
RAUVISIO CRYSTAL AND RAUVISIO CRYSTAL SLIM

Technical Information

This "RAUVISIO crystal and RAUVISIO crystal slim"
Technical Information is valid as of October 2015.

With the publication of this document, the previous
Technical Information F20600 (July 2015) is no
longer valid.

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1 INFORMATION AND SAFETY NOTES

Validity

This Technical Information is valid worldwide.

Technical Information version

To ensure your safety and proper use of our products, please check regularly to see whether a newer version of this Technical Information is available.

You can obtain the latest version from your local retailer, your REHAU sales office or document can be downloaded at www.rehau.com/surface-solutions

Navigation

At the beginning of this Technical Information, you will find a detailed table of contents with the hierarchical headings and corresponding page numbers.

Pictograms and logos



Safety information



Legal notice



Important information



Information on the internet



Your benefits

Proper use

RAUVISIO products may only be planned, processed and installed in accordance with this Technical Information. Any other use is in violation of the specifications and therefore prohibited.

Suitability of the material

The latest valid Technical Information must be observed in the processing / installation and use of RAUVISIO crystal and RAUVISIO crystal slim. Our technical information is based on lab results and experience at the time of publication. The publication of this information does not constitute an assurance of the properties of the described products. No guarantee, either expressed or implied, can be derived from it.

This information does not release the user / buyer from their responsibility to assess the material and fabrication with regard to its technical suitability for the respective property conditions and uses.

Disclosure of information

It is essential to ensure that your customers, including end customers, are aware of the necessity to observe the current Technical Information as well as instructions for care and use for RAUVISIO crystal and RAUVISIO crystal slim products.

The instructions for use and care must be provided to the end customer either by yourself or by your customer.

Note to our distribution partners and customers that press RAUVISIO glass laminates and resell the laminated boards: Please also inform your customers of the need to follow the current Technical Information and make this available to them.

Note to fabricators of pressed glass laminate boards: Please ensure that at least the installation guidelines (chapter „11 Installation guidelines – summary“) and the instructions for use and care (chapter 12) are made available to your customers and processing and installation firms.

Safety information and installation instructions

Observe the information on packaging, accessory parts and installation instructions. Keep the installation instructions handy for easy access.

If you do not understand the safety information or the individual installation procedures or something is unclear, please contact your REHAU sales office.

Applicable guidelines and safety equipment

Strictly observe all applicable safety and environmental regulations as well as the regulations from the trade supervisory authority and the employers' liability insurance association. Such regulations always take precedence over the information and recommendations in this Technical Information.

Always use safety equipment such as:

- Gloves
- Safety glasses
- Ear protection
- Dust mask

Adhesives and auxiliary materials

Strictly observe the safety instructions for any adhesives.

Always store auxiliary materials such as alcohol-based cleaning products and other easily flammable materials in safe and well-ventilated places.

Ventilation / extraction, production dust

Ensure adequate ventilation and extraction for the processing machines.

If you inhale production dust, get fresh air and seek medical attention if you experience any symptoms.

Protective measures and disposal

RAUVISIO crystal and RAUVISIO crystal slim are harmless to the environment. Dust from the material is non-toxic. Dust concentrations should be minimised through suitable safety measures such as extraction or dust masks.

Dust from RAUVISIO crystal and RAUVISIO crystal slim presents no specific risk of explosion.

Disposal code in accordance with the waste catalogue ordinance:

- 170203 / Construction and demolition waste consisting of wood, glass, plastic
- 120105 / Waste from mechanical shaping processes and from the physical and mechanical surface treatment of metals and plastics (plastic shavings and lathe shavings).

Fire behaviour

Due to acrylic and styrene copolymer composition, RAUVISIO crystal and RAUVISIO crystal slim behaves favourably in the case of fire and is classified as normally inflammable under DIN 4102-B2. In case of fire, no toxic substances such as heavy metals or halogens are released. The same firefighting techniques used for wood-containing materials can be used.

Extinguishing fires

Suitable extinguishing agents for fighting fires are:

- Water spray
- Foam
- CO₂
- Extinguishing powder

For safety reasons, full water jets are unsuitable.

When extinguishing fires, wear appropriate protective clothing and, if necessary, a self-contained breathing apparatus.

2 RAUVISIO CRYSTAL – THE GLASS LAMINATE

2.1 Product description

Whether in the kitchen, the bathroom or the living room – glass is widely used in modern furniture design. Glass is a particularly popular material for furniture fronts thanks to its high-quality appearance and feel. However, this is also accompanied by extensive production requirements.

RAUVISIO crystal combines the high-quality appearance of real glass with the advantages of a polymer material. REHAU offers maximum flexibility for the production of fronts, backsplashes and frameworks with a glass effect.



Fig. 2-1 RAUVISIO crystal for glass-look surfaces

RAUVISIO crystal is designed for vertical applications indoors. For horizontal applications consult with REHAU's Application Engineering Department.



RAUVISIO crystal features the following advantages:

- Non-porous, hygienic surface
- Scratch and abrasion resistant
- Break resistant
- Low weight
- Can be processed with woodworking tools
- Maximum flexibility in processing
- Production monitoring record, Technical Inspection Agency certification for RAUVISIO crystal complete



This product passes strict European AMK kitchen testing, which subjects the product to rigorous steam and temperature cycling testing to ensure no failures occur with the product. AMK compliance can only be guaranteed if the pressed board is purchased through REHAU. When processing individual laminates, i.e., bonding carried out by the customer, the laminator bears sole responsibility (in consultation with the adhesive and board manufacturer).

2.2 Product structure of RAUVISIO crystal

RAUVISIO crystal is a composite material consisting of the individual components listed below. The properties of the individual materials and proper processing are critical for the overall quality of furniture components made from RAUVISIO crystal.

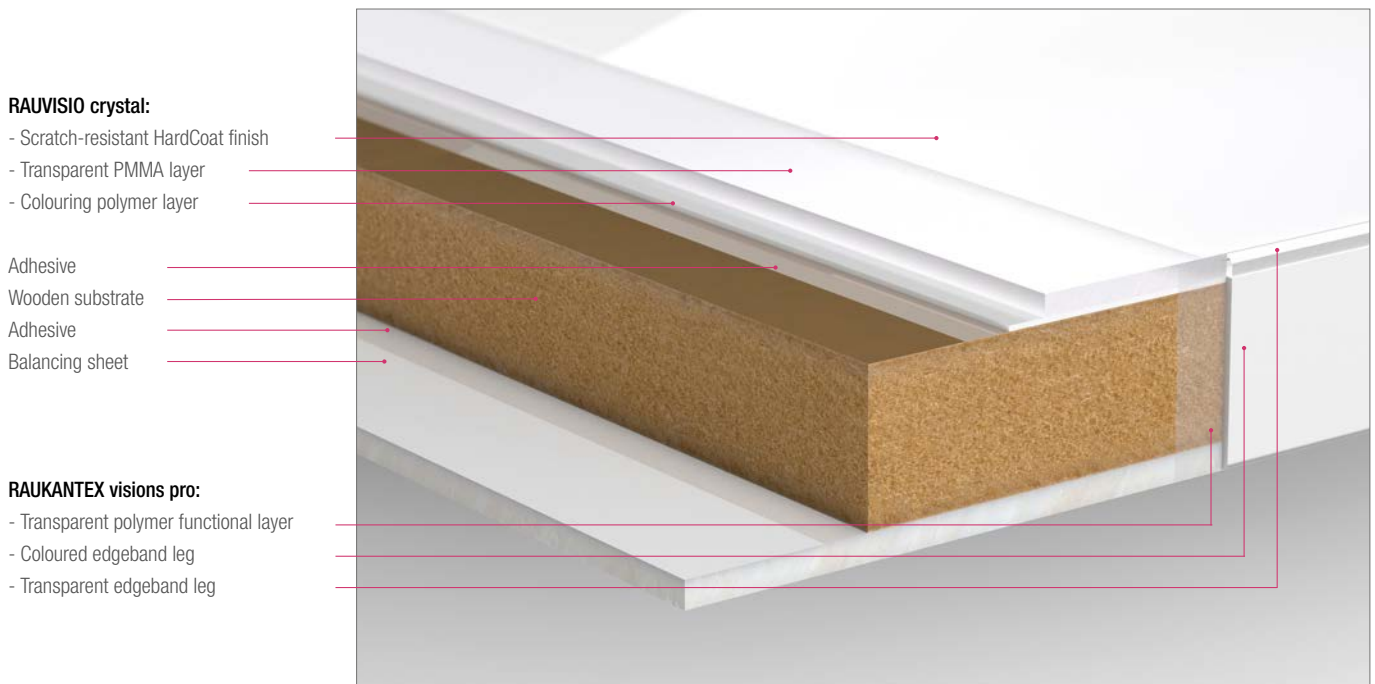


Fig. 2-2 RAUVISIO crystal system solution with RAUKANTEX visions pro edgeband

Layer	Material / thickness	Description
Protective foil	Polyethylene protective foil (PE)	The visible side of the glass laminate is covered with a PE protective foil, which provides optimum surface protection during transport, processing and installation. It must only be removed following installation.
Glass laminate	Material thickness 2.0 mm	
	Scratch-resistant HardCoat finish	Increases chemical, abrasion and scratch resistance, achieving a reflective, high-gloss or matt, satined glass effect.
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass effect Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure bond to the substrate. Independently tested adhesive systems are used in combination with the relevant components.
Substrate	Material and thickness are matched to the application	Independently tested substrates and thicknesses are used to ensure a permanently consistent quality.
Balancing sheet	Material thickness 2.0 mm in the product coordination guide for the surface and edge	Colour-coordinated balancing sheet maintains the balance of the overall component within the standard tolerances of the wood panel material industry under different climatic conditions (one-sided heating of the component should be avoided).

2.3 Individual components

All RAUVISIO crystal components can be ordered individually:

Laminate (high-gloss / matt)

RAUVISIO crystal is a co-extruded polymer surface consisting of multiple layers.

1.6 mm:	Transparent layer	Acrylic (PMMA)
0.4 mm:	Colouring layer	Acrylic / styrene copolymer

Thanks to the 2.0 mm thick material combination, RAUVISIO crystal creates a real-glass effect with outstanding adhesion to the substrate. The laminate is available in high-gloss and matt versions.



Fig. 2-3 Glass laminate RAUVISIO crystal in the high-gloss and matt versions

Balancing sheet (embossed)

A technically coordinated balancing sheet was developed for the surface-wooden substrate system group solution, based on the technical properties of the sandwich structure. Its 2.0 mm thickness minimises warping under the effects of heat, cold or fluctuating humidity. The functionality of the balancing sheet is based on the coordinated material properties, in particular with regard to thermal expansion and the forces generated by it.

