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CENELEC

CENELEC Guide n° 25

Guide on the use of Standards for the implementation of the EMC Directive

In the light of the debates around the EMC Directive, the Technical Board invited CLC/TC 210 "EMC" to envisage the conversion of pertinent PERM Documents into CENELEC Reports (ref.: BT decision D100/235). After review and updating of CLC(PERM)009 *Guidance on how to use the Standards for the implementation of the EMC Directive* and CLC(PERM)010 *Low Frequency emission limits for equipment connected to Public Power Supply Systems*, CLC/TC 210 combined them into CENELEC Report R210-007 *Report on the use of Standards for the implementation of the EMC Directive*. In March 2000, the Technical Board authorized the issuing of R210-007 (ref.: BT decision D103/070) and in July 2001 the Technical Board resolved to convert this CENELEC Report into CENELEC Guide 25 (ref.: BT decision D108/222). A second edition of this Guide was prepared by CLC/TC 210 "EMC" in the course of 2004 and approved by the CENELEC Technical Board by correspondence in February 2005.

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Guide on the use of Standards for the implementation of the EMC Directive

Contents

Foreword

This second edition of the CENELEC Guide has been prepared by CENELEC Technical Committee TC210, EMC. It was approved on 1 February 2005.

The first edition was approved by CENELEC initially as CENELEC Report R210-007:200X and in July 2001 as CENELEC Guide 25.

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

INTRODUCTION

The EMC Directive states that a presumption of conformity with the protection requirements (emission and immunity) related to EMC shall be deemed to exist for all apparatus in conformity with those harmonised standards (ENs) that are identified as relevant by publication of their reference numbers in the Official Journal of the European Communities (OJEU).

As some guidance to manufacturers and to all relevant parties involved in conformity assessment aspects on EMC was felt necessary, CENELEC/TC 210 produced a document CLC (PERM) 009, which was endorsed by 73 BT (September 1992) as a standing CENELEC document. The second updated version was approved by 80 BT (July 1994).

The first edition of CENELEC Guide 25 was based on the original first version of standing document CLC (PERM) 009 (August 1994), with the addition of:

- an explanatory annex 1 on "low-frequency emission requirements" which originates from CLC (PERM 010) updated, but without modifications of the principles involved.

- the addition of an annex 2 on some useful definitions and abbreviations.

This second edition of CENELEC Guide 25 updates the references to the standards, adds new information, and also includes editorial corrections.

Note: It is recommended that CENELEC Guide 24 *EMC standardization for Product Committees* is read in conjunction with this Guide.

1. General Principles

Conformity with the harmonised standards listed in the Official Journal (OJEU) of the European Union (generic and product standards i.e. product-family or dedicated product standards) provides a presumption of conformity with the protection requirements of EMC Directive 89/336/EEC (covering emission and immunity). Harmonised standards are thus designed to satisfy the protection requirements of the EMC Directive.
The complete list of harmonised standards published in OJEU under the EMC-directive may be found on the following web site of the European Commission:

http://europa.eu.int/comm/enterprise/newapproach/standardization/harmstds/reflist/emc.html

Standards may be used to demonstrate compliance with all the protection requirements (this means, if applicable, low-frequency as well as high-frequency phenomena, emission as well as immunity) or may be used to cover them only in part, the remainder being covered by the procedure of article 10.2 of the Directive.

The simplest route to compliance is for a manufacturer to use standards that cover the whole of the EMC protection requirements of the Directive, in which case the manufacturer has to apply all the normative EMC requirements of those standards listed in the OJEU whose scopes are applicable to the individual product.

In the absence of appropriate product standards i.e. product-family or dedicated product standards in the OJEU list, the generic standards shall be applied to show compliance.

