DIN EN 12184:2014-06 (E)

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

Contents

Page

Foreword 6

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms and definitions 9

4 Test apparatus 10

5 Type classes 11

6 General requirements 11

7 Preparation for testing 12
7.1 General 12
7.2 Test dummy 12
7.3 Human test occupant 12

8 Wheelchair performance 12
8.1 Performance of driving characteristics 12
8.1.1 General 12
8.1.2 Ability to climb rated slope 12
8.1.3 Ground unevenness 13
8.1.4 Maximum downhill speed 13
8.1.5 Dynamic stability 14
8.1.6 Obstacle climbing and descending 15
8.1.7 Static stability 15
8.1.8 Maximum speed 15
8.1.9 Distance range 15
8.2 Static, impact and fatigue strength 16
8.2.1 Requirements 16
8.2.2 Test 16
8.3 Wheelchairs for use as seats in motor vehicles 16
8.4 Climatic performance 17

9 Component properties 17
9.1 Foot supports, lower leg support assemblies and arm supports 17
9.1.1 Requirements 17
9.1.2 Test methods 17
9.2 Component mass 18
9.3 Pneumatic tyres 18
9.4 Anterior pelvic support 18
9.5 Resistance to ignition 18
9.5.1 Upholstered composite parts 18
9.5.2 Foam materials 19
9.5.3 Other parts in contact with the occupant 19
9.5.4 Power and control systems 19

10 Propulsion and braking systems 19
10.1 Means for operating brakes 19
10.1.1 Requirement 19
10.1.2 Test for determination of brake operating forces 20
10.2 Braking functions 20
10.2.1 Requirements 20
10.2.2 Test methods 21
10.3 Freewheel device 22

11 Operations 23
11.1 Operations intended to be carried out by the occupant and/or assistant 23
11.2 Controls intended for operation by the occupant 23
11.3 Controls intended for operation by an assistant 24
11.4 Assistant control unit, push handles and handgrips 24
11.4.1 Requirements 24
11.4.2 Test method 25
11.5 Operating forces 25
11.5.1 Requirements 25
11.5.2 Test method 25
11.6 Seating adjustments for tilt and recline systems 26
11.6.1 Requirements 26
11.6.2 Test method 26

12 Electrical systems 26
12.1 General requirements 26
12.2 Circuit protection 26
12.3 Battery chargers 27
12.4 Charging connector 27
12.5 Battery enclosures and containers 27
12.6 Emergency stop 27
12.7 Lighting 28
12.8 Switching off while driving 28
12.9 Software 28

13 Information supplied by the manufacturer 28
13.1 General 28
13.2 Pre-sale information 29
13.3 User information 30
13.4 Service information 31
13.5 Labelling 31

14 Test report 32

15 Tables 33

16 Figures 36

Annex A (informative) Recommendations for dimensions and manoeuvring space of electrically powered wheelchairs 42

A.1 Specific dimensions 42
A.1.1 Dimensions when ready for use 42
A.1.2 Push handle height 42
A.1.3 Ground clearance 42
A.2 Manoeuvring space 42
A.2.1 Turning diameter 42
A.2.2 Pivot width or reversing width 42
A.3 Speed settings 42

Annex B (informative) Recommended design features 44

B.1 Introduction 44

B.2 General recommendations 44
B.2.1 Anti-tip devices 44
B.2.2 Component mass 44
B.2.3 Fittings and tools 44
B.2.4 Tyres 44
B.2.5 Means to inflate tyres 44
B.2.6 Surface temperature 44
B.2.7 Occupant transfer into or out of the wheelchair 45
B.2.8 Resistance to contamination from urine incontinence 45
B.2.9 Indication for rated slope 45
B.2.10 Mirrors 45
B.2.11 Head support 45
B.2.12 Continuous operating forces 45
B.3 Recommendations for performance characteristics 46
B.3.1 Indication of electrical faults 46
B.3.2 Batteries and their containers 46
B.3.3 Control mechanism feedback 46
B.3.4 Freewheel alarm 46
B.3.5 Maximum speed 46

Annex C (informative) Recommendations for lighting and reflectors 47

C.1 General 47
C.2 Headlights 47
C.3 Lateral reflectors 47
C.4 Rear lights 47
C.5 Rear reflectors 48

D.1 Background 49
D.2 Related provisions in this document 49

Annex E (informative) Recommendations for safety in freewheel mode 50

E.1 General 50
E.2 Recommendation 50
E.3 Recommended test methods 50
E.3.1 Caution 50
E.3.2 Wheelchair switched on 50
E.3.3 Wheelchair switched off 51
E.3.4 Attempted switch-on 51
E.3.5 Battery set disconnected 51

Annex F (informative) Wheelchairs with nominal speed of not less than 10 km/h -- Dynamic stability for slopes of 10° or steeper 52

F.1 General 52
F.2 Modifications to dynamic stability test environment 52

G.1 Technical changes between the first (1999) and second (2006) editions 53
G.2 Technical changes between the second (2006) and third (2009) editions 54
G.3 Technical changes from the third (2009) edition 55

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Council Directive 93/42/EEC 57

Bibliography 60