

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Household and similar electrical appliances – Safety –
Part 2-124: Particular requirements for commercial dry ice blasting machines**

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-124: Exigences particulières pour les machines de projection de glace
carbonique à usage commercial**

[IEC 60335-2-124:2024](https://standards.iteh.ai/catalog/standards/iec/5c2987f0-7171-466e-97a9-ccb2b080ae20/iec-60335-2-124-2024)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-124: Particular requirements for commercial dry ice blasting
machines**

FOREWORD

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IEC 60335-2-124 has been prepared by subcommittee 61J: Electrical motor-operated cleaning appliances for commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
61J/780/FDIS	61J/781/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for commercial dry ice blasting machines.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new sub clause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or sub clause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type; [IEC 60335-2-124:2024](https://standards.itec.org/iec/60335-2-124-2024)

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- test specifications: in italic type; [5c2987f0-7171-466e-97a9-ccb2b080ae20/iec-60335-2-124-2024](https://standards.itec.org/iec/60335-2-124-2024)

- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 and SC61J supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

<https://www.iec.ch/sc61j/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules can differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

<https://www.iec.ch/standards/docs/standards/60335-2-124-2024>
NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-124: Particular requirements for commercial dry ice blasting machines

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of dry ice blasting machines intended for commercial indoor or outdoor use for the following hand-guided applications:

- cleaning,
 - decoating,
 - stripping
- of surfaces.

The blasting machines are either equipped with containers for storage of dry ice or produce dry ice internally.

These machines are not equipped with a traction drive.

The following power systems are covered:

- mains powered motors up to a **rated voltage** of 250 V for single-phase appliances and 480 V for other appliances,
- **battery-operated machines.**

This standard does not apply to

- dry ice blasting machines with integrated generation of compressed air;
- dry ice blasting machines using other transport gases besides compressed air or nitrogen;
- dry ice blasting machines with nozzles being controlled by robotic arms;
- spray extraction machines for commercial use (IEC 60335-2-68);
- high pressure cleaners (IEC 60335-2-79);
- sand blasting equipment (abrasive blasting);
- hand-held and transportable motor-operated electric tools (IEC 60745 series, IEC 61029 series, IEC 62841 series);
- machines designed for use in corrosive or explosive environments (dust, vapour or gas);
- machines designed for use in vehicles in non-ventilated environment;
- machines designed for use on board of ships or aircraft.

NOTE 101 Attention is drawn to the fact that in many countries, additional requirements on the safe use of the equipment covered can be specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Modification:*

Replace the first paragraph with the following:

conditions under which the machine is operated in normal use, as intended by the manufacturer

It denotes the load corresponding to the highest obtainable load of all particular loads of the various functions that can be operated at the same time according to the manufacturer's instructions, being equipped with the appropriate nozzle while being supplied at **rated voltage** and continuously spraying **cleaning agent** with the highest flow rate and at rated pressure.

Containers of machines, if applicable, are filled before starting the operation to the highest level as indicated on the container, or completely if no marking is provided. Additional necessary supply means (e.g. compressed air), if applicable, are connected and supply according their maximum rating. All filters, strainers etc. need to be in clean condition.

The largest gas bottles intended, if any, are connected, fully filled to the machine. During operation the rated gas pressure needs to be maintained.

3.6 Definitions relating to parts of an appliance

3.6.101

trigger gun

hand-held spraying device where the flow of the **cleaning agent** is regulated by an integrated manually operated control device

3.7 Definitions relating to safety components

3.7.101

operator presence control

OPC

control device that automatically interrupts the power, e.g. to a drive, when the **operator's** actuating force is removed

Note 1 to entry: Such devices can be, for example, continuous action controls ("hold-to-run" controls).

3.7.102

guard

part of the machine specifically designed to provide protection by means of a physical barrier

Note 1 to entry: Three main kinds of **guards** can be distinguished: fixed **guards**, interlocking moveable **guards** and adjustable **guards**. Interlocking movable **guards** are required where frequent access is envisaged, while fixed **guards** can be used where frequent access is not envisaged.

Note 2 to entry: Examples are a casing, a shield, a cover, a screen, a door, an enclosure or a fence.

Note 3 to entry: Other parts of the machine that fulfil a primarily operational function, such as, for example, the frame of the machine, may also fulfil a protective function but are not referred to as **guards**.

3.8 Definitions relating to miscellaneous matters

3.8.101

operator

person installing, operating, adjusting, maintaining, cleaning or moving the machine

3.8.102

cleaning agent

compressed air or nitrogen with the addition of dry ice particles

Note 1 to entry: Dry ice particles can consist of solid dry ice particles or of dry ice snow.

3.11 Definitions relating to remote functionality

3.11.5

Note 101 to entry: Control of the **cleaning agent** jet at the **trigger gun** is not regarded as **remote operation**.

4 General requirement

This clause of Part 1 is applicable except as follows.

Modification:

Replace the first paragraph with the new following text:

Machines shall be constructed so that they function safely so as to cause no danger to persons or surroundings during normal use, even in the event of carelessness, and during installation, adjusting, maintenance, cleaning, repairing or transportation.