When showing compliance through standards it is often necessary to comply with more than one standard. This is because some EMC standards do not cover the whole EMC domain covered by the EMC Directive. They may concern only immunity (e.g. EN 61547, EN 61131-2) high-frequency emission (e.g. EN 55014-1, EN 55011, EN 55015, etc.) or low frequency emission phenomena (e.g. EN 61000-3-2, EN 61000-3-3).

When dedicated product standards are listed either for emission or immunity, the directly corresponding product family standards do not normally apply as well, except when referred to in the dedicated standards.

2 Application to typical equipment

With a view to helping manufacturers, the following non-exhaustive Table 1 shows, for some examples of typical equipment, those standards to apply to cover the protection requirements of the EMC Directive. All the standards on the horizontal line, corresponding to a category of equipment, shall be applied to demonstrate presumption of conformity by article 10.1 only **(**application of harmonised standards).

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

Note that this table is indicative only. The definitive list of standards that are applicable under the EMC Directive is published in the Official Journal of the European Union. The reference to the Commission website where the latest list may be viewed is shown on page 2 of this guide.

3 Criteria for selecting standards

Selecting a particular product standard for application to a given product may sometimes give difficulties.

One may, however, put forward the following series of 6 basic principles to help in the selection of appropriate standards:

(1) The scopes of the product-family or dedicated product standards govern their applicability to individual products. The scopes of the standards should therefore be considered carefully, with all their implications.
In case of doubt (which may still arise with very broad scope definitions in product-family standards) a second principle (see item 2 following) may be useful.

(2) It is the intended use and function of the equipment that determines the EMC standards to be applied.

Example:
A washing machine, whatever communication or microprocessor modules are used in it, remains basically classified as household equipment for the application of standards and therefore EN 55014-1 and EN 55014-2 apply.

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

Note: It may be advisable to include at a later stage requirements for connection ports to public and/or private telecommunication lines in both generic and product (family) standards. This would make the problem easier by avoiding the need to resort to additional standards.

(4) The scopes of EN 55011, EN 55013, EN 55014, EN 55015 and EN 55022, for radio-interference emission limitation, are in general mutually exclusive. This means that only one of them has to be selected for given single function equipment to comply with the protection requirements of the EMC Directive.

(5) Despite these general principles, borderline problems may still occur that are difficult to solve. For multifunction apparatus, it may be necessary to comply with more than one standard for emission and/or immunity. See Annex 4 for further information.

(6) EN 61000-3-2 and EN 61000-3-3 are published in the OJEU as product family standards, and apply in their own right to all products in the scope of these standards.

Table 1
(Non-exhaustive table)

Families of products	Standards covering the protection EMC requirements			
	Emission			Immunity
	Harmonics (see Note 2)	Voltage fluctuations (see Note 2)	Radio-interference	(All aspects)
1) Household appliances and portable tools (motor-driven such as vacuum cleaners, washing machines etc; heating and cooking appliances, etc.)	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 55014-1 (1)	EN 55014-2
2) Lighting equipment	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 55015 (12)	EN 61547
3) TV receivers and audio equipment	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 55013	EN 55020
4) Professional audio, video and entertainment lighting control equipment	EN 55103-1 (refers to EN 61000-3-2)	EN 55103-1 (refers to EN 61000-3-3)	EN 55103-1	EN 55103-2
5) Information Technology (I.T.) equipment	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 55022	EN 55024
6) Mains signalling equipment	-	-	EN 50065-1	EN 50065-2-1 EN 50065-2-2 EN 50065-2-3 EN 50082-1 (3) EN 61000-6-1 (9)
7) ISM equipment	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 55011	EN 61000-6-2
8) Industrial equipment in general	- (4)	- (4)	EN 50081-2 (8) EN 61000-6-4 (10)	EN 61000-6-2
9) Static watt-hour meters (Classes 1 and 2)	-	-	EN 61036	EN 61036
10) Static watt-hour meters (Classes 0,2 S and 0,5 S)	-	-	EN 60687	EN 60687
11) Electronic ripple control receivers	-	-	EN 61037	EN 61037
12) Time switches for tariff and load control	-	-	EN 61038	EN 61038
13) Marine navigational equipment	-	-	EN 60945	EN 60945
14) Automatic electrical controls for household and similar use (7)	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 60730-1 **and -x** (5)	EN 60730-1 **and -x** (5)
15) Household electronic switches for fixed installations (7)	EN 60669-2-1 (refers to EN 61000-3-2)	EN 60669-2-1 (refers to EN 61000-3-3)	EN 60669-2-1	EN 60669-2-1
16) Induction watt-hour meters	-	-	-	EN 60521

