
RAUVISIO CRYSTAL AND RAUVISIO CRYSTAL SLIM

Technical information

This Technical Information Publication – “RAUVISIO CRYSTAL AND RAUVISIO CRYSTAL SLIM” – is valid from September 2018 onwards.

Upon publication it supersedes the validity of the previous Technical Information F20600 EN (status December 2016).

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1 INFORMATION AND SAFETY NOTES

Validity

This Technical Information publication is valid worldwide.

Latest version of the Technical Information

For your own safety and in order to ensure correct application of our products, please check regularly whether an updated version of this Technical Information is already available.

You can obtain the current version of the document from your local dealer, your REHAU sales office or you can download it from www.rehau.com/ti.

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 instructions



Legal notice



Important information



Information on the internet



Your advantages

Intended use

RAUVISIO products may only be configured, installed and operated as described in this technical information. Any other use is deemed to be outside the intended scope of application.

Suitability of the material

Our currently valid Technical Information publication must be observed for the processing, installation and use of RAUVISIO crystal and RAUVISIO crystal slim. Our Technical Information publications are based on laboratory values and experience gained up to the date 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 its duty to properly and competently assess this material and its assembly as to their suitability for the respective conditions of the object and for the intended purposes.

Forwarding of information

It is essential to ensure that your customers, including end customers, are informed about the necessity to observe the current Technical Information publication as well as the care and usage instructions for RAUVISIO crystal and RAUVISIO crystal slim.

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 glass laminates and resell the laminated boards: Please inform your customers of the need to follow the current Technