

Ideen für Dach · Wand · Fassade

LAUKIEN

Technische Planungsunterlagen

Vielfältig
Wirtschaftlich
Nachhaltig

0 Product information

0.0 General information

With the LAUKIEN metal program we offer you structural elements for the functional cladding and individual design of façade, roof and other parts of the building envelope.

Our extensive product range of cladding elements comprises numerous trapezoidal profiles, corrugated profiles, panels, cassettes and extruded profiles made of metal. In addition, we offer a wide range of accessories for the design of architecturally high-quality façades, one of our main focuses.

Your requests are decisive for us when developing our products. We not only offer an extraordinarily broad range of standard products but also focus ourselves on current trends and individual design when developing our products.

In section 2 of this file which addresses designers, engineers and processing companies with examples for various designs, we offer suggestions for planning and realizing rear-ventilated curtain façade claddings.

Note: As there are different directives, standards and provisions in various countries the static requirements regarding the material of the cladding element, the fastening elements, the substructure and fasteners required for the load-bearing anchoring base can only be clarified when considering the given factors of the respective project. Therefore, for example, an object-related structural analysis based on the height of construction and the resulting wind loads should be prepared. Furthermore the specific directives and rules for façade claddings must be considered.

0 Product information

0.1 Production and sales

Primary material for our cladding elements made of metal strips are flat sheets of aluminium and steel. The coating is done by means of the coil-coating procedure in various colours and grades. Furthermore we manufacture our products from copper, zinc and high-grade steel. Due to the number of product types, the various materials and numerous colours we keep in stock we can offer **nearly 2,000 product variants**.



Our production sites are located in Kiel and in Burg, close to Magdeburg. Due to our **own production facilities** we are able to quickly and flexibly react to our customers' requests. With state-of-the-art equipment and production processes we produce high-quality metal claddings for roof, wall and façade. The shipments are predominantly made by our own vehicles.

About 20 members of staff in the field service and more than 30 office-based sales consultants are in charge of our customers. Staff members in the departments applications engineering and



technical customer service provide additional support for more complex technical tasks, if required even on the construction site.

0 Product information

0.2 Materials

For our **LAUKIEN Roof and Façade Products made of aluminium sheets** we use sheets and strips according to DIN EN 485 Part 2.

There is a large number of different aluminium alloys according to DIN EN 485 which are suitable for shaping roof, wall and façade profiles. Without requiring particular certificates the alloys EN AW-3004 (AlMn 1 Mg 1, AlMn 1 Mg 1 Cu), EN AW-3005 (AlMn 1 Mg 0,5) and EN AW-5005A (AlMg 1) with a minimum of 0.2% proof stress of 165 N/mm² are deemed to be suitable.

Our LAUKIEN Extruded Profiles consist of aluminium alloys according to DIN EN 573.

Primary material for our **LAUKIEN Roof and Façade Products made of steel sheets** are sheets and strips according to DIN EN 10346. For coil-coated steel sheets materials of the grade S 320 + Z with a zinc coating of 275 g/m², ZM 130/140 and AZ 150 according to DIN EN 10346 as well as aluminium-zinc (AZ) 185 according to DIN EN 10346 are used. Primary materials are held available in various material thicknesses and coating systems.

Products made of copper, zinc or high-grade steel we manufacture on request. For products made of high-grade steel sheets we use material with the material code 1.4301 according to DIN EN 10088. If materials having other qualities and properties than the ones stated above are required we are able to procure the respective materials.

Note: The various material thicknesses and coating systems enable an optimum selection of our products for the respective place of installation. The material specifications necessary for the design are part of our design charts and load charts on our website.

0 Product information

0.3 Corrosion Protection

Products made of bright **aluminium plate** form a natural oxide layer at the surface protecting the surface from corrosion. By coil-coating the aluminium strips an additional colouring is achieved. Due to the high number of colour variants and special top coats there is a wide scope for design. In addition to coatings with 25 µm of polyester coating we offer high-grade coating systems such as PVDF or PUR / PA.

Zinc-coating combined with coil-coating ensures a respective protection against corrosion for products made of **steel sheets**. We also offer various coating and colour variants for these materials.

We would like to **provide advice to you** what options are available for your application!

