The Layher Cassette roof

for weatherproofing and temporary halls – low-cost, labour-saving roofing.

Layher cassette roofs have established themselves as a firm favourite at construction sites for conversion, renovation and restoration. The structure itself and all the equipment is protected during the conversion or roof repair and normal business operations can continue under a secure roof.

If weatherproofing is the aim then there are many reasons to choose the Layher cassette roof system.

Economical thanks to top-class technology
A sophisticated, proven construction consisting of high-quality components, specially equipped for recurrent, changing assembly and dismantling operations.

Long, useful service life
The Layher cassette roof is almost indestructible. Its practical design coupled with the chosen materials are key reasons making it an investment that will retain its value over many years. The use of cassette roof girders ensures rapid assembly. The roof trusses are assembled astonishingly quickly at ground level, then mounted on the supporting structure using a crane. The roof cassettes for the intermediate bays are inserted into the channel section and locked in place with clamping plates and wedges. That's all there is to it! No tensioning or tying is required.

The cassettes act as bracing elements. Only every second bay is assembled as a so-called truss bay, and there are no doubled roof trusses. This represents an additional saving of material and, consequently, also of money and assembly time.

Economical modular system
Variable roof areas are possible thanks to the well-conceived section lengths of the roof trusses and the U-shaped top chord

Vast spans
Depending on the static system and the load, it is possible to create roof structures with spans of more than 40 m.

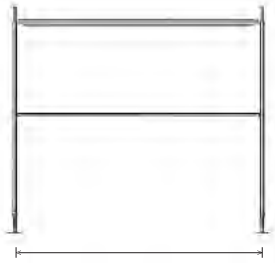
Easy to open for material supply
To permit material supply to the site, the Layher cassette roof can be opened at any location by simply removing one or more roof cassettes. No crane is needed.

System-independent
The Layher cassette roof does not require any specific substructure. This means that no unwanted additional investments are required.
The Layher cassette roof can be mounted easily on almost any scaffolding or other suitable substructure.

Total weatherproofing
Rainwater is excluded correctly thanks to the overlapping, shaped roof surface elements. This is a basic requirement for any weatherproofing roof.

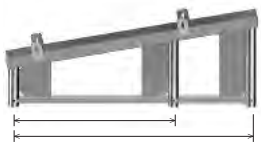
Notes on construction and use
When assembling and using the roof, it is essential to observe the applicable regulations and the manufacturer's assembly instructions. Personal safety apparatus (PSA) for protection against falls must be used. A verified structural analysis for spans of up to 27.1 m exists for the roof structure. It is necessary to check the stability of the supporting structure (e.g. scaffolding) and the roof structure.

This cassette roof is a non-insulated, rainproof covering under which condensation may form and drip depending on the outside weather. The connections between the cassettes are not sealed and rainwater may penetrate due to unfavourable wind conditions. We cannot therefore accept any liability for damage to the covered structure. However, additional sealing options exist.

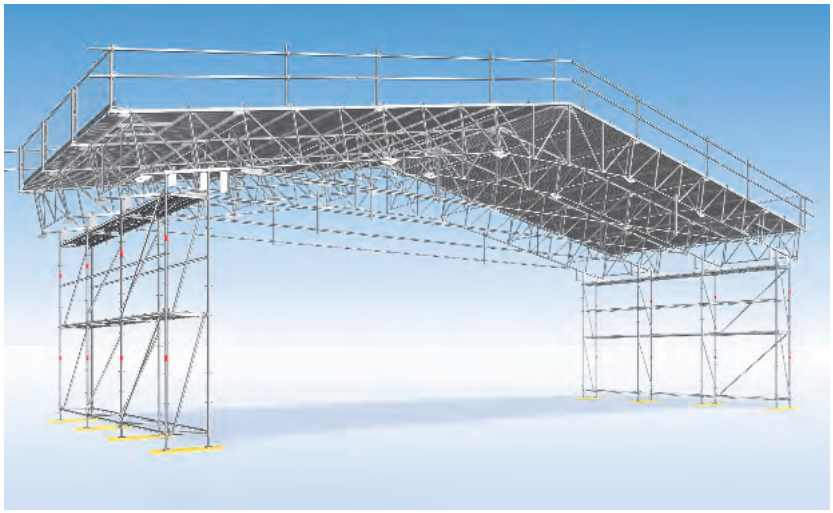


Axis dimensions, bay length: 2.57 m

Axis dimensions, frame: 0.73 / 1.09 m



Axis dimensions, roof support: 0.73 / 1.09 m



Roof girder system as truss elements

The system for large spans and rapid assembly for everyday use

Truss elements
These one metre high **roof girders** are the elements that support the cassette roof (U-shaped top chord for the insertion of the roof cassettes, tubular bottom chord and posts of diameter 48.3 mm). The **ridge support** is intended for the construction of double-pitch roofs with a roof angle of approximately 11°.

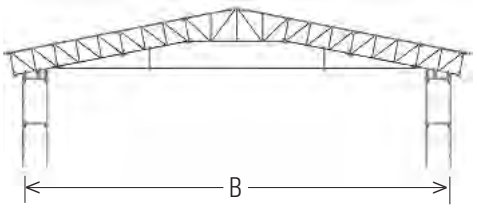
The **roof girders** or **ridge supports** are connected to one another at the bottom chord with **30 x 50 mm bolts** and **4 mm safety clips.** At the top chord, it is possible to use either two M 14 x 80 bolts with nuts or **14 x 77 mm bolts with 2.8 mm safety clips.**

Depending on the structural analysis, some construction variants may require the use of a third 14 x 107 mm bolt and 2.8 mm safety clip at the top chord.

A truss bay consisting of a pair of roof trusses connected to **girder stiffeners** is pre-assembled at ground level and the roof cassettes are mounted on it and wedged in place.

A crane is used to place the pre-mounted truss bays on the scaffolding at intervals of 2.57 m, while the unoccupied intermediate bays are reinforced with **tubular stiffeners** and then closed using roof cassettes.

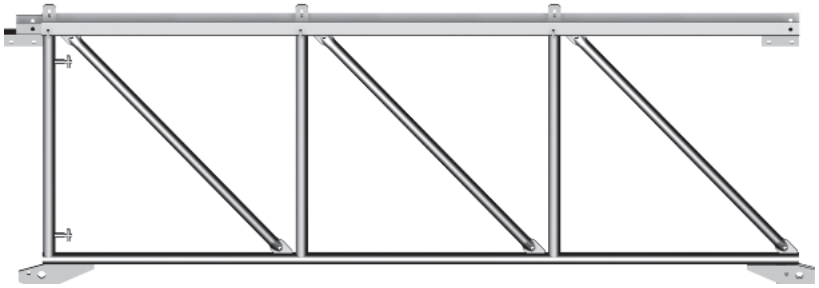
Maximum spans as a function of the structural analysis
(in all cases, external scaffolding dimensions)



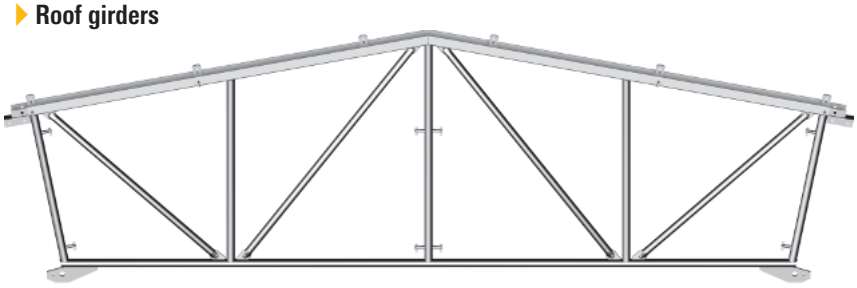
Snow load 0.75 kN/m²:
B = 15.3 m without tie
B = 23.2 m with tie

Snow load 0.25 kN/m²:
B = 21.2 m without tie
B = 27.1 m with tie

Larger spans are possible in individual cases subject to verification.



Roof girders



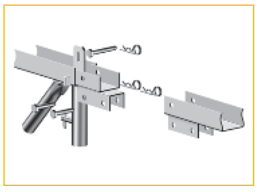
Ridge supports

Bolt
30 x 50 mm

Safety clip
4 mm

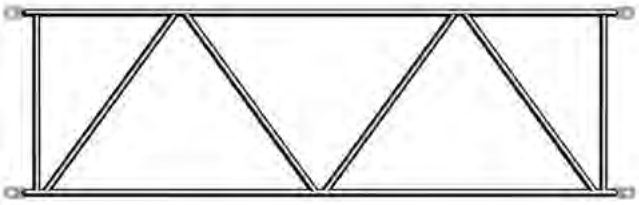
Bolt, 14 x 77 mm with safety clip

Bottom chord joint

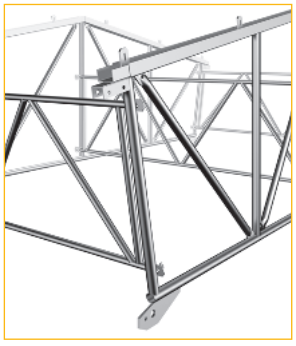


Top chord joint

Bolt, 14 x 107 mm with safety clip



Girder stiffener



Mounting of girder stiffener

Tubular stiffener

Roof girder system as truss elements

Bracing elements
In the case of high levels of snow and/or large spans, it is necessary to install a **tie.**
The **end pieces of the ties** are connected to the last bottom chord joint using **30 x 61 mm bolts** (Ref. No. 5904.000) and extended by one or more tie spacers of 4.0 m or 6.0 m. The tie elements are joined to one another using lattice girder connectors (Ref. No. 4916.000) and are suspended using scaffolding tubes and couplers. When mounting ties, it is necessary to install a 2.0 m long roof girder as the external roof girder.

Lattice girder connectors (Ref. No. 4916.000) are used to connect the tie end pieces or spacers. Each of these requires either two M 14 x 65 bolts with nuts or four **14 x 77 mm bolts with 2.8 mm safety clips.**

Tie, end piece

Tie connection

Tie

Bolt
30 x 61 mm

Safety clip
4 mm

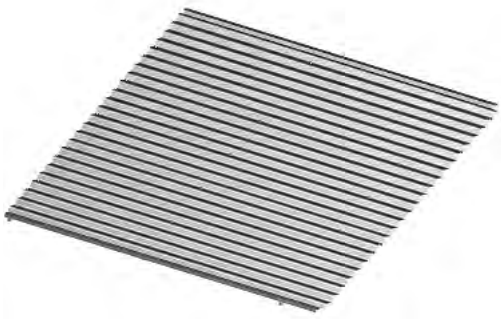
Bolt, 14 x 77 mm with safety clip

Lattice girder connector, round steel

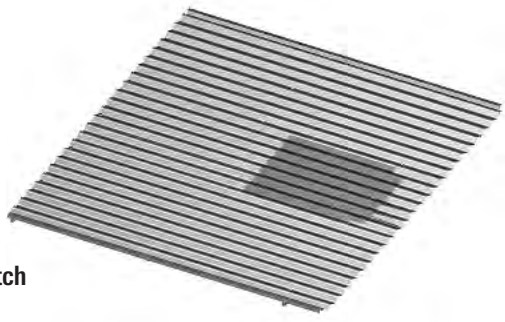
Roof cassette elements

Roof cassettes with corrugated sheet
The roof cassettes consist of a robust, hot-dip galvanized steel frame with shaped steel sheets and form the rainproof, walk-on roof covering of the cassette roof. The cassettes improve the horizontal rigidity of the roof. They can be supplied in lengths of 1.0 m and 2.0 m. The roof cassettes are inserted in the channel section of the top chord and are secured positively and non-positively using wedges and clamping plates. In this case, the clamping plate acts as a force-distributing base while the specially shaped wedge prevents slippage.

The 2.0 m-long cassette is also available with an **access hatch** to provide you with a safe, easy way onto the roof.



Roof cassette



Roof cassette with access hatch

Roof cassette elements

Ridge cassettes for use with roof trusses consisting of **roof girders and ridge supports.**

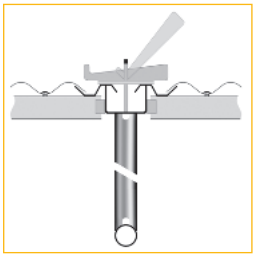
Ridge cassette

Support scaffolding for cassette roofs is usually clad with translucent scaffolding tarpaulins. If additional light is required, **light cassettes** can also be installed.

The light cassettes are fitted with transparent corrugated plastic panels together with a grid at the bottom to prevent people falling through. There is therefore no need for safety guards around the light cassette.

Light cassette

Wedges and clamping plates for securing the roof cassettes both on the roof trusses and in the intermediate bay.



Cassette fixing

Wedge for fixing cassette

Clamping plate for fixing cassette

The **carrying handles** are inserted in the edge section of the roof cassettes and simplify the insertion and removal of individual roof cassettes without there being any need to bend or go too close to the opening.

Carrying handle

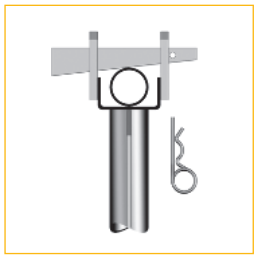
Roof support

Top scaffolding guardrail, secure assembly thanks to lower bracket levels

Roof supports as connecting elements for the supporting structure

The **roof support** is mounted on the appropriate support scaffolding. It can be used for SpeedyScaf and Allround scaffolding of width 0.73 m or 1.09 m (see the "Axis dimensions" diagram on page 2). The premounted truss bays are inserted in the roof support and secured using 2 **wedges** (Ref. No. 5913.000) with **safety clips** (Ref. No. 5905.000) to ensure that they cannot lift out of position. And if the roof has to be mounted on another structure? Our engineers have even found solutions for this requirement. Please consult us.

Wedge for roof support



Detail for roof support

Safety clip, 4 mm

Logistics

Tubular pallet for the transport and storage of 13 ridge cassettes or 20 roof cassettes, also suitable for brick guards.

Design: **hot-dip-galvanized**

Tubular pallet

The **modular skeleton box** in standardized European dimensions has a **carrying capacity of 2 t** and is stackable with Euro pallets.
The upper part has crane eyelets.

A side opening makes it possible to remove the stacked items even if several pallets are positioned on top of one another.

Design: **hot-dip-galvanized**

Modular skeleton box

Fall protection

Safety when walking on the roof
Safety when walking on the roof and the fall protection of anyone who slips on the roof is provided by **brick guards** in the eaves area of the side protection.

To this end, the **connecting piece** accommodates the **guardrail support** Ref. No. 1716.000 and, if necessary, commercially available semi-circular gutter supports can be installed on the structure for the controlled removal of water from the roof.

A **standard connection** (Ref. No. 5934.000) is provided for the construction of the side protection in the gable area or at the barge board and for the Allround scaffolding of openings on the roof surface. This is installed instead of the clamping plate. The standard connector accommodates a steel scaffolding tube as a guardrail post.
Max. distance between posts: 3.0 m.

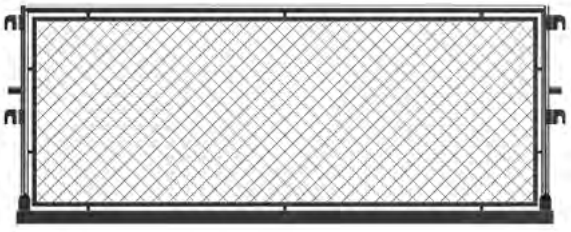
Connecting pieces for cassette supports

Euro guardrail support, single

Standard connection

Side protection, gable

Side protection, eaves



SpeedyScaf brick guard support

Safety gear

End fastener for suspending fall arrester/ pre-tensioner. Fastened in each case with wedge (Ref. No. 5913.001).

Intermediate fastener for assembly of an intermediate element, max. distance 15 m. Each fastening with wedge (Ref. No. 5913.001).

Ridge fastener for fitting of an intermediate element in the ridge area. Fastened in each case with wedge Ref. No. 5913.001.

Intermediate element as rope guide on intermediate and ridge fastener.

Safety rope as attachment device on the roof for suspending a gripper.

Gripper for use on stainless steel ropes, dia. 8 mm, snap hook for securing the gripper and for attachment of a safety harness with connectors or with sliding arrester system.

Tensioning device for final tensioning of the safety rope. The tensioning device is fastened with a screw-on compression connection to the safety rope and screwed to the fall arrester on the other side.

Pre-tensioner for holding the safety rope with parallel-adjustable clamping jaws, for suspension from the end fastener. The tips of the pressure pads must be checked for flattening before every installation. The pressure pads must be replaced at the latest after they have been used 25 times.

Fall arrester is fitted between end fastener and end tensioner, element for once-only release!

According to German BGV C22 regulations, equipment to prevent falls by personnel must be provided for work areas and walkways where the height of the fall is more than 2.0 m.

