



Barrier 100

Responsibility opened towards the future

Most architects embrace the idea of a passive house that is integrated and friendly with the environment, which consumes very little energy. The idea started to stick among potential customers who, for various reasons, were prepared to seriously evaluate this concept. **Barrier 100** windows and doors open proudly to those who want a passive house, complying with all the requirements of such a building.

Please keep in mind that a passive house is a complex construction, where indoor microclimate indices need to be carefully studied, so that design and execution solutions can be effective. General principles of passive houses are applied to each project depending on local conditions. In conclusion, we can say that every passive house is unique, just like **Barrier 100** windows and doors.

Warranty of **Barrier**® windows and doors

The quality of **Barrier**® windows and doors proves our responsibility and high professionalism in manufacturing and mounting them. Warranty of **Barrier**® windows is 5 years. Average life expectancy is 15 years for fittings and 20 years for PVC profiles.

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- Barrier 60
- Barrier 70
- Barrier 86
- Barrier 100**
- Barrier Doors
- Barrier Garage
- Barrier Architect

windows
that protect your
home



Barrier 100

doors and windows for passive houses, with PVC REHAU Geneo PHZ profiles

Responsibility opened towards the future

Barrier 100 windows and doors meet the needs for thermal insulation of passive houses, with a heat transfer coefficient of **Uf = 0.79 W/m²K.**

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Barrier® Representative



comfort is high and stable

passive house = sun's house

Barrier 100



Barrier 100 completes the symphony of perfect insulation

In line with the basic principle of a passive house - more comfort with less energy - **Barrier 100** windows have brought thermal insulation and sealing parameters to never seen before values. Of course, the contribution of **Barrier 100** windows is complete only if the other elements of a building are as innovative and energy efficient. We would like to mention below the most important ones.

Thermal insulation and energy consumption

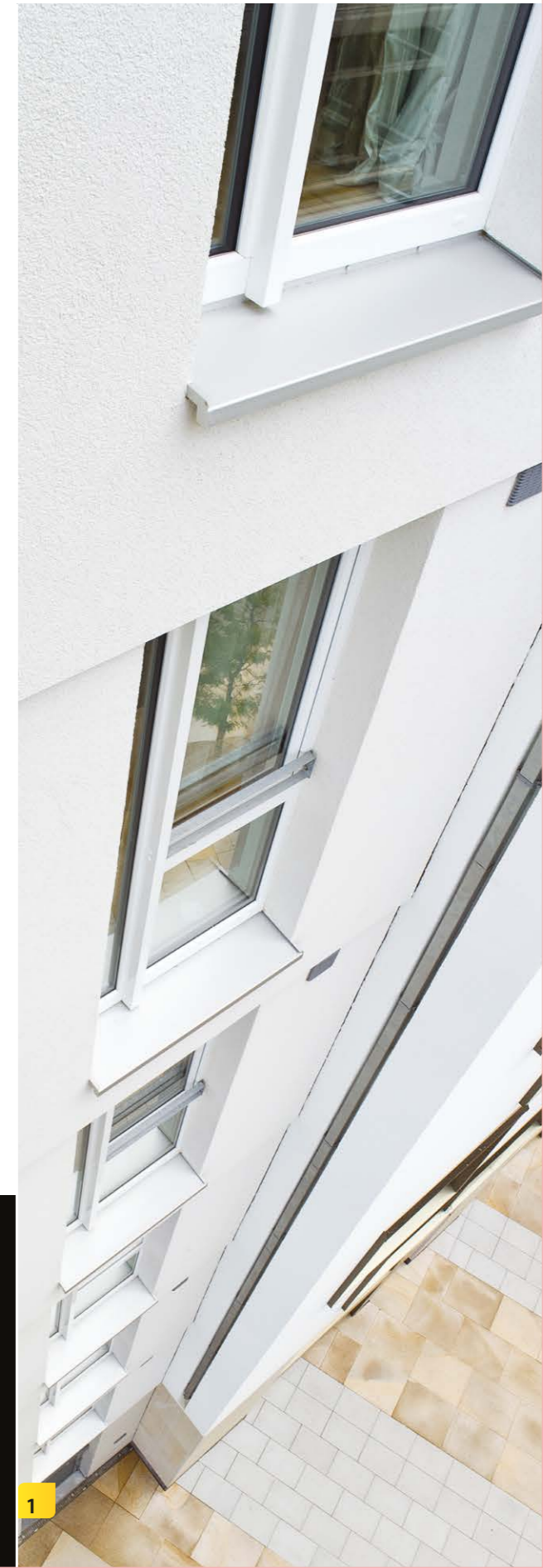
Heat transfer indices of opaque materials (walls, roof, floors over foundation ground) must be between 0.1 and 0.15 W/m²K. For heating and cooling, annual consumption will be 15 kW/m²/year max. or 120 kW/m²/year max. (primary energy), including lighting and preparation of hot water. A heating system is optional, and if such a system is present, power will not be higher than 10 W/m².

Sealing and fresh air input

Mobile elements of closure must be airtight and not allow losses higher than 0.6 of air volume in a house within an hour. All penetrations through the house's shield against winds and snow will be well insulated. Ventilation system will be as economical as possible, with a yield $\geq 75\%$, perhaps with pre-treatment of air through heat transfer to the ground. A heat exchanger will recover heat from the air exchanged with outside, reducing energy consumption.

Energy production systems, water management

Photovoltaic solar panels, or for hot water production, must be present. In case of a heating system, a heat pump will be used. Low power energy consumers (LED lighting) or using a KNX system can significantly improve energy consumption management. Rainwater can be stored, filtered and used in the household.



A passive house is integrated into the environment. The shape of the house starts from a simple house layout, with a compact volumetric analysis, often exploiting land relief. The most important feature is the opening towards the south. It is recommended that other sides have as few gaps as possible, preferably none, on the north side. A passive house lives by being oriented towards the south, towards the sun.

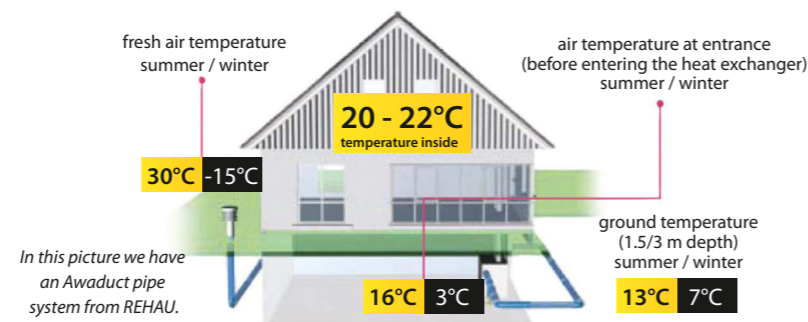
Comfort is high and stable

The pleasure of living in a passive house is intense. The synergy of initially designed systems provides healthy and constant comfort at very low maintenance costs.



Natural pre-treatment of fresh air

System of underground pipes, preferably with anti-microbial component, provides naturally pre-treated fresh air entering the home, via energy exchange with the ground.



Barrier 100 windows are created for passive houses

In 1988 the "passive house" concept was mentioned for the first time. Eight years later, the Passive House Institute was founded in Darmstadt, Germany. Today there are about 30,000 officially certified homes, most of them are in Germany and Austria. In Romania, passive houses are so few that one can count them on his fingers. On one hand, the costs for building such a house are higher than for a standard building, and on the other hand, we do not have national programs to support the implementation of renewable energies.

And yet... people are interested in them. Firstly, most architects embrace the idea of a house that is integrated and friendly with the environment, and consumes very little energy. The idea started to stick among potential customers who, for various reasons, were prepared to seriously evaluate this concept. Barrier 100 windows and doors open proudly to those who want such a house, complying with all the requirements for passive houses.

Please keep in mind that a passive house is a complex construction, where indoor microclimate indices need to be carefully studied, so that design and execution solutions can be effective. General principles of passive houses are applied to each project depending on local conditions. Thus we can say that every passive house is, first of all, unique.

