

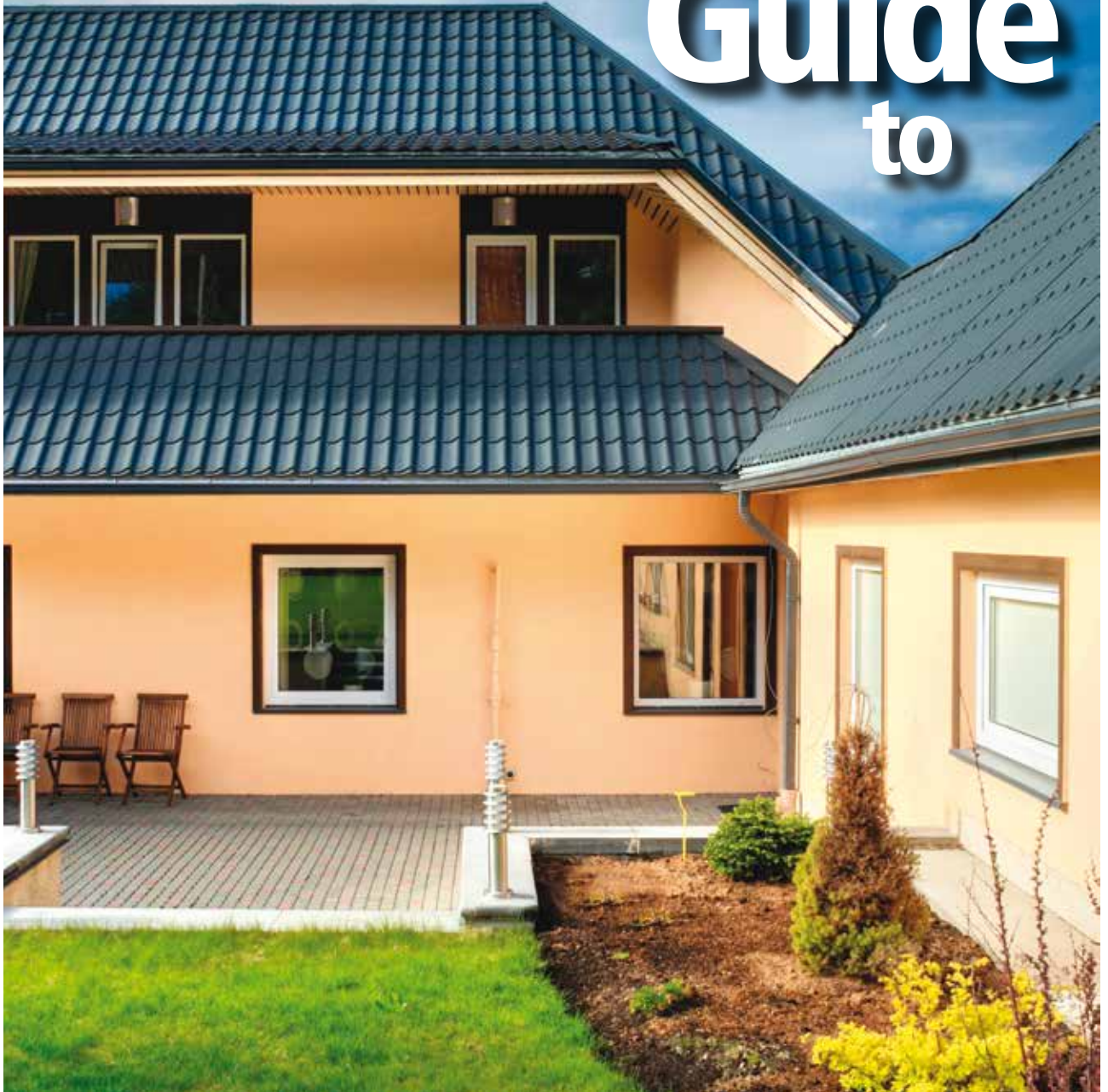
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The Guide to



External Render AVAL System

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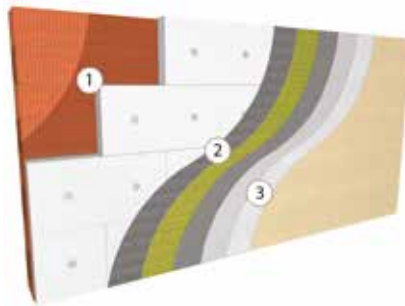


In this edition we focus on an insulation element that gives the final character of the building - the rendering.

Why render plays such an important role in the insulation system? Why cannot we finish the façade just with a painted reinforcing layer?

The answer is simple. To meet all the insulation system functions which are assigned to it, and to meet them in 100%, the system must be complete, that is made up of:

1. adhesive for application of thermal insulation material;
2. reinforcing layer, that is the adhesive with the mesh;
3. thin-coat render or tile cladding.



The role of renders

Therefore, what function a thin-coat render performs in the thermal insulation systems?

First of all:

- Protects layers beneath - the reinforcing layer, the insulating material as well as the façade of the building - both from

the harmful effects of weather conditions and against mechanical damages caused by various factors;

- Regulates „breathing of building“, i.e. transports in and out molecules of water vapour;
- Gives a unique, attractive appearance, final character of the buildings.

That is why only the full thermal insulation provides adequate protection for the building as well fulfills all the functions of the system. Therefore, render on the façade is necessary.

Types of renders

Types of renders and, hence, their suitability to a particular project, are determined mainly by the binder used for the production and the type of insulating material used for thermal insulation. The most popular types of

Choose the render

Before you choose the render for your house, you must answer a few questions:

WHAT IS THE DIFFUSION RESISTANCE OF THE WALLS?

The render should not significantly restrict the flow of water vapour through the partition (the wall with all of its elements: internal plaster, external render, thermal insulation, etc). Before deciding it is advised to check the project documentation.

You can also use the calculation program available on the web-site www.atlas.com.pl. It will help you to design the partition properly. If the renders are applied on the walls made of high vapour permeability materials, such as aerated concrete, then they should have similar characteristics. Then, use the renders based on the silicate or mineral binder. Similarly, when the wall is insulated with the mineral wool.

WHAT IS THE AGE OF THE BUILDING?

For rendering decades-old buildings, which have very high vapour permeability, you should definitely use the renders of similar characteristics (e.g., those that should not significantly restrict the flow of water vapour through the partition), especially silicate ones.

IS A GREEN AREA LOCATED IN THE NEIGHBOURHOOD?

If so, there is always a risk of organic dirt, algae and fungi. In this case, the façade should be covered with mineral or silicate renders which have strong alkaline reaction (pH ~ 12) and practically prevent the growth of microorganisms. Also the silicone dispersion renders, which contain the biocide additives that reduce the growth of microorganisms, can be used. Another ally in the fight with the biological corrosion is low water absorption, making the spores difficult to settle.

IS THE HOUSE LOCATED BY A BUSY ROAD OR ANOTHER „SOURCE“ OF PERMANENT SOILING?

If the answer is yes, then we have to deal with two problems. First, building close to such roads get dirty quickly, so it is recommended in this situation to use silicone renders, which can be easily kept clean.

This render is called „self-cleaning“ as the smaller dirt is being removed itself during the rainfall. Secondly, due to high traffic, the render may be subject to cracking under vibration. To

prevent this, we recommend acrylic render which is highly flexible and can make up for tension. The render can be easily cleaned with a pressure washer.

WHAT COLOURS WILL BE USED ON THE FACADE?

Atlas offers wide range of unique render and paint colours - 400 ready recipes allow to meet any expectations. An important element is the choice of an appropriate combination of colours as well accurate joining of colours. Special programs available on the website www.atlas.com.pl can assist you in this regard.

WHAT KIND OF RENDER WE CHOOSE IN TERMS OF TYPE AND AGGREGATE THICKNESS?

In this case, the decision mainly depends on aesthetics. We have a choice of two types of renders: spotted ones marked with letter „N“ and rustic ones marked with letter „R“. You should choose the aggregate thickness - from 1 mm to 3 mm. The coarser the grain, the visual effect is more clear. It also allows you to hide any shortcomings.

The best way is to leave the render choice to the system designer and put it in the project documentation. However, if it is not possible, and there are doubts as to the choice of a suitable render and place of application, you should consult the manufacturer's Technical Advisor.

renders are: mineral, acrylic, silicone and silicate. The main parameters of the renders are presented in the table.

Renders application

As we have acquired the knowledge about renders and we know from the previous lessons, how to prepare the basecoat, we can safely go to the renders application.

