

# DIN EN 81-20:2020-06 (E)

## Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts

---

<b>Contents</b>		<b>Page</b>
European foreword .....		6
<b>0</b>	<b>Introduction .....</b>	<b>8</b>
<b>0.1</b>	<b>General .....</b>	<b>8</b>
<b>0.2</b>	<b>General remarks .....</b>	<b>8</b>
<b>0.3</b>	<b>Principles .....</b>	<b>9</b>
<b>0.4</b>	<b>Assumptions .....</b>	<b>9</b>
<b>1</b>	<b>Scope .....</b>	<b>13</b>
<b>2</b>	<b>Normative references .....</b>	<b>14</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>16</b>
<b>4</b>	<b>List of significant hazards .....</b>	<b>23</b>
<b>5</b>	<b>Safety requirements and/or protective measures .....</b>	<b>25</b>
<b>5.1</b>	<b>General .....</b>	<b>25</b>
<b>5.2</b>	<b>Well, machinery spaces and pulley rooms .....</b>	<b>25</b>
<b>5.2.1</b>	<b>General provisions .....</b>	<b>25</b>
<b>5.2.2</b>	<b>Access to well and to machinery spaces and pulley rooms .....</b>	<b>30</b>
<b>5.2.3</b>	<b>Access and emergency doors - Access trap doors - Inspection doors .....</b>	<b>31</b>
<b>5.2.4</b>	<b>Notices .....</b>	<b>32</b>
<b>5.2.5</b>	<b>Well .....</b>	<b>33</b>
<b>5.2.6</b>	<b>Machinery spaces and pulley rooms .....</b>	<b>46</b>
<b>5.3</b>	<b>Landing doors and car doors .....</b>	<b>54</b>
<b>5.3.1</b>	<b>General provisions .....</b>	<b>54</b>
<b>5.3.2</b>	<b>Height and width of entrances .....</b>	<b>54</b>
<b>5.3.3</b>	<b>Sills, guides, door suspension .....</b>	<b>54</b>
<b>5.3.4</b>	<b>Horizontal door clearances .....</b>	<b>55</b>
<b>5.3.5</b>	<b>Strength of landings and car doors .....</b>	<b>56</b>
<b>5.3.6</b>	<b>Protection in relation to door operation .....</b>	<b>60</b>
<b>5.3.7</b>	<b>Local landing lighting and "car here" signal lights .....</b>	<b>62</b>
<b>5.3.8</b>	<b>Locking and closed landing door check .....</b>	<b>63</b>
<b>5.3.9</b>	<b>Locking and emergency unlocking of landing and car doors .....</b>	<b>63</b>
<b>5.3.10</b>	<b>Requirements common to devices for proving the locked condition and the closed condition of the landing door .....</b>	<b>66</b>
<b>5.3.11</b>	<b>Sliding landing doors with multiple, mechanically linked panels .....</b>	<b>66</b>
<b>5.3.12</b>	<b>Closing of automatically operated landing doors .....</b>	<b>67</b>
<b>5.3.13</b>	<b>Electric safety device for proving the car doors closed .....</b>	<b>67</b>
<b>5.3.14</b>	<b>Sliding or folding car doors with multiple, mechanically linked panels .....</b>	<b>67</b>
<b>5.3.15</b>	<b>Opening the car door .....</b>	<b>68</b>
<b>5.4</b>	<b>Car, counterweight and balancing weight .....</b>	<b>68</b>
<b>5.4.1</b>	<b>Height of car .....</b>	<b>68</b>
<b>5.4.2</b>	<b>Available car area, rated load, number of passengers .....</b>	<b>68</b>
<b>5.4.3</b>	<b>Walls, floor and roof of the car .....</b>	<b>74</b>
<b>5.4.4</b>	<b>Car door, floor, wall, ceiling and decorative materials .....</b>	<b>75</b>
<b>5.4.5</b>	<b>Apron .....</b>	<b>76</b>
<b>5.4.6</b>	<b>Emergency trap doors and emergency doors .....</b>	<b>76</b>
<b>5.4.7</b>	<b>Car roof .....</b>	<b>77</b>
<b>5.4.8</b>	<b>Equipment on top of the car .....</b>	<b>81</b>

