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Irish Standard
I.S. EN 50598-1:2014

Ecodesign for power drive systems, motor starters, power electronics & their driven applications - Part 1: General requirements for setting energy efficiency standards for power driven equipment using the extended product approach (EPA), and semi analytic model (SAM)

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EUROPEAN STANDARD

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EN 50598-1

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English Version

Ecodesign for power drive systems, motor starters, power electronics & their driven applications - Part 1: General requirements for setting energy efficiency standards for power driven equipment using the extended product approach (EPA), and semi analytic model (SAM)

Ecoconception des entraînements électriques de puissance, des démarreurs de moteur, de l'électronique de puissance et de leurs applications entraînées - Partie 1: Exigences générales pour définir les normes d'efficacité énergétique d'un équipement entraîné via l'approche produit étendu (EPA) et par le modèle semi-analytique (SAM)

Ökodesign für Antriebssysteme, Motorstarter, Leistungselektronik und deren angetriebene Einrichtungen - Teil 1: Allgemeine Anforderungen zur Erstellung von Normen zur Energieeffizienz von Ausrüstungen mit Elektroantrieb nach dem erweiterten Produktansatz (EPA) mit semi-analytischen Modellen (SAM)

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Foreword

This document (EN 50598-1:2014) has been prepared by CLC/TC 22X "Power electronics".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-11-17
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-11-17

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

EN 50598, *Ecodesign for power drive systems, motor starters, power electronics & their driven applications*, will consist of the following parts:

- *Part 1: General requirements for setting energy efficiency standards for power driven equipment using the extended product approach (EPA), and semi analytical model (SAM)*;

- *Part 2: Energy efficiency indicators for power drive systems and motor starters*;

- *Part 3: Quantitative ecodesign approach through life cycle assessment including product category rules and the content of environmental declarations*.

The CLC/TC 22X/WG 06 is the enabled task force for dealing with the Mandate M/476 from European Commission for the standardization in the field of variable speed drives and/or power drive system products.

It has been set a close collaboration with several other technical committees (i.e. CLC/TC 2; CLC/TC 17B) in order to provide a comprehensive standard for energy efficiency aspects and ecodesign requirements together with a pilot stakeholder committee CEN/TC 197 from the customers side.

Key points:

- Requirements on the content of semi analytical models for motor system driven equipment;
- Requirements how to use them in the extended product approach.

The content could be of interest for the following technical committees CLC/TC 59X, CLC/TC 111X, CEN/TC 44, CEN/TC 113, CEN/TC 121, CEN/TC 123, CEN/TC 142, CEN/TC 143, CEN/TC 156, CEN/TC 228, CEN/TC 232 and CEN/TC 299.

It is the intention of the working group that this document, once finalized as European standard series, will be further processed to an international consensus in IEC and ISO.

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Introduction

The Technical Committee CLC/TC 22X has circulated at 2010-03-31 the document CLC/TC 22X/Sec0100/DC document including the mandate M/476 from European Commission for standardization in the field of variable speed drives and/or power drive system products.

As the PDS contains converter driven motors, the requirements for measuring of the energy efficiency of motors with non-sinusoidal supply is under the responsibility of CLC/TC2 covering the requirement from Mandate M/470.

The document is based on the CENELEC technical board document referenced BT137/DG8058/INF also reproducing this EC-mandate.

The CLC/TC 22X/WG 06 as being the standardization task force for dealing with this Mandate has close collaboration with several other technical committees (i.e. CLC/TC 2; CLC/TC 17B).

Therefore CLC/TC 22X committee has been enabled responsible to clarify all relevant aspects in the field of energy efficiency and ecodesign requirements for power electronics, switchgear, control gear, and power drive systems and their industrial applications.

The sometimes controversial requirements are illustrated in Figure 1. The work has been agreed to provide the reasonable target as a best compromise.

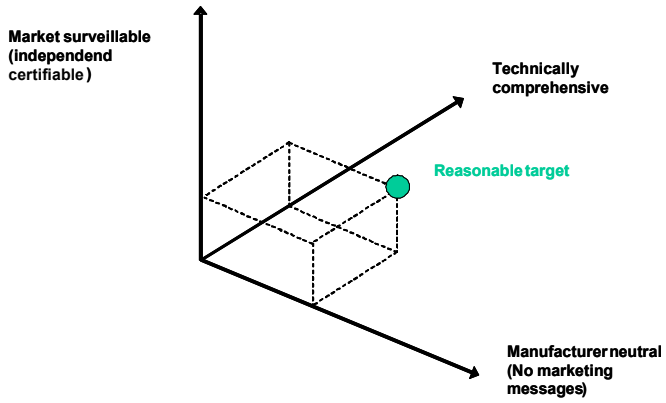

Figure 1 — Illustration of controversial requirements for the energy related product (ErP) standardization

EN 50598 is developed under the CENELEC projects number 24602 to 24604 for compliance with requirements from the horizontal mandate M/495.

Its three parts are together directly related to the mandates M/470 and M/476.

For the other mandates listed in Table 1, this standard could be applied if the future product standards developed will make reference to it.

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Table 1 — Mandates of the European Commission given to CEN, CENELEC and ETSI and how they are contributed by these standard series parts

Mandates	Part 1	Part 2	Part 3
M/470 Motors		✓	✓
M/476 PDS		✓	✓
M/495 Horizontal all future Applications	✓	✓	✓
M/488 HVAC comfort fans	✓	✓	(✓)
M/498 Pumps	✓	✓	(✓)
M/500 Compressors	✓	✓	(✓)

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1 Scope

This European Standard provides a general methodology to energy efficiency standardization for any extended product including a motor system by using the methodological guidance of the extended product approach (EPA).

It enables product committees for driven equipment with included motor systems to interact with the relative power losses of the included motor system (e.g. PDS) in order to determine the system energy efficiency aspects for the extended product by calculation.

This should be based on specified calculation models for speed/load profiles, the duty profiles and relative power losses of appropriate torque versus speed operating points.

This part of the EN 50598 series specifies the methodology of determination of losses of the extended product including a motor system and its sub-parts.

This framework is explained by an example for pumps.

This part of the standard does not specify requirements for environmental impact declarations.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50598-2, *Ecodesign for power drive systems, motor starters, power electronics & their driven applications — Part 2: Energy efficiency indicators for power drive systems and motor starters*

IEC 60050-161, *International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility*

3 Terms, definitions, symbols, units and abbreviated terms

For the purposes of this document, the terms and definitions given in IEC 60050-161 and the following apply.

3.1
Energy Efficiency Index
EEI
value describing an energy efficiency aspect of an application, resulting from the extended product approach (EPA)

Note 1 to entry: If the extended product is a pump system, the EEI is the ratio of the input power to the theoretical reference power required for the application.

3.2
Extended Product
EP
driven equipment together with its included motor system (e.g a PDS, a motor starter)

Note 1 to entry: See Figure 2.

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