SCHÜCO

Schüco Deflame

Fire resistant spandrel area in FWS 50/60

Schüco Deflame –
fire resistant spandrel area

A fire can quickly become a serious incident if the building fire safety strategy does not take into account the propperties of the facade.

Tested to the latest European standards, the fully integrated Schueco Deflame system can maintain the horizontal compartmentation line - floor structure-perimeter seal-facade.

Standards and Guidelines in Europe

According to the curtain walling product standard EN 13830, for fire resistance and fire propagation (to upper levels), part configuration curtain walling kits shall be tested in accordance with EN 1364-4 and classified in accordance with EN 13501-2.

The fire safety requirements for curtain walls may differ internationally. Local building regulations, standards and guidelines must be followed, but it should be noted that these provide only the minimum requirements. It is up to everyone involved in the design, execution and maintenance of a building, to take relevant responsibility.

Integrity E is the ability of the element of construction that has a separating function, to withstand fire exposure on one side only, without the transmission of fire to the unexposed side as a result of the passage of flames or hot gases. They may cause ignition either of the unexposed surface or of any material adjacent to that surface.

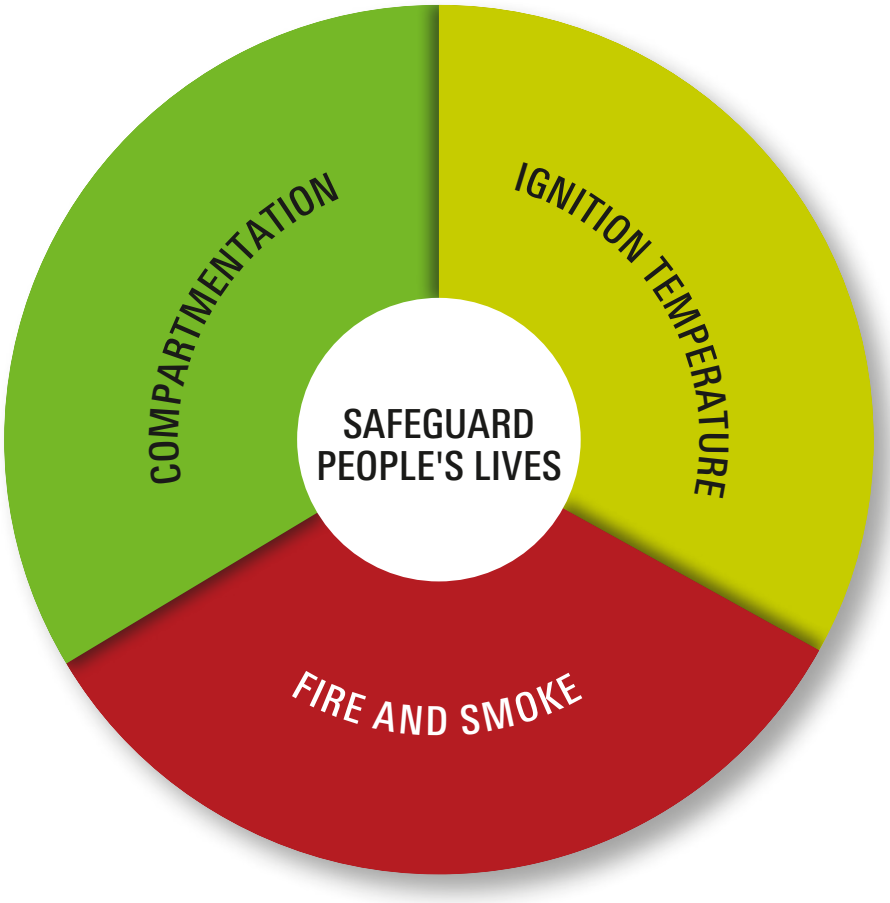
The assessment of integrity shall generally be made on the basis of the following three aspects:

- cracks or openings in excess of given dimensions;
- ignition of a cotton pad;
- sustained flaming on the unexposed side.

Thermal insulation I is the ability of the element of construction to withstand fire exposure on one side only, without the transmission of fire as a result of significant transfer of heat from the exposed side to the unexposed side. Transmission shall be limited so that neither the unexposed surface nor any material in close proximity to that surface is ignited. The element shall also provide a barrier to heat, sufficient to protect people near to it. The performance level used to define thermal insulation shall be the mean temperature rise on the unexposed face limited to 140 °C above the initial mean temperature, with the maximum temperature rise at any point limited to 180 °C above the initial mean temperature.

What is the purpose of the fire resistant spandrel area in a facade?

Passive fire protection is a key component of any fire strategy. It is built to safeguard people's lives and limit the financial impact of damage to buildings and their contents. It limits the spread of fire by containing it in a single compartment.



Good to know:

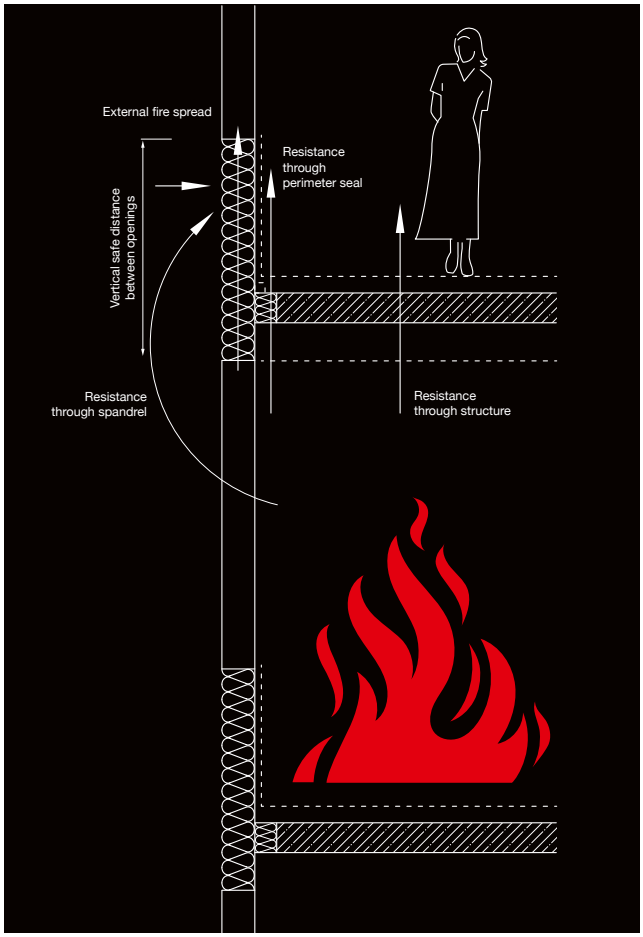
- Fire can spread through the floor slab, through the gap between floor slab and facade, through the openings, through the facade itself (joints, gaps, cavities, mullions)
- Even if the entire facade consists of none combustible materials, this does not guarantee safety
- The fire stopping alone, fitted between the floor slab and facade, is not enough to provide compartmentation
- Fully fire resistant facades (featuring fire rated glazing) may not necessarily limit the fire spread over the hight of the building

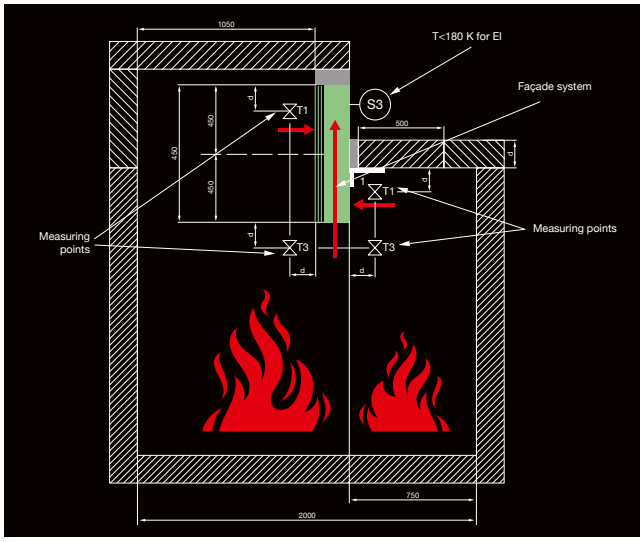
A fundamental aspect of curtain wall design, in relation to fire safety, is vertical and horizontal compartmentation and its implication on the building envelope.

It should not be assumed that the fire stopping alone and conventional spandrel zone configurations provide compartmentation.

In the case of common mullion-transom facade, due to the material nature and the way the facade is build (running in front of the floor slab), the spandrel panels as well as the mullion profiles can provide a medium for temperature rise and fire spread over the height of the building.

Schueco's Deflame FWS 50/60 fire resistant spandrel area features a horizontal thermal separation, fully integrated within the entire facade build up, which does not allow temperature transfer over the height of the building.



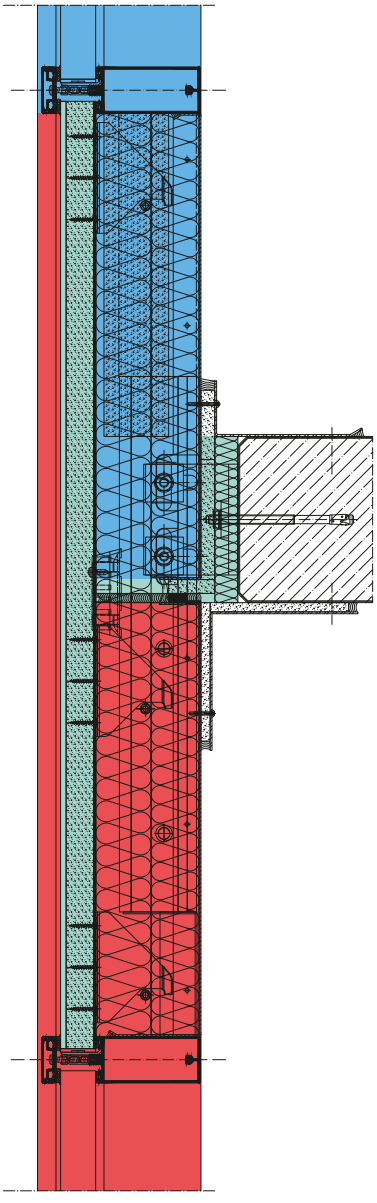


Existing solutions – downsides and comparison with Deflame FWS 50/60

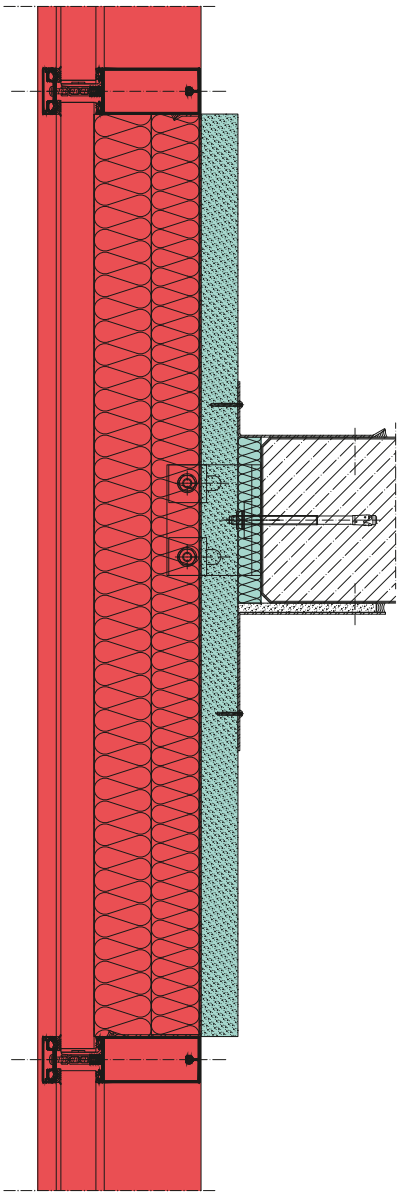
Thermal separation

T° much higher than the min required to achieve "I" criteria

T° < 180° (less than min T° for "I")



Schüco Deflame FWS 50/60



Existing solutions
(various suppliers)

Key Features Deflame

There are some existing solutions, from various suppliers. These generally feature fire resistant boards to the back of the façade (shown in green). Although these solutions pass the relevant test, this is due to the fact that this test method does not assess the performance over the height of the building. Only the spandrel area is tested, thus the temperature above the fire rated boards is not measured, neither integrity above this level is assessed. What can happen in reality is temperature transfer through the framing. Meaning that even if the EI rating is maintained at the area where the boards are, it is not maintained right above them- it could be more than 600 degrees at that location. This means that floor finishes, furniture, curtains, blinds, can catch fire from the proiles due to the extremely hot surface.

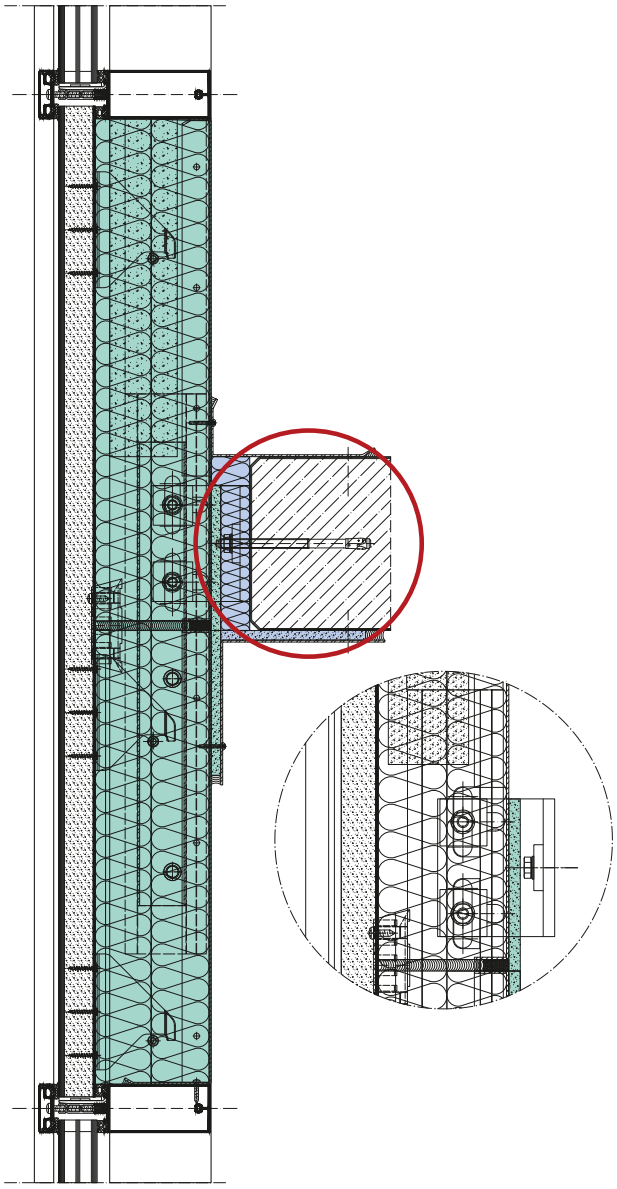
For comparison, with our new development Deflame FWS 50/60 there is no temperature transfer through the mullions over the height of the building. This is due to the thermal separation introduced within the system. Deflame is a patented new development which maintains the rating through the façade itself.

- It is fully integrated, meaning that the overall facade zone is not increased by any additional components and it looks exactly the same as a conventional mullion- transom facade
- It is flexible in terms of architecture because it covers a wide area of application
- It is an “off-the-shlef“ system, already available and in stock
- Classification of EI 90 and EI 60 for the façade (different solutions); EI 90 and EI 120 for the perimeter seal
- Façade and perimeter seal can be used independently from one another, which brings additional flexibility

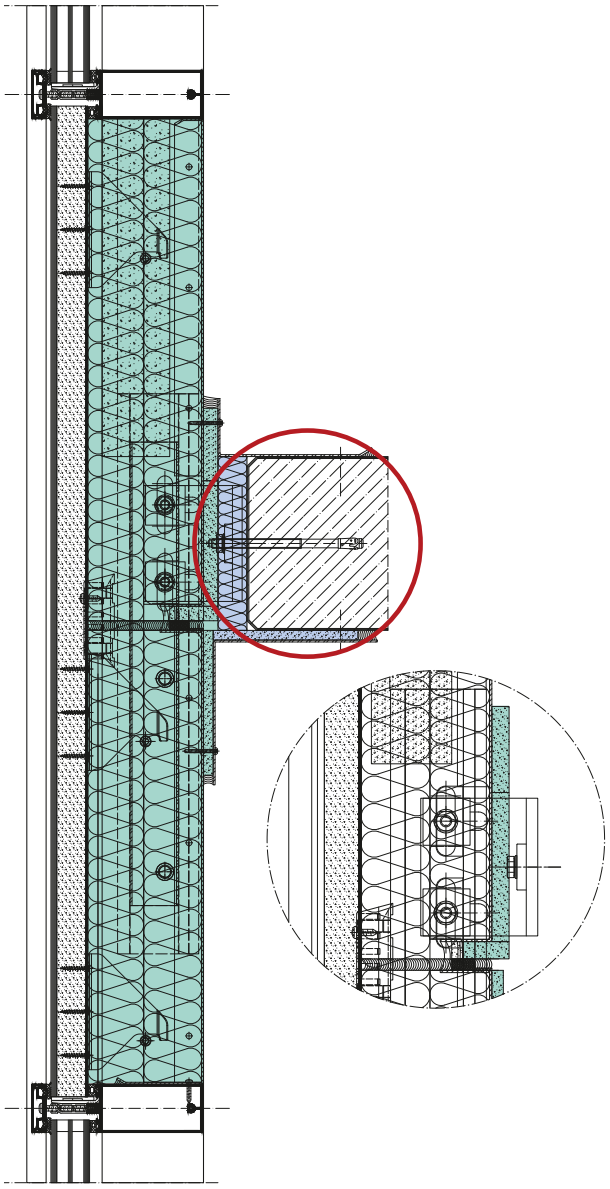
System classification in accordance with EN 13501-2

Façade

Perimeter seal



FACADE EI 60
PERIMETER SEAL EI 90



FACADE EI 90
PERIMETER SEAL EI 90

Classifications in accordance with EN 13501-2

The FWS 50 and 60 façade systems are tested for 60 and 90 minutes and have achieved the classifications EI 60 and EI 90.
Refer to the classification reports for the direct area of application and the system versions.

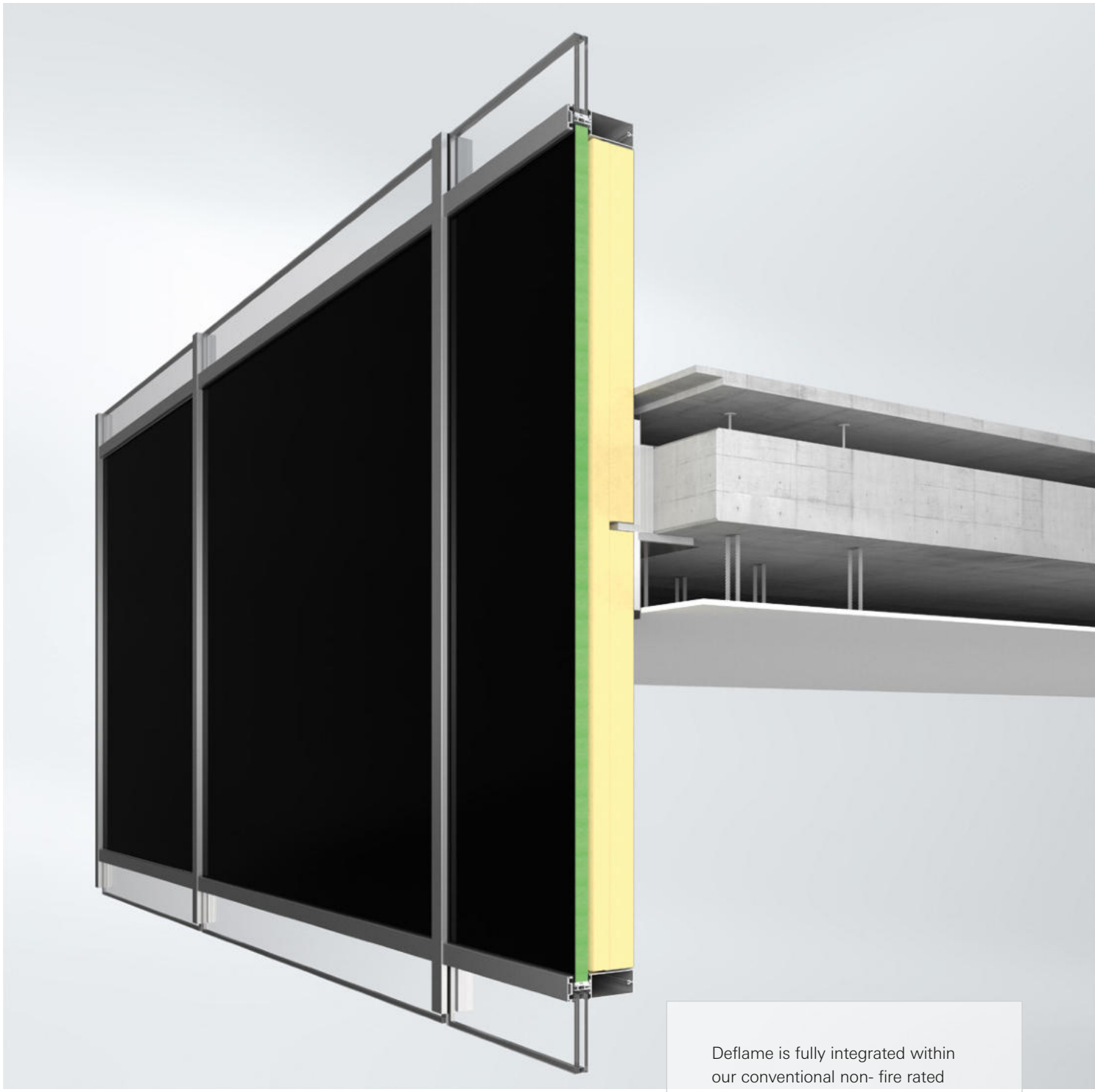
20-005087-PR01 ➞ Façade EI 60 and perimeter seal EI 90
20-005087-PR02 ➞ Façade EI 90 and perimeter seal EI 90
20-005087-PR03 ➞ Perimeter seal EI 120

The maximum dimensions for the sprandel area are:
EI 60: Width: min. 300 mm, max. 2110 mm, Height: min. 340 mm, max. 2040 mm
EI 90: Width: min. 300 mm, max. 1930 mm, Height: min. 340 mm, max. 1870 mm

Perimeter seal available in fire resistant classes- EI 90 and EI 120

Schüco Deflame in FWS 50 / 50.SI and FWS 60 / 60.SI			
		Type Institute ift Rosenheim GmbH	
Type of test	Basis	No. of the test certificate/report	Test result
Fire resistant spandrel area	EN 13501-2:2007+A1:2009 EN 13501-2:2016 tested in acc. with EN 1364-4 configuration 2	20-005087-PR01	EI 60
		20-005087-PR02	EI 90
Fire resistant perimeter seal	EN 13501-2:2007+A1:2009 EN 13501-2:2016 tested in acc. with EN 1364-4 configuration 2/5	20-005087-PR02	EI 90
		20-005087-PR03	EI 120
Air permeability	EN 12152:2002-02	21-002090-PR01	AE
Watertightness	EN 12154:1999-12		RE 1200
Watertightness (dynamic)	EN 13050:2011-07		750 PA
	CWCT:2005		600 PA
Resistance to wind load	CWCT:2005, Part 3, section 3.5.2.2		Permitted load = 2,0 kN/m² Increased load = 3,0 kN/m²
Impact resistance	EN 14019:2016-06		I5/E5