Addition:

[IEC 60335-2-124:2024](https://standards.iteh.ai/catalog/standards/iec/5c2987f0-7171-466e-97a9-ccb2b080ae20/iec-60335-2-124-2024)

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For the purpose of this standard, the term "appliance" as used in Part 1 is to be read as "machine".

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

Addition:

WARNING – Some tests can result in suffocation, cold burn, and intense noise. It is therefore important that personnel be protected from suffocation due high concentration of CO₂ or N₂ gas from dry ice, extreme cold surface and intense noise from the spray nozzle. The test area shall be well ventilated to protect personnel from harmful CO₂ or N₂ gas.

5.101 The hydrostatic tests of 21.103 shall be performed with water to reduce the risk for the personnel.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement:

Machines shall be one of the following classes with respect to the protection against electric shock:

- class I, or
- class III.

Hand-held parts containing electrical components shall be of **class III construction**.

Compliance is checked by inspection and by the relevant tests.

6.2 Addition:

Machines shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Replace the 4th dashed item as follows:

- business name and address of the manufacturer and, if applicable, his authorized representative; any address shall be sufficient to ensure postal contact;

Addition:

Machines shall be marked in addition with the following:

- serial number, if any;
- designation of the machine and series or type, allowing the technical identification of the product. This may be achieved by a combination of letters and/or numbers;

NOTE 101 Designation of machine, series or type includes the model or type reference as required in Part 1.

- year of construction, i.e. the year in which the manufacturing process is completed;

NOTE 102 The year of construction can be part of the serial number.

- the mass of the most usual configuration in kg;
- the maximum inlet gas pressure;
- the warning sign ISO 7010 W010 (2011-05) – Warning – Low temperature/Freezing conditions;
- the warning sign ISO 7010 W041 (2016-10) – Warning – Asphyxiating atmosphere;
- the warning sign ISO 7010 M003 (2011-05) – Wear ear protection;
- the warning sign ISO 7010 M004 (2011-05) – Wear eye protection;
- the warning sign ISO 7010 M009 (2011-05) – Wear protective gloves.

NOTE 103 The standard for protective gloves is ISO 21420 in combination with EN 511.

The equipotential bonding connector shall be marked with symbol IEC 60417-5021 (2002-10) on the connector or close to it.

If the machine design cannot avoid incorrect mounting leading to an unsafe situation in accordance with 22.106, it shall be marked with information on the correct mounting.

7.6 Addition:

[symbol IEC 60417-5021 (2002-10)] equipotentiality



[warning sign ISO 7010 W010 (2011-05)] Warning – Low temperature/Freezing conditions



[warning sign ISO 7010 W041 (2016-10)] Warning – Asphyxiating atmosphere



[warning sign ISO 7010 M003 (2011-05)] Wear ear protection



[warning sign ISO 7010 M004 (2011-05)] Wear eye protection



[warning sign ISO 7010 M009 (2011-05)] Wear protective gloves

The rules for warning signs in ISO 3864-1 do not apply. It is acceptable to show these signs in monochrome colour.

7.12 Modification:

Add after the Note the following new Note:

NOTE 101 Alternative requirements for instructions in hard copy form are available in 7.12.9.

Replace the 4th paragraph with the following new text.

This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.

Addition:

The front cover of the instructions shall include the substance of the following warning:

CAUTION Read the instructions before using the machine.

This wording may be replaced by symbols ISO 7000-0434A (2004-01) and ISO 7000-0790 (2004-01).

The instructions shall contain at least the following:

- the business name and full address of the manufacturer and, if applicable, his authorized representative;
- designation of series or type of the machine as marked on the machine itself, except for the serial number;

NOTE 102 The designation of series or type can be abstracted, as long as the identification of the product is ensured.

- the general description of the machine;
- the intended use of the machine and the auxiliary equipment as covered by the scope of this standard;

NOTE 103 Examples of auxiliary equipment are spray accessories.

- the meaning of the symbols used on the machine and in the instructions;
- drawings, diagrams, descriptions and explanations necessary for the safe use, maintenance and repair of the machine and for checking its correct functioning;
- information regarding putting into service, safe operation, handling, transportation, and storage of the machine taking into account its weight;
- instructions to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations;
- the conditions in which the machine meets the requirement of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns;
- the procedure to be followed to prevent unsafe situations in the event of accident (e.g. contact with or spillage of battery acid, oil) or equipment breakdown;
- the substance of the following:

This machine is intended for commercial use, for example in workshops, industry, factories and rental businesses.
- the temperature range for storage and operation;
- the specifications of the gas bottles to be used, if applicable.

The instructions shall indicate the type and frequency of inspections and maintenance required for safe operation, including preventive maintenance measures. They shall, if applicable, give the specifications of the spare parts if they affect the health and safety of the **operator**.

In addition, the instructions shall give the following information, if applicable:

- information on the characteristics of the dry ice pellets to be used;
- information on the choice and use of personal protective equipment (PPE);
- essential characteristics of auxiliary equipment which may be fitted to the machine.

7.12.9 Modification:

Add the following new text after the 2nd paragraph:

Instead of hard copy, electronic form can be used if the following conditions are met: