BS EN 131-7:2013

BSI Standards Publication

Ladders

Part 7: Mobile ladders with platform

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National foreword

This British Standard is the UK implementation of EN 131-7:2013.

The UK participation in its preparation was entrusted to Technical Committee B/512, Ladders.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Foreword

This document (EN 131-7:2013) has been prepared by Technical Committee CEN/TC 93 “Ladders”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard is one of a series about ladders. The other Standards of this series are listed in Clause 2 and in the Bibliography.

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1 Scope

This European Standard defines terms and specifies the general design characteristics of mobile ladders with platform. It applies to mobile ladders with a working platform, with a maximum area of 1 m^2, and a maximum platform height of 5 m, to be used only by one person at the time. The maximum load is 150 kg which includes a maximum combined load of the user and any tools, equipment and materials

It does not apply to portable ladders according to EN 131-1, to portable ladders according to EN 131-4, to portable ladders for fire service use according to EN 1147, to loft ladders according to EN 14975, to step stools according to EN 14183, to Stairs, stepladders and guard-rails according to EN ISO 14122-3 and to insulating ladders according to EN 50528.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 131-2, *Ladders — Part 2: Requirements, testing, marking*

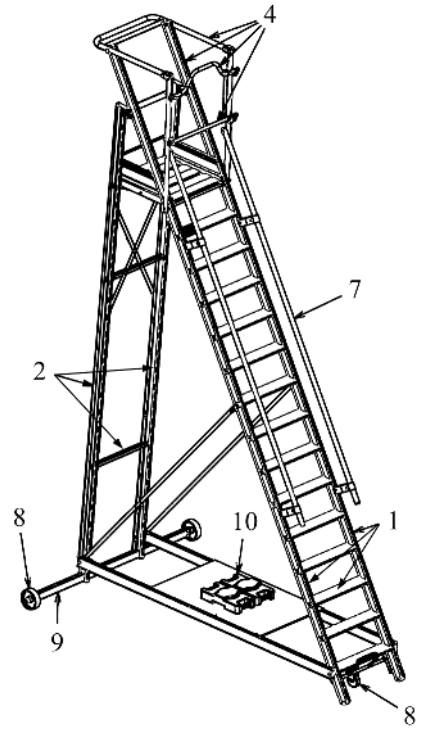
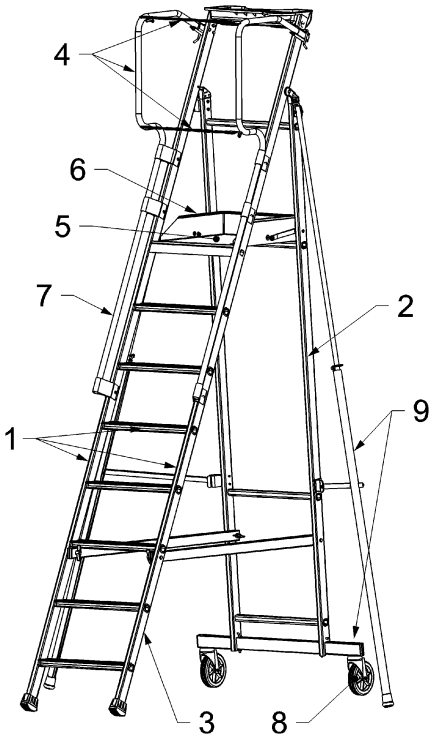
EN 131-3, *Ladders - Part 3: User Instructions*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

Table 1 — Terms and definitions

Dimensions in millimetres

No	Term	Definition	Figure
3.1	ascending leg	leg of a ladder with climbing supports	 **Figure 1**
3.2	supporting leg	leg of a ladder without climbing supports	
3.3	stile	lateral part of a ladder which supports the rungs or steps as well as cross struts of supporting legs	
3.4	preventions from falls		
3.4.1	guard rail	device to hold and protect from falls, installed on the platform of mobile platform ladders	
3.4.2	middle rail	element of the guard rail, placed between the top rail and the platform	
3.4.3	gate at the ascending leg	rigid or flexible device, parallel to the platform, to hold and to protect from falls	
3.5	platform	topmost standing surface which is different from a step	 **Figure 2**
3.6	toe board	side protection fixed at the platform or the guard rail	
3.7	handrail	device for mobile ladders parallel to the ascending leg, which allows a secure grip during the ascending/descending	
3.8	wheel	device to facilitate the movement of the mobile platform ladder Note 1 to entry: Wheels can be: — used only use for transportation; or — used for transportation and as load bearing element; — fitted with brakes.	
3.9	stabiliser	device to increase the stability of the mobile platform ladder	

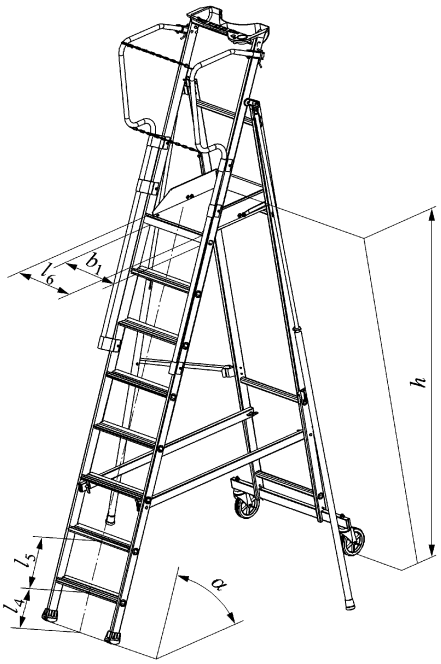
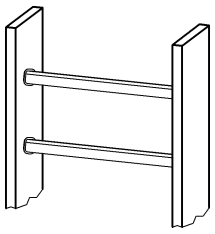
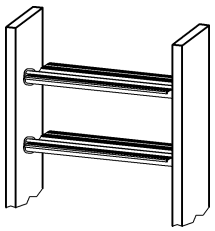
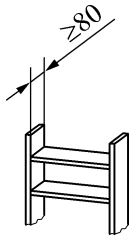
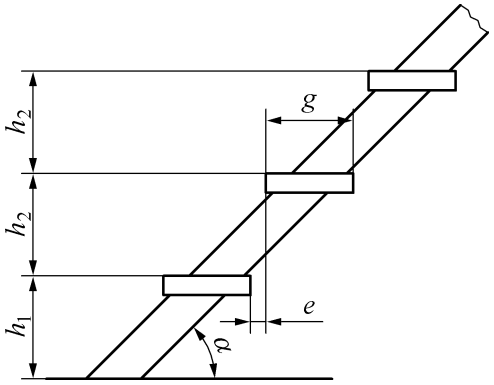
3.10	ballast	permanent/fixed load applied to the mobile platform ladder used to increase its resistance to overturning	
3.11	angle of inclination of the ascending leg α	angle between the floor and the imaginary line joining the upper edges of the sides of the front steps	 **Figure 3**
3.12	distance between the bottom end and the lowest rung/wide rung/ step l_4	distance from the lower end of the ladder to the upper edge of the lowest rung/wide rung/step, measured in the middle line between the stiles	
3.13	distance between rungs/wide rungs/steps l_5	distance between the rungs/wide rungs/steps and between the top rung/wide rung/step and the platform measured in the middle line between the stiles at the upper edges	
3.14	climbing height h	vertical distance between the ground and the top of the platform measured vertically when all feet are in contact with the ground	
3.15	inner width of ascending leg b_1	usable distance between the inner sides of the stiles measured at the level of the platform	
3.16	Rung (g)	climbing support with a standing surface from front to back of less than 50 mm and at least 20 mm	 **Figure 4**
3.17	wide rung (g)	climbing support with a standing surface from front to back equal to or greater than 50 mm and less than 80 mm	 **Figure 5**
3.18	Step (g)	climbing support with a standing surface from front to back equal to or greater than 80 mm	

			Figure 6
3.19	distance between the bottom end and the lowest rung/ wide rung/ step h_1	vertical distance between the floor and the top of the first rung/wide rung/step	
3.20	distance between rungs/ wide rungs/ steps h_2	vertical distance between the rungs/wide rungs/steps and between the top rung/wide rung/step and the platform measured in the middle line between the stiles at the upper edges	
3.21	clearance *e*	clearance between two rungs of consecutive ascending legs	**Figure 7**

4 Requirements

4.1 General

A mobile platform ladder shall be designed and manufactured to prevent accidental slips of product and/or user.

The marking shall be legible and durable.

The durability of the marking shall be verified.

Wide rungs/steps and platforms shall be designed to be horizontal when the product is used on a flat floor.

Wide rungs, rungs, steps and platforms made of metal or plastics shall have a textured surface on the working face to reduce slipping. The contact surface of the coverings shall adhere firmly to the rungs or steps.

4.2 Surface finishes

This requirement shall be according EN 131-2.

The coating of wooden parts shall be transparent and permeable to water vapour. This does not apply to platform components manufactured from plywood materials.

4.3 Materials

4.3.1 General

The requirements on materials shall be according to EN 131-2 apply unless otherwise stated.

4.3.2 Wood

Wood used for the platform should be of durable quality and be suitable for both indoor and outdoor use.

The coating shall be transparent and permeable to water vapour.

Coatings applied to platform components manufactured from plywood materials shall be permeable to water but may be opaque.

The surface of the platform shall be slip resistant.

4.4 Stabiliser

If the design makes stabilisers necessary to fulfil the stability test requirements, they shall be supplied with the ladder. It shall be clear that the product is meant to be used with stabilisers. Specific safety instruction shall be visible on the ladder and may be repeated on the stabilisers.

4.5 Ballast

If the design makes ballasts necessary to fulfil the stability test requirements, they shall be supplied with the ladder. It shall be clear that the product is meant to be used with a ballast. Specific safety instruction shall be visible on the ladder and may be repeated on the ballast.

5 Dimensional requirements

5.1 Ascending legs

5.1.1 Ascending legs with angle 60° ≤ α ≤ 75°

The dimensional requirements for ascending legs angle 60° ≤ α ≤ 75°are shown in Table 2.

Table 2 — Dimensional requirements for ascending legs with angle 60° ≤ α ≤ 75°

Dimensions in millimetres

	b_1	h	g	l_4	l_5
min.	400		20	0,5 × l_5	230
max.		5 000		l_5 + 15	300

This product is ascended and descended facing the ladder.

Handrails can be added to this product.

5.1.2 Ascending legs with angle 45° ≤ α < 60°

This product shall be fitted with a handrail on each side of the ascending leg.

The dimensional requirements for ascending legs with angle 45° ≤ α < 60° are shown in Table 3.

Table 3 — Dimensional requirements for ascending legs with angle 45° ≤ α < 60°

Dimensions in millimetres

	b_1	h	g	e	h_1	h_2
min.	400		80		150	200
max.		5 000		50	h_2 + 40	250

This product can be descended facing away from the ladder.

5.2 Supporting legs

The projection on the horizontal plan of the platform shall be within the contact points of the ladder with the ground within a maximum tolerance of 100 mm due to the possible eccentricity of the swivel casters or other design of the platform ladder.

If the projection on the horizontal plan of the platform within the contact points of the ladder with the ground is greater than 100 mm, additional precautions are taken regarding the stability. The stability test described in 6.7 is not suitable for such described products.

5.3 Platform and toe board

The platform shall be permanently fixed to the ladder. The platform shall be equipped with toe board on all sides where access is not permitted, except the ascending side.

The dimensions (width and length) shall be between 400 mm and 1 000 mm (see Table 4).

The platform shall be equipped with a solid toe board such that its top edge is at least 50 mm above the adjacent platform level. A toe board on the access side is not permitted unless it is removable during access to and from the platform.

Table 4 — Dimensions of platform and toe board

Dimensions in millimetres

	a	l_6	l_7	*b*
min.	50	400	400	0
max.		1 000	1 000	≤ *a*

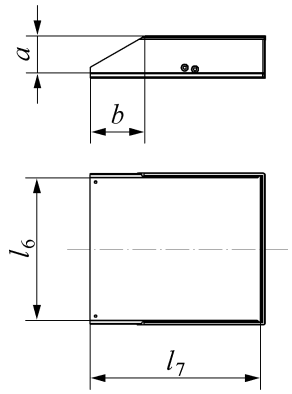


Figure 8 — Dimensions of platform and toe board

5.4 Working area

The working area is shown in Figure 9. The dimensional requirements are given in Table 5.

Distance between the guardrail and the top of the platform: **w**

Interior distance between the front guardrail and the gate: **x**

Interior distance between the guardrails: **y**

Clear between the platform and the guardrail: **z**

Table 5 — Dimensional requirements for the working area

Dimensions in millimetres

	w	x	y	z
min.	950	400	400	
max.	1100			80

If the gate is flexible (e.g. chain), the measurement is taken during the test in 6.4.

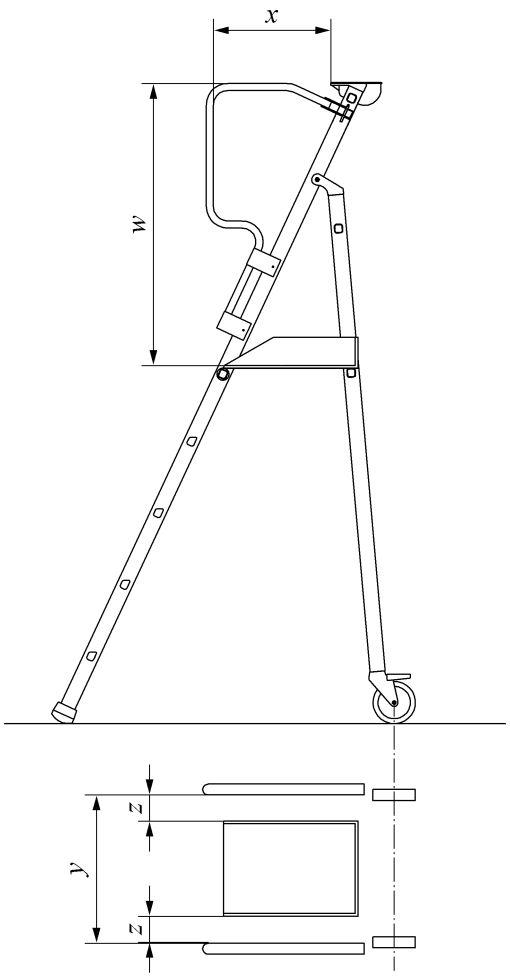


Figure 9 — Working area

5.5 Wheels and castors

The mobile ladder shall be fitted with devices which ensure that there is no movement of the mobile ladder while in position of use.

5.6 Prevention of falls: Guardrails, Middle rails

The height of the guardrail shall be at least 950 mm from the platform to the top of the guardrail. The guardrails and middle rails shall avoid a sphere (470 mm diameter d) to pass (see Figure 10).

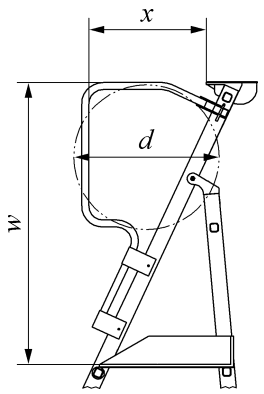


Figure 10 — Side protection

Table 6 — Dimensional requirements for guardrail

Dimensions in millimetres

	w
min.	950
max.	1 100

Ascending side(s) are optional to fit guard rails, middle rails and gates. They can be rigid or flexible such as chains, ropes etc.

NOTE In some countries, it is compulsory to fit these elements.

5.7 Handrails

Handrails shall be fitted on products when the angle α of the ascending legs is ≥ 45° and ≤ 60° as shown in the Figure 11.

Dimensions in millimetres

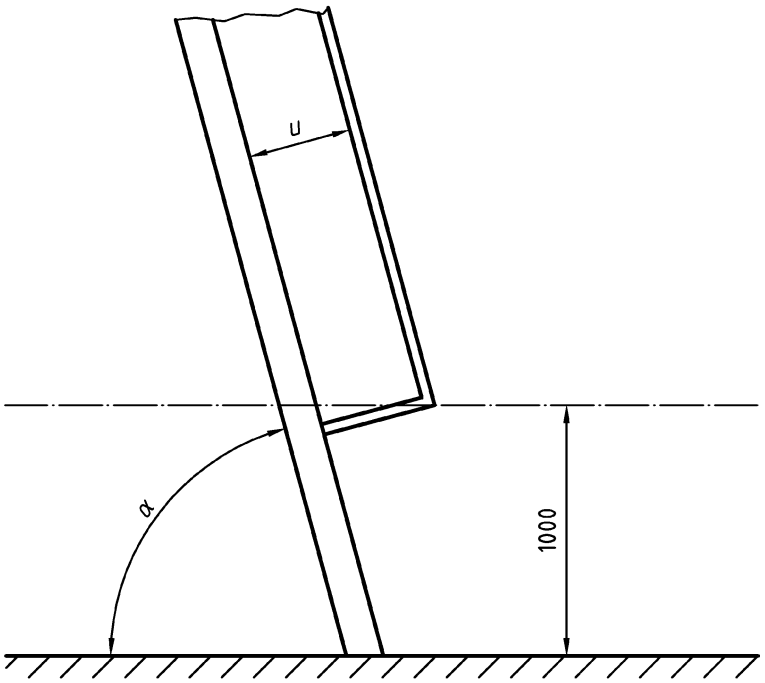


Figure 11 — Positioning of a handrail on a step leader

The table below gives indicative dimensions that may be applied:

α (degrees)	**u (linear dimension perpendicular to the ascending legs) (mm)**
45	625
50	500
55	375
60	250

6 Testing

6.1 General

All the tests shall be conducted in the most unfavourable position of the mobile ladder and its components.

6.2 Torsion test of steps, rungs, wide rungs

This test shall be according EN 131-2.

6.3 Bending test for steps, rungs, wide rungs

This test shall be according EN 131-2.

6.4 Platform and complete product test

6.4.1 Platform test

6.4.1.1 Test for all platform sizes

The tests (see Figure 12) shall be carried out according to the testing procedure in EN 131-2, except the platform shall be tested at the following four positions:

— in the middle of the platform;

— in the middle of the front edge;

— in the middle of the rear edge;

— at one of the two front corners.

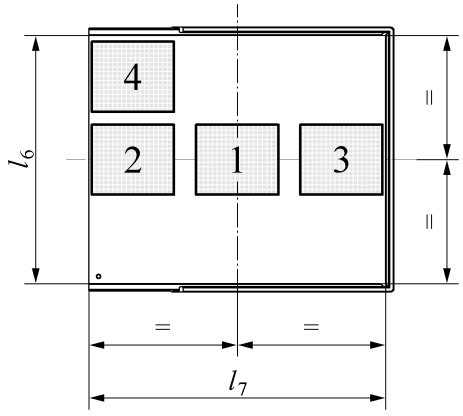


Figure 12 — Platform test for platform area ≤ 0,5 m^2

6.4.1.2 Platform Area > 0,5 m^2

This test shall be carried out in addition to the previous test described in 6.4.1.1.

If the platform area is more than 0,5 m^2, put 2 loads of each 2 600 N on two plates of max. 100 mm × 100 mm distributed equally in the middle of the platform (see Figure 13).

Requirement: no disassembly, cracking or rupture shall occur.

NOTE This load is applied for the foreseeable misuse of the platform by two people.

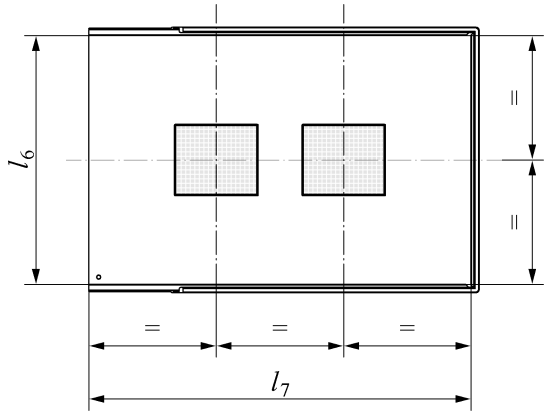


Figure 13 — Platform test for platform area > 0,5 m^2

6.4.2 Complete product test

The product is placed in the use position. The stability devices/ ballast shall be fitted in position.

Place the test load F = 3 500 Nin the middle of the ascending leg uniformly distributed on the surface of the rung/wide rung/step for a period of 1 min (see Figure 14).

Requirement: no disassembly, cracking or rupture shall occur.

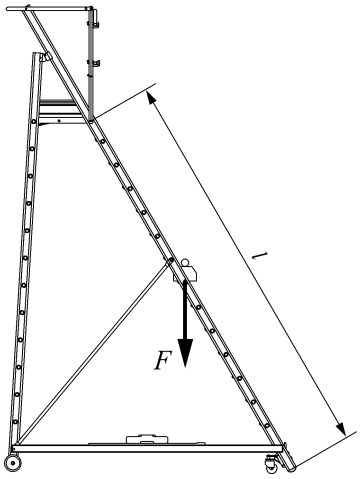


Figure 14 — Complete product test

6.5 Protection bending test

6.5.1 Tests on guardrails (principal guardrails and top handrail of the gate)

To eliminate the free movements apply a preload of 20 N horizontally for a period of 1 min. The position of the handrail under the preload is the starting point for the measurement of bending.

— Apply the test load of 300 N horizontally for one minute distributed over a length of 100 mm and a depth equal to the principal guardrail in the most unfavourable position and direction, and then measure the deflection.

Requirement: maximum deflection under load 35 mm.

— Apply the test load of 1 250N vertically for one minute distributed over a length of 100 mm and a width equal to the principal guardrail in the most unfavourable position, and then pull the load off.

Requirement: no disassembly, cracking or rupture shall occur.

6.5.2 Test on middle rail (intermediate guardrail and the middle rail of the gate)

Apply the test load of 1 250 N vertically for 1 min, than put the load off.

Requirement: no disassembly, cracking or rupture shall occur.

6.6 Side handrail testing

This test shall be according to EN 131-2.

6.7 Stability test

6.7.1 Platform ≤ 0,5 m^2

Place the mobile platform ladder in position of use, complete with any ballast and/or stabilisers, with any brake device activated on an even and solid ground. The castors shall be placed in the most unfavourable position.

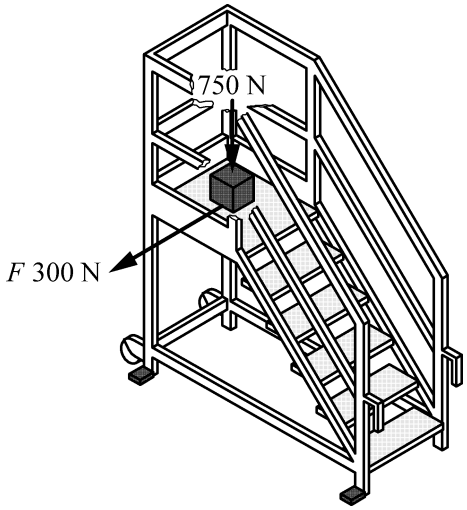
Apply a test load of 750 N distributed centred on a rigid steel plate of max. 200 mm × 200 mm located on the centre of the platform.

Apply a suitable system to prevent slippage of the ladder towards the direction of the horizontal force. This system shall not change the resistance to overturning of the mobile platform ladder and shall have a height above the ground not greater than 10 mm.

Apply gradually to the level of the platform a horizontal pulling force F = 300 N to the edge of the platform in the most unfavourable position and direction (see Figures 15 and 16).

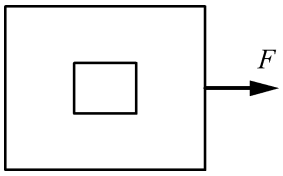
For platform heights greater than 2,5 m, the pulling force is increased to F = 450 N when the product is intended for outdoor use or where it might be affected by wind.

The test is passed if the mobile platform ladder does not overturn.



Key
F load

Figure 15 — Stability test



Key
F load

Figure 16 — Diagram of the platform

NOTE The load of 750 N is placed in the centre of the platform because of its dimensions which limit the user's positions.

6.7.2 Platform > 0,5 m^2

Place the mobile platform ladder in position of use, complete with any ballast and/or stabilisers, with any brake device activated on an even and solid ground. The castors shall be placed in the most unfavourable position".

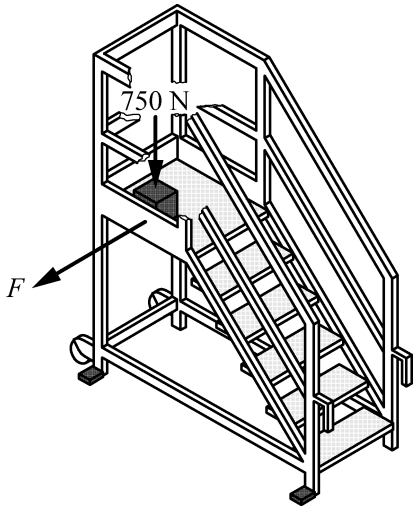
Apply a test load of 750 N distributed centred on a rigid steel plate of max. 200 mm × 200 mm located in the most unfavourable position on the platform.

Apply a suitable system to prevent slippage of the ladder towards the direction of the horizontal force. This system shall not change the resistance to overturning of the mobile platform ladder and shall have a height above the ground not greater than 10 mm.

Apply gradually to the level of the platform a horizontal pulling force F = 300 N to the edge of the platform in the most unfavourable position and direction (see Figures 17 and 18).

