
**Assistive products — Hoists for the
transfer of persons — Requirements
and test methods**

*Produits d'assistance — Lève-personnes pour transférer des
personnes — Exigences et méthodes d'essais*



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Contents

	Page
Foreword.....	vii
Introduction.....	viii
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 General requirements and test methods.....	8
4.1 General requirements.....	8
4.1.1 Risk management.....	8
4.1.2 Ergonomic factors.....	8
4.1.3 Noise and vibration.....	8
4.1.4 Safety of moving and folding parts.....	9
4.1.5 Prevention of traps for parts of the human body.....	10
4.1.6 V-shaped openings.....	11
4.2 General test methods.....	11
4.2.1 Test conditions.....	11
4.2.2 Apparatus.....	11
4.2.3 Permissible errors of test equipment.....	12
4.2.4 Test report.....	12
4.2.5 Safety and performance requirements.....	16
4.2.6 Test methods for general safety requirements.....	19
4.3 Requirements for body-support units.....	22
4.4 Central suspension point.....	22
4.4.1 Requirements for central suspension point.....	22
4.4.2 Test method for the central suspension point.....	22
4.5 Spreader bar.....	22
4.5.1 Requirements for spreader bar.....	22
4.5.2 Test methods for the spreader bar.....	23
4.6 Performance.....	23
4.6.1 Requirements for performance.....	23
4.6.2 Test methods for performance.....	23
4.7 Rate of movements of the hoist.....	24
4.7.1 Requirements for rate of lifting and lowering.....	24
4.7.2 Test methods for rate of lifting and lowering.....	24
4.7.3 Requirements for rate of powered horizontal movement.....	24
4.7.4 Test methods for rate of powered horizontal movement.....	24
4.8 Operating forces/torques.....	24
4.8.1 Requirements for operating forces/torques.....	24
4.8.2 Test methods for operating forces/torques.....	25
4.9 Durability.....	25
4.9.1 Requirements for durability.....	25
4.9.2 Test methods for durability.....	25
4.10 Hydraulic components.....	27
4.10.1 Requirements for hydraulic components.....	27
4.10.2 Test methods for hydraulic components.....	28
4.11 Pneumatic components.....	28
4.11.1 Requirements for pneumatic components.....	28
4.11.2 Test methods for pneumatic components.....	28
4.12 Machine washable hoists.....	29
4.12.1 Requirements for machine washable hoists.....	29
4.12.2 Test methods for machine washable hoists.....	29
4.13 Requirement for information supplied by the manufacturer.....	30
4.13.1 General.....	30
4.13.2 Instructions for use.....	30

	4.13.3 Labelling	32
5	Mobile hoists — Specific requirements and test methods	37
	5.1 General requirements	37
	5.2 Static strength	37
	5.2.1 Requirements for static strength	37
	5.2.2 Test methods for static strength	37
	5.3 Static stability	38
	5.3.1 Requirements for static stability	38
	5.3.2 Test methods for static stability	38
	5.4 Immobilizing device (brakes)	38
	5.4.1 Requirements for immobilizing device (brakes)	38
	5.4.2 Test methods for immobilizing device (brakes)	38
	5.5 Moving forces	39
	5.5.1 Requirements for moving forces	39
	5.5.2 Test methods for moving forces	39
	5.6 Requirement for information supplied by the manufacturer	40
	5.6.1 Pre-sale information	40
6	Mobile hoists for transferring a person in standing position— Specific requirements and test methods	41
	6.1 General requirements	41
	6.2 Static strength	41
	6.2.1 Requirements for static strength	41
	6.2.2 Test method for static strength	41
	6.3 Static stability	41
	6.3.1 Requirements for static stability	41
	6.3.2 Test methods for static stability	42
	6.4 Immobilizing device (brakes)	43
	6.4.1 Requirements for immobilizing device (brakes)	43
	6.4.2 Test methods for immobilizing device (brakes)	43
	6.5 Moving forces	43
	6.5.1 Requirements for moving forces	43
	6.5.2 Test methods for moving forces	43
	6.6 Durability	43
	6.6.1 Requirements for durability	43
	6.6.2 Test methods for durability	43
	6.7 Requirement for information supplied by the manufacturer	44
	6.7.1 Pre-sale information	44
7	Stationary hoists — Specific requirements and test methods	44
	7.1 General requirements	44
	7.2 Specific safety requirements	45
	7.2.1 Requirements for specific safety requirements	45
	7.2.2 Test methods for specific safety requirements	45
	7.3 Static strength (free-standing stationary hoists only)	45
	7.3.1 Requirements for static strength (free-standing stationary hoists only)	45
	7.3.2 Test methods for static strength (free-standing stationary hoists only)	45
	7.4 Static stability (free-standing stationary hoists only)	46
	7.4.1 Requirements for static stability (free-standing stationary hoists only)	46
	7.4.2 Test methods for static stability (free-standing stationary hoists only)	46
	7.5 Static strength for all other stationary hoists	47
	7.5.1 Requirements for static strength for all other stationary hoists	47
	7.5.2 Test methods for static strength for all other stationary hoists	47
	7.6 Requirement for information supplied by the manufacturer	47
	7.6.1 User information	47
8	Non-rigid body-support units — Specific requirements and test methods	47
	8.1 General requirements	47
	8.2 Requirements for material and seams of the non-rigid body-support unit	47

