



RAUVISIO crystal™ acrylic surface

Technical information




na.rehau.com/crystal



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This manual contains safety-related information that requires your special attention. It is indicated with the safety alert symbol and the signal words described below:

 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a risk of property damage, including damage to the individual components.

DISCLAIMER: The technical suggestions in this guide are designed to provide you with the best results when working with RAUVISIO crystal.

01 Information and safety notes.

Latest version of the technical information

To ensure your safety and proper use of our products, please regularly check whether a more recent version of the technical information is available.

You can obtain the latest version of the document from your local retailer, your REHAU sales office or download it from na.rehau.com/crystal

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 is therefore prohibited.

Suitability of the material

Our valid technical information is to be observed for the processing/installation and use of RAUVISIO crystal. Our technical information is based on empirical values and knowledge acquired up to the time of printing. The dissemination of this information does not comprise any assurance of the properties of the products described. No explicit or implicit guarantee may be derived from it. The information does not release the user/purchaser from their obligation to assess the suitability of this material and the correct processing thereof to attain the required results in terms of objective and application.

Publication of information

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

The care and usage instructions must be made available to the end customer either by you or by your customers.

Note to our distribution partners and customers that press RAUVISIO acrylic 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 processors of pressed acrylic laminate boards: Please ensure that at least the installation guidelines and the care and usage instructions are handed over to your customers and to fabrication and installation companies.

Safety and installation instructions

Observe the information on packaging, accessory parts and installation instructions. Keep the installation instructions so that they are always available. If you do not understand the safety instructions or installation recommendations, or if there is any uncertainty with regard to their content, please contact your local REHAU sales office.

Relevant regulations and safety equipment

All applicable safety and environmental regulations as well as the regulations of the trade supervisory center and professional association must be strictly observed. These always take priority over the instructions and recommendations given in the technical information.



CAUTION

To reduce the risk of injury always use safety equipment such as

- Gloves
- Safety goggles
- Ear protection
- Dust mask

Adhesives and additional tools

Strictly observe the safety instructions for any adhesives.



CAUTION

To reduce the risk of injury strictly observe safety instructions for any adhesive. Always store additional tools such as alcohol-based cleaning products and other easily flammable materials in safe and well-ventilated places.



CAUTION

To reduce the risk of injury ensure adequate ventilation and extraction for the processing machines. If production dust is inhaled, provide fresh air and in the event of symptoms seek medical advice.

Ventilation/extraction, production dust

Dust created by drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. Appropriate protective measures should be taken when processing this material.

California residents, visit www.rehau.com/us-en/ca-prop-65 for more information.

Protective measures and disposal

RAUVISIO crystal is a coextruded material made from acrylic and styrene copolymer that is not harmful to the environment. The dust that forms is not toxic. The dust concentration is to be minimized through suitable protective measures such as extraction and use of a dust mask. Dust from RAUVISIO crystal presents no specific risk of explosion.

Disposal code in accordance with the Waste Catalog Regulation:

- 170203/Construction and demolition works consisting of timber, glass and plastic
- 120105/Waste from mechanical shaping processes and from the physical and mechanical surface finishing of metals and plastics (plastic swarf and lathe swarf)

Fire behavior

Due to the composition of its main ingredients acrylic and styrene copolymer, RAUVISIO demonstrates favorable fire behavior and is categorized in DIN 4102-B2 as normal flame resistance. In the event of a fire, no toxic substances such as heavy metals or halogens are released. The same fire-fighting techniques can be used as for construction materials containing wood.



WARNING

To reduce the risk of serious injury or death use the following fire extinguishing procedures.

Fire-fighting

Suitable extinguishing agents for fire-fighting are

- Water spray
- Foam
- CO₂
- Extinguishing powder

A solid-stream water jet is unsuitable for safety reasons.

When fire-fighting, wear suitable protective clothing and if necessary standalone breathing apparatus.

02 Product description

2.01 Description

RAUVISIO crystal combines the high-quality appearance of intense reflectivity with the positive properties of a polymer material. REHAU thus offers maximum flexibility for the production of cabinet face, backsplash or side wall solutions with a visual glass effect.

RAUVISIO crystal is designed for vertical indoor use. For a horizontal application, clearance is required on your own authority for the specific application or consultation with REHAU's Applications Engineering Department.

RAUVISIO crystal has the following advantages:

- Non-porous, hygienic surface
- Scratch and abrasion resistant
- Resistant to breakage
- Low weight
- Machinable with woodworking tools
- Maximum flexibility in processing
- Production plant monitoring, TÜV certification for RAUVISIO crystal fabricated panels

The guarantee of AMK conformity by REHAU can be provided only if the pressed boards have been purchased from REHAU. When processing individual laminates, i.e., self-performance of adhesion on the customer's own authority, the laminator's actions are his own responsibility (in consultation with the adhesive and board manufacturer).

2.02 Product structure of RAUVISIO crystal

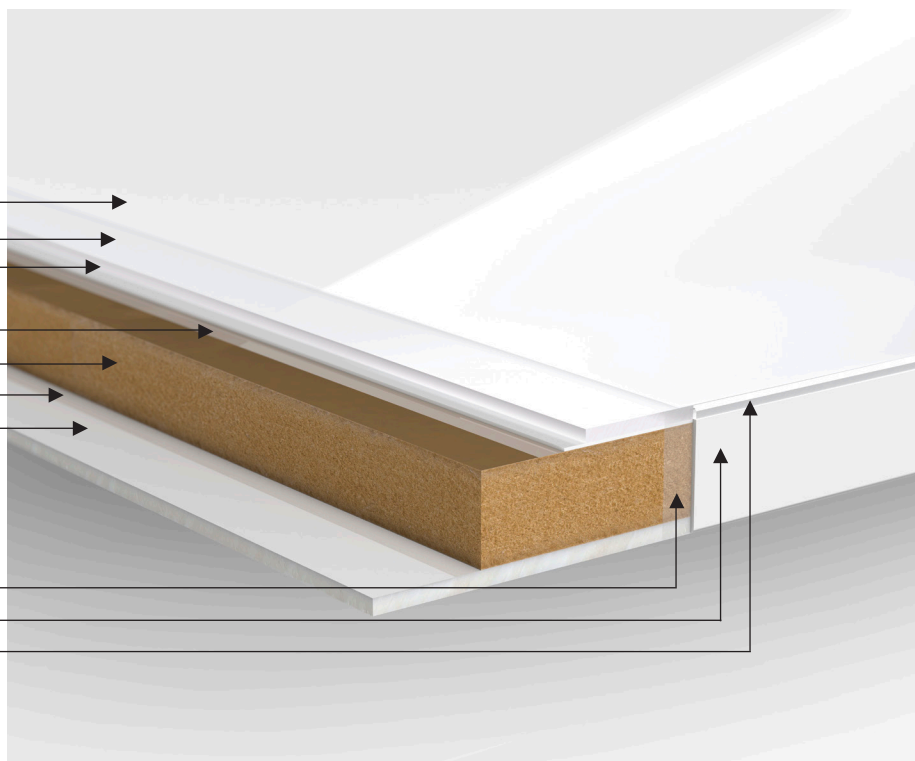
RAUVISIO crystal is a laminated material consisting of the individual components shown below. The properties of the individual materials as well as proper application are decisive for the overall quality of furniture components with RAUVISIO crystal.