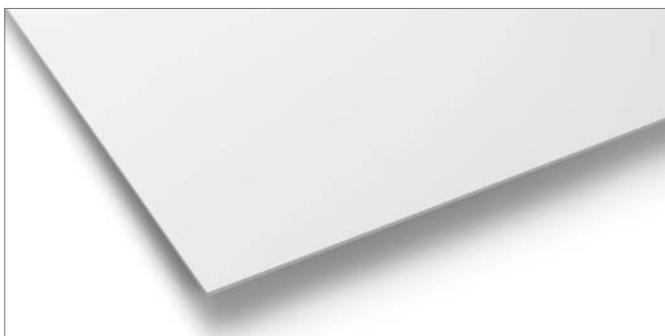


Fig. 2-4 RAUVISIO crystal balancing sheet in the colour bianco

Edgeband collection

For RAUVISIO crystal, REHAU offers two perfectly coordinated edgeband designs. RAUKANTEX visions pro in the Duo-Design look creates the look of a fine glass panel thanks to the top, transparent leg. RAUKANTEX color pure/pro, available with a high-gloss or matt finish, creates the glass look through the application of a 45° chamfer. All edgebands are also available as the zero-joint edgeband RAUKANTEX pro.



Fig. 2-5 RAUVISIO crystal edgeband collection in the colour bianco

2.4 RAUVISIO crystal composite pressed board

In addition to the individual product components, the right processing parameters are key to ensuring the permanent high quality of the system component. To ensure the quality of the pressed board, REHAU offers the system component consisting of the surface, substrate and balancing sheet as a pressed board in the large format (1,300 x 2,800 mm).



Fig. 2-6 RAUVISIO crystal composite pressed board in the colour bianco



The pressing of individual components is carried out by authorised REHAU fabricators and checked against pre-defined quality standards. These are monitored by TÜV Rheinland in Germany.

3 RAUVISIO CRYSTAL SLIM – POLYMER GLASS PANEL

3.1 Product description

RAUVISIO crystal slim combines a high-quality real glass appearance with the advantages of a polymer material and therefore offers maximum flexibility as part of the production process for backsplash solutions and wall claddings and also as an infill panel for fronts.

RAUVISIO crystal slim is a composite comprised of a co-extruded glass laminate and the balancing sheet and consists of the following layers:

1.6 mm: Transparent layer

2.4 mm: Colouring layer

RAUVISIO crystal slim does not require a substrate, i.e., the transparent and colouring layer together make up the final thickness of 4 mm. The polymer glass panel is available in high-gloss and matt versions.



Fig. 3-1 RAUVISIO crystal slim in a backsplash application



RAUVISIO crystal slim features the following advantages:

- Non-porous, hygienic surface
- Thanks to the lotus effect, the high-gloss version can be written on with a water-soluble board marker
- Simple cleaning with water and microfibre cloth
- Scratch and abrasion resistant
- Break resistant
- Low weight
- Can be processed with woodworking tools
- Maximum flexibility in processing

RAUVISIO crystal slim is designed for vertical applications indoors. For horizontal applications, either secure independent approval at your own risk or consult with REHAU's Application Engineering Department.

The thermal expansion coefficient must always be taken into account. The material properties listed in the technical datasheet (in particular of thermal or mechanical/physical nature) must be observed and evaluated with respect to the specifics of each application. Risk assessment and approval are the responsibility of the customer. If you have any questions, please contact the REHAU Application Engineering Department.

The PMMA surface of the glass laminate with scratch-resistant coating is protected by a special PE foil **that may only be removed after installation.**

3.2 Product structure of RAUVISIO crystal slim

RAUVISIO crystal slim is a composite comprised of a co-extruded glass laminate and balancing sheet and consists of the layers shown below:

RAUVISIO crystal slim does not require a substrate, i.e., the transparent and colouring layer together make up the final thickness of 4 mm.

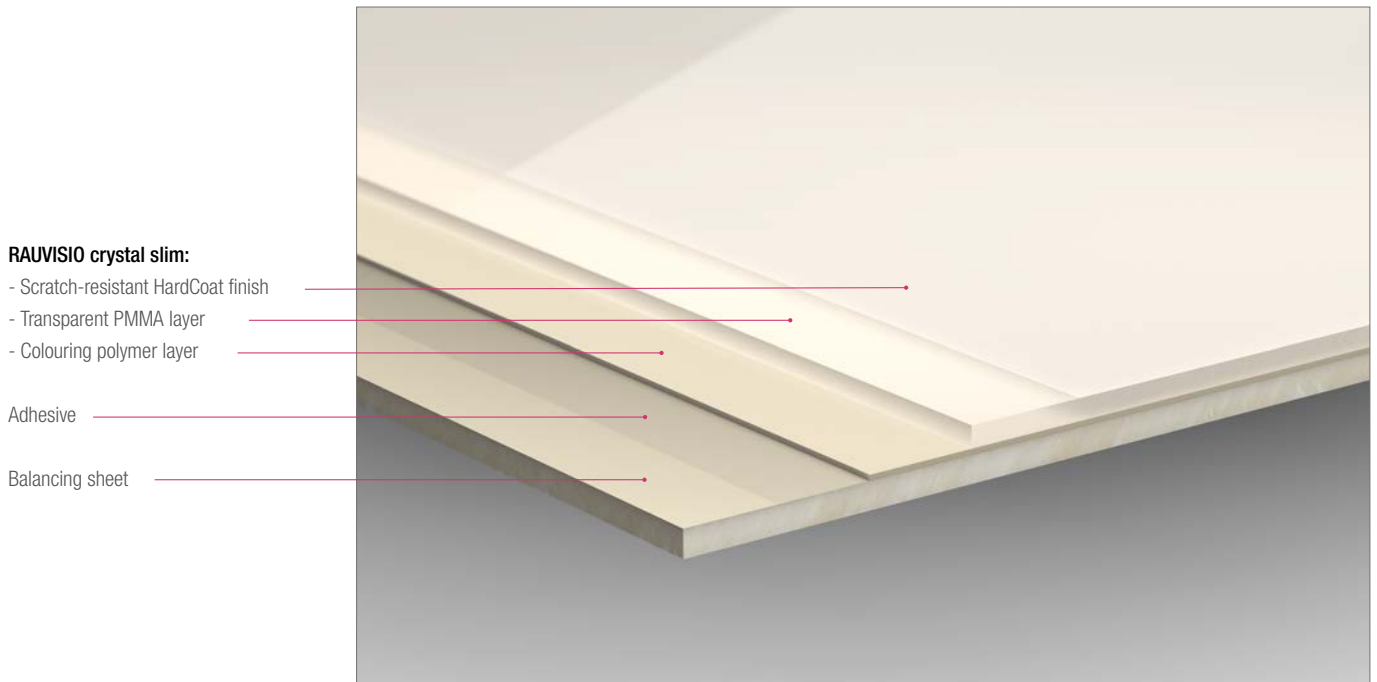


Fig. 3-2 RAUVISIO crystal slim system solution

Layer	Material / thickness	Description
Protective foil	Polyethylene protective foil (PE)	The visible side of the glass laminate is covered with a PE protective foil, which provides optimum surface protection during transport, processing and installation. It must only be removed following installation.
Glass laminate	Scratch-resistant HardCoat finish	Increases the chemical, abrasion and scratch resistance, achieving a reflective, high-gloss or matt, satined glass effect.
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass effect Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure bond
Balancing sheet	See the product coordination guide	Colour-coordinated balancing sheet maintains the balance of the overall component within the standard tolerances under various climatic conditions.

4 RAUVISIO CRYSTAL MAGNETIC

The products RAUVISIO crystal composite and RAUVISIO crystal slim are also offered in optional magnetic versions, with the magnetic effect created by a steel inlay. This does not result in any changes to the surface properties.

Increased magnetic force is achieved through the use of a Neodym magnet (neodymium-iron-boron). Due to the material thickness of 2.0 mm, standard magnets achieve only a limited magnetic effect.

4.1 Product structure of RAUVISIO crystal composite magnetic

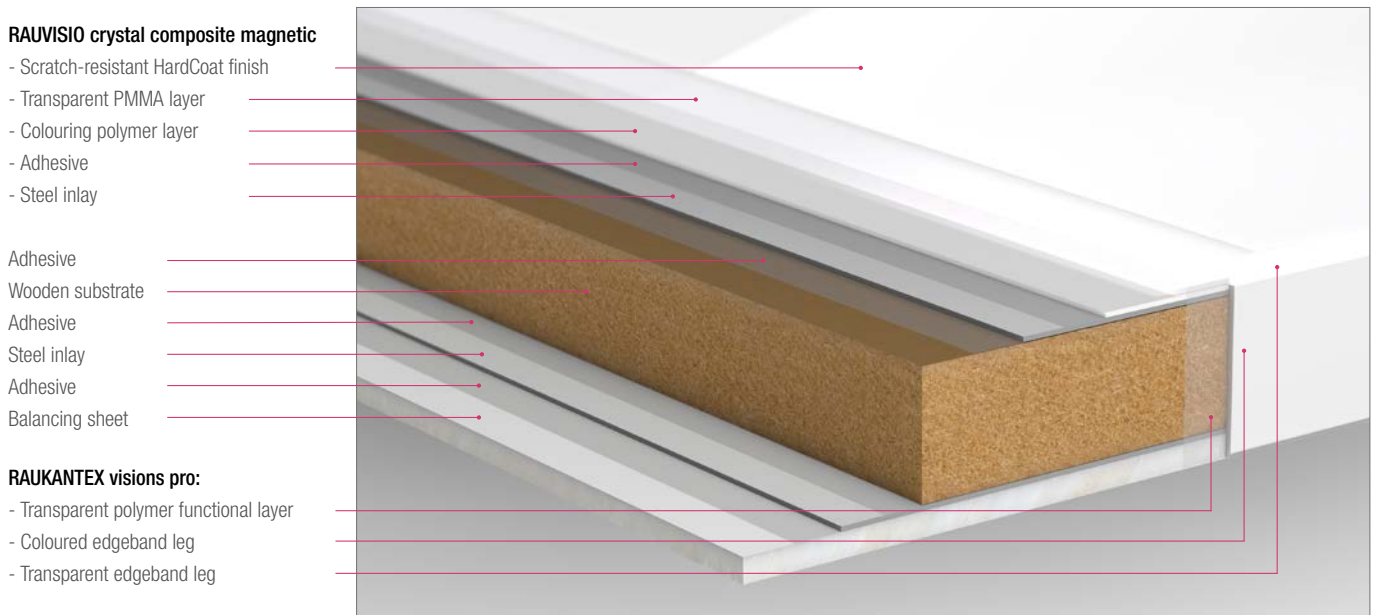


Fig. 4-1 RAUVISIO crystal composite magnetic system solution

Layer	Material / thickness	Description
Protective foil	Polyethylene protective foil (PE)	The visible side of the glass laminate is covered with a PE protective foil, which provides optimum surface protection during transport, processing and installation. It must only be removed following installation.
Glass laminate	Material thickness 2.0 mm	Increases chemical, abrasion and scratch resistance, achieving a reflective, high-gloss or matt, satined glass effect.
	Scratch-resistant HardCoat finish	
Surface adhesive	1.6 mm: Transparent PMMA layer	Depth effect, glass effect
	0.4 mm: Colouring polymer layer	Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure bond to the substrate. Independently tested adhesive systems are used for the particular application in combination with the respective components.
Steel inlay	Steel 100 µm	The thin 100 µm inlay ensures the magnetic effect.
Substrate	Material and thickness are matched to the respective application	Independently tested substrates and thicknesses are used in order to be able to ensure a permanently consistent quality in the respective application.
Steel inlay	Steel 100 µm	The thin 100 µm inlay ensures the magnetic effect and the balance of the overall system.
Balancing sheet	Material thickness 2.0 mm in the product range coordination guide for the surface & edge	Colour-coordinated balancing sheet whose properties allow it to avoid warping of the overall component exceeding the standard tolerances of the wood panel material industry under different climatic conditions (one-sided heating of the component should be avoided).

4.2 Product structure of RAUVISIO crystal slim magnetic

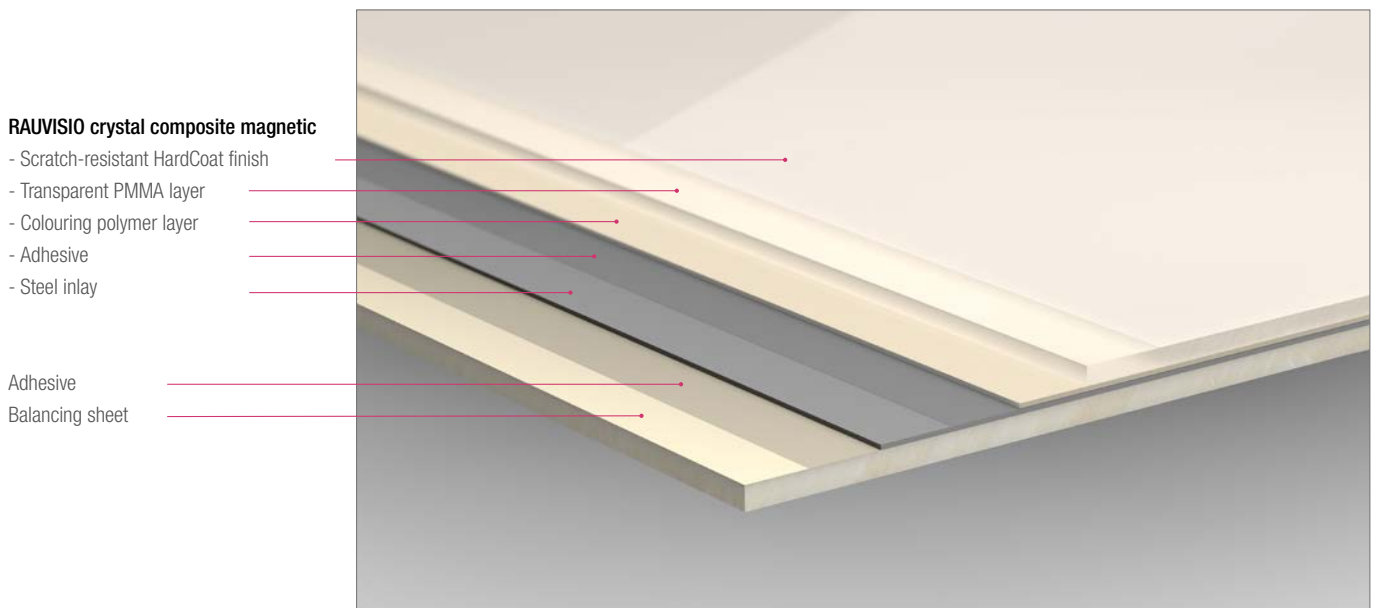


Fig. 4-2 RAUVISIO crystal slim magnetic system solution

Layer	Material / thickness	Description
Protective foil	Polyethylene protective foil (PE)	The visible side of the glass laminate is covered with a PE protective foil, which provides optimum surface protection during transport, processing and installation. It must only be removed following installation.
Glass laminate	Scratch-resistant HardCoat finish	Increases chemical, abrasion and scratch resistance, achieving a reflective, high-gloss or matt, satined glass effect. Depth effect, glass effect Colour effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass effect Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure bond
Steel inlay	Steel 100 µm	The thin 100 µm inlay ensures the magnetic effect.
Balancing sheet	See the product range coordination guide	Colour-coordinated balancing sheet maintains the balance of the overall component within the standard tolerances under various climatic conditions.

5 TRANSPORT, PACKAGING AND STORAGE

5.1 Transport and loading information



Check the exterior packaging for damage as soon as the goods arrive:

- If damage has occurred, open the packaging in the presence of the haulier and record the damage to the goods.
- This must be confirmed by the haulier with their name, company, date and signature.
- The damage must be reported to the haulier within 24 hours.

If you do not do this, the haulier's transport insurance is not liable.

Delivery

Due to the required planarity, the boards and laminates are shipped on adequate squared timbers or pallets depending on the mode of despatch.

- Following delivery of the packaging units (PUs), unload with a ground conveyor or similar equipment.
- If the appropriate equipment is not available, the boards can be unloaded by hand. In this case, ensure that the boards do not become dirty and are not subjected to any mechanical loads.
 - When unloading by hand, wear suitable protective equipment, e.g., gloves, as sharp edges can cause cuts.
 - The use of transport aids such as suction lifters, lever holds and board transporters is recommended for handling; see also Chapter „7.1 Unpacking“.
- When transporting the RAUVISIO crystal boards in horizontal position, avoid bending.

5.2 Packaging



Protect the boards with foam non-woven material.

With RAUVISIO crystal it is essential to protect the narrow sides and surfaces. Surface protection must also be ensured for RAUVISIO crystal slim. Particularly when moving, picking and further processing the boards, avoid or remove any dirt that may get between the individual boards. Otherwise, the weight acting on the boards when stacked / dead weight will result in pressure points on the laminate surfaces.

- Protect the surfaces with foam non-woven material.
This will prevent marks to the surface due to impurities when pressure is applied while the components are stacked.

5.3 Internal transport and storage

Internal transport

Transport RAUVISIO crystal board material or laminates in a flat and level position with support throughout.

The ideal method is to transport them in the packing variant in which they were delivered (no repacking recommended).

Storage

RAUVISIO crystal is delivered on pallets or squared timber with the appropriate protective boards to cover them. The packaging units can be stacked. However, due to the stack pressure, no more than five units can be stored on top of each other.



Protecting the packaging units:

The packaging units must be protected against damage, high temperatures and humidity fluctuations, as well as high UV levels from artificial lighting or direct sunlight.

Store the boards flat and level with the floor.

RAUVISIO crystal board material must be stored and transported in a flat and level position with support throughout. Storage on the supplied packaging units is recommended. Otherwise, at least a level and properly prepared 5-slat storage platform is required (see sketch). This is the only way to prevent bending or warping.

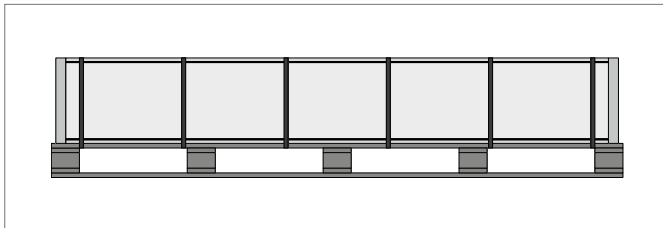


Fig. 5-1 Pallet packaging

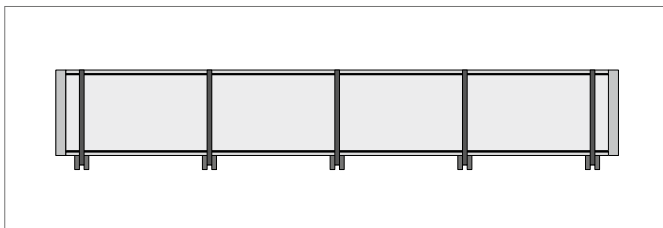


Fig. 5-2 5-slat storage

In case of improper storage in violation of the storage instructions above (pallet or at least 5-slat storage), there is no guarantee that signs of warping will not occur.

The material must be stored in closed, heated rooms where the room temperature is between 15 and 25 °C and the relative humidity is between 40 and 60 %.

Before opening the packaging unit, the goods must undergo an acclimatisation period at room temperature of at least 48 hours or longer, depending on the season.

After opening and removing a quantity of the product, it must be ensured that the cover panel remains on top of the goods when re-stored to prevent soiling and asymmetrical temperature / humidity effects (e.g., through draughts or heated air) and thus prevent warping or surface damage.

Storage before and after bonding the laminate

All materials bonded together must be acclimatised for a sufficient amount of time and reach the same temperature.

Storage immediately after bonding must be in closed, heated rooms. Ensure that the storage temperature does not exceed 60 °C.

6 PREREQUISITES FOR PROCESSING

6.1 Edgeband material

The use of RAUKANTEX edgeband material is recommended to create a uniform appearance between the RAUVISIO crystal surface and the narrow surface. The best visual results are achieved by using RAUKANTEX pro. As the colour of the polymer functional layer matches the colour of the edge, no visible joint is apparent. The RAUKANTEX edgeband product range can be supplied to match the surface in the materials ABS (acrylonitrile-butadiene-styrene) or PMMA (polymethylmethacrylate).

6.2 Processing individual laminates

6.2.1 Substrate

Wooden substrates, lightweight boards or composite material substrates are suitable for use as a substrate for RAUVISIO crystal. In order to meet the high demands on the surface, it is critical that the substrate is selected with the intended application in mind.

When choosing the substrate, adequate planarity must be ensured. This is the basis for the planarity of the pressed end product.

Another factor for in appearance is the surface structure of the substrate. A delicate surface structure is essential for an even and therefore high-quality surface. An MDF board is recommended for the substrate. MDF has a very fine surface structure from which only smaller fibres are pulled out during processing (cutting, milling, drilling, bonding). By contrast, considerably more fibres are pulled out from chipboard, OSB or plywood with a risk that these tears /impurities will push through the laminate and be "distracting". With chipboards, particles can fall out of the middle layer, leaving indentations in the laminate. This risk does not apply when using an MDF substrate.



For a high-quality surface appearance, an MDF substrate is recommended.

6.2.2 Adhesive

In addition to selecting a suitable substrate, selecting the right adhesive is important for system functionality. Single-component reactive PU hotmelts have been increasingly popular over the past few years. These adhesives can be applied to the board or substrate easily using rollers. A short press-down time is usually sufficient to ensure high initial strength. To ensure high surface quality, the pressing must be done with a continuous roller lamination system. The hotmelt

adhesives react with air, humidity/moisture in the material and the temperature.

When selecting a suitable adhesive type, it is important to ensure that there is sufficient adhesive force to resist the forces that can occur between the wooden substrate and the plastic laminate in different climatic conditions and prevent the plastic laminate from slipping on the wooden substrate, thereby creating a joint opening towards the edgeband, as well as delamination effects in general.



Ensure sufficient adhesion/final adhesion strength.

An adhesion strength of approx. 80 % is achieved after just a few hours; the adhesive joint takes max. 7 days to achieve its final strength.

Check the bond.

Especially with custom applications, the bond must be checked by the customer to ensure compliance with specifications.

6.2.3 Balancing sheet

Ensuring a functional overall system that maintains dimensional stability under fluctuating temperature and moisture conditions requires a balancing sheet that guarantees stability. Without a balancing sheet, RAUVISIO crystal is very likely to show signs of warping.

Generally, a symmetrical composition is optimal to avoid warping. A special polymer balancing sheet was developed that is similar to glass laminate in thickness and composition and thus demonstrates similar properties under different climatic conditions, which minimises warping. This is generally the best choice.

With custom solutions, component tests may be required to qualify the whole composite. In individual cases, use of the desired balancing sheet must be coordinated with REHAU's Application Engineering Department. Please contact your REHAU sales office about this.

7 PRIOR TO PROCESSING

7.1 Unpacking

Before opening the packaging unit, the goods must undergo an acclimatisation period at room temperature of at least 48 hours or longer, depending on the season.



Carefully unpack the boards.

When opening the packaging, ensure that the surfaces are not damaged by sliding or sharp objects. Appropriate lifting technology must be used to separate the boards.

Open the packaging with package shears.

Do not use sharp objects.

1. Cut the packaging tape.
2. Cut the protective foil vertically.
3. With 2 people and 4 vacuum suction devices, carefully lift the top protective board vertically without sliding it or, in the case of a single package, remove the box.
4. Prevent or remove any debris that gets between the individual boards.

7.2 Check the boards or laminates



Please check the RAUVISIO crystal system components with regard to the following points before beginning to process the products (see "Chapter 6.4 Documents for the material warranty"):

- External damage such as cracks or dents
- Surface damage or defects
- Planarity (for pressed boards)
- Surface tension on the reverse of the laminate (for single laminates)
- Colour uniformity within the production batch

The surfaces of RAUVISIO crystal are always delivered with a protective foil. In spite of this protective foil, it is possible that slight scratches, indentations or defects may be present on the laminates upon delivery. These cannot be entirely avoided in the production process and do not automatically represent grounds for a complaint.

When different laminates are combined for a job, it should be ensured that only laminates with the same production number are used.

When processing sheets with different batch numbers, it is essential to check the colour compatibility prior to processing.

A colour uniformity check must be performed in daylight, but not in bright sunlight, as minor defects on the surface may occasionally be present upon delivery. These cannot be entirely avoided in an industrial production process and do not automatically represent grounds for complaint.



Any costs resulting from checking the above points shall not be borne by REHAU. This also applies to follow-up costs in the further processing of defective goods.

7.3 Conditioning



RAUVISIO crystal and all other materials to be processed, e.g., edgebands, must be conditioned prior to processing at room temperature (min. 18 °C) for a period of at least 48 hours.

Processing is also carried out at room temperature.

It must be ensured, particularly in the colder months, that all boards are acclimatised. If the size of the stack prevents the laminates in the middle from acclimatising sufficiently, the acclimatisation period must be extended.

7.4 Documents for the material warranty

In order to trace back complaints, the delivery notes for the goods and the shipping labels must be retained.

The ink-jet stamp on the narrow side of the board can be used to identify the production batch. This information must be given to the REHAU sales office in case of a complaint.

8 PROCESSING RAUVISIO CRYSTAL

8.1 Proper handling of RAUVISIO boards

Placing the boards on the machine table

The machine table must be large enough, have no sharp edges and be completely clean.

Alternatively: Cover the machine table with a clean cover layer (wooden board, cardboard, etc.) or rotate the board so the protective foil is facing down and the balancing sheet facing up.

Formatting the boards

The nesting procedure is recommended when formatting the board. When formatting with a saw, be sure to observe the instructions for placing the board on the machine table (see above). In this case, work with a scoring saw blade.

Between the processing steps

After milling/sawing, all residue must be removed and all surfaces cleaned.

For transport, place the boards vertically and individually on appropriate trolleys.

Alternatively: Stack the boards on a pallet with a clean and pliable interlay of cardboard or foam between them.

Edging the boards

When edging the boards, work with a static inhibitor to prevent shavings from sticking to them.

Ensure the boards are fed into the machinery in a clean state and orderly fashion.

Any shavings or dust must be safely removed through the extraction unit.

Drilling and milling

When drilling/milling, any sawdust or shavings must be safely removed, e.g., through suction or blowing.

Packing the boards

Stack the boards on a pallet in layers with a clean and pliable interlay of cardboard or foam between them.

Use a transport lock to prevent damage due to slipping or similar.

8.2 Preparing the individual laminates

8.2.1 Pre-treatment of the laminates and substrates

RAUVISIO crystal is treated with a Corona pre-treatment on the styrene copolymer underside. This pre-treatment ensures a good bond between the laminate and the adhesive. Due to the high wettability of the surface, good adhesion is ensured. The wettability can be established using a test ink. The measurement for this is surface tension, which is measured in [mN/m]. It is known that the surface tension reduces with time. It is therefore recommended that the laminate be processed within one year.

If the surface tension is less than 38 mN/m, the ABS reverse must be post-treated. This can be done via flame treatment, Corona/plasma treatment or priming, among others.

Before the laminate is glued to the substrate, both should be run through a cleaning station. Here it is important that there are no foreign objects on the top or underside of the laminate after cleaning. Foreign objects can leave imprints during the lamination process which are only visible once the protective foil has been removed.

8.2.2 After processing the pressed board

After pressing the laminates, ensure that no foreign objects get between the individual layers or any such objects are thoroughly removed to prevent any indentations caused by the pressure exerted by the stack.

Before onward transport takes place, a rest period / curing time of min. 24 hours must be observed.

For further processing, check when the subsequent processing steps can be carried out. This will depend on the adhesive system and environmental conditions. Refer to the adhesive's product data sheet to do this.

For picking/storing individual components it is recommended to protect the surfaces with non-woven material or similar. This will prevent marks to the surface due to impurities when pressure is applied while the components are stacked.

8.3 Mechanical processing of RAUVISIO crystal

RAUVISIO crystal can be processed with most approved and sharp wood working tools. When machining, the polyethylene protective foil must remain on the high-gloss surface. Tears and delamination to the plastic laminates must be prevented through the use of suitable tools.

To check the quality of the RAUVISIO crystal system solution, test processing on samples is recommended.

Optimal machine parameters, tool configuration and cutting speeds must be established individually prior to production using a series of samples. The REHAU Application Engineering Department and your tool manufacturer will be happy to support you with this.

8.3.1 Cutting

Various factors are responsible for ensuring a good cutting result:

- Correct saw blade projection
- Feed rate
- Tooth shape
- Tooth pitch
- Saw speed
- Cutting speed

Depending on the amount of cutting, either carbide-tipped (HW) or diamond-tipped (DP) circular saw blades can be used.

8.3.1.1 Cutting RAUVISIO crystal

Sizing saws

Saws with a high number of teeth are recommended.

The best cutting quality is achieved with the trapezoid/flat/chamfer tooth shape combination. Saws with an alternate tooth form and work-side blade angle achieve good cutting results.

Saw blades with hollow teeth produce worse cutting quality (chips in the cover layer). Due to the subsequent formatting of the boards in the edging process, minimal chipping can usually be tolerated.

Good edges on both sides can be achieved by using the appropriate scoring saw blade.

Optimal saw blade projection:	20–30 mm
Recommended cutting speed:	60–70 m/s
Tooth feed:	0.03–0.05 mm

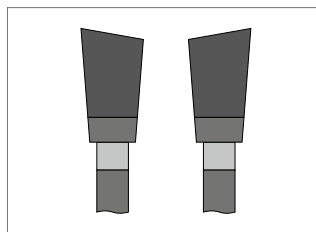


Fig. 8-1 Alternate tooth

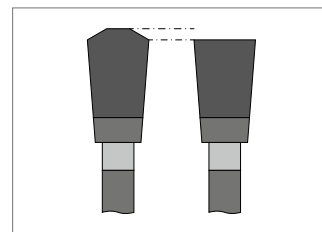


Fig. 8-2 Trapezoid/flat

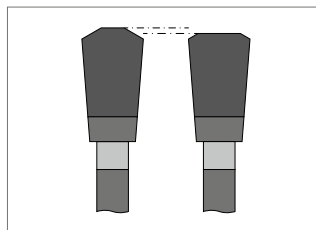


Fig. 8-3 Trapezoid/flat/chamfer

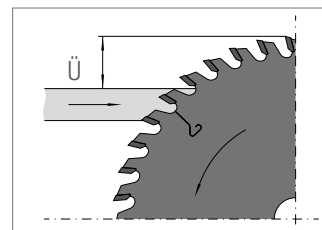


Fig. 8-4 Saw blade projection

Panel sizing saw

On panel sizing equipment, good results are achieved with the trapezoid/flat tooth form.

Good edges on both sides can be achieved by using the appropriate scoring saw blade. Scoring saw blades with an alternate tooth geometry and a high tool cutting edge angle (approx. 25°) have proved effective.

One alternative to process with the front side with the polyethylene protective foil facing down.