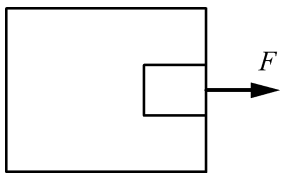
For platform heights greater than 2,5 m, the pulling force is increased to F = 450 N when the product is intended for outdoor use or where it might be affected by wind.

The test is passed if the mobile platform ladder does not overturn.



Key
F force

Figure 17 — Stability test



Key
F force

Figure 18 — Diagram of the platform

6.8 Stiffness test

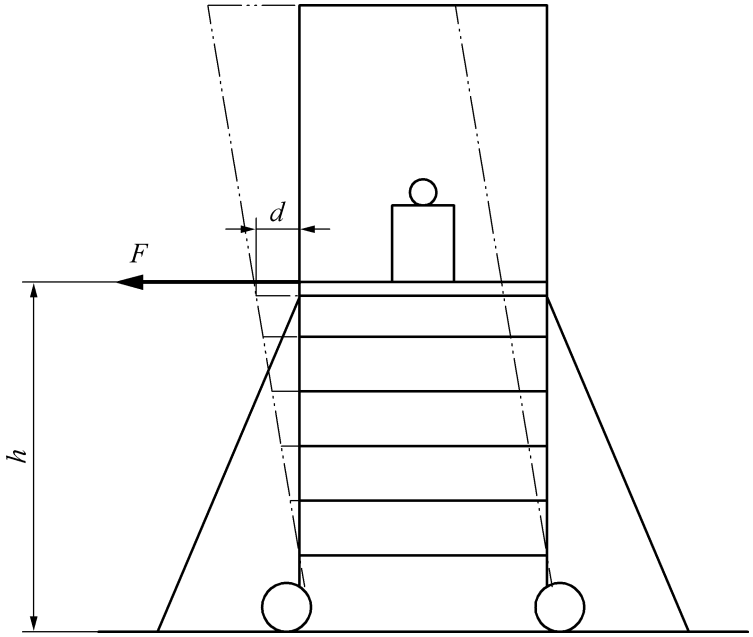
Place the mobile platform ladder in position of use, complete with any ballast and/or stabilisers, with any brake device activated on an even and solid ground. The castors shall be placed in the most unfavourable position. To establish the origin for measurement, apply a pre load of 20 N horizontally over a period of 1 min.

Apply a test load of 750 N distributed centred over a rigid steel plate of max. 200 mm × 200 mm in the middle of the platform.

Apply a suitable system to prevent loosing contact of all feet/wheels to the ground without affecting the original stiffness of the mobile platform ladder.

Apply gradually to the level of the platform a horizontal pulling load of 300 N at the edge of the platform in the most unfavourable position and direction (see Figure 19 and Figure 20).

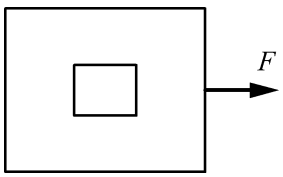
The maximum deflection d measured under load at platform height is: $d \leq 10\ \text{mm} + 0{,}01 \times h$.



