



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 12184:2022

**Electrically powered wheelchairs,
scooters and their chargers -
Requirements and test methods**

Elektrorollstühle, Scooters und
zugehörige Ladegeräte - Anforderungen
und Prüfverfahren Elektrorollstühle,
Scooter und zugehörige Ladegeräte -

Fauteuils roulants électriques, scooters
et leurs chargeurs - Exigences et
méthodes d'essai

09/2022



National Foreword

This European Standard EN 12184:2022 was adopted as Luxembourgish Standard ILNAS-EN 12184:2022.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN 12184:2022

EUROPEAN STANDARD **EN 12184**

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2022

ICS 11.180.10

Supersedes EN 12184:2014

English Version

Electrically powered wheelchairs, scooters and their chargers - Requirements and test methods

Fauteuils roulants électriques, scooters et leurs
chargeurs - Exigences et méthodes d'essai

Elektrorollstühle, Scooters und zugehörige Ladegeräte
- Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 17 July 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
4 Test apparatus.....	9
5 Type classes.....	10
6 General requirements	11
6.1 Risk management.....	11
6.2 Intended performance and technical documentation	11
6.3 Clinical evaluation and investigation.....	11
6.4 Wheelchairs that can be dismantled.....	11
6.5 Single-use fasteners	11
6.6 Biocompatibility and toxicity	12
6.7 Contaminants and residues.....	12
6.8 Infection and microbiological contamination	12
6.9 Overflow, spillage, leakage, and ingress of liquids	13
6.10 Safety of moving parts	14
6.11 Prevention of traps for parts of the human body	15
6.12 Folding and adjusting mechanisms	16
6.13 Surfaces, corners, edges and protruding parts	16
6.14 Ergonomic principles.....	17
6.15 General modifications to normative references	17
6.16 Applicable provisions for specified types of wheelchair	17
6.17 Recommendations	17
7 Preparation for testing.....	17
7.1 General.....	17
7.2 Test dummy.....	18
7.3 Human test occupant	18
8 Wheelchair performance	18
8.1 Driving characteristics.....	18
8.2 Static, impact and fatigue strength	21
8.3 Wheelchairs for use as seats in motor vehicles	21
8.4 Climatic performance	22
9 Component properties	22
9.1 Foot supports, lower leg support assemblies and arm supports.....	22
9.2 Component mass	24
9.3 Pneumatic tyres.....	24
9.4 Means for maintaining a sitting posture.....	24
9.5 Resistance to ignition	24
10 Propulsion and braking systems.....	25
10.1 Means for operating brakes	25
10.2 Braking functions.....	26

10.3	Freewheel device	29
11	Operations.....	29
11.1	Operations intended to be carried out by the occupant and/or assistant.....	29
11.2	Controls intended for operation by the occupant.....	30
11.3	Controls intended for operation by an assistant.....	30
11.4	Assistant control unit, push handles and handgrips	31
11.5	Operating forces.....	32
11.6	Occupied seating adjustments	33
12	Electrical systems	33
12.1	General requirements.....	33
12.2	Circuit protection	33
12.3	Battery chargers.....	34
12.4	Charging connector.....	35
12.5	Battery enclosures and containers	35
12.6	Emergency stop	35
12.7	Lighting.....	36
12.8	Switching off while driving.....	36
12.9	Software	36
12.10	Lithium cells and batteries.....	36
12.11	Remote control	36
13	Information supplied by the manufacturer	37
13.1	General	37
13.2	Pre-sale information	37
13.3	User information.....	38
13.4	Service information	39
13.5	Labelling	39
14	Test report, tables and figures.....	40
Annex A (informative)	Recommendations for dimensions and manoeuvring space of electrically powered wheelchairs.....	49
Annex B (informative)	Recommended design features.....	51
Annex C (informative)	Recommendations for lighting and reflectors	55
Annex D (informative)	EN 12184 and rail interoperability	57
Annex E (informative)	Recommendations for safety in freewheel mode	58
Annex F (informative)	Hazardous substances	60
Annex G (normative)	Applicable provisions for particular types of wheelchair.....	66
Annex H (informative)	Technical changes from the previous edition of EN 12184	73
Bibliography	75

European foreword

This document (EN 12184:2022) has been prepared by Technical Committee CEN/TC 293 “Assistive products and accessibility”, the secretariat of which is held by SIS.

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 March 2023, and conflicting national standards shall be withdrawn at the latest by May 2024.

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

This document supersedes EN 12184:2014.

Annex H provides details of the significant technical changes between this document and EN 12184:2014.

Requirements and test methods for manual wheelchairs are specified in EN 12183.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

Introduction

This is the fifth edition of this European Standard. The previous editions were published in 1999, 2006, 2009 and 2014.