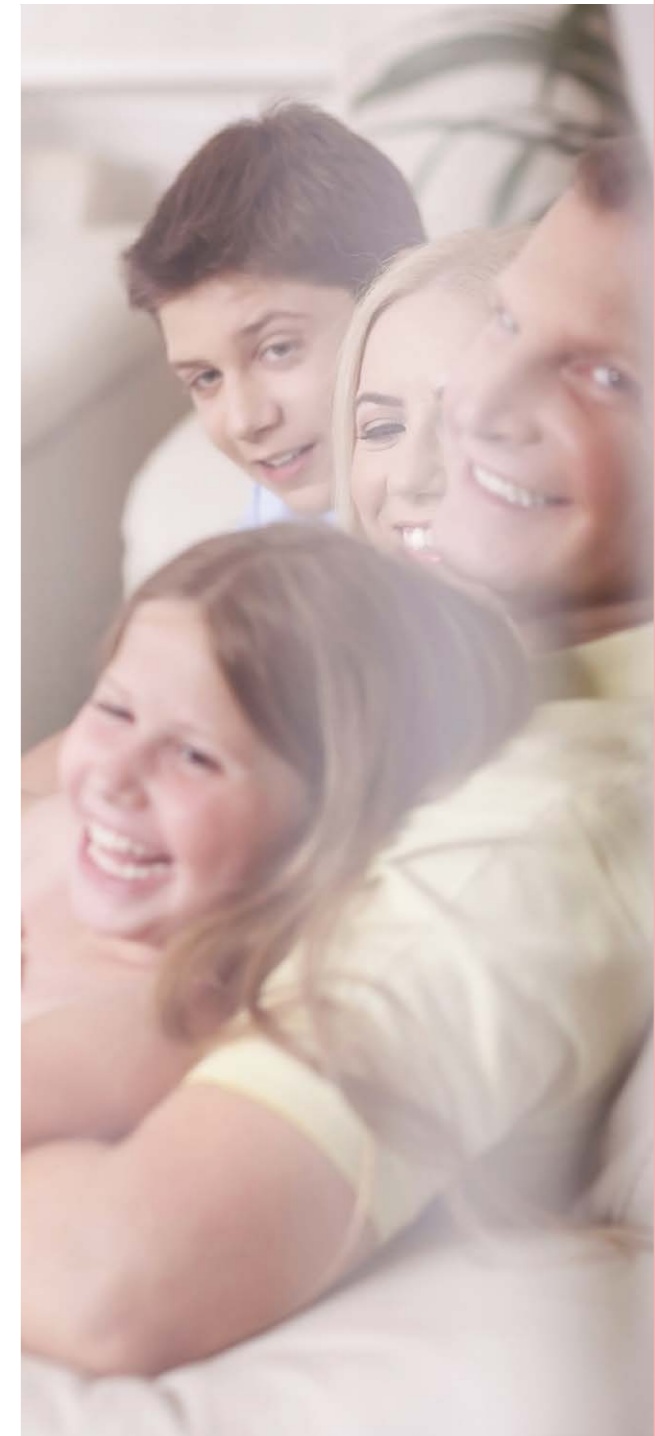
Main features of Barrier 100 windows

Quality materials: top of the line REHAU profiles, packages with 3-glass sheets, ROTO LUX fittings, wide range of accessories.

Heat transfer coefficients U_f from 0.79 W/m²K, adaptation up to noise protection class 5 or anti-burglary protection class WK3.

Special resistance to extreme weather conditions, strong wind gusts or showery rains.

Very high sealing capacity, air loss per hour is lower than 60% of indoor air. Three rows of co-extruded gaskets insulate very efficiently air chambers formed between a frame and sash.



Barrier® is a strong brand, and we provide only high-quality products. Having you as our customer means we will answer your needs by providing the best materials, most advanced technologies and well-trained and dedicated consultants, so that when it comes to quality windows, the first word that comes to your mind is Barrier.

Do you have a project in mind?

Consider using, from the early stage of design, **Barrier 100** windows. Details presented by our **Barrier®** consultants will help you have adequate, properly configured windows, in a nutshell: perfect windows.

Standards of a passive house
annual energy consumption <i>for heating or cooling</i>
15 kWh/m ² /year maximum
primary fuel consumption <i>for heating, hot water and electricity</i>
120 kWh/m ² /year maximum
pressure losses <i>n50 ≤ 0.6/hour at 50 Pa (N/m²)</i>
0.6 maximum of indoor volume/hour
heating/cooling source
maximum power of 10 W/m ²
heat transfer coefficient <i>thermal insulation, windows and doors not included</i>
U = 0.10 ÷ 0.15 W/m ² K
heat transfer coefficient <i>windows and doors - in total, for entire panel</i>
U = 0.70 ÷ 0.85 W/m ² K
ventilation system <i>with heat economiser</i>
efficiency > 75%

thermal diagram through a window section - thermal insulation is constant



For more technical information or further explanations of definitions or effects of different parameters, please talk to a Barrier® consultant