End fastener

Intermediate fastener

Intermediate element

Ridge fastener

Safety rope

Rope end tensioner

Rope pre-tensioner

Fall arrester

Gripper

Safety gear

Safety harness AX 60 S
Attachment eyelet in shoulder area,
2 attachment loops in chest area,
2 lateral holding eyelets, quick fasteners on body and leg straps, comfortable, padded and ergonomic back support, conforming to EN 361.

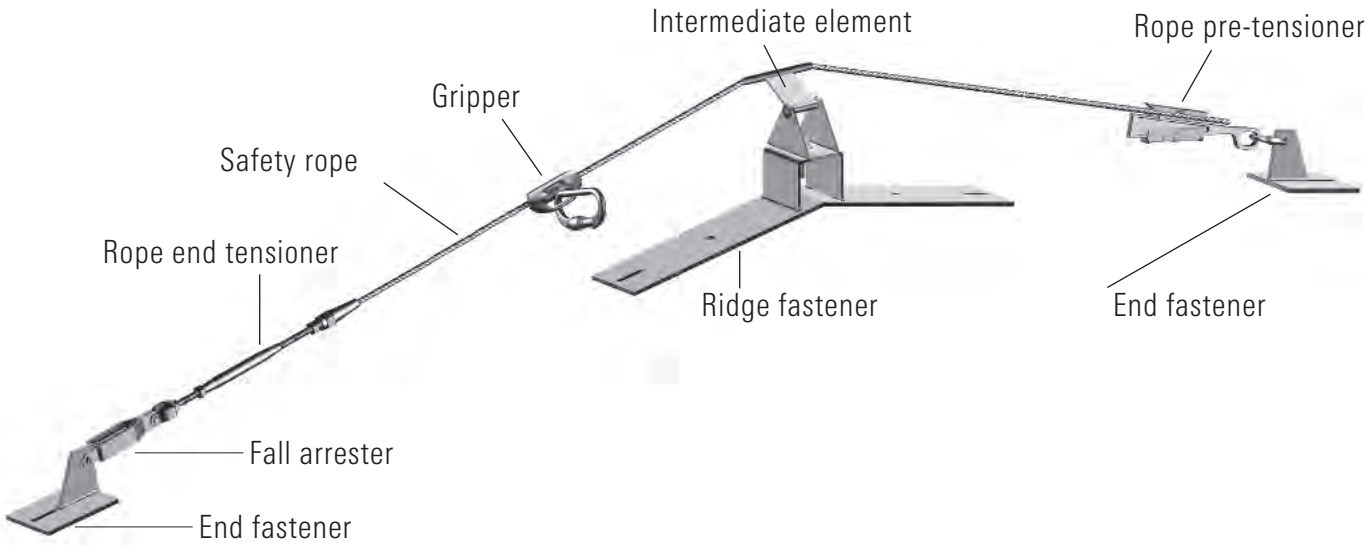
Safety harness AX 60 S

Travelling arrester system, model ASK 1
Travelling rope shortener made of stainless steel, firmly sewn belt fall arrester (conforms to EN 355) with snap hook, rope length 5.0 m, conforms to EN 353-2.

Travelling arrester system, model ASK 1

Equipment case
For storage and transportation of safety harnesses and arrester systems.

Equipment case



Attachment device
with horizontally movable guide in accordance with EN 795 class C.

Layher Lightweight cassette roof

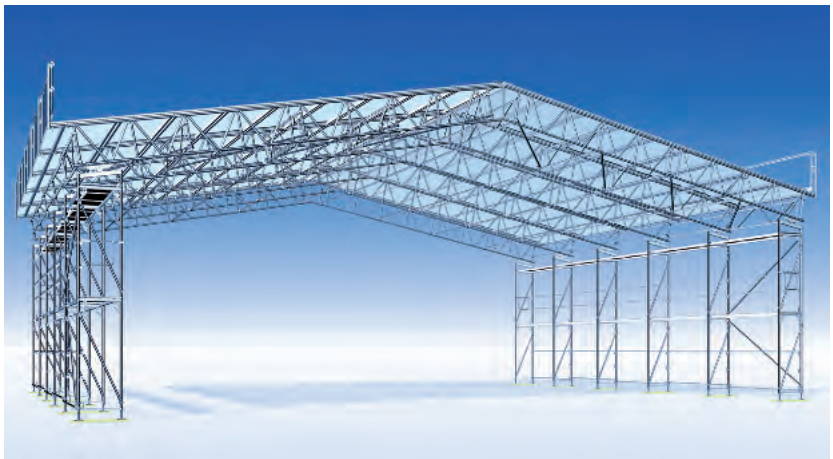
Roof technology for many uses in lightweight design

