

DIN EN 12159:2024-11 (E)

Builders hoists for persons and materials with vertically guided cages

Contents		Page
European foreword		4
Introduction		5
1	Scope	6
2	Normative references	7
3	Terms and definitions	9
4	Safety requirements and/or protective/risk reduction measures	11
4.1	Design considerations	11
4.2	Load combinations and calculations	11
4.2.1	General	11
4.2.2	Calculation of structure	11
4.2.3	Proof calculation	16
4.2.4	Limit states	17
4.2.5	Proof of competence	17
4.2.6	Methods for the proof of competence	18
4.2.7	Stability	20
4.2.8	Fatigue stress analysis of drive and braking system components	21
4.3	Base frame	21
4.4	Mast, ties and buffers	22
4.4.1	Guide structures and masts	22
4.4.2	Mast ties	22
4.4.3	Buffers	22
4.5	Hoistway protection and landing access	22
4.5.1	General	22
4.5.2	Hoist base enclosure	23
4.5.3	Landing access	23
4.5.4	Full height gates (see Figure 5)	24
4.5.5	Reduced height gates (see Figure 6 and Figure 7)	25
4.5.6	Materials for enclosure and guarding	27
4.5.7	Landing gate locking devices	28
4.5.8	Clearances	29
4.6	Cage	30
4.6.1	General requirements	30
4.6.2	Overspeed safety devices against falling of the cage	32
4.6.3	Overload detection device	33
4.7	Drive unit	33
4.7.1	General provisions	33
4.7.2	Protection and accessibility	34
4.7.3	Rack and pinion drive	34
4.7.4	Braking system	37
4.8	Electric installations and appliances	38
4.8.1	General	38
4.8.2	Protection against electric faults	38
4.8.3	Protection against the effects of external influences	39
4.8.4	Electric wiring	39
4.8.5	Contactors, relay-contactors	39
4.8.6	Electrical safety devices	39
4.8.7	Safety contacts	41

4.8.8	Lighting	41
4.9	Control and limiting devices	41
4.9.1	General	41
4.9.2	Travel limit switches	41
4.9.3	Erection accessories	42
4.9.4	Stopping devices	42
4.9.5	Stopping the hoist	42
4.9.6	Control modes	42
4.10	Breakdown conditions	44
4.10.1	Alarm device	44
4.10.2	Emergency escape	44
4.10.3	Emergency operation by a competent person	44
5	Verification of safety requirements and/or protective/risk reduction measures	44
5.1	Verification of design	44
5.2	Verification tests	47
5.2.1	Introduction	47
5.2.2	Locking devices for cage and landing gates	48
5.2.3	Overspeed safety device and overspeed governors	49
5.2.4	Energy accumulation type buffers with buffered return movement and energy dissipation buffers	50
5.3	Verification tests on each hoist before first use	50
6	Information for use	51
6.1	Instruction handbook	51
6.1.1	Comprehensive information	51
6.1.2	of the instruction handbook	51
6.2	Markings	56
6.2.1	General	56
6.2.2	Rating plate	56
6.2.3	Mast or guide section identification label	56
6.2.4	Basic user information label	56
6.2.5	Label in the cage	57
6.2.6	Label on the roof	57
6.2.7	Label at ground level	57
6.2.8	Label at overspeed safety device and/or overspeed governors	57
6.2.9	Drive motor label	57
6.2.10	Marking of control elements	57
Annex A (informative)	European storm wind map	58
Annex B (normative)	Electrical safety devices	60
Annex C (informative)	List of significant hazards	62
Annex ZA (informative)	Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered	64
Bibliography	68