

**Elektromagnetiline ühilduvus. Liftide, eskalaatorite ja liikurkõnniteede tooteperekonnastandard. Emissioon**

**Electromagnetic compatibility - Product family standard for lifts, escalators and moving walks - Emission**

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English Version

## Electromagnetic compatibility - Product family standard for lifts, escalators and moving walks - Emission

Compatibilité électromagnétique - Norme famille de produits pour ascenseurs, escaliers mécaniques et trottoirs roulants - Émission

Elektromagnetische Verträglichkeit - Produktfamilien-Norm für Aufzüge, Fahrtreppen und Fahrsteige - Störaussendung

This European Standard was approved by CEN on 6 February 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (EN 12015:2014) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2014 and conflicting national standards shall be withdrawn at the latest by September 2014.

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

This document supersedes EN 12015:2004.

The limits given in this European Standard recognise the fact that the product family covers a total range of lifts, escalators and moving walks used in residential buildings, offices, hospitals, hotels, industrial plants etc. and that lifts, escalators and moving walks are deemed to have their own dedicated power supply and be connected with the consent of the supply authority to a low impedance source.

The related EMC product family standard for immunity is:

EN 12016, *Electromagnetic compatibility — Product family standard for lifts, escalators and moving walks — Immunity*.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This European Standard is a Type C standard as stated in EN ISO 12100.

This European Standard has been prepared to provide one means of complying with the requirements of the Electromagnetic Compatibility (EMC) Directive. The requirements of this European Standard have been specified so as to ensure a level of electromagnetic emission which will cause minimal disturbance to other equipment. The levels, however, do not cover the following cases:

- a) where the probability of an occurrence likely to produce emissions in excess of those which would normally be experienced is extremely low, e.g. the emergency stopping of a lift, escalator or moving walk under a fault condition;
- b) where highly susceptible apparatus will be used in the close proximity of the equipment covered by this European Standard, in which case further measures may have to be taken to:
  - 1) reduce the level of electromagnetic emission to below that specified in this European Standard; or
  - 2) increase the immunity of the affected apparatus.

The given emission limits, are on the basis that equipment of the product family range may be installed both indoor and outdoor in all types of building, involves the switching of heavy currents and high inductive loads and, generally, is connected to a low voltage system.

Values for the harmonic emission limits are taken from the harmonised standard EN 61000-3-12:2005. Taking into account the characteristics and environment of lifts, escalators and moving walks these harmonic values are applicable for all input currents without current limitation stated by EN 61000-3-12:2005.

Due to the size of an installed lift, it becomes impracticable to test the total assembly either in a test laboratory or in situ where the uncontrolled environment may also influence the test procedures and results. This applies also to measurements within the car. Similar considerations regarding dimensions apply equally to the testing of escalators and moving walks.

### Rational to the revision of EN 12015:1998

#### a) Important changes

Introduced requirements to control the emissions below 30 MHz of the drive to machine/motor connection. The emission limits are independent of the magnitude of the conducted current. Limits and test method are referred to EN 55014-1:2000. Regarding other ports, the radiated tests above 30 MHz cover the cable connections and there are no known problems below 30 MHz.

Introduced requirements to control mains electricity supply harmonic emissions and voltage fluctuations.

NOTE The radiation measurements in Table 1 have been harmonised with EN 55011:1998.

The term "installation" has been changed to "system". This is due to the fact that official interpretation defines that fixed installations are not covered by the conformity assessment procedures for CE Marking and declaration of conformity according to the EMC Directive, valid for apparatus and systems. The scope of the standard is applicable to the apparatus and assembly of apparatus of lifts and escalators and assembly into systems.

#### b) Environmental issues

Lifts, escalators and moving walks are systems whose apparatus and assembly of apparatus are distributed (and some of which move) throughout the building. The definition in EMC terms of the use of the building (residential or industrial) cannot be predetermined or assumed to be fixed. Therefore, to cover requirements in all cases, no differentiation between environments has been made and a single set of limits has been maintained. This set of high frequency limits is based on the industrial limits of EN 61000-6-4:1997 and is known to be above the usual limits for the residential environment. This is justified by the experience that systems in compliance with EN 12015:1998 have not been known to cause EMC interference with regard to mains and radiated emissions above 30 MHz.

