SINTEF Technical Approval

TG 20053

Issued first time: 08.02.2012
Revised: 09.03.2021
Amended:
Valid until 01.03.2026
Provided listed on
www.sintefcertification.no

SINTEF confirms that

Hardhaus escape ladder

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

Bjarne Johnsen AS
Pb. 13 Kokstad
5863 Bergen
www.bjas.no

2. Product description

Hardhaus escape ladder is a foldaway ladder to enable escape from buildings in case of fire. The ladder is fixed vertically to the external wall to provide easy access from exit points such as windows, balconies etc. see fig. 1. The escape ladder will automatically fold out when the locking pin is pulled out of the locking device, thus enabling secure escape from access point to ground level.

The ladder is composed of sections of approx. 1200 mm in length, and is delivered as a package containing 1 top section, 1 middle section and 1 bottom section. Extra middle sections are delivered as additional packages. The top section and bottom section have a total length of 2360 mm, and the total ladder length is determined by the number of 1200 mm middle sections being used. The ladder is assembled with connector units and wall fixings, see fig. 2. When folded the ladder appears on the wall as a flat aluminum batten, where the stairs are concealed inside the ladder.

Hardhaus escape ladder is produced of extruded aluminum profiles of quality AW 6063 T5 in accordance with EN 515, EN 573 and EN 755. Fig. 3 shows the profile dimensions.

In addition to the ladder parts, necessary wall fixtures, connector units, quick release locking pins and top cover are supplied as well as locking bolts and nuts. Stair bolts, locking nuts and quick release pins are made of stainless, acid resistant steel of quality 304SS in accordance with DIN 933, and 316SS in accordance with DIN 985.

3. Fields of application

Hardhaus wall ladder can be mounted as a rescue ladder on detached houses, townhouses, cabins, barracks, office buildings, low apartment buildings etc., with a need for escape access from window, balcony, terrace etc.

Hardhaus wall ladder is used as a measure for better safety and security through enhanced escape from buildings where the requirements for escape routes in accordance with Regulations on technical requirements for construction works (TEK) otherwise is satisfied in another way.

Fig. 1
Hardhaus escape ladder unfolded for escape.

The field of application for the ladder is for escape from windows with bottom edge less than 5 m above leveled ground.

For use as approved escape route, see chap. 6 regarding special conditions for use and installation.

4. Properties

Load-carrying capacity

The Hardhaus eacape ladder satisfies the load requirements specified in EN131 Ladders – Portable ladders. The ladder can be loaded with 2.6 kN in the middle of a stair and at the outer stringer. The ladder's load bearing capacity is assessed to correspond to the weight of one adult person in each 1200 mm section of the ladder, provided that there is sufficient wall fixing as specified in section 7.

Reaction to fire

Hardhaus wall ladder is made of anodized aluminium of quality AW 6063#T5 with fire class A1 according to EN 13501-1.

Durability

On the basis of the material qualities specified in section 2, the Hardhaus escape ladder is considered to have satisfactory durability.

SINTEF Certification
www.sintefcertification.no
e-mail: certification@sintef.no

Contact, SINTEF: *Magnus Kron*
Author: *Jon Lundesgaard*

SINTEF AS
www.sintef.no
Entreprise register: NO 919 303 808 MVA

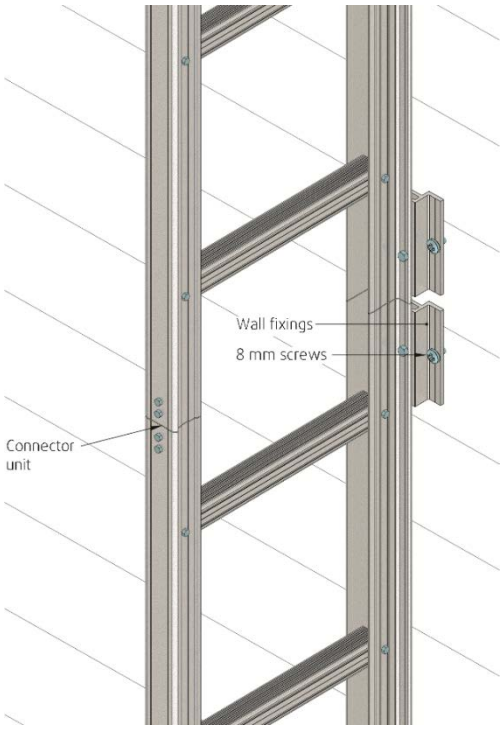

Fig. 2
Assembling principle for the ladder and for wall fixings. Stair width and stair distance is approx. 300 mm.

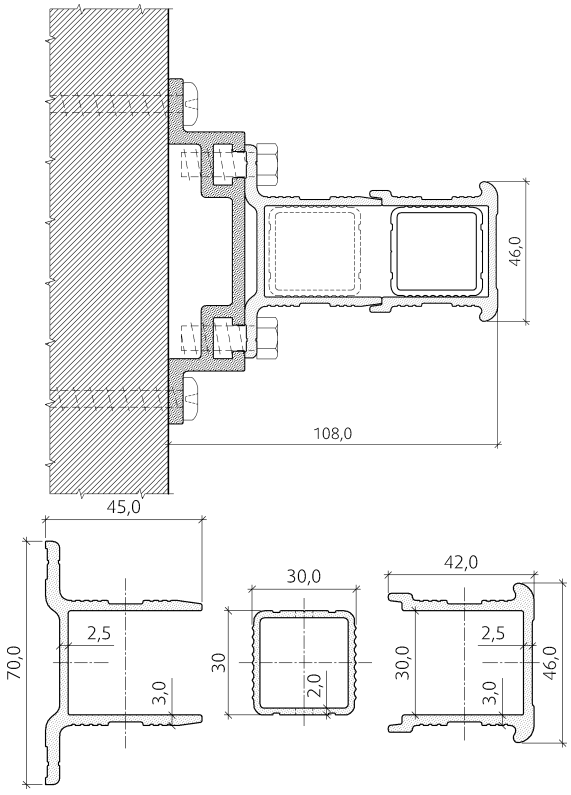

Fig. 3
Cross-section of folded ladder and profiles for inner stringer, stair and outer stringer.

5. Environmental aspects

Substances hazardous to health and environment
Hardhaus escape ladder contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Effect on soil, surface water and ground water
The leaching properties to soil and water have not been tested.

Environmental declaration
No environmental declaration (EPD) has been made for Hardhaus escape ladder.

6. Special conditions for use and installation

Design considerations
The Hardhaus escape ladder is intended to facilitate escape from buildings in the early stages of a fire, and should be installed where it is best protected from flames and heat radiation from fire in lower levels/floors. The ladder should ideally not be placed close to windows at lower levels.

The ladder shall be mounted with lowest stair at least 0,6 m and outer stringer at least 0,5 m above ground. The height above terrain should be increased if it can be assumed that outfolding of the ladder may be prevented by snow or storage of objects along the wall. Maximum height between ground and the lowest stair is 1,0 m.

The ladder must be mounted with the top at least 1,0 m, or preferably 1,35 m, above the lower window sill or above balcony railing. The top stair to hold on when entering the ladder should be 0,6 - 0,9 m above window sill/railing.

The distance to the side post of escape windows should be maximum 0,35 m, but for windows with a center post the ladder should be placed adjacent to the side post.

In cases with difficult escape conditions, e. g. casement windows with a center post and opening outwards, the ladder may be placed in line with the center post to give satisfactory conditions for escaping. Another option is to use a plateau beneath the window. The manufacturer has compiled installation instructions adapted to different types of windows, i.e. pivot window, top-hung window, casement window etc.

Escape route from window according to TEK
For buildings in risk class 1, 2 and 4 a window the lower edge less than 5 m above ground can be used as an approved escape route in accordance to TEK, provided that the height and width of the window opening is in accordance to fig. 4.

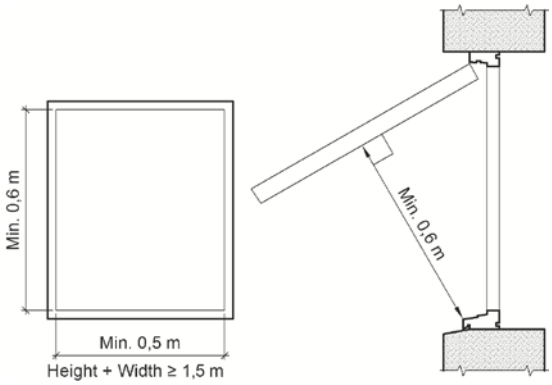

Fig. 4
Minimum measures for free opening in escape windows.
Window with a center post must meet the requirements on each side of the post.

The distance from the floor to the bottom edge of escape windows must be maximum 1,0 m unless other measures have been taken to ease the escape.

Escape windows must be marked as an exit, except in dwellings.

Hardhaus escape ladder must have a distance of minimum 2,0 m from window, or be shielded against flames and heat radiation from underlaying floors.

See also SINTEF Building Research Design Guide 520.391 and TEK § 11-13 with guidance.

Connecting ladder components
Each escape ladder component is connected at outer stringers with connector units and two 6 mm nuts and bolts in each stringer end.

Inner stringers are fastened to the wall fixings with the accompanying 8 mm screws and nuts.

Wall fixing
Each escape ladder section is to be fixed securely at the top and bottom with the accompanying wall fixings, see fig. 2. Two 8 mm stainless screws are to be used at each anchor point.

Mounting on wooden walls is done with wood screws, and the l position of the ladder shall be adjusted to facilitate that most fixing screws are connected to the structural framework behind the cladding. It is also required that the thickness of timber cladding is at least 19 mm and fixed to the framework behind in accordance with the recommendations in SINTEF Building Research Guidelines.

Fixing the escape ladder to masonry and concrete walls is done with expansion bolts, concrete screws or other anchoring systems applicable for the relevant substrate.

The ladder should be installed by a qualified craftsman.

Maintenance
The ladder should be subject to a yearly test of the ladder itself and its functions, and control of the screws' anchoring to the wall.

Transport and storage
The ladder is delivered in shrink wrap package. All deliveries shall include installation instructions in Norwegian. Necessary installation parts such as wall connectors, connection units, quick release pins and screws shall be delivered together with the ladder sections.

7. Factory production control

Hardhaus escape ladder is produced in China for Bjarne Johnsen AS, Bergen.

The holder of the approval is responsible for the factory production control in order to ensure that the product is produced in accordance with the preconditions applying to this approval.

The manufacturing of Hardhaus escape ladder is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

8. Basis for the approval

The evaluation of Hardhaus escape ladder is based on reports owned by the holder of the approval.

The evaluation of design and technical solutions are based on recommendations given in SINTEF Building Research Design Guides.

9. Marking

Each escape ladder shall be marked with the name of the manufacturer and production date identification. The approval mark for SINTEF Technical Approval No. 20053 may also be used.

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402.

for SINTEF

Hans Boye Skogstad
Approval Manager