17) Programmable controllers (industry)	-	-	EN 50081-2 (8) EN 61000-6-4 (10)	EN 61131-2
18) Low-voltage switchgear and controlgear (7)	-	-	EN 60947-1 **and-x** (6)	EN 60947-1 **and-x** (6)
20) Alarm systems	EN 61000-3-2	EN 61000-3-3 or EN 61000-3-11	EN 50081-1 EN 61000-6-3 (11)	EN 50130-4
21) Uninterruptible power systems (UPS)	Note 13	Note 13	EN 50091-2	EN 50091-2
22) Arc welding equipment	EN 60974-10	EN 60974-10	EN 60974-10	EN 60974-10
23) Residual current operated protective devices for household use	-	-	EN 61543	EN 61543
24) Adjustable speed power drives	EN 61800-3 (refers. to EN 61000-3-2) (4)	EN 61800-3 (refers to EN 61000-3 3) (4)	EN 61800-3	EN 61800-3
25) Radio-communication equipment and telecommunication network equipment	EN61000-3-2	EN 61000-3-3 or EN 61000-3-11	See ETSI relevant standards	See ETSI relevant standards

Notes on table 1:

General note:

A dash (-) indicated in columns 2 to 4 means either that the relevant family of products is, with our present knowledge, not concerned with the phenomenon, or that the standards do not presently 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) For microwave ovens and other appliances for domestic use designed to use or radiate radio-frequency energy, EN 55011 applies instead of EN 55014-1.

2) Only for equipment intended for connection to LV public supply.

3) EN 50082-1 may be used until 1 July 2004.

4) No limits in standards for equipment connected to private LV networks but installation restrictions by supply authorities may apply (see Annex 1).

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

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

7) The EMC Directive applies insofar as these products are apparatus, or components with direct functions within the scope of the EMC Directive and are sold as a single commercial unit.

8) Class A, group 1 equipment limits of EN 55011.

9) For residential, commercial and light industrial environments, EN 50065-2-1 may be used, and supersedes this generic standard on 1 October 2004. For industrial environments, EN 50065-2-2 may be used, and supersedes this generic standard on 1 October 2004. For equipment used by electricity suppliers and distributors, EN 50065-2-3 may be used, and supersedes this generic standard on 1 August 2004.

10) EN 50081-2 may be used until 1 July 2004.

11) EN 50081-1 may be used until 1 July 2004.

12) Requirements for lighting apparatus in the ISM frequency bands 2.45 GHz and 5.8 GHz are contained in EN 55011. Requirements for all other lighting apparatus are contained in EN 55015.

13) The UPS standard refers to EN 60555-2 and EN 60555-3 for harmonics and flicker respectively. These standards have been superseded by EN 61000-3-2 and EN 61000-3-3 respectively

4 General remarks on the list of EMC harmonised standards

The following remarks are intended to facilitate the use of the consolidated lists of harmonised standards published in OJEU.

a) For product standards, for example, EN 60669, EN 60730, EN 60945, EN 61036, EN 61037 and EN 61038, which include requirements other than EMC, only the EMC clauses for emission and immunity apply within the framework of the EMC Directive

b) When new editions or revised (amended) standards are published in the OJEU, the consolidated list of published standards indicates the date of cessation of presumption of conformity *doc* (with the EMC Directive) of the superseded standards. This date is, in most cases, the same as the date of withdrawal of the superseded standard *dow* indicated by the standardisation body in the revised standard, but it may be different in exceptional cases.

c) Products placed on the market in the European Economic Area (EEA) between the date of listing of the new standards in the OJEU and the date of cessation

of presumption of conformity of the standard being superseded, may comply with *either* the superseded standard *or* the newly listed standard.

d) From the date of cessation of conformity of the superseded standard, all products placed on the market (including continuous manufacture of individual product types first placed on the market before this date) shall comply with the requirements of the newly listed standard.

e) If the newly listed standard has a narrower scope than the superseded standard.

From the date of cessation of conformity, products within the scope of the newly listed standard shall comply with that standard. The "superseded" standard is only partly superseded in the sense that it remains valid for products within its scope but outside the scope of the newly listed standard.

f) If the newly listed standard has a broader scope than the superseded standard.

From the date of cessation of conformity, products within the scope of the newly listed standard shall comply with that standard.

g) If the newly listed standard has a scope which encompass products previously not covered by a product or product family standard.

Up to the date of cessation of conformity, products may comply with the relevant generic standard(s). From the date of cessation of conformity, all products within the scope of the newly listed standard shall comply with that standard.

h) These principles (a-g) are also valid for amendments.

i) In some cases, it may be necessary to apply a product standard containing general rules (general part of a series of standards or sub-standards) in conjunction with a more dedicated particular part (often identified by the same number plus a different suffix number from 2 to x).

When the standard or part containing the general rules is not sufficient to give presumption of conformity with the protection requirements, this particular case is indicated in the OJEU list by a specific note (in addition a dash – is placed in the columns corresponding to the superseded standard and to the date of cessation of conformity of the superseded standard)

The same principle and note are applied when a standard without its amendment is not sufficient to give presumption of conformity.

j) References to other standards in EMC product standards:

- See Annex 3 for additional information.

k) Where a standard contains an Annex ZA (because it is based on an international standard) this annex prevails regarding the use of references. See Annex 3 for additional information.

Note: Users of standards are encouraged to identify outdated references to CENELEC via their National Committee.

ANNEX 1

Low frequency emission requirements
Relation between standardisation and the EMC Directive
(Explanatory)

It is desirable to clarify the relation between standardisation and the EMC Directive for the case of the low-frequency emission requirements and limits for equipment.

CENELEC TC 210 views were given in a document which was approved at 74 BT (December 92) as standing document CLC (PERM) 010 and which is now appended to this CENELEC Guide in an updated version, but without changes to the principles involved.

1 Introduction

Development of standards and recommendations covering phenomena such as harmonics and voltage fluctuations injected or produced on the power supply for the connection of apparatus to the public power supply system, makes it necessary to consider standardisation aspects in relation to the EMC Directive. This concerns primarily the European Commission and standardisation bodies, but also power supply authorities, industrial users, installers and manufacturers of equipment.

2 Standardisation situation and evolution

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

a) Low-power equipment rated at less than 16 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 may be and are specified in harmonised standards for harmonic current injection and for current fluctuations leading to voltage fluctuations.

Conformity with these standards can be tested at the manufacturing stage under well-defined test conditions independent of installation conditions. This is of major importance for the manufacturer, since equipment that is in conformity with harmonised

standards is presumed to comply with the protection requirements of the EMC Directive.

The harmonised standards EN 61000-3-2 and EN 61000-3-3 (or EN 61000-3-11 in some cases) cover all equipment equal to or less than 16A rating and intended for direct connection to public low-voltage supply systems.

It should be noted that in EN 61000-3-2, limits for professional equipment above 1000 W are "under consideration". For such equipment, no limits will therefore be applicable under article 10.1 of the EMC Directive until an amendment to the existing EN 61000-3-2 is adopted with the corresponding implementation dates for this amendment.

b) Equipment with rated current greater than 16A and intended for direct connection to the public supply systems

Harmonised standard EN 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).

At present, no limits on harmonics are applicable to this category of equipment under article 10.1 of the EMC Directive. International Technical Report IEC 61000-3-4 serves as guidelines for users of equipment and supply authorities, to decide whether or not, or in which conditions, loads may be connected to the public power supply system. Work is in hand to convert this report into a standard, and EN 61000-3-12 is expected to be published in 2004.

Above 75A, it is considered probable that no standards will be prepared even in the future and only guidelines or Technical Reports will be issued by the standardisation bodies. These documents will be used by agreement between supply authorities and their customers.

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

For such equipment, it has appeared impossible to define limits independent of the final location of the equipment in a reasonable manner. If limits in the 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.

Detailed approved international reports (guides), from IEC SC 77A, IEC 61000-3-6 and IEC 61000-3-7, are available for 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 reports is that of flexible guidelines in several stages intended for use by supply authorities, installers and users of equipment during their negotiations to reach a common and co-ordinated solution.

No requirements for harmonised standards are applicable under the EMC Directive for such equipment

3 Generic standards

Although only the generic emission standards for the residential, commercial and light industrial environments endorse the requirements and limits of the harmonics and flicker standards, in practice EN 61000-3-2 and EN 61000-3-3 apply to all products within their scope as they are listed as harmonised standards in OJEU.

4 Summary - Reference to standards in relation to the EMC Directive

Equipment within the scope of EN 61000-3-2, EN 61000-3-3 or EN 61000-3-11 shall comply with those standards and may bear the CE marking in relation to low-frequency emission by making reference to those standards in the EC declaration of conformity.

All other equipment may refer to the relevant product, product family, or generic standard for emission, which however may not contain such low-frequency emission limits usable at manufacturing stage (i.e. ignoring installation conditions) for such equipment.

Such equipment outside the scope of EN 61000-3-2, EN 61000-3-3 or EN 61000-3-11, may thus carry the CE marking by reference to the generic standards, but it seems desirable that the EC declaration of conformity should explicitly include the following statement (or similar):

"Installation restrictions may be applied by supply authorities in relation to harmonics and voltage fluctuations (flicker)"

Where all the parties involved agree that it is not possible to set limits at the manufacturing stage without considering in detail the local connection conditions, there should be no legal reason to withhold the CE marking, for industrial high power apparatus. One should however not infer from this (and this explains the need for a clear indication in the EC declaration of conformity) that such equipment may freely and without any restriction be connected anywhere in the supply. Agreement between supply authorities, installers and users of equipment before connection appears to be the best solution.

ANNEX 2

Definitions and abbreviations

The following definitions and abbreviations are from CENELEC Internal Regulations Part 2:2002, and referenced by number, except for the definition of the "harmonised standard" (in the sense of the EMC Directive).

Harmonisation (of national standards): Prevention or elimination of differences in the technical content of standards having the same scope, particularly those differences that may cause hindrances to trade.
NOTE: Harmonization of these standards is considered to be achieved when the products manufactured to the national standards of one country may be regarded as being complying, without modification, with the standards of the other countries and vice versa.

Harmonised European standard (in the sense of the EMC-directive)
European standard published in OJEU supporting the presumption of conformity with the protection requirements of the EMC Directive.

European Standard (EN): Standard adopted by CEN/CENELEC standard carrying with it the obligation of implementation as an identical national standard and withdrawal of conflicting national standards.

National deviation: Modification of, addition to or deletion from the content of an EN (and HD for CENELEC) made in a national standard within the same scope as the EN (and HD for CENELEC).
NOTE It does not form part of the EN (and HD for CENELEC).

A-deviation: National deviation from an EN (and HD for CENELEC) due to regulations the alteration of
which is for the time being outside the competence of the CEN/CENELEC national member
NOTE Where standards fall under EC Directives, it is the view of the Commission of the European Communities (OJ No C 59, 1982-03-09) that the effect of the decision of the Court of Justice in Case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted within the EC except under the safeguard procedure provided for in the relevant Directive.