Substrate priming

The process of renders application must be preceded by the preparation of the substrate on which they will be applied. To do it we should use a primer professionally known as a priming mass.

Its purpose is to enhance the adhesion of the render to the façade surface and to unify the absorption of the whole substrate.

These elements are very important and have significant impact on the render application and its future appearance.

Types of priming masses:

It is very important to choose the right primer for the render. Thus, for example, Atlas/Aval products need following primers:

- ATLAS CERPLAST (AVAL KT 16) - a primer under mineral, acrylic, mosaic renders;
- ATLAS SILKON ANX (AVAL KT 76) - a primer under silicone renders;

Priming

Priming mass is usually applied one day before the render, depending on weather conditions. It can be applied in three ways: manually with a brush or a roller, or mechanically with the use of a spray gun or an aggregate.

The most common application mistakes

One of the most common mistakes is the excessive dilution of the primer. It results in much more difficult render application, reduced substrate adhesion and unequal absorption.

Following, it can result in uneven render drying (render dries faster locally). In case of colourful (dyed) renders it might cause stains and local render discolouration.

TYPE OF RENDER	MINERAL	ACRYLIC	SILICONE	ACRYLIC-SILICONE	ACRYLIC-SILICONE
Type of main binder	Cement	Styrene-acrylic resin	Silicone resin	Styrene-acrylic and silicone resin	Styrene-acrylic resin, water glass
PROPERTIES					
Water vapour permeability	✓✓✓	✓	✓✓	✓	✓✓✓✓
Impact resistance	✓✓	✓✓✓✓	✓✓✓	✓✓✓✓	✓
Surface absorption resistance	✓✓	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓
Ageing resistance	✓✓✓✓	✓	✓✓	✓✓	✓✓✓
Dirt resistance	✓✓	✓✓	✓✓✓✓	✓✓✓	✓✓✓✓
Biological factors resistance	✓✓✓	✓✓	✓✓✓✓	✓✓✓	✓✓✓✓
AREA OF APPLICATION					
Urban zone	✓✓✓	✓✓	✓✓✓✓	✓✓✓	✓✓✓✓
Suburban unwooded zone	✓✓✓	✓✓	✓✓✓✓	✓✓✓	✓✓✓✓
Proximity of green areas and water tanks	✓✓✓	✓	✓✓✓✓	✓✓✓	✓✓✓✓



AVAL KT 16



AVAL KT 76

Render application

After the application of a priming mass, you can start the rendering. Depending on the render type and application method, this process is divided into several phases.

The manual application of ready-to-use renders (acrylic, silicone, hybrid).

When applying this type of renders you should take into account the type and size of the façade and the weather factor. Why? Thin-coat dyed renders should be unconditionally applied "wet on wet", without any interruption over the entire façade surface, i.e. from a corner to a corner. In the case of detached houses, where wall surfaces are rather small, this type of work should not be a problem.

The problem may appear on larger surfaces, e.g. on blocks of flats. How to deal with it? The best solution is to plan appropriate technological gaps. You should choose a place where the render joints – vertical or horizontal line that will not be conspicuous. These places, e.g. where the render colours are changed, are often planned by the designer. Generally the lines of windows, staircases vertical separations, or other places are used for that purpose. Each project has its characteristic design, so if you know that one whole wall cannot be done in one cycle, you should list down not only the time, but also a place of a technological break. To sum up: the laying of the dyed renders must be carefully planned.



How to apply the render?

Ready-to-use renders are supplied in buckets. They should be opened and thoroughly mixed with a ribbon mixer to unify their texture and colour. It is recommended to mix a number of buckets of render in order to avoid colour differences between the buckets (it sometimes may happen, especially when buckets are of different batches).



Steel float



Ribbon mixer

After proper mixing, we proceed to the render application. It is applied "wet on wet" with a stainless steel float by pressing to the surface so that, depending on weather

conditions and the number of persons involved in the application, you are able to connect it vertically and horizontally with the following render areas.

The render is applied with the thickness equal to its aggregate size. If we apply too much, we will not be able to form the proper structure. When we put the render we remember to collect the excessive amount at the same time.

The next step is the texture forming, which gives the render its final appearance. It depends on the conditions in which the render is applied, the render type, and above all the size of the surface which it is applied on. We form the texture with a plastic float by rubbing the render surface. This way we move the render aggregate and thus we obtain the final visual effect.

The technique of texture forming depends on the type of the render. 'Spotted' render can be

formed with circular or 'figure eight' moves. It is important to texture the render in the same way over the entire surface of the elevation. Rustic render, commonly called 'the bark beetle', as its name suggests, imitates the marks left by beetles. To get this effect, you should rub the render with a plastic float with vertical (gives vertical marking) or horizontal (gives horizontal marking) moves.

The application and texture forming of ready-to-use renders seems trivial process. However, as usually, the simplest things make the biggest problems. Therefore, to conduct the render texture forming correctly, we should engage a qualified brigade, preferably with vast experience.

At the construction site execution problems, which the brigade will have to deal with, may occur - crooked and uneven walls, window reveals treatment, often decorative trims, rustication and other surprises.

When applying manually you should also remember that all kinds of items placed perpendicularly to the façade, such as window reveals or rustication, are generally not covered in the same technological process as the rest of the building (often done the next day).

Manual application of dry mineral renders

Application of this type of renders slightly differs from the application of ready-to-use renders (dispersion ones). The product is supplied to the site as a dry mix in a bag. A key element in this case is the proper mixing. Each manufacturer pro-



Spotted texture



Rustic texture





Applying renders using a steel trowel



Spray application of renders

vides adequate guidance as to the amount of water in order to obtain proper consistency that will provide both application and render parameters.

Guidelines are given in the so-called range due to climatic conditions. For example, in the case of dry and hot air the consistency of the applied render may be thinner.

You pour the dry mixture into the appropriate amount of water and mix to reach a proper consistency. Then - as in the case of adhesives - after the time indicated by the manufacturer (usually 5 minutes), re-mix the mass. Manual application process itself is the same as in the case of ready-to-use renders. So where is the difference? Mineral renders are "dry", and therefore have large colour limitations (due to differences in the composition of raw materials used for the mineral renders and dispersion ones).

They are produced only in several pastel colors. A common solution is to use a mineral render and coat it with a paint.

Spray application of the renders

This technology is very different from the one described above. First, for the mechanical application only the renders designed to this can be used. Although both technologies - by hand or with a machine - are completely different, sometimes the producer informs that the render can be applied either manually or by spraying.

However, due to different types of application, both the parameters of the mixture, its composition, type of raw materials used for manufacturing and the render parameters after drying differ significantly. Concerning the primer, the difference lies in the fact that beside the application with the use of a roller or a brush (as in the manual technology) you can apply it by spraying, which gives less consumption of the product and uniform covering of the façade. Renders for spray applica-

tion are prepared in the same way as the manually applied ones: whether wet or dry, they should be mixed. This step is crucial here. Why? In the manual technology, we are able to locate even a small lump and remove it or rub with the float. When this lump occurs while spraying, it blocks the nozzle, creates a blockage, and thus forces a break for the machine cleaning. Only the thoroughly mixed render can be put in the aggregate tank and sprayed. That's right: sprayed.

In this method, it's just so much or that much as spraying is not that easy. You have to - as builders would say - "form your hand" or to gain experience and intuition in order to reach the correct render proportions and to get the expected effect. Apply it in one place long enough and keep the right distance from the gun nozzle to the façade. It's almost all. Sprayed render is left to dry after application without any other additional work.

Spraying method has also other advantages over the manual one, namely: - Application, regardless the surface of the façade, requires only three persons, one of them is responsible for a continuous supply of the product to the aggregate tank, the second one, due to the length and size of the hose, helps to maneuver, and the third one is spraying the render on the façade;

- Can be sprayed on all surfaces - horizontal and vertical, window reveals and not available in the manual technology oval spaces and the rustication - in the same technological process;
- You can stop the spraying of a white render whenever you want and the connection will not be visible;
- The time of the application is up to 3 times faster than of the manual one;
- Gives fully repeatable and more clear render structure on the entire façade.

There are also two disadvantages of this technology, which must be mentioned here. First, the spraying unit cost ranges from 3.5 up to 6.5 thousand EUR. The second is the need to protect all elements of the building, such as windows, gutters, window sills, against contamination.

In addition to the issues listed and described in this lesson and related to the render application, there are still many other elements or technological problems. We will deal with them in the next lessons. We hope that we have been able to explain to all thermal insulation installers from where certain actions and steps of render application arise and enrich the knowledge of those who just start their adventure with thermal insulation.