Geneo PHZ® creator of high performances for windows

Technology used in manufacturing **Barrier 100** windows and doors with REHAU Geneo PHZ® profiles is the endemic response to insulation requirements of passive houses. Glass panels are made of 3 sheets with high insulation performance (two sheets of glass with Low-E is recommended), are provided with inert gas insert (Argon or Krypton) and thermal insulating rods. Due to mass reinforcement of profiles, in most cases using steel reinforcement is not necessary. This reduces the risk of creating thermal bridges, leaving enough space to insert thermal insulating modules into profile chambers.

For the climate in Romania, as well as in Central and Eastern Europe, it is recommended that extensive glass surfaces towards the south be used, equipped with movable shading elements, and avoid, as much as possible, windows and doors on the northern side of a building.

Mounting Barrier 100 windows

*In order for a window to meet planned parameters, it needs a quality mounting, according to all the rules of this art. Solbanc profile is very important for correctly mounting window sills, and mounting sheets for indoor and outdoor guarantee perfect fitting of windows with building walls. A series of details about windows fitting with adjacent walls are important and necessary in order to increase insulation to vapour permeability. Coordination between the person designing your house and **Barrier®** consultants is essential.*



These profiles are for presentation purposes

RAU - FIPRO® - composite material of the future

RAU-FIPRO® is the result of cutting-edge technology used in aerospace industry and Formula 1. Mass reinforcement of REHAU Geneo PHZ® profiles increases considerably the carrying capacity of woodwork panels, reducing their weight. By using thermo-modules, profiles have very high thermal performances.

3 levels of gaskets, for a perfect seal

REHAU Geneo PHZ® profile for windows, with three marginal levels of gaskets, provides optimum insulation. Material of gaskets is very elastic, with high resistance to wear, ensuring long life to our products. Median gasket completes the insulating role of the 6 profile chambers, sealing gaps between the frame and sash.

Range of REHAU Geneo PHZ® profiles is very wide. Profiles are adjusted to main architectural typologies of windows and doors used in a building. You can use them for very big panoramic windows, sliding or normal patio doors, or entrance doors. Using a profile specific to each woodwork panel guarantees its perfect functioning. Lack of reinforcement, due to mass reinforcement of RAU - FIPRO® innovative material, results in a lower weight of panels, which are easier to handle. In addition, you can use thermo-modules, as thermal insulation of this profile reaches never before seen levels.

Class A ★★★★★

profile material TOP

RAU - FIPRO® (mass reinforced PVC)

thermal insulation coefficient TOP

Uf up to 0.79 W/m²K

soundproofing class TOP

5 (glass = 50 dB, RwP = 47 dB)

anti-burglary protection TOP

up to class WK3 (WK2/without steel)

profile thickness

86 mm

visible width of profile

115 mm

number of constructive chambers

6 chambers

chamber rooms thickness

3 mm

gaskets TOP

3 rows (with median gasket), grey

fittings TOP

visible (ROTO Lux), hidden optionally (ROTO NT)

glass packages (min/max, mm)

44 - 52 mm

profile surface

HDF - smooth, compact, easy to maintain

colours

wide range - laminating or painting

aluminium plating on the outside

optional

REHAU Geneo PHZ® is a top profile, complete, ready to face the harshest bad weather for your family's comfort. And that's not all - it provides more safety, insulation and ease of use than any other conventional profile. The innovation of the future brings you energy saving, both literally and figuratively.



TOP 52 mm glass package

light transmission

58 - 73%

noise attenuation

33%

heat transfer coefficient (U_g)

0.5 W/m²K (with inert gas)

glass package 44 mm

light admission

58 - 73%

acoustic attenuation

33%

coefficient from thermal transmission (U_g)

0,6 W/m²K (inert gas)

Basic structure of a glass set consists of a SGG Planitherm 4S glass sheet (outside), a Low-E glass sheet (middle) and a Low-E glass sheet (interior). In general, the thickness of glass sheets is 4 mm (6 mm for sizes exceeding 1500 mm).