Design flexibility thanks to a wide area of direct application, including variations of its position in relation to the floor slab

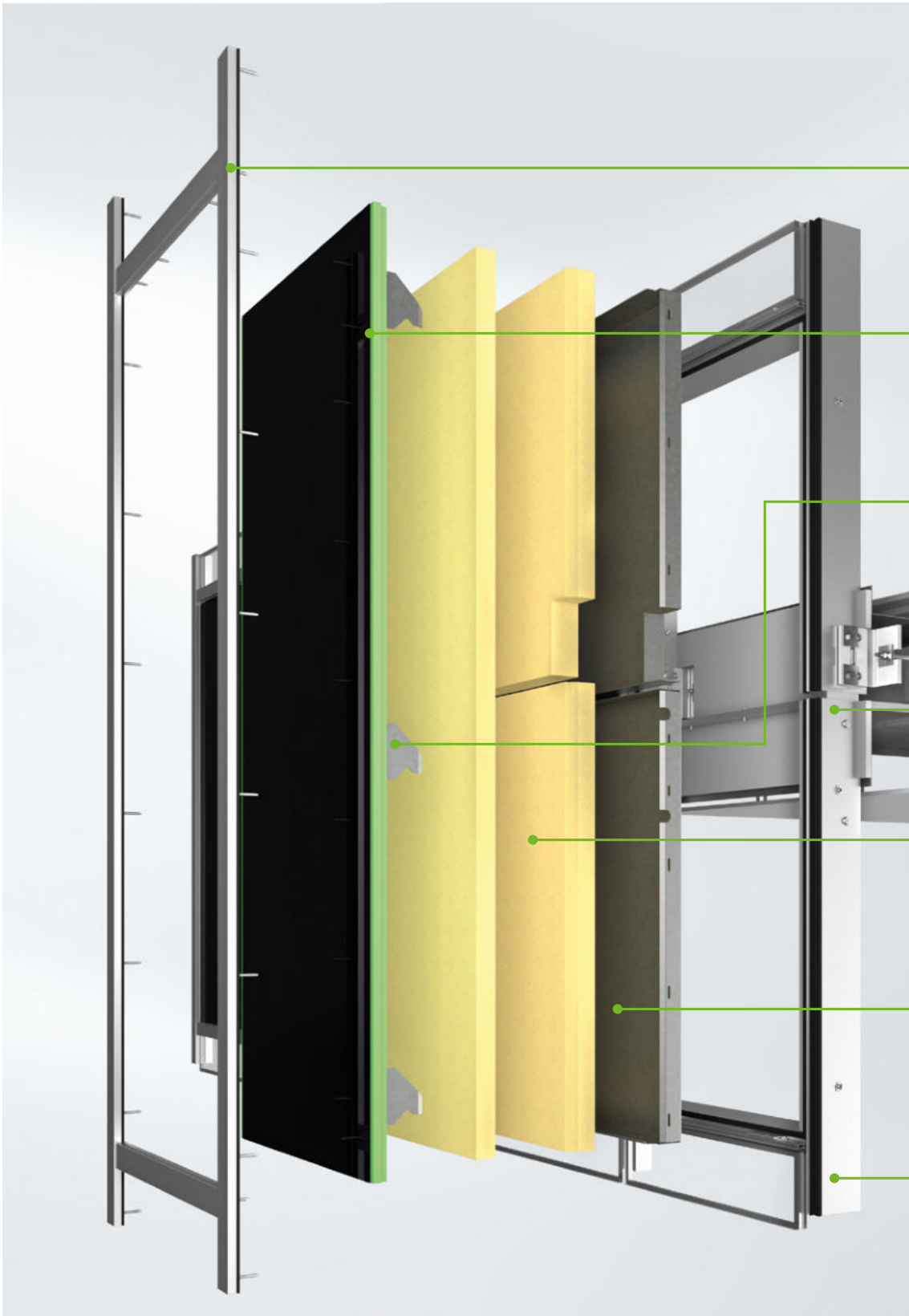


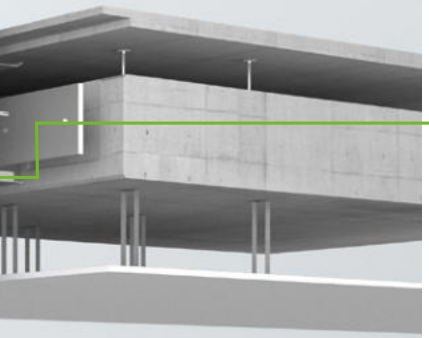
Deflame is fully integrated within our conventional non- fire rated FWS 50 and 60 series, there is no visible differences.

In the event of fire, the Deflame mullion insert profile ensures the structural integrity of the system in the spandrel zone.

Simple to fabricate and quick to install

The Deflame panel is supplied to size together with the prefabricated mullion insert profiles. As a result, all that remains to be done is to mount the retaining brackets on the panel, and to fabricate the spandrel panel with metal sheet. No specific tools or machinery are required. The production of Schüco Deflame does not require the fabricator to be certified.





Pressure plate/cover cap

Schüco Deflame fire-resistant panel

Schüco Deflame retaining bracket

Schüco Deflame insert profile

Insulation

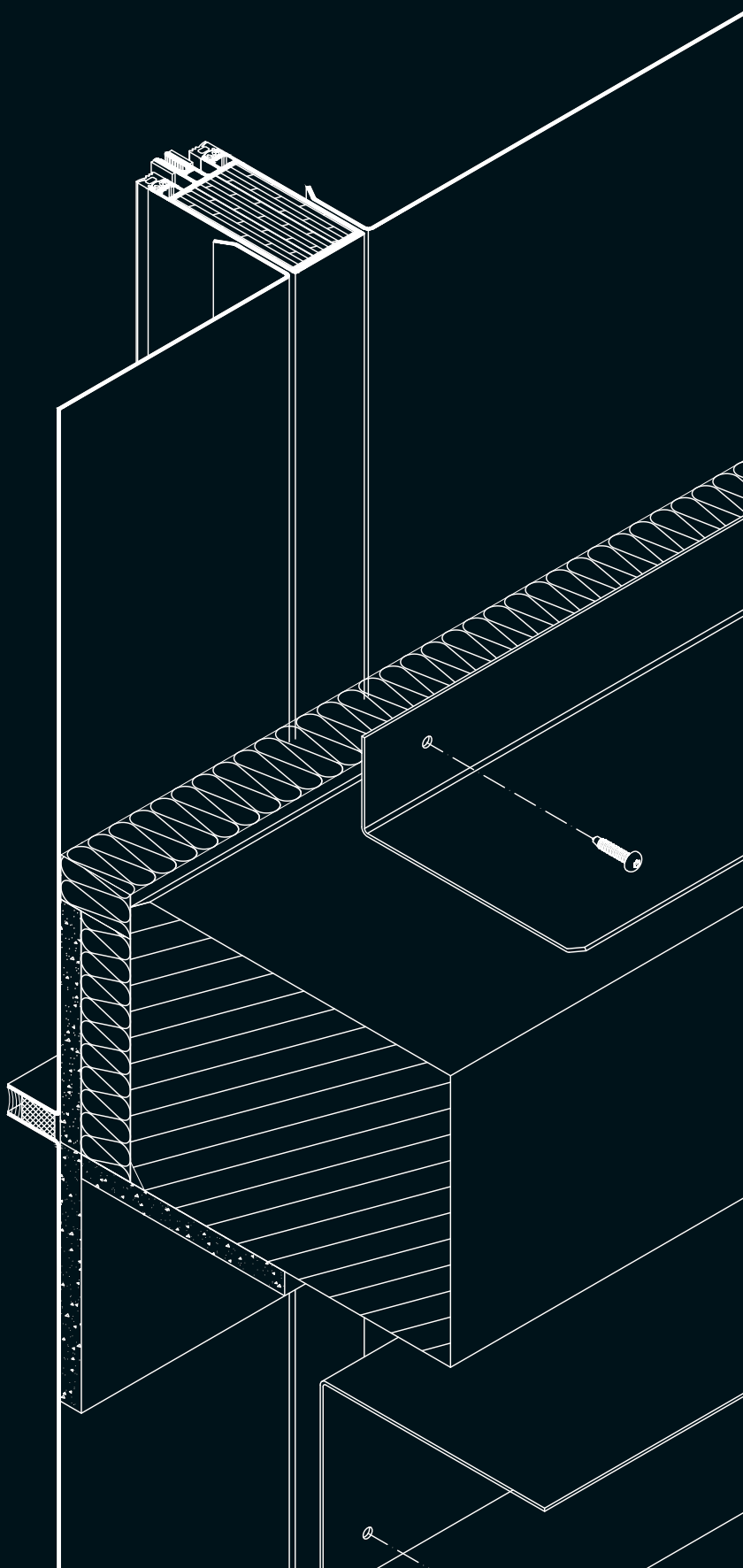
Metal panel

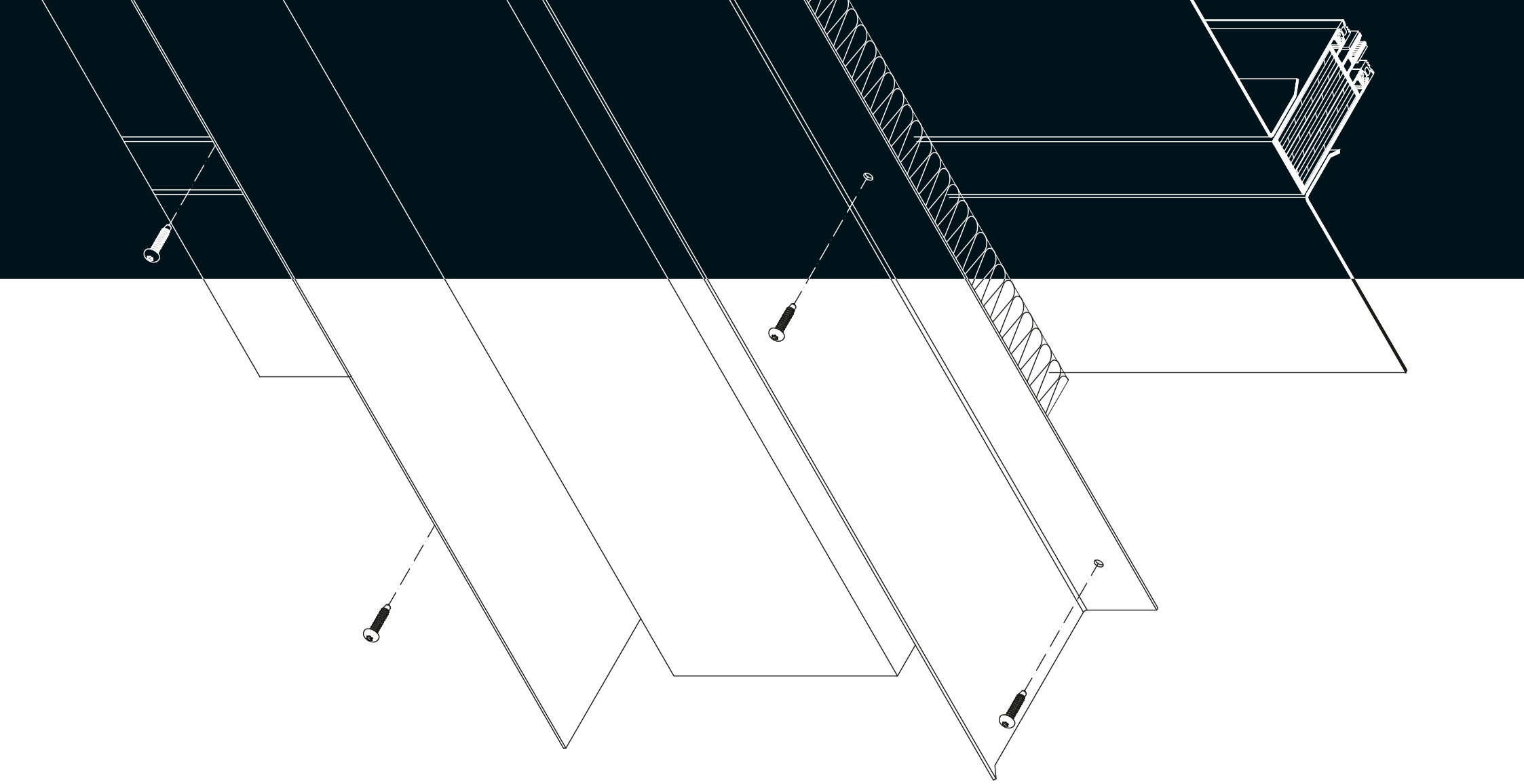
FWS 50/60 mullion

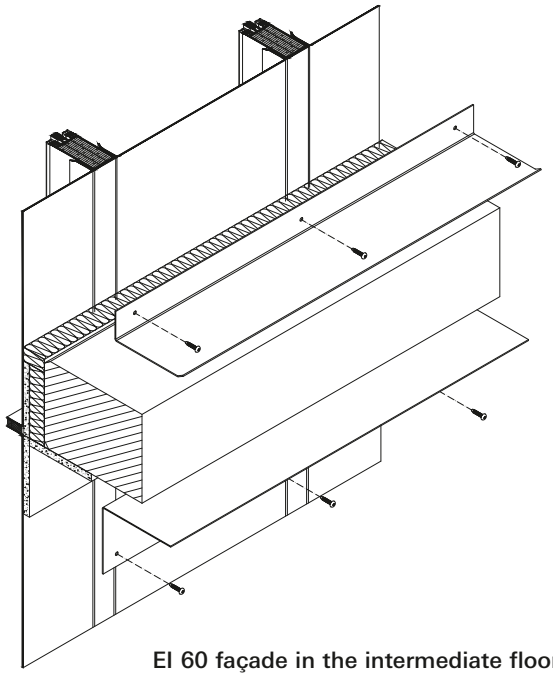
Design flexibility

With the Schüco Deflame fire-resistant spandrel area there is no need to make any compromise on either fire protection or facade design. It ist fully integrated into the conventional non-fire rated Schüco FWS 50/60 mullion/transom façade and the high degree of design freedom means that the transitions between the fire resistant spandrel area and vision areas of the façade are not just seamless, but invisible too. The opaque external side of the panel can be designed with any non-flammable material, such as metal sheet or glass, to create a unique façade design. Floor-to-ceiling views are still also possible with Schüco Deflame. This is because the height of Deflame and its position in relation to the floor slab can vary.

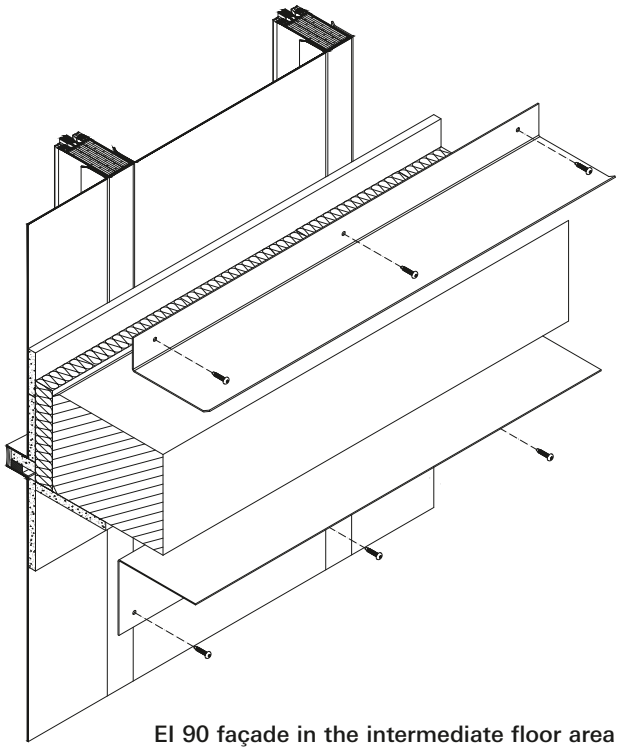
Technical details







EI 60 façade in the intermediate floor area

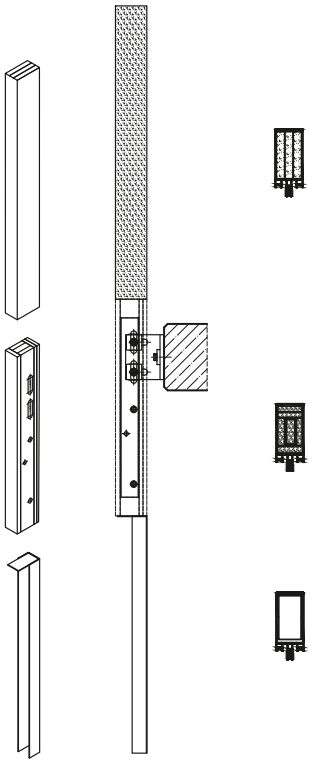


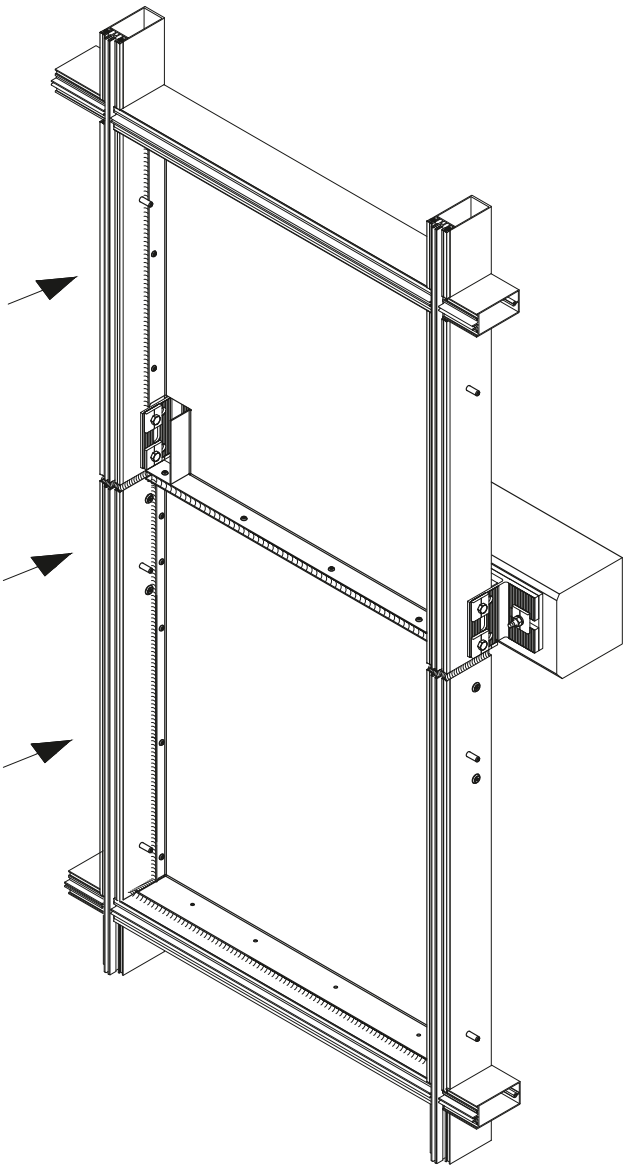
EI 90 façade in the intermediate floor area

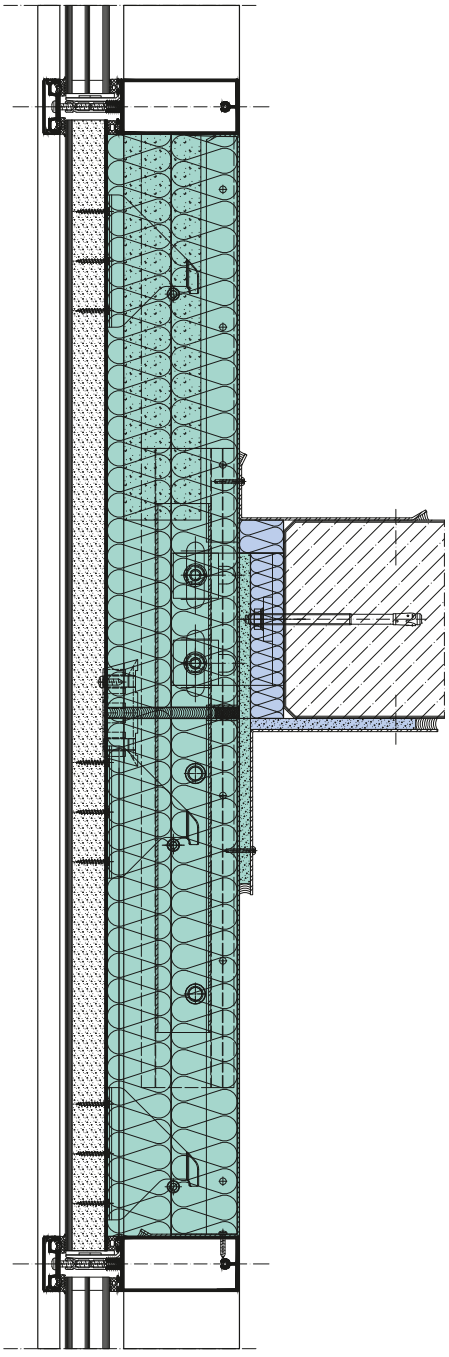
Schüco Deflame insert

Schüco Deflame insert
with steel

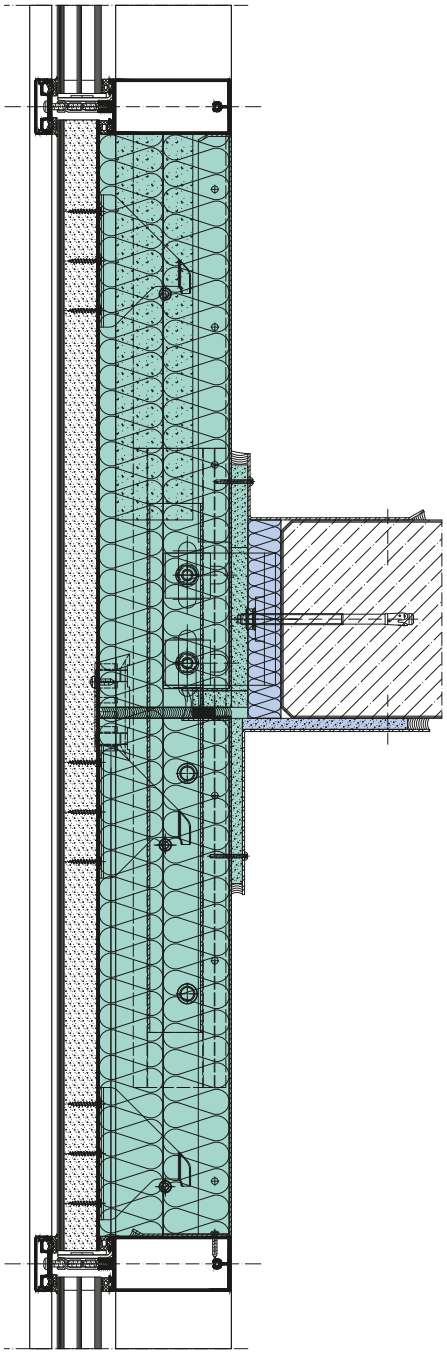
2 mm steel sheet





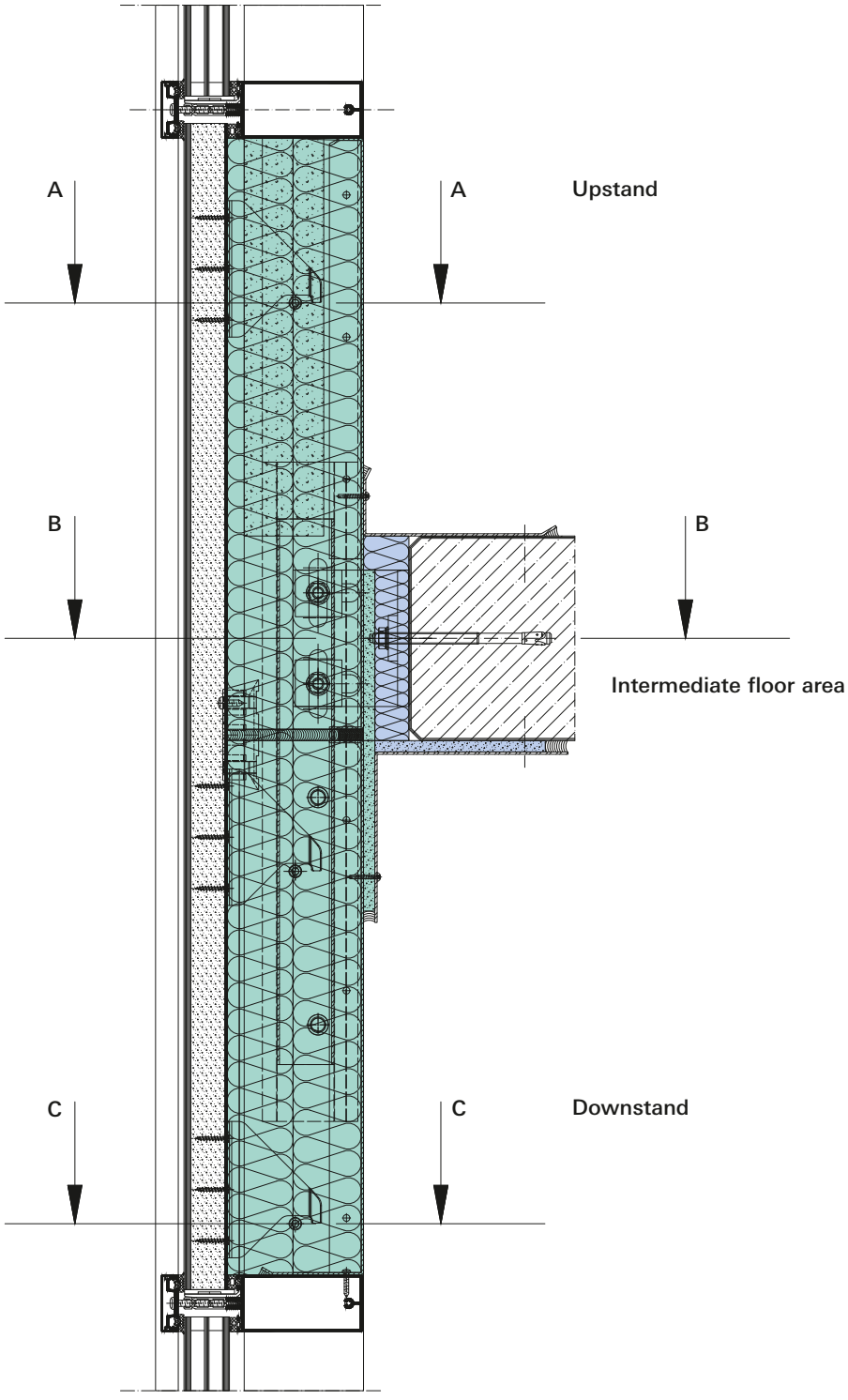


EI 60 FAÇADE

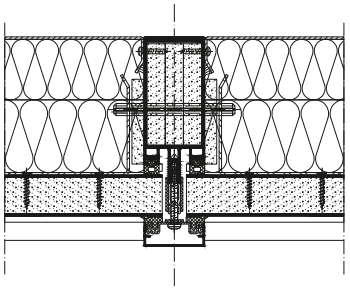


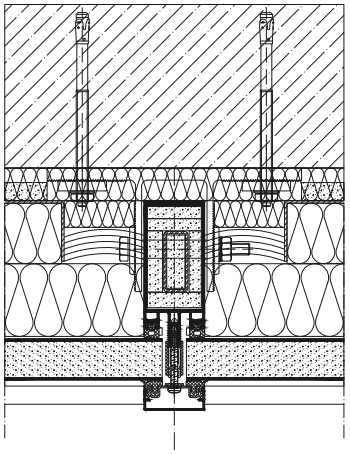
EI 90 FAÇADE

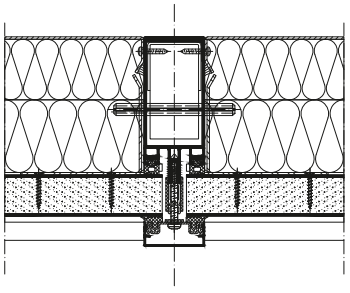
Application examples for basic depths Facade spandrel zone classification EI 60



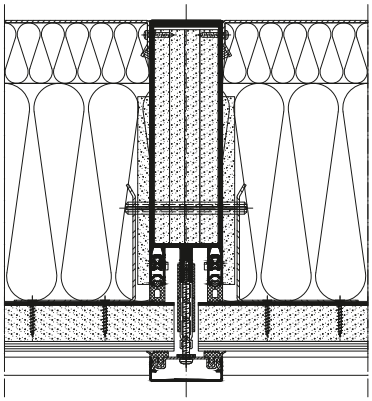
Mullion 105 mm, infill 34 mm (including 2 x 2 mm sheet)

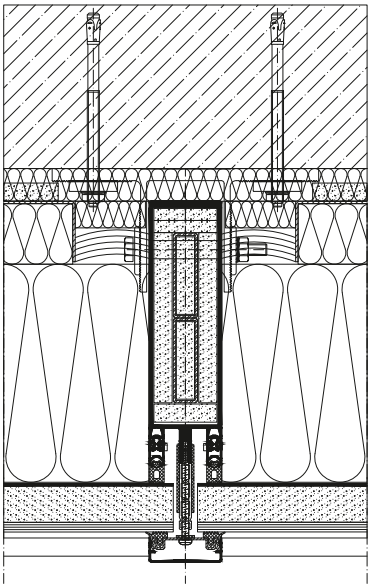


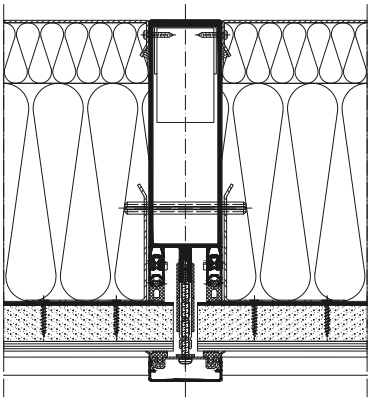




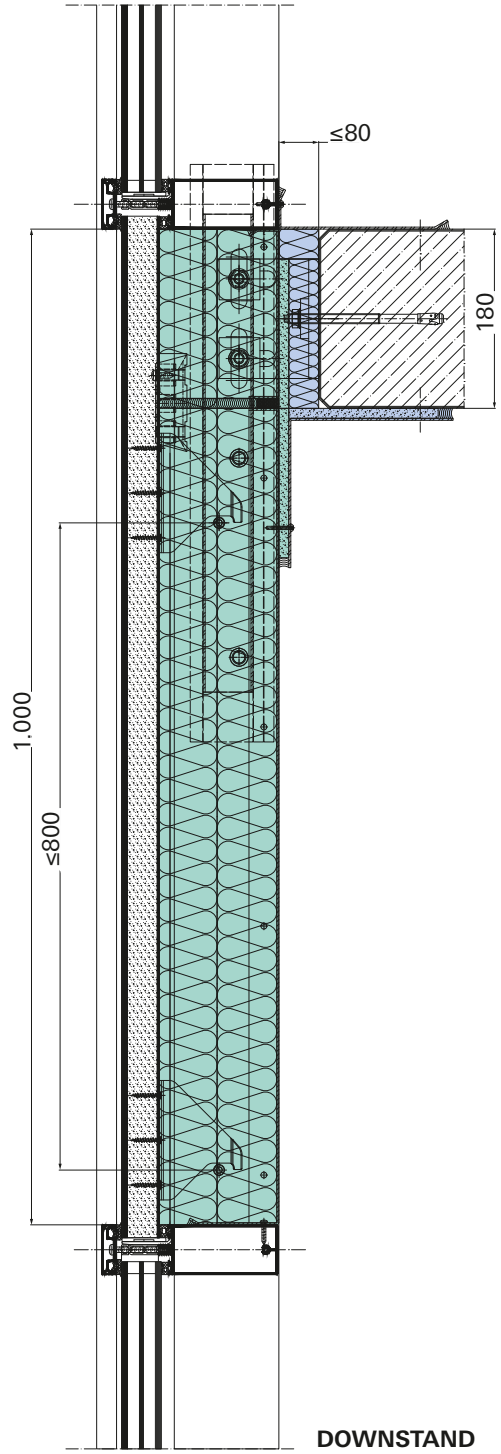
Mullion 200 mm, infill 38 mm (including 2 mm sheet and 6 mm glass)



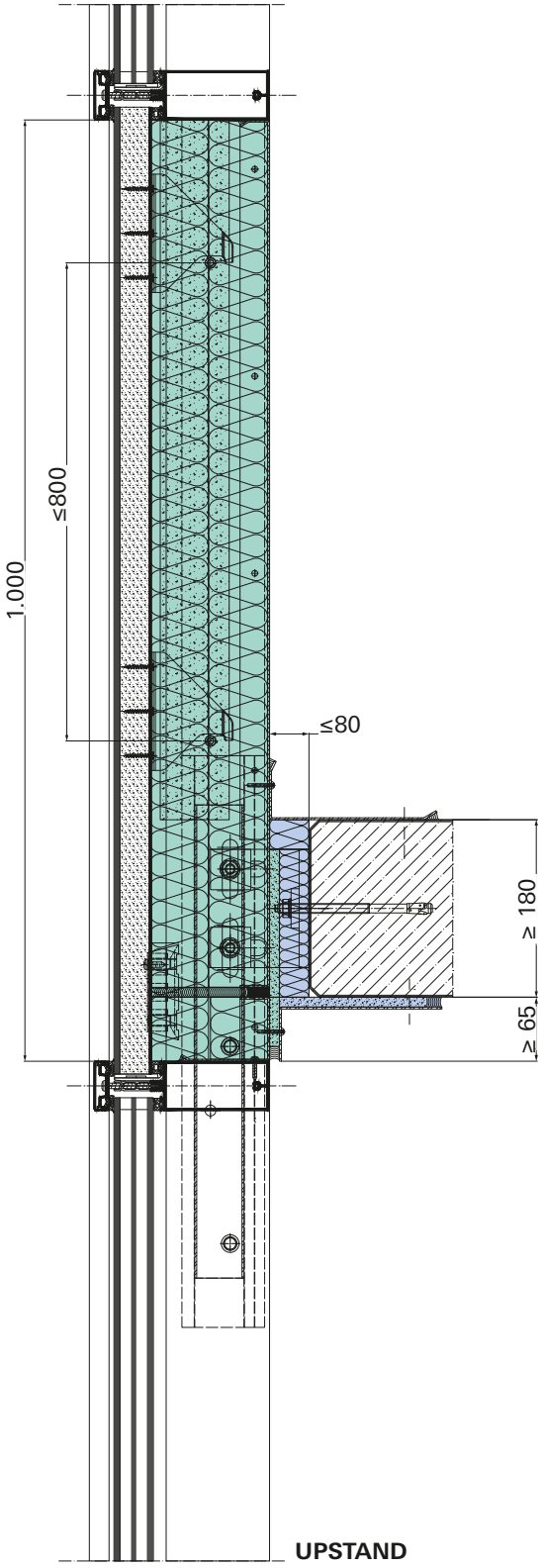




Application examples for 1 metre fire-resistant area
Facade spandrel zone classification EI 60

