

# DIN EN 12184:2009-12 (E)

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

---

<b>Contents</b>		<b>Page</b>
Foreword .....		5
Introduction .....		6
<b>1</b>	<b>Scope .....</b>	<b>7</b>
<b>2</b>	<b>Normative references .....</b>	<b>7</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>9</b>
<b>4</b>	<b>Test apparatus .....</b>	<b>9</b>
<b>5</b>	<b>Type classes .....</b>	<b>10</b>
<b>6</b>	<b>General requirements .....</b>	<b>10</b>
<b>7</b>	<b>Design requirements .....</b>	<b>11</b>
7.1	Foot supports, lower leg supports and arm supports .....	11
7.2	Pneumatic tyres .....	11
7.3	Fitting an anterior pelvic support .....	11
7.4	Wheelchairs for use as seats in motor vehicles .....	11
7.5	Braking systems .....	12
7.6	Freewheel device .....	12
7.7	Component mass .....	12
7.8	Battery enclosures and containers .....	12
7.9	Operations intended to be carried out by the occupant and/or assistant .....	13
7.10	Controls intended for operation by the occupant .....	13
7.11	Assistant control unit, push handles and handgrips .....	14
7.12	Charging connector .....	14
<b>8</b>	<b>Performance requirements .....</b>	<b>14</b>
8.1	General .....	14
8.2	Foot supports, lower leg support assemblies and arm supports .....	14
8.2.1	Requirements .....	14
8.2.2	Tests .....	15
8.3	Static, impact and fatigue strength .....	15
8.3.1	Requirements .....	15
8.3.2	Test .....	15
8.4	Braking system .....	16
8.4.1	General requirements .....	16
8.4.2	Tests .....	17
8.5	Operating forces .....	18
8.5.1	Requirements .....	18
8.5.2	Test .....	19
8.6	Assistant control unit, push handles and handgrips .....	19
8.6.1	Requirements .....	19
8.6.2	Test .....	20
8.7	Charging connector .....	20
8.7.1	Requirements .....	20
8.7.2	Test .....	20
8.8	Performance of driving characteristics .....	20

8.8.1	General .....	20
8.8.2	Ability to climb maximum safe slope .....	20
8.8.3	Ground unevenness .....	21
8.8.4	Maximum downhill speed .....	21
8.8.5	Dynamic stability .....	22
8.8.6	Obstacle climbing .....	22
8.8.7	Static stability .....	23
8.8.8	Maximum speed .....	23
8.8.9	Distance range .....	23
8.9	Surface temperature .....	23
8.10	Resistance to ignition .....	24
8.10.1	Upholstered composite parts .....	24
8.10.2	Foam materials .....	24
8.10.3	Other parts .....	24
8.11	Climatic test .....	24
8.12	Seating adjustments for tilt and recline systems .....	24
8.12.1	Requirements .....	24
8.12.2	Test method .....	24
9	Electrical requirements .....	25
9.1	General requirements .....	25
9.2	Requirement for controller on/off switch .....	25
9.3	Requirement for power indicator .....	25
9.4	Requirements for circuit protection .....	25
9.5	Requirements for battery chargers .....	25
9.6	Charge level indicator .....	26
10	Requirements for information supplied by the manufacturer .....	26
10.1	General .....	26
10.2	Pre-sale information .....	26
10.3	User information .....	27
10.4	Service information .....	28
10.5	Labels .....	28
11	Test report .....	28
12	Tables .....	30
13	Figures .....	32
Annex A (informative) Recommendations for test dummies of mass greater than 100 kg .....		36
A.1	General .....	36
A.2	Construction .....	36
A.3	Accelerometer mounting .....	36
A.4	Design aims .....	37
Annex B (informative) Recommendations for dimensions and manoeuvring space of electrically powered wheelchairs .....		45
B.1	Specific dimensions .....	45
B.1.1	Dimensions when ready for use .....	45
B.1.2	Push handle height .....	45
B.1.3	Ground clearance .....	45
B.2	Manoeuvring space .....	45
B.2.1	Turning diameter .....	45
B.2.2	Reversing width .....	45
B.3	Speed settings .....	45
Annex C (informative) Recommended design features .....		47
C.1	Introduction .....	47

<b>C.2</b>	<b>General recommendations</b> .....	<b>47</b>
<b>C.2.1</b>	<b>Anti-tip devices</b> .....	<b>47</b>
<b>C.2.2</b>	<b>Component mass</b> .....	<b>47</b>
<b>C.2.3</b>	<b>Fittings and tools</b> .....	<b>47</b>
<b>C.2.4</b>	<b>Tyres</b> .....	<b>47</b>
<b>C.2.5</b>	<b>Means to inflate tyres</b> .....	<b>47</b>
<b>C.2.6</b>	<b>Surface temperature</b> .....	<b>47</b>
<b>C.2.7</b>	<b>Occupant transfer into or out of the wheelchair</b> .....	<b>48</b>
<b>C.2.8</b>	<b>Resistance to contamination from urine incontinence</b> .....	<b>48</b>
<b>C.2.9</b>	<b>Indication for maximum safe slope</b> .....	<b>48</b>
<b>C.2.10</b>	<b>Mirrors</b> .....	<b>48</b>
<b>C.2.11</b>	<b>Head support</b> .....	<b>48</b>
<b>C.2.12</b>	<b>Accidental release of parking brakes and freewheel devices</b> .....	<b>48</b>
<b>C.3</b>	<b>Recommendations for performance characteristics</b> .....	<b>49</b>
<b>C.3.1</b>	<b>Indication of electrical faults</b> .....	<b>49</b>
<b>C.3.2</b>	<b>Batteries and their containers</b> .....	<b>49</b>
<b>C.3.3</b>	<b>Lighting</b> .....	<b>49</b>
<b>C.3.4</b>	<b>Control mechanism feedback</b> .....	<b>49</b>
<b>C.3.5</b>	<b>Freewheel alarm</b> .....	<b>49</b>
<b>C.3.6</b>	<b>Maximum speed</b> .....	<b>49</b>
<b>Annex D (informative) Recommended seating design</b> .....		<b>50</b>
<b>Annex E (informative) Manoeuvring forces</b> .....		<b>51</b>
<b>E.1</b>	<b>Recommendations</b> .....	<b>51</b>
<b>E.1.1</b>	<b>Push handle force</b> .....	<b>51</b>
<b>E.1.2</b>	<b>Handrim force</b> .....	<b>51</b>
<b>E.2</b>	<b>Manoeuvring test for handrim-activated power-assisted wheelchairs</b> .....	<b>51</b>
<b>F.1</b>	<b>Technical changes between the first (1999) and second (2006) editions</b> .....	<b>52</b>
<b>F.2</b>	<b>Technical changes from the second (2006) edition</b> .....	<b>53</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Council Directive 93/42/EEC of 14 June 1993 concerning medical devices</b> .....		<b>55</b>
<b>Bibliography</b> .....		<b>59</b>