Barrier 100 glass packages, top thermal insulation

On average glass represents 90% of the surface of a woodwork panel. For this reason, proper configuration of the glass package is highly important in order to obtain an overall uniform set that is both thermal insulating and sound insulating.

Barrier 100 recommends two packages of 3 glass sheets, with 44 or 52 mm thickness. TERMIX spacer rods, made of plastic with steel insert, have low energy transfer, eliminating the appearance of condensed water in the outer perimeter of the glass. With the help of inert gas insertion between glass sheets (argon or krypton), the thermal characteristics of a glass package are significantly improved, as required for passive houses.

Orientation towards the cardinal points is important for optimum performance of the glass package. Therefore, **Barrier 100** provides optional solutions to increase its effectiveness. For a south or west orientation of your windows, you can choose 4S reflective glass, and also external shutters. Regardless of your house's orientation, we recommend two Low-E sheets.



Barrier 100 provides good and proper performance

The functions of quality fittings must be ensured for a long period of time. Wear resistance, upon permanent and intense requirement, depends greatly on the quality of profiles, but especially on the quality of fittings being used. In case of **Barrier 100** windows, where an additional weight of 3-sheets package is added to daily requirements, as well as observance of a high sealing standard, specific to passive houses, the use of quality fittings is mandatory.

Types of fittings provided by **Barrier 100** are ROTO Lux, with visible hinges, and ROTO NT Designo, with hidden hinges. The latter highlight the special design of your windows, especially if you choose lamination with background or customised special foils.

A second important function of fittings is to protect indoor areas against burglary. Special blocking elements, as well as other security features, allow us to establish the resistance class for each window and door, so that you feel safe.

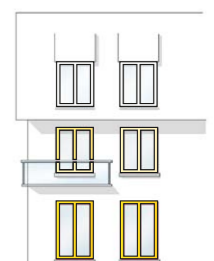
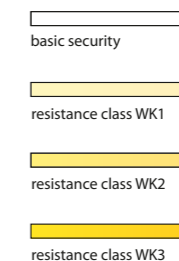


Basic security - very hard to access windows.

Resistance class 1 (WK1) - minimum protection against the use of lever-type tools.

Resistance class 2 (WK2) - improved protection against the use of simple tools (screwdrivers, pliers, blades).

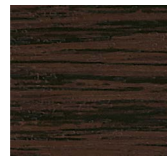
Resistance class 3 (WK2) - optimal protection against the use of heavy tools such as a claw crowbar.



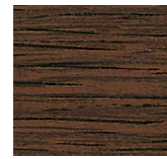
standard colours



granular brown
code 9631



dark oak 2
code 4914



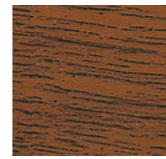
dark oak 1
code 9638



mahogany
code 9632



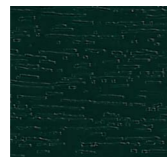
granular walnut
code 225L



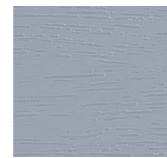
golden oak
code 7512



grey-anthracite
code 4443 / RAL 7016*



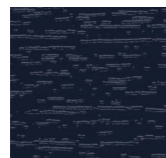
dark green
code 9773 / RAL 6009*



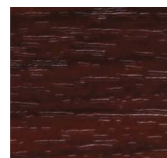
grey
code 9922 / RAL 7001*

Renolit, Exofol or Hornschuch foils, used by **Barrier®**, are among the most resistant on the market. Regardless of the number of years that has passed, the profiles will look as great as they did on the first day. **Barrier 100** windows provide a wide colour range. You can also choose painted profiles, in a range of 150 RAL colors.

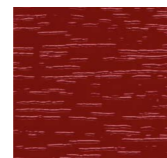
non-standard colours



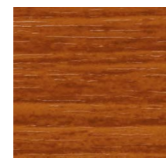
granular blue steel
code 4681 / RAL 5011*



