

DIN EN 12159:2013-03 (E)

Builders hoists for persons and materials with vertically guided cages

Contents		Page
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	7
3	Terms and definitions	8
4	List of hazards	10
5	Safety requirements and/or measures	13
5.1	General	13
5.2	Load combinations and calculations	14
5.2.3	Safety factors	19
5.2.4	Load cases, the different combinations of loads and forces which are to be calculated ...	20
5.2.5	Stability	21
5.2.6	Fatigue stress analysis of drive and braking system components	21
5.3	Base frame	22
5.4	Mast, ties and buffers	22
5.4.1	Guide structures and masts	22
5.4.2	Mast ties	22
5.4.3	Buffers	23
5.5	Hoistway protection and landing access	23
5.5.1	General	23
5.5.2	Hoist base enclosure	23
5.5.3	Landing access	23
5.5.4	Materials for enclosure and guarding	27
5.5.5	Landing gate locking devices	28
5.5.6	Clearances	29
5.6	Cage	29
5.6.1	General requirements	29
5.6.2	Safety devices against falling of the cage	31
5.6.3	Overload detection device	32
5.7	Drive unit	33
5.7.1	General provisions	33
5.7.2	Protection and accessibility	33
5.7.3	Suspension system	34
5.7.4	Braking system	39
5.7.5	Counterweight	40
5.8	Electric installations and appliances	40
5.8.1	General	40
5.8.2	Protection against electric faults	41
5.8.3	Protection against the effects of external influences	41
5.8.4	Electric wiring	41
5.8.5	Contactors, relay-contactors	42
5.8.6	Electric safety devices	42
5.8.7	Safety contacts	42
5.8.8	Lighting	42
5.9	Control and limiting devices	43
5.9.1	General	43

5.9.2	Travel limit switches	43
5.9.3	Slack rope device	43
5.9.4	Erection accessories	43
5.9.5	Stopping devices	43
5.9.6	Stopping the machine	44
5.9.7	Control modes	44
5.10	Breakdown conditions	45
5.10.1	Alarm device	45
5.10.2	Emergency escape	45
5.10.3	Manual lowering by persons trapped in the cage	45
5.10.4	Emergency operation by a competent person	45
5.11	Noise	46
5.11.1	General	46
5.11.2	Noise reduction at the design stage	46
5.11.3	Noise emission measurement	46
6	Verification	46
6.1	Verification of design	46
6.2	Special verification tests	49
6.2.1	Introduction	49
6.2.2	Locking devices for cage and landing gates	50
6.2.3	Overspeed safety device and overspeed governors	52
6.2.4	Energy accumulation type buffers with buffered return movement and energy dissipation buffers	53
6.3	Verification tests on each machine before first use	53
7	User information	53
7.1	Instruction handbook	53
7.1.1	Comprehensive information	53
7.1.2	Contents of the instruction handbook	54
7.2	Markings	59
7.2.1	General	59
7.2.2	Rating plate	59
7.2.3	Mast or guide section identification label	59
7.2.4	Basic user information label	59
7.2.5	Label in the cage	60
7.2.6	Label at ground level	60
7.2.7	Label at overspeed device	60
7.2.8	Drive motor label	60
7.3	Marking of control elements	60
Annex A (normative) European stormwind map		61
Annex B (normative) Electric safety devices		62
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC		63
Bibliography		64