



Czech Manufacturer of Sheet Metal Roofing



# Comax ComBo 430

Summary of basic **information**  
**for self-installation** of the roofing



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# I. Basic information about the product

## Function

Comax ComBo 430 is a small-format roof and facade system for sloping and steep surfaces. Roofing elements in the form of diamond-shaped sheets are not moulded and are therefore applicable not only for flat but also for cylindrical shapes of double-skin roof and facade surfaces. The minimum safe pitch of the ComBo 430 covering is 22°.

## Advantages

Comax ComBo 430 is based on historically proven roof shingles. Current production technology has made it possible to improve the anchoring of the roofing elements to the entire formwork. The elements are anchored indirectly using a system stainless steel extension and mounting material. The elements are connected to each other by simple lying grooves, which ensure the compactness and waterproofness of the cladding. Expansion stress due to temperature changes are excluded with Comax ComBo 430. The lightness of the aluminum alloy roofing puts minimal strain on the underlying roof structure, which is particularly advantageous during renovations. The size of the elements makes ComBo 430 optimally adapted to smaller roof areas and facades. Small, lightweight elements are of course also convenient in terms of assembly and logistics.

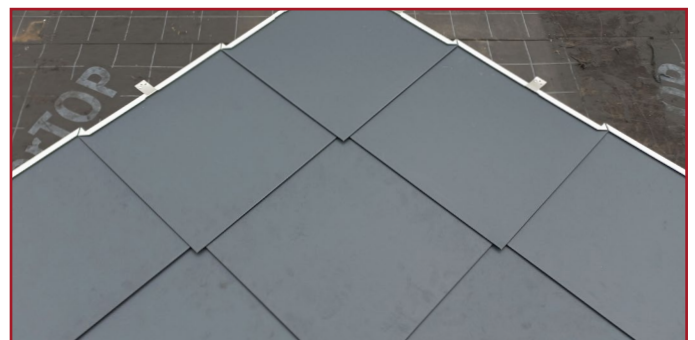
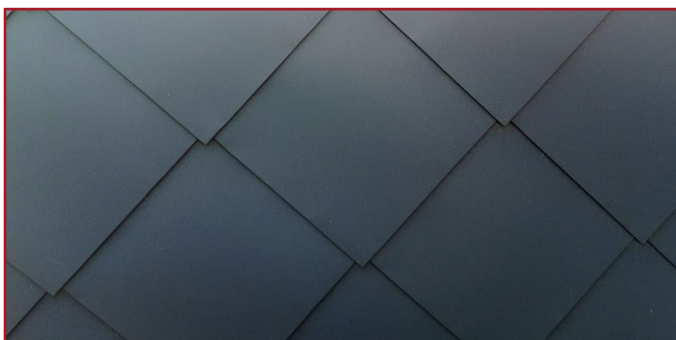
## Roof system elements

- Comax ComBo 430 roof sheets
- Basic (starting) sheets
- Compact ridge ventilation
- Curved elements - roof flashings, gutters, ridges
- Mounting material, extensions, nails, screws and adhesives
- System of safety elements on the roof - snow catchers, footbridges, ladders, safety hooks
- Roof ventilation system - turbines, ventilation sheets, chimneys
- Roof water drainage system - gutters, downspouts, elbows, leader head, hooks, sockets

## ComBo 430 sheets and their anchoring

The roofing is anchored to the substructure indirectly and concealed by means of extensions. Individual sheets are interlocked. The interlocking consists of simple horizontal grooves which compactly connect the entire covered area. In the bottom corner, the sheet is fitted with a moulded hook that prevents the corners from coming off and breaks the flow of water running down the edge. A single system extension anchors the diagonally oriented roof sheet to the formwork in the upper corner. It is then hidden under another set of sheets. Concealed direct anchoring is only used in the ridge and gable flashing area.

## Example of implementation



## Comax ComBo 430

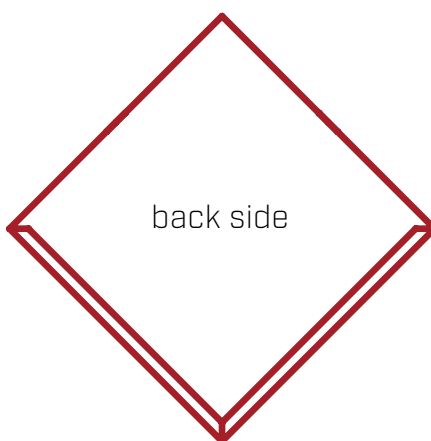
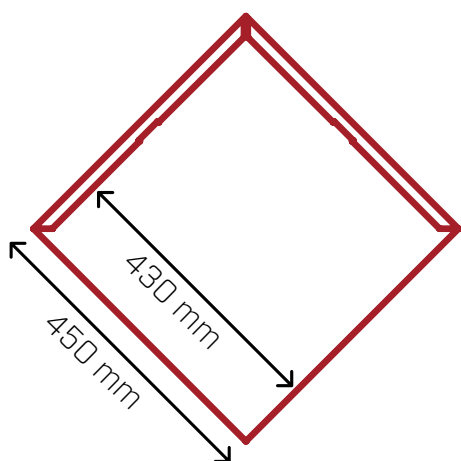
Comax ComBo 430 is manufactured in premium quality exclusively from painted aluminum alloy sheet. Dual core protection is provided by organic coatings continuously applied to the sheet coils. Extensions and fasteners are stainless steel. To cover a square meter area, 5.4 square sheets 430 x 430 mm are required. The sheets are optimized in shape and size for attachment with a single flat extension



Comax ComBo 430  
[430 x 430mm]

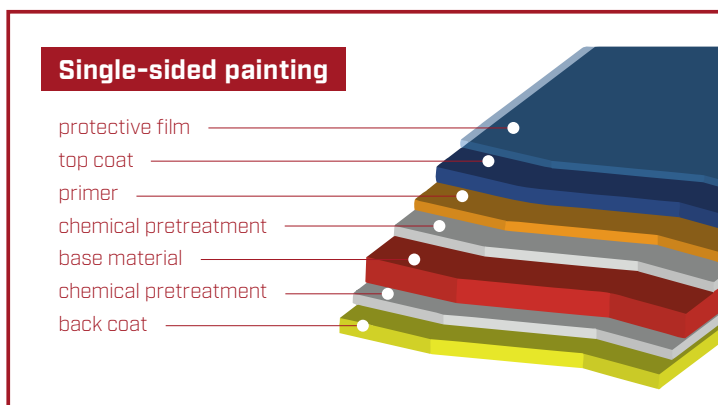


ComBo Extension



## Surface finishes

We are the only company in the Czech Republic to paint sheet metal coils using our Coil-Coating technology. It consists in rolling individual layers of a special organic coating on an unrolled steel or aluminum coil with subsequent curing in furnaces, which guarantees an evenly uniform coating over the entire strip and gives the material unique functional and aesthetic properties for use in the most demanding conditions – indoor and outdoor. The face of the material can be protected against damage during transport and handling with a protective film. The elements of the COMAX ComBo 430 roof system are manufactured by pressing or bending from painted aluminum alloy sheet. The surface layer provides dual protection to the metal core.



## Comax ComBo 430 colour shades

The basic aesthetic quality of roofs and facades made of painted sheet metal is the colour. In addition to standard colours, **COMAX Roofs®** as a manufacturer of painted sheet metal can offer more than 600 RAL-derived colours with shade correction according to its own standards in gloss, semi-matt and matt finishes. The current range of standard shades can be found in the catalogue. The condition for delivery of a non-standard shade is the purchase of a minimum quantity of 400 m<sup>2</sup> of sheet metal elements. For information on the availability of roof accessories in non-standard colours, please contact the **COMAX Roofs®** Sales Department.

## Protective foil

The face of the smooth painted ComBo 430 sheets and system flashing can be protected from mechanical damage during transport, storage and handling. In the textured finish, the templates are supplied without foil. The foil, which is intended only for short-term protection, must be removed immediately when the roofing is installed. The foil is not intended for long-term protection of the sheet metal, leaving it on the roof or facade will lead to colour defects, difficult removal of the foil, and possibly even corrosion of the sheet metal. The foil is not resistant to ultraviolet radiation and it is necessary to protect the foiled templates and sheet from sun exposure even during storage. The foil is removed by manual pulling at sheet temperatures of 10 - 30°C. Dispose of the removed foils in the separate waste collection as PLASTIC PACKAGING - foils [15 01 02].

## II. Handling and storage

ComBo 430 small-format roof sheets are delivered packed on euro pallets. The small format is very convenient in terms of transport and handling. Please adhere strictly to the unloading, storage instructions given on [www.comaxroofs.co.uk](http://www.comaxroofs.co.uk), as we do not accept any liability for possible defects in the event of non-compliance.

## III. Recommended tools, machines and equipment

- Sheet metal snips (left, right)
- Sheet metal guillotine shears
- Sheet metal curved snips (left, right)
- Stanley knife
- Plastic mallets (small, large)
- Hammer
- Straight chimney pliers (small, large)
- Curved chimney pliers (small, large)
- Groove-maker (small, large)
- Folding pliers (small, large)
- Flat nose pliers (small, large)
- Round nose pliers (small, large)
- Locksmith clamps
- Square
- Surface gauge
- Stapler, staple hammer (for foils and tapes)
- Cordless drilling screwdriver with torque limiter
- Bit holders and screwdriving bits
- Magnetic wrench for farm screws
- Combination spanner
- Riveting pliers for blind rivets
- Extrusion gun (for glue)
- Ruler, pencil, liner
- Flat chisel
- Wood saw
- Hand-held electric circular saw
- Broom and dustpan

The painted sheet metal of COMAX ComBo 430 templates is easy to divide by cutting. **The use of an angle grinder is excluded.** Local heating of the material leads to degradation of the sheet metal and its coating and subsequent corrosion. Flying hot sparks damage the painted surface and metal particles baked into the paint layer cause colour stains.

## IV. Installation of Comax ComBo 430 roofing

Ideally, during installation we can follow the implementation project, which addresses not only the overall composition of the roof but also the anchoring of the roofing and other fitting elements, including their expansion, the implementation of possible roofing conducts and details of the fitting design of penetrations, sheathing and roof drainage with respect to local building conditions.

The staff of the **COMAX Roofs®** Technical Department will be happy to help you with your roof solution.

ČSN 73 1901 - designing of roofs prescribes that all materials used in the roof layer must be chemically compatible. Care must also be taken with respect to ions carried by run-off or rain-water dripping. All materials from **COMAX Roofs®** ensure material compatibility when installed correctly. They do not release any colouring or toxic substances into the drained water. They are therefore suitable for rainwater harvesting systems.

### Fasteners

The basic requirement is material compatibility, the system fasteners for ComBo 430 templates are therefore stainless steel.

- a. System stainless steel ring (convex) nail 2.8/3.1 x 25 mm.
- b. Screw for anchoring the sheet metal to the wooden base: Fitting stainless steel screw 4,5 x 35 mm hemispherical head, groove PZD 2 used for flashing
- c. Stainless steel flat head screw 4.2 x 25 mm - Philips PH2 cross slot. Replaces nails for anchoring to OSB boards (OSB board according to ČSN EN 300 with a minimum thickness of 18 mm and density over 625 kg/m<sup>3</sup> ).

### Laying plan

The project documentation of the roof, including views, provided by the client, is the basis for the preparation of the laying plan.

#### We subtract the following dimensions/parameters from the project documentation:

- Length of the roof at the eaves
- Length of the rafter
- Ridge length
- In the case of hipped roofs, the length of the corners
- Distance, height and width of dormers
- All roofing conducts must be listed and focused in the project (e.g. dormers, skylights, hatches, chimneys, etc.)

#### Main principles for creating a laying plan:

- a. First, make a drawing of the individual surfaces with the location of the roofing conducts in the chosen scale, e.g. 1:100. We calculate the areas according to the dimensions of the Comax ComBo 430 templates. The individual templates must be correctly oriented according to the pitch
- b. Small-format roofing does not need to be addressed in terms of thermal expansion of the metal
- c. **COMAX Roofs®** technicians will help you with the installation plan free of charge.

## Roof measurement procedure:

Measuring is carried out on the roof with finished full-width formwork. In the figure below, the edges whose lengths need to be measured for the laying plan are marked in red. It is also necessary to measure the widths and lengths (w, d) of the conducts together with the distance (distance) from the eaves and gable edge. The last dimension required is the length of the rafter (perpendicular from the ridge to the eaves edge). Also plot the prevailing wind direction on the sketch.

A roof measurement is recommended even if there is a project plan for the house. Very often, the actual dimensions of the roof do not correspond to the proposed condition. This problem applies to both renovations and new buildings, where the real roof can deviate from the original project documentation.

If the laying plan is designed by the **COMAX Roofs®** Technical Department - it must be checked and confirmed by the customer as part of the order.

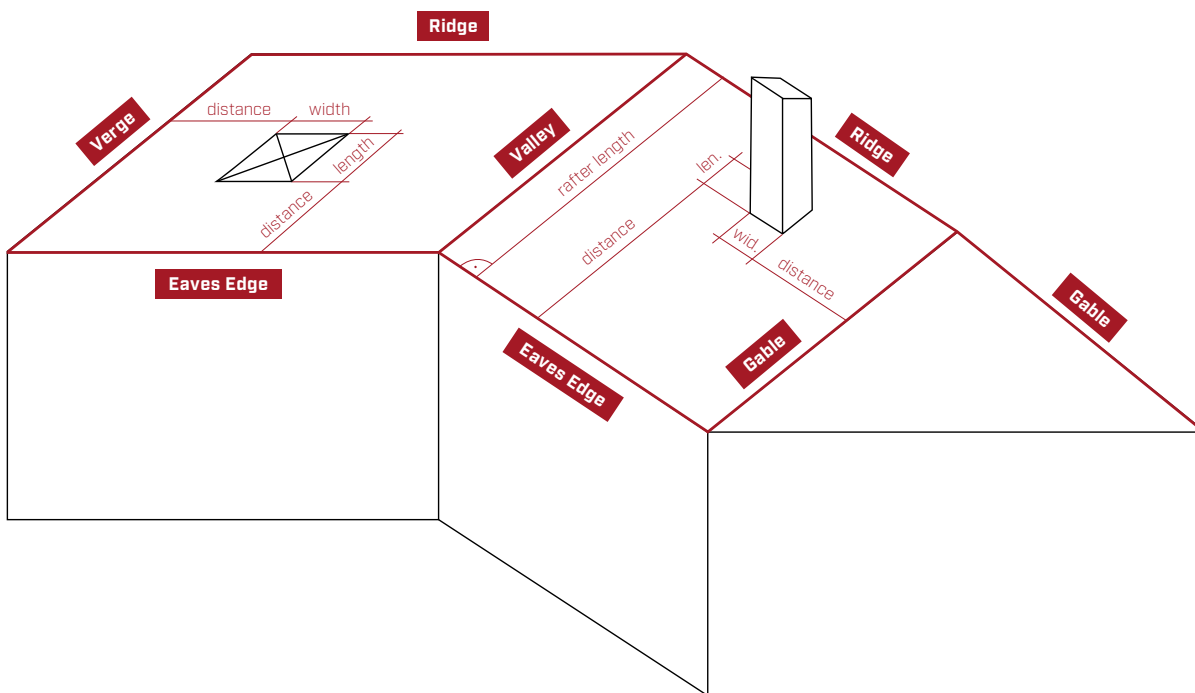


Figure 1: Roof measurement scheme for making a laying plan.

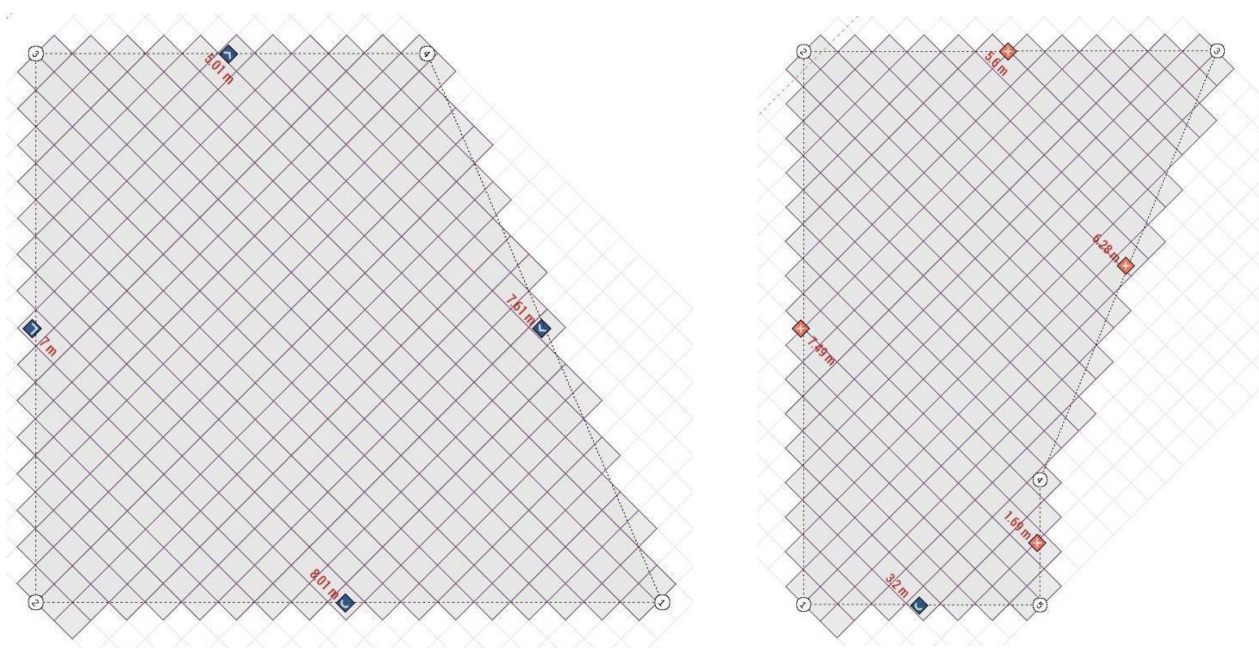


Figure 2: Example of the processing of the laying plan.

## The underlying structure

### a. Double-skin roof

A reliable roofing solution with **COMAX Roofs®** sheet metal roofing over common heated spaces is a double-skin roof. The underlying structure of the roofing consists of formwork. The air gap, which gave the double-skin roof its name, is defined beneath the formwork of small roofs by counter-battens. It is important that the formwork is anchored with sufficiently long nails (>120mm) - directly into the rafters. For proper function, the air gap must be open - ventilated at both ends at the eaves and at the ridge. The vents must be fitted with a protective grille to prevent birds and insects from entering the air gap. If the air gap between the connections is completely interrupted by a wide roofing conduct (chimney, skylight), it is necessary to provide an exhaust on the lower side of the penetration and an intake on the upper side, or to allow ventilation of the air gap by other measures. The protective waterproofing protects the thermal insulation from moisture that has penetrated or precipitated into the roof. If the diffusion is open - it also allows the thermal insulation to dry out. The thermal insulation is installed most easily between the rafters and allows the attic to be used as a heated space. It must remain dry to function properly. It is therefore protected by an impermeable vapor barrier on the interior side and a diffusion-permeable safety waterproofing on the ventilated gap side. This arrangement is suitable for normal interiors. For interiors with a demanding moisture balance, different solutions with moisture sealed - absolutely non-absorbent insulation should be used.

