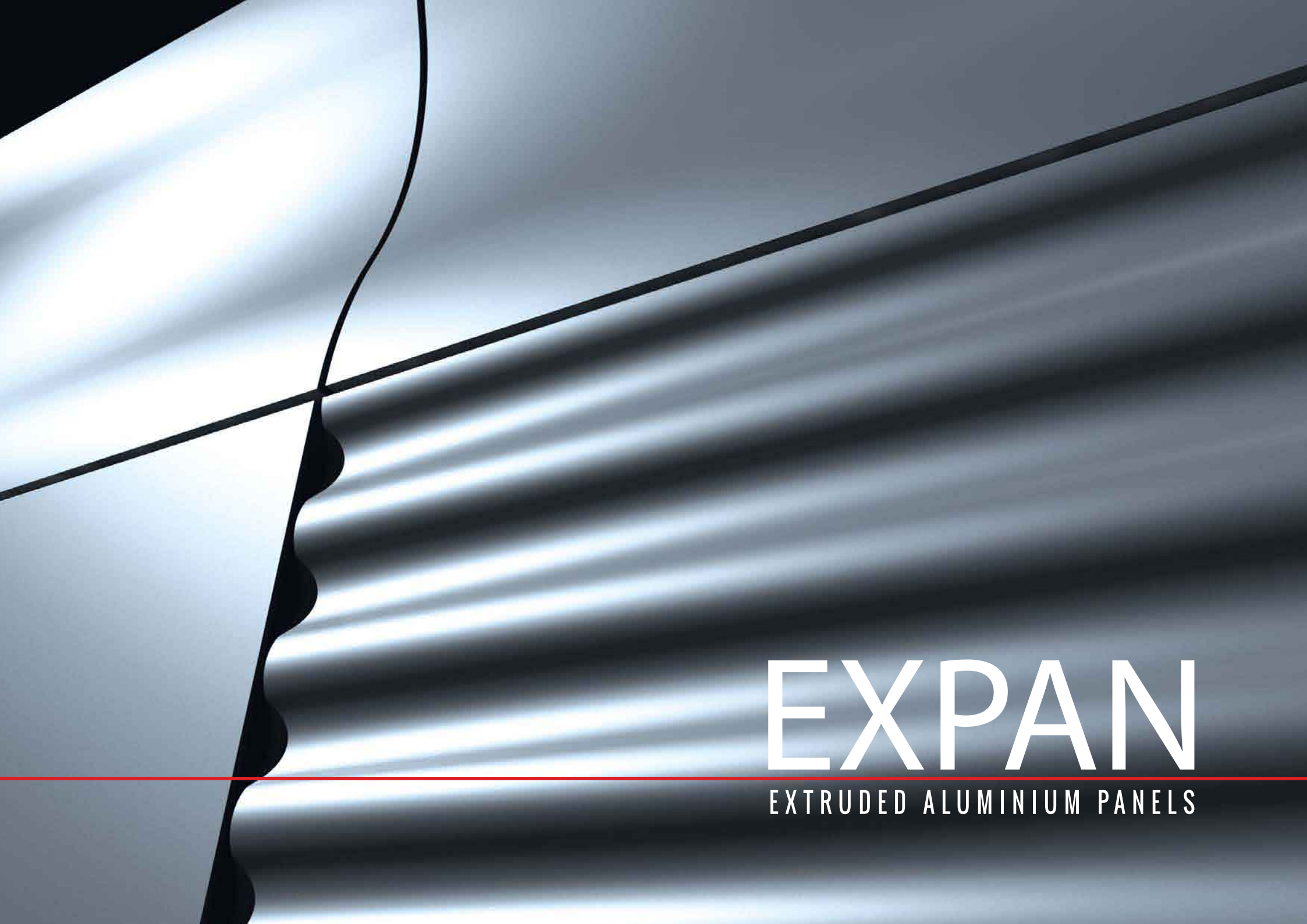
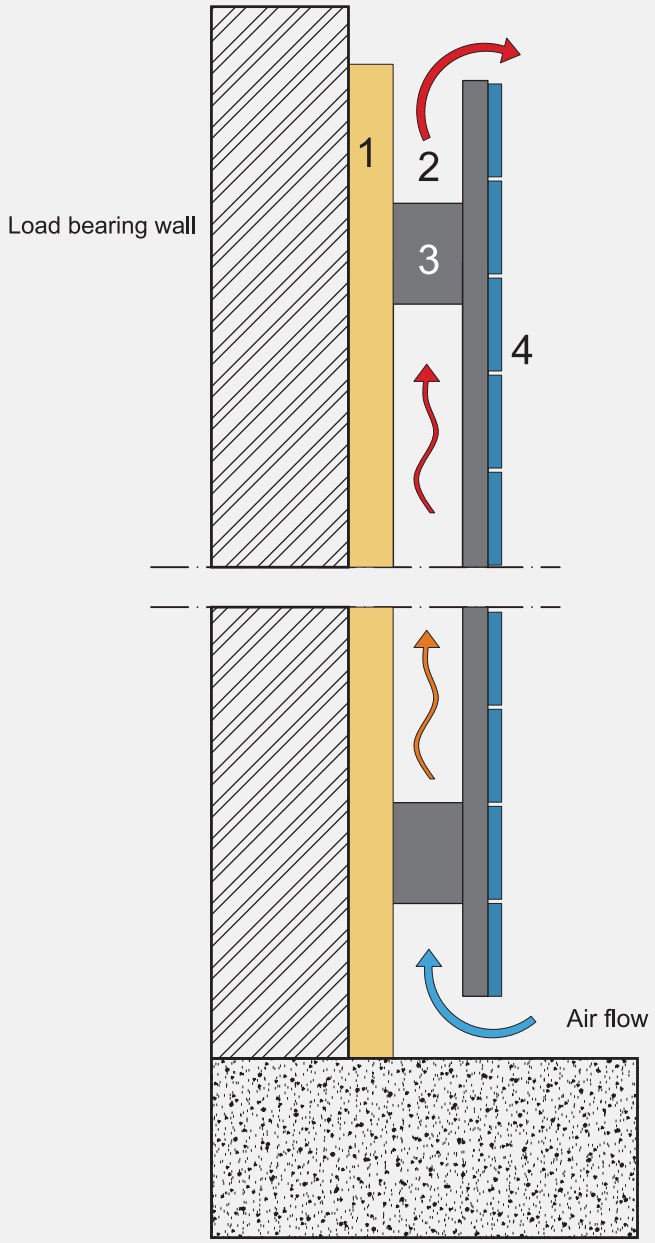


EXPAN

EXTRUDED ALUMINIUM PANELS

RAINSCREEN PRINCIPLES



Ventilated wall cladding is made of several elements which are added to the load bearing wall of the building:

1. Thermal insulation layer (of different thicknesses according to energy requirements)
2. Rear ventilated cavity
3. Adjustable sub-frame which determines the distance from the main wall.
4. External rainscreen cladding which provides technical performances protecting the building against weather conditions.

This construction method has considerable ecological and economical benefits:

- The ventilated wall cladding incrases the lifetime of the building
- The outside wall of the building and the thermal insulation layer remain dry
- The ventilated wall cladding gives excellent protection against heat and cold ensuring a comfortable internal environment
- This cladding method is an energy-saving façade leading to minimum carbon dioxide discharge
- Protection against acoustic pollution

WHAT IS ALUMINIUM

Origin

Aluminium is the third most abundant element on earth (after oxygen and silicon). An estimated 8% of the earth's crust consists of aluminium. The highest concentration of aluminium is found in bauxite (45-60%). Bauxite was first discovered in Les Baux, a town in southern France, hence the name bauxite.

History

In 2011, Aluminium celebrates its 125th anniversary!

- In 1761, a Frenchman named de Morveau discovered a previously unknown material. He gave it the name "alumina", from the Latin word "alumen", which means "light".
- In 1787, the chemist Lavoisier determined that alumina was an oxide of a metal that was unknown at that time.
- In 1821, bauxite was discovered at Les Baux.
- In 1825, the chemist Oersted isolated the metal for the first time in a more or less pure state by using a complex distillation method.
- In the following years, Wöhler (1827) and Deville (1854) searched for less expensive ways to produce aluminium.
- In 1855, an aluminium rod produced by Deville was exhibited next to a silver rod at the World Exhibition in Paris. The response to the new metal was enthusiastic.
- In 1865, the author Jules Verne suggested that space travel would one day become reality thanks to aluminium.
- In 1866, Charles Martin Hall and Paul Héroult developed a method for extracting aluminium from alumina by using electrolysis.
- In 1898, the Bayer process was developed. This made it possible to produce alumina powder from bauxite on a large scale.
- On the eve of the 20th century, aluminium was poised to acquire the status of a basic material for the production of all sorts of new and modern products.

Alloys

Aluminium can be alloyed with manganese, silicon, magnesium, zinc and other elements. The addition of a small amount (0.5-3%) of one or more other metals is sufficient to enhance certain useful properties of aluminium, such as strength, hardness, weldability or corrosion resistance.

Surface treatment

A thin, matt grey oxide layer forms on the surface of "natural" aluminium due to a natural reaction with oxygen in the air. It protects aluminium products against corrosion and causes aluminium to last longer than other construction materials under comparable conditions.
The following methods can be used to provide additional protection or for aesthetic reasons:

Anodizing

This is an electrochemical process that artificially increases the thickness of the oxide layer on the aluminium from 0.1 µm to 15 or 30 µm. Anodized finishing can be produced in various colours.

Powder coating

The coating is sprayed in powder form onto the pre-treated aluminium surface with the aid of static electricity. After the coating is applied, it is dried and cured in an oven. Coatings can be applied in any desired colour and with various thicknesses.

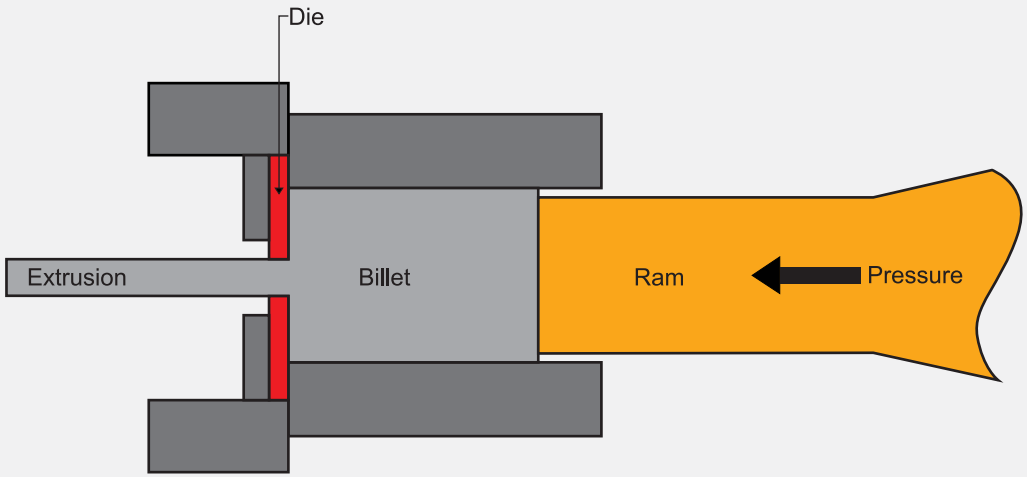
THE EXTRUSION PROCESS

The principle of extrusion is simple: A heated billet is pressed through a die with great force, and the finished profile emerges from the die in a manner that is not unlike piping icing through a pastry bag to decorate a cake.
The profile emerges at a speed of 5–50 meters per minute and reaches a length of 25–45 meters. Cooling takes place immediately, by air or water. To ensure that the profiles are straight and to release internal stresses, the profiles are stretched after cooling. At the same time, they are checked to ensure that all key functional dimensions are correct and that the surface quality is correct. The profiles are then cut to the appropriate length. The material is then subjected to natural ageing or artificial ageing to bring it to its permanent level of tensile strength.

The extrusion process can be summarized in the following main steps:

- Heating the billet to the plasticity temperature (approximately 450° C)
- Pushing through the die under high pressure
- Cooling when the profile is straightened
- Stretching the profile
- Cutting to size
- ‘Ageing’ in an oven at approximately 170°C, depending on the mechanical properties required.

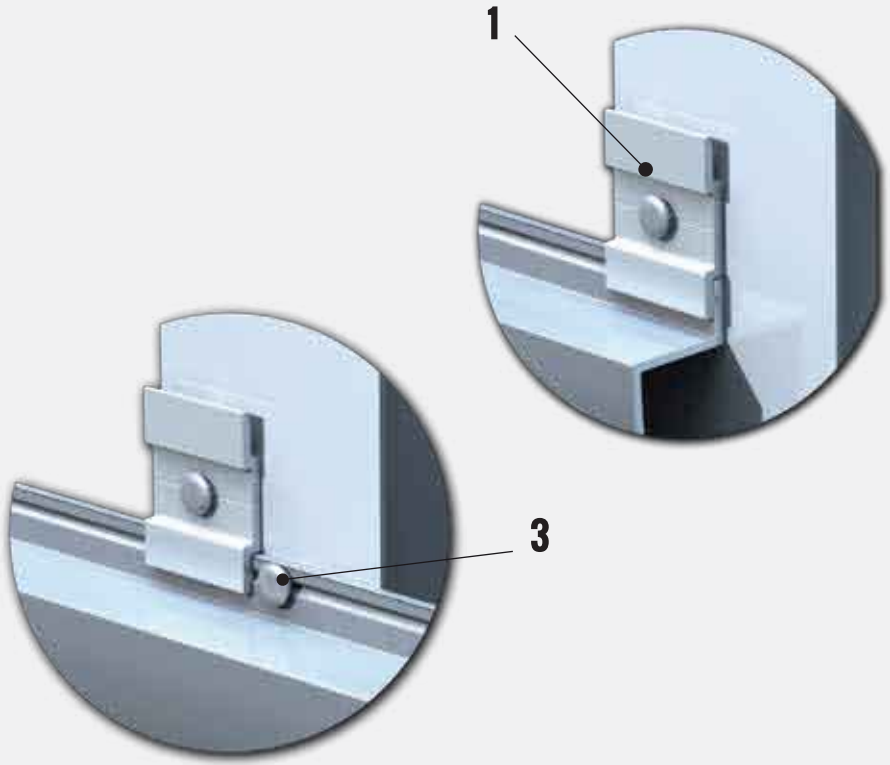
Extrusion die

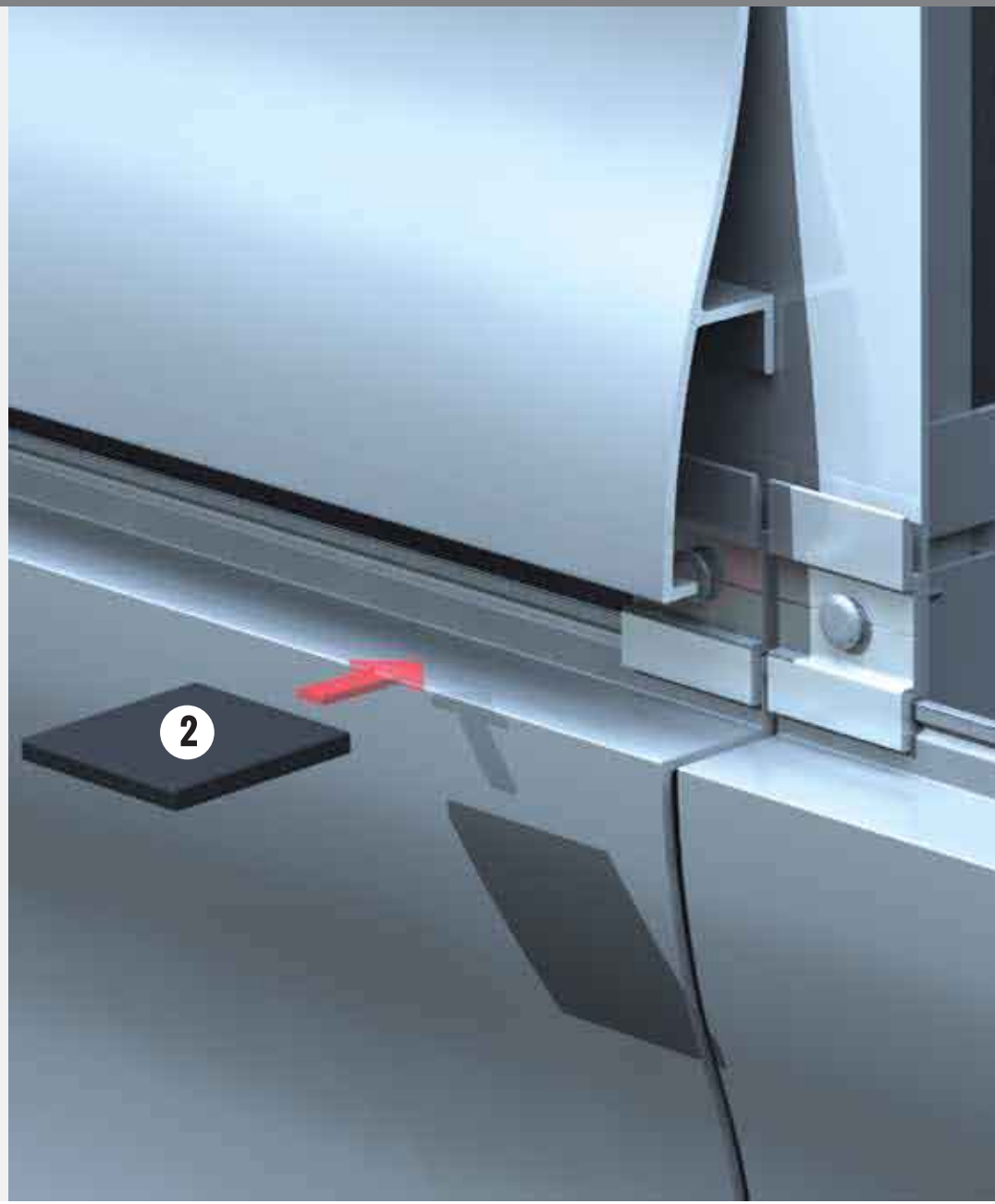


Schematic view of the extrusion process

THE FIXING METHOD

The fixing method, which is the same for all panels, uses a uniquely designed extruded aluminium fixing clip (1). The clip has a small lip on the back which is inserted into the receiving groove at the top of the panel. The clip will also receive the top panel . The clip will have an approximate length of 40mm. and will have to be positioned at the vertical mullions. The panels are then fixed to the supporting frame by means of stainless steel fasteners having regard for the chosen panel/panel joint dimension via a spacing gauge (2). This fixing method will permit the panels to freely expand and contract. In addition, to avoid panels sliding from their position, it is necessary to fix the panel directly to the central mullion as shown below (3).





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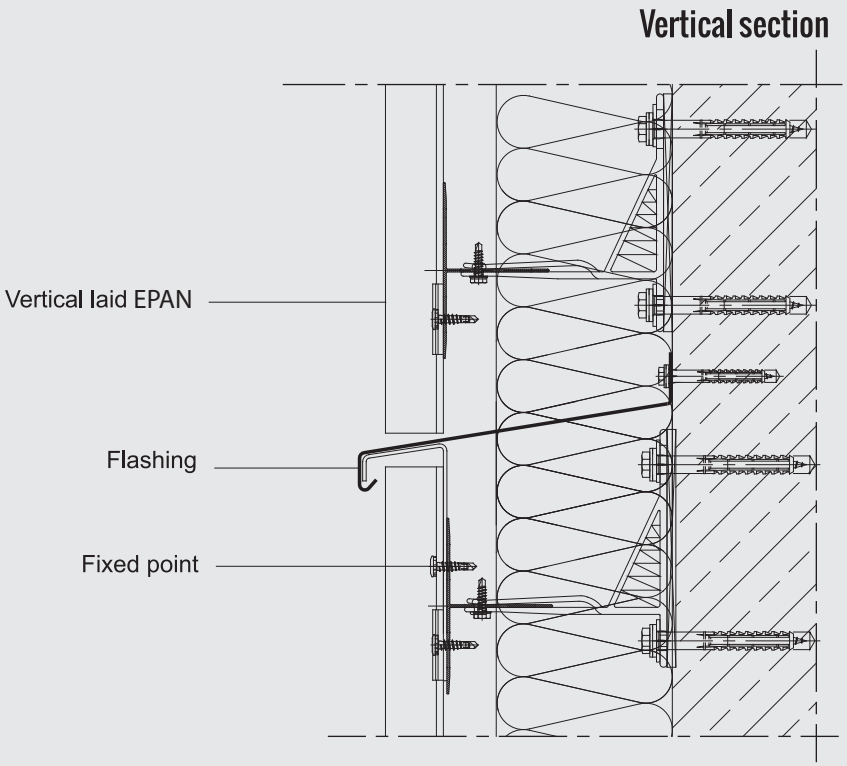
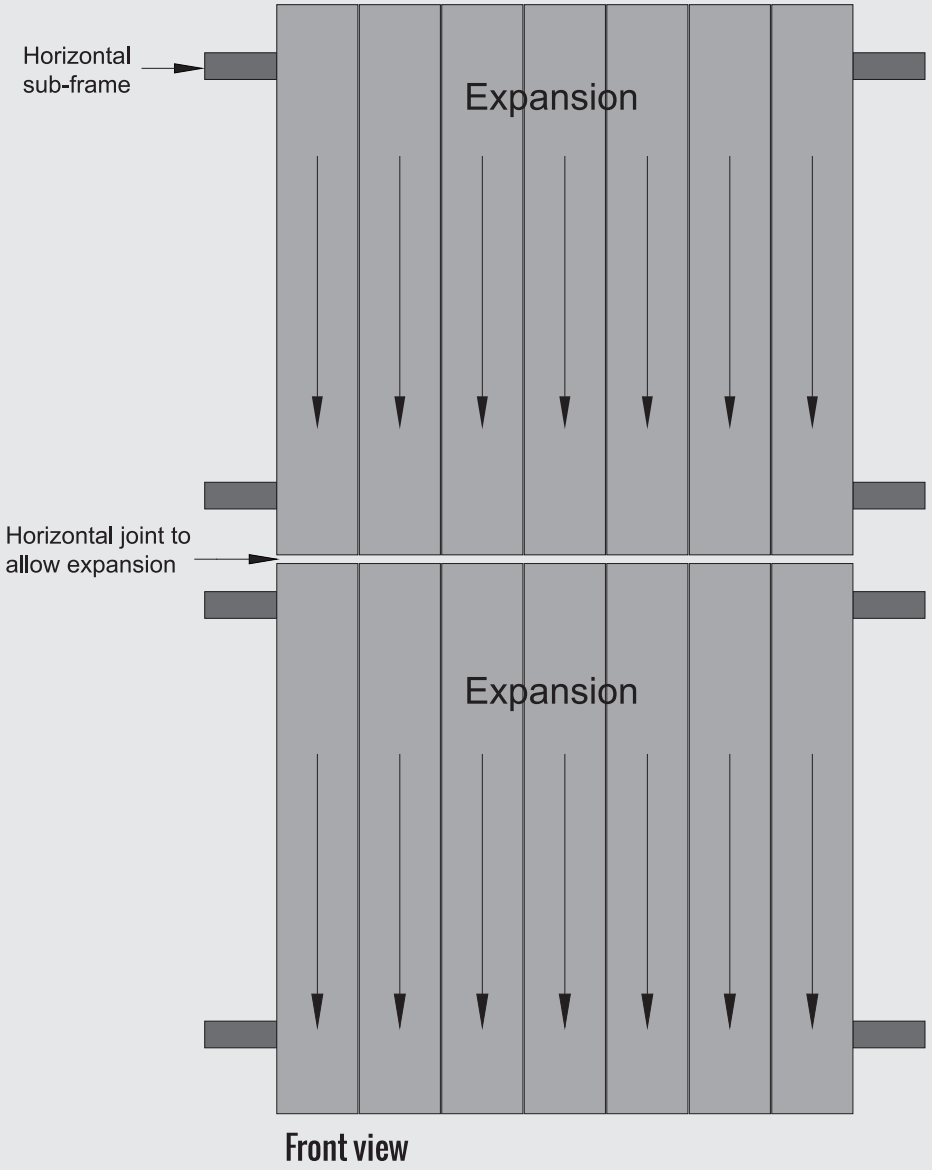
VERTICAL LAYOUT

EPAN is generally laid horizontally. However sometimes, a vertical layout is required.

Also in these circumstances XPAN is incredibly easy to install. In the following pages we will show you how vertical layout panels can be installed.





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VERTICAL LAYOUT - Schematic views

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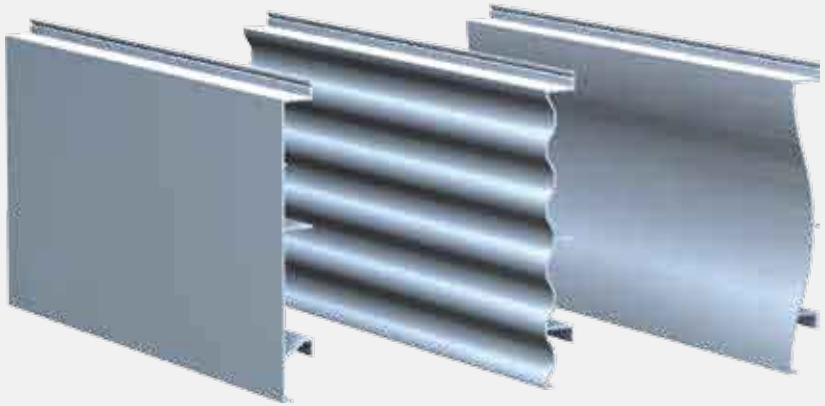
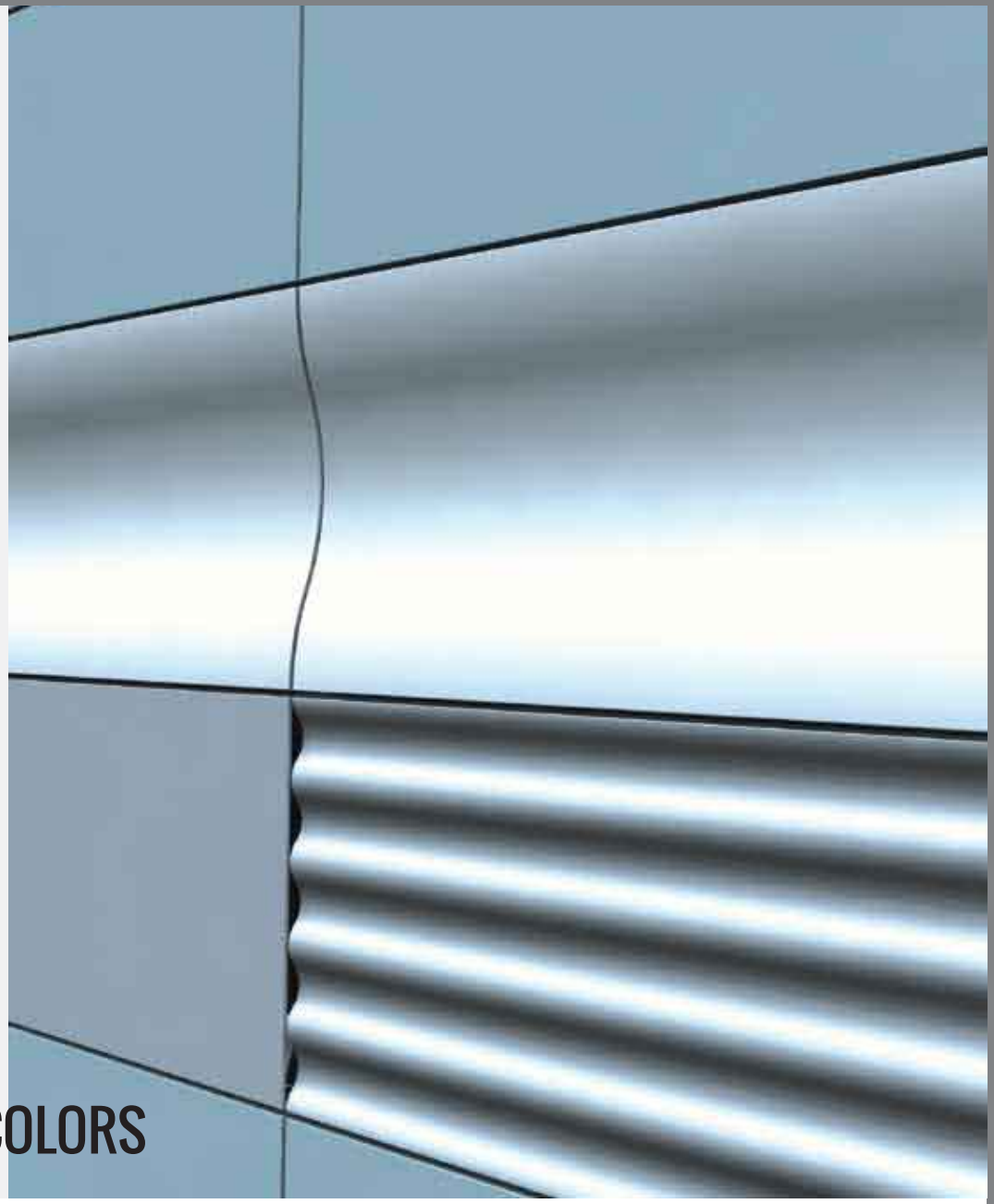
EPAN ADVANTAGES

What makes EPAN really unique is that it represents the first extruded cladding system made of 300mm. module size extruded profiles. We have chosen the 300mm. module because it is a standard dimension for wall cladding and modular for floor to floor span.

There are many other advantages that make of EPAN the best solution available, such as:

- Extreme rigidity
- Reduced number of vertical mullions
- Reduced erection time
- Fast and easy fixing method
- Panels are ready to be installed
- Small quantities can be supplied in different colors and finishes
- New profile shapes can be designed by Promoclad in collaboration with the customer
- Endless combination possibilities





PLAY WITH SHAPES AND COLORS

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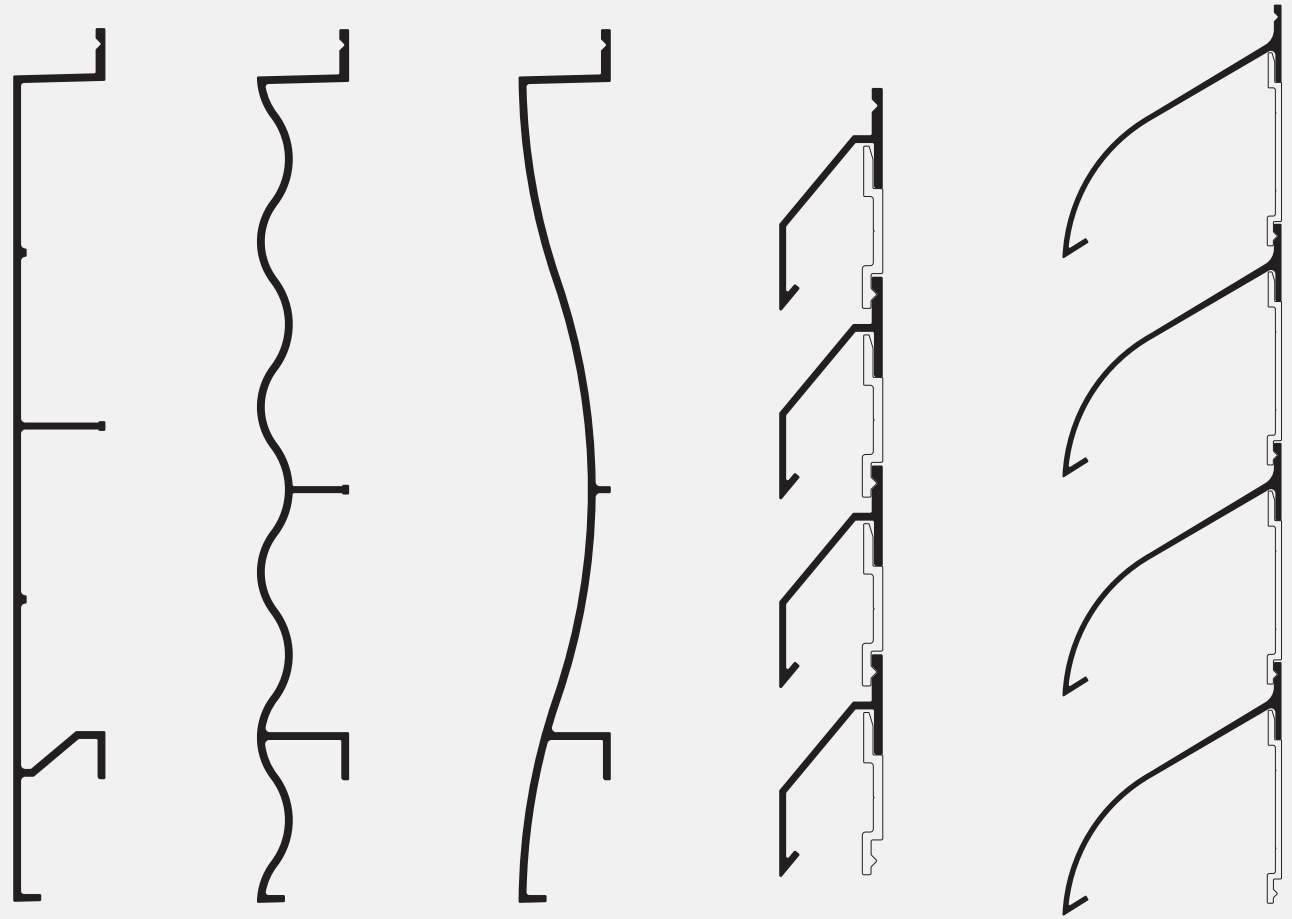
THE PROFILE RANGE

EPAN consists of five different profiles always available. Many others can be added to increase even further design possibilities. In the following pages we will show our standard range:

EPAN 1 - Flat surface profile
EPAN 2 - Sinusoidal profile
EPAN 3 - Concave/convex profile
EPAN 1L - Louver blade
EPAN 2L - Sunshade blade



EPAN 1 EPAN 2 EPAN 3 EPAN 1L EPAN 2L

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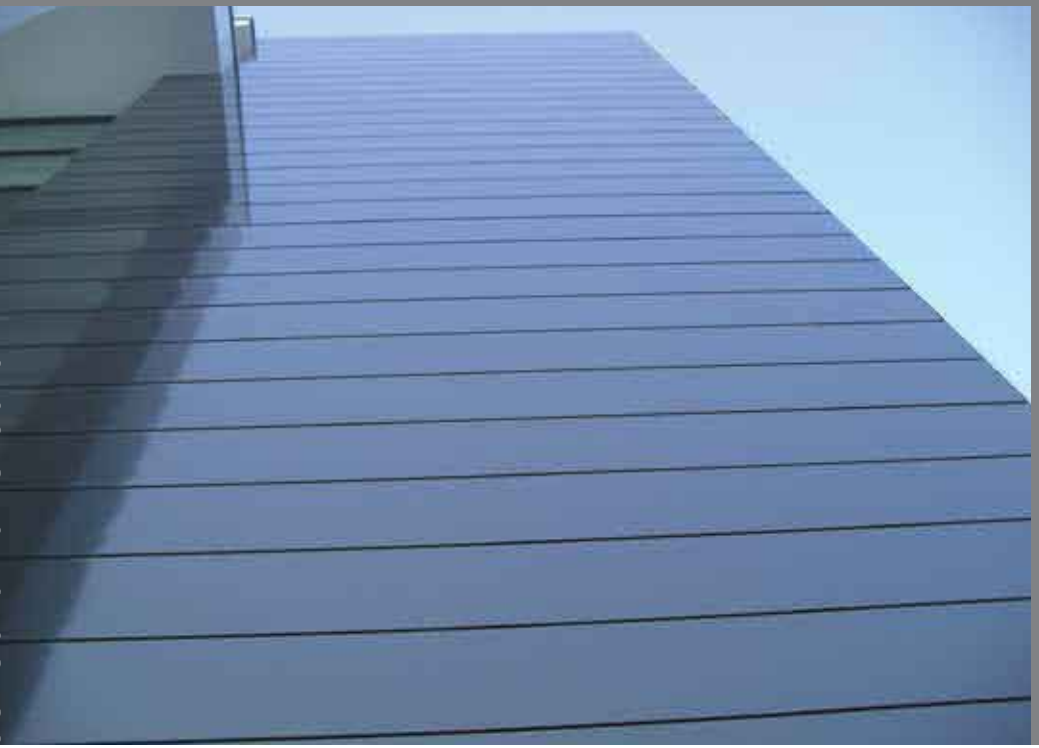
REAL POSSIBILITIES



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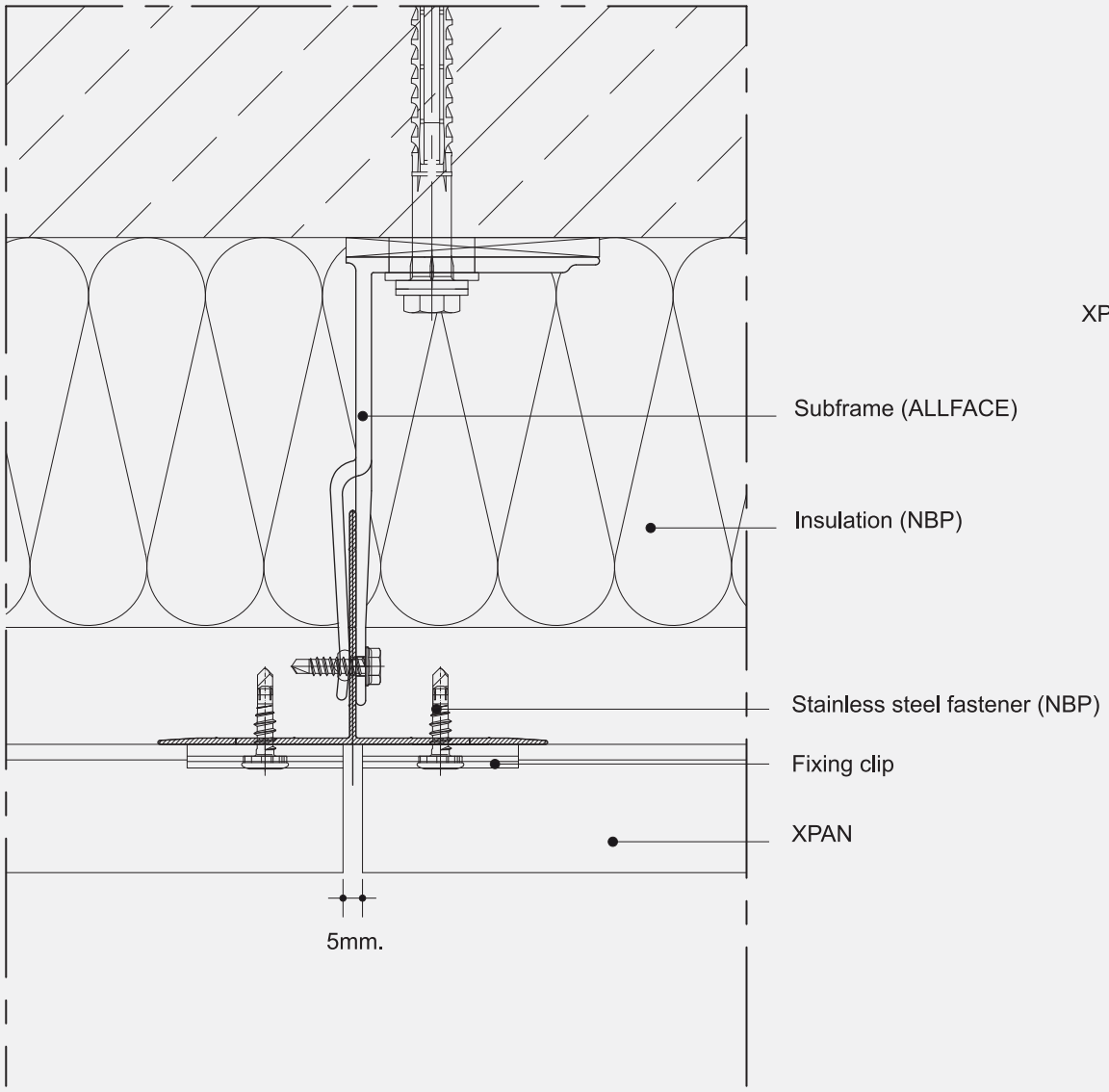
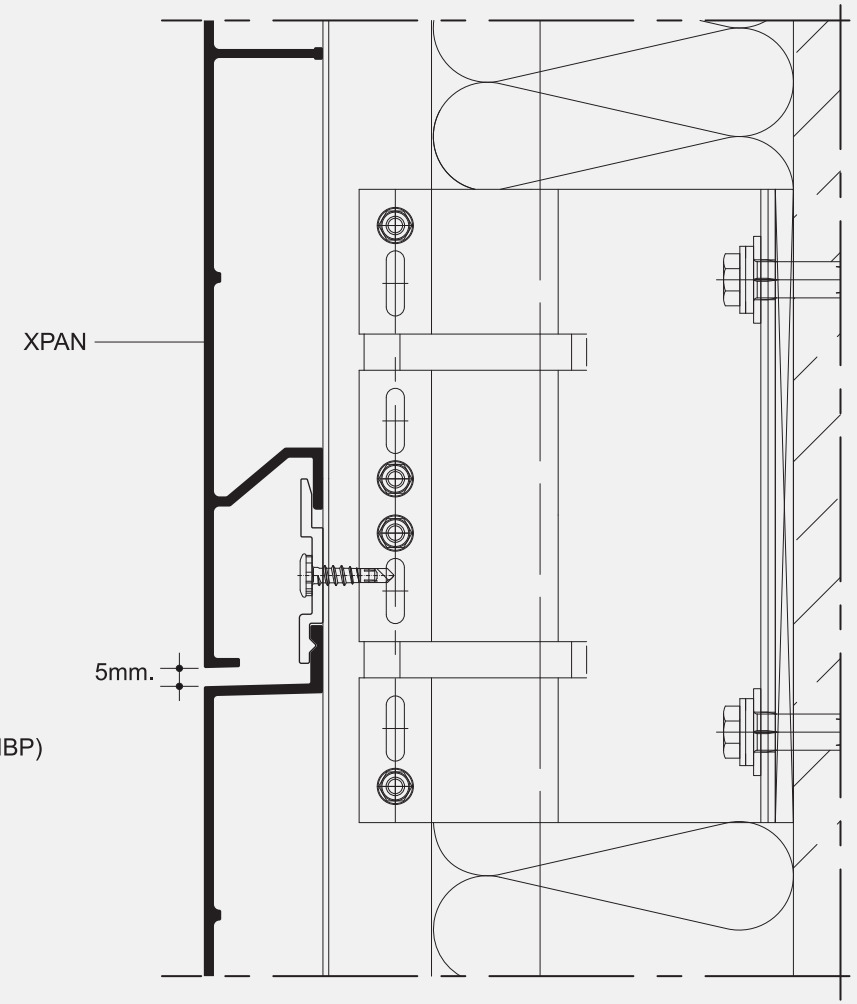
1- Vertical joint



2- Horizontal joint



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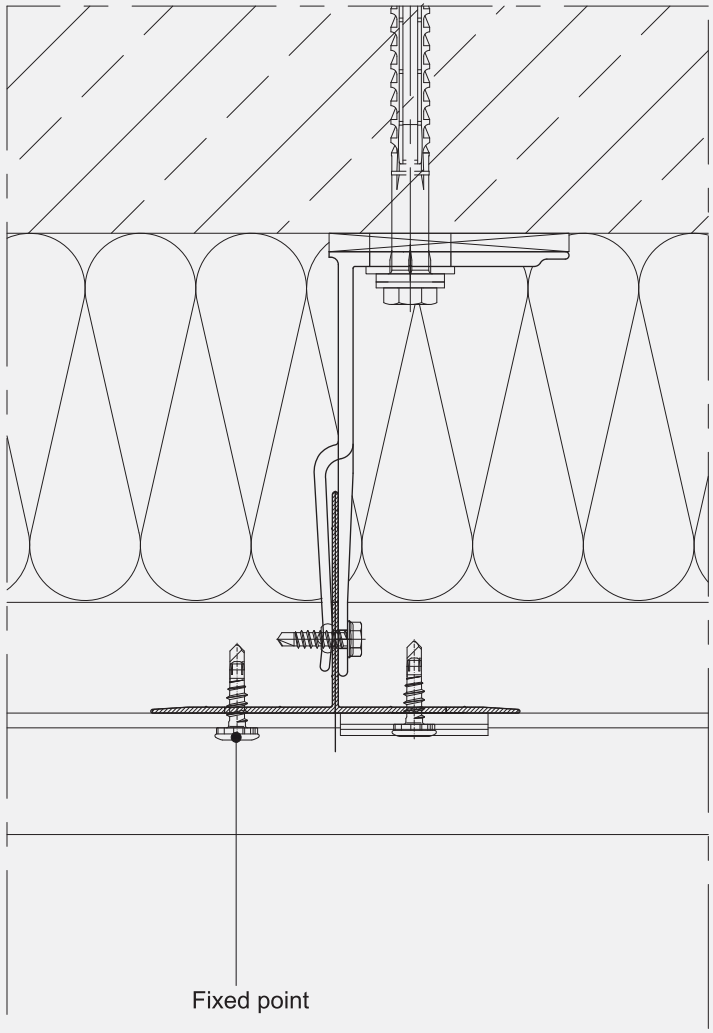
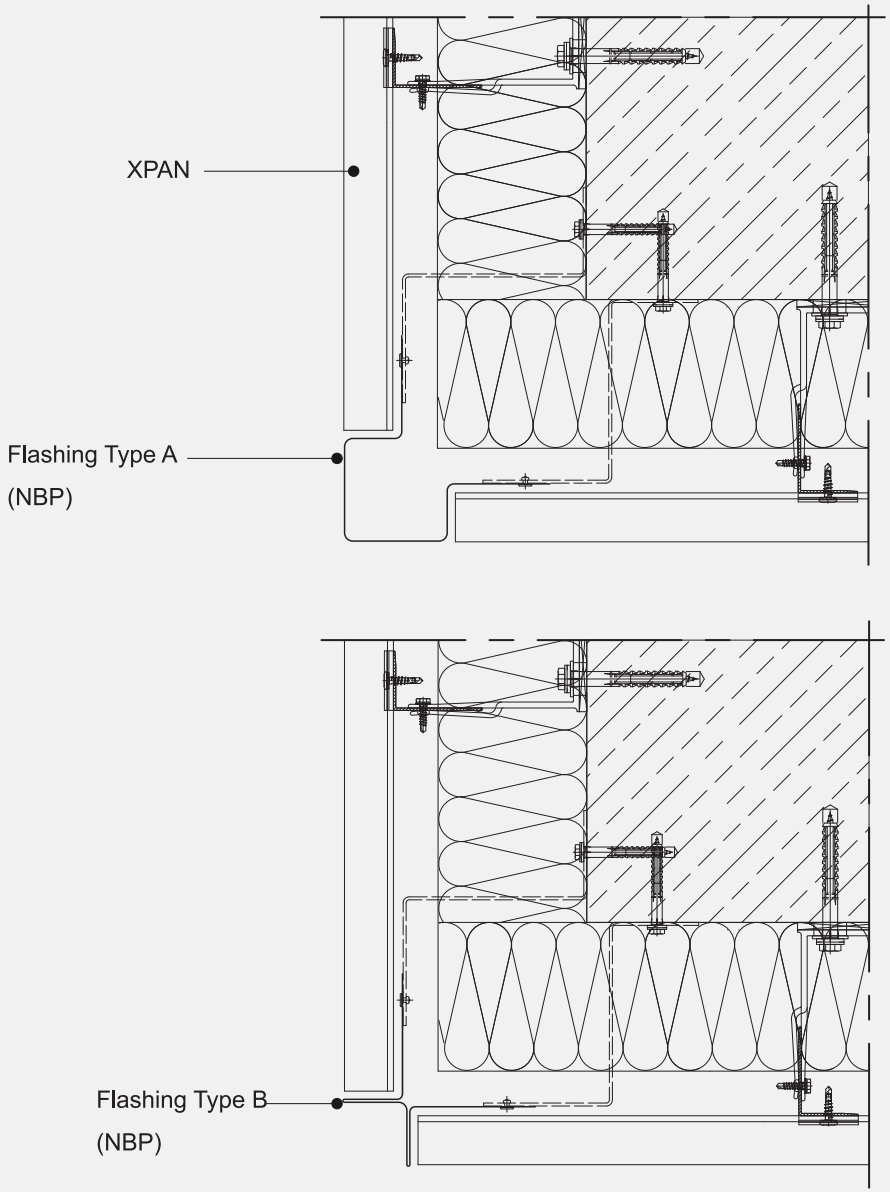
3 - Central mullion detail



4 - Outside corner with flashings



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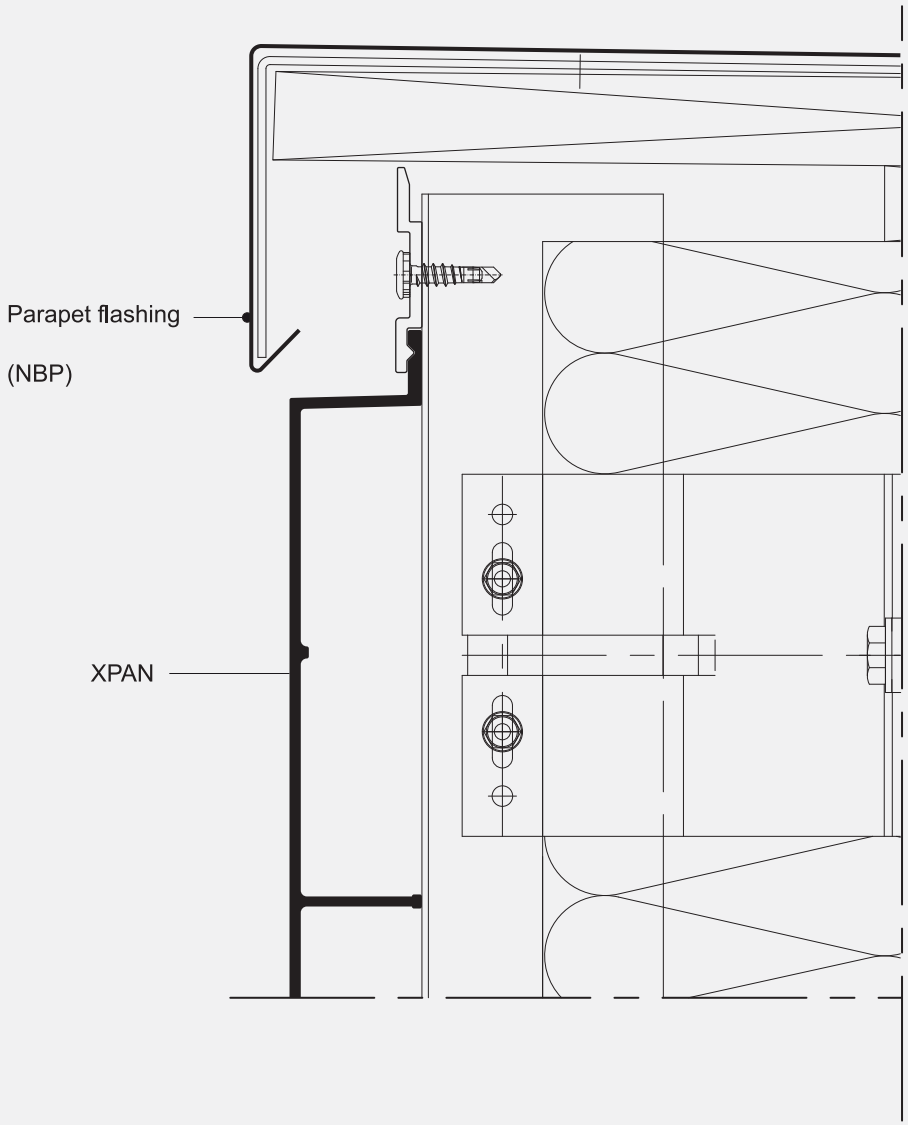
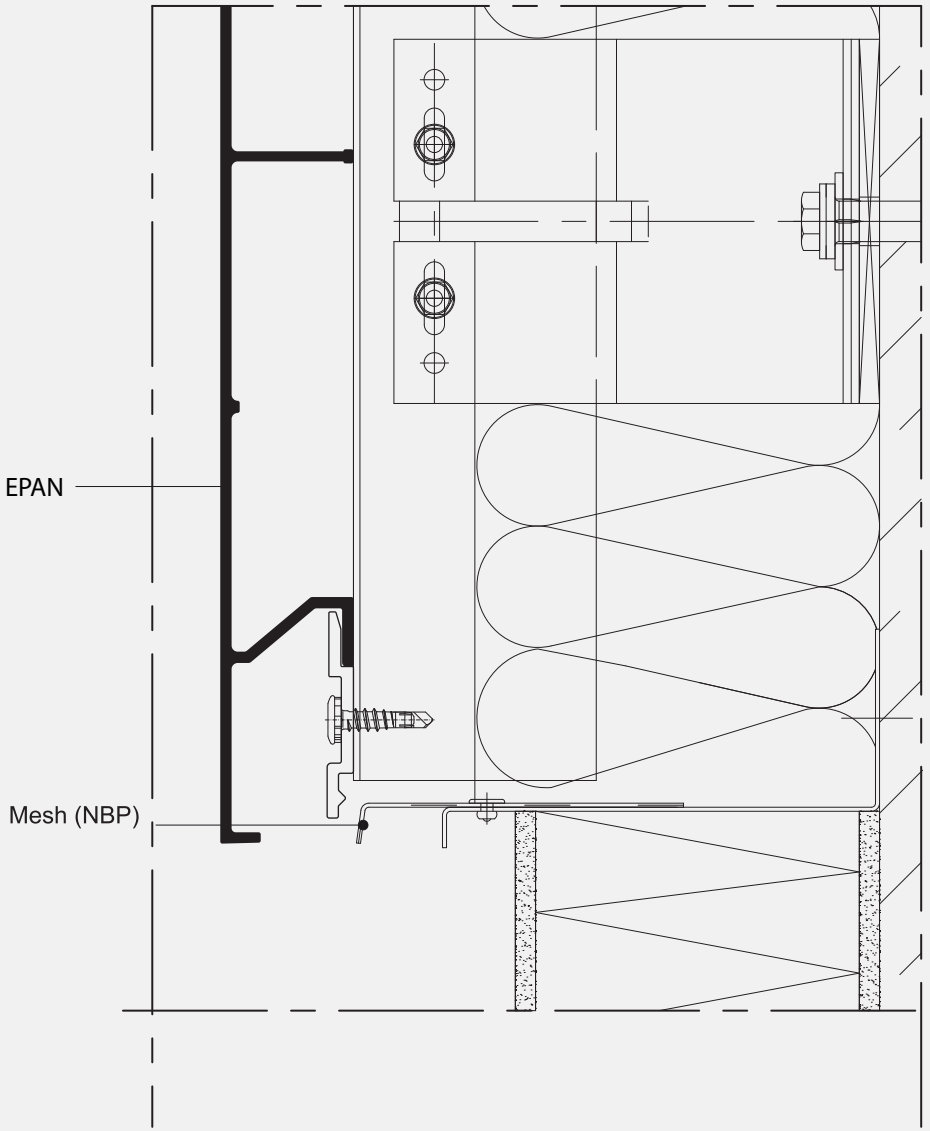
5 - Coping