Regarding conducted limits, these are also based on the fact that the supply cabling is separated from other building supplies at least up to the point of common coupling (PCC). Additionally, system wiring is segregated in accordance with the manufacturers' specifications.

Regarding radiated emission limits above 30 MHz, the lift, escalator or moving walk area is separated, to a large extent, from domestic appliances.

All the limits used take into account that systems have to comply with the safety protection requirements regarding earth leakage currents. The application of more stringent limits than have been shown to be adequate, would require the use of larger filters (both inductance and capacitance). The use of these will increase the susceptibility of the system to low electricity mains supply conditions and increase earth leakage currents. There is also an increase in power dissipation in the filter, causing (in the general case) increased energy consumption, additional ventilation and/or cooling requirement for the building. This is especially valid for higher duty systems.

#### **Rational to the revision of EN 12015:2004**

In general, lifts, escalators and moving walks are connected to three-phase supply and considered as a combination of a balanced three-phase load and one or more loads connected between phase and neutral or between phases, defined as hybrid equipment in EN 61000-3-12:2005, 3.7. Therefore EN 61000-3-12:2005, Tables 2, 3 and 4 apply to the system in accordance with flow chart of application of harmonic limits. In most of the cases Table 3 and Table 4 apply by prior verification of 3<sup>rd</sup> order harmonic.

Regarding lifts, escalators and moving walks connected to single-phase supply, EN 61000-3-12:2005, Table 2 is applicable to the A.C. mains port.

As the supply authorities do not guarantee a defined mains impedance, the mains short circuit power may vary from location to location. As these parameters are normally not known in advance, a practical assumption has to be made, based on values already known from other lifts/escalators and moving walks already in service. Due to that fact, a short circuit ratio  $R_{sc} = 250$  is defined as an average value for lifts, escalators and moving walks.

Radio equipment and telecommunications terminal equipment clearly falls under the 1999/5/EC Directive (R&TTE) even if it is used as part of lifts, escalators and moving walks.

## 1 Scope

This European Standard specifies the emission limits in relation to electromagnetic disturbances and test conditions for lifts, escalators and moving walks, which are intended to be permanently installed in buildings. These limits however, may not provide full protection against disturbances caused to radio and TV reception when such equipment is used within distances given in Table 1.

This European Standard is not applicable for apparatus which are manufactured before the date of its publication as EN.

## 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 55011:2009, *Industrial, scientific and medical equipment — Radio-frequency disturbance characteristics — Limits and methods of measurement (CISPR 11:2009, modified)*

EN 55014-1:2006, *Electromagnetic compatibility — Requirements for household appliances, electric tools and similar apparatus — Part 1: Emission (CISPR 14-1:2005)*

EN 55022:2010, *Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement (CISPR 22:2008, modified)*

EN 61000-3-2:2006, *Electromagnetic compatibility (EMC) — Part 3-2: Limits — Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase) (IEC 61000-3-2:2005)*

EN 61000-3-11:2000, *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  $\leq 75$  A and subject to conditional connection (IEC 61000-3-11:2000)*

EN 61000-3-12:2005, *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  $\leq 75$  A per phase (IEC 61000-3-12:2004)*

EN 61000-6-3:2007, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006)*

EN 61000-6-4:2007, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-3:2006)*

IEC 60050-161:1990+A1:1997+A2:1998, *International Electrotechnical Vocabulary — Chapter 161: Electromagnetic compatibility*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 61000-6-3:2007, EN 61000-6-4:2007 and IEC 60050-161:1990+A1:1997+A2:1998 and the following apply.

### 3.1 apparatus

assembly of components with an intrinsic function as defined by its manufacturer