### b. Full-width deck

COMAX ComBo 430 is an open system. The system assumes full support of the roofing. The substrates can be flat or glazed concave or convex. The individual templates can be laid on a variety of substrates in roof structures or double or multi-pitch facades. We therefore always recommend a ventilated air gap under the formwork. The formwork material must allow sufficient anchoring of the extensions, which ensure the stability of the lightweight roofing material. The recommendations given in this manual assume a pull-out resistance of 500N per extension. This will be satisfied by nailing in two nails in good quality softwood planks (quality > C24, wood moisture content <10%). The planks must be nailed perpendicular to the roof pitch so that the anchorage is distributed evenly throughout the formwork. The planks should be long enough to be anchored in at least three rafters. The timber slats of the timbers used for the formwork should be oriented with the core of the trunk facing outwards. When using OSB formwork, the extensions must be screwed to the substrate with suitable screws to achieve the necessary pull-out resistance. Stainless steel 4.2 x 25 mm flat head screws from **COMAX Roofs®** are suitable for OSB according to EN 300 with a minimum thickness of 18 mm and a density of over 625 kg/m<sup>3</sup>. If the formwork is chemically incompatible with the covering, it is necessary to separate them with a suitable separation film. Incompatible boards are mainly cement-bonded particleboards and OSB, as well as boards treated with anti-wood-damage agents (acidic or containing metal ions), which can be released from the wood.

The pitch of the roof with Comax ComBo 430 should be higher than 22°. Curved roofs with a lower pitch at the ridge should be constructed with Comax FALC 25 in this area, with additional waterproofing measures if necessary. In the following we describe the details of the structure of a double-skin roof with a ventilated gap under the formwork. **COMAX Roofs®** Technical Department will advise you on the specific solution.

## Additional waterproofing layer

The protective waterproofing protects the thermal insulation from moisture that has penetrated or precipitated into the roof. It is most often made as a diffusion open film, as this also promotes drying of the thermal insulation. The thermal insulation is installed between the rafters and allows the attic to be used as a heated space. It must remain dry to function properly. It is therefore protected by an impermeable vapor barrier on the interior side and a diffusion-permeable



safety waterproofing on the ventilated gap side. The thermal insulation is extended under the rafters with an additional layer. This arrangement is suitable for normal interiors. For interiors with a demanding moisture balance, different solutions with moisture sealed - absolutely non-absorbent insulation should be used. The waterproofing layer is selected according to the building use and local conditions. The correct type of protective layer is also chosen with regard to any impregnation not sufficiently bound in the timber, which may completely destroy the layer. The installation of the foils is carried out in accordance with the manufacturer's instructions, as is the use of additional fasteners and sealing elements and, where appropriate, supporting formwork. Most membranes are fitted with application strips which greatly simplify and speed up the installation and connection to the eaves edge or in the area. Properly detailed, the roofing system is windproof. This is the only way to ensure the parameters of a low-energy or passive building. For technical assistance with the composition of the roof layer, please contact the **COMAX Roofs®** Technical Department.

## **Additional separation, drainage layer**

This layer protects the metal roofing from the underside against any harmful chemical and mechanical influences from the roof structure. These influences can be acidic (wood preservatives) or alkaline. The coating improves slip resistance during thermal expansion length changes of the metal, reduces nail penetration and formwork irregularities and also improves protection against weather noise. Protects against precipitation moisture during construction. A separation layer must always be applied when using OSB. For Comax ComBo 430 roofing we recommend an asphalt strip with a textile finish.

**Keep in mind that this layer is perforated with an anchoring material and therefore cannot be considered a safety waterproofing layer.**

## **Joining**

The Comax ComBo 430 templates are joined together by inserting folds behind the water grooves to form a lying groove in the surface. The templates are anchored to the substrate using flat hidden extensions. There are a total of 5 holes in the flat stainless steel extensions - the pair of smaller holes are for system nails, the pair of larger holes for anchor bolts. The larger hole in the center makes it easier to measure the roof area - orient the extension with the hole on the score line. The bottom corner of the template is secured with a moulded hook. At the bottom - eaves edge, the starter templates are threaded behind the eaves retractable flashing or retractable strip. Any connection to the wall or gable edge is to be made as an indirect connection - the roof surface is terminated with a bend, which is followed by the flashing. Battens and flashings up to a length of 4 m are supplied by **COMAX Roofs®**.

Painted materials are not suitable for soldering. Although soldering of aluminum is possible after mechanical removal of the lacquer layers, heating will further degrade the material. Soldering aluminum in a construction environment is then particularly difficult. It is possible to join painted materials by bonding. Polyurethane or MS polymer adhesives with flexible bond (Sh 40) certified for this purpose are suitable. The bonded joint should be fixed with a clamp or tight rivets while the adhesive is curing. However, such a joint cannot be considered as an expansion joint.