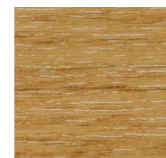
granular black cherry
code 168L



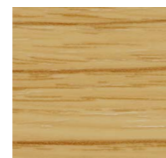
dark red
code 9792 / RAL 3011*



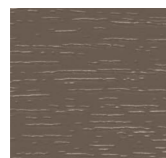
Douglas pine
code 4404



Irish oak
code 913L



granular dark oak
code 9910



granular grey-quartz
code 1014L / RAL 7039*



granular grey-basalt
code 134L / RAL 7012*



grooved aluminium
code 1049L



light grey
code 7666 / RAL 7035*



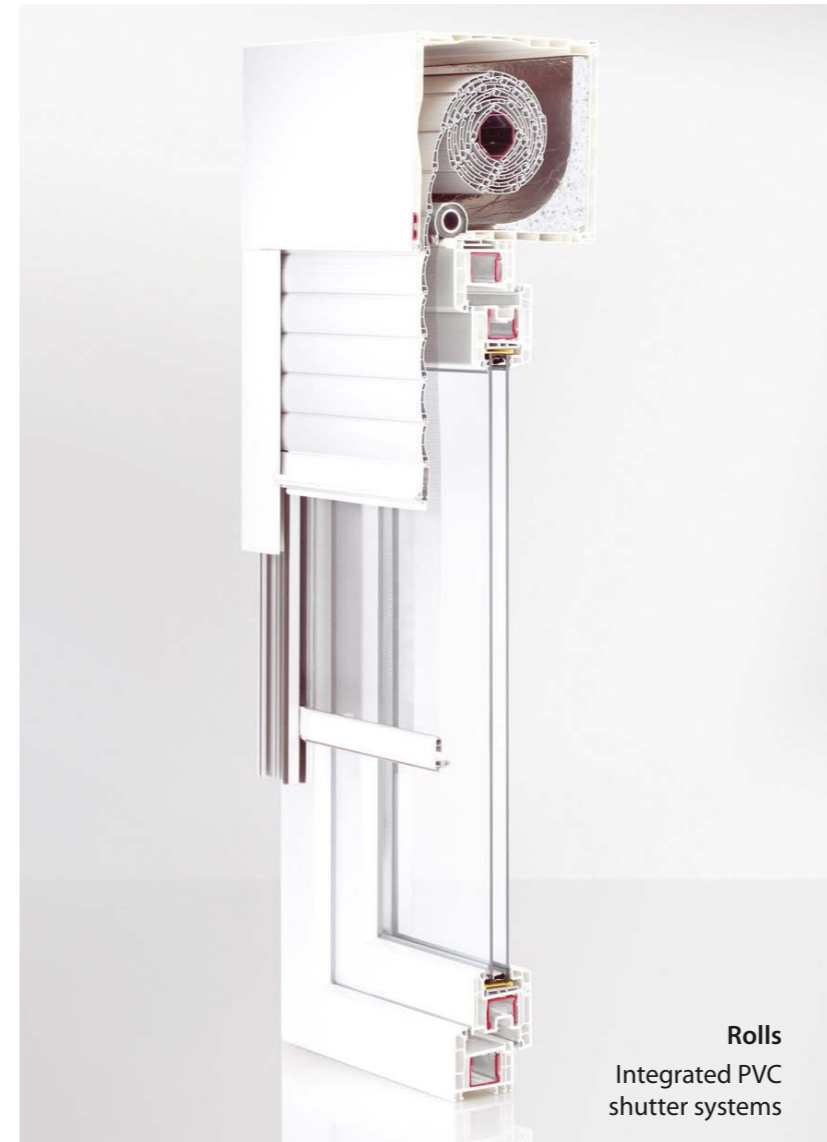
granular cream
code 4444 / RAL 9001*



granular white
code 9734

* - recommended RAL colours. Before choosing the final colour, RAL codes are checked for each case.

We know no limits when discussing the colours of your windows' profiles. **Barrier®** uses the latest and most efficient technology to laminate profiles. Our range of colours and textures is complemented by customised printed foils, with the design that you suggested. By choosing the colour of a foil, your **Barrier 100** windows become active and unique elements in your home. If you choose Rehau Geneo PHZ® profiles with aluminium protection, you need to earnestly study the entire range of RAL colours.



Rolls
Integrated PVC
shutter systems



Blinds - outdoor view



PVC blinds
Protection from
sunlight, added privacy



Sills
Protection inside and
outside

Accessories for passive houses

Choosing accessories for **Barrier 100** windows and doors needs to be consistent with the principles of thermal insulation and fresh air ventilation, specific to passive houses.

Barrier 100 accessories are suitable to be used for passive houses. However, careful coordination of the design and execution of technical details is required.