8.3	Test methods for non-rigid body-support unit.....	48
8.3.1	Test methods for non-rigid body-support unit designed to be laundered.....	48
8.3.2	Test method for durability for non-rigid body-support unit.....	48
8.4	Requirement for information supplied by the manufacturer.....	48
8.4.1	Pre-sale information.....	48
8.4.2	User information.....	48
8.4.3	Labelling.....	49
9	Rigid body-support units — Specific requirements and test methods.....	49
9.1	General requirements.....	49
9.2	Requirements for backrest.....	50
9.3	Requirements and test methods for durability.....	50
9.4	Requirement for information supplied by the manufacturer.....	50
9.4.1	User information.....	50
9.4.2	Labelling.....	50
10	Bathtub hoists — Specific requirements and test methods.....	51
10.1	General requirements.....	51
10.1.1	General.....	51
10.1.2	Risk analysis.....	51
10.1.3	Ergonomic factors.....	51
10.1.4	Noise.....	51
10.1.5	Safety of moving and folding parts.....	51
10.1.6	Prevention of traps for parts of the human body.....	51
10.1.7	V-shaped openings.....	51
10.2	General test methods.....	52
10.2.1	Test conditions.....	52
10.2.2	Test equipment.....	52
10.2.3	Permissible errors of test equipment.....	52
10.2.4	Test report.....	52
10.3	Safety requirements.....	52
10.3.1	General safety requirements.....	52
10.3.2	Test methods for general safety requirements.....	52
10.4	Body-support units.....	53
10.5	Spreader bar.....	53
10.6	Performance.....	53
10.7	Rate of movements of the hoist.....	53
10.8	Operating forces/torques.....	53
10.9	Durability.....	53
10.9.1	Requirements for durability.....	53
10.9.2	Test methods for durability.....	53
10.10	Static strength and stability.....	54
10.10.1	Requirements for static strength and stability.....	54
10.10.2	Test methods for static strength and stability.....	54
10.11	Hydraulic components.....	54
10.12	Pneumatic components.....	55
10.13	Specific safety requirements.....	55
10.13.1	Requirements for specific safety requirements.....	55
10.13.2	Test methods for specific safety requirements.....	55
10.14	Non-rigid body-support units.....	55
10.15	Rigid body-support units — Requirements.....	55
10.16	Requirement for information supplied by the manufacturer.....	55
10.16.1	General.....	55
10.16.2	Instructions for use.....	55
10.16.3	Labelling.....	55
	Annex A (informative) Rationale for specific safety requirements.....	56
	Annex B (informative) Periodic inspection and maintenance.....	58
	Annex C (informative) Compatibility of hoist/spreader bar/body-support units.....	61

Annex D (informative) Guidelines for colour coding for size of non-rigid body-support units.....	74
Bibliography.....	75

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 173, *Assistive products*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 293, *Assistive products and accessibility*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 10535:2006), which has been technically revised.