Note: The resistance to corrosion is subdivided into five categories, RC1 to RC5, and is governed by the standard DIN EN 10169 „Continuously organic coated (coil-coated) steel flat products“. Among others it depends on the quality of the metallic coating, the coating thickness and the number of the coating layers.

| | Belastung | Lage |
|------|---------------|--|
| RC 1 | insignificant | Interior without special requirements |
| RC 2 | low | Country atmosphere |
| RC 3 | moderate | City atmosphere |
| RC 4 | strongly | Industrial atmosphere |
| RC 5 | very strong | Aggressive industrial atmosphere, sea coast atmosphere |

0 Product information

0.4 Coating systems, colours and anti - condensation fleece

The **coil-coating procedure** combines environmental compatibility with efficiency to a great extent. Cold-rolled electro-galvanized or hot-dip coated steel strips are cleaned, chemically pre-treated and coated by applying one or several layers of liquid coating materials in a continuous process. Afterwards a heat treatment follows. By means of this production process coating systems with various film thicknesses, surface structures and quality grades are produced.

| Coating system on steel sheet | Overall layer thickness | Corrosion resistance category according to DIN EN 10169 | Surface |
|-------------------------------|-------------------------|---|---------------------|
| Alu zinc 185 | 25 µm | RC4 | spangle pattern |
| Granidur | 50 µm | RC5 | slightly structured |
| Polyester coating | 25 µm | RC3 | smooth |
| Polyester coating | 30 µm | RC3 | matt (bauhausstil) |
| PVDF coating | 25 µm | RC3 | smooth |

Both the **colours** for structural elements made of steel sheets and also the ones for structural elements made of aluminium sheets are available from stock according to our supply program. You haven't found your desired colour? No problem. Subject to our minimum order quantity and perhaps with longer delivery periods we supply many other colours up to colours individually sampled. For all 25 µm-coatings it may be necessary to protect the surface prior to further processing and transport. This is done by means of a **special protection film** which is attached to the visible face of the material prior to processing. It is mandatory to remove the film immediately after installation as otherwise it may cause discolouration on the surface and removing the film may become difficult at a later date.

On request, our **anti - condensation fleece** is applied on the back of our corrugated profiles, trapezoidal profiles or our tile profile. The moisture produced inside the building (condensate) is absorbed by the fleece and released to the ambient air if the attic is adequately ventilated. Any dripping is prevented. To avoid water to become capillary absorbed in the overlap the anti-condensation fleece is recessed in the area of the lateral cover. At the end of the profiles at the roof ridge and the eaves a thermal split cut* is implemented. A further alternative is a recess cut* (200 mm) to avoid the intrusion of moisture.

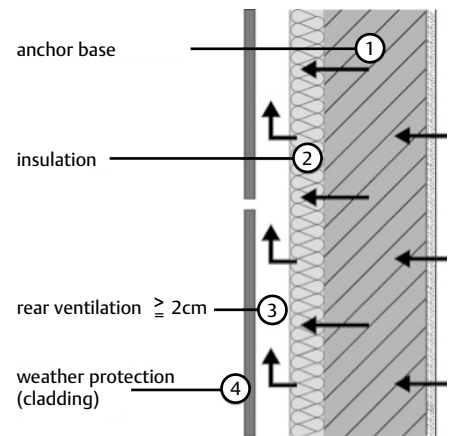
*Not for the tile profile.

0 Product information

0.5 Rear-ventilated curtain façade (VHF) and its benefits

The main feature of the rear-ventilated curtain façade (VHF) is the structural separation of the two components insulation (thermal insulation, protection against cold and fire) and cladding (weather protection). The ventilated space between the components regulates the moisture content within the building structure. By means of the given airflow moisture from condensation or accumulated during construction is reliably removed. Damp external walls quickly dry out; an optimum indoor climate is ensured.

According to DIN 18516 the clearance for the rear-ventilated space is at least 2.0 cm. Aeration and de-aeration at the wall base and at the roof edge as well as at the door and window lintel and at the window sill respectively have a space of at least 50 cm²/m. This requirement is normally met by inserting a perforated metal plate with the respective ventilation capacity.



*schematic sketch:
general composition of a rear
ventilated curtain façade (VHF)*

Benefits of the rear-ventilated curtain façade (VHF)

Thermal insulation

The rear-ventilated curtain façade system (VHF) can be designed with individually measured insulation materials for various energetic requirements. Any desired thickness of insulation materials can be used so that the requirements of the recent energy conservation act are normally met without any problems.

Protection against condensation water

Due to the structure of the rear-ventilated curtain façade (VHF), the vapour diffusion resistance decreases from the internal to the external walls. Any moisture from condensation or accumulated during construction is channelled through the ventilated space and contributes to an optimised indoor climate. The insulation is effectively ensured.

0 Product information

0.5 Rear-ventilated curtain façade (VHF) and its benefits

Rain protection

The rear-ventilated curtain façade (VHF) belongs to the wear class III according to DIN 4108-3. It is resistant to driving rain. Moisture is quickly removed through the ventilated space between insulating material and cladding (weather protection).

Sound insulation

Depending on the thickness of the insulation, the mass of the cladding and the percentage of open joints the sound insulation index can be increased by up to 14 dB for rear-ventilated curtain façades.

Sustainability

Environmental objectives are met both for new buildings and energy-efficient renovation of buildings when using rear-ventilated curtain façades (VHF). By the potential reduction of the required heat energy the emission of carbon dioxides can be decreased.

Public and regional grant programs are often provided for the energy-efficient upgrading of existing façades.

Efficiency

The aspects of efficiency are also an important factor when considering the requirements of sustainable constructions. The long service life, long maintenance intervals and a subsequent return of the components to their material cycles are main benefits of a rear-ventilated curtain façade (VHF).

Cost certainty

The basis for the calculation of a rear-ventilated curtain façade (VHF) is, also when renovating an old building, a precise cost planning on principle. Furthermore the rear-ventilated curtain façade (VHF) provides additional benefits such as an execution of the constructions works which is mainly independent from weather conditions, the short, efficient use of scaffoldings, the low disposal costs during the construction phase, the low lifecycle cost due to the long maintenance intervals and thus a long-term maintenance and increase of the value of your building.

0 Product information

0.6 Dimensional tolerances and use

Our material for flashings, both plates and coiled material, is available from stock in various coating systems and colours. Here, we meet the acceptable tolerances on dimensions and shape for blanks according to DIN EN 10143 for steel and according to DIN EN 485 for aluminium. For stamped parts the tolerances specified in the standard DIN 6930 are applicable. We produce flashings according to the requirements for tolerances stated in the standard DIN 6935.

The minimum bending radii of metal profiles depend on the alloy, the sheet thickness and the coating system of the primary material.

When producing our LAUKIEN trapezoidal profiles and corrugated profiles as well as the snap-on panel LAUKIEN Steckpaneel PLUS® we meet the tolerances required by the standard DIN EN 1090 „Execution of steel structures and aluminium structures“. For the individual LAUKIEN façade products the tolerances required by DIN EN 508 „Roofing and cladding products from metal sheet“ are applicable.

Our quality management system, the internal production control as well as regular external audits by independent testing institutes ensure a consistently high quality of our products.

Note: According to the building law for lightweight metal structures a proof of stability with respective proof for the anchoring and fastening must be provided for the area of roofs, walls and ceilings.