Where this document does not apply to particular wheelchairs, contracting parties should consider whether appropriate parts of this document can be used. Manufacturers can also consider whether appropriate parts of this document can be used to assess the performance of their products against the general safety and performance requirements of Regulation (EU) 2017/745 [21] of 5 April 2017 on medical devices.

1 Scope

This document specifies requirements and test methods for electrically powered wheelchairs, with a maximum speed not exceeding 20 km/h, intended to carry one person of mass not less than 25 kg and not greater than 300 kg, including

- electrically powered scooters with three or more wheels,
- manual wheelchairs with an add-on electrically powered drive system,
- handrim-activated power-assisted wheelchairs,
- electrically powered stand-up wheelchairs,
- wheelchairs with a pivot drive wheel unit, and
- push-assist wheelchairs.

This document does not apply to balancing wheelchairs, custom-made electrically powered wheelchairs or electrically powered wheelchairs intended for use in sports.

This document also specifies requirements and test methods for manual wheelchairs with electrically powered ancillary equipment.

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.

EN 614-1:2006+A1:2009, *Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles*

EN 1021-2:2014, *Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source match flame equivalent*

EN 12183:2022, *Manual wheelchairs - Requirements and test methods*

EN 15194:2017, *Cycles - Electrically power assisted cycles - EPAC Bicycles*

EN 60335-2-29:2004,¹ *Household and similar electrical appliances - Safety - Part 2-29: Particular requirements for battery chargers (IEC 60335-2-29:2002)*

EN 60601-1:2006,² *Medical electrical equipment - Part 1: General requirements for basic safety and essential performance (IEC 60601-1:2005)*

EN 62133-2:2017,³ *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems*

¹ EN 60335-2-29:2004 is amended by EN 60335-2-29:2004/A2:2010 and EN 60335-2-29:2004/A11:2018.

² EN 60601-1:2006 is amended by EN 60601-1:2006/A2:2021, EN 60601-1:2006/A12:2014 and EN 60601-1:2006/A1:2013; and corrected by EN 60601-1:2006/corrigendum Mar. 2010.

³ EN 62133-2:2017 is amended by EN 62133-2:2017/A1:2021.

EN 62304:2006,⁴ *Medical device software - Software life-cycle processes (IEC 62304:2006)*

EN ISO 10993-1:2020, *Biological evaluation of medical devices - Part 1: Evaluation and testing within a risk management process (ISO 10993-1:2018, including corrected version 2018-10)*

EN ISO 14155:2020, *Clinical investigation of medical devices for human subjects - Good clinical practice (ISO 14155:2020)*

EN ISO 14971:2019,⁵ *Medical devices - Application of risk management to medical devices (ISO 14971:2019)*

EN ISO 20417:2021, *Medical devices - Information to be supplied by the manufacturer (ISO 20417:2021, Corrected version 2021-12)*

EN ISO 22442-1:2020, *Medical devices utilizing animal tissues and their derivatives - Part 1: Application of risk management (ISO 22442-1:2020)*

ISO 7176-1:2014, *Wheelchairs — Part 1: Determination of static stability*

ISO 7176-2:2017, *Wheelchairs — Part 2: Determination of dynamic stability of electrically powered wheelchairs*

ISO 7176-3:2012, *Wheelchairs — Part 3: Determination of effectiveness of brakes*

ISO 7176-4:2008, *Wheelchairs — Part 4: Energy consumption of electric wheelchairs and scooters for determination of theoretical distance range*

ISO 7176-6:2018, *Wheelchairs — Part 6: Determination of maximum speed of electrically powered wheelchairs*

ISO 7176-8:2014, *Wheelchairs — Part 8: Requirements and test methods for static, impact and fatigue strengths*

ISO 7176-9:2009, *Wheelchairs — Part 9: Climatic tests for electric wheelchairs*

ISO 7176-10:2008, *Wheelchairs — Part 10: Determination of obstacle-climbing ability of electrically powered wheelchairs*

ISO 7176-11:2012, *Wheelchairs — Part 11: Test dummies*

ISO 7176-13:1989, *Wheelchairs — Part 13: Determination of coefficient of friction of test surfaces*

ISO 7176-14:2008, *Wheelchairs — Part 14: Power and control systems for electrically powered wheelchairs and scooters — Requirements and test methods*

ISO 7176-19:2008,⁶ *Wheelchairs — Part 19: Wheeled mobility devices for use as seats in motor vehicles*

ISO 7176-21:2009, *Wheelchairs — Part 21: Requirements and test methods for electromagnetic compatibility of electrically powered wheelchairs and scooters, and battery chargers*

⁴ EN 62304:2006 is amended by EN 62304:2006/A1:2015.

⁵ EN ISO 14971:2019 is amended by EN ISO 14971:2019/A11:2021.

⁶ ISO 7176-19:2008 is amended by ISO 7176-19:2008/AMD 1:2015.