386, *Telecommunication network equipment – Harmonised standard for ElectroMagnetic Compatibility (EMC) requirements*

ETSI EN 301489 (all parts), *ElectroMagnetic Compatibility (EMC) standard for radio equipment and services*

ETSI EN 303 446-1, *ElectroMagnetic Compatibility (EMC) standard for combined and/or integrated radio and non-radio equipment – Part 1: Requirements for equipment intended to be used in residential, commercial and light industry locations*

ETSI EN 303 446-2, *ElectroMagnetic Compatibility (EMC) standard for combined and/or integrated radio and non-radio equipment – Part 2: Requirements for equipment intended to be used in industrial locations*

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility*

IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*

IEC Guide 108, *Guidelines for ensuring the coherence of IEC publications – Horizontal functions, horizontal publications and their application*

Regulation (EU) No. 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardization. Official Journal of the European Union L316, of 2012-11-14, p. 12-33, and subsequent amendments

Regulation (EU) 2022/2480 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 1025/2012 as regards decisions of European standardization organizations concerning European standards and European standardization deliverables

Vademecum on European Standardisation in support of Union legislation and policies – Part 3: Guidelines for the execution of standardisation requests (Ref. Ares (2015)4888510 – 06/11/2015