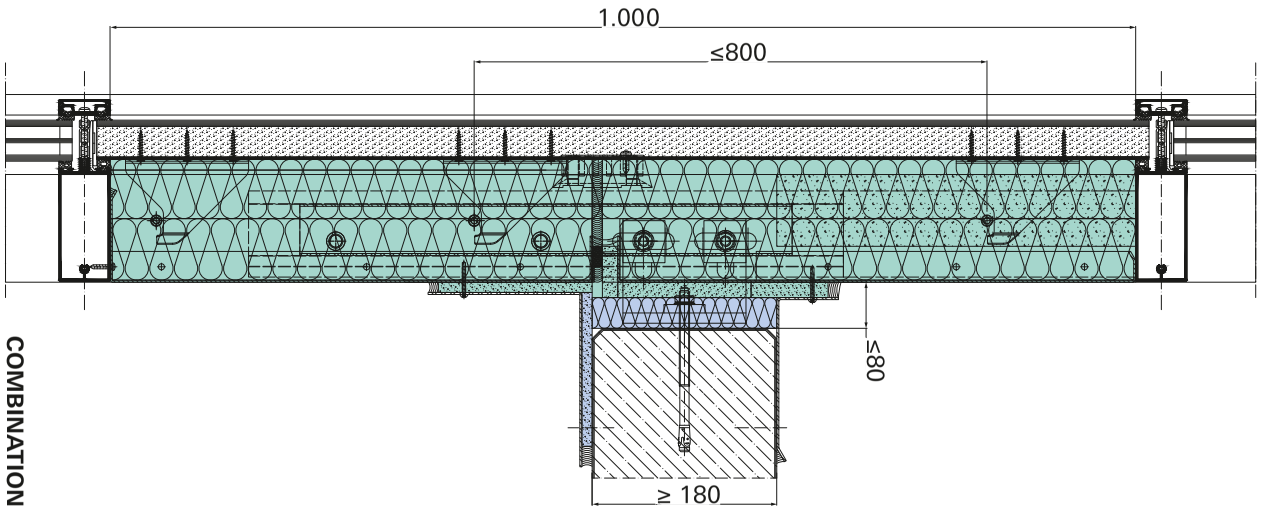


DOWNSTAND

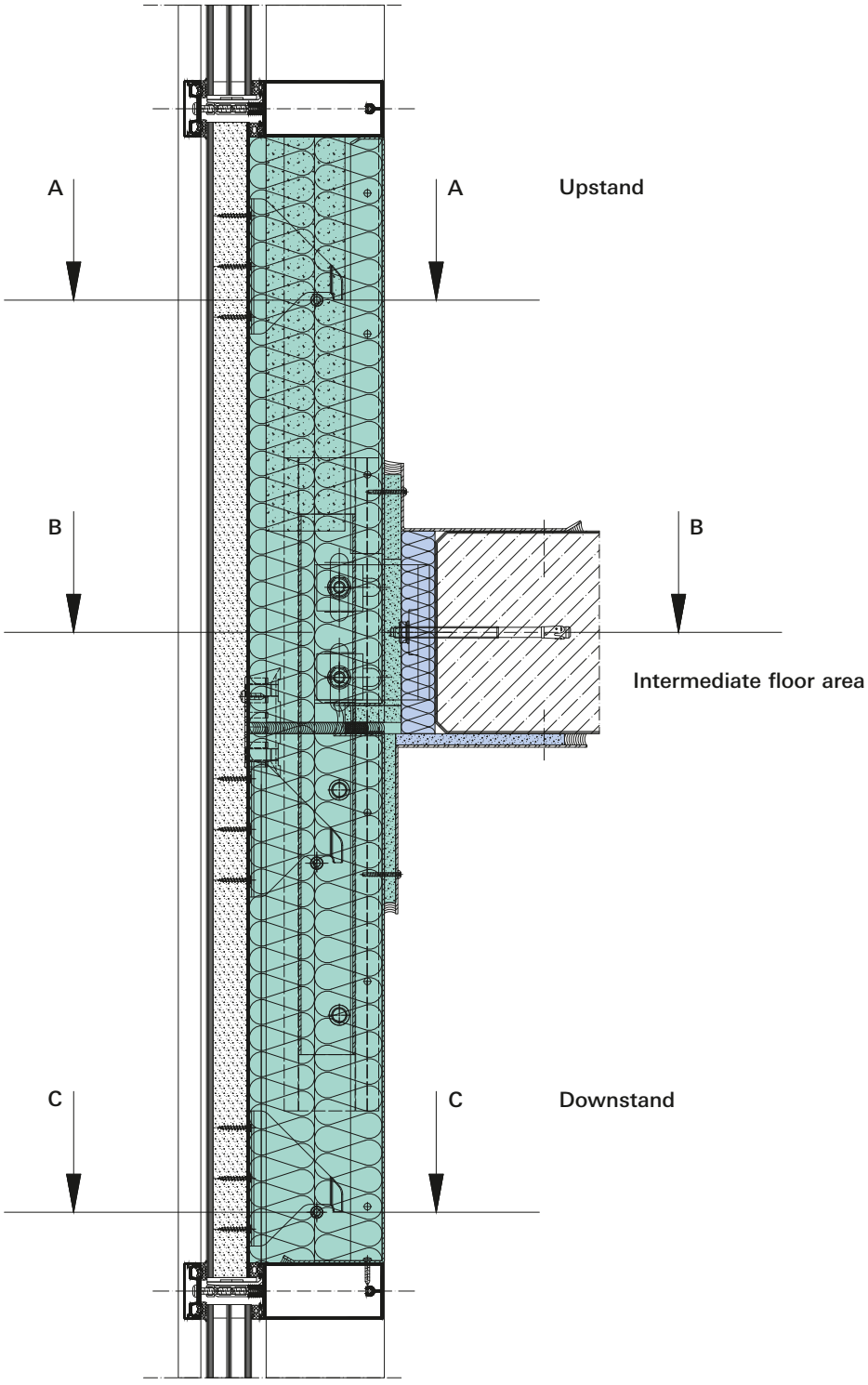


UPSTAND

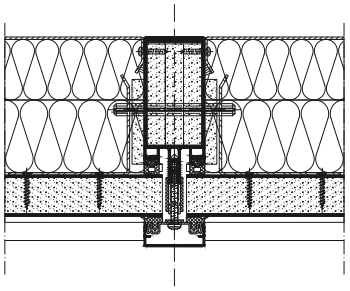
COMBINATION OF DOWNSTAND AND UPSTAND

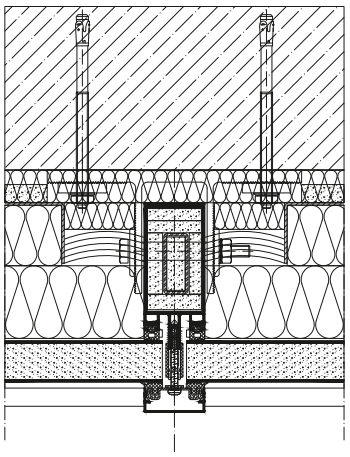


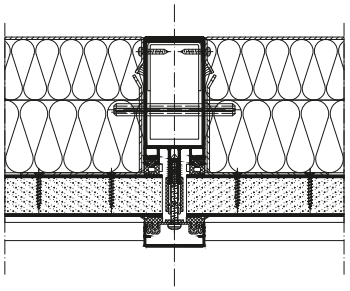
Application examples for basic depths Facade fire-resistant spandrel zone classification EI 90



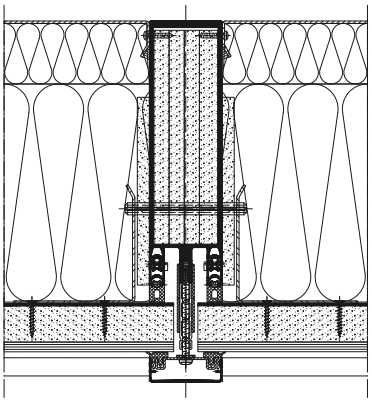
Mullion 105 mm, infill 34 mm
(including 2 x 2 mm sheet)

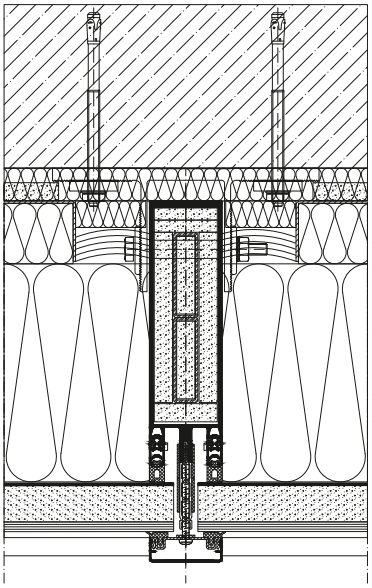


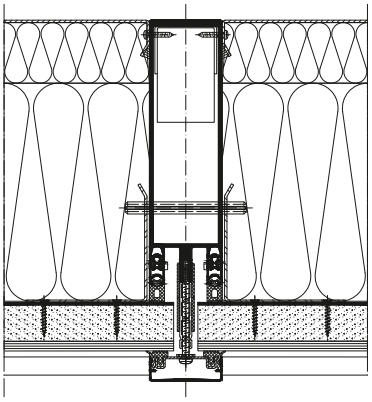




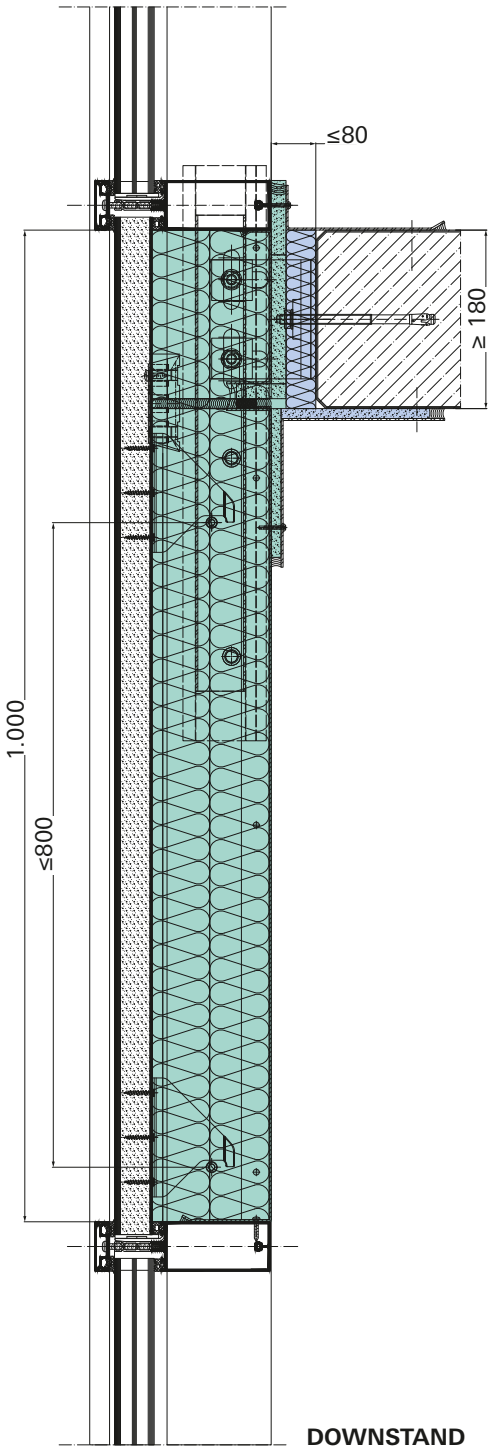
Mullion 200 mm, infill 38 mm
(including 2 mm sheet and 6 mm glass)