B-deviation: National deviation from an HD due to particular technical requirements, permitted for a special transitional period.

Date of ratification (dor): Date when the Technical Board notes the approval of an EN (and HD for CENELEC), from which time the standard may be said to be approved.

Date of availability (dav): Date when the definitive text in the official language versions of an approved CEN/CENELEC publication is distributed by the Central Secretariat.

Date of announcement (doa): Latest date by which the existence of an EN (and HD for CENELEC) a TS or a CWA has to be announced at national level.

Date of publication (dop): Latest date by which an EN has to be implemented at national level by publication of an identical national standard or by endorsement.

Date of withdrawal (dow): Latest date by which national standards conflicting with an EN (and HD for CENELEC) have to be withdrawn.

Amendment: Ratified supplementary document to an EN (and HD for CENELEC) already circulated to CEN/CENELEC national members for national implementation, to be read in conjunction with that EN (and HD for CENELEC) and which alters and/or adds to previously agreed technical provisions in that EN (and HD for CENELEC)

Corrigendum: Supplementary document to one, two or all three versions of a CEN/CENELEC publication, which corrects one or more errors or ambiguities inadvertently introduced in either drafting or printing and which could lead to incorrect or unsafe application of those versions

ANNEX 3

Additional information on references to other standards in EMC standards

Practically all EMC harmonised standards make reference to the basic standards for the test and measurement methods to be applied.

A number of standards listed in the OJEU specify also some requirements (limits) by reference to other standards (for example, by stating "the requirements of EN 55022, class A apply").

This last case is only admitted when the referred standard is also an harmonised standard published in OJEU under the EMC directive.

1. Prevailing references

References to other standards are sometimes indicated in several places in a standard. The precise references indicated in the normative annex ZA prevail over those indicated in any other part of the standard to determine the dated or undated character of the referred standard.

In standards developed only by CENELEC, the indications given in the clause 'Normative references" prevail to define the dated or undated character of a referred 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 referred standard in the clauses of a standard.

2. Additional information on procedures used in CENELEC when international standards (mostly IEC standards) are endorsed as ENs

a) When there is no CENELEC directly corresponding edition of a referenced international standard, this international standard (e.g. from IEC) is quoted unchanged in annex ZA, without CENELEC counterpart on the left side
Remark: That IEC document is dated or undated according to IEC choice. In this case, the IEC referenced document has to be used.

b) When there is a directly corresponding edition of CENELEC EN to the referred international standard and that international reference is dated, the annex ZA gives the indication of the corresponding CENELEC document (mostly EN) with its date.

Remark: In this case, the dated edition of CENELEC EN applies (modified or not according to the case)

c) When there is a directly corresponding edition of CENELEC (mostly EN) to the international standard and that international reference is undated, the annex Z gives the indication of the latest valid corresponding CENELEC document (mostly EN) with its date.

Important remark: In this last case, the undated international reference becomes de facto dated for European use. This general policy prevents the automatic change over to a future unknown referenced standard when using the standard. Deviations from this last general rule are only possible on special request of the responsible Technical Committee.

ANNEX 4

Multifunction equipment

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

Multifunctional equipment should be operated in its normal mode of operation, if two or more functions are capable of operating simultaneously under normal operation, then tests must be conducted with these functions operating simultaneously.

For multifunctional equipment where functions work in isolation under normal operation, these functions can be tested in isolation. However, equipment that has isolated functions, which can be configured to operate simultaneously during testing, then this is acceptable to operate them simultaneously.

In any event, all clauses of the relevant standards must be applied. Where limits cover the same frequency range or phenomena the most stringent limits should be applied for emissions and immunity. If the same test is covered by more than one standard then this test only needs to be performed once provide 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.) ensures the overall product complies with the most stringent test limits for emissions 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.