

ISO 14122-4:2016-06 (E)

Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Selection and design of ladder systems	6
4.1	General	6
4.1.1	Design and construction	6
4.1.2	Choice depending on available space	6
4.1.3	Spacing between the ladder and any permanent obstruction	6
4.2	Choice of a type fall protection device	7
4.2.1	Necessity of a fall protection device	7
4.2.2	Types of fall protection devices	7
4.2.3	Guidance for a risk assessment	8
4.3	Height of ladder flights and fall protection device	8
4.3.1	Limits of space	8
4.3.2	Ladder systems >3 000 mm and 10 000 mm total height, H	8
4.3.3	Ladder systems >10 000 mm total height, H	9
4.4	Platforms and landings	9
4.4.1	Installation of platforms at arrival and departure areas	9
4.4.2	Arrangement of platforms and landings for ladders with a total height, H >10 000 mm	9
5	Specific requirements of ladder systems	10
5.1	General requirements	10
5.1.1	Permanent action (dead load)	10
5.1.2	Variable action (rated load)	11
5.1.3	Additional loading	13
5.1.4	Design	14
5.2	Ladder with two stiles	14
5.2.1	Strength	14
5.2.2	Rungs	14
5.2.3	Connection of ladder and guard-rail	17
5.3	Ladder with one stile	17
5.3.1	Strength	17
5.3.2	Rungs	18
5.4	Departure and arrival areas	19
5.4.1	General requirements	19
5.4.2	Departure area (entrance)	19
5.4.3	Arrival area (exit)	19
5.4.4	Access opening	19
5.4.5	Trap doors	21
5.5	Fall protection device	22
5.5.1	Safety cage	22
5.5.2	Fall arrester	26
5.6	Platforms and landings	26
5.6.1	Access platforms	26

5.6.2	Intermediate and rest platforms	26
5.6.3	Intermediate landings	27
5.6.4	Moveable rest landings	29
5.7	Requirements on moveable parts of fixed ladders	30
6	Verification of safety requirements	30
6.1	General	30
6.1.1	General requirements	30
6.1.2	Verification of stability by calculation	31
6.1.3	Verification of stability by testing	31
6.2	Tests of fixed ladders with two stiles	31
6.2.1	Strength and bending of a ladder element	31
6.2.2	Test for safety cage	32
6.3	Test of ladders with one stile	33
6.3.1	Test of ladder elements	33
6.4	Test of extensions of guard-rails	35
7	Information for use for fixed ladders	36
7.1	Instruction handbook	36
7.1.1	General	36
7.1.2	Ladder systems with fall arrester	36
7.2	Marking of ladder systems with fall arrester	37
Annex A (normative) Requirements for the design of anti-climb devices		38
Annex B (informative) Summary of main dimensions of a fixed ladder equipped with a safety cage		42
Annex C (informative) Significant technical changes between this part of ISO 14122 and the previous edition		44
Bibliography		47