## **Expansion**

Thermal expansion is a typical physical property of all substances. In many cases it can be used technically, in roofing it is an undesirable property, but it must not be neglected. Small-format roofing such as Comax ComBo 430 compensates for thermal stresses in the joints automatically. The expansion capability of the joint used (flush groove) must not be compromised by gluing, screwing or riveting.

## Laying templates

The installation of COMAX ComBo 430 templates is a technical job requiring skilled and careful workers. In order for a roof or facade area to have an aesthetic appearance in addition to its useful function, strict regularity in the coverage of the area must be achieved. Comax ComBo 430 is laid from eaves to ridge. At the latest after the installation of the starter templates on the eaves retractable flashing or retractable strip, it is advisable to start marking the auxiliary grid lines on the formwork and the battens, in which the extensions will be placed. The system's stainless steel extensions have a hole for this purpose, by which the hook of the bobbin can be hooked and the appropriate line in the pitch simply marked. The horizontal spacing of the templates is 497 mm. The edge templates in the gables, at the eaves, chimneys and eaves are cut and fitted with a 20 mm bend at the bottom to hook this bend behind the water groove of the relevant flashing. For the ridge, cut the templates as required and fit the water groove. When the template loses its hook for the extension by cutting, anchor it directly with a fitting screw. From an aesthetic point of view, it is advisable to measure the roof area so that the installation is symmetrical - the outermost templates are cut equally on both edges (mirrored). It is important to apply even pressure when sliding the templates on top of each other so that they do not slide back down before being fixed. Every now and then a check measurement should be made sideways and upwards, probably more often in the beginning to make sure that the laying does not deviate from the vertical and horizontal. Printing the foil under the covering will make the job much easier.

**If the roof temperature exceeds 60°C in summer - DO NOT step on the hot surface. The painted layer softens, there is a risk of slipping or damaging the surface.**



## Additional material

- a. Safety waterproofing foils (according to the roof layer - diffusion open) according to ČSN 73 1901. **ATTENTION: The foil must always be suitable for the application.**
- b. Roof battens and boards.
- c. Fastening and anchoring material.
- d. Separating foils.
- e. Butyl rubber sealing tape – used for bonding diffusion foil to porous substrates, as a seal under the counter-battens.
- f. Polyurethane flexible adhesive sealant, an auxiliary waterproofing agent in roof details, surface bonding as a substitute for soldering.

## V. Installation of additional structures

The Comax ComBo 430 roofing is installed on the formwork under which any protective waterproofing has already been installed, including the installation of its eaves and a perforated strip to prevent birds and insects from entering the air gap of the double-skin roof.

Before the actual roofing is laid, we will fit the recessed gutter hooks and drainage gutters, eaves, gable flashing and retractable eave strip. We prepare the chimney flashings and, if necessary, the roof windows. The flashing will be done using the coils sent to site. We supply suitable Comax Falc Coil material in both finishes and roofing colours.

### Eaves retractable flashing

The installation of the roof area begins with starter templates, which are threaded under the eaves retractable flashing, or retractable strip, at the eaves edge. The starting templates invariably determine the geometry of the template laying in the area. If the eaves edge is not perpendicular to the roof slope, the starter templates must be adapted from the standard templates by trimming at the angle of the eaves edge and bending approx. 20 mm underneath for insertion behind the eaves retractable flashing. The corner with the extension must always face up the pitch - directly towards the ridge of the roof. The ventilation of the roof air gap should be covered with a perforated profile against birds and wasps.

### Flashing to the wall longitudinal

One option is to use the bottom longitudinal wall flashing profile. The flashing is anchored to the roof surface behind the water groove using extensions. The upper part of the flashing is anchored to the wall according to the dimensions using a cover strip of smaller lengths directly according to the wall material using screws and possibly dowels (the safety waterproofing or even the separation layer is lifted up to the wall and covered with the wall flashing). The individual parts of the flashing are overlapped „from water“ - the installation is carried out from the eaves to the ridge. If the adjacent wall has a low attic, we recommend that the entire area is flashings. The individual cut templates are fitted with a 20 mm bend underneath. Fix the template by hooking the bend behind the water groove of the flashing. If the template has been lost by cutting the section for the extension, anchor it with the extension behind the side bend or directly with a screw.

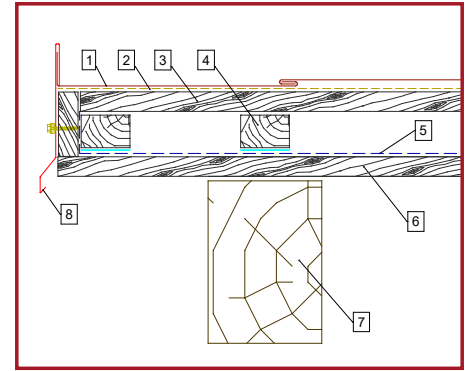
### Eaves

The eaves are generally one of the weak points of the roof. Careful attention must be paid to its design. Above all, the width of the eave should not be underestimated and the fact that the gutter may be clogged with leaves or similar debris should be taken into account. The eave shall be supported by formwork or thickened flashing throughout. The COMAX ComBo 430 roof templates must be terminated in the eave and fitted with a downward bend (diagonally, according to the direction of the gutter), similar to that on the eaves edge of the roof. The templates are then anchored by bending under the inner bend of the safety eave, which replaces the connection rail. If the pitch is low, it is advisable to modify the formwork and make the eave recessed. The gutter is fixed to the substrate by expansion joints. It is recommended to reinforce the safety waterproofing under the air gap and to make a formwork bed for it.

**Tip: make the bending easier by cutting off the edge bends of the ComBo 430 template 15-20 mm beyond the bend line towards the template area.**

## Gable flashing

The gable flashing protects the exposed edge of the roof from wind and rain. The following example shows a simple solution (flat retractable gable flashing). The batten is rolled behind the raised edge of the individual templates attached with extensions. The bottom reinforcement of the molding is fixed by threading or by extensions. For small lengths, direct anchoring is also permissible. The figure shows a possible solution:



## Installation of ridge or corner

In our installation instructions, we assume the use of Comax ComBo 430 templates on a double-skin roof. In the vast majority of cases, the ridge or corner will need to be made as ventilated. Due to the required venting area, linear venting is not easy. A gap of approximately 40 mm is omitted in the formwork of the ridge and the retaining waterproofing is reinforced at the ridge. The bent ridge is supported by a pair of ventilation ridge rails. The battens are fixed under the top templates, which are cut to size and fitted with a water groove. In the gable, the ridge is closed with a lid. The apex templates are anchored directly to the substrate with fitting screws so that the screws are hidden under the ridge, which is screwed to the ventilation ridge rails. This design is suitable for roofs where there is no risk of the ventilation gap being closed by a layer of snow in winter. The air gap can of course also be ventilated by point fans or turbines.

For a pitched roof, a modified detail is used - the air gap outlet must be oriented in the direction of the prevailing wind. The ventilated gap is protected from birds and insects by the density of the perforation of the ridge ventilation bar.

To ventilate roofs with complex shapes, roofs in high snow areas, other solutions must be used. Roof turbines can also come into play. For ventilation of smaller roofs and roof details, we preferably use point ventilation templates:

For further information, contact the **COMAX Roofs®** Technical Department who will help you to solve the problems on your roof.

## Connection when changing the pitch of the roof planes – attic transition

This is a transition from one roof plane at an angle to another. We finish the edge of the mansard roof section with a 25 mm bend on the templates in the pitch of the upper roof plane. Attach the templates to this bend with extensions anchored to the upper roof surface. Start the upper part of the roof again with the starting templates in the same way as for the eaves edge. If the upper roof area does not reach the required pitch, we recommend that it is covered with Comax FALC 25, which with additional waterproofing measures can be used from a pitch of 4°. FALC 25 is available in the same colour as Comax ComBo 430.

## Connection when changing the pitch of the roof planes - transition of a pitched roof

This detail is very common in reconstruction of older buildings. Ideally, we make use of the possibility of bending the template in the middle section. If the bend does not come out in the middle of the template, it is necessary to adjust the whole area and not to start at the eaves with a standard starter template, but to adjust a suitable template from the complete template so that the break in the pitch falls in the middle of the template. Other solutions are visually less suitable.

## Finishing the pitched roof

A pitched roof can end with an attic or an edge. If the attic is low, it is operationally advantageous to clad it at full height. The detail is broadly similar to the ridge design. In the case of a double-pitched roof, to which all of the above solutions apply, ventilation of the air gap must be carried out. Depending on the wind situation, it is possible to choose either a bottom-vented or a top-vented design.

## Chimney flashing

The flashing of a chimney, flue or skylight is classically made up of four parts, which are watertight and connected to each other by means of folding - essentially along the water. The flashing is anchored to the chimney body indirectly (expansion) by means of a cover strip. The lining itself is made loose - conical for expansion reasons. In the side parts, the flashing is finished with a water groove, behind which it is anchored to the substrate with extensions. The individual templates are cut in this part and finished with a bend that hooks behind the water grooves (as in the case of gable flashings). The lower part of the flashing overlaps the cut templates finished with a water groove. The templates are anchored by extensions behind this groove and the lower part of the flashing is hooked behind it. At the top, the flashing is laid and the covering is continued by pulling the starter templates behind the auxiliary connection rail, which runs across the full width of the flashing.

If the top edge of the chimney is within approx. 2 m of the ridge, the covering is not connected and the bottom flashing is carried through to the ridge. For skylights and large chimneys, the upper part of the flashing should be done in such a way that water does not form a pool. The waterproofing membrane must be adjusted in the same way (by folding it diagonally). If a large chimney (skylight) interrupts the ventilation gap of a double-skin roof to a significant extent, the detail should be made as ventilated or ventilation should be provided by another measure - the ComBo 430 ventilation template.