The saw blade projection should be set in accordance with the diameter:

Saw blade	Projection
Ø 300 mm	approx. 20 mm
Ø 350 mm	approx. 25 mm
Ø 400 mm	approx. 25 mm
Ø 450 mm	approx. 30 mm

8.3.1.2 Cutting RAUVISIO crystal slim

Because RAUVISIO crystal slim is a pure polymer composite, the use of a suitable plastic saw blade is recommended to achieve a high-quality and splay- and chip-free cutting quality.

Plastic saw blades have a high number of saw teeth and a negative rake angle.

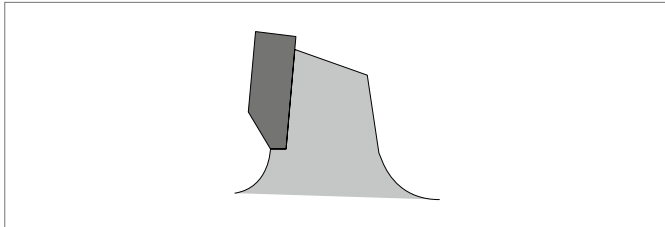


Fig. 8-5 Negative rake angle

Optimal saw blade projection:	approx. 10 mm
Recommended cutting speed:	60–70 m/sec
Tooth feed:	0.01–0.02 mm

Perform your sawing on a sufficiently large, level surface. As every vertical motion potentially lowers cutting quality, place the RAUVISIO crystal slim board between two MDF boards prior to cutting if necessary.

8.3.2 Milling on straightline edgebanders

In brief, the material can be processed with solid carbide or carbide-tipped tools, carbide turnover knife cutters or diamond-tipped milling cutters. However, the tools must cut with alternating blade angles.

With turnover knife cutters, knife marks can occur. Using tools with collet systems with a high rotational speed yields visible benefits. A crystal clear edgeband in the area of the polymer glass laminate cannot be achieved with any conventional milling tool. If this is required, it is necessary to work with special polishing milling tools or use mono-crystalline diamond milling tools afterwards.

Cutters for straightline edgebanders

Tool	Cutters with low cutting pressure are recommended.
Cutting speed	80 m/s
Tooth feed	0.15–0.20 mm

Table shaper and milling tools for straightline edgebanders

Tool	Cutter heads with carbide turnover knives (polished) or diamond-tipped milling tools with the largest possible blade angle are recommended. Polished cutting edges and finely polished clearance angles are recommended.
Diameter	As large as possible
Cutting speed	50–60 m/s Example: Ø100 mm → 12,000 rpm Ø125 mm → 9,000 rpm Ø150 mm → 8,000 rpm Ø180 mm → 6,000 rpm
Tooth feed	0.3–0.5 mm

CNC processing – stationary technology

Clamping equipment	Hydraulic chucks, power shrink-fit chucks, heatshrink chucks
Tool	Solid carbide shank-type cutters, turnover knife cutters with alternating blade angles, diamond-tipped shank-type cutters (Z = 2 or Z = 3 depending on the required feed rate)
Cutting speed	Diameter-dependent: 15–25 m/s
Tooth feed	0.15–0.25 mm (absolutely not ≤ 0.1 mm)
Processing	In the counter run

8.3.3 Special processing: engraving the surface and processing the pure polymer (e.g., RAUVISIO crystal slim)

To give the surface various visual accents, appropriate stationary processing methods can be used to apply surface engravings/V-grooves to the polymer material.



Depending on the quality requirements, various cutting materials and axial tool directions can be used.

To create a matt engraving look, a carbide milling tool can be used.

For a high-quality glossy surface, a minimal take-off of 0.1 – 0.2 mm with a monocrystal diamond hub is required, which means that pre-milling/clearing of the geometry with carbide milling tools may be necessary, depending on the depth of the desired milling. Here it must be noted that, to achieve an equivalent quality on both milling flanks, it is necessary to process the flanks in each milling direction.

Ideal processing parameters

Feed: 2 m/min

Speed: 18,000 rpm

Similar requirements for the tool technology and machine parameters also apply when processing the pure laminate or RAUVISIO crystal slim (e.g., for applying a bevelled edge geometry).



8.3.4 Drilling

Dowel hole drilling in the polymer glass layer

Conventional carbide-tipped (HW) dowel drills achieve the best results. Drilling pins do not achieve satisfactory results.

A fast drilling mode is required.

With a slow drilling mode, long plastic shavings collect around the drill.

Feed: 3–4 m/min

Speed: 4,500 rpm

Dowel hole drilling in the polymer balancing sheet

Conventional carbide (HW) dowel drills can be used. The best hole edges are achieved with TC high-performance dowel drills.

A fast drilling mode is required. With a slow drilling mode, plastic shavings collect around the drill. Drilling pins achieve good results in the balancing sheet as well.

Feed: 3–4 m/min

Speed: 4,500 rpm

Through holes

The best hole edges on the entry side (glass laminate) and exit side (balancing sheet) can be achieved with carbide (HW) through-hole drills.

Feed: 3–4 m/min

Speed: 4,500 rpm

A fast drilling mode is required. Here, again, a slow drilling mode cannot be used, as plastic shavings collect around the drill.

Hinge drilling

Standard cylinder head drills are recommended for this.

A slow drilling mode almost inevitably leads to melting of the hole edge and the formation of long shavings that can collect around the drill.

Feed: 1.5–2 m/min

Speed: 3,000 rpm

Speeds above $n = 4.000$ rpm are not recommended.

Cutting holes in RAUVISIO crystal slim

When drilling holes (e.g., electrical socket cut-outs), the use of a surface grinder that utilises a guide bush and a template to trace the exact shape of the cut is generally recommended.

When using hole saws, sharp saw blades with slightly dull centre drills should be used. To prevent chipping on the hole edge, begin by only half-drilling the hole from one side. Then drill from the opposite side and complete the hole.

8.3.5 Lifetime

The lifetime of the tools and the results of the work naturally depend on various factors, such as, the tool and the machine. Tool lifetime tests with RAUVISIO crystal showed longer lifetimes than when processing melamine-coated chip boards.

Due to the variety of processing machines and the varying complexity of the tasks, we recommend discussing the customer-specific requirements with the relevant REHAU sales office or the tool manufacturer.

The information presented here was developed in collaboration with established tool manufacturers; more detailed recommendations regarding machine parameters and tool recommendations can be provided by your REHAU sales office.

8.4 Processing RAUVISIO crystal magnet



Machining RAUVISIO crystal magnet can produce sparks. This must always be taken into account in the removal of the chips. It is also crucial to wear adequate personal protective equipment and observe the applicable fire protection regulations.

Due to the steel inlay, carbide-tipped tools with soldered cutters and a transverse cut are suitable for processing RAUVISIO crystal magnet. Diamond-tipped tools may not be used as the steel inlay can cause damage to the cutters.

The metal insert generally leads to shorter lifetimes for the tools.

Cutting

A carbide-tipped (HW) saw blade is recommended for cutting. A flat tooth with chamfer blade has proven suitable here.

Recommended speed: $n = 2500-4500$ rpm
Recommended feed: $v_f = 6-10$ m/min
Recommended saw blade projection: $\ddot{u} = 15-20$ mm

Milling

A solid carbide (HW) spiral router cutter with alternate twist Z2+2 is recommended.

Recommended speed: $n = 14000-18000$ rpm
Recommended feed: $v_f = 5-10$ m/min
Recommended cutting direction: counter run
Recommended oscillation: path = 5–6 mm

To achieve the highest possible tool life, the tool must be continuously oscillated in the Z axis during the milling. The oscillation should be between 5–6 mm. The use of two tools is recommended. One tool is used to pre-mill the pieces, while the second tool is used to mill the contour.

Drilling

A carbide-tipped (HW) Z2 dowel drill is recommended. To achieve clean entry/exit holes, it is recommended to drill the material from both sides.

Recommended speed: $n = 4500$ rpm
Recommended feed:

8.5 Edging with RAUKANTEX pro

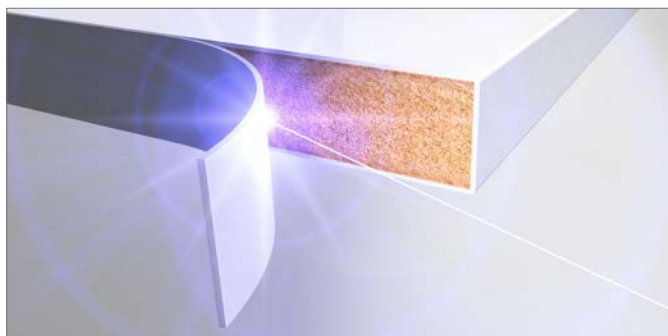


Fig. 8-6 Zero-joint edging – RAUKANTEX visions pro

Due to the high-quality surface of RAUVISIO crystal, REHAU recommends the use of RAUKANTEX pro for both of the following edging options.

See the processing notes / TLV RAUKANTEX pro (PMMA and ABS) as well as RAUKANTEX visions / magic 3D (V-M 25/01) and RAUKANTEX color. For more information, please contact your REHAU sales office.

The resulting component quality (e.g., adhesion of the edgeband, appearance and use characteristics) depends on the machine configuration and the quality of the boards used and must be checked by the fabricator.

Optimal machine parameters, tool configuration and cutting speeds must be established individually prior to production using a series of samples. The REHAU Application Engineering Department will be happy to support you with this.

8.5.1 The “duo solution” – RAUKANTEX visions pro



Fig. 8-7 RAUKANTEX visions pro

The RAUKANTEX visions pro edgeband materials for jointless edgeband processing are made from PMMA. They are designed for processing on edgebanding machines with all available zero-joint technologies (laser, hot-air, NIR, plasma).

See the processing notes / TLV RAUKANTEX pro (PMMA) and RAUKANTEX visions / magic 3D (V-M 25/01).

The edgeband materials feature a transparent polymer functional layer. The customer must check the suitability of RAUKANTEX pro through processing tests.

When processing RAUKANTEX visions pro, it is especially important to ensure sufficient application of pressure in the narrow, transparent area of the edgeband to the transparent area of the glass laminate, as well as synchronisation between the edgeband feed and the board feed in order to ensure optimal transparency of the glass effect.

The joint quality with regard to chips and splay in the transparent area depends on the cutting system, milling direction and milling quality, milling geometry, etc.