5.4.9	Ventilation .....	81
5.4.10	Lighting .....	81
5.4.11	Counterweight and balancing weight .....	82
5.5	Suspension means, compensation means and related protection means .....	82
5.5.1	Suspension means .....	82
5.5.2	Sheave, pulley, drum and rope diameter ratios, rope/chain terminations .....	82
5.5.3	Rope traction .....	83
5.5.4	Winding up of ropes for positive drive lifts .....	83
5.5.5	Distribution of load between the ropes or the chains .....	84
5.5.6	Compensation means .....	84
5.5.7	Protection for sheaves, pulleys and sprockets .....	85
5.5.8	Traction sheaves, pulleys and sprockets in the well .....	87
5.6	Precautions against free fall, excessive speed, unintended car movement and creeping of the car .....	87
5.6.1	General provisions .....	87
5.6.2	Safety gear and its tripping means .....	90
5.6.3	Rupture valve .....	96
5.6.4	Restrictors .....	97
5.6.5	Pawl device .....	98
5.6.6	Ascending car overspeed protection means .....	99
5.6.7	Protection against unintended car movement .....	100
5.7	Guide rails .....	103
5.7.1	Guiding of the car, counterweight or balancing weight .....	103
5.7.2	Permissible stresses and deflections .....	103
5.7.3	Combination of loads and forces .....	107
5.7.4	Impact factors .....	107
5.8	Buffers .....	109
5.8.1	Car and counterweight buffers .....	109
5.8.2	Stroke of car and counterweight buffers .....	110
5.9	Lift machinery and associated equipment .....	111
5.9.1	General provision .....	111
5.9.2	Lift machine for traction lifts and positive drive lifts .....	111
5.9.3	Lift machine for hydraulic lifts .....	117
5.10	Electric installations and appliances .....	126
5.10.1	General provisions .....	126
5.10.2	Incoming supply conductor terminations .....	128
5.10.3	Contactors, contactor relays, components of safety circuits .....	128
5.10.4	Protection of electrical equipment .....	129
5.10.5	Main switches .....	130
5.10.6	Electric wiring .....	131
5.10.7	Lighting and socket outlets .....	132
5.10.8	Control of the supply for lighting and socket outlets .....	132
5.10.9	Protective earthing .....	133
5.10.10	Electrical identification .....	133
5.11	Protection against electric faults; failure analysis; electric safety devices .....	133
5.11.1	Protection against electric faults; failure analysis .....	133
5.11.2	Electric safety devices .....	134
5.12	Controls - Final limit switches - Priorities .....	139
5.12.1	Control of lift operations .....	139
5.12.2	Final limit switches .....	146
5.12.3	Emergency alarm device and intercom system .....	147
5.12.4	Priorities and signals .....	148
6	Verification of the safety requirements and/or protective measures .....	148
6.1	Technical compliance documentation .....	148
6.2	Verification of design .....	148
6.3	Examinations and tests before putting into service .....	152
6.3.1	Braking system (5.9.2.2) .....	152
6.3.2	Electric installation .....	153
6.3.3	Checking of the traction (5.5.3) .....	153
6.3.4	Car safety gear (5.6.2) .....	153
6.3.5	Counterweight or balancing weight safety gear (5.6.2) .....	154

6.3.6	Pawl device (5.6.5) .....	154
6.3.7	Buffers (5.8.1, 5.8.2) .....	155
6.3.8	Rupture valve (5.6.3) .....	155
6.3.9	Restrictor/one-way restrictor (5.6.4) .....	155
6.3.10	Pressure test .....	156
6.3.11	Ascending car overspeed protection means (5.6.6) .....	156
6.3.12	Stopping of the car at landings and levelling accuracy (5.12.1.1.4) .....	156
6.3.13	Protection against unintended car movement (5.6.7) .....	156
6.3.14	Protection against falling/shearing (5.3.9.3.4) .....	157
7	Information for use .....	157
7.1	General .....	157
7.2	Instruction manual .....	157
7.2.1	General .....	157
7.2.2	Normal use .....	157
7.2.3	Maintenance .....	157
7.2.4	Examinations and tests .....	158
7.3	Logbook .....	158
Annex A(normative) List of the electric safety devices .....		160
Annex B(informative) Technical compliance documentation .....		163
Annex C(informative) Periodic examinations and tests, examinations and tests after an important modification or after an accident .....		164
C.1	Periodic examinations and tests .....	164
C.2	Examinations and tests after an important modification or after an accident .....	164
Annex D(informative) Machinery spaces - Access .....		166
Annex E(informative) Building interfaces .....		167
E.1	General provisions .....	167
E.2	Support of Guide Rails .....	167
E.3	Ventilation of car, well and machine rooms .....	167
E.3.1	General .....	167
E.3.2	Ventilation of the well and car .....	168
E.3.3	Ventilation of machine rooms .....	169
Annex F(normative) Pit access ladder .....		170
F.1	Types of pit access ladder .....	170
F.2	General provisions .....	170
F.3	Ladder uprights and rungs .....	170
F.3.1	Ladder uprights .....	170
F.3.2	Ladder rungs .....	171
F.4	Specific provisions for non fixed type ladders .....	171
F.5	Location of the ladder in the pit .....	171
Annex ZA(informative) Relationship between this European Standard and the essential requirements of Directive 2014/33/EU aimed to be covered .....		173
Bibliography .....		178