RAUVISIO crystal:

- Scratch-resistant hard coat finish
- Transparent PMMA layer
- Coloring polymer layer
- Adhesive
- Wooden substrate
- Adhesive
- Balancing sheet

REHAU LaserEdge™

- Transparent polymer functional layer
- Colored edgeband layer
- Transparent edgeband layer



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 and must only be removed after installation
Glass laminate	Material thickness 2.0 mm	
	Scratch-resistant hard-coat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, polished or natural, satin finished glass visual effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Colored polymer layer	Depth effect Color effect
Surface adhesive	PUR surface adhesive	Ensures a secure adhesion to the substrate material Independently tested adhesive systems are used for the application concerned in combination with the respective components
Substrate material	The material and thickness are matched to the respective application	Independently tested substrates and thicknesses are used in order to be able to ensure permanently consistent quality in the respective application
Balancing sheet	Material thickness 2.0 mm design matched to the surface and edgeband	Color-coordinated balancing sheet, which – on account of its properties – in varying climatic conditions avoids warpage of the whole component outside of the customary tolerances of the wooden board materials industry (one-sided warming of the component must be avoided)

2.03 Individual components

Laminate (natural/polished)

RAUVISIO crystal is a 2 mm thick acrylic laminate. Thanks to the combination of materials, RAUVISIO crystal creates a visual depth effect with outstanding adhesion to the substrate. The laminate is available in polished (high-gloss) and natural (matte) versions.

Balancing sheet (embossed)

Thanks to the 2.0 mm thickness of our specially developed balancing sheet, warping from heat, cold and fluctuating humidity is optimally minimized. 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.

Edgeband collection

For RAUVISIO crystal, REHAU offers two perfectly coordinated edgeband designs. Thanks to the transparent top layer, REHAU LaserEdge duo design creates the visual effect of back painted glass. Solid color ABS available with a polished or natural finish, creates the glass visual effect through the application of a 45° chamfer. All edgebands are also available as the zero-joint LaserEdge.

2.04 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 large format (51 x 110 in [1300 x 2800 mm]).

The pressing of the individual components is performed by authorized REHAU fabricators. The prerequisite for this is the checking and fulfilling of the defined quality requirements. These are monitored by TÜV Rheinland in Germany.

2.05 The finished component RAUVISIO crystal complete

The REHAU cabinet door portal can be used to have custom cabinet doors made in zero-joint quality from the RAUVISIO crystal surfaces and matching edgebands.

03 RAUVISIO crystal slim

3.01 Product description

RAUVISIO crystal slim combines a high-quality intense reflectivity with the advantages of a polymer material and therefore offers maximum flexibility in the production process for backsplash solutions, wall claddings and as an infill panel for frame elements.

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

1.6 mm: Transparent layer

2.4 mm: Color layer

RAUVISIO crystal slim does not require a substrate board, i.e., the transparent and color layers together make up the final thickness of 4 mm. The polymer glass panel is available in polished and natural finishes.

RAUVISIO crystal slim has the following advantages:

- Non-porous, hygienic surface
- The polished finish can be written on with a water-soluble board marker
- The natural finish can be written on with a water-soluble chalk marker
- Easy cleaning with water and a microfiber cloth
- Scratch and abrasion resistant
- Resistant to breakage
- Low weight
- Machinable with woodworking tools
- Maximum flexibility in processing

RAUVISIO crystal slim is designed for vertical indoor use.

The thermal expansion coefficient must always be taken into account. The material properties listed on the technical data sheet (in particular of a thermal or mechanical/physical type) must be observed and assessed for the respective application. Risk assessment and approval are the responsibility of the customer.

If you have any questions, please contact the REHAU Applications Engineering Department.

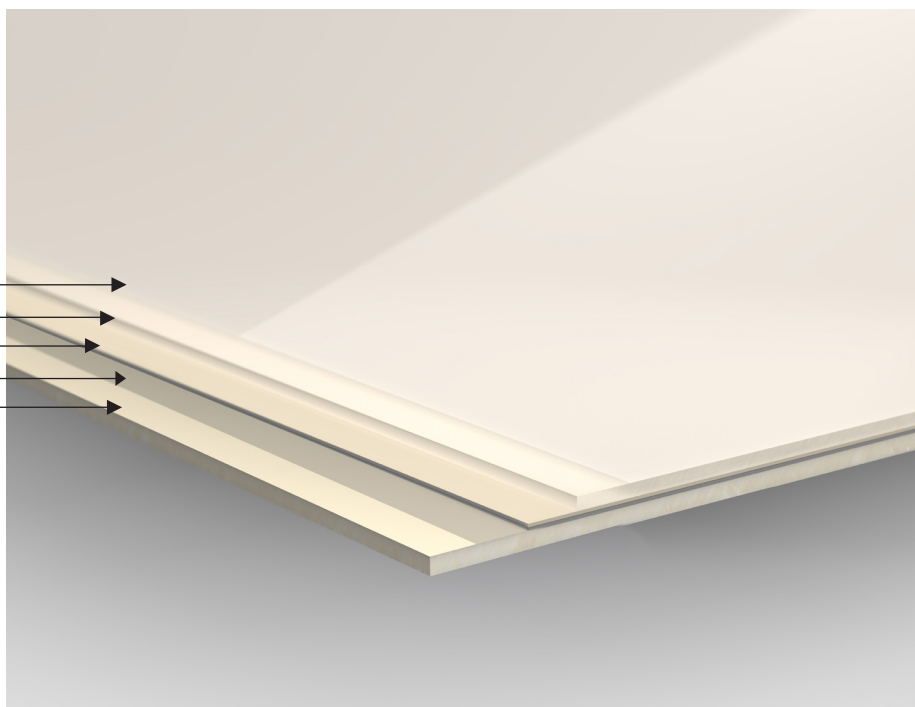
The PMMA surface of the glass laminate with scratch-resistant coating is protected by a special PE foil that must not be removed until after installation.

3.02 Product structure of RAUVISIO crystal slim

RAUVISIO crystal slim is a composite comprised of a co-extruded glass laminate and the balancing sheet and consists of the following layers: RAUVISIO crystal slim does not require a substrate, i.e., the transparent and color layers together make up the final thickness of 4 mm.

RAUVISIO crystal slim:

Scratch-resistant hard coat finish
Transparent PMMA layer
Color polymer layer
Adhesive
Balancing sheet



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 and must only be removed after installation
Glass laminate	Scratch-resistant hard coat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, polished or natural, satin finished glass visual effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Color polymer layer	Depth effect Color effect
Surface adhesive	PUR surface adhesive	Ensures a secure adhesion
Balancing sheet	Design match to the surface	Color-coordinated balancing sheet, which on account of its properties keeps the overall system in balance in varying climatic conditions

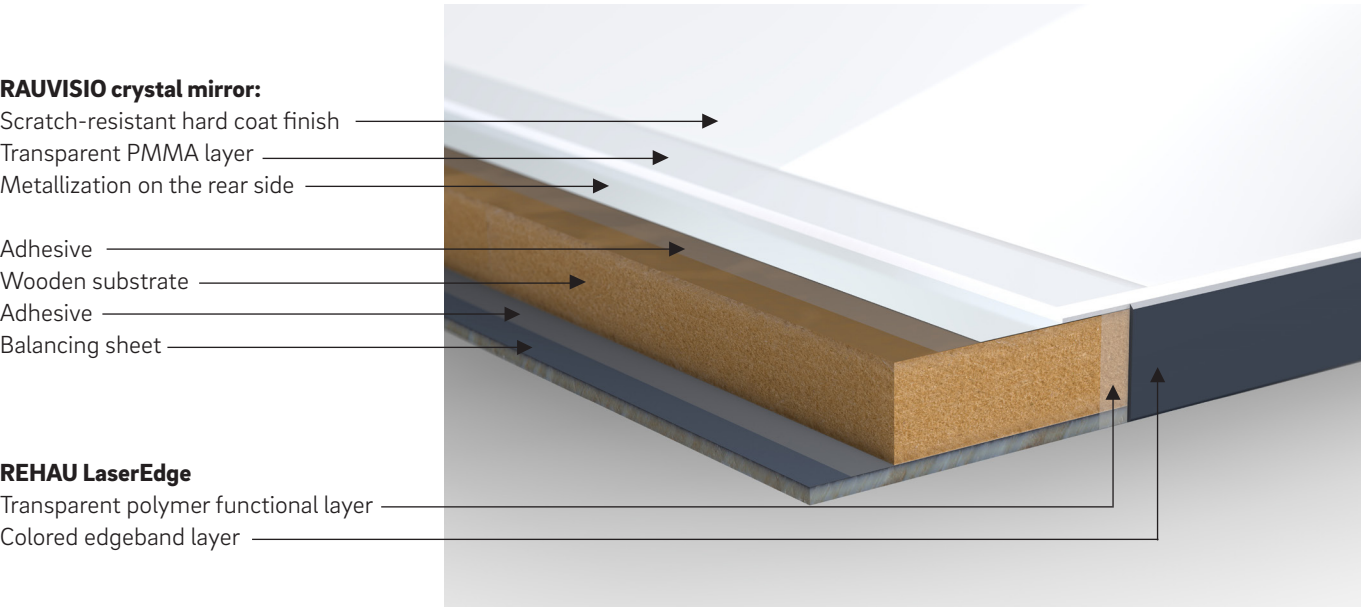
04 RAUVISIO crystal Decorative Mirror

The polymer mirror is offered in the following product variants:

- RAUVISIO crystal mirror slim (4 mm mirror panel)
- RAUVISIO crystal mirror composite (pressed board)
- RAUVISIO crystal mirror complete (edged component)

4.01 Product structure of RAUVISIO crystal mirror composite

RAUVISIO crystal mirror is a composite material consisting of the individual components listed below. The properties of the individual materials and appropriate processing are crucial for the overall quality of furniture components.



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 and must only be removed after installation
Mirror laminate	Material thickness 2.0 mm	Metallized on the rear side
	Scratch-resistant hard coat finish	Increase in the chemical resistance as well as the abrasion and scratch resistance, achievement of a reflective, polished or natural satinized glass visual effect
Surface adhesive	PUR surface adhesive	Ensures a secure adhesion to the substrate material Independently tested adhesive systems are used for the application concerned in combination with the respective components
Substrate material	The material and thickness are matched to the respective application	Independently tested substrates and thicknesses are used in order to be able to ensure permanently consistent quality in the respective application
Balancing sheet	Material thickness 2.0 mm RAUVISIO crystal Fumo color	Coordinated balancing sheet, which – on account of its properties – in varying climatic conditions avoids warpage of the whole component outside of the customary tolerances of the woodworking industry (one-sided warming of the component must be avoided)

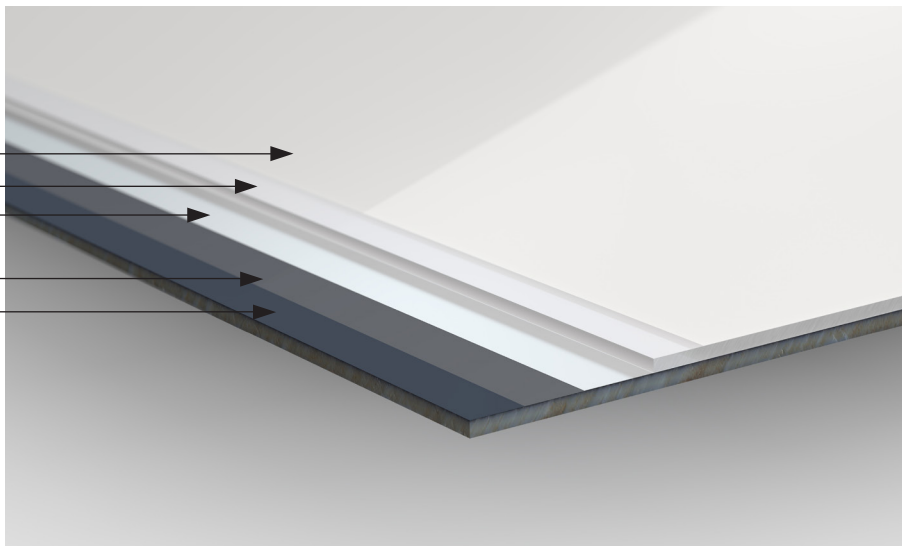
4.02 Product structure of RAUVISIO crystal mirror slim

RAUVISIO crystal mirror slim:

- Scratch-resistant hard coat finish
- Transparent PMMA layer
- Metallization on the rear side
- Adhesive
- Balancing sheet

RAUVISIO crystal slim:

- Scratch-resistant hard coat finish —————→
- Transparent PMMA layer —————→
- Metallization on the rear side —————→
- Adhesive —————→
- Balancing sheet —————→



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 and must only be removed after installation
Mirror laminate	Material thickness 2.0 mm	Metallized on the rear side
	Scratch-resistant hard coat finish	Increase in the chemical resistance as well as the abrasion and scratch resistance, achievement of a reflective, polished or natural satinized glass visual effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion to the substrate material Independently tested adhesive systems are used for the application concerned in combination with the respective components
Balancing sheet	Material thickness 2.0 mm	RAUVISIO crystal Fumo balancing sheet, which on account of its properties keeps the overall system in balance in varying climatic conditions

4.03 Product features of RAUVISIO crystal mirror

For RAUVISIO crystal mirror boards, the visual effect is comparable with glass mirrors in many cases, especially when viewed from a short distance (up to approximately 10 feet). As the viewing distance increases (10-20 feet or greater), optical imperfections can become visible.

The material must not be exposed to temperatures > 122° F (50°C). Otherwise there is a danger of surface impairments or degradation of the planarity of the structure.

Adhesion

If the individual laminate is going to be bonded, PUR adhesives are recommended. For adhering RAUVISIO crystal mirror slim, the use of hybrid polymer adhesives is recommended.

Depending on the application, sufficient adhesion must be ensured. Pretreatment of the surface of the rear side may be necessary under certain circumstances. In this case the necessary surface tension can be set by means of corona/plasma treatment, flame treatment or priming.

To check the quality of the RAUVISIO crystal mirror system solution, test adhesions must be performed on test samples.

If the RAUVISIO crystal mirror board or slim panel will be bonded to a wall or other surface, it is critical to ensure a proper adhesive system is used otherwise this could cause minor distortions in the flatness of the panel, which will result in visible distortion in the mirror reflection causing optical imperfections. Please follow Section 10 Applications and installation instructions for proper adhesive instructions.

Machining

Like all other RAUVISIO crystal products, RAUVISIO crystal mirror can be machined with the parameters described in this technical information publication.

When working with individual laminates, the rear side in particular must be carefully handled, because this side is not provided with a protective foil. In order to prevent damage, cutting must be performed with the rear side facing upward.

Due to the industrial manufacturing process, small inclusions and scratches cannot be completely avoided – the surface is assessed in accordance with the tests in the technical data.

05 Transport, packaging and storage.

NOTICE

To reduce the risk of property damage use the following transport, packaging and storage procedures.

6.01 Transport and loading information

Upon delivery the external packaging must be immediately checked for signs of damage.

- If damage has occurred, open the packaging in the presence of the freight carrier and record the damage to the goods.
- The freight carrier's driver is to confirm the damage by giving their name, the freight carrier, date and signature.
- **The damage is to be reported to the freight carrier within 24 hours. Otherwise the haulier's insurance company will not accept liability.**

Delivery

The boards or laminates are shipped loaded on square timber battens or pallets, depending on the type of shipment, to ensure they are kept flat.

- After delivery, unload the packaging units with an industrial truck 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.
- Suitable protective equipment such as gloves should be worn during manual handling, as sharp edges can cause cuts.
- Use transport aids, such as suction lifters, lifting handles and board transporters for handling and observe the handling instructions, see also "Unpacking".
- When transporting the RAUVISIO crystal boards in horizontal position, deflection is not allowed.

6.02 Packaging

Protect boards with foam materials.

In the case of RAUVISIO crystal it is essential to protect the narrow sides and the surface. Surface protection must also be ensured for RAUVISIO crystal slim. The trapping of debris between sheets is to be avoided when moving, picking and processing individual sheets. Otherwise the stack pressure/dead weight of the boards will inevitably cause indentations in the laminate surfaces.

- Protect surfaces with foam mats. This will prevent marks being caused on the surface when stacking components.

6.03 Internal transport and storage

Internal transport

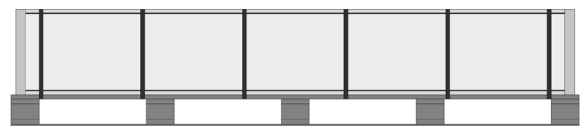
Transport RAUVISIO crystal board material or laminate in a flat and level position with support throughout. Transport within the supplied packaging is recommended to achieve this (re-packing is not recommended).

Storage

RAUVISIO crystal is delivered on pallets or squared timbers with the appropriate protective boards to cover them. The RAUVISIO crystal packaging units are stackable. 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 and direct sunlight.



Pallet packaging



5-bolster storage (sticks)

Store boards flat and level.

RAUVISIO crystal board material must be stored and transported in a flat and level position with support throughout. Storage on the supplied packaging unit is recommended. Alternatively, boards must be supported by a minimum of 5 evenly spaced timber battens of equal size. This is necessary to prevent bending or warping.

In the event of improper storage contrary to the storage regulations described above (pallet or at least 5-batten storage), no assurances can be given against warping.

The material must be stored in closed, heated rooms where the room temperature is between 59°F and 77°F (15°C and 25°C) and the relative humidity is between 30% and 70%.

Prior to opening of packaging units, boards must be allowed to acclimate to room temperature for at least 48 hours.

Prior to returning opened or partially used packaging units to storage the cover plate must be placed on top. This is to prevent contamination and uneven temperature/humidity penetration (due to drafts or heating air), and thus counteract warping effects as well as surface damage.

Storage before and after adhesion of the laminate

Prior to adhesion, all materials must be acclimated for a sufficient period of time and therefore no longer have any temperature differences.

After adhesion, panels must be stored in enclosed, heated rooms. Ensure that the storage/transport temperature does not exceed 140°F (60°C).

06 Before processing

NOTICE

To reduce the risk of property damage use the following unpacking and conditioning procedures.

7.01 Unpacking

Before opening the packaging unit, you must allow boards to acclimate to room temperature for sufficient time – at least 48 hours or longer, depending on the season.

Carefully unpack the boards.

Care must be taken when opening the packaging to ensure that surfaces are not damaged by sharp tools. Suitable lifting equipment must be used to separate individual boards.

1. Open the packaging with scissors.
2. Do not use a sharp blade!
3. Cut the packaging tape.
4. Cut the protective film away from sheets.
5. With 2 people, or 4 suction cups carefully lift the top board vertically, without sliding it, or carefully remove carton if individually packed.
6. Debris which can get trapped between the individual boards must be completely avoided or removed.

7.02 Check boards and laminates

Please check the RAUVISIO crystal system components with regard to the following points before any further processing and therefore finishing of the goods takes place:

- External damage, such as cracks or notches
- Surface damage or blemishes
- Flatness (when purchasing pressed board)
- Surface tension of the laminate rear side (with purchasing single laminate)
- Color 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 blemishes may be present on the laminates on delivery. These cannot be entirely excluded for technical production reasons and do not constitute a direct reason for complaint.

Where an order utilizes multiple laminate sheets, it is recommended that laminate sheets are grouped

according to manufacturing date. Uniformity of color across production batches should be checked prior to processing.

A color uniformity check must be performed in daylight – on account of the objective comparability in daylight – and not in bright sunlight. On account of the industrial production processes, occasional minimal optical impairments of the surface cannot be entirely avoided and are not a reason for complaint.

The costs incurred for checking the above mentioned points cannot be accepted by REHAU. This also applies to consequential costs incurred in the further processing of defective goods.

7.03 Conditioning

RAUVISIO crystal and all other materials to be processed, e.g., edgebands, must be acclimatized at room temperature (at least 64°F [18°C]) prior to processing for a period of at least 48 hours.

Processing is also performed at room temperature. Particularly in colder months, ensure that all boards are acclimatized. If there is incomplete acclimatization of the laminate due to the stack size, the duration should be adjusted accordingly.

7.04 Documents for material warranty

Delivery notes and shipping labels should be retained to aid batch traceability in the event of a technical issue.

The inkjet printing on the edge of the substrate can also be used for the unique identification of a production batch. This must be given to the REHAU sales office in the event of a complaint.

07 Processing of RAUVISIO crystal

NOTICE

To reduce the risk of property damage use the following processing procedures.

8.01 Proper handling of RAUVISIO boards

Placing the boards on the machine table

The machine table must be of sufficient size, must not have any sharp edges and must be thoroughly cleaned.

Alternatively, cover the machine table with a clean base (chipboard, carton, etc.) or position the board rotated, protective film downwards and balancing sheet upwards.

Cutting the boards to size

The nesting process is recommended to cut the boards to size. When cutting to size using a saw, observe the instructions for positioning the boards on the machine table (see above). In this case, work with a scoring blade.

Between processing steps

All debris (swarf, wood chip, etc) should be removed and surfaces cleaned after every milling/sawing operation.

For transport, position the boards vertically and separated on appropriate trolleys.

Alternatively, stack the workpieces in layers with clean and padded carton/foam material inserted in-between on a pallet.

Edging the workpieces

Anti-static agents should be used while edgeband is being applied. Ensure that the boards are fed into the system cleanly and safely. Any loose chipping created must be safely removed via extraction.

Drilling and milling

Extraction must be used during drilling/milling operations to ensure that the swarf is dependably removed.

Packing the workpieces

Stack the workpieces in layers on pallets with a clean and pliable interlay of cardboard or foam between the layers. Use retainers during transport to avoid damage due to slippage, etc.

8.02 Preparing the individual laminates

8.02.01 Pre-treatment of the laminate and substrate

RAUVISIO crystal is provided with a corona pre-treatment on the colored underside. This pre-treatment ensures a good bond of the laminate to the adhesive. Due to a high wettability of the surface good adhesion is ensured. The wettability can be established using a test ink. The measurement for this is the surface tension, which is given in the unit [mN/m]. It is proven that the surface tension reduces with time. It is therefore recommended that the laminate is processed within one year.

If the surface tension is less than 38 mN/m, the ABS rear side must be retro-treated. This can be done, for example, by way of flaming, corona/plasma treatment or priming.

Before the laminate is glued to the substrate board, both must 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 that do not become visible until the protective foil is removed.

8.02.02 After manufacture of the pressed board

After pressing the laminates, make sure that no foreign particles get between the individual layers or that any such objects are thoroughly cleaned to prevent any indentations being caused on account of the pressure exerted by the stack.

Before onward transport takes place, a rest period/curing time of at least 24 hours must be maintained in a flat position. Any deflection whatsoever that the composite experiences during the curing time will inevitably lead to warping and must be avoided.

For further processing it must be checked, depending on the adhesive system and environmental conditions, when the subsequent fabrication steps can be carried out. 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 being caused on the surface when stacking components.

8.03 Mechanical processing of RAUVISIO crystal

RAUVISIO crystal can be processed with most approved and sharp woodworking tools. When machining, the

polyethylene protective foil must remain on the surface. Tears in and delaminations of 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 Applications Engineering Department and your tool manufacturer will be happy to support you with this.

8.03.01 Cutting

Various factors are responsible for a good cutting result:

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

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

8.03.01.01 Cutting of RAUVISIO crystal

Sizing saws

Saws with a large number of teeth are fundamentally recommended.

The best cutting quality is achieved with the trapezoid-flat-chamfer (TR-FL-FA) tooth shape combination. Saws with an alternating tooth shape and a work-face 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.

Optimal saw blade projection:	20 – 30 mm
Recommended cutting speed:	60 – 70 m/s
Feed per tooth:	0.03 – 0.05 mm

Panel sizing saws

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

Scoring blades with an alternating tooth geometry and a high blade angle (approx. 25°) have proved effective. An alternative is to process with the front side - i.e., with the

Saw blade	Projection (P)
Ø 300 mm	Approx. 20 mm
Ø 350 mm	Approx. 25 mm
Ø 400 mm	Approx. 25 mm
Ø 450 mm	Approx. 30 mm

polyethylene protective foil-facing down.

8.3.1.2 Cutting of 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, score-free and chip-free cutting quality. Plastic saw blades have a high number of saw teeth and a negative rake angle.

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

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

Formatting RAUVISIO crystal decor and metallic decors

When processing RAUVISIO crystal decor and metallic decors such as Zucchero, you must ensure that all parts are installed in the same direction as the logo on the protective foil. If an element is installed upside down, a different visual effect may be created due to the way that the decors or metallic particles are aligned.

8.03.02 Milling on straightline edgebanders

Fundamentally, the material can be machined with solid carbide or carbide-tipped tools, carbide turnable end mill inserts or diamond-tipped milling cutters. However, the tools must have cutting edges with alternating splay angles.

In the case of turnable end mill inserts, shaft eccentricities can leave marks. Using tools with collet systems with a high rotational speed brings visible benefits.

A crystal clear edgeband in the area of the polymer glass laminate cannot be achieved with any conventional milling cutter. If this is required, it is necessary to work with special polishing cutters or to use mono-crystalline diamond cutters 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 cutters for straightline edgebanders

Tool	Cutter heads with carbide turnable inserts (polished) or diamond-tipped milling cutters with the largest possible splay 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 machining - stationary technology

Clamping equipment	Hydraulic chucks, power shrink chucks, heat shrink chucks
Tool	Solid carbide end mills, turnable end mill inserts with alternating splay angles, diamond-tipped end mills (t = 2 or t = 3, depending on the required feed rate)
Cutting speed	Diameter-dependent: 15 – 25 m/s
Tooth feed	0.15 – 0.25 mm (in no case ≤ 0.1 mm)
Machining	Up-cut

8.03.03 Special machining

Surface routing and V-grooves can be introduced into the polymer material by means of stationary machining to give the surface visual effects and accents.

Depending on the quality requirement, various cutting materials and tool geometries are used.

To create a matte milled visual effect, a carbide milling tool can be used.

A minimal chip removal of 0.1 – 0.2 mm with a monocrystalline diamond cutter is required for a high-quality gloss surface, which means that – depending on the depth of the desired milling – premilling/reaming of the geometry with carbide cutters is necessary. Equivalent quality of the two milling faces can only be achieved by machining in each case in the same cutting direction.

Ideal processing parameters

Feed: 2 m/min
Rotational speed: 18.000 rpm

Similar requirements of the tool technology and machine parameters also apply when machining the pure laminate, i.e., RAUVISIO crystal slim (e.g., for the application of a chamfered edge geometry).

Similar application parameters as described above can be used for the creation of backlighting effects through rear-side routing of the furniture board. To ensure a uniform appearance – in particular in the case of relief milling over a large area – surface clamping (e.g., a nesting table) is recommended.

To minimize temperature uptake and thus maintain a milling pattern that is as uniform and as flat as possible, several milling operations are imperative:

Reaming up to -0.3 mm: Carbide-tipped end-milling cutter, up-cut, n = 18.000 rpm

Rough milling up to -0.1 mm: Carbide-tipped end-milling cutter, up-cut, n = 20.000 rpm

Finish milling to 0: Carbide-tipped end-mills (natural) or MCD polishing end-mills (polished), up-cut, n = 20.000 rpm

Subsequent varnishing – with a 2-component water varnish system – of the milled surfaces to be backlit is recommended in order to create translucent surfaces and to laminate the traces of milling. Ensure the compatibility of the systems used with the aid of test samples. If you have any questions, your local REHAU sales office and the REHAU Applications Engineering Department will provide you with support.

8.03.04 Bending of RAUVISIO crystal

In contrast to real glass, polymer material can be cold formed within defined limits in the 2D area. This can take place concavely and convexly subject to the maintenance of a minimum radius of 400 mm.

Application of the bending technique requires the use of defined materials in the structure as well as suitable process parameters and machine technology. Pre-qualification must take place on the basis of first article production and approval testing and is the responsibility of the fabricator. If you have any questions, your local REHAU sales office and the REHAU Applications Engineering Department will provide you with support.

8.03.05 Drilling

Dowel hole drilling in the polymer layer

Conventional carbide-tipped (HW) dowel drill bits achieve the best results. Drilling pins do not achieve satisfactory results. However, fast drilling (S-S mode) is required.

With slow drilling (L-S mode), long plastic shavings collect around the drill bit.

Feed: 3 – 4 m/min
Rotational speed: 4.500 rpm

Dowel hole drilling in the polymer balancing sheet

Conventional carbide-tipped (HW) dowel drill bits can be used. The best hole edges are achieved with solid carbide-tipped high-performance dowel drill bits.

Fast drilling (S-S mode) is required. With slow drilling (L-S mode), long plastic shavings collect around the drill bit. Good results can also be achieved on the balancing sheet with drilling pins.

Feed: 3 – 4 m/min
Rotational 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-tipped (HW) throughhole drill bits.

Feed: 3 – 4 m/min
Rotational speed: 4.500 rpm

Fast drilling (S-S-S mode) is required. Here, again, slow drilling (L-S-L mode) cannot be used, as plastic shavings collect around the drill bit.

Hinge drilling

Standard cylinder head drills are recommended for this. Slow drilling (L-S mode) almost inevitably leads to melting of the hole edge and the formation of long plastic shavings that can collect around the drill bit.

Feed: 1.5 – 2 m/min
Rotational speed: 3.000 rpm

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

Cutting holes in RAUVISIO crystal slim

See chapter "Drilling."

8.04 Tool lives

The tool lives and the work result do of course depend on several factors, e.g., the material, the tool and the machine. Tool life tests with the material RAUVISIO crystal resulted in a longer tool life than with the machining of melamine-coated chipboard. Due to the variety of processing machines and the varying complexity of the tasks, we recommend that you discuss your customer-specific requirements with the relevant REHAU sales office or the tool manufacturer.

The findings shown were elaborated in collaboration with established tool manufacturers; detailed recommendations regarding machine parameters and tool recommendations can be provided by your REHAU sales office.

8.05 Edging with REHAU LaserEdge

Due to the high-quality surface of RAUVISIO crystal, REHAU recommends the use of LaserEdge for both of the following edging options. For further information, please contact your REHAU sales office.

The resulting component quality (e.g., adhesion of the edgeband, appearance and application properties) depends on the machine settings and the board quality 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 Applications Engineering Department will be happy to support you with this.

8.05.01 Edging with Duo-Edge

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

The edgeband materials are provided with a transparent polymer functional layer. The customer must check by means of processing tests the suitability of LaserEdge.

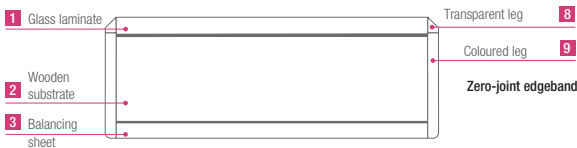
When processing Duo-Edge, it is particularly important to ensure sufficient application pressure in the narrow, transparent area of the edgeband onto the transparent area of the clear laminate, as well as synchronization between the edgeband infeed and the board feed, in order to obtain optimal transparency of the visual depth effect.

The joint quality with regard to chipping and scoring in the transparent area depends on the cutting system, cutter infeed, cutter quality, cutter geometry, etc. 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 has a transparent polymer functional layer for this purpose. This creates a transparent bond between the board and edgeband and completes the glass effect.

This system solution, consisting of the board and zero-joint edgeband, enables all-round zero-joint edgebanding and complete coverage of the wooden substrate with plastic elements.

Depending on the processing options, the machining to the edgeband material can be executed as a radius or with various chamfer geometries.

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



Transparent edgeband leg

Glass look in the edgeband area

Combined with RAUVISIO crystal surface

Possible variants:
Greenish coloring of the transparent edgeband leg for an improved glass visual effect

Colored edgeband leg

Design match to the surface and balancing sheet
Covering of the substrate board, balancing sheet and colored layer of the surface material RAUVISIO crystal

Possible variants:
Decoration of the edgeband leg, e.g., with a stainless steel visual effect, wood effect, etc.

The Duo-Edge is only available as a zero-joint edgeband with a polymer functional layer. On account of the transparent edgeband leg, application with adhesives is not possible.

8.05.02 Finishing with a beveled edge

An alternative to Duo-Edge is edging with a color-coordinated ABS color referred to as beveled edge. In contrast to the Duo-Edge, this can be either a primer edgeband for conventional adhesive processing or a zero-joint edgeband.

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

Thanks to the use of an adhesion promoting primer edgeband, the beveled edge remains an interesting edging option, particularly where zero-joint processing is impossible. The visual depth effect in the edgeband area is most effective when a 45° chamfer is milled on the edgeband and surface, thus revealing the clear laminate.

Depending on the quality requirements, various cutting materials and axial directions of the tools can be used to create the desired surface appearance of the milled area (natural/polished).

To achieve a surface appearance that is as uniform as possible, the milling cutter must have high degree of concentricity, a large number of cutting edges and a slow feed rate to minimize plane eccentricities, as well as a rigid tool guide, rigid tool clamping and uniform low chip removal when using a scraper in order to avoid differing gloss effects and chipping/chatter marks on the surface material. The use of end face milling technology is recommended in order to eliminate cutter eccentricities. Please contact your respective machinery or tool manufacturer on this subject.

Special downstream processing methods that need to be assessed on a case-by-case basis are another potential means of optimizing gloss in the milling area.

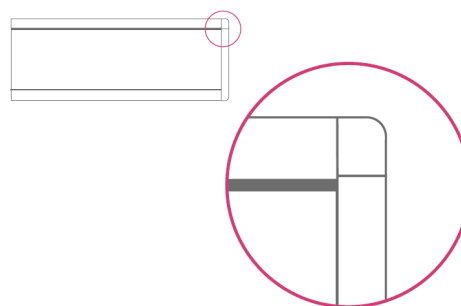
The beveled edge is available through the REHAU Express Collection as the zero-joint LaserEdge with a polymer functional layer as well as the adhesion promoting ABS edgeband.

8.06 The preassembled component

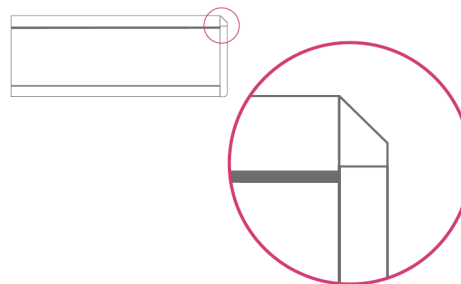
In addition to pure laminate and pressed large-sized board, REHAU offers customers the option of using the configurator to order customized laser-edged components.

For fronts (nominal size 21.1 mm with Duo-Edge), in collaboration with TÜV Rhineland successful certification has been performed in accordance with AMK guidelines. The certified component is characterized by the following quality features:

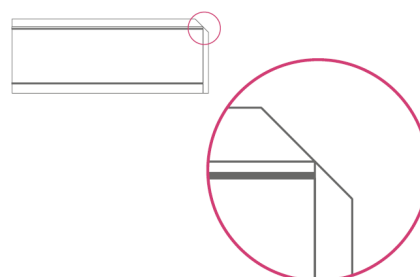
- Quality
- Usability
- Regular production monitoring



RAUVISIO crystal polished radius



RAUVISIO crystal 45° chamfer



RAUVISIO crystal 45° on the edgeband and surface material

08 Machining on the construction site

NOTICE

To reduce the risk of property damage use the following machining procedures.

9.01 Sawing

RAUVISIO crystal slim can be cut to the desired dimensions with a circular saw and guide rail. Contours and fine cut-outs can be made with a jigsaw.

10.01.01 Circular saw

REHAU recommends the following procedure for machining RAUVISIO crystal slim with a circular saw:

- Use a plastic saw blade with a large number of teeth and trapezoidal-flat tooth geometry
- Select a high speed and keep the rake angle as negative as possible
- A uniform and slow manual feed brings the best results
- To avoid chipping on the visible face, you can machine the laminate with the embossed rear side facing upwards

9.01.02 Jigsaw

To achieve good results with the jigsaw, please observe the following recommendations:

- Use a plastic saw blade with a tooth spacing of 2.5 mm
- Set the reciprocation stroke to a high speed
- To avoid chipping on the visible face, you can machine the laminate with the embossed rear side facing upwards

9.02 Milling

RAUVISIO crystal slim can be sized to the desired dimensions with a router and a guide rail.

When machining with the router, please observe the following:

- Use end mills made of carbide
- Select the highest possible speed
- Manual feed should be slow and uniform

Milling a chamfer

When milling a chamfer, make sure that the chamfer size does not exceed the thickness of the transparent layer. An attractive visual effect can be created with about 1.5 mm. Please use a 45° milling cutter to make a chamfer.

9.03 Sanding

The machined edgebands of RAUVISIO crystal slim can be improved further with a random orbital sander and fine sandpaper.

Observe the following points:

- A very good basis for a subsequent polishing operation can be created with an 800 grit
- Do not remove the protective foil before completing the machining

9.04 Polishing

A high gloss result can be achieved with a rotary polisher and a 1-step polish. As an alternative to the polishing machine, the process can be performed by hand with a polishing felt.

- Apply the polish with a spatula to avoid splashes
- If the result is not yet satisfactory, the sanding and polishing steps can be repeated
- Do not remove the protective foil before completing the machining

9.05 Drilling

Flexible on-site holes can be drilled easily.

The following recommendations apply for drilling:

- Use a drill bit for plastic
- Drill with slight pressure and a matching feed into the material
- For hole cutting REHAU generally recommends the use of a router, by means of which – with the aid of a stationary seal ring and the use of a template placed on it – the desired cut-out can be dependably traced

- When using hole saws, sharp saw teeth with slightly blunt centering drills should be used
- To prevent chipping of the hole edge, initially pilot drill the hole half way from one side only. Then drill from the opposite side and finish the hole (alternatively use a wooden underlay sheet into which you can drill)

9.06 Adhesion of RAUVISIO crystal slim

- Depending on the condition of the substrate, work with beads of adhesive in a V shape (levels very uneven surfaces) or apply the adhesive with a notched trowel
- Attach the board by applying pressure to the whole surface

Make sure that the expansion joints are at least 2 mm.
It is recommended that spacers are used as shims.

9.07 Grouting of RAUVISIO crystal slim

- Remove the protective foil after the adhesive has cured
- Grout the joints with a matching colored silicone
- Screed the silicone

09 Applications and installation instructions

NOTICE

To reduce the risk of property damage follow the following application and installation instructions.

RAUVISIO crystal is designed for vertical indoor use. A horizontal application is performed as a matter of principle on the user's own authority. Consultation with REHAU's Applications Engineering Department may be necessary.

10.01 Front application

RAUVISIO crystal was originally developed for front applications and combines a high-quality appearance of depth with the advantages of a polymer material and therefore offers maximum flexibility in the production process, using conventional woodworking processes. Whether you are sawing, milling, drilling or edging with matching REHAU edgeband solutions, a complete depth effect front can be created without any special processes. The use of the polymer balancing sheet ensures sufficient flatness, which is essential for front applications.

RAUVISIO crystal slim can also be used for infill panel applications. For infill panel applications, the thermal expansion coefficient must be taken into account.

10.02 Backsplash application

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

The thermal expansion coefficient must always be taken into account for installation as a backsplash. The expansion joint must be rated depending on the board size, the thermal coefficient of expansion (see technical data) and the prevailing ambient conditions and installation conditions. Empirically, an expansion joint of 2 mm is recommended for two-dimensional adhesion in housing construction.

RAUVISIO crystal is a thermoplastic polymer material and therefore only suitable for maximum surface temperatures of 176°F(80°C). A sufficient minimum gap to the edge of the cooking range must therefore be ensured with the gap size depending on the type of cooking range and the radiant temperatures it emits.

In the event of improper use, e.g., if the burners/heating elements (on the cook top) are not covered or are not fully covered for long periods when switched on or if there is

Cooking range	Minimum distance
Induction, ceramic, cast iron	≥ 50 mm
Gas	≥ 200 mm

direct contact with hot pots and pans, etc., the surface can incur temperature damage. Splashes of fat that hit the surface when in proper use do not damage the surface and can be removed without any residue.

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

For the two-dimensional mounting of RAUVISIO crystal to the back panel, use of the polymer hybrid adhesive SikaBond® AT universal is recommended. This requires the base surface to be level, clean and free of grease. The instructions of the adhesive manufacturer must also be observed.

Before applying the adhesive, it should be tested on an inconspicuous place to see whether any damage occurs to the polymer.

The adhesive should be applied in beads with a spacing of approx. 50 mm. A V-shaped bead layout is recommended, the thickness of which must be matched to the substrate conditions in question (for a flat substrate the standard thickness is 6 mm).

In the area of the cooking range a minimum bead spacing of 25 mm is recommended on account of the effect of the higher temperatures.

Partially, double-sided adhesive tape can be used to mount it to the wall. When mounting it to the wall, be sure to apply sufficient pressure so that a maximum clearance of 2 mm between the board and the wall occurs and adequate adhesion can be ensured.

Joints that need to be maintained on account of the thermal expansion, for example, butt joints in corner areas or connections to walls (as described above), must

also be sealed and grouted with silicone joints. This is especially important where RAUVISIO crystal can come into contact with moisture.

Connection or expansion joints are maintenance joints that must be regularly checked and replaced as necessary.

REHAU accepts no liability for damage resulting from improper or unprofessional processing.

Please check whether there are any country-specific regulations relating to the environment of cooking ranges and apply these accordingly.

10.03 Bathroom and shower wall paneling

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

The same installation instructions as in chapter 13.2 apply with respect to the consideration of expansion joints, e.g., in corner areas and onto adjacent attachments, of at least 2 mm and mounting by means of a polymer hybrid adhesive (e.g., SikaBond® AT universal) with a bead spacing of 50 mm.

Recesses and drill holes must also be made 4 mm larger and sealed with silicone to prevent the infiltration of moisture behind the panels.

For sealing external and abutting edges, silicone jointing is recommended over all exposed edges to prevent the infiltration of moisture, dirt, waterlogging and mold.

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

REHAU accepts no liability for damage resulting from improper or unprofessional processing.

10 Technical data

RAUVISIO crystal is designed for vertical indoor use. Horizontal use and alternative applications must be checked by the customer and compared with the currently applicable requirements.

The hard coat PMMA surface of the glass laminate is protected by a special PE foil that must not be removed until after installation.

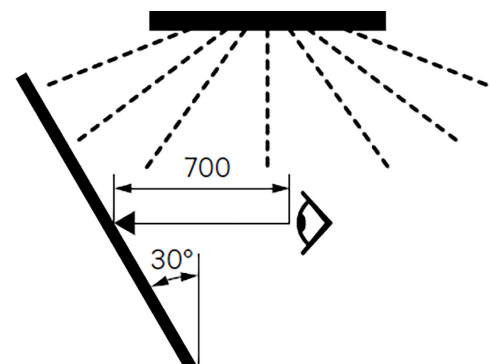
An overview of general information on RAUVISIO crystal (applies to all product variants):

Visual characteristics	Test standard	Requirements	Test results
Surface gloss level	AMK-MB-009, 09/2010	Measurement with 60° geometry	Polished: ≥ 85 GLE Natural: ≤ 6 GLE
Color/decor	AMK-MB-009, 09/2010	No significant change to the master sample; Uniform coverage properties/decor pattern	Fulfilled
Light fastness	Based on DIN EN ISO 4892-2, Meth. B (behind window glass) Assessment according to DIN EN ISO 105 A02	Assessment according to the blue scale	≥ level 7
		Assessment according to the grey scale	≥ level 4
Surface	AMK-MB-009, 09/2010 based on EN ISO 7823-2*	Uniform surface, surface defects must not affect the overall appearance from a distance of 0.7 m. A flawless surface cannot be reproduced due to the industrial production process; small blemishes and surface irregularities are permissible	Fulfilled

*This standard applies to the extrusion process only. Downstream steps in the process are not affected.
Surface and colors within tight application-compliant tolerance limits – defined tolerance limits are color-tone specific and must be agreed with the customer.

The following boundary conditions apply:

Viewing distance	700 mm
Illumination intensity	1000 - 2000 lx
Angle of inclination	30° out of vertical
Light source's color temperature (daylight, diffused light or D65 lamps)	6500 K
Viewing time	20 s max



Surface properties - mechanical/physical	Test standard	Requirements	Test results
Chemical resistance	DIN 68861/T1	Polished: 1A Natural: 1B	See table "Substances"
Scratch resistance	DIN 68861/T4	Polished: 4C Natural: 4B	Fulfilled
Micro-scratch resistance	DIN CEN TS 16611 (Prov. A/B)	Procedure A: Polished/Natural: max. 5% Procedure B: Polished/Natural: Class 5 mirror: Class 4	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 vapor	DIN 438-2	Level 5 No changes	Fulfilled
Flexural modulus of elasticity**	DIN EN ISO 178		3080 N/mm ²
Flexural strength**	DIN EN ISO 178		98 N/mm ²
Impact strength**	DIN EN ISO 179-1		11 kJ/m ²
Linear thermal expansion coefficient per Kelvin temperature change**	DIN 11359-2	- 40 °C ... + 20°C + 10 °C ... + 40°C + 20 °C ... + 80°C	0.590 E-4 0.667 E-4 0.754 E-4

The testing of the chemical resistance in accordance with DIN 68861-1 comprises the substances set out in the table below; other substances have not been explicitly tested and must be tested independently by the customer. Test results apply exclusively to the varnished board surface and not to mechanically exposed radii or chamfers in the milled area or on the surface.

**Only RAUVISIO crystal slim

Component tests on the edged component

The scope of supply by REHAU comprises RAUVISIO crystal as of the individual laminate or pressed board with or without edging. The details below relate to the finished edged component pressed by REHAU with Duo-Edge. Attention is drawn to the fact that REHAU accepts liability under warranty law for its scope of supply only in accordance with the REHAU specification, but not for any pressing or edging processes performed 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 the processing of RAUVISIO crystal, on the use of suitable adhesives and edgebanding, and on the observance of REHAU's processing instructions in accordance with this technical information publication. REHAU Applications Engineering Department provides appropriate support for the setting of machine and process parameters. 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, which is provided without obligation.

Component tests	Test standard	Test result
Temperature resistance	Assessment to AMK-MB-001 (05/03)	Passed
Infiltration of water vapor	Assessment to AMK-MB-005 (07/2007), Module 1	Passed
Humid climate resistance	Assessment to AMK-MB-005 (07/2007), Module 2	Passed
Alternating climate resistance	Assessment to AMK-MB-005 (07/2007), Module 3	Passed
Long-term heat storage 4 weeks 50°C	Assessment after 24h acclimation	Passed

* The component tests refer to the AMK parts specified in the AMK table with the respectively stated status.

An overview of the specific data of RAUVISIO crystal:

Product data	Test standard	Laminate	Slim (4 mm panel)	Composite (pressed board)	Completed (edged component)
RAUVISIO crystal - surface					
Total thickness of laminate		2.0 mm ± 0.1 mm			
Transparent layer		1.6 mm ± 0.1 mm			
Colored 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])				21.0 mm ± 0.4 mm	21.1 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	
Surface weight	-	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 rear side	Check with test ink	≥ 44 mN/m (upon delivery) ≥ 38 mN/m (upon adhesion)			

*The projection in the MDF substrate can be up to 10 mm (standard size 2805 mm x 1305 mm)

An overview of the specific data of RAUVISIO crystal mirror:

Product data	Test standard	Laminate mirror	mirror slim	mirror composite	mirror complete
Thickness	As per technical drawing based on DIN 438-2	2.0 mm \pm 0.1 mm	4.0 mm \pm 0.2 mm	21.1 mm \pm 0.4 mm	21.1 mm \pm 0.4 mm
Width	As per technical drawing based on DIN 438-2	1220 mm \pm 1.5 mm	1220 mm \pm 1.5 mm	1220 mm \pm 1.5 mm*	Dimension \pm 0.5 mm
Length	As per technical drawing based on DIN 438-2	2440 mm \pm 5 mm	2440 mm \pm 5 mm	2440 mm \pm 5 mm*	Dimension \pm 0.5 mm
Angle deviation	As per technical drawing based on DIN 438-2	\pm 0.3°	\pm 0.3°	\pm 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	15 mm
Surface weight	-	~ 2.38 kg/m ²	~ 4.75 kg/m ²	~ 16.1 kg/m ²	~ 16.1 kg/m ²

*The projection in the MDF substrate can be up to 10 mm (standard size 2445 mm x 1255 mm)

An overview of the specific data of RAUVISIO crystal mineral:

Product data	Test standard	Laminate	Slim	Composite
Thickness	As per technical drawing based on DIN 438-2	2.2 mm \pm 0.2 mm	4.2 mm \pm 0.3 mm	21.1 mm \pm 0.4 mm
Width	As per technical drawing based on DIN 438-2	1300 mm \pm 1.5 mm	1300 mm \pm 1.5 mm	1300 mm \pm 1.5 mm*
Length	As per technical drawing based on DIN 438-2	2800 mm \pm 5 mm	2800 mm \pm 5 mm	2800 mm \pm 5 mm*
Angle deviation	As per technical drawing based on DIN 438-2	\pm 0.3°	\pm 0.3°	\pm 0.3°
Edge defects	As per technical drawing based on DIN 438-2	15 mm	15 mm	15 mm
Surface weight	-	2.68 kg/m ²	5.2 kg/m ²	~ 16.1 kg/m ²

*The projection in the MDF substrate can be up to 10 mm (standard size 2805 mm x 1305 mm)

11 Installation guidelines

NOTICE

Observe the following instructions to avoid causing damage to property.

1. Store and transport large-sized boards only on pallets with level and robust base protection boards over the entire surface (e.g., 18 mm MDF).
2. Always unload/load from the short side in the center. Do not store large-sized boards or preassembled boards in damp rooms and directly on the ground.
3. Do not store large-sized boards or preassembled boards in the open air nor in areas with UV radiation sources.
4. Acclimate preassembled elements prior to installation for at least 24 hours at room temperature (at least 18°C). At delivery temperatures below 5°C, the elements must be acclimated on all sides for at least 48 hours.
5. Do not deposit any objects on large-sized boards or preassembled elements, because this could cause damage.
6. Boards made from RAUVISIO crystal are laminated with an environmentally compatible polyethylene foil for protection during transport and storage. The surface protection remains on the board until it is time to use the finished part at the end customer's premises.
7. RAUVISIO crystal is suitable for vertical indoor use (in particular furniture fronts and backsplash applications). Special applications that go beyond the assured properties described above must be independently tested in relation to the respective application by the fabricator/customer or must be queried with the manufacturer and approval tested as required.
8. For the two-dimensional mounting of RAUVISIO crystal slim (e.g., for a backsplash application), adhesion with polymer hybrid adhesive (SikaBond® AT universal) is recommended. To do so, the substrates to be bonded must be level, clean and free of grease. The instructions of the adhesive manufacturer must also be observed.
9. The adhesive should be applied in beads with a spacing of approx. 50 mm. Expansion joints must be taken into consideration to suit the installation situation. The acclimated material must not be installed at temperatures below 15°C.
10. All materials and components must be checked for damage or defects prior to processing/installation.
11. To avoid stress cracking during processing and installation, interim storage prior to installation is allowed only in the original packaging in frost-free enclosed rooms.
12. The non-edged narrow sides of the wooden substrate must not come into contact with moisture. The cut edges must always be sealed with suitable edging.
13. All drill holes in the wooden substrate boards must be sealed so that they are watertight during installation.
14. Strong chemical substances, e.g., strong solvents, special cleaners (such as drain cleaners, industrial cleaners, etc.) and corrosive abrasive cleaners can cause damage to the surface.
15. The following elements can cause scratches during cleaning: grains of sand or similar, scrubbing utensils/cleaning sponges, etc.
16. Treatment with an anti-static plastic cleaner is an effective measure to minimize static charging.

Do not stand on RAUVISIO crystal products.

Do not cut with sharp objects.

Do not work on the surface with tools.

12 Care and useage instructions for the end user

RAUVISIO crystal is an impact-absorbing and resistant acrylic surface material with an outstanding visual depth effect. It is suitable for vertical indoor use.

The surface has a high-gloss, scratch-resistant and abrasion-resistant coating, avoiding signs of normal domestic wear and tear as far as possible.

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

Most dirty marks and fingerprints can be removed with water and a microfiber cloth. In addition, normal household liquid cleaners can be used to clean the surface.

Strong solvents, special cleaners (e.g., drain cleaners, industrial cleaners), corrosive abrasive cleaners and strong chemical substances can cause damage to the surface. Remove stubborn dirt with a soft sponge, commercially available plastic cleaners or cleansing milk (without any abrasive agents).

Do not use any abrasive cleaning sponges with scouring pads (e.g., Scotch Brite, pot scourers, etc.) or brushes. If too much force is exerted, they can cause scratches.

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.

The product is resistant to all household chemicals, substances and disinfectants. Extended exposure to corrosive substances can leave marks or damage the material. The following table shows the chemical resistance to common substances. The testing of chemical resistance to any other substances that are not listed in this table is the responsibility of the user.

Substances	RAUVISIO crystal polished		RAUVISIO crystal natural	
	T	A	T	A
Acetic acid	16 h	5	16 h	5
Citric acid	16 h	5	16 h	5
Ammonia water	16 h	5	16 h	5
Ethyl alcohol	16 h	5	16 h	5
Red wine	16 h	5	16 h	5
Beer	16 h	5	16 h	5
Cola	16 h	5	16 h	5
Coffee	16 h	5	16 h	5
Black tea	16 h	5	16 h	5
Black currant juice	16 h	5	16 h	5
Evaporated milk	16 h	5	16 h	5
Water	16 h	5	16 h	5
Petrol	16 h	5	16 h	5
Acetone	16 h	5	10 s	5
Ethyl-butylacetate	16 h	5	10 s	5
Butter	16 h	5	16 h	5
Olive oil	16 h	5	16 h	5
Mustard	16 h	5	16 h	5
Onion	16 h	5	16 h	5
Disinfectants	16 h	5	16 h	5
Cleaning agent	16 h	5	16 h	5
Cleaning solution	16 h	5	16 h	5

T Exposure time

A Requirement as classification code to DIN EN 12720:2009-07

h Hour(s)

s Second(s)

m Minute(s)

Assessment according to DIN EN 12720 (07/2009)

Chemical durability	Result
5	No visible change
4	Just noticeable change in gloss or color
3	Slight change in gloss or color; the structure of the test surface is not changed
2	Heavy marks visible; the structure of the test surface is however largely undamaged
1	Heavy marks visible; the structure of the test surface is changed
0	Test surface severely changed or destroyed

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