

Concerning EMC
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Electromagnetic compatibility (EMC)

Relevant standards for commercial cleaning machines

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Foreword

This document has been prepared by the Technical Committee of the European Cleaning Machines Association EUnited Cleaning, which represents the leading European manufacturer of commercial cleaning machines.

I.E., by this Technical Recommendation the European cleaning machines industry defines requirements and recommends measures in addition to existing European and international standards. Cleaning machines manufacturers which are associated in EUnited Cleaning declare to comply with this Technical Recommendation.

Introduction

With the use of more electronic devices in areas where cleaning machines operate, there is a need to ensure that cleaning machines are provided with adequate immunity to external electromagnetic fields. Furthermore, as more cleaning machines are fitted with electrical and electronic devices, there is a need to ensure that emission of electromagnetic fields from the cleaning machines meets acceptable limits.

High frequency electrical disturbances emerge during the normal operation of many parts of the cleaning machines and systems; they are generated within a large frequency range with different electrical characteristics. Furthermore, electrostatic discharges are relevant to cleaning machines.

With respect to those technical requirements, this document identifies these international standards which shall be used by manufacturers of professional cleaning machines to meet adequate electromagnetic compatibility of their products. These standards provide test methods and acceptance criteria which are correct for cleaning machines considering the specific characteristics and the operating parameters of this machinery.

1 Scope

This document applies for cleaning machines under the scope of the international standards of IEC SC 61J 'Electrical motor-operated cleaning appliances for commercial use' and of CEN TC 197/WG 5 'High-pressure water jet machines', used in residential, commercial, light industry and industrial environment.

This document does not cover:

- cleaning machines intended for use outside the electromagnetic environments specified in the standards mentioned in Cl. 4, e.g. special customer demands;
- cleaning machines intended for use on public areas with a maximum speed exceeding 25 km/h;
- interaction between systems on the cleaning machines.

2 Normative references

This document refers to European and international standards. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60335-2-29, *Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers*

IEC 60335-2-67, *Household and similar electrical appliances – Safety – Part 2-67: Particular requirements for floor treatment and floor cleaning machines, for industrial and commercial use*

IEC 60335-2-68, *Household and similar electrical appliances – Safety – Part 2-68: Particular requirements for spray extraction appliances, for industrial and commercial use*

IEC 60335-2-69, *Household and similar electrical appliances – Safety – Part 2-69: Particular requirements for wet and dry vacuum cleaners, including power brush, for industrial and commercial use*

IEC 60335-2-72, *Household and similar electrical appliances – Safety – Part 2-72: Particular requirements for automatic machines for floor treatment for commercial and industrial use*

IEC 60335-2-79, *Household and similar electrical appliances – Safety – Part 2-79: Particular requirements for high pressure cleaners and steam cleaners*

IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions*

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A*

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*

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

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

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

CISPR 12, *Vehicles, boats, and internal combustion engines – Radio disturbance characteristics – Limits and methods of measurement for the protection of off-board receivers*

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

CISPR 14-2, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity*

EN 1829, *High pressure water jet machines – Safety requirements*

EN 55012, *Vehicles, boats and internal combustion engine driven devices – Radio disturbance characteristics – Limits and methods of measurement for the protection of receivers except those installed in the vehicle/boat/device itself or in adjacent vehicles/boats/devices*

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

EN 55014-2, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60335-2-29, -67, -68, -69, -72, -79, and EN 1829 apply.

4 Relation between machine types and EMC standards

For the following appliances under the scope of the listed safety standards, the standards for electromagnetic disturbance (emission) and immunity are considered to fulfil the requirements for the electromagnetic compatibility of these appliances.

appliances	remarks	relevant safety standard	low frequency phenomena ¹	electro-magnetic disturbance	electro-magnetic immunity
stand-alone chargers ²		IEC 60335-2-29			CISPR 14-2
on-board chargers	built in, contacted separately	IEC 60335-2-72	IEC 61000-3-2 IEC 61000-3-3	CISPR 14-1	
polishing machines		IEC 60335-2-67		CISPR 12	
	powered by combustion engine or battery powered traction drive				
spray extraction appliances		IEC 60335-2-68	IEC 61000-3-2 IEC 61000-3-3	CISPR 14-1	
	powered by combustion engine			CISPR 12 ⁶	
vacuum cleaners		IEC 60335-2-69	IEC 61000-3-2 IEC 61000-3-3	CISPR 14-1	
sweeping and scrubbing machines		IEC 60335-2-72		CISPR 14-1	IEC 61000-6-2 ³
	powered by combustion engine or battery powered traction drive			CISPR 12 ⁶	
high-pressure cleaners		IEC 60335-2-79 or EN 1829	IEC 61000-3-2 IEC 61000-3-3	CISPR 14-1	CISPR 14-2
	combustion engine powered			CISPR 12 ⁶	

NOTE Many areas are not homogeneous for their EMC classification; for example hospitals and airports have areas with different levels of classifications, for areas outside the generic standard definitions special rules may be applicable.

¹ Relevant only for mains-operated products;

normally, the itemised appliances which are connected to the public supply system have a rated current of less than 16 A; otherwise, IEC 61000-3-11 and -12 have to be considered.

² The term stand-alone chargers includes chargers which are attached to a machine but not built in

³ If applicable due to table 1 - table 4 of IEC 61000-6-2