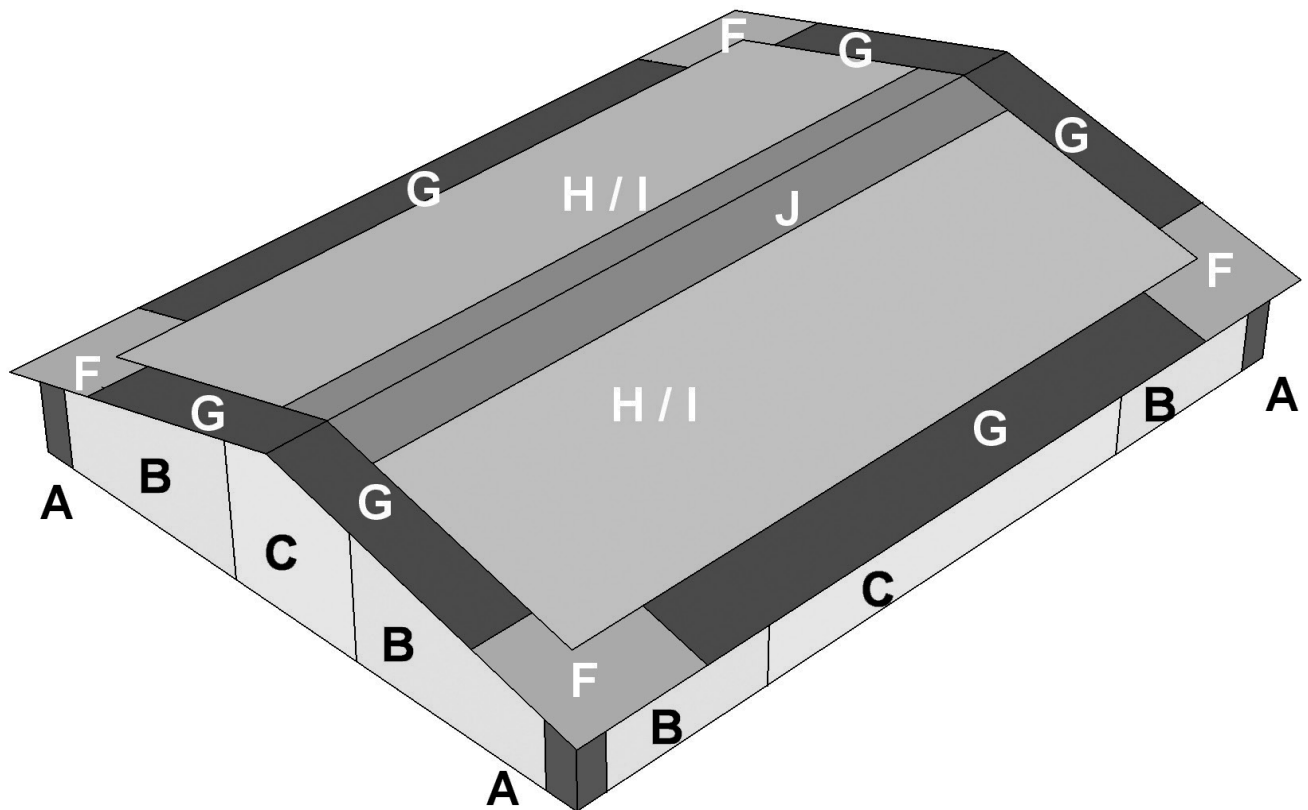
The verification procedures and load bearing capacities are stated in the applicable rules and standards (e.g. DIN EN 1990, DIN EN 1993, DIN EN 1999 or technical approvals). On www.laukien.de you find rules and standards as well as load bearing capacities for the LAUKIEN profiles such as load charts, type testing documents as well as approvals and certificates. The values required for calculating the impact on structures resulting from wind and snow loads are taken from the applicable series of standards of DIN EN 1991 and are to be determined for the intended construction project.

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0.6 Dimensional tolerances and use

Fig.: Building with the various load ranges marked

Depiction of the roof and wall areas according to DIN EN 1991-1-4



- A - corner areas of wall surface
- B - edge areas of the wall surface
- C - normal areas of the wall surface

- F - corner areas of the roof surface
- G - edge areas of the roof surface
- H - normal areas of the roof surface windward side
- I - normal areas of the roof surface lee side
- J - areas of the roof ridge

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0.6 Dimensional tolerances and use

When using roof and wall elements the **LAUKIEN installation guidelines** and the rules of the IFBS (International Association for Lightweight Metal Structures) are to be observed. A consistent direction of installation must be ensured on principle when installing metal profiles.

It is essential to consider **temperature-dependent alternations of length**, particularly when using aluminium profiles. There are various options to compensate temperature-dependent alternations of length by a proper selection of the dimensions and distances of the cladding elements as well as by the design of mountings and connections at the buildings; additionally creative accents can be achieved. By using suitable systems for the substructure and fastening these effects can also selectively be reduced.

From Section 2.1 Examples of Structures you may find many detailed views of fitting edges, outside corners, inside corners, reveals, lintel areas, wall base areas and sill areas as well as details of roofs.