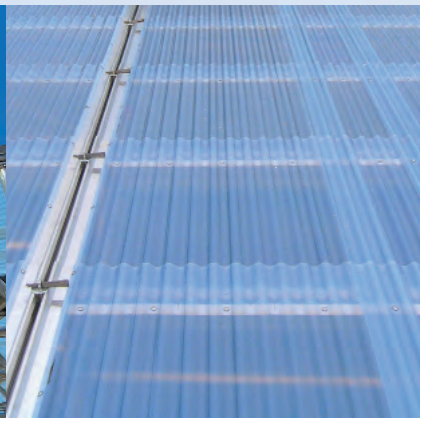
The lightweight cassette roof is a very light roof with a roof covering of aluminium/PVC roof cassettes that can be erected on system-independent lattice girders. With a few extra parts, sturdy yet lightweight roofing can be provided for a wide range of applications.

The advantages of the lightweight cassette roof

... simply looks good

- thanks to its attractive appearance it harmonizes well with the city environment and is therefore ideal for work in inner-city areas.
- not only lightweight, but also stable: low-inflammability, hailproof, impervious to many chemical substances, UV and light-resistant, and impossible to fall through as per GS Bau 18 regulations.
- translucent but not transparent. As a result, light cassettes are not needed. However, there is no glare effect from sunlight which might affect the work in progress under the roof.





... pays for itself quickly

- can be fitted without problem onto all 750 lattice girders and hence can be easily used with every existing scaffolding system.
- Rapid assembly of the stiffening elements using the proven Layher snap-on claws.
- Thanks to the fact that supplementary parts can be used repeatedly, e.g. the channel sections and shell clamp for building surface scaffolding on non-system lattice girders, rapid amortization of the overall investment is assured.

... makes light work

- The entire roof is extraordinarily light at around 13.0 kg per m^2 (including lattice girders and stiffening elements).
- The corners of the cassettes are protected from damage by the snap-in aluminium section.
- The lightweight cassettes can be stacked very well with or without pallets.

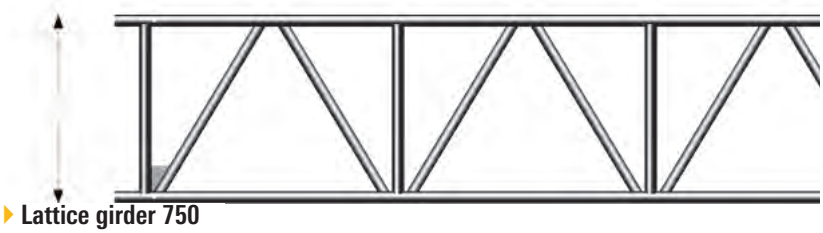
Lightweight cassette roof elements

Aluminium 750 lattice girders for medium spans and rapid assembly. These form the supporting structure for the lightweight cassette roof. The **ridge section 750** can be used to create double-pitch roofs with a roof pitch of 11°. The **lattice girders** or ridge sections are connected to one another with two **T4 lattice girder spigots** and eight **lattice girder bolts** with a safety clip at each join.

In the case of manual assembly, it is simply necessary to connect the roof trusses on the ground. Using a crane, it is also possible to assemble entire truss bays at ground level and position these at intervals of 2.57 m on the support scaffolding.

The T4 lattice girder spigots, the lattice girder bolts with safety clips and the supports are not special lightweight roof components. Instead, they come from the pre-existing Layher range.