Transparent edgeband leg

Glass effect in the edgeband area

Combined with RAUVISIO crystal surface

Possible variants:

Greenish colouration of the transparent edgeband leg for an enhanced glass effect



Fig. 8-8 Enhanced glass effect through subtle colouring in the transparent area

Coloured edgeband leg

Product coordination guide for surface and balancing sheet

Covering the substrate, balancing sheet and the coloured layer of RAUVISIO crystal

Possible variants:

Decoration of the edgeband leg, e.g., with a stainless steel look, wood look, etc.



Fig. 8-9 Variation through RAUKANTEX decorative designs



The “DUO solution” RAUKANTEX visions pro is only available as a zero-joint edgeband with a polymer functional layer. Due to the transparent edgeband leg, processing with adhesives is not possible.

To create a visual and functional zero-joint look between the board and the edgeband, a zero-joint edgeband is used. The back of the edgeband materials feature a transparent polymer functional layer. This enables a transparent bond between the board and edgeband and completes the glass effect.

This system group solution consisting of the board and zero-joint edgeband enables **extensive zero-joint edgebanding** and thus the perfect full jacket coverage of the wooden substrate with plastic elements.

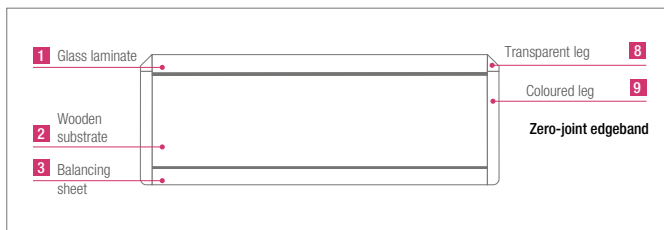


Fig. 8-10 RAUVISIO crystal – pressed system component with RAUKANTEX visions pro

Depending on the processing options, processing on the edgeband material can be carried out as a radius or with various milling geometries.



Fig. 8-11 RAUVISIO crystal polished radius



Fig. 8-12 RAUVISIO crystal 45° chamfer



Fig. 8-13 RAUVISIO crystal 20° chamfer

To create a uniform gloss, the PMMA edgeband material can be polished to a high gloss matching the laminate and edgeband surface, resulting in a homogeneous, high-gloss surface appearance.

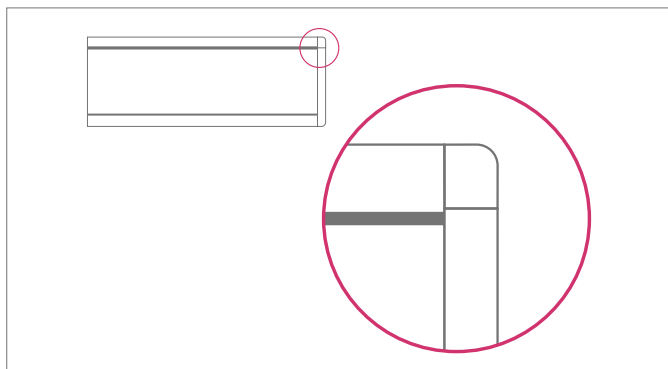


Fig. 8-14 RAUVISIO crystal – radius polished

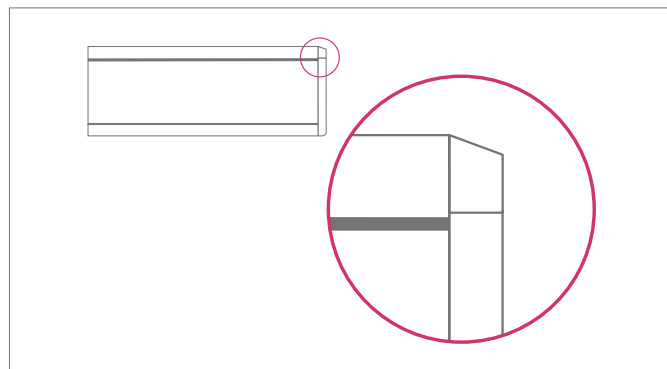


Fig. 8-16 RAUVISIO crystal – 20° chamfer

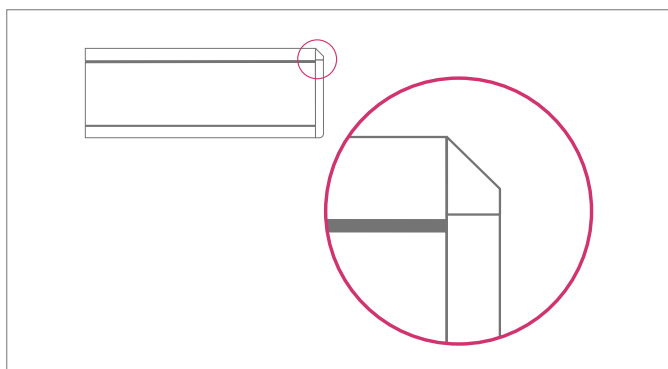


Fig. 8-15 RAUVISIO crystal – 45° chamfer

8.5.2 The “uno solution” – RAUKANTEX color pure/pro



Fig. 8-17 RAUKANTEX color pure/pro high-gloss version



Fig. 8-18 45° chamfer on the edgeband and surface

One alternative to duo edgebanding with RAUKANTEX visions pro is edging with a colour-coordinated RAUKANTEX color (“uno solution”). In contrast to the duo edgeband, this can be processed either as a primer edgeband version for conventional adhesive processing or as a zero-joint version.

REHAU offers a colour-coordinated edgeband portfolio for the RAUVISIO crystal decorative designs in glossy and matt variants, which creates a homogeneous appearance with the laminate surfaces as well as in the corner copying area, particularly in combination with a colour-coordinated polymer functional layer.

Thanks to the use of a primer edgeband, the uno solution remains an interesting edging option, particularly where zero-joint processing is impossible. The glass effect in the edgeband area is most effective when a 45° chamfer is milled on the edgeband and surface, revealing the glass laminate.

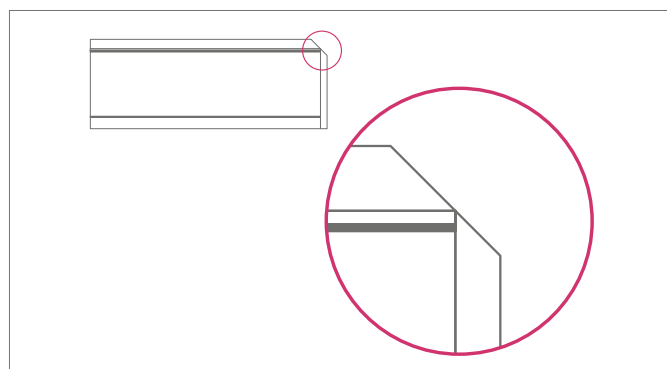


Fig. 8-19 45° chamfer on the edgeband and surface material

Depending on the quality requirements, various cutting materials and axial directions of the tools can be used to create the desired surface appearance in the milling area (matt/glossy).

To create a surface appearance that is as uniform as possible, the milling tool must have high concentricity, a high number of edges and a slow feed rate to minimise plane marks, as well as a stable tool guide/tool clamping and low, uniform take-off when scraping to avoid variable gloss effects and chips/chatter marks on the surface material.

Another possible means of optimising gloss in the milling area is special downstream processing methods that need to be assessed on a case-by-case basis.



The “uno solution” is available as the zero-joint edgeband RAUKANTEX color pro with a polymer functional layer as well as the primer edgeband RAUKANTEX color pure through the REHAU Express Collection.

8.5.3 Edgeband processing for RAUVISIO crystal slim

If the machine-based edge quality is insufficient, sand paper or polishing paste can be used on site to optimise the result. First the edges need to be deburred. To do this, first use a coarser sand paper (400–600) and then use a finer sand paper (1500–3000) to complete the process. For polishing, use a suitable fine polishing paste and a soft cloth.

8.6 The edged component

In addition to the pure laminate and pressed large size board, REHAU offers customers the option of using the configurator to order laser-edged components.



Fig. 8-20 Laser-edged component

For fronts (nominal size 19 mm with duo edge), successful certification was carried out according to AMK regulations in collaboration with TÜV Rheinland. The certified component features the following quality characteristics:

- Quality
- Suitability for use
- Regular production monitoring



The configurator for laser-edged components can be found at www.rehau.com/oberflaechenkonfigurator

9 APPLICATIONS AND INSTALLATION NOTES

RAUVISIO crystal is designed for vertical applications indoors. For horizontal applications consult with REHAU's Application Engineering Department.

9.1 Front application

RAUVISIO crystal was originally developed for front applications and combines a high-quality real glass appearance with the advantages of a polymer material and therefore offers maximum flexibility as part of the production process using conventional wood working tools. Whether in terms of milling, drilling or edging with suitable REHAU edgeband solutions: a complete glass-effect front can be created without special processes. The use of the polymer balancing sheet ensures sufficient flatness, which is essential for front applications.



Fig. 9-1 RAUVISIO crystal as a front application

RAUVISIO crystal slim can also be used for infill panel applications (Example: 5 panel doors). For infill panel applications, the thermal expansion coefficient must be taken into account.



Fig. 9-2 RAUVISIO crystal slim as an infill material

9.2 Backsplash application

RAUVISIO crystal slim or edged RAUVISIO crystal can also be used in backsplash applications.



Fig. 9-3 RAUVISIO crystal as a backsplash

The thermal expansion coefficient must also be taken into account during installation as a backsplash. Based on experience, a general gap / joint of at least 4 mm to adjacent elements such as walls, cabinets or worktops is recommended.

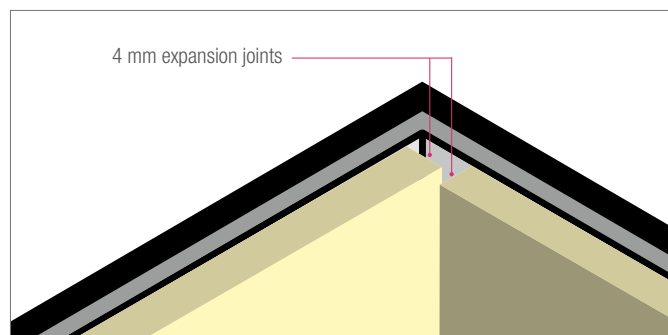


Fig. 9-4 Expansion joints

RAUVISIO crystal is a thermoplastic polymer material and therefore only suitable for surface temperatures of max. 80°C. Thus, depending on the type of cooktop and the radiant temperatures, a sufficient minimum gap must be ensured.

Cooktop	Minimum gap
Induction, Ceran, cast iron	≥ 50 mm
Gas	≥ 200 mm

In the case of improper use, such as if the burners are not or only partially covered when switched on for long periods or if there is direct contact with hot pots and pans, etc., temperature damage can occur to the surface.

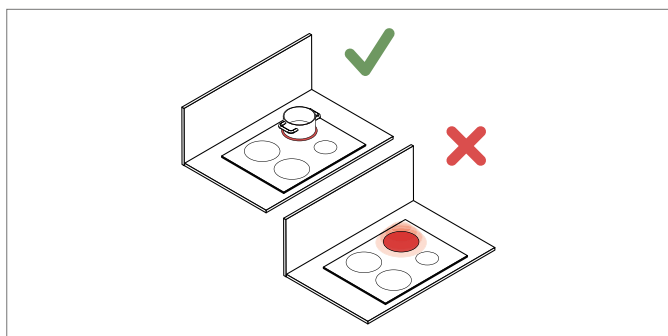


Fig. 9-5 Proper and improper use

To avoid these potential hazards, heat shields made of heat-resistant materials such as stainless steel can be installed behind the cooktop.

Check with local building codes when using crystal backsplash behind gas cook tops. When in doubt, a 12" high stainless steel (or other non combustible) backsplash that spans the width of the cooktop range will satisfy most building codes.

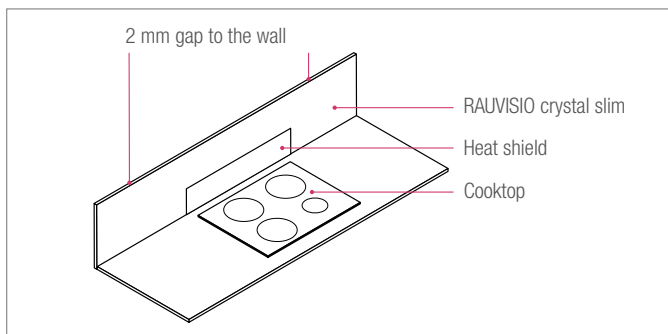


Fig. 9-6 Heat shield and gap to the backsplash – RAUVISIO crystal

To adhere RAUVISIO crystal to the back wall, use of a polymer hybrid adhesive is recommended (e.g. SikaBond® AT universal). This requires the base surface to be level, clean and free of grease. The instructions of the silicone manufacturer must also be observed.

Before applying the silicone, it should be tested in an inconspicuous location to see whether any damage occurs to the polymer.

The silicone should be applied in a serpentine pattern (approx. 6 mm thick), vertically with gaps of approx. 50 mm. In the area of the cooktop, a smaller gap of 25 mm is recommended due to the heat effect.

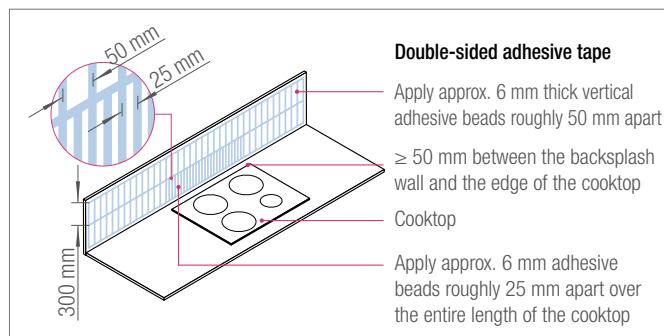


Fig. 9-7 Applying RAUVISIO crystal to the wall

Partially double-sided adhesive tape can be used to affix it to the wall. When affixing it to the wall, be sure to apply sufficient pressure so that a maximum gap of 2 mm between the board and the wall is achieved and adequate adhesion can be ensured.

Gaps that need to be maintained due to thermal expansion, for example joints in corner areas or connections to the wall (as described above), must also be sealed and jointed with silicone joints. This is especially important where RAUVISIO crystal can come into contact with moisture.

Connecting or expansion joints are maintenance joints that need to be checked regularly and repaired as necessary.

Current notes from the German Contractors Federation (Zentralverband Deutsches Baugewerbe / Fachverband Fliesen und Naturstein) for the installation of bonded waterproofing with tiled finishes in indoor areas must be observed to ensure that water cannot penetrate and cause construction damage. REHAU accepts no liability for damage resulting from improper processing and installation.



Please check local building codes and regulations to cooktop environment and observe them accordingly.

The compatibility of the adhesive/silicone used with RAUVISIO crystal must be checked independently by the customer.

9.3 Bath and shower wall cladding

RAUVISIO crystal slim is also suitable as a replacement for tiles in wet rooms (the variant pressed on a wooden substrate is not suitable due to the increased risk of swelling).

For sealing exterior and abutting faces, the use of a silicone seal across all exposed edges to prevent penetration of moisture as well as dirt, waterlogging and fungi is recommended.

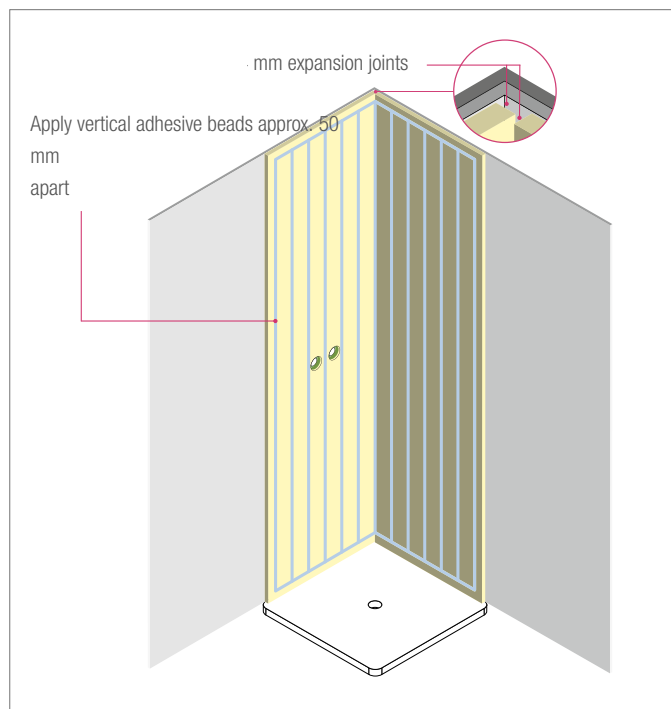


Fig. 9-8 Expansion joints and adhesion of RAUVISIO crystal slim to the wall

The same installation notes as in chapter 10.2 apply with respect to the requirements for expansion joints, such as in corner areas or with regard to contiguous elements of at least a 4 mm gap and adhesion by means of a polymer hybrid adhesive (e.g. SikaBond® AT universal) with a serpentine gap of 50 mm.

Recesses and drill holes must also be made 4 mm larger and sealed with silicone to prevent penetration of moisture.

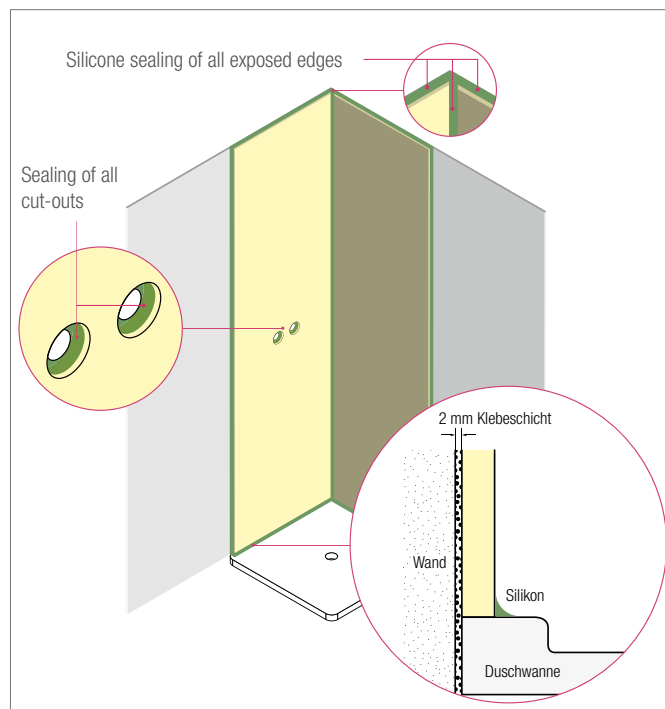


Fig. 9-9 Silicone seal



All connection and moving joints must be sealed with fungicidal sanitary silicone.

Current notes from the German Contractors Federation (Zentralverband Deutsches Baugewerbe / Fachverband Fliesen und Naturstein) for the installation of bonded waterproofing with tiled finishes in indoor areas must be observed to ensure that water cannot penetrate and cause construction damage. REHAU accepts no liability for damage resulting from improper processing and installation.

10 TECHNICAL SPECIFICATIONS

RAUVISIO crystal is designed for vertical applications indoors. Horizontal application and alternative applications must be checked by the customer and compared with the relevant requirements.

The HardCoat PMMA surface of the glass laminate is protected by a special PE foil **that may only be removed after installation**.

General data for RAUVISIO crystal at a glance:

Visual characteristics	Test standard	Requirements	Test result
Surface gloss level	AMK-MB-009, 09/2010	60° measurement geometry	High-gloss: ≥ 85 GLE Matt: ≤ 6 GLE
Colour	AMK-MB-009, 09/2010	No significant changes to the master sample; uniform covering properties	Fulfilled
Surface	AMK-MB-009, 09/2010	Uniform surface, surface defect must not affect the overall appearance from a distance of 0.7 m. A flawless surface cannot be guaranteed due to the industrial production process; small blemishes and surface irregularities are permissible.	Fulfilled
Lightfastness	based on DIN EN ISO 4892-2, Art. B (behind window glass)	Assessment according to the blue scale	\geq level 7
	Assessment according to DIN EN ISO 105 A02	Assessment according to the grey scale	\geq level 4

Surface and colours within tight tolerance limits appropriate for the application – defined tolerance limits are colour-specific and must be agreed with the customer

Surface properties - mechanical / physical	Test standard	Requirements	Test result
Chemical resistance ¹⁾	DIN 68861 / T1	High-gloss: 1A Matt: 1B	See "Substances" table Page 31
Scratch-resistance	DIN 68861 / T4	High-gloss: 4D Matt: 4C	Fulfilled
Micro-scratch resistance	IHD-W-466 (Art. A)	High-gloss: Class 1 Matt: Class 2	Fulfilled
Performance in dry heat	68861 / T7 / DIN EN 12722 DIN CEN TS 16209	7D Class C	70 °C 100 °C
Performance in moist heat	DIN 68861 / T8 / DIN EN 12721	8B	70 °C
Cross-hatch test	DIN EN ISO 2409	GT 0-1	Fulfilled
Performance in water vapour	DIN 438-2	Level 5 No changes	Fulfilled
Flexural modulus of elasticity ²⁾	DIN EN ISO 178		3080 N/mm ²
Flexural strength ²⁾	DIN EN ISO 178		98 N/mm ²
Impact strength ²⁾	DIN EN ISO 179-1		11 kJ/m ²
Linear thermal expansion coefficient per Kelvin temperature change ²⁾	ISO 11359-2	-40 °C ... +20 °C	0.590 E^{-4}
		+10 °C ... +40 °C	0.667 E^{-4}
		+20 °C ... +80 °C	0.754 E^{-4}

¹⁾ The testing of the chemical resistance to DIN 68861-1 includes the substances in the table below, other substances have not been tested specifically and must be tested by the customer separately. Test results apply exclusively to the coated board surface and not for mechanically exposed radii or chamfers in the milling area or in the surface.

²⁾ Only RAUVISIO crystal slim

Component tests on the edged component

The scope of supply from REHAU includes only the RAUVISIO crystal laminate and the pressed board without edging. The details below refer to the finished, edged component from REHAU with RAUKANTEX visions pro. Please note that REHAU only accepts warranty liability for its scope of supply as per the REHAU specification, not for the pressing and edging processes executed outside of REHAU. The results of the component tests on the finished, edged component are particularly dependent on the machine and process parameters to be set by the customer for processing RAUVISIO crystal, using the suitable adhesive and edgeband as well as full compliance with the REHAU processing instructions in accordance with this Technical Information. When setting the machine and process parameters, the REHAU Application Engineering Department will provide the appropriate support. Please note that our advice relating to technical applications is correct to the best of our knowledge, but we cannot accept any liability for this free service that is provided without obligation.

Component tests	Test standard	Test result
Temperature resistance	Assessment under AMK-MB-001 (05/03)	passed
Infiltration of water vapour	Assessment under AMK-MB-005 (07/2007), module 1	passed
Humid climate resistance	Assessment under AMK-MB-005 (07/2007), module 2	passed
Alternating climate resistance	Assessment under AMK-MB-005 (07/2007), module 3	passed
Long-term heat storage: 4 weeks at 50 °C	Assessment after 24h acclimatisation	passed

¹⁾ The component tests apply to the portions of the AMK listed in the table with the respective status.

Material properties	Test standard	Technical specifications
Glass laminate raw density	DIN EN 323	1.18 kg/dm ³
Balancing sheet raw density	DIN EN 323	1.16 kg/dm ³
Fire behaviour	DIN 4102/1	B 2
Material unit / Sand content	Residue on ignition	≤ 1 %
Shore hardness D	DIN ISO 7619-1	91 ± 3
Vicat softening temperature	DIN EN ISO 306 – Art. B50	≥ 99 °C
Glass laminate & Balancing sheet		

The technical data for RAUVISIO crystal at a glance:

Product data	Test standard	Laminate	slim version (4 mm panel)	Composite (pressed board)	Complete (edged component)
RAUVISIO crystal – Surface					
Total thickness glass laminate		2.0 mm ± 0.1 mm			
Transparent layer		1.6 mm ± 0.1 mm			
Coloured layer		0.4 mm ± 0.1 mm			
RAUVISIO crystal – Balancing sheet					
Acrylic / styrene copolymer		2.0 mm ± 0.1 mm			
Thickness	as per technical drawing based on DIN 438-2	2.0 mm ± 0.1 mm	4.0 mm ± 0.2 mm		
Furniture front pressed board (Substrate MDF 15 [mm])				19.2 mm ± 0.4 mm	19.2 mm ± 0.4 mm
Backsplash pressed board (Substrate MDF 12 [mm])				16.2 mm ± 0.4 mm	16.2 mm ± 0.4 mm
Width	as per technical drawing based on DIN 438-2	1300 mm ± 1.5 mm	1300 mm ± 1.5 mm	1300 mm ± 1.5 mm	Dimension ± 0.5 mm
Length	as per technical drawing based on DIN 438-2	2800 mm ± 5 mm	2800 mm ± 5 mm	2800 mm ± 5 mm	Dimension ± 0.5 mm
Angle deviation	as per technical drawing based on DIN 438-2	± 0.3°	± 0.3°	± 0.3°	max. 0.5 mm / 1000 mm
Edge defects	as per technical drawing based on DIN 438-2	15 mm	15 mm	15 mm	
Weight per square metre	–	Laminate: ~2.38 kg/m ² Balancing sheet: 2.31 kg/m ² ~ 4.75 kg/m ²		16 mm: ~ 13.8 kg/m ² 19 mm: ~ 16.1 kg/m ²	16 mm: ~ 13.8 kg/m ² 19 mm: ~ 16.1 kg/m ²
Surface tension laminate reverse side	Check with test ink	≥ 44 mN/m (upon delivery) ≥ 38 mN/m (with adhesive)			

The technical data for RAUVISIO crystal magnet at a glance:

Product data	Test standard	Slim magnet	Composite magnet
Thickness	as per technical drawing based on DIN 438-2	4.2 mm ± 0.2 mm	19.5 mm ± 0.4 mm
Width	as per technical drawing based on DIN 438-2	1250 mm ± 1.5 mm	1250 mm ± 1.5 mm
Length	as per technical drawing based on DIN 438-2	2800 mm ± 5 mm	2800 mm ± 5 mm
Angle deviation	as per technical drawing based on DIN 438-2	± 0.3°	± 0.3°
Edge defects	As per technical drawing based on DIN 438-2	15 mm	15 mm
Weight per square metre	–	~ 5.58 kg/m ²	~ 17.7 kg/m ²
Magnetic force with Neodym magnet (block magnet 20 x 20 x 10 mm class N42)	–	~ 0.17 N/cm ²	~ 0.17 N/cm ²

11 INSTALLATION GUIDELINES – SUMMARY



Damage to the RAUVISIO surface due to improper handling

Observe the following notes to avoid property damage.

Only transport and store large size boards on pallets with level and stable base protection boards along the length (e.g. MDF 18).

Always unload / load the pallets from the short side in the centre.

Do not store large size boards and fabricated boards in damp rooms or directly on the ground.

Do not store large size boards and fabricated boards either outside or in areas with UV light sources.

Acclimatise fabricated elements prior to installation for at least 24 hours at room temperature (min. 18°C). At delivery temperatures below 5 °C, the elements must be conditioned for at least 48 hours on all sides.

Do not rest any objects on large size boards and fabricated elements, as this could lead to damage.

High-gloss boards made from RAUVISIO crystal are laminated with an environmentally safe polyethylene foil for protection during transport and storage (does not apply for satined matt variants). The surface protection should remain on the board until it is time to use the finished part at the end customer's location.

RAUVISIO crystal is suitable for vertical applications indoors (in particular furniture fronts and backsplash applications). For special applications beyond the ones described above, the fabricator or customer must independently assess the suitability of the chosen application and check with the manufacturer as necessary.

The use of silicone is recommended for surface application of RAUVISIO crystal slim (e.g., backsplash applications). This requires the base surface to be level, clean and free of grease. The instructions of the adhesive manufacturer must also be observed.

The adhesive should be applied in a serpentine pattern at gaps of approx. 50 mm. Depending on the installation, expansion joints may be necessary.

The acclimatised material must not be installed at temperatures < 15 °C.

All materials and components must be checked for damage or defects prior to processing / installation.

To avoid stress cracking during processing and installation, materials and components must only be temporarily stored in the original packaging in frost-free and closed rooms.

The narrow sides of the wooden substrate without edgeband must not come into contact with moisture. The cut edges must always be sealed with suitable edging (RAUKANTEX visions pro or RAUKANTEX color pure/pro).

All drill holes in the wooden substrate boards must be sealed during installation to make them watertight.

Strong chemical substances, e.g. strong solvents, special cleaners (such as drain cleaners, industrial cleaners, etc.) and as aggressive scouring agents can damage the surface.

Scratches can be caused during cleaning by grains of sand or similar, abrasive scrubbing utensils / cleaning sponges, etc.

Treatment with an anti-static plastic cleaner is an effective measure to minimise static charging.

Do not stand on RAUVISIO crystal products.

Do not cut with sharp objects.

Do not work with tools on the surface.

12 USE AND MAINTENANCE INSTRUCTIONS FOR END USERS



Congratulations on choosing a product made from this high-quality and durable material.

RAUVISIO crystal is a hard-wearing and resistant surface material made from acrylic. It is suitable for vertical application indoors.

The non-porous, homogeneous material is hygienic and suitable for contact with foodstuffs and is resistant to fungal and bacterial growth.



The product is resistant to all household chemicals and substances such as disinfectants. Extended use of aggressive substances can leave marks or damage the material. The following table shows the chemical resistance against common substances. Testing the chemical resistance to other substances not listed in the table is the responsibility of the user.

Substances	Result
Acetic acid	No visible change
Citric acid	No visible change
Sodium carbonate	No visible change
Ammonia water	No visible change
Ethyl alcohol	No visible change
White wine, red wine, fortified wine	No visible change
Beer	No visible change
Cola drink	No visible change
Instant coffee	No visible change
Black tea	No visible change
Blackcurrant juice	No visible change
Evaporated milk	No visible change
Water	No visible change
Petrol	No visible change
Acetone	No visible change
Ethyl-butylacetate	No visible change
Butter	No visible change
Olive oil	No visible change
Mustard	No visible change
Cooking salt	No visible change
Onion juice	No visible change
Disinfectants	No visible change
Black ball pen paste ink	No visible change
Stamp ink	No visible change
Cleaning agent	No visible change
Cleaning solution	No visible change



RAUVISIO crystal is easy to clean – most soiling and finger marks can be removed with water and a microfibre cloth. In addition, household liquid cleaners can be used to clean the surface.



RAUVISIO crystal is easy to clean



Strong solvents, special cleaners (e.g. drain cleaners, industrial cleaners), aggressive scouring agents and strong chemical substances may damage the surface. Remove stubborn soiling with a soft sponge, common plastic cleaner or liquid cleaner (without scourer).

Do not use abrasive cleaning sponges with scourers (e.g. Scotch Brite, scouring pads, etc.) or brushes; these can cause scratches if too much force is applied.

Refrain from using mechanical cleaning processes, e.g. razor blades, knives or scrapers, etc., as this can cause scratches and damage the abrasion-resistant coating.



RAUVISIO crystal has an outstanding depth effect. The surface has a high gloss and as scratch- and abrasion-resistant coating, which keeps domestic wear and tear to a minimum.

NOTES

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Subject to technical changes
F20600 DE 01.2016