Key

F load

Figure 19 — Stiffness test



Key

F load

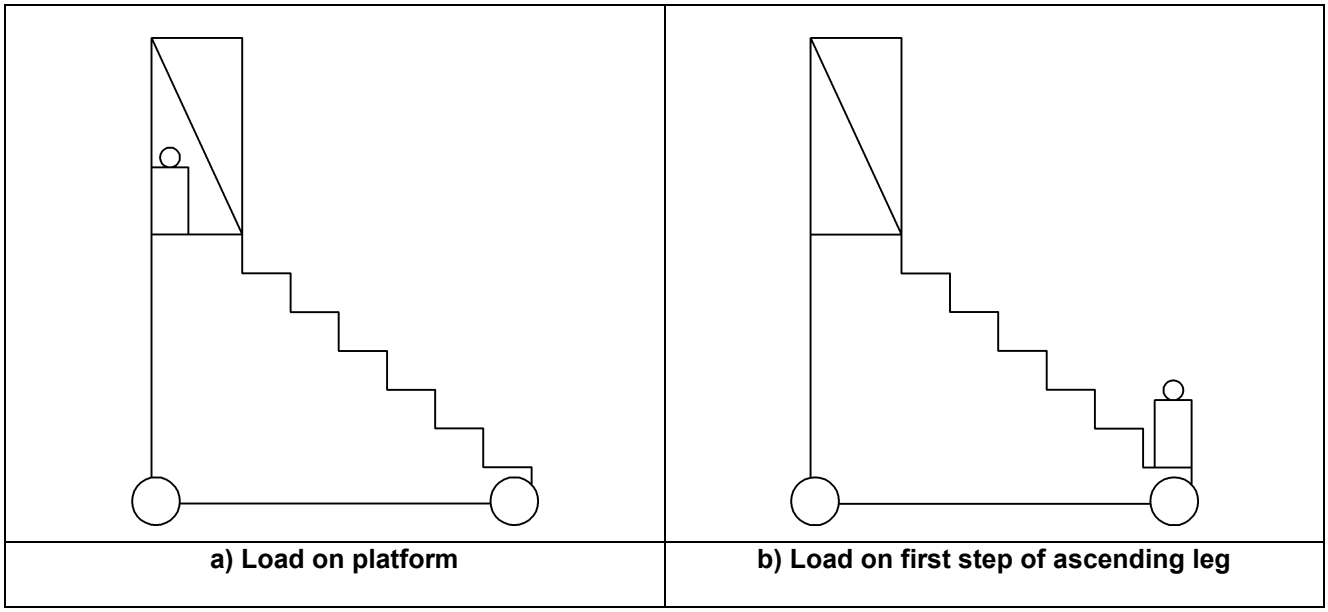
Figure 20 — Diagram of the platform

6.9 Test for products equipped with spring wheels

Apply a test load of 200 N uniformly distributed over a rigid steel plate of 100 mm x 100 mm on the centre of the first step of the ascending leg (see Figure 21 b)). This test shall be repeated for every other ascending leg.

When the product has only one ascending leg, the test is also carried out with the test load on the centre of the edge of the platform (see Figure 21a)).

Requirement: both feet of the side where the load is applied shall be in contact with the floor during the test.



a) Load on platform | **b) Load on first step of ascending leg**

Figure 21 — Test for products equipped with spring wheels

6.10 Kick-up test of the platform

This test shall be carried out in accordance with EN 131-2

6.11 Test of opening restraint devices

The product shall be tested in position of use according to EN 131-2.The products shall be tested with all points normally in contact with the ground supported on rollers (refer to EN 131-2 for specifications on rollers).

6.12 Test of hooks

Mobile platform ladders, which can be extended, shall be tested in according to EN 131-2.

6.13 Bottom stile end test

This test is according to EN 131-2.

6.14 Feet pull test

This test is according to EN 131-2.

6.15 Test method for plastic ladders

This test is according to EN 131-2.

6.16 Marking durability

This test shall be according to EN 131-2.

7 Marking, User and safety instruction

7.1 Marking

Markings shall be displayed as specified in EN 131-3 and additionally the following specific markings when required:

— comply with EN 131-7;

— use only with stabiliser;

— use only with ballast;

— for outdoor use caution to the wind;

— use only with activated brakes;

— for platform heights greater than 2,5 m, a marking shall show if a product cannot be used outside. (Outdoor use is allowed if the product passes the required stability test described in 6.7.);

— for further markings specific for mobile ladders with platform.

7.2 User Instruction

User instructions shall be provided as specified in EN 131-3 and additionally the following specific safety instructions when required:

— use only with stabiliser;

— use only with ballast;

— for outdoor use caution to the wind;

— use only with activated brakes;

— for platform heights greater than 2,5 m, the safety instructions shall specify if a product cannot be used outside (Outdoor use is allowed if the product passes the required stability test described in 6.7.);

— for further user instructions specific for mobile ladders with platform.

Bibliography

[1] EN 131-1, *Ladders — Part 1: Terms, types, functional sizes*

[2] EN 131-4, *Ladders - Part 4: Single or multiple hinge-joint ladders*

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[4] EN 1147, *Portable ladders for fire service use*

[5] EN 14183, *Step stools*

[6] EN 14975, *Loft ladders — Requirements, marking and testing*

[7] EN 50528, *Insulating ladders for use on or near low voltage electrical installations*

[8] EN ISO 14122-1, *Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means of access between two levels (ISO 14122-1:2001)*

[9] EN ISO 14122-3, *Safety of machinery - Permanent means of access to machinery - Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

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