Ridge section 750

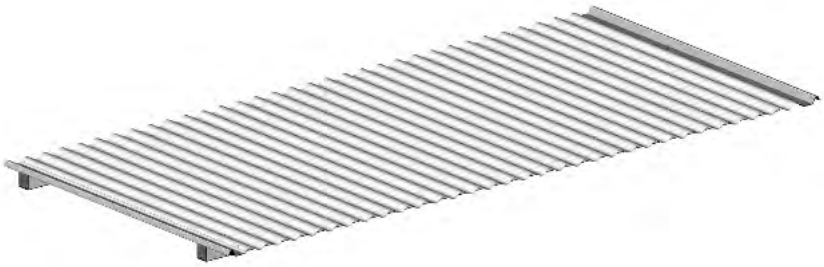


Lattice girder 750

Lattice girder spigot T4

Lattice girder bolt with safety clip

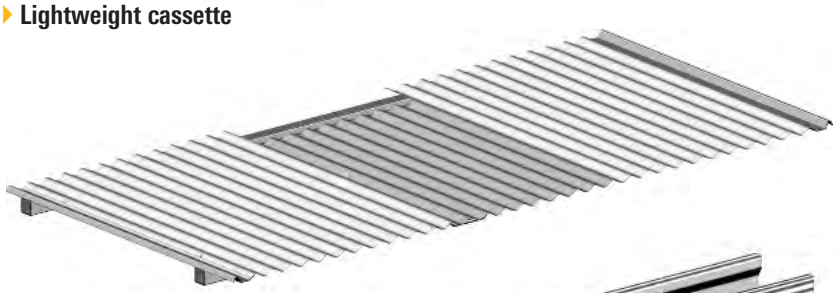
Support



Lightweight cassette

The **lightweight cassettes** consist of an aluminium frame with a PVC covering and are:

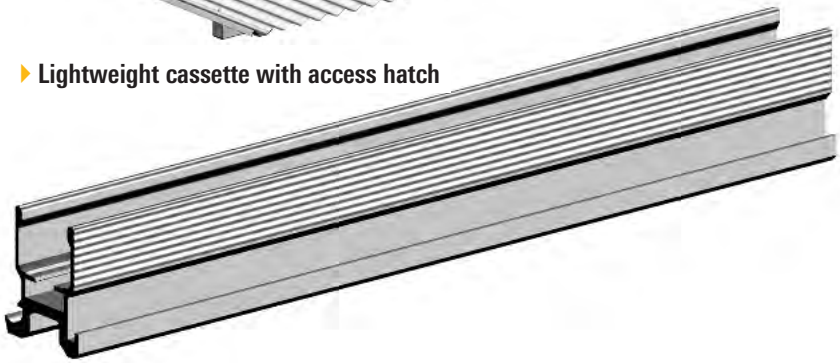
- low-inflammability components in accordance with DIN 4102
- resistant to chemical influences
- UV-resistant
- resistant to low temperatures
- hailproof
- resistant to penetration by falling persons in accordance with GS Bau 18
- walk-on if assembly decks are used



Lightweight cassette with access hatch

The **lightweight cassette with access hatch** permits easy access from the support scaffolding.

The **channel section,** which is available in a variety of lengths, is used to house the lightweight cassettes.

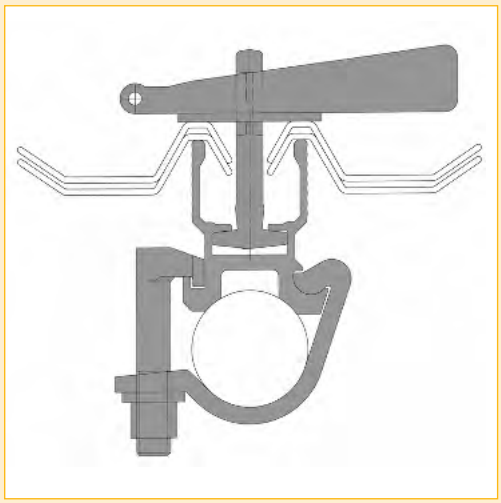


Channel section

Lightweight cassette roof elements

Clampable channel sections are fixed every 2 m to the top chord of the lattice girders using **shell clamps, hook bolts** and **nuts.** The **seals** at the channel section joins prevent water penetration.

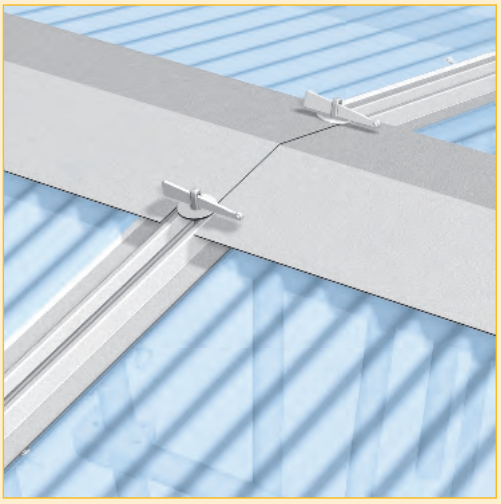
Lightweight cassettes are fixed at overlaps using **rapid clamps.** The free ends of cassettes at the eaves must also be fixed.



