



Edition 1.0 2024-01 EXTENDED VERSION

INTERNATIONAL STANDARD



This extended version of IEC 60335-2-124:2024 includes the content of the references made to IEC 60335-1:2020

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

Document Preview

IEC 60335-2-124:2024

https://standards.jteh.ai/catalog/standards/jec/5c2987f0-7171-466e-97a9-ccb2b080ae20/jec-60335-2-124-2024





THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat 3, rue de Varembé CH-1211 Geneva 20 Switzerland

Tel.: +41 22 919 02 11 info@iec.ch

www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublishedStay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.





Edition 1.0 2024-01 EXTENDED VERSION

INTERNATIONAL STANDARD



This extended version of IEC 60335-2-124:2024 includes the content of the references made to IEC 60335-1:2020

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

Document Preview

IEC 60335-2-124:2024

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 13.120, 97.080 ISBN 978-2-8322-8190-1

Warning! Make sure that you obtained this publication from an authorized distributor.

iTeh Standards (https://standards.iteh.ai) Document Preview

IEC 60335-2-124:2024

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60335-1 Edition 6.0 2020-09

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - SAFETY -

Part 1: General requirements

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The text of this Interpretation Sheet is based on the following documents:

Draft	Report on voting
61/5999/DISH	61/6009/RVDISH

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

IEC 60335-2-124:2024

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

INTRODUCTION

Edition 6 of IEC 60335-1:2020 defines and introduces requirements for a detachable power supply part of an appliance. In the document, 24.2 prohibits the use of a power supply in a flexible cord.

QUESTION:

Does Subclause 24.2 prohibit the use of a detachable power supply part?

ANSWER

No, a "detachable power supply part" is a defined term and is not captured by the term "power supply" as used in Subclause 24.2.

NOTE A detachable power supply part is captured by the defined term when the output of the power supply part is detachable from the class III construction part of the appliance at:

- the power supply part, or
- $\boldsymbol{\mathsf{-}}$ the class III construction part of the appliance.

However, the supply cord (if any) does not have to be detachable from the detachable power supply part.

CONTENTS

FO	REWORD	6
INT	RODUCTION	9
1	Scope	10
2	Normative references	10
3	Terms and definitions	15
4	General requirement	27
5	General conditions for the tests	27
6	Classification	32
7	Marking and instructions	32
8	Protection against access to live parts	43
9	Starting of motor-operated appliances	45
10	Power input and current	46
11	Heating	48
12	Charging of metal-ion batteries	53
13	Leakage current and electric strength at operating temperature	54
14	Transient overvoltages	
15	Moisture resistance	58
16	Leakage current and electric strength	61
17	Overload protection of transformers and associated circuits	63
18	Endurance	63
19	Abnormal operation	63
20	Stability and mechanical hazards	74
21	Mechanical strength	,76
22	Construction	79
23	Internal wiring	94
24	Components	96
25	Supply connection and external flexible cords	101
26	Terminals for external conductors	108
27	Provision for earthing	110
28	Screws and connections	112
29	Clearances, creepage distances and solid insulation	115
30	Resistance to heat and fire	123
31	Resistance to rusting	128
32	Radiation, toxicity and similar hazards	128
Ann	ex A (informative) Routine tests	143
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances		145
Annex C (normative) Ageing test on motors		166
Ann	ex D (normative) Thermal motor protectors	167
Ann	ex E (normative) Needle-flame test	168
Ann	ex F (normative) Capacitors	169
Δnr	nex G (normative). Safety isolating transformers	171

Figure B.1 – Examples of battery-operated appliance constructions and application of normative Annex B (1 of 2)	164
Figure B.2 – Examples of correct polarity connection marking representing three batteries	
Figure I.1 – Simulation of faults	
Figure L.1 – Sequence for the determination of clearances	
Figure L.2 – Sequence for the determination of creepage distances	
Figure L.3 – Measurement of clearances	
Figure O.1 – Tests for resistance to heat	
Figure O.2 – Selection and sequence of tests for resistance to fire in hand-held appliances	
Figure O.3 – Selection and sequence of tests for resistance to fire in attended appliances	184
Figure O.4 – Selection and sequence of tests for resistance to fire in unattended appliances	185
Figure O.5 – Some applications of the term "within a distance of 3 mm"	187
Figure Q.1 – Flowchart outlining the sequence of tests for the evaluation of electronic circuits (1 of 2)	191
Figure S.1 – Flowchart giving guidance on measurement of power input and current	00-
concerning the representative period	
Figure AA.1 – Position of dry ice-blasting machines	
Table 1 – Power input deviation	
Table 1 – Power input deviation	46
Table 2 – Current deviation Provident	
Table 3 – Maximum normal temperature rises	
Table 4 – Voltage for electric strength test	
Table 5 – Characteristics of high-voltage sources .7.1.4666.97a9.cch2h080ae20/fec.603	
Table 6 – Impulse test voltage	
Table 7 – Test voltages	
Table 8 – Maximum winding temperature	
Table 9 – Maximum abnormal temperature rise	
Table 10 – Dimensions of cables and conduits	
Table 11 – Minimum cross-sectional area of conductors	
Table 12 – Pull force and torque	
Table 13 – Nominal cross-sectional area of conductors	
Table 14 – Torque for testing screws and nuts	
Table 15 – Rated impulse voltage	
Table 16 – Minimum clearances	116
Table 17 – Minimum creepage distances for basic insulation	120
Table 18 – Minimum creepage distances for functional insulation	121
Table 19 – Minimum thickness for accessible parts of reinforced insulation consisting of a single layer	123
Table A.1 – Test voltages	144
Table B.1 – Artificial source characteristics	147
Table B.2 – Total area of openings for metal-ion cells	155
Table B.3 – Volume of air injected at 2 070 kPa	155

Table C.1 – Test conditions	166
Table R.1 – General fault/error conditions	195
Table R.2 – Specific fault/error conditions	197
Table R.3 – Semi-formal methods	203
Table R.4 – Software architecture specification	203
Table R.5 – Module design specification	204
Table R.6 – Design and coding standards	205
Table R.7 – Software safety validation	205
Table T.1 – Minimum property retention limits after UV-C exposure	209
Table T.2 – Minimum electric strength for internal wiring after UV-C exposure	210
Table U.1 – Examples of acceptable measures against unauthorised access and transmission fault/error modes	213
Table AA.1 – Determination of uncertainty	217

iTeh Standards (https://standards.iteh.ai) Document Preview

EC 60335-2-124:2024

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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

FORFWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication. ccb2b080ae20/iec-60335-2-124-2024
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This extended version (EXV) of the official IEC Standard provides the user with the comprehensive content of the Standard.

IEC 60335-2-124:2024 EXV includes the content of IEC 60335-2-124:2024, and the references made to IEC 60335-1:2020.

The specific content of IEC 60335-2-124:2024 is displayed on a blue background.

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;
- test specifications: in italic type;
- 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

iTeh Standards (https://standards.iteh.ai) Document Preview

EC 60335-2-124:2024

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

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.

NOTE 1. This means that the technical committees responsible for the part 2 standards have determined that it is 4 2024 not necessary to specify particular requirements for the appliance in question over and above the general

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.

https://

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES -SAFETY -

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

Scope

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

- https://s dry ice blasting machines with integrated generation of compressed air; 2016c-60335-2-114-2024
 - 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

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.