The main changes are as follows:

- aspects on hoists with robotic features has been included;
- guidelines regarding compatibility of hoists/body-support units have been included;
- the informative annex on Inspection has been further developed;
- lowering of minimum capacity of a mobile hoist from 120 kg to 100 kg;
- requirement of emergency lowering device for mobile hoist and standing/raising hoists has been included.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This corrected version of ISO 10535:2021 incorporates the following correction:

- in [4.2.5.2](#), the sentence "Electrically operated hoists shall conform to IEC 60601-1:2005+AMD1:2012, Clause 14 regarding electrical safety unless requirements are covered by this document." has been added at the beginning of the first paragraph.

Introduction

It appears from studies that the nursing and caring profession involves many physically burdening factors in the caring for and nursing of persons with disabilities. A hoist offers a safe means of supportive lifting and moving, either assisted or independently.

This document specifies requirements and test methods that are relevant to hoists for the transfer of persons with disabilities. This document addresses further needs in terms of providing safety for both the person with a disability and the attendant, while taking into account the potential new development within robotic technology on hoist solutions.

Assistive products — Hoists for the transfer of persons — Requirements and test methods

1 Scope

This document specifies requirements and test methods for hoists and body-support units intended for the transfer of persons with disabilities. The document applies to the following products classified in ISO 9999:—¹⁾.

- 12 36 03 Mobile hoists for transferring a person in sitting position with sling seats;
- 12 36 04 Mobile hoists for transferring a person in standing position;
- 12 36 06 Mobile hoists for transferring a person in sitting position with solid seats;
- 12 36 09 Mobile hoists for transferring a person in lying position;
- 12 36 12 Stationary hoists fixed to walls, floor or ceiling;
- 12 36 15 Stationary hoists fixed to, or mounted in or on, another product;
- 12 36 18 Stationary free-standing hoists;
- 12 36 21 Body-support units for hoists.

This document covers different types of mobile and stationary hoists. Some of the requirements and test methods are general and others are only valid for specific product types.

[Annexes A, B and C](#) provide general recommendations.

This document does not apply to devices that transport persons between two levels (floors) of a building.

It does not include methods for the determination of ageing or corrosion of such hoists and units.

It does not include methods to qualify individual units prior to use.

The requirements of this document are formulated with regard to the needs of both the persons being hoisted and the attendant using the hoist.

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.

ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3758, *Textiles — Care labelling code using symbols*

ISO 10993-1, *Biological evaluation of medical devices — Part 1: Evaluation and testing within a risk management process*

ISO 14971, *Medical devices — Application of risk management to medical devices*

1) Under preparation. Stage at the time of publication: ISO/FDIS 9999:2021.

ISO 15223-1:2021, *Medical devices — Symbols to be used with information to be supplied by the manufacturer — Part 1: General requirements*

ISO 20417, *Medical devices — Information to be supplied by the manufacturer*

IEC 60204-1, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60601-1:2005+AMD1:2012+AMD2:2020, *Medical electrical equipment — Part 1: General requirements for basic safety and essential performance*

IEC 60601-1-2:2014, *Medical electrical equipment — Part 1-2: General requirements for safety — Collateral standard: Electromagnetic compatibility — Requirements and tests*

IEC 60601-1-11, *Medical electrical equipment — Part 1-11: General requirements for basic safety and essential performance - Collateral Standard: Requirements for medical electrical equipment and medical electrical systems used in the home healthcare environment*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

EN 853, *Rubber hoses and hose assemblies — Wire braid reinforced hydraulic type — Specification*

EN 854, *Rubber hoses and hose assemblies — Textile reinforced hydraulic type — Specification*

EN 1021-1, *Furniture — Assessment of the ignitability of upholstered furniture — Part 1: Ignition source smouldering cigarette*

EN 1021-2, *Furniture — Assessment of the ignitability of upholstered furniture — Part 2: Ignition source match flame equivalent*

EN 13480-3:2017, *Metallic industrial piping — Part 3: Design and calculation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 **adverse condition**

condition in which failure is most likely to occur

3.2 **attendant**

person who operates the hoist if not the *person with disability* (3.36)

3.3 **backrest**

part of the *body-support unit* (3.6) that provides support to the back of the person being lifted in a hoist

3.4 **backwards**

180° to the *forwards* (3.20) direction of travel