

DIN EN 15095:2008-02 (E)

Power-operated mobile racking and shelving, carousels and storage lifts - Safety requirements

Contents	Page
Foreword	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Significant hazards	9
4.1 Mechanical hazards	9
4.2 Electrical power hazards	9
4.3 Hazards through ignoring ergonomic principles in machine design	10
4.4 Hazards caused through failure of power supply, failure of machine parts or other functional faults	10
4.5 Hazards arising from inappropriate design or failure of safety systems	10
4.6 Hazards caused through electromagnetic influences	10
4.7 List of significant hazards	10
5 Safety requirements and protective measures	13
5.1 General requirements	13
5.2 Mechanical hazards	13
5.3 Electrical hazards	20
5.4 Ergonomics	21
5.5 Power supply faults, machine parts failing or other malfunctions	22
6 Verification of the safety requirements and/or protective measures	23
6.1 Conformity of safety measures to safety requirements	23
6.2 Design/Manufacturing phase	25
6.3 At the installation site, before power is switched on	25
6.4 Commissioning	26
7 Information for the user	26
7.1 Instruction handbook	26
7.2 Marking	28
Annex A (informative) Types of power-operated storage equipment	30
Annex B (informative) Power-operated mobile storage systems	33
Annex C (informative) Rail tolerances for mobile racking	35
Annex D (normative) Rack and pinion	38
D.1 Pinion	38
D.2 Rack(s)	38
D.3 Rack/pinion(s) engagement	38
Annex E (informative) Chains in vertical carousels	40

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC	41
Bibliography	42
Figures	
Figure A.1 -- Storage equipment with vertically circulating carriers (vertical carousels)	30
Figure A.2 -- Storage equipment with horizontally circulating carriers (horizontal carousels)	30
Figure A.3 -- Storage lift	31
Figure A.4 -- Mobile shelving	31
Figure A.5 -- Mobile racking	32
Figure B.1 -- Clearances to building parts (see 5.2.4.2)	33
Figure B.2 -- Protective devices and edge clearance according to 5.2.4.3	33
Figure B.3 -- Example of a cable barrier	34
Figure B.4 -- Example of local protection on mobile racking according to 5.2.4.7	34
Figure C.1 --Twist of the rail	35
Figure C.2 -- Maximum absolute vertical tolerances	35
Figure C.3 -- Maximum relative vertical tolerance	36
Figure C.4 -- Maximum inclination of the rails	36
Figure C.5 -- Straightness of the rails	36
Figure C.6 -- Uneven floor	37
Figure D.1 -- Rack / pinion(s) engagement	39
Figure E.1 -- Third deep system	40
Figure E.2 -- Horizontal system	40
Tables	
Table 1 -- List of significant hazards	11
Table 2	24