6 - Base



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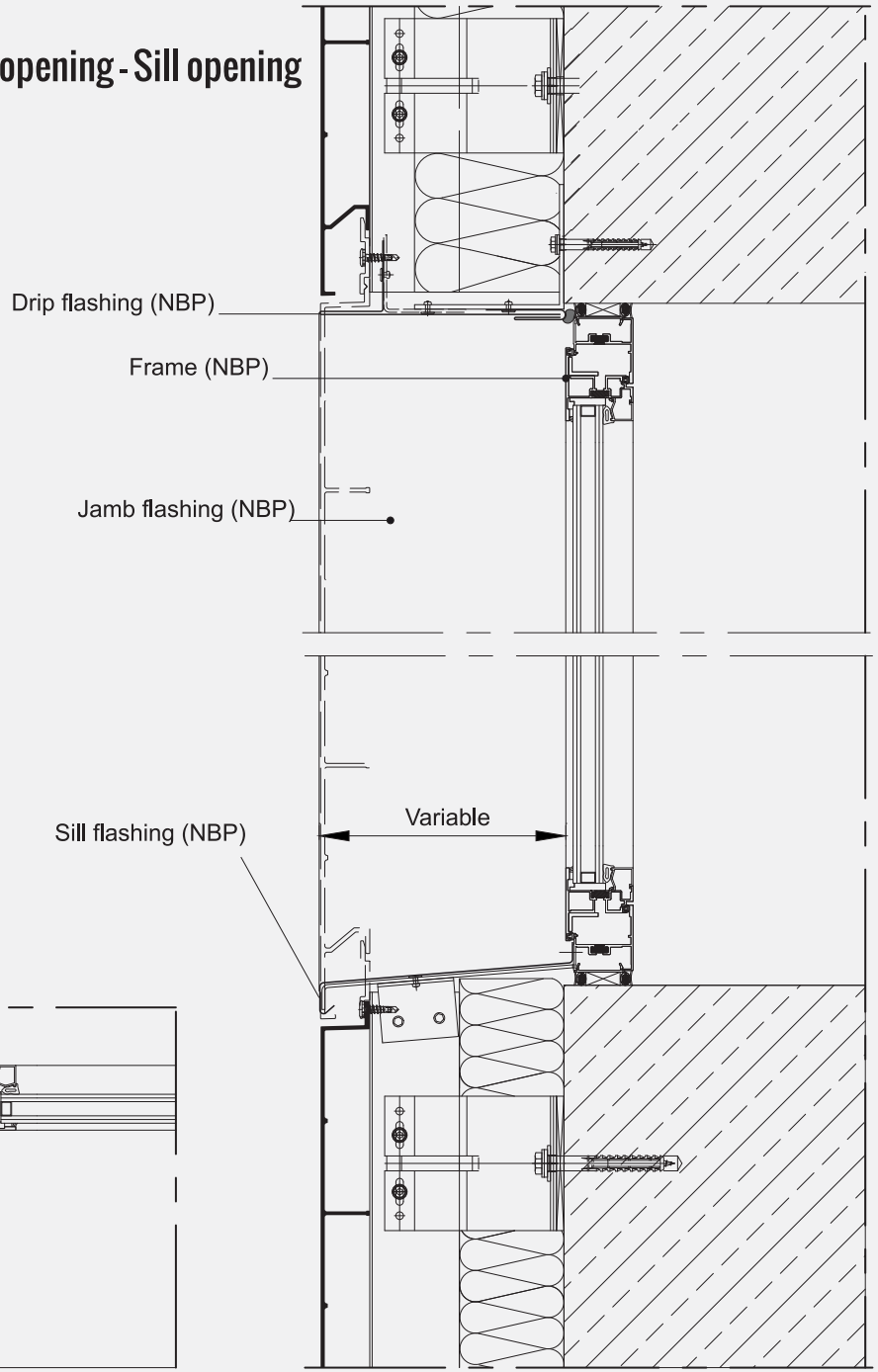
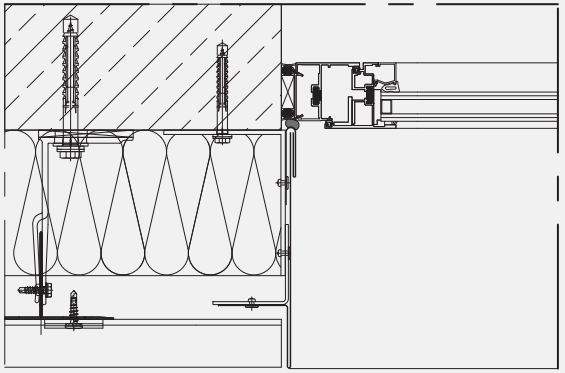
Schematic view

7 - Head opening - Sill opening



8 - Jamb opening



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