## Rooflights cladding

The procedure is similar to that used for cladding chimneys. For technical assistance from **COMAX Roofs®**, we will report the conducts and their dimensions already when entering the dimensions of the roof planes into the system for creating the roof plan. We recommend consulting with the skylight manufacturer, who usually has the appropriate type of system flashing applicable to COMAX ComBo 430.

## Roofing conducts (ventilation chimneys, antennas)

In the case of roof sheathing conducts, we also supply suitable material (for ventilation, sleeves for antenna conducts, flex hose, etc.). They are made and adapted specifically for sheet metal roofing and meet the tightness and serviceability requirements of this roofing material.

## Snow guards and breakers, solar systems

Snow and ice prevention systems shall be installed in accordance with ČSN 73 0035.

The installation of these systems increases the operational safety of buildings and reduces excessive stresses on the roof structure and gutters in the event of melted snow melt slide. The roof made of COMAX ComBo 430 metal templates can be fitted with flat or linear barriers. In both cases, these barriers cannot catch a loose snow avalanche! Their expert placement in the roof area will prevent these avalanches. Flat barriers consist of simple metal snow breakers (noses) anchored to the formwork or battening so that they also form an extension of the respective template. The placement of the breakers depends on the snow load of the roof area. In snow areas 2-3, it is recommended to fit the lower 2/3 of the roof when the roof pitch is up to 30°, from

30° the whole roof is fitted. The hooks are fitted on every second template, in the eaves area on every template.

The linear barriers consist of a retaining grid (ladder) supported by brackets. The brackets are anchored to the formwork in close proximity to the rafters (max. spacing 1m) and their flat part passes over the system extension. The linear barrier is placed on the roof at the eaves where the heated space under the roof ends. Depending on the size and pitch of the roof, it is advisable to use more than one linear barrier or to use a combination with snow breakers. The installation of snow guards should be described in the roof design - not only the snow area of the building should be considered, but also the interrelationships of the roof surfaces in the vicinity and the avoidance of dynamic impact caused by avalanche.

Also, the solar system attachments pass their flat part over the system extension - they are anchored similarly to snow guards. Heavier systems or systems with wind stress must be anchored to the rafters and the passage through the roofing must be solved with conduct sleeves.

## Use on the facade

COMAX ComBo metal templates are also suitable for facade applications. It should be remembered that a facade is not a steep roof and that the builder expects other, mostly aesthetic qualities from a metal facade. The metal cladding of the facade is also usually closer to the observer, so that any craftsmanship flaws will become apparent. If flatness is desired, unevenness should be compensated for when the formwork is installed. The COMAX ComBo 430 templates are free of depressions and can be shaped with a slight bend in the diagonals - they therefore also clad uneven surfaces. All details on the facade must be addressed from an aesthetic point of view, which is more important than waterproofing. The **COMAX Roofs**<sup>®</sup> technical department looks forward to working with you on your facade.

## VI. Maintenance

External influences can have a negative impact on the viability of the roofing material. We recommend that you regularly inspect the roofing and systematically remove accumulated dirt that could cause a chemical reaction and thus damage the protective coating. In the event of damage to the surface (e.g. scratches or peeling paint), the area must be thoroughly cleaned (including degreasing) and then treated with a repair paint.

### An annual inspection should be carried out:

- Roof structure ventilation functionality
- Condition and fixing of the drainage systems
- Condition and fixing of roof safety features
- Condition, tightening and fastening of roofing conducts
- Condition of seals (ventilation strips)
- Condition and tightening of self-tapping screws
- Condition of finish and flashings (cladding)

## VII. Description of risks

The installation and operation of Comax ComBo 430 roofing involves only minimal risks, which are prevented by observing the basic safety rules.

In particular, the installation and maintenance of the roofing involves the risk of persons and objects falling from a height and cutting themselves on the edge of the sheet. Any person who handles the templates and battens in any way must take care not only for their own health but also the health of others. The installation of roofing should be carried out by a competent person. When cutting, it is important to keep the sheet to be cut at a safe distance from the cutting plane. Use cut-resistant protective gloves to securely grip the individual elements. When working at heights, use adequate guarding and secure the workplace from unauthorized entry.

### Disposal method

Sheet metal roofing from **COMAX Roofs®** is fully recyclable.

### References to norms

**The following standards and provisions must be observed when installing Comax ComBo 430 roofing:**

- ČSN 73 19 01 - Designing of roofs
- ČSN 73 36 10 - Designing fitting structures
- ČSN EN 1991-1-3,4,5 - Loads on structures from snow, wind, temperature
- ČSN 73 0001-5 - Wooden structures
- ČSN EN 507 - Aluminum sheet roofing with full support
- CKPT Rules for Roof Design and Construction 2014
- CKPT Rules for the design and execution of fitting structures 2020

### Roofing materials we supply:





**COMAX ROOFS®** is a trademark of company  
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## 10 benefits of COMAX ROOFS



**Czech made**



**long tradition**



**colorfastness**



**flexibility**



**recyclability**



**compatibility**



**fair play**



**quality**



**expertise**



**teamwork**