Fixing of channel section

Keder roof ledgers are mounted in intermediate bays (crane assembly) or in attached bays (manual assembly) in the stiffening bay's stiffener axis at the lower chord of the aluminium lattice girders.

Lightweight cassette roof stiffeners and **horizontal diagonal braces** must be secured in the stiffening bay at least every 2 m.



Ridge cover fixing

Ridge covers are also fixed with rapid clamps once the lightweight cassettes have been laid.

Seal for channel section

Shell clamp

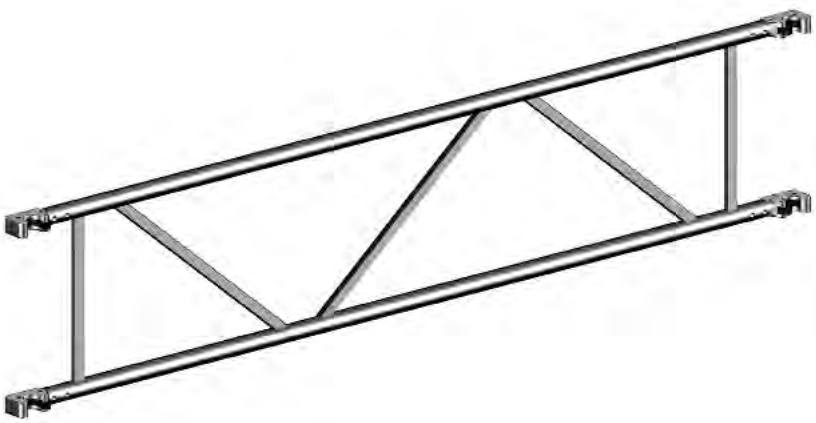
Hook bolt

Nut M 14

Rapid clamp

Keder roof ledger

Horizontal diagonal brace



Lightweight cassette roof stiffener

Ridge cover

Lightweight cassette roof elements

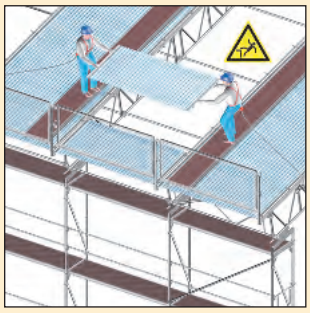
Safety guardrail supports are mounted at the ends of the roof girders. Each of these is fixed with a 14 x 77 mm bolt with 2.8 mm safety clips.
Brick guard supports ensure that individuals can walk safely on the roof and prevent objects from falling from the roof.

Fixing eaves guard-rail support

The **adaptor for gable safety guardrails** is connected to the aluminium lattice girders. By inserting the **guardrail post** and using assembly guardrails, it is possible to create a two-part side protection.

If a **tie** is required then this can easily be connected to the bottom chord of the lattice girder using a **tie adaptor.** The tie tubes are connected using **lattice girder connectors** and **M 14 x 65 special bolts.**

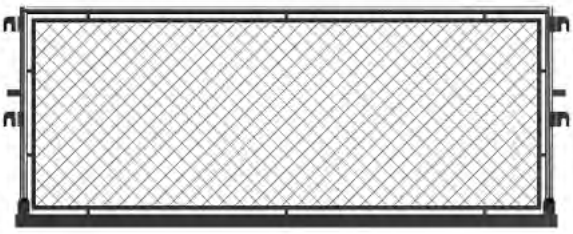
Assembly decks are required in order to walk on the lightweight cassette roof.



Intermediate bay

The **lightweight cassette pallet** can be used to transport and store 20 cassettes (design: hot-dip-galvanized).

Eaves guardrail support



Brick guard

Adaptor for gable safety guardrail

Adaptor for tie

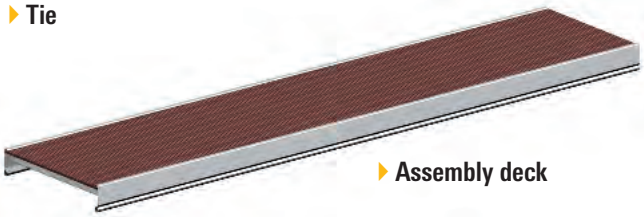
Special bolt M 14 x 65

Gable safety guardrail post

Assembly guardrail

Lattice girder connector

Tie



Assembly deck

Pallet for lightweight cassettes