HELIOS

SPEKTRA®

THERMAL INSULATION SYSTEMS

EPS

ETA

ETA-08/0122

MW

ETA

ETA-08/0078

MANUAL FOR FACADE BUILDERS AND ENGINEERS

FACADE – CHOOSING THE SUITABLE "SUIT" FOR YOUR HOME

The word **FACADE** has two meanings: from the technical aspect, these are all external surfaces of a building, whereas sometimes this word only refers to those wall surfaces which face the street and are also more colorful than the other, non-exposed surfaces. When choosing a coating and colour shade, one must be aware there are many factors to take into consideration. Usually, the first thing we think of is the esthetical effect – the influence of the selected coating and shade on the appearance of the building, the harmony with its architecture, the taste and wishes of the owner of the building, and so on. However, we tend to forget about the technical and physical characteristics of both the coating and the building. By this, we mean the composition of the surface, adhesion and resistance of the coating on it, light and weather resistance of the selected coating and shade, and finally, the principles of construction physics, as interventions on the external walls affect the function of the facade, especially its insulation properties.

In the present manual, one can find all the necessary information for a comprehensive and high-quality installation of **SPEKTRA** thermal insulation systems. Let us go through the most common mistakes and their consequences, examples of good practices and recommendations from the experts. Graphically illustrated details will help us to understand the difference between flawless and average work.

Nowadays, when the prices of energy product seem to be sky high, a high-quality installation of thermal insulation systems is almost indispensable in order to take the burden off the family budget. There are several factors to which we must pay attention in order to increase the energy savings as much as possible. The main factors include: the location of the building, the architectural shape of the building and the type and method of construction.

The location of the building affects the strain the building is exposed to in the many years of use. Most of the times, one is not able to select the ideal location, however, it must be taken into consideration that strong external strain, such as the wind, sun, increased humidity, flooding, etc. can significantly affect the use of energy for heating and cooling, and result in the need for early renovation, and a shorter life span of the facade system.

From the energy aspect, the **architecture of the building** is an important factor which can also affect the consumption in residential houses to up to 20 %. As the surface of the house's facade can be different for buildings of the same volume, careful planning is of utmost importance.

The **type and method of construction** also have an important influence on the life span of the building and its facade. When building facade systems or renovating, it is important to already have a prior high-quality construction of basements, waterproofing, balconies, roofings with large or small overhangs, and other elements which significantly contribute to the heat transfer and the so-called thermal bridges. With old buildings, especially multi-apartment blocks, it is much more difficult to install facade systems near window openings and stairway lines, as these buildings were not built and planned having in mind the insulation of larger thicknesses.

SPEKTRA thermal insulation system

encompasses products for the protection and decoration of facade surfaces. With plaster colours you can express your personality, brighten up the architecture of the building, ensure energy saving, maintain the value of the building, improve the quality of living and protect the environment. Thus, we are offering you the possibility to fulfill the sense of satisfaction, perfection and safety.

Warning:

SPEKTRA thermal insulation systems have the European Technical Approval **ETA-08/0122** for the EPS system and **ETA-08/0078** for the MW system. The information is to be regarded as a general guideline and should not be considered as a guarantee, as specific/actual methods of use are not taken into consideration. The expert team is at your disposal for all questions.

Contents

Thermal insulation facade systems (TIS)

Quality level	1 Adhesion	2 Insulation	3,5 Processing	4 Reinforcement	5 Impregnation	6 Top coat
SPEKTRA EPS (GRAPHITE) premium EPS ETA ETA-08/0122	 • **SPEKTRA ADHESIVE EPS**	 • **SPEKTRA EPS F insulation panels** • SPEKTRA EPS GRAPHITE F insulation panels	 • **SPEKTRA ADHESIVE EPS** • SPEKTRA ADHESIVE EPS rough*	 • SPEKTRA reinforcing facade mesh	 • **SPEKTRA UNI GRUND**	 • **SPEKTRA SILICONE PLASTER**
SPEKTRA EPS classic EPS ETA ETA-08/0122	 • **SPEKTRA ADHESIVE EPS**	 • **SPEKTRA EPS F insulation panels** • SPEKTRA EPS GRAPHITE F insulation panels	 • **SPEKTRA ADHESIVE EPS** • SPEKTRA ADHESIVE EPS rough*	 • **SPEKTRA reinforcing facade mesh**	 • **SPEKTRA UNI GRUND**	 • **SPEKTRA ACRYLIC PLASTER**
SPEKTRA MW premium MW ETA ETA-08/0078	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA facade MW lamella** • SPEKTRA facade MW panel	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA reinforcing facade mesh**	 • **SPEKTRA UNI GRUND**	 • **SPEKTRA SILICONE PLASTER**
SPEKTRA MW extra MW ETA ETA-08/0078	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA facade MW lamella** • SPEKTRA facade MW panel	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA reinforcing facade mesh**	 • **SPEKTRA UNI GRUND**	 • **SPEKTRA SILICONE&SILICATE PLASTER ***
SPEKTRA MW classic MW ETA ETA-08/0078	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA facade MW lamella** • SPEKTRA facade MW panel	 • **SPEKTRA ADHESIVE MW**	 • **SPEKTRA reinforcing facade mesh**	 • **SPEKTRA UNI GRUND**	 • **SPEKTRA SILICATE PLASTER ***

AUXILIARY PRODUCTS

- SPEKTRA polyurethane adhesive for insulation panels
- NEOSTIK PUR FOAM FOR ROOF TILES (optionally pistol)
- NEOSTIK PUR FOAM UNIVERZAL (optionally pistol)
- NEOSTIK PUR FOAM FOR INSULATION PANELS(pistol)

- NEOSTIK ROUGH ACRYLIC SEALING COMPOUND
- NEOSTIK SILICON NEUTRAL
- NEOSTIK ADHESIVE SEALING COMPOUND FOR ALL SURFACES
- SPEKTRA MOSAIC PLASTER

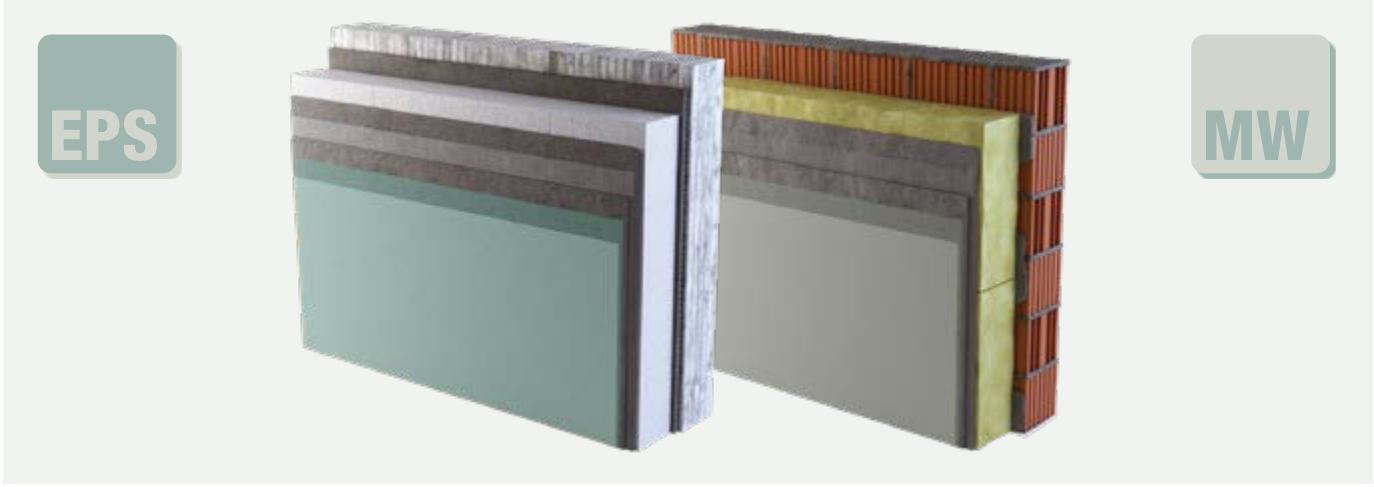
All SPEKTRA thermal insulation systems are also available in a STRONG version, which has double reinforcement and therefore more mechanical resistance. For faster adhesion of EPS insulation panels, it is also possible to use SPEKTRA polyurethane adhesive for insulation panels.

* available on request

1. Thermal insulation system (TIS)

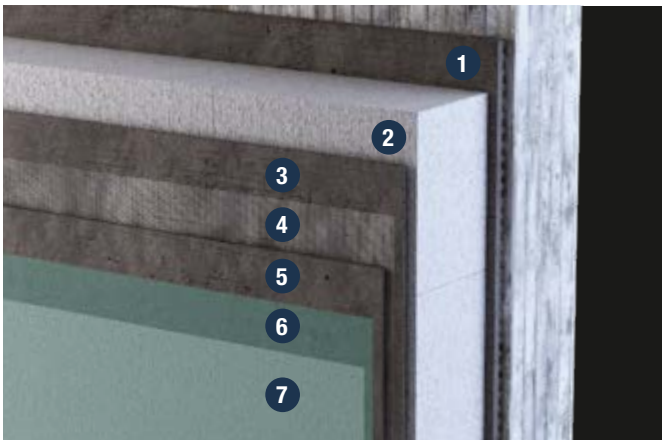
SPEKTRA thermal insulation system EPS
ETA 08/0122

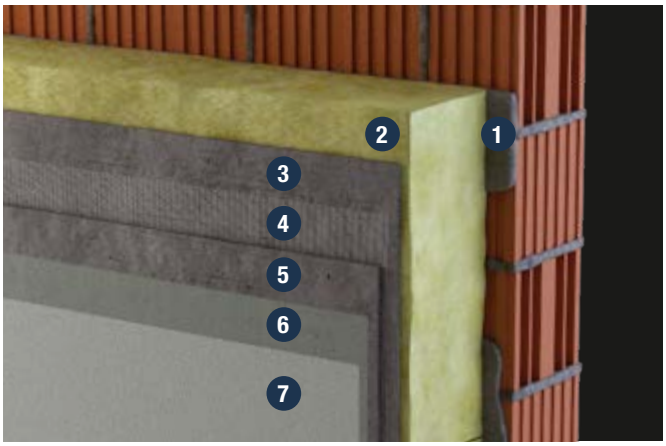
SPEKTRA thermal insulation system MW
ETA 08/0078



1. SPEKTRA adhesive for polystyrene EPS
2. SPEKTRA Facade polystyrene panel (EPS-F)
3. SPEKTRA adhesive for polystyrene EPS
4. SPEKTRA reinforcing mesh
5. SPEKTRA adhesive for polystyrene EPS
6. SPEKTRA UNI GRUND
7. SPEKTRA plaster – acrylic or silicone

1. SPEKTRA adhesive for mineral wool MW
2. SPEKTRA Facade MW lamella / panel
3. SPEKTRA adhesive for mineral wool MW
4. SPEKTRA reinforcing mesh
5. SPEKTRA adhesive for mineral wool MW
6. SPEKTRA UNI GRUND
7. SPEKTRA silicone plaster





Area of application of SPEKTRA thermal insulation systems

SPEKTRA EPS	SPEKTRA MW lamella /panel
Facade protection system with expanded polystyrene panels (EPS) for heat and sound insulation of old and new buildings up to a height of 22 m.	Facade insulation system with lamellas from mineral wool (MW) for an added quality of sound and fire protection of new and old buildings even above a height of 22 m.
optimal thermal protection	non-combustibility
economical price	ecological system
easy to use	high level of vapour permeability

1.1 European Technical Approval – ETA

ZAG
ZAVOD ZA GRADBENIŠTVO SLOVENIJE
SLOVENIAN NATIONAL BUILDING AND CIVIL ENGINEERING INSTITUTE

EOTA
Member of www.eota.eu

Dimičeva 12,
1000 Ljubljana, Slovenija
Tel.: +386 (0)1 280 44 72, +386 (0)1-280 45 37
Fax: +386 (0)1 280 44 84
e-mail: info.ta@zag.si
http://www.zag.si

European Technical Assessment — **ETA-08/0122 of 21.09.2020**

English version prepared by ZAG

General Part

Technical Assessment Body issuing the ETA	**ZAG Ljubljana**
Trade name of the construction product	**SPEKTRA toplotno izolativni sistem EPS / FASADEX EPS fasadni sustav / ZVEZDA toplotno izolacioni sistem EPS / COLOR toplotno izolativni sistem EPS / MEGAFAS EPS fasadni sustav / EFFECTA EPS fasadni sustav**
Product family to which the construction product belongs	**04: External Thermal Insulation Composite Systems with rendering (ETICS) for the use as external insulation to walls of buildings**
Manufacturer	**HELIOS Tovarna barv, lakov in umetnih smol Količevo, d.o.o.** **Količevo 65** **SI-1230 Domžale, Slovenia** https://www.helios-group.eu/
Manufacturing plants	**CHROMOS boje i lakovi d.d.** **Radnička cesta 173d** **HR-10000 Zagreb, Croatia** **Helios Srbija a.d.** **Radovana Grkovića 24** **RS-32300 Gornji Milanovac, Republic of Serbia**
This European Technical Assessment contains	*24 pages including 2 annexes which forms an integral part of this assessment*
This European Technical Assessment is issued in accordance to Regulation (EU) No 305/2011, on the basis of	*ETAG 004, edition February 2013, used as European Assessment Document (EAD)*
This version replaces	*ETA-08/0122 issued on 06. 11. 2018*

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.
Communication of this European Technical Assessment (including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

ZAVOD ZA GRADBENIŠTVO SLOVENIJE LJUBLJANA

1.2 General instructions and notes

Components of the TIS
- Adhesive
- Insulation material
- Facade anchors
- Auxiliary accessories for facade systems
- Priming coat (reinforcing compound)
- Glass fibre mesh
- Finishing decorative layers (priming coat and plaster)

1.3 Preparatory work

We can start the thermal insulation system installation after:
- the roof is finalized and the grooves are installed,
- concrete walls are at least 3 months old, and brick ones at least one month old,
- doors, windows and other joinery been installed,
- all surfaces which might be damaged during the installation works (glass, wood, aluminium, handles on windows, etc.) are covered and protected,
- the surface shows no signs of humidity, interior plasters and screeds must be treated 3–5 weeks before and dry,
- the surface is checked and tested for adequacy,
- basic conditions: surface temperature: 10–30 °C, evenness of the surface: ±1 cm per 4 m,
- all horizontal surfaces, profiles, panel mouldings, etc. are covered and protected in order to prevent potential humidity penetration,
- clear information about the installation of connections and finishing elements is available
- causes for salting out in old buildings are eliminated and capillary moisture is removed,
- fence holders on balconies or terraces have been installed.

Notes:

- During the initial phases of installation and drying, the temperature of the ambient, the surface and the material should be at least +5 °C (with silicate plasters at least 8 °C) throughout the entire drying time.
- Installation is not allowed if the temperature of the ambient, the surface and the material exceeds +35 °C (or +27 °C with silicate plasters).
- Weather conditions (rain, fog, wind, direct sunlight) have a negative affect on drying and curing; therefore, protective shading must be used (shading screens for construction scaffolding).
- The time of drying and bonding of the material must be taken into consideration; in addition to the uneven humidity of the surface and human factors which influence the final appearance and quality of work, the drying time is significantly prolonged also by negative weather conditions.
- Basic materials, adhesives, compounds and plasters must not be mixed with additives or other materials. Materials of different qualities are not to be mixed either.
- Materials must be stored in a cool place also during the time prior to the application.
- The selection of the colour also affects the construction-physical appearance. Dark colours absorb heat more than the light ones, which causes a greater increase of the wall temperature and thus also results in a more significant thermal strain. The light reflectance value, the light reflection coefficient (Y value) shows the share of light the surface will reflect (100 % = white, 0 % = black). There are different requirements for different facade systems: for a facade with a thermal insulation system it generally applies that in the selection of the colour shade of the finishing layer, the Y value should not be below 25 %.
- We recommend selecting the colour according to the HGMIX EXTERIOR COLOUR COLLECTION colour chart.
- More information on IR reflective pigments and shading can be found on page 52.

1.4 Surfaces for TIS

The contractor is responsible for checking the surface before commencing work and based on his expertise, defining whether it is suitable for the installation of thermal insulation.

If working with new surfaces (brick, concrete, porous concrete, etc.), the contractor can quickly determine whether they are suitable for the mounting of insulation panels.

With other, older surfaces, it must be checked whether the substrate is adequate. Old buildings with different surfaces require careful testing, measurement and, if necessary, also the assistance of experts. All systems must be adhered and fixed with anchors.

The surface is tested randomly in different spots:

- the following properties are checked with a visual inspection:
  - humidity *(Image 1)*
  - presence of cracks *(Image 2)*
  - type of surface *(Image 3)*
- by wiping with your hand or with a black cloth, the chalking and "blooming" of the surface is tested *(Image 4)*,
- stability and load bearing capacity is tested with scratching and carving with a hard pointy object,
- absorbency is tested by wetting the substrate with a paint brush,
- a level batten or a plumb is used to test the flatness of the vertical surfaces.

1

Surface humidity

2

Presence of cracks

3

Type of surface

4

Surface chalking and "blooming" test

2. Installation of the thermal insulation system

Prior to commencing work, a string must be placed horizontally on the surface of the facade on which insulation panels will be placed, and the direction must be determined vertically – leveling out.

Base of the facade

The plinth of the facade is the part of the facade exposed to water splashes. This area begins with the level of the terrain and is approximately 30 cm high. Due to more extensive mechanical requirements and increased humidity compared to other parts of the facade, special measures are required for this particular part.

Constructive measures must be taken to direct rain water away from the facade.

Mineral wool (MW) is not to be installed in the plinth area; instead, insulation panels for the plinths are used.

5

6

After determining the height of the base, the **plinth edge profile** is placed on the upper edge of the base *(Images 5 and 6)* in a straight line (with a spirit level) and mechanically fixed. The dimensions of the final profile depend on the thickness of the thermal insulation material. Construction adhesive is then applied on the contact edge of the base edge profile, thus protecting the system against damage and insects.

7

8

It is also possible to have the facade and plinth in the same facade line, without using the base profile *(Image 7)*.

Installing the drip element in the area of the plinth when dealing with thick insulation, using an insert base profile *(Image 8)*.

2.1 Bonding TIS panels

When mixing adhesives, follow the manufacturer's instructions. Consumption depends on the surface, and ranges from 4.5 to 6.0 kg/m^2 according to adhesion norms.

Adhesive can be applied manually or mechanically, and the following must be taken into consideration:

- there should be no air circulation between insulation panels and the surface (otherwise, this causes a fireplace effect and the rapid spread of fire)
- the panels should be evenly connected to the surface (otherwise they can bend outwards or inwards, *images 11, 12*).

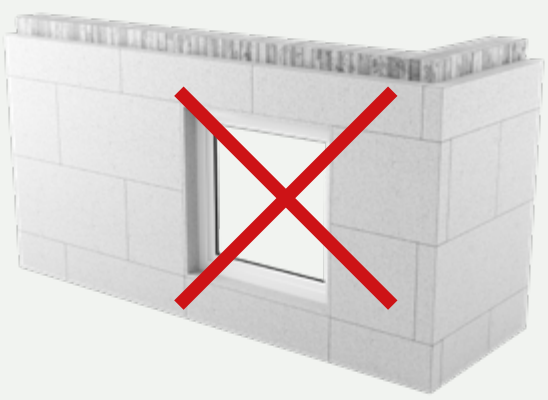
Panels are to be placed from the bottom up. First, they must be mounted on the corners of the building.

9

In the corners, panels overlap alternately *(Image 9)*.

Panels shorter than 50 cm are not to be used around openings and in the corners. Panels in the corners of window or door openings – are to be placed around the corner by cutting them in an L-shaped form, so the corner is surrounded with one piece of insulation as shown in Image 9; insulation elements should not meet in the corners of an opening *(Image 10)*.

10

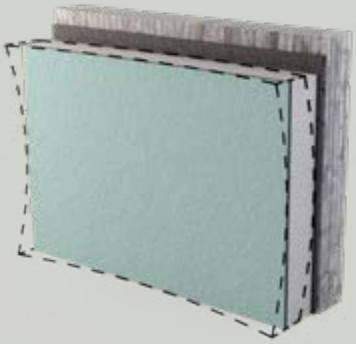


Note:

Strain of insulation systems based on surface heating due to weather exposure and forces applied onto the surface *(Images 11 and 12)*.

11

Low exterior temperature



12

High exterior temperature

Applying adhesive to polystyrene (EPS) panels

With normal surfaces (uneven surface of up to ± 1 cm), adhesive is to be applied in strips on the edges, and in spots in the middle. Apply an approx. 5 cm wide strip around the edge of the panel, and 3–6 spots in the middle of the panel of approx. 10–15 cm in diameter *(image 13)*. The required quantity of adhesive must be in accordance with the tolerance of the surface and the thickness of the adhesive layer (1–2 cm), in order to reach a contact surface of at least 40 %.

13

With level and non-absorbent surfaces, adhesive can be applied across the entire panel surface with a notched trowel which has notches of at least 12 mm in width. The percentage of contact surface must be, due to a more low-quality substrate, as close as possible to 100 %. *(Image 14)*.

14

Mechanical application of adhesive

Using an adhesion gun, apply a strip on the edge and a W-shaped line onto the internal surface of the EPS panel. The strip should be 5 cm wide and 2 cm high. Application must be even, there must be a contact surface of at least 40 % *(Image 15)*.

15

Application of adhesive on a mineral wool (MW) lamella

Prior to the application of adhesive on the lamella, the lamellae manufacturer recommends pressing the adhesive into the lamella with a masonry trowel, which is to be followed by the application of adhesive *(Image 16)*. This helps solidify the fibres and the dust on the surface which was formed during the manufacturing of the panel. When applied manually, adhesive must be applied across the entire surface with a special trowel for lamellae, and applied onto the surface with a notched trowel.

16

Application of adhesive on a mineral wool (MW) panels

If mineral wool insulation panels had not been previously stabilized and fixed, this must be done before applying adhesive. To fix the panels, apply an approximately 1 mm layer of thin-layer adhesive onto the entire surface of the panel. This prevents layer separation on the insulation panel *(Image 17).* Panels can be additionally fixed with facade anchors, which are to be placed on the spots where adhesive is applied underneath.

With normal surfaces (surface unevenness of up to ± 1 cm), adhesive is to be applied in strips on the edges, and in spots in the middle. Apply an approx. 5 cm wide strip around the edge of the panel, and 3–6 spots in the middle of the panel of approx. 10–15 cm in diameter (image 17). The required quantity of adhesive must be in accordance with the tolerance of the surface and the thickness of the adhesive layer (1–2 cm), in order to reach a contact surface of at least 40 %.

17

- The quantity of adhesive on the surface must be just enough to enable the panels / lamellae to be placed before adhesive starts to dry.
- The use of humid or damaged panels / lamellae is not permitted.
- If adhesive is left on the panel/lamella or wall too long, a thin dry layer forms on the adhesive, which might cause problems with adhesion onto the surface.
- Thermal insulation panels / lamellae must be pressed into the surface, and pressed immediately after the application of adhesive.
- Adhesive between contact surfaces must be removed immediately and completely in order to prevent thermal bridges.

2.2 Installing insulation panels

18

19

Thermal insulation panels are to be installed closely one next to the other, from the bottom up. There should be no open joints between the panels. There should be no cross joints. Avoid any open joints. If they occur, they must be sealed with strips of the same insulation material *(Image 18)*.

Joints wider than 2 mm must be sealed with an insulation material or a suitable foam filler, but this only applies to EPS F panels *(Image 19)*. There should be no joints wider than 5 mm.

20

21

Joints are not to be filled with adhesion mortar or basic plaster *(Image 20)*.

When placing each row of panels, a batten must be used each time to check whether they are placed in a straight line.

When cutting parts of panels, pay attention to the squareness and use adequate tools:
- for EPS, use an annealed wire
- for mineral wool panels, use a knife or a manual saw.

Once the EPS panels are fixed onto the surface, they must be left for 72 hours in normal drying conditions, or longer if the conditions should require so. Evenness is then checked with a 4-meter batten. If needed, sand uneven surfaces perpendicularly to the contact surfaces.

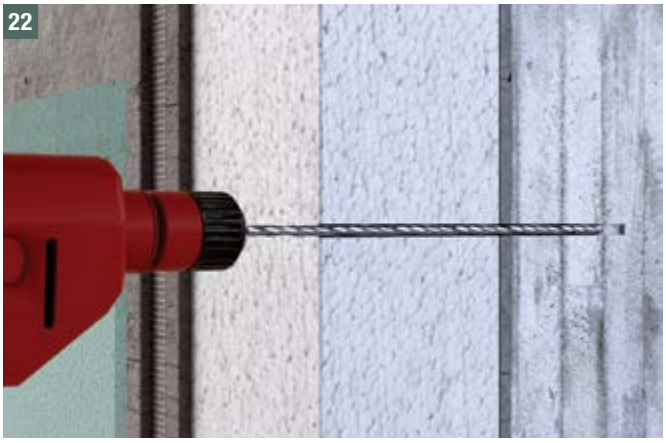
Insulate the reveals after you have completed the adhesion process of base surfaces. Place sealing strips or window profiles on window or door frame contact surfaces *(Image 21)*.

Installing two-layer insulation panels

Insulation panels of the same kind can be installed in two layers, preferably of the same thickness. The first layer of insulation panels is to be glued in accordance with the instructions in this manual. The second layer is glued on the first one by applying adhesive to the entire surface of the panels. Move the vertical and horizontal joints during the process.

If additional fixing (anchoring) is required, only the first layer of EPS F-type panels should be fixed, whereas for other types of insulation this should be done for both layers of panels (see chapter 8.6.3). Both layers of insulation panels must be installed with a horizontal and vertical offset of about 25 cm.

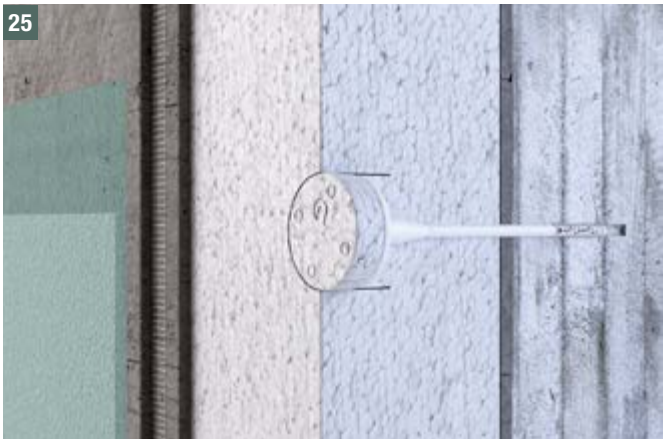
22



23

24

25



2.3 Fixing insulation panels

On supporting surfaces, thermal insulation panels can additionally be fixed with facade anchors – 72 hours after adhesion or once dry.

EPS F panels and mineral wool lamellae in new buildings and TIS systems with a surface mass < 30 kg/m^2 do not have to be additionally fixed with facade anchors – unless otherwise stated due to the location of the building and average values of local winds.

For buildings which are higher than 8m, we recommend using facade anchors to fix EPS F panels.

TIS systems with MW lamellae with a surface mass of 30 kg/m^2 and the height of the building exceeding 25 m **must always be additionally fixed with** facade anchors. Surfaces of old facades – which are restored with a prior test of surface bearing capacity – must also always be fixed.

In addition to being glued with adhesive, purpose-made polystyrene insulation panels for the plinth area must always be additionally fixed with anchors before adhesive begins to cure (in wet condition); 4 anchors/m^2 or at least 2 per panel must be used.

When choosing anchors, make sure they are suitable for the surface, the facade system and that they meet the requirements for use. For most insulation panels, the diameter of the anchor canopy must be at least 60 mm, whereas for lamellas, the diameter of anchors must be between 100 and 140 mm.

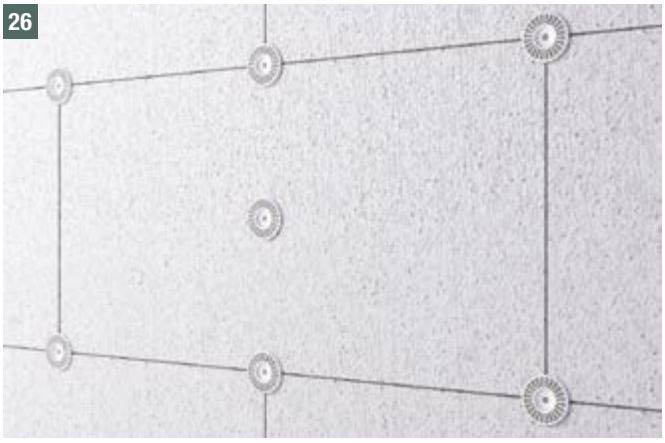
Drilling holes for anchors:

- only once the adhesive has cured sufficiently (the plinth area is an exception),
- use a drill with the same diameter as stated on the anchor,
- use the drilling machine with a hammer only for drilling into regular concrete and solid brick *(Image 22)*,
- for hollow bricks and other surfaces, use drills suitable for such surfaces,
- break through mineral wool panels with a non-vibrating drill machine,
- the set drilling depth = length of anchor + 10–15 mm,
- the drilling depth into the load-bearing surface is 50 mm,
- old facade systems and plasters **are not regarded** as a load-bearing surface.

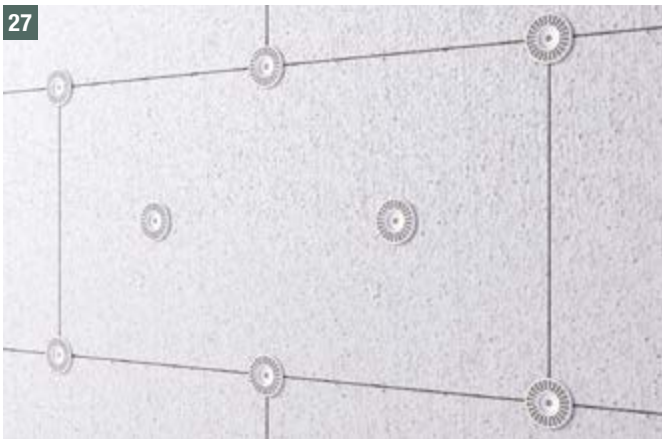
The anchor must be placed in the same plane as the panel, or deeper, to match the depth of the rondelle plate *(Images 23 and 24)*. Depending on the type of anchor, it can be hammered or screwed in. With thermal insulation panels, we recommend covering the anchor with an insulation plate *(Image 25)*.

Check whether the anchors are firmly fixed. Unsuitably fixed anchors must be removed. Place new anchors next to the position of the old ones, and seal the newly formed hole with insulation material. Anchoring is to be carried out on the spots where there is adhesive between the panel and the wall. Anchors are to be fixed under the reinforcing layer.

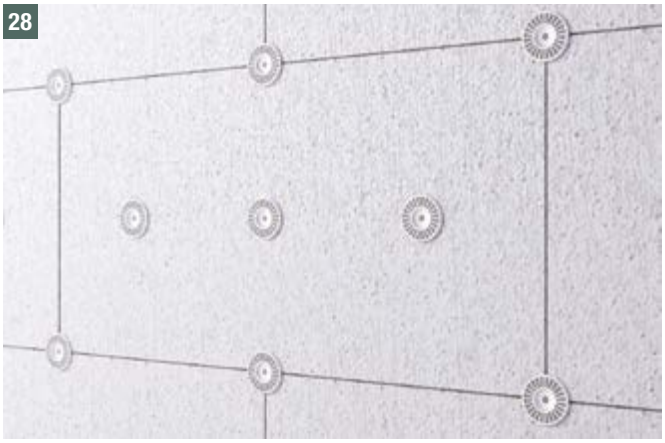
26



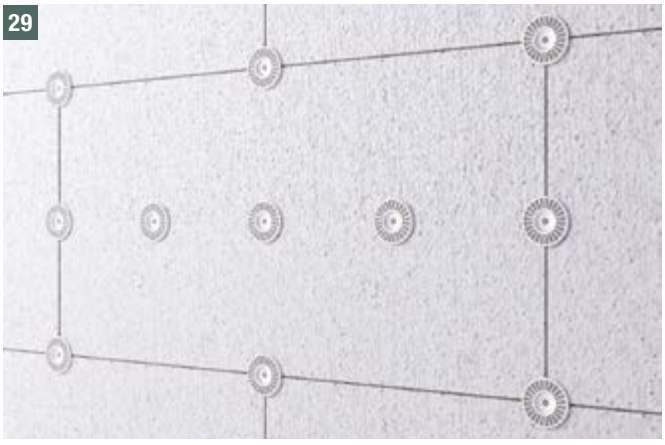
27



28



29



The number of anchors and fixing outline

Several interconnected factors affect the number of anchors:

- the location of the building (average speed of the wind and the category of the terrain),
- architecture of the building,
- building outline,
- type of surface,
- the selected facade system (weight per m^2, type of insulation).

The height and length of the surface indicate the size of fixing zones on the edges, which in certain locations depend on the relation between height and width, and the speed of wind. As a result of wind, edge zones are subject to more strain and thus fixed more strongly. The minimum number of anchors required is $6/m^2$, or in the case of higher buildings, old surfaces or strong winds, as much as $12/m^2$ might be needed depending on the requirements. On edge zones, the number of anchors can be increased – depending on the speed of wind, the shape of the ground surrounding the building, and the height – to 12 anchors per m^2. The width of the edge zone on both sides must be at least 1 m. If the height of the building exceeds its length, the width of the edge zone must be 10 % of its length; if the height is equal or lower, the width of the edge zone must be 10 % of its height.

The number of facade anchors must be determined by the project designer in the project documentation; these instructions are to be followed in the execution of the project. We recommend fixing MW panels according to the W outline, but they can also be fixed according to the displayed T outline.

T outline 6 anchors on EPS F and MW panels
(100 × 50 cm) – *Image 26*

T outline 8 anchors on EPS F and MW panels
(100 × 50 cm) – *Image 27*

T outline 10 anchors on EPS F and MW panels
(100 × 50 cm) – *Image 28*

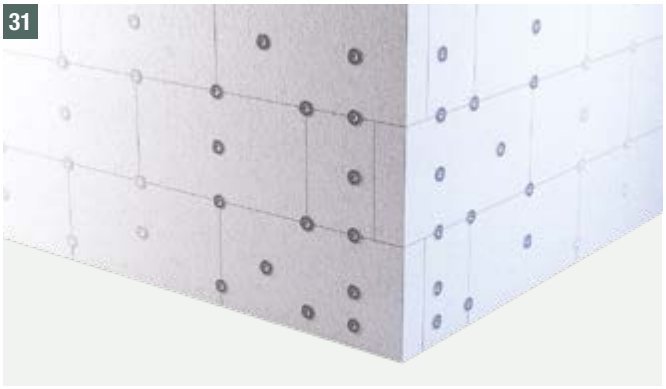
T outline 12 anchors on EPS F and MW panels
(100 × 50 cm) –*Image 29*

Outline 6 anchors on MW lamellae
(120 × 20 cm) – *Image 30*

30

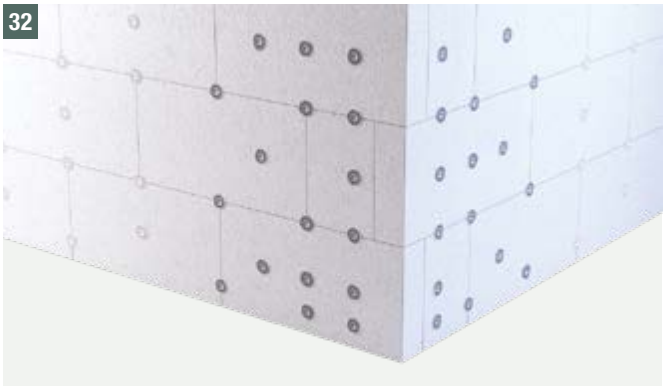
Outlines for additional fixing of insulation elements on edges with 8, 10 or 12 anchors/m²

31



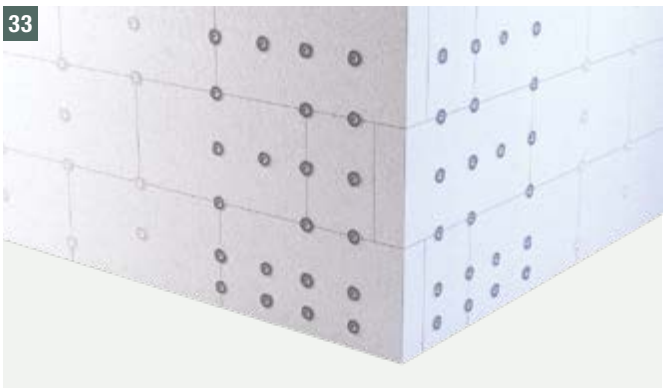
T outline 6 anchors on the surface, or 8 anchors including the edge zone for EPS F and MW panels (100 × 50 cm) – *Image 31*

32



T outline 6 anchors on the surface, or 10 anchors including the edge zone for EPS F and MW panels (100 × 50 cm) – *Image 32*

33

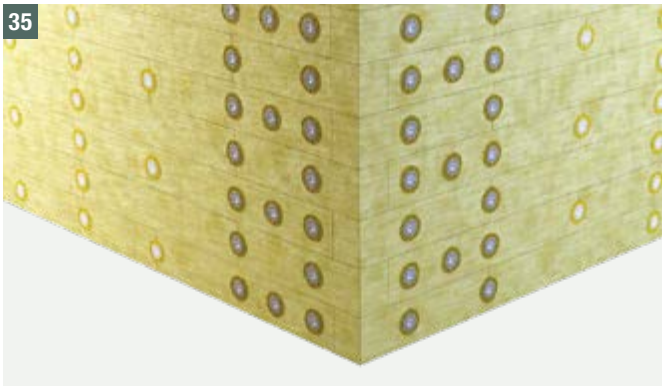


T outline 6 anchors on the surface, or 12 anchors including the edge zone for EPS F and MW panels (100 × 50 cm) – *Image 33*

34

Outline for fixing MW lamellae (120 × 20 cm), 6 surface anchors, or 8 including the edge zone – *Image 34*

35



Outline for fixing MW lamellae (120 × 20 cm), 6 surface anchors, or 10 including the edge zone – *Image 35*

36

Outline for fixing MW lamellae (120 × 20 cm), 6 surface anchors, or 12 including the edge zone – *Image 36*

	Landscape categories								
	Windy area cat. I			Area with wind barriers cat. II			Non-exposed area, city cat. III		
	Height of the building			Height of the building			Height of the building		
Speed of wind km/h	< 10 m	10–25 m	< 25–50 m	< 10 m	10–25 m	< 25–50 m	< 10 m	10–25 m	< 25–50 m
to 85	6	6	6	6	6	6	6	6	6
from 85 to 115	8	8	10	6	6	8	6	6	8
from 115 to 135	10	12	12	8	10	10	6	8	10

2.4 Preparation for reinforcement and leveling of unevenly mounted thermal insulation panels

Unevenness on already mounted EPS F panels must be leveled out with sanding trowel or with a purpose-made sanding machine for polystyrene. The dust formed in this process must be removed thoroughly. Due to the effects of UV rays, the surface of the panels yellows after a long exposure. The resulting yellow floury substance must be removed completely (sanded and swept off) prior to reinforcement.

Mineral wool panels and lamellas must be covered with an impregnation layer prior to reinforcement (thin adhesive – *Image 37*), which protects them against humidity and ensures good adhesion of the reinforcing layer of the facade system.

Angles (edges)

For all connections on the insulation layers of doors and windows, and when building in construction parts, such as lightning conductors, sockets and rainwater pipes, permanent protection must be provided against leakage of the thermal insulation system, in accordance with the height and position as well as the speed of wind. As a rule, long-lasting protection is only possible when using facade profiles.

Diagonal reinforcement

Window and door openings require diagonal reinforcement which is to be placed in before reinforcing the surface and fixed by placing the edge of the strip at an angle of approx. 45°. Strip dimensions are usually 30 × 40 cm. The first fibers must be places completely into the corner, or meshes are to be placed at the corner *(slika 38)*.

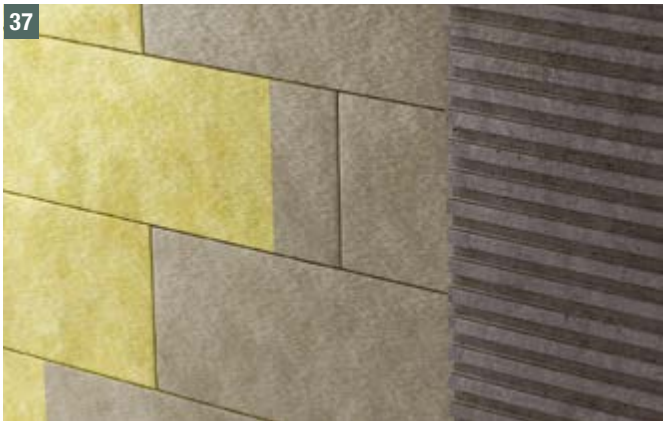
Edges

When using edge profiles with a glass fibre mesh or angles with a mesh, the foundation coat must be applied in the width of the planned legs. This enables the placing in of the edge profile and the leg of the mesh into the foundation coat. The connection must be made with a 10 cm overlap *(slika 39)*.

The edges without finished profiles must be made in such a manner that glass fibre meshes (approx. 20 cm) are pulled around the edges, and installed in the base layer with an at least 10 cm overlap.

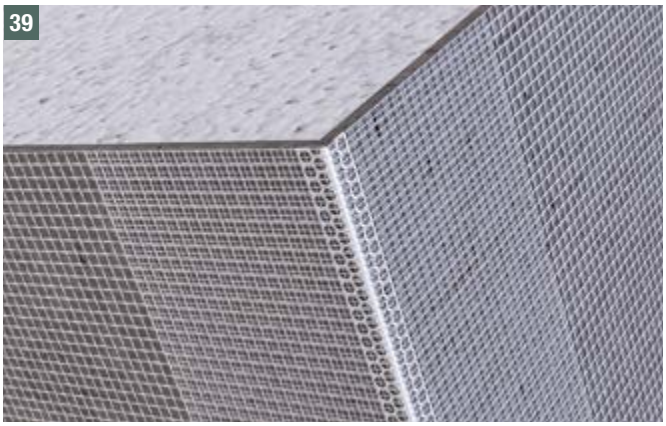
Drip profiles on the edges are used in overhang finishes to enable proper drainage of rainwater which – as a result of wind – wet the surface of the facade *(Image 40)*.

37

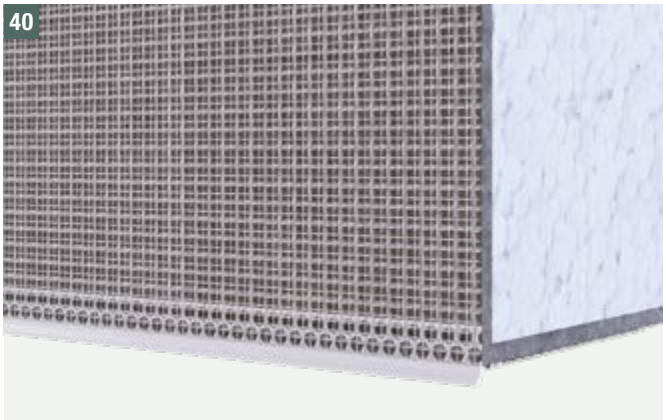


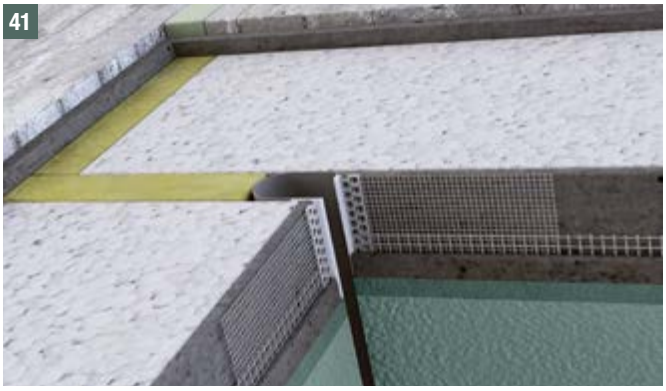
38

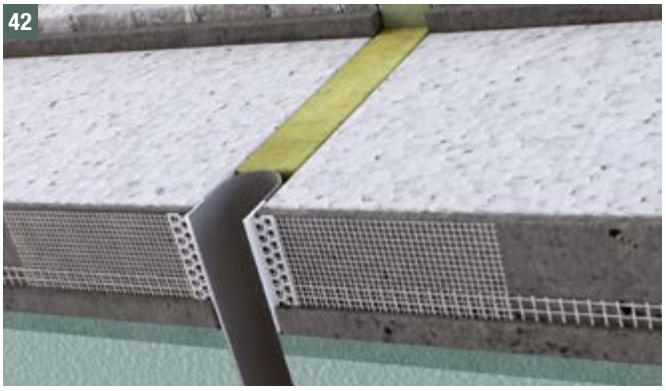
39



40




41


42

Expansion profiles

They are used to bridge the elongations of large surfaces which are subject to statical expansion and contraction as a result of heating or cooling – thus moving more than the facade system could bear without such expansion. The movement of the surface can also be caused by static movements of the building, which is subject to expansion due to its dimension, which prevents damage on the building caused by the terrain, build-in materials and various forces acting on the building *(Images 41 and 42)*.

2.5 Reinforcing of insulation panels

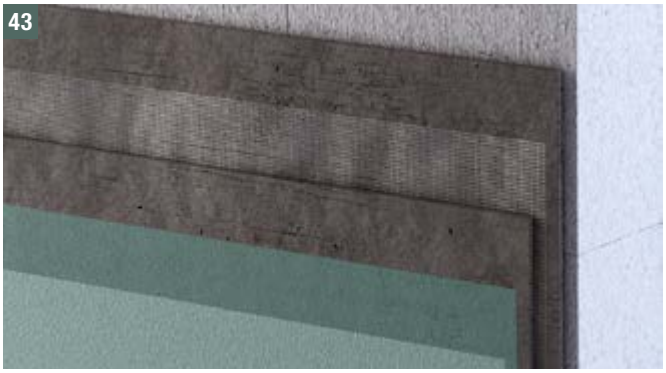
Surfaces are to be reinforced following 2 to 3 days of drying of the adhesive used for the insulation. Optimal drying and curing conditions are at a temperature of 20 °C and a relative humidity of 60 %). The drying time is prolonged in the event of a lower temperature or higher air humidity. If reinforcing is done diagonally, it is extended by 24 hours. First, a reinforcement compound (adhesive) is to be applied manually or mechanically onto a suitably prepared thermal insulation surface, in a thickness of at least 2 – 3 mm. The alkali-resistant glass fibre mesh is to be pressed in into the freshly applied reinforcement compound from top to bottom in vertical strips, covering at least 10 cm. To ensure sufficient coverage, the mesh must be covered wet-on-wet with the reinforcement compound. Smoothen from the middle towards the edge, without making creases, so that the mesh is not well visible.

If work is interrupted, the mesh must be re-covered in order to continue with the work, so that the reinforcement compound is removed from the mesh at approx. 10 cm width. This serves to achieve good adhesion and an even surface.

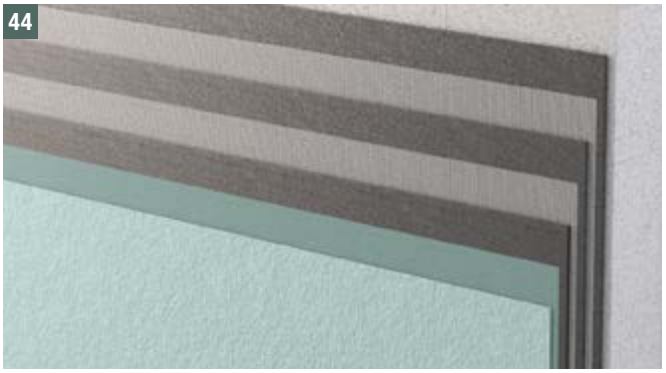
Two-layer reinforcement of high-wear facades of parts of facade surfaces

To increase the resistance of the facade surface to impacts caused by extreme weather conditions (hail, downpour with strong wind), mechanical damage resulting from vandalism or damage caused by animals or other factors, we recommend two-layer reinforcement. This is also advised when choosing a finishing plaster in a dark shade ($15 > Y < 25$), where the intensive heating of facade surfaces cause more expansion and contraction which can lead to the cracking of the facade at an earlier stage.

If an additional layer of glass fibre mesh is required to achieve increased mechanical strength, make sure to lay the first one without any overlap (tight contact). The basic plaster on the first layer must be cured before the application of the second layer. The overlap of the second reinforcement layer is done with an offset against the first one and with an at least 10 cm overlap of the reinforcement mesh.


43

One-layer reinforcement


44

Two-layer reinforcement

2.6 Finishing coat

After 5 to 7 days (optimal drying and curing conditions are at a temperature of 20 °C and a relative humidity of 60 %), or once the reinforced coat is completely dry, the finishing coat can be applied. The finishing coat is composed of the universal primer SPEKTRA UNI GRUND and the finishing decorative plaster.

24 hours prior to the application of the finishing plaster, the dry surface must be coated well with a priming coat, which is to be thinned according to the instructions of the manufacturer and shaded to approximately the same shade as the plaster.

Prior to the application of the finishing plaster, which must be mixed well in its original packaging, the quantity of the plaster for one side of the facade must be unified. Apply the plaster evenly with a stainless steel trowel in the thickness of the diameter of the thickest grain, and then use a plastic trowel to achieve the desired structure. Grooved plaster is to be structured with circular, vertical or horizontal, movements of the trowel once the surface is already slightly dry. The grained plaster is to be structured immediately after application.

While structuring, the milky part remaining on the trowel during the smoothening process must be removed frequently. This, fine part is always to be thrown away.

Important:

- Only timely and correctly carried out structuring, regular cleaning of the structuring tools and a sufficient number of workers enable an even appearance of the facade without visible connecting points.
- In order to prevent visible connecting points between different heights on the scaffold, work must be carried out diagonally in a stepped manner, and interruptions across the entire side of the surface must be avoided.
- As plasters are produced from natural fillers and pigments, it is not possible to exclude minor deviations in shades and structure; therefore, we recommend using the entire material from one filling and using one container, both when mixing the material before application as well as throughout the entire work process.

2.6.1 Granulation and treatment of finishing plasters

Granulation: 1.0 / 1.5 / 2.0 / 2.5 mm
Treatment: Z (grained)
Material: **SPEKTRA ACRYLIC PLASTER**
SPEKTRA SILICONE PLASTER
SPEKTRA SILICATE PLASTER
SPEKTRA SILICONE&SILICATE PLASTER

Granulation: 1.5 / 2.0 / 2.5 mm
Treatment: R (grooved)
Material: **SPEKTRA ACRYLIC PLASTER**
SPEKTRA SILICONE PLASTER
SPEKTRA SILICATE PLASTER
SPEKTRA SILICONE&SILICATE PLASTER

Properties of SPEKTRA finishing plasters

	SPEKTRA ACRYLIC PLASTER	SPEKTRA SILICONE PLASTER	SPEKTRA SILICONE OR SILICATE PLASTER	SPEKTRA SILICATE PLASTER
composition	dispersion binder	dispersion binder + silicone binder	dispersion binder, waterglass, silicone binder	waterglass + dispersion binder
vapour permeability (SIST EN 15824:2009)	+ (V2medium)	++ (V1 – high)	+++ (V1 – high)	+++ (V1 – high)
water absorption (SIST EN 15824:2009)	++ (W3 – low)	+++ (W3 – low)	+++ (W3 – low)	++ (W3 – low)
elasticity	+++	+++	+	+
mechanical resistance	++	++	+++	+++
shade selection	HGMIX	HGMIX	HGMIX	HGMIX
weather resistance	high	high	high	high

Key:

+++ excellent

++ very good

+ good

The shelf life of finishing plasters can be significantly extended by applying facade paints that offer additional UV protection, resistance to harmful atmospheric influences, moisture and mechanical damage. The following SPEKTRA facade paints are suitable for the protection of new finishing dispersion plasters: SPEKTRA Top Dry facade paint, SPEKTRA SILICONE FACADE PAINT, SPEKTRA SILOXANE FACADE PAINT and SPEKTRA ACRYLIC FACADE PAINT. When renovating old dispersion plasters, we recommend using SPEKTRA Renoxan facade paint and SPEKTRA UNIVERSAL FACADE PAINT. They are available in several colour shades according to the HGMIX EXTERIOR COLOUR COLLECTION chart. UV and weather-stable inorganic pigments are used for tinting, and selected dark shades are also optionally available in the version with IR reflective pigments, which achieve a Y value of less than 25 %. More information on IR reflective pigments and tinting can be found on page 52.

More detailed information on SPEKTRA facade paints is available in the Technical data sheet and on **www.helios-profi.si** and **www.helios-deco.si**.

3. Components of the SPEKTRA thermal insulation system

3.1 Base coat, adhesives and plasters

Impregnation

SPEKTRA UNI GRUND

Enables an even colour shade on the finishing coat

- deep penetration into the surface
- good adhesion
- evens out the absorbency of the surface

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for the impregnation of exterior and interior wall surfaces prior to the application of the SPEKTRA plasters.
CONSUMPTION:	1 kg covers 4–5 m^2 of surface in 1 coat
THINNING:	with water up to 10 % (in terms of weight)
PACKAGING UNITS:	8 kg / 25 kg
COLOUR SHADES:	white, HGMIX
TINTING:	possible with pigment pastes suitable for water-based paints, 3 to 5 %

Adhesion

SPEKTRA ADHESIVE EPS

Polymer cement mortar

- adhesion, reinforcement and treatment of polystyrene thermal insulation panels

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	as an adhesive for sticking styrofoam panels to mineral surfaces made of concrete, which is at least 2 months old, bricks, plaster, ytong blocks, asebstos-cement and other surfaces/(mortar) laying glass lattice onto thermal insulation panels (reinforcement) and as a compound for the final treatment (smoothening) before the application of the decorative plaster.
CONSUMPTION:	adhesion: 4–5 kg/m^2, reinforcement and treatment: 5–6 kg/m^2
COMPOUND PREPARATION:	mix the contents of 1 bag with approx. 6 l of water to achieve a homogeneous compound; leave the mixture to rest for approx. 10 minutes, and then mix again.
PACKAGING UNITS:	25 kg natron bags

Adhesion

SPEKTRA ADHESIVE MW
Polymer cement mortar

- adhesion, reinforcement and treatment of polystyrene thermal insulation panels, mineral wool, wool cement boards and similar materials.

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	as adhesive for the adhesion of polystyrene thermal insulation panels (expanded polystyrene, styrofoam), heraklith, mineral wool, glass wool/(mortar) laying glass lattice onto thermal insulation panels (reinforcement) and as compounds the final treatment (smoothening) before the application of the decorative plaster.
CONSUMPTION:	adhesion: 4–5 kg/m^2, reinforcement and treatment: 6 kg/m^2
COMPOUND PREPARATION:	mix the contents of 1 bag with approx. 5.5 l of water to achieve a homogeneous compound; leave the mixture to rest for approx. 10 minutes, and then mix again.
PACKAGING UNITS:	25 kg natron bags

SPEKTRA adhesive EPS rough
Polymer cement mortar

- adhesion, reinforcement and treatment of polystyrene thermal insulation panels

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	as an adhesive for sticking styrofoam panels to mineral surfaces made of concrete, which is at least 2 months old, bricks, plaster, ytong blocks, asebstos-cement and other surfaces/(mortar) laying glass lattice onto thermal insulation panels (reinforcement) and as a compound for the final treatment (smoothening) before the application of the decorative plaster.
CONSUMPTION:	adhesion: 4–5 kg/m^2, reinforcement and treatment: 5–6 kg/m^2
COMPOUND PREPARATION:	mix the contents of 1 bag with approx. 6 l of water to achieve a homogeneous compound; leave the mixture to rest for approx. 10 minutes, and then mix again.
PACKAGING UNITS:	25 kg natron bags

Auxiliary products

SPEKTRA polyurethane adhesive for insulation panels

- low expansion
- good adhesion to insulation panels
- strengthens with air humidity
- fast execution
- ETAG 004

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	insulation panels, facades, wood/plaster ... Excellent adhesion to: styrofoam, styrodur, stone wool, concrete, tiles, bricks, plaster, wood and other building materials.
PACKAGING UNITS:	800 ml

Top coat

SPEKTRA ACRYLIC PLASTER

Water resistance and vapour permeability

- easy application
- resistance to the effects of weathering and the harmful industrial atmosphere
- resistant to abrasion and impact
- elasticity

6-10 h

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for the treatment of different types of finely treated construction surfaces (fine mineral plasters, fibre-cement and plaster-cardboard panels) and concrete, and as top coat in facade thermal insulation systems.
CONSUMPTION:	1.0 mm Z: approx. 2.2 kg/m2 1.5 mm Z: approx. 2.5 kg/m2 2.0 mm Z: approx. 3.0 kg/m^2 2.5 mm Z: approx. 3.2 kg/m^2 1.5 mm R: cca. 2.5 kg/m2 2.0 mm R: cca. 2.8 kg/m^2 2.5 mm R: cca. 3.2 kg/m^2
THINNING:	with water if necessary
PACKAGING UNITS:	25 kg
COLOUR SHADES:	white, HGMIX

SPEKTRA SILICONE PLASTER

Extreme water resistance and vapour permeability

- resistant to the effects of weathering
- resistant to dirt
- resistant to scrubbing and impact
- easy to apply

6-10 h

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	a top structure plaster for the protection and decoration of exterior and interior surfaces on old and new mineral plasters, stoppers, concrete surfaces and as a top coat in facade thermal insulation systems
CONSUMPTION:	2.0 mm Z: 3.0 kg/m^2 1.5 mm Z: 2.5 kg/m^2 2.0 mm R: 2.8 kg/m^2 1.5 mm R: 2.5 kg/m^2 2.5 mm R: 3.2 kg/m^2
THINNING:	with water if necessary
PACKAGING UNITS:	25 kg
COLOUR SHADES:	white, HGMIX

SPEKTRA SILICONE&SILICATE PLASTER *

Durable water-resistant plaster which prevents the formation of micro-organisms

- high level of water resistance
- high level of vapour permeability
- resistant to dirt absorption
- resistant to the harmful effects of weathering and the industrial atmosphere
- colour stability

6-10 h

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	used as a top structural plaster for the protection and decoration of exterior and interior surfaces (all types of finely treated old and new mineral plasters, levelling compounds, concrete surfaces), and as a top coat in facade thermal insulation systems.
CONSUMPTION:	With 1.5 mm ~ 2.5 kg/m^2; With 2.0 mm ~ 3 kg/m^2 R 2.0 mm ~ 2.8 kg/m^2
THINNING:	with water, if required
PACKAGING UNITS:	25 kg
COLOUR SHADES:	white, HGMIX

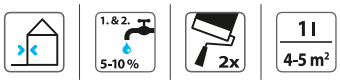
* available to order

Top coat

SPEKTRA SILICATE PLASTER *

Pre-prepared final plaster on the basis of potassium sodium silicate and acrylic dispersions

- easy application
- high level of vapour permeability
- resistance to the effects of weathering and the harmful industrial atmosphere
- resistant to abrasion and impact
- resistant to dirt absorption



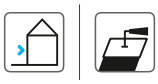
INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for the protection and decoration of exterior wall surfaces made from old and new mineral plasters, and the renovation of old layers of silicate paints and plastering.Due to its vapor permeability and matt surface, it is suitable for the renovation of facade surfaces of listed buildings.
CONSUMPTION:	Granulation 1.0 mm: cca. 2.3 kg/m^2 Granulation 1.5 mm: cca. 2.6 kg/m^2 Granulation 2.0 mm: 3,0 kg/m^2
PACKAGING UNITS:	25 kg
COLOUR SHADES:	white, HGMIX (pastel shades)

SPEKTRA MOSAIK PLASTER *

Ready-made multicolour acrylate decorative plaster

- resistant to abrasion and impact
- resistance to the effects of weathering and the harmful industrial atmosphere
- water resistance
- washability



INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for plinths, frames and decorations on priming plasters, concrete, exterior and interior walls, pillars and staircases and for window, door and fireplace frames.
CONSUMPTION:	Grain 1.0 mm: 2.0 to 2.5 kg / m^2 Grain 2.0 mm: 3.5 to 4.5 kg / m^2
THINNING:	no thinning
PACKAGING UNITS:	25 kg
COLOUR SHADES:	20 shades according to the colour chart

* available to order

3.2 Supplementary programme

Insulation

SPEKTRA EPS F insulation panels

SPEKTRA EPS GRAPHITE F insulation panels

SPEKTRA facade MW lamella

SPEKTRA facade MW panel

Reinforcement

SPEKTRA reinforcing facade mesh

145 g, width of 1 m, in a roll of 50 m^2

SPEKTRA PP plastic anchor

SPEKTRA tool for mounting PPV anchors

SPEKTRA anchor with PPV screw

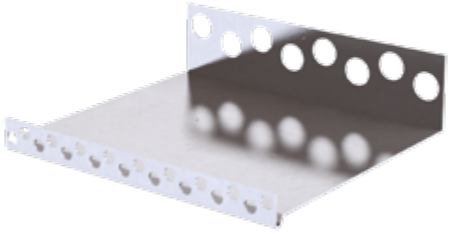
SPEKTRA EPS and MW plugs

⌀ 70 × 17

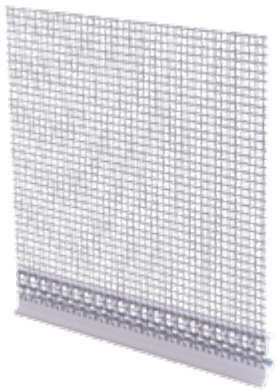
SPEKTRA PSK fixing anchor

SPEKTRA supporting ALU base profile

120 – 160 mm, 2.50 m

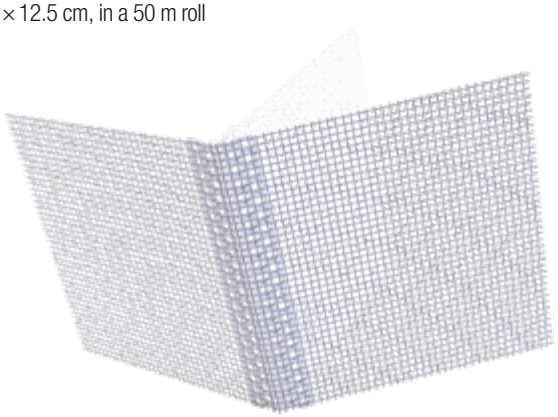


SPEKTRA mounting profile for the plinth profile



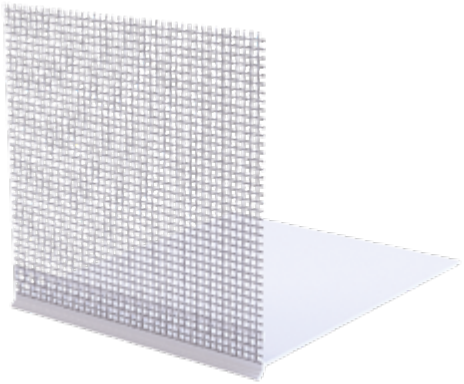
SPEKTRA corner PVC profile with reinforcing mesh

12.5 × 12.5 cm, in a 50 m roll



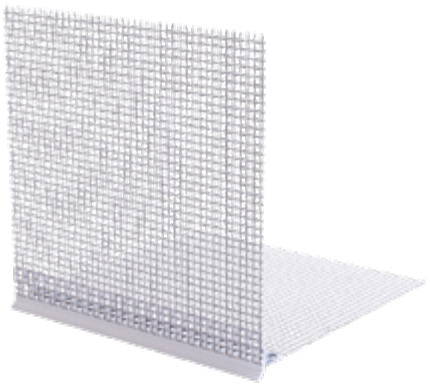
SPEKTRA insert base PVC profile

50 – 100 mm with reinforcing mesh 2.50 m



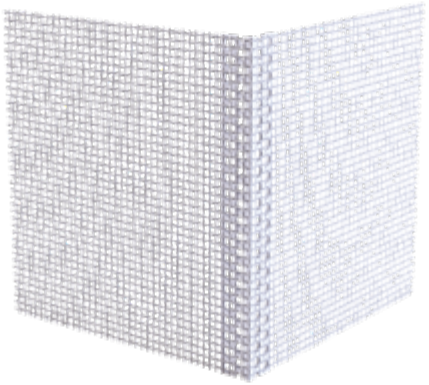
SPEKTRA drip PVC profile with reinforcing mesh

10 × 10 cm, 2.50 m



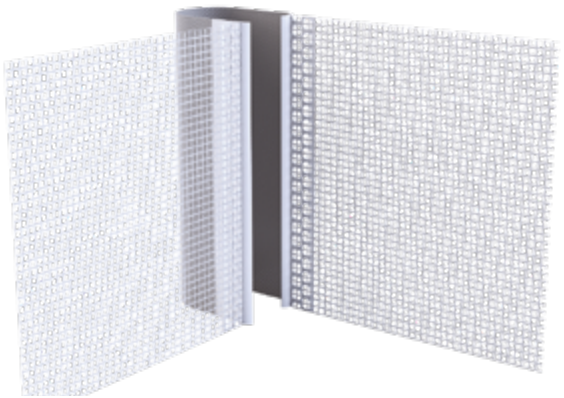
SPEKTRA PVC 90° corner profile with reinforcing mesh

10 × 15 cm, 2.50 m



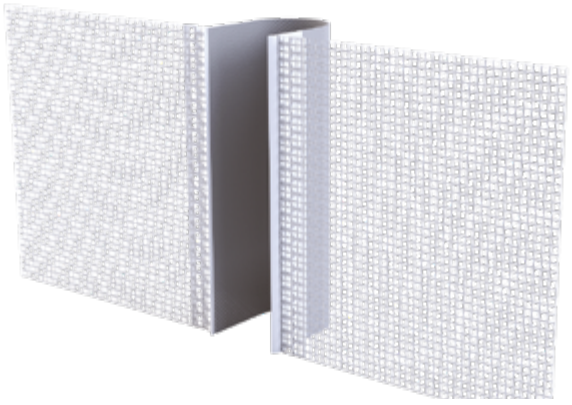
SPEKTRA dilatation profile TYPE I

2.50 m (angled)



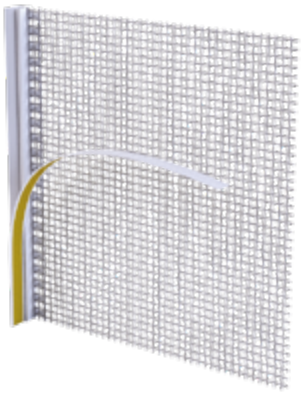
SPEKTRA dilatation profile TYPE II

2.50 m (straight)



SPEKTRA window profile with VWS reinforcing mesh

2.40 m



SPEKTRA PVC connection profile with reinforcing mesh for sheet metal frames

2.50 m

SPEKTRA compressed sealing tape 15 mm

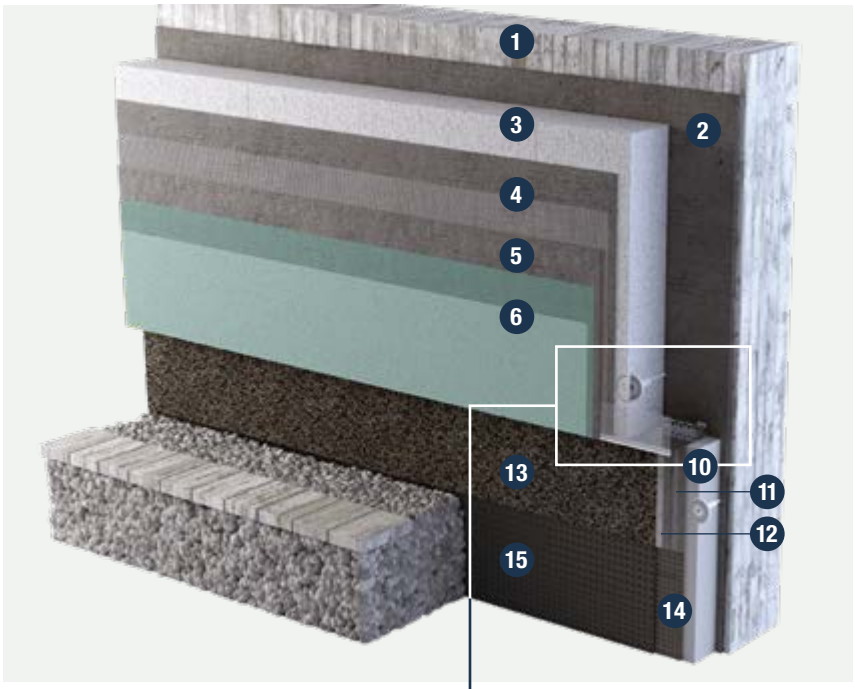
width of joint 1 – 4 mm, 13 m/roll, 600 Pascal BG1, black

SPEKTRA compressed sealing tape 15 mm

width of joint 4 – 9 mm, 8 m/roll, 600 Pascal BG1, black

4. Technical drawing for the installation of the SPEKTRA thermal insulation system

Installing the SPEKTRA thermal insulation system with an overhang in the area of the plinth using the SPEKTRA supporting ALU profile



Zoom-in

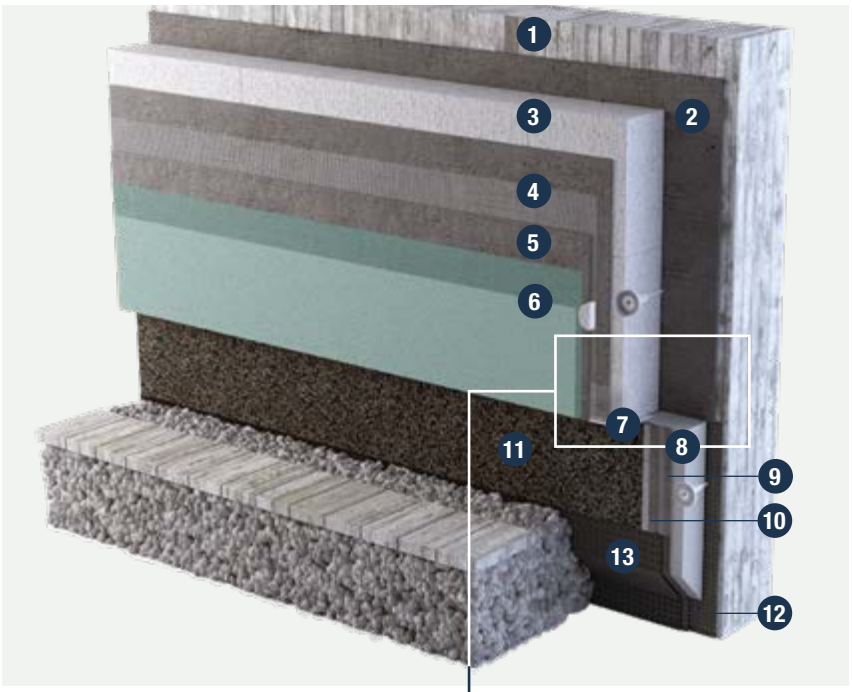
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. SPEKTRA supporting ALU profile
8. SPEKTRA mounting profile
9. SPEKTRA compressed sealing tape BG1
10. Insulation panel for the plinth
11. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
12. SPEKTRA facade adhesive
13. SPEKTRA UNI GRUND with SPEKTRA MOSAIC plaster
14. Hydroinsulation
15. TIS protection against damage under the level of the terrain

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system in the case of an overhang in the area of the plinth using the SPEKTRA insert base PVC profile with mesh



Zoom-in

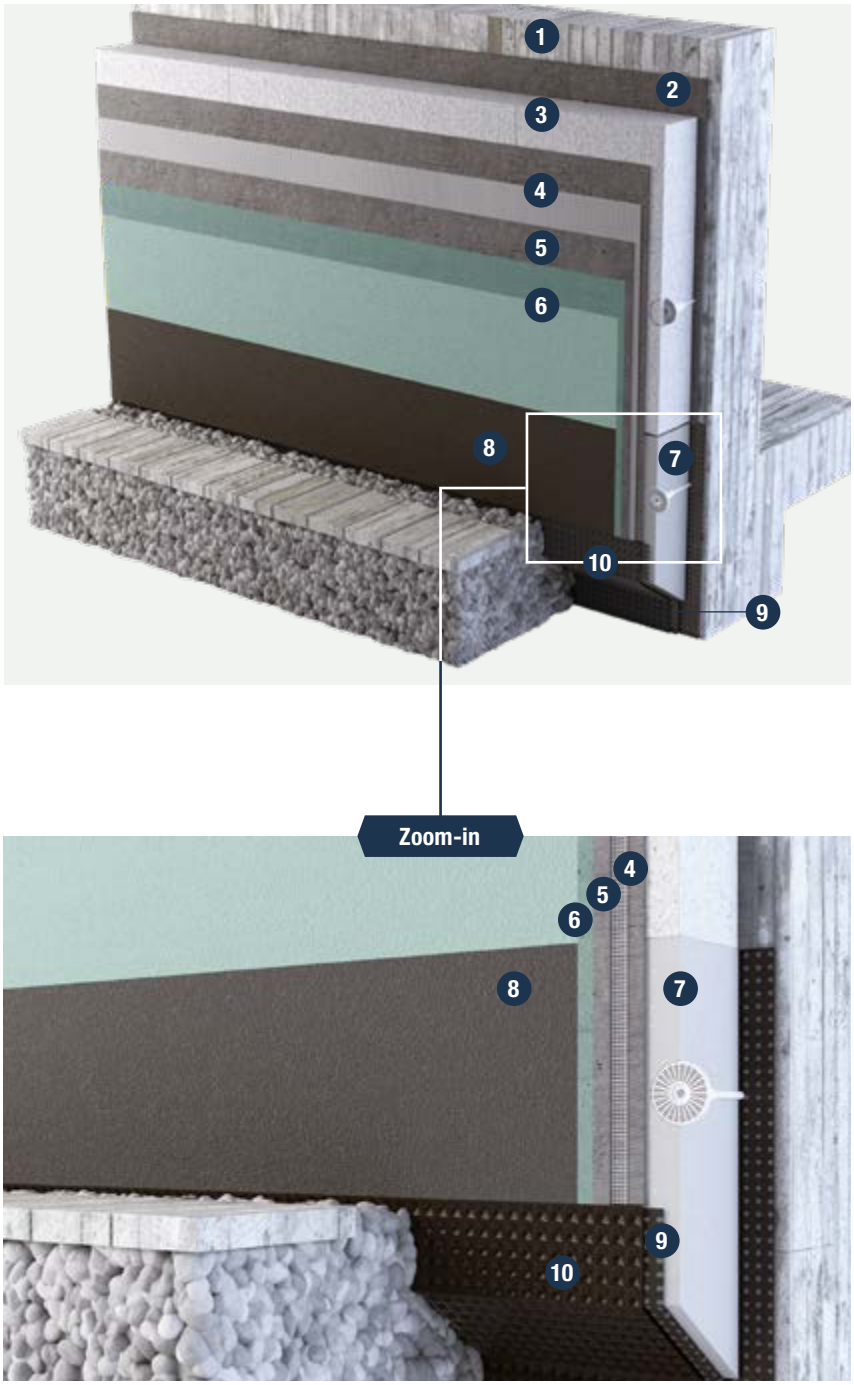
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. SPEKTRA insert base PVC profile with mesh
8. Insulation panel for the plinth
9. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
10. SPEKTRA facade adhesive
11. SPEKTRA UNI GRUND with SPEKTRA MOSAIC plaster
12. Hydroinsulation
13. TIS protection against damage under the level of the terrain

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system with a plinth in the plane of the facade surface



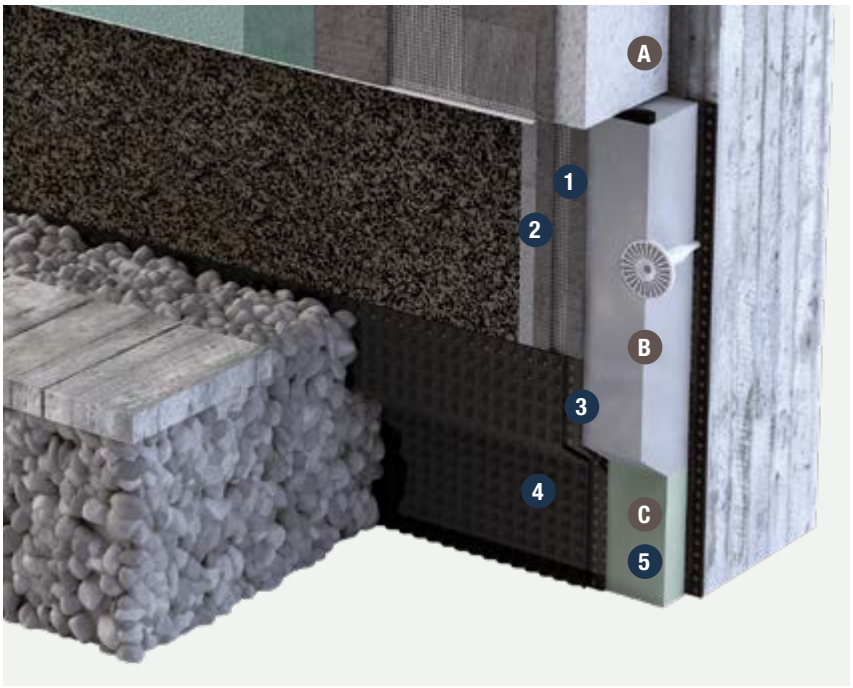
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. Insulation panel for the plinth
8. SPEKTRA MOSAIC plaster
9. Hydroinsulation
10. Protection against damage under the level of the terrain

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

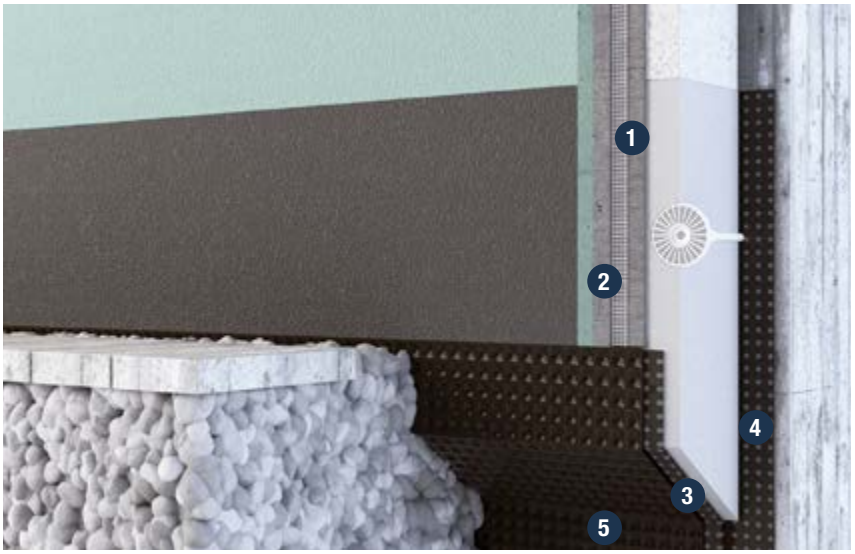
Installing the SPEKTRA thermal insulation system in the plinth area by mounting thermal insulation onto the insulation of basement areas, or placing the finishing element on the foundation of the building



Key:

1. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
2. SPEKTRA facade adhesive
3. Hydroinsulation
4. Protection against damage under the level of the terrain
5. Thermal insulation of basement areas

A. EPS
B. Insulation panel for the plinth
C. Insulation of basement areas

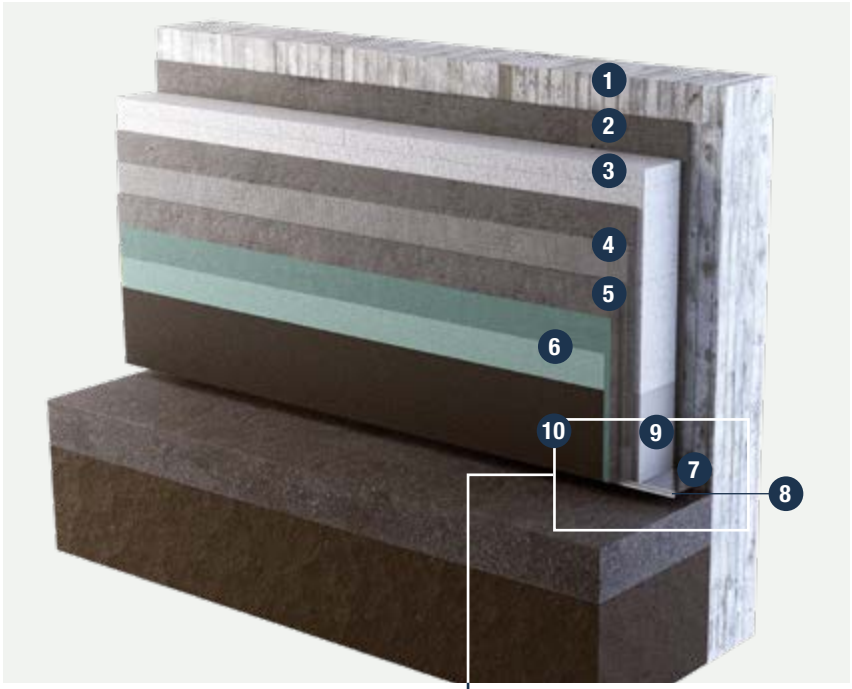


1. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
2. SPEKTRA facade adhesive
3. Hydroinsulation
4. Hydroinsulation of the building by installing a hydroinsulation facade system
5. Protection against damage under the level of the terrain

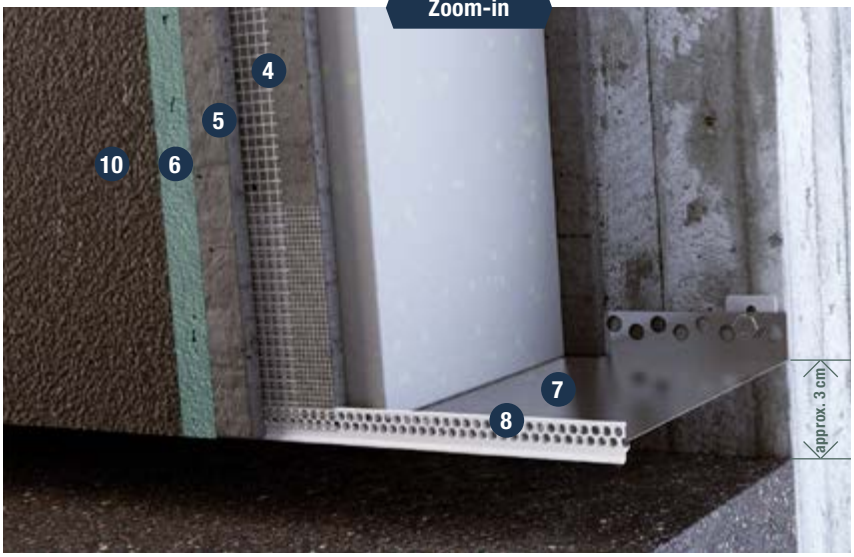
IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system in the plinth area with the finishing element in the level of the terrain when installation in the area 50–80 cm below the level of the terrain is not possible



Zoom-in



Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. SPEKTRA supporting ALU profile
8. SPEKTRA mounting profile
9. Insulation panel for the plinth
10. Base coat with the SPEKTRA MOSAIC plaster

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system with detailed structuring of the external edges and corners around joinery using the SPEKTRA window profile with a VWS reinforcing mesh

Key:

1. Joinery
2. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
3. SPEKTRA corner PVC profile with reinforcing mesh
4. SPEKTRA window profile with VWS reinforcing mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. Feather of window profile with protection – PVC film

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Building in of the window sill

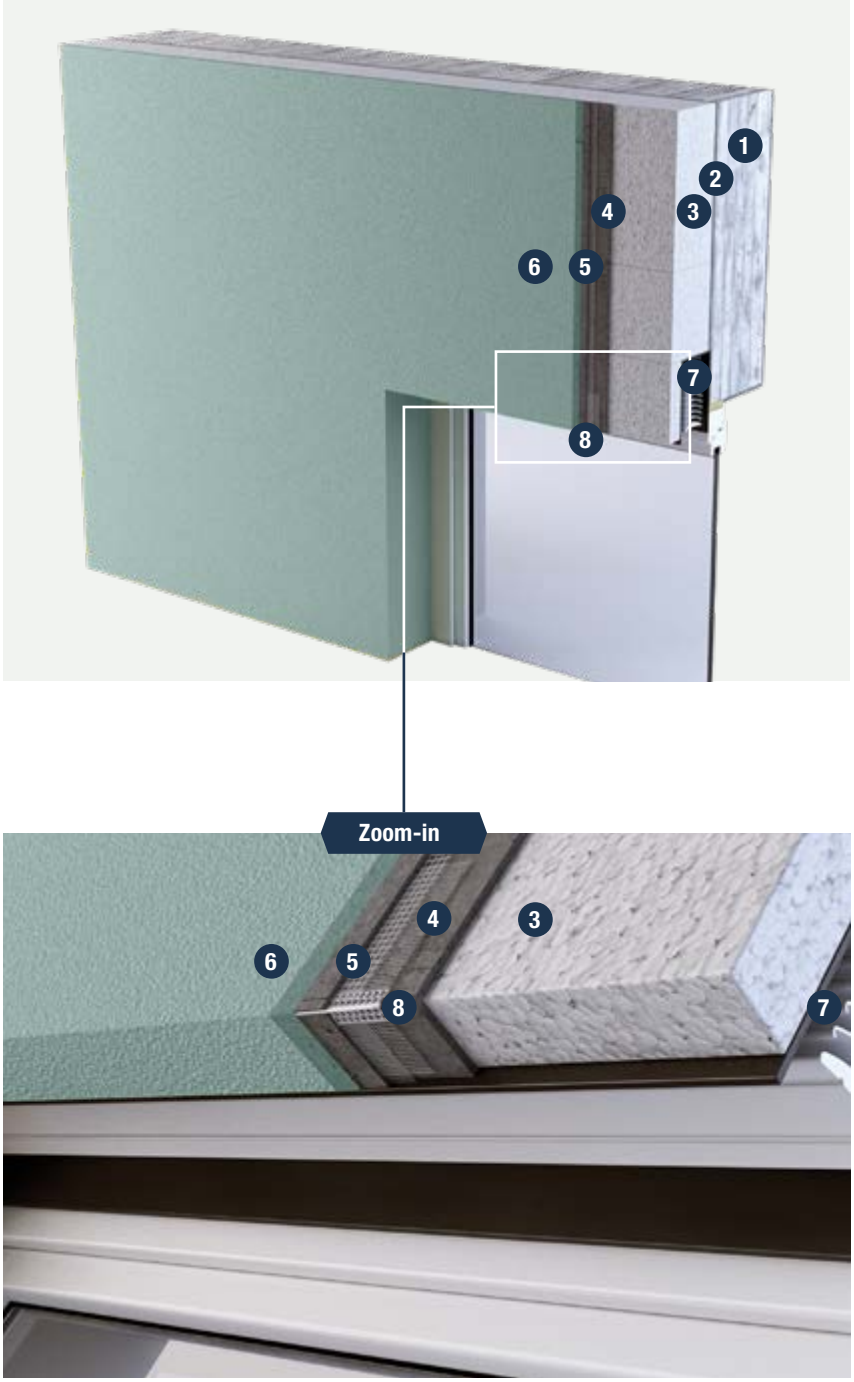
Key:

1. Joinery
2. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
3. SPEKTRA facade adhesive
4. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
5. Waterproof installation of window sill connections; e.g. with compressed sealing tape for joints BG1

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system and insulation of the blinds cassette



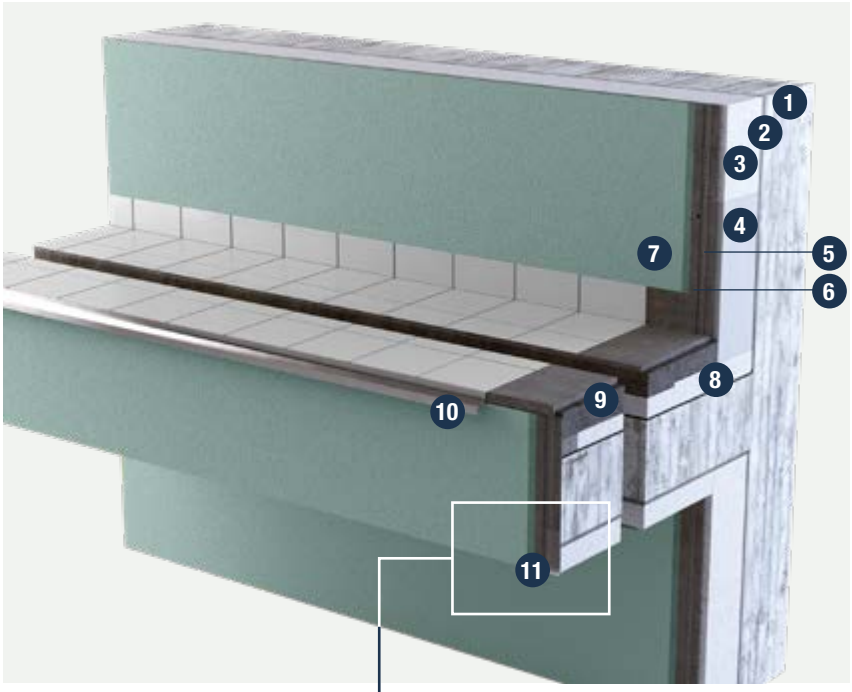
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
7. Storage – window blinds cassette
8. SPEKTRA drip PVC profile with reinforcing mesh

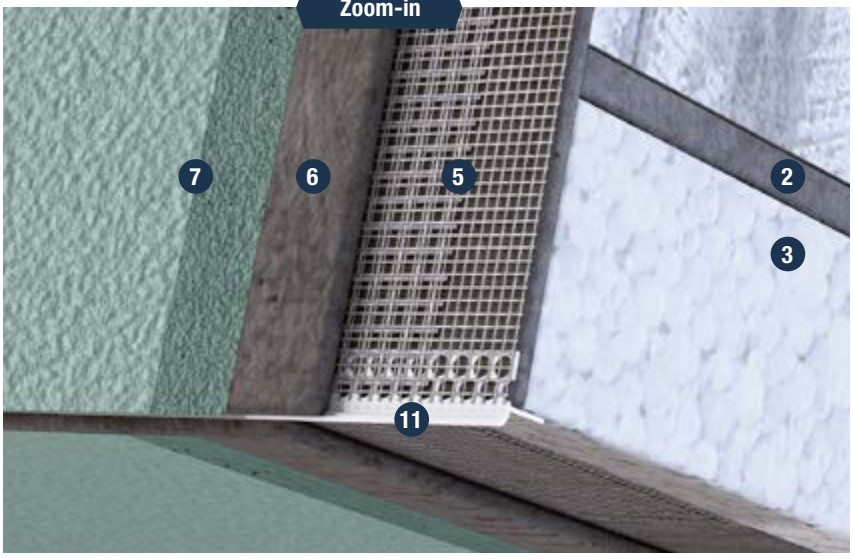
IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system on overhangs of balcony elements and the use of drip profiles



Zoom-in



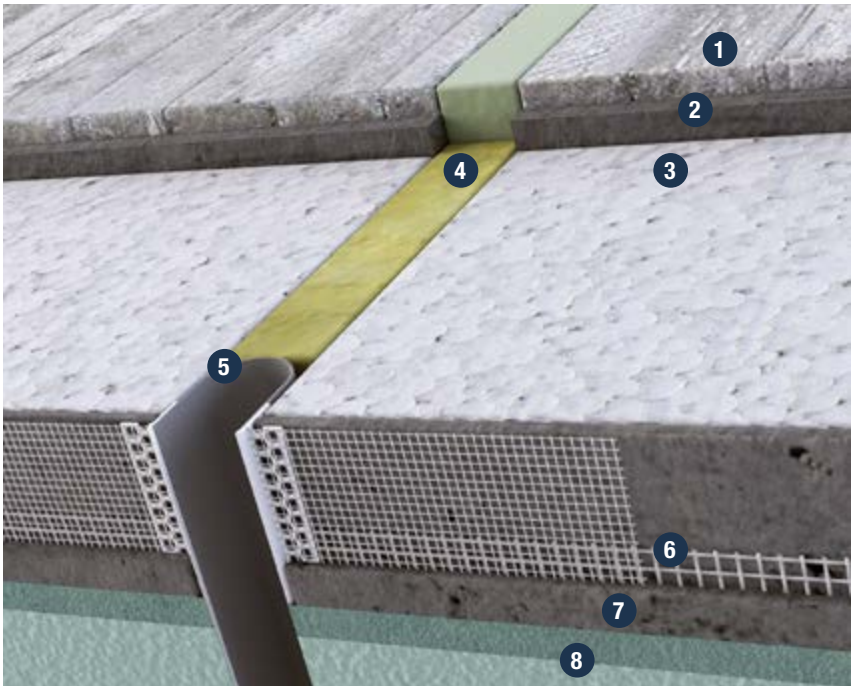
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. Insulation panels for the plinth
5. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
6. SPEKTRA facade adhesive
7. SPEKTRA UNI GRUND with SPEKTRA finishing plaster
8. Walk-on pavement insulation panels
9. Concrete pavement with installed waterproofing and ceramic cladding
10. Drip profile – finishing element of the ceramic cladding
11. SPEKTRA drip PVC profile with reinforcing mesh

IMPORTANT

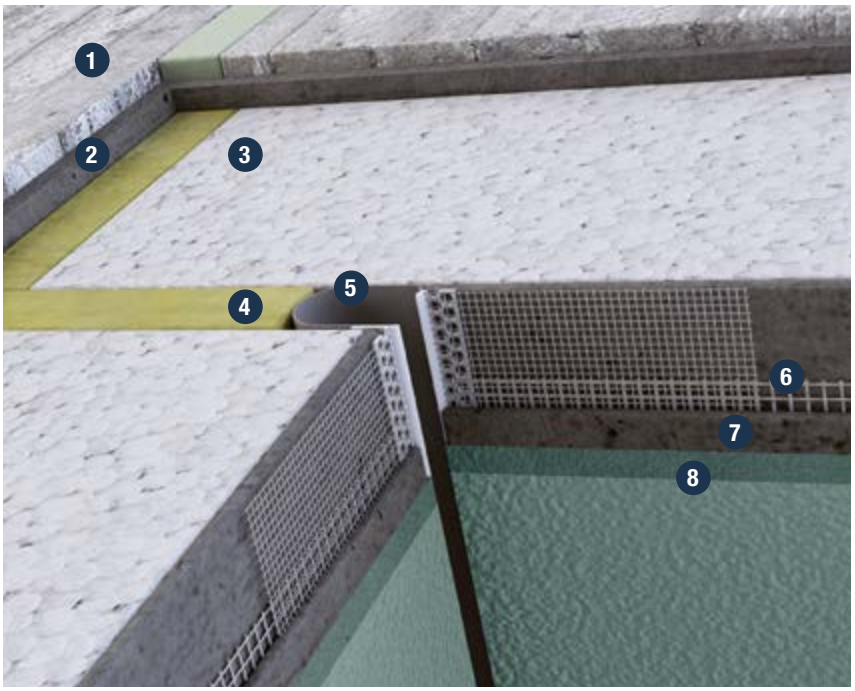
The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system on construction dilatations of the building due to the size of the building or annexes



Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. Mineral wool insulation
5. SPEKTRA dilatation profile TYPE II
6. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
7. SPEKTRA facade adhesive
8. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

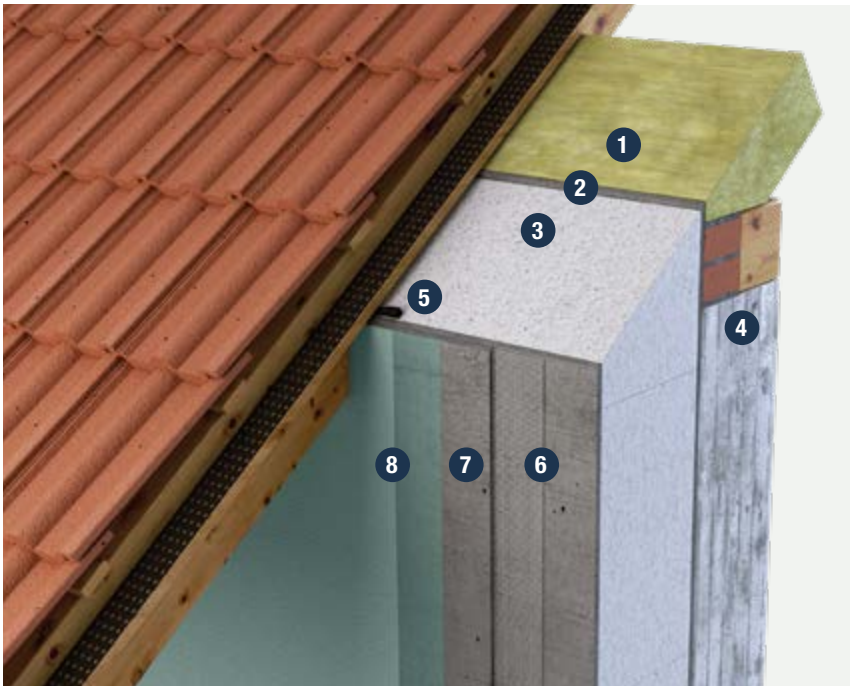


5. SPEKTRA dilatation profile TYPE I

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

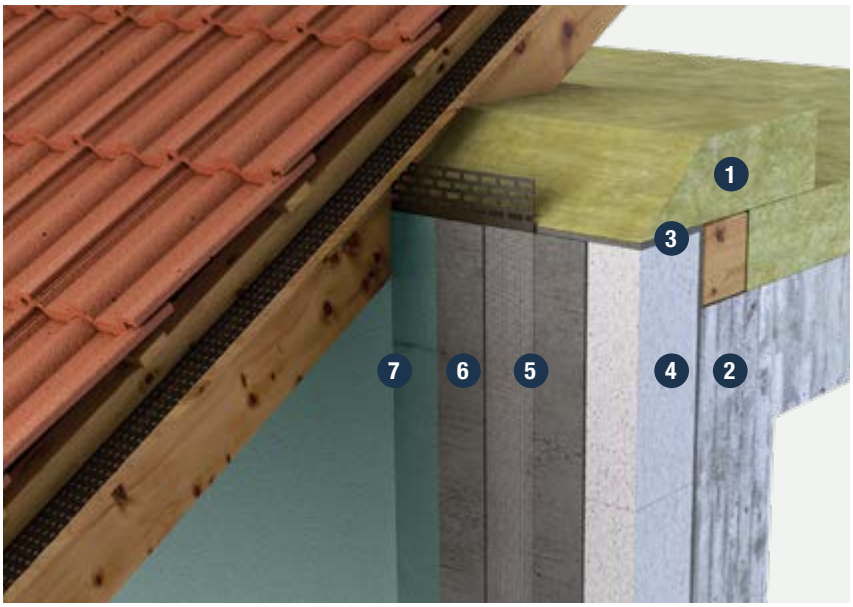
Installing the SPEKTRA thermal insulation system on the roofing structure



Key:

1. Roofing insulation
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. Load-bearing structure
5. SPEKTRA compressed sealing tape BG1
6. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
7. SPEKTRA facade adhesive
8. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

Installing the SPEKTRA thermal insulation system on the roofing structure with a ventilated attic area



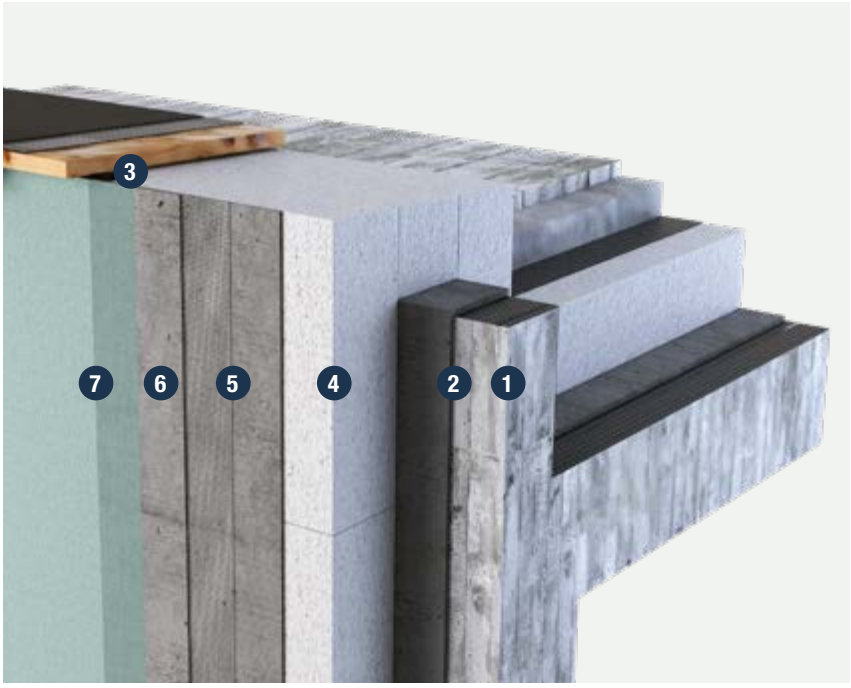
Key:

1. Roofing insulation
2. Load-bearing structure
3. SPEKTRA facade adhesive
4. SPEKTRA insulation panels
5. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
6. SPEKTRA facade adhesive
7. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

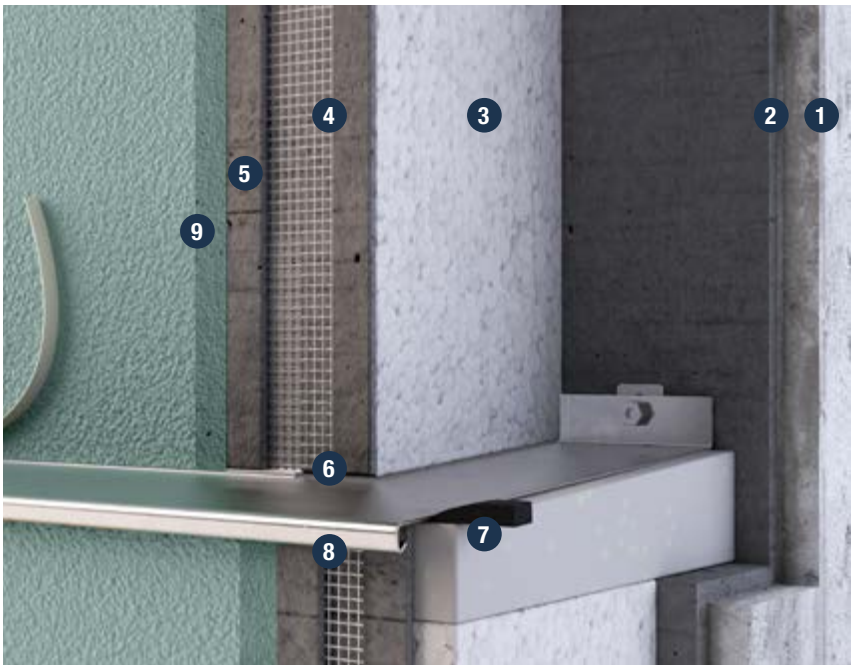
Installing the SPEKTRA thermal insulation system in the area of flat roofing



Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA compressed sealing tape BG1
4. SPEKTRA insulation panels
5. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
6. SPEKTRA facade adhesive
7. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

Installing the SPEKTRA thermal insulation system with a shift of the facade plane by following the shift of the load-bearing structure



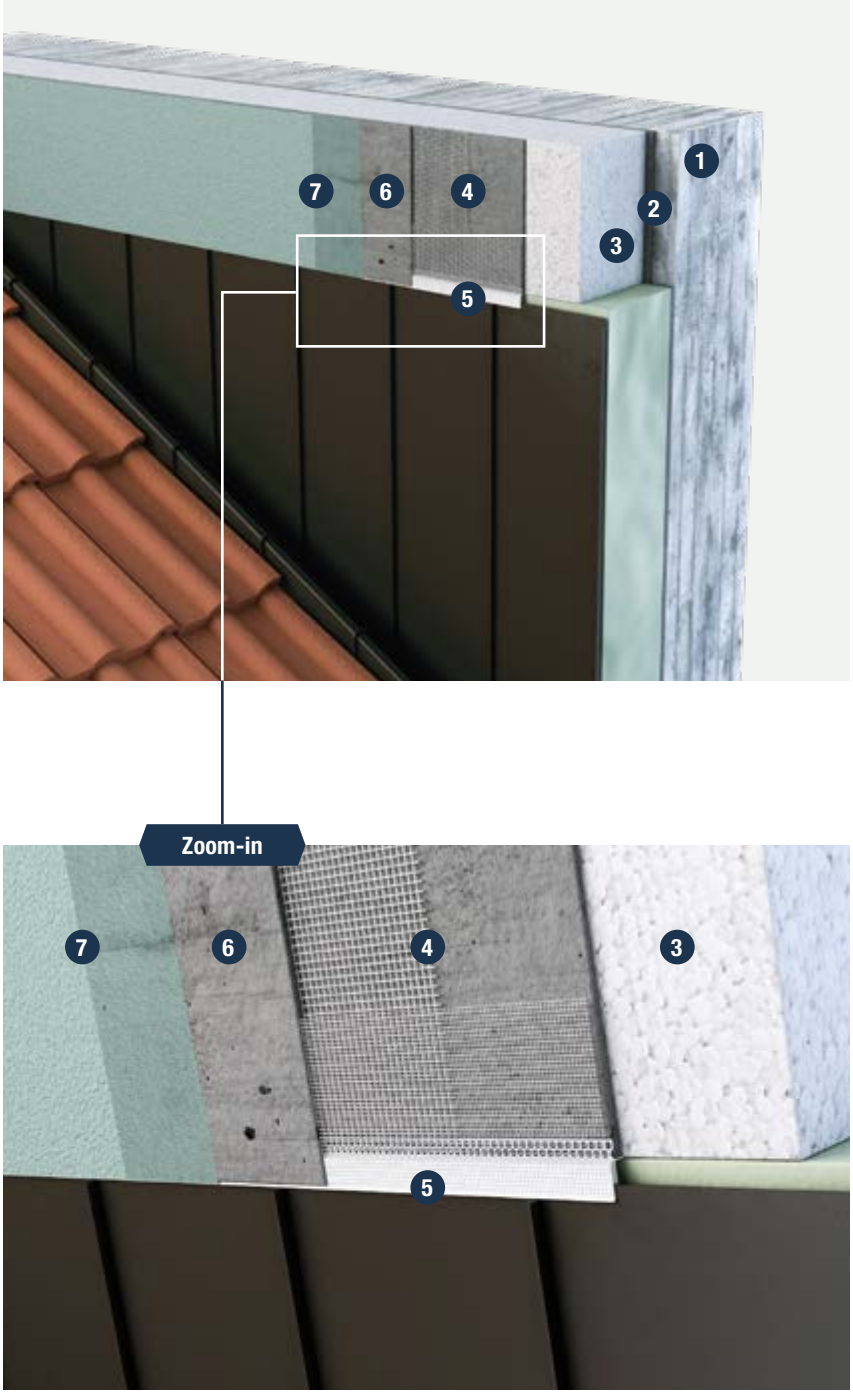
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA facade adhesive
6. SPEKTRA drip PVC window profile with reinforcing mesh
7. SPEKTRA compressed sealing tape BG1
8. Protective profile of the facade system
9. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installing the SPEKTRA thermal insulation system with a connection to roofing finishing elements



Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. SPEKTRA PVC connection profile for sheet metal frames with reinforcing mesh
6. SPEKTRA facade adhesive
7. SPEKTRA UNI GRUND with SPEKTRA finishing plaster

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Building fire protection

Fire safety requirements for external walls must be aligned with the applicable regulations stated in the Rules issued by the Ministry of the Environment and Spatial Planning; **Fire safety in buildings** for which technical guidelines TSG-1 –001:2019 are applicable.

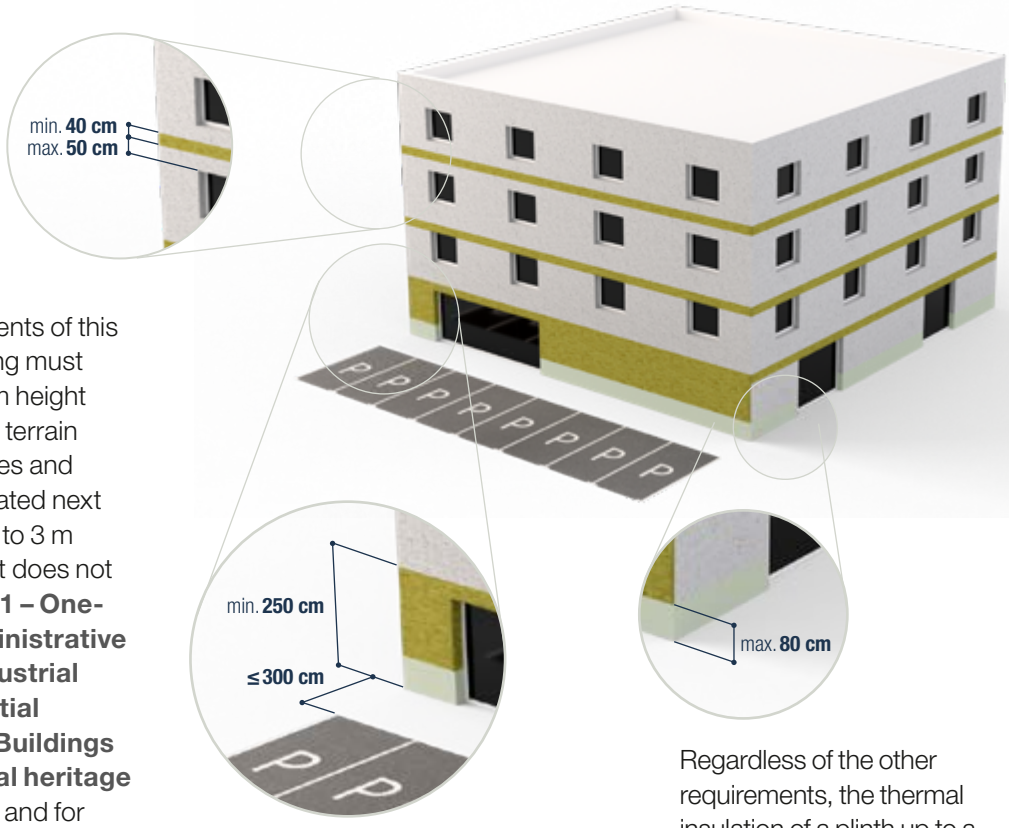
Based on the classification of the building and other data, the project designer – in accordance with the applicable regulations – determines the suitable type of facade system, which must be fully adhered to.

Basic classification of buildings based on height	Combustibility class
Height of the building	**For buildings from groups CC-SI**
up to 10 m	D-s3, d2
from 10 to 22 m	B-d0(1)
more than 22 m	A2-s1, d0

(1) The external thermal insulation composite system (ETICS) of at least B-d0 class is used for:

- residential buildings with a hight of up to 10 m have no restrictions,
- for buildings between 10 and 22 m of height with a required fire protection separation between floors of the building, the spreading of fire in the area above the windows or doors is limited by replacing the strip of combustible insulation with non-combustible insulation of a height of at least 40 cm over the entire perimeter of the building, at a maximum height of 50 cm above the openings. Non-combustible insulation must be fixed with anchors. The replacement of combustible insulation with the non-combustible one is not required if the layer of insulation is thinner than 5 cm.

Fire safety separation between floors of the building is installed at up to 50 cm above the window or door area and at least a 40 cm in height of the non-combustible thermal insulation.



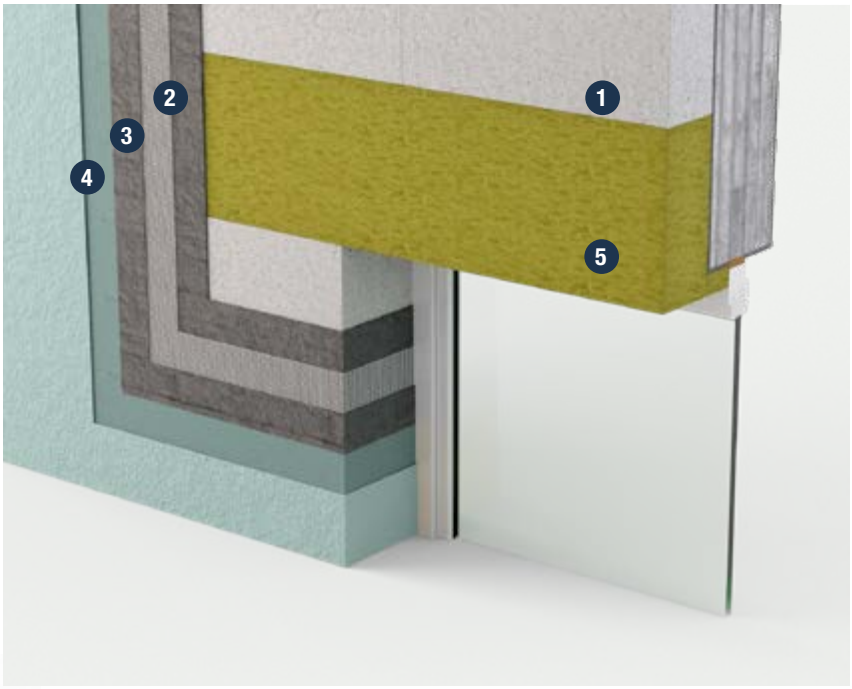
Regardless of the other requirements of this guideline, the exterior wall cladding must be between 0.8 m and a minimum height of 2.5 m above the A1 or A2 class terrain if parking spaces for motor vehicles and motorbikes are planned to be located next to the building at a distance of up to 3 m from the facade. This requirement does not apply to CC SI group buildings **111 – One-dwelling buildings, 122 – Administrative and office buildings, 125 – Industrial buildings, 1271 – Non-residential agricultural buildings, 1272 – Buildings for ceremonies, 1273 – Cultural heritage** not applicable to other purposes, and for buildings of other groups, which are not separated in height into several fire sectors.

Regardless of the other requirements, the thermal insulation of a plinth up to a height of 0.8 m can be made of combustible material.

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

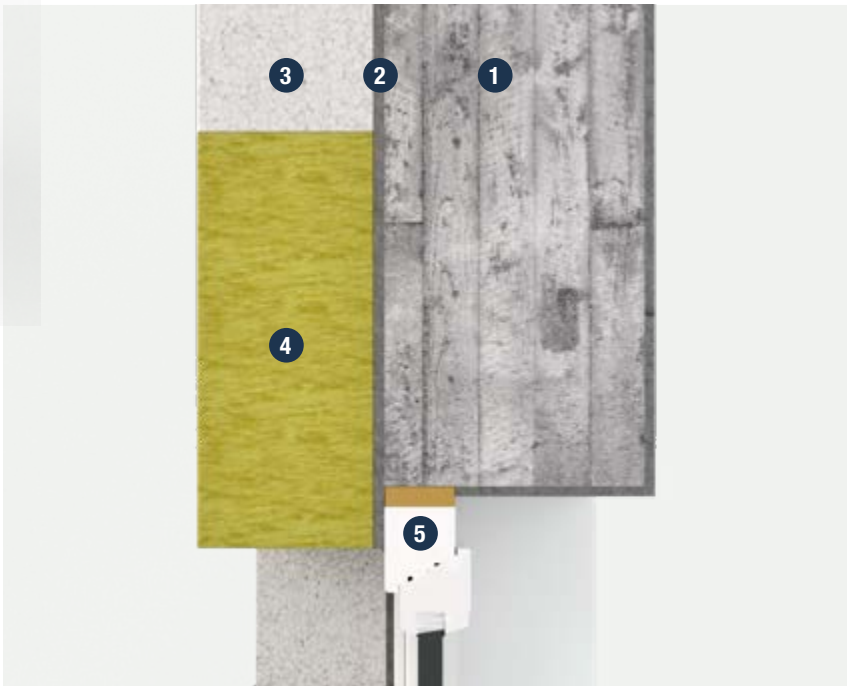
Fire safety protection in the height of the window lintel.



Key:

1. SPEKTRA insulation panels
2. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
3. SPEKTRA facade adhesive
4. SPEKTRA facade adhesive with the SPEKTRA reinforcing facade mesh
5. Insulation lamella / panel made of mineral wool (fire safety class A)

Installation of fire protection when the window is on the edge of the load-bearing structure



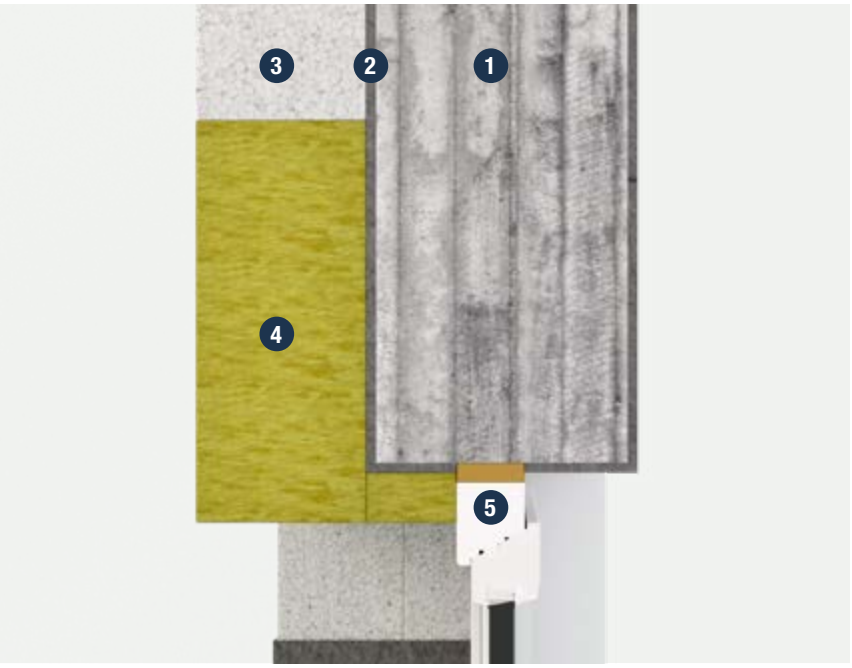
Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. Insulation lamella / panel made of mineral wool (fire safety class A)
5. Joinery – window

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

Installation of fire protection when the window is in the middle of the load-bearing structure



Key:

1. Load-bearing structure
2. SPEKTRA facade adhesive
3. SPEKTRA insulation panels
4. Insulation lamella / panel made of mineral wool (fire safety class A)
5. Joinery – window

Note:

It is mandatory for the insulation with the SPEKTRA thermal insulation system MW to be fixed with facade fixing anchors when installing fire protection strips.

IMPORTANT

The examples shown are only a schematic representation. The proposed technical solutions are subject to specific situations and a correct and effective installation, which is beyond the control of Helios, Tovarna barv, lakov in umetnih smol Količevo, d.o.o.

5. Renovation of thermal insulation system facades

5.1 Recommended renovation of thermal insulation systems with SPEKTRA facade paints

When installing thermal insulation system, one rarely thinks that in order to ensure a long life span of the facade system, regular maintenance of the facade surface is required. Due to everyday weather and static exposure, facade systems are constantly under strain and thus subject to the occurrence of minor or major damage. Damage can occur in the form of biological changes (formation of algae and mould), cracks in the facade surface due to static strain, and aging of sealing/adhesive, permanently elastic materials which must be checked annually and renovated, if needed.

Despite a high-quality installation of thermal insulation facade systems, regular annual checks are very important, as regular damage repair can enable the facade system life span to reach several decades.

Examples of damage for which regular elimination is recommended:

Note:

It is recommended to entirely renovate the facade system when it is between 10 and 20 years old (depending on exposure and other influences), when the binders in the finishing plaster are still in good condition. As a result, major interventions in the facade system and the related renovation costs will be avoided.

Colour fading due to an incorrectly selected shade

Friable and worn out surface

Sealing, permanently elastic putties used for contact surfaces

Physical damage

Infestation of the surface as a result of mould and algae

Static damage

5.1.1 Basic renovation of the facade system

1. Thoroughly clean the facade surface with a high-pressure cleaner, in order to remove dust an loose particles .

2. If needed, treat algae- or mould-infested surfaces with **SPEKTRA biocide agent SANITOL**.

3. Cleaned surfaces are to be impregnated 1 × with **SPEKTRA acrylic impregnation**.

4. Coat the facade surface 2 × with **SPEKTRA facade paint UNIVERSAL** or **SPEKTRA Renoxan facade paint.**

SPEKTRA acrylic impregnation

Evens out surface permeability and improves adhesion

- penetrates deep into the surface
- strengthens poorly bonded and chalked old coatings
- decreases the consumption of finishing coatings

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for impregnation of lime and lime-cement surfaces, old chalked plasters and coatings, plaster-cardboard panels and other porous surfaces, also use it as a primer before levelling with an interior putty or before applying the first coat of paint. It is also used as a primer before applying SPEKTRA facade paints.
CONSUMPTION:	1 l of thinned impregnation covers 10 – 12 m^2 with 1 coat
THINNING:	to be thinned with water, in a ratio up to 1:3 depending on surface permeability
PACKAGING UNITS:	1 l / 5 l / 10 l
COLOUR SHADES:	colourless

SPEKTRA biocide agent SANITOL

Quick and effective action against mold and algae

- for interior and exterior wall surfaces
- water-soluble

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	for the restoration of interior and exterior wall surfaces infested by mould and algae (plasters, concrete, fibre-cement panels, plaster panels, and wall surfaces painted with dispersion paints), and for the destruction of house fungus on wooden surfaces.
CONSUMPTION:	1 l of thinned impregnation covers 5 – 10 m^2 of surface in 1 coat
THINNING:	with water up to 1 : 4
PACKAGING UNITS:	0.5 l / 1 l
COLOUR SHADES:	transparent, slightly yellowish

SPEKTRA FACADE PAINT UNIVERSAL

For the restoration of thermal insulation systems (EPS and MW) as well as other facade surfaces

- ability to reinforce and bridge micro-cracks
- biocidal protection of the colour film
- colour stability (inorganic pigments)
- wear resistance (quartz fillers)
- high level of water resistance

6-10 h

INSTRUCTIONS FOR USE

AREA OF APPLICATION:	restoration of styrofoam- and mineral wool based thermal insulation systems, for painting all types of mineral and dispersion plasters, fibre-cement panels, wood-cement panels and concrete, and for covering old dispersion coatings.
CONSUMPTION:	1 l covers 6–8 m^2 of smooth surface in 1 coat
THINNING:	with water from 5 to 10 %
PACKAGING UNITS:	HGMIX: 2 l / 10 l / 15 l
COLOUR SHADES:	white, HGMIX

SPEKTRA FACADE PAINT Renoxan

Siloxane facade paint for renovation

EPS & MW

SISTEM acrylic impregnation

- facade paint with an excellent microenforcement effect (ability to reinforce and bridge micro-cracks)
- for the restoration of thermal insulation systems (EPS and MW) as well as other facade surfaces
- high vapor permeability and high water repellency
- biocidal protection of the colour film
- HGMIX (Inorganic pigments)

6-10 h

INSTRUCTIONS FOR USE

For	painting different types of mineral and dispersion plasters, fibre-cement and wood-cement panels and concrete, and for coating over old dispersion coatings.
CONSUMPTION	1 l covers 6–8 m^2 of surface in 1 coat
THINNING	with water from 5 % to 10 %
PACKAGING	5 l / 10 l
COLOUR SHADES	White, HGMIX

5.1.2 Renovation of building joinery and wooden cladding

Wooden joinery (windows, doors, fences, etc.) are surfaces for which renovation is recommended on 2–6 years, depending on the exposure to weathering, how well they are preserved and the method of construction of the wooden element. Renovation intervals can be prolonged if joinery is subject to regular maintenance with paints for decoration and protection of wooden surfaces.

Physical damage

Strongly exposed surfaces

No regular renovation

Adequately preserved surface for restoration

5.1.3 Renovation of metal, PVC and cold galvanized surfaces with top coats

Metal parts of the facade are exposed to moisture, UV light and various harmful atmospheric influences, as well as mechanical damage. The frequency of restoration also depends on the quality of protection of the elements at the first installation. Timely restoration of worn-out coatings prevents the deterioration of metal surfaces. The choice of a protection system for the restoration of worn-out old coatings depends on the type of metal and the level of wear or damage.

Regardless of the type of surface to be restored, it is important to have a properly prepared surface and suitable conditions for the application of coatings (air humidity and temperature), and to guarantee proper dilution, application method and drying conditions.

More detailed product information on the BORI and TESSAROL sub-brands for the protection and decoration of wooden, metal and PVC surfaces is available in the Technical data sheet and on **www.helios-profi.si** and **www.helios-deco.si**.

Wooden surfaces

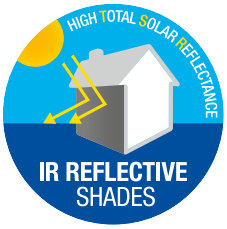
Metal surfaces

PVC joinery

Small cold galvanized objects

6. Selecting colour shades

6.1 EXTERIOR COLOUR COLLECTION



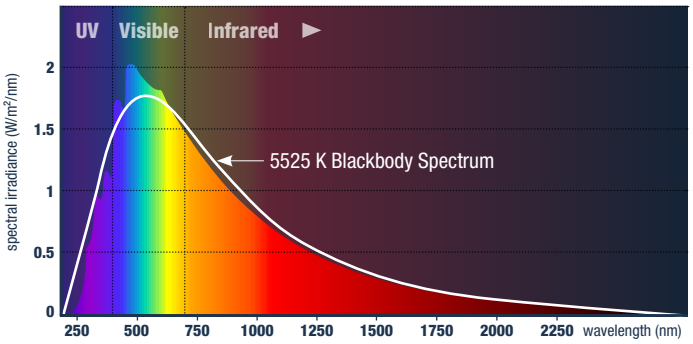
The HGMIX EXTERIOR COLOUR COLLECTION chart offers a range of colour shades that can be prepared on the basis of a wide selection of exterior SPEKTRA wall paints. Your own set of shades allows you to create an individual style for your facade surface.

The HGMIX EXTERIOR COLOUR COLLECTION includes 450 shades for exterior wall surfaces, divided into 7 colour categories; pastel, neutral, red, orange, yellow, green and blue. The colour chart also allows you to choose decorative plasters for plinths.

A special feature of the HGMIX EXTERIOR COLOUR COLLECTION colour chart are the IR reflective shades, whose IR pigments prevent heat absorption in the final layer and thus have a significant effect on irradiated surfaces becoming less heated. All colour shades are made with inorganic pigments, which ensures maximum light and weather resistance of the colour shade. This is particularly important when dealing with facade surfaces, which are more exposed to harmful weather conditions (sun, rain, wind, etc.), which additionally contribute to an undesired discolouration of the colour shade.

6.2 IR reflective pigments

Sunlight consists of an ultraviolet, visible, and infrared spectrum of radiation (Image).

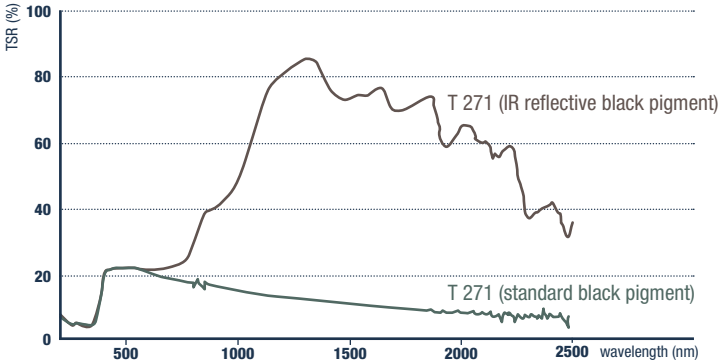


Comparison of Y and TSR

Y is the approximate amount (in %) of the **visible** part of the sunlight reflected from the shade. The black shade has a Y value of 0 % and the white one 100 %. With white and very light shades, the Y value is close to 100; the more intense the shade, the lower the Y value.

TSR – the total solar reflectance is the amount of solar energy of the **entire** spectrum of sunlight reflected from the surface. When using conventional pigments, the Y and TSR values for a particular shade are very similar, although their meaning is very different. The TSR value also includes the % of the reflected IR spectrum of solar energy. The higher this value, the less the irradiated surface heats up. The infrared part of the spectrum accounts for almost 60 % of all solar energy and, in case of dark shades, it is also mostly absorbed into the surface. Heat absorption on dark facade surfaces causes increased heating – at an air temperature of 25 °C, dark surfaces can heat up to 80 °C. Such high level of heating leads to greater expansion and contraction of the installed finishing plaster and consequently the appearance of micro cracks on the finishing plaster. When using standard pigments for the preparation of dark shades, the Y and TSR values are low. When special pigments that reflect the IR part of light are used for the preparation of dark shades, they still have a low Y value, whereas the TSR value remains high. Dark shades of the finishing layer in the thermal insulation system that have been prepared this way will prevent overheating of the facade and extend its lifespan.

An example of the same shade prepared with a standard black pigment (green) and with an IR reflective black pigment (gray). In both cases, the Y value is 22.



6.3 Colour studies

The construction or renovation of a facade system is a big step for every investor or owner. As a result, in addition to a correct and high-quality construction, the final appearance of the building is also extremely important. Unfortunately, it is difficult to imagine the appearance in advance, as it is hard to tell what the shade will look like on the entire surface only by looking at the colour card.

To this end, we offer a free of charge colour study of the building to all our customers (if they decide to buy our thermal insulation system). This way, our customers know beforehand how the finished building will look like and how it will merge with the surroundings, and are able to compare between different shades and colour combinations.

Some examples of already prepared colour studies with the **SPEKTRA thermal insulation system.**

Info:

For any kind of advice about the correct and effective use of HELIOS brand products, please contact our technical support team:

E-Mail:
projects@helios-group.eu
deco.coatings@helios.si

web:
www.helios-profi.com
www.helios-deco.com

Helios TBLUS d.o.o.
Količevo 65, 1230 Domžale, Slovenia

T +386 1 722 40 00
E deco.coatings@helios.si
www.helios-deco.com
www.helios-profi.com

Member of the HELIOS Group.

Follow us on:

Helios TBLUS