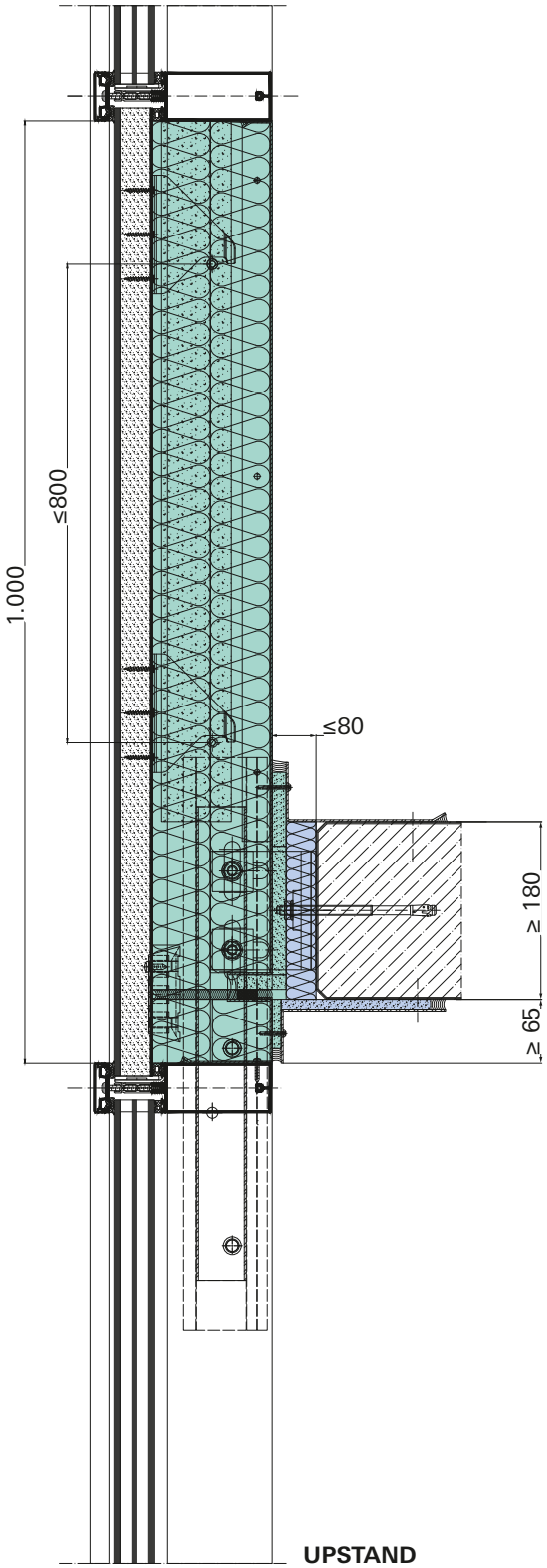




Application examples for 1 metre fire resistant area
Facade fire-resistant spandrel zone classification EI90

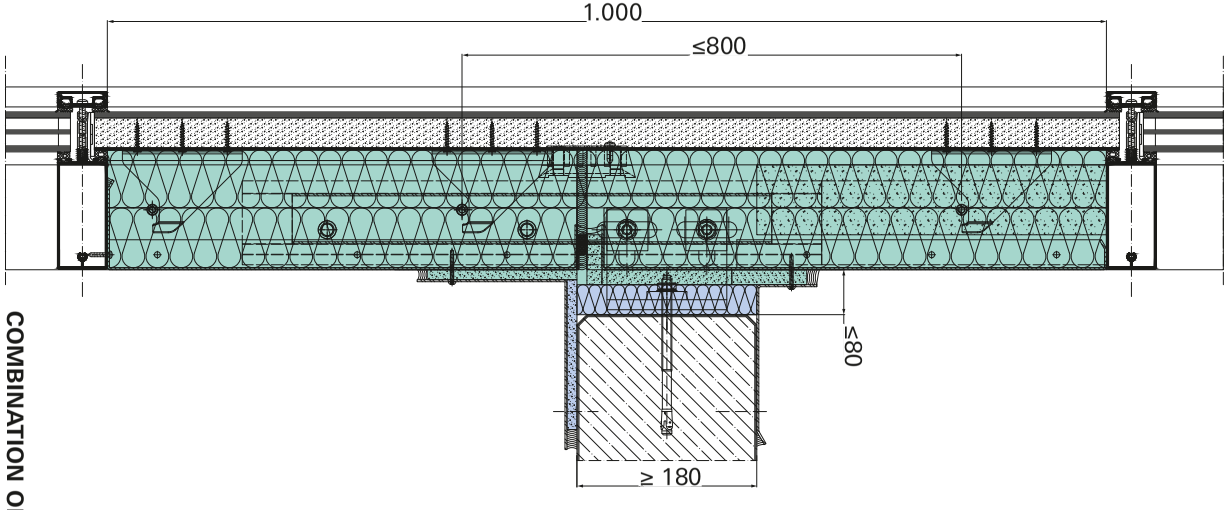


DOWNSTAND

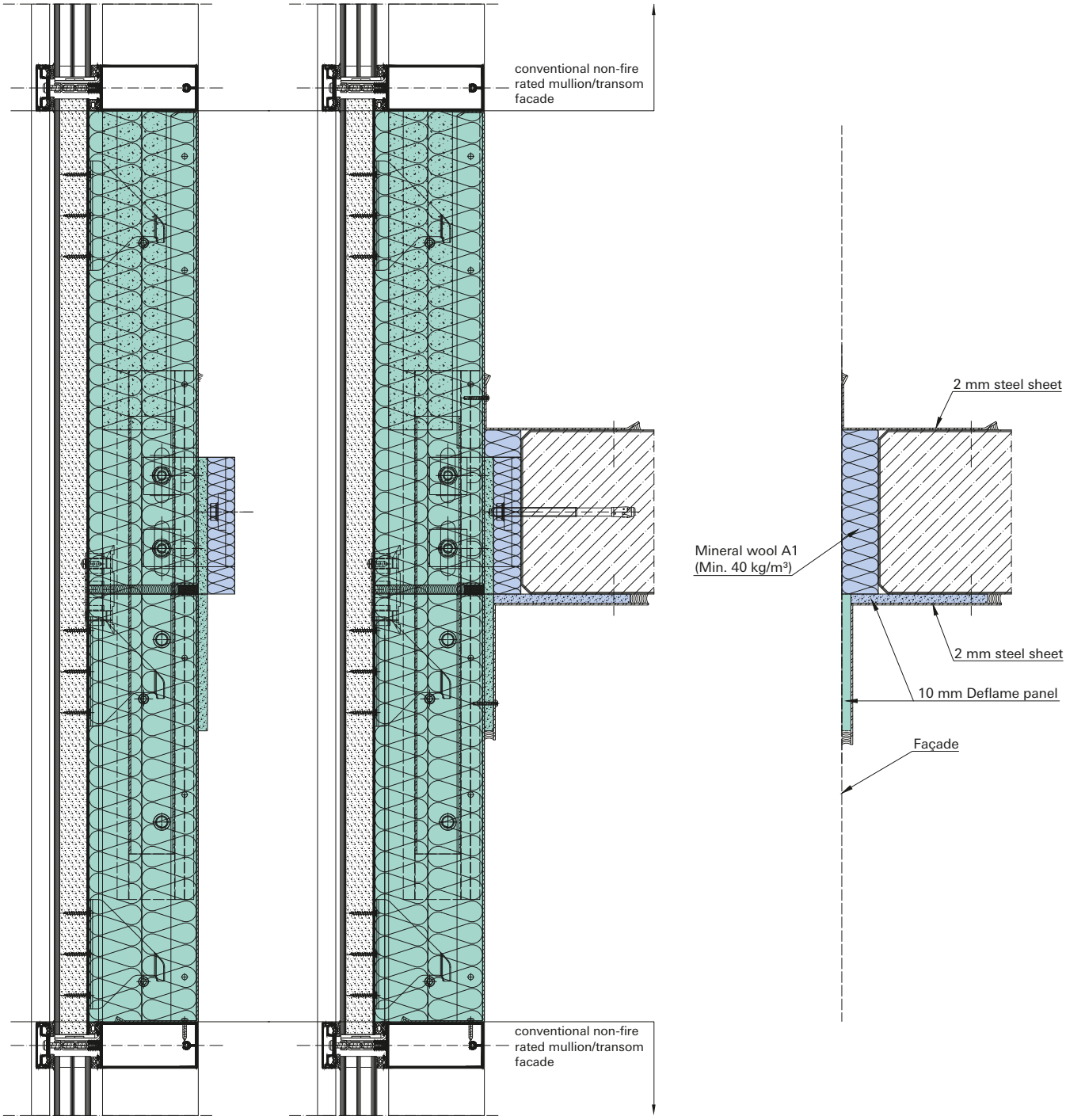


UPSTAND

COMBINATION OF DOWNSTAND AND UPSTAND

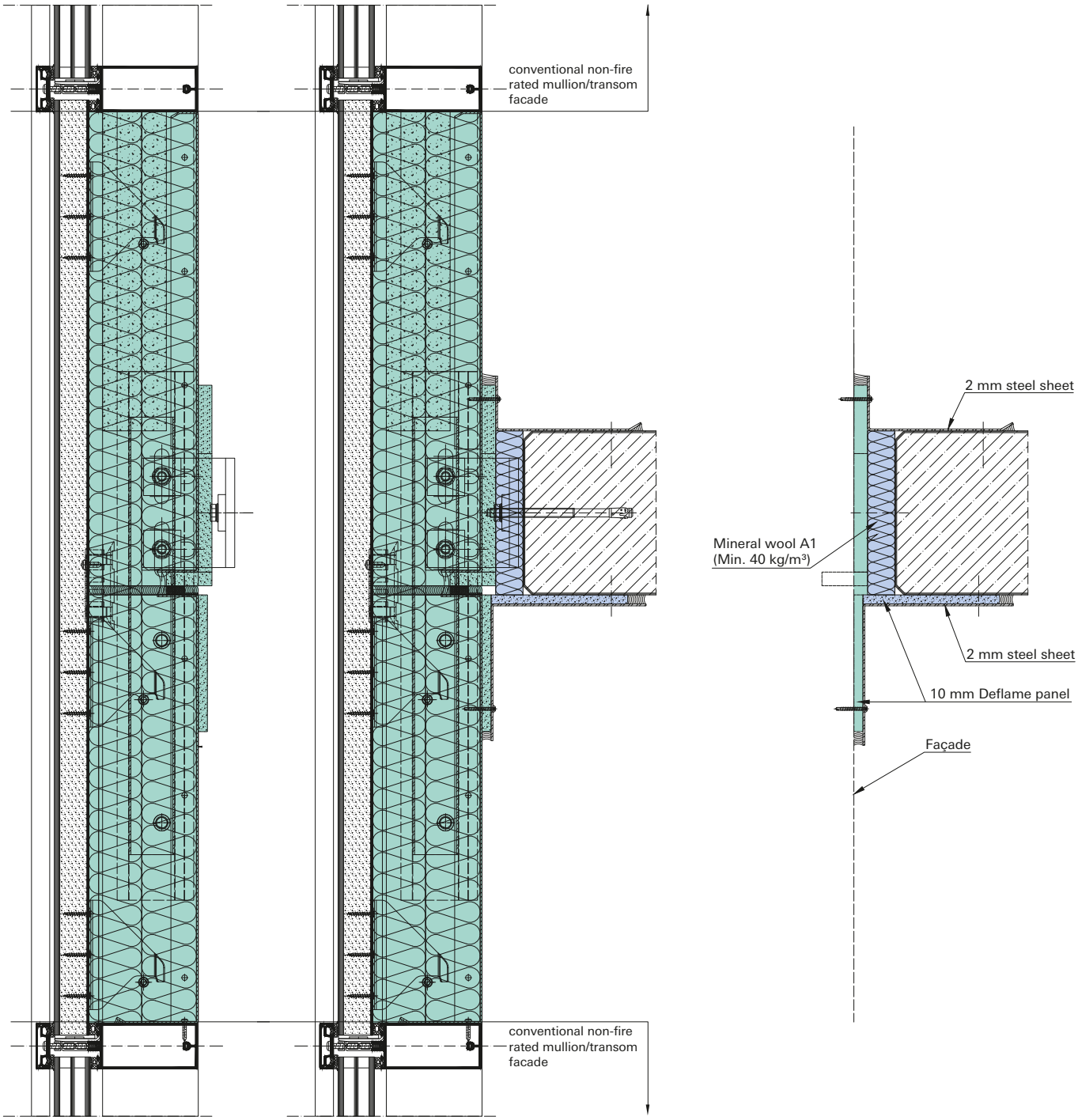


Facade fire-resistant spandrel zone class EI 60, perimeter seal fire-resistant class EI 90



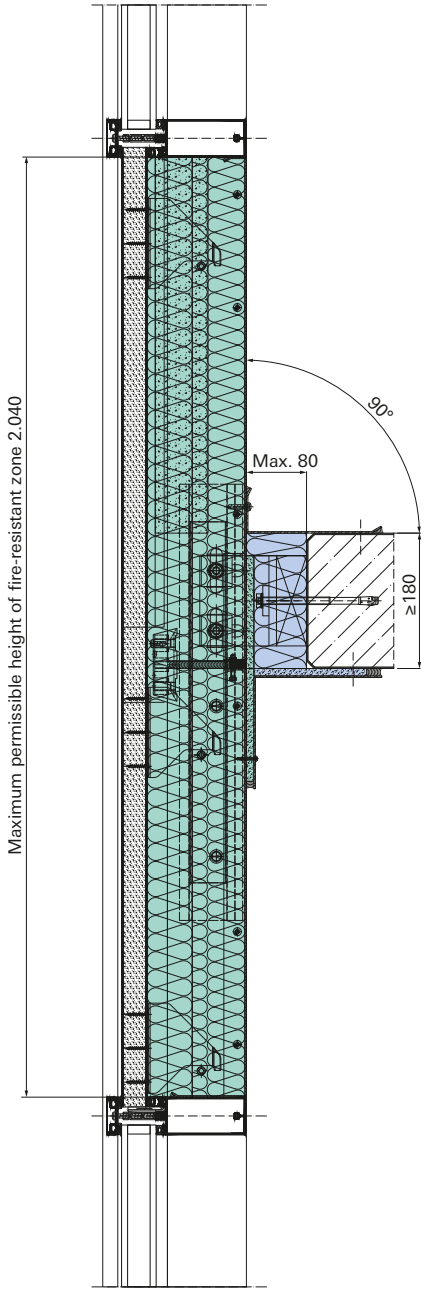
⚠ **The perimeter seal is also available in fire-resistant class EI 120 (separate classification report).**

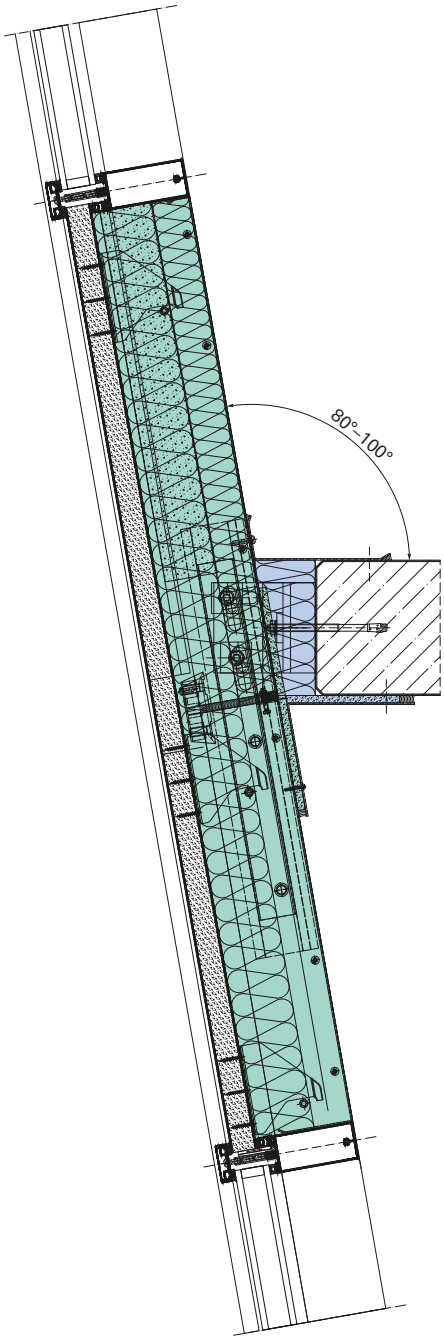
Facade fire-resistant spandrel zone class EI 90, perimeter seal fire-resistant class EI 90

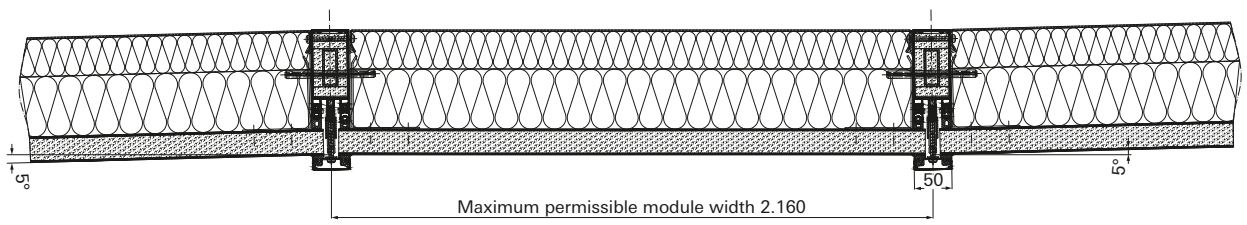


⚠ **The perimeter seal is also available in fire-resistant class EI 120 (separate classification report).**

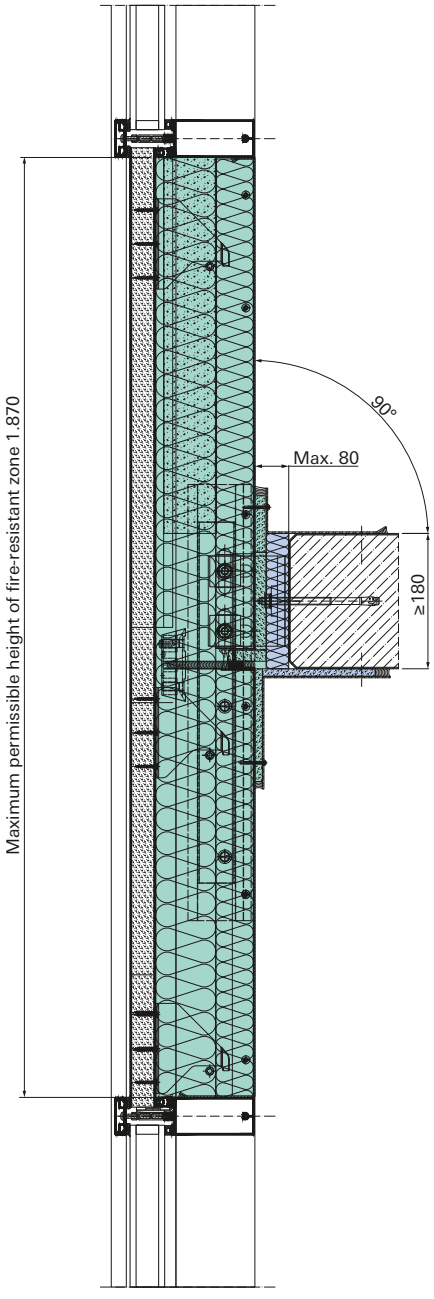
Permissible angles and segmentation in accordance with EN 1364-4 | EI 60

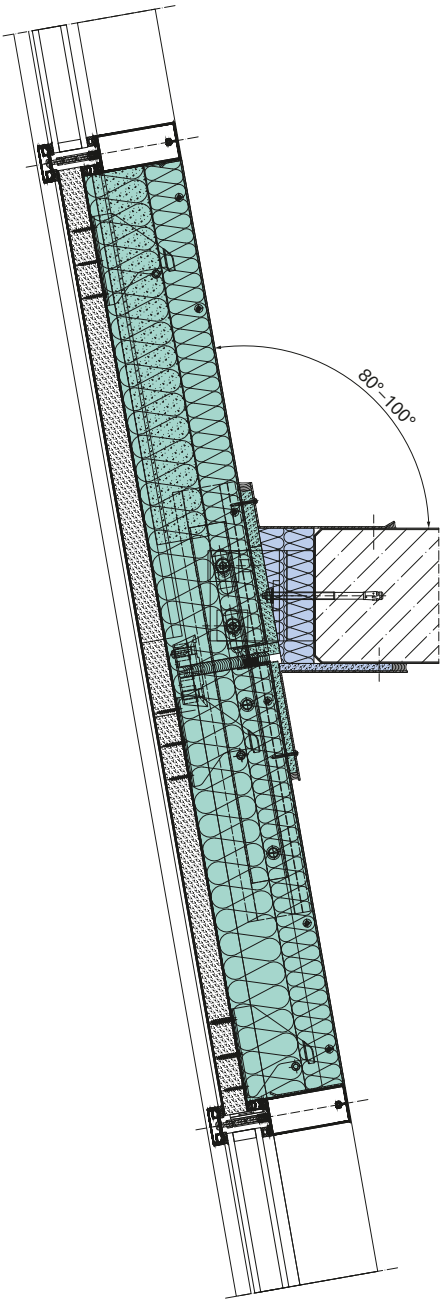


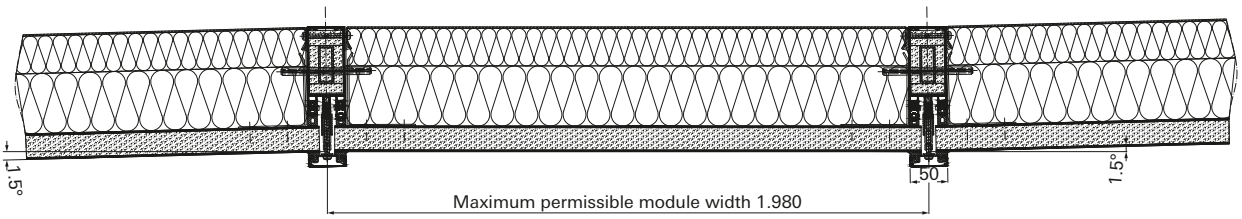




Permissible angles and segmentation in accordance with EN 1364-4 | EI 90







Schüco Deflame:

Fire protection and design freedom in a system solution

The new Schüco Deflame system is a fire resistant spandrel zone fully integrated in the conventional Schüco FWS 50/60 mullion transom facade.

- Facade fire resistant classes - EI 60 and EI 90
- Perimeter seal - EI 90 and EI 120
- Flexible position of the spandrel panel in relation to the floor slab

Schüco Deflame offers planning and design freedom in a tested "off the shelf" system.

Schüco – System solutions for windows, doors and façades
Based in Bielefeld, the Schüco Group develops and sells system solutions made of aluminium, steel and PVC-U for building envelopes. Its product portfolio comprises window, door, façade, ventilation, security and sun shading systems. Intelligent and networked products complete the range available for residential and commercial projects. Schüco also provides consultancy and digital solutions for all phases of a building project – from the initial idea through to design, fabrication and installation, as well as after sales with maintenance and servicing. Fabrication machinery and customer-oriented service complement the product portfolio. Sustainability is a significant part of the business model. For example, the circular construction industry with closed material cycles is one of six defined focus areas for sustainability. Founded in 1951, the company is now active in more than 80 countries and achieved a turnover of 1.995 billion euros in 2021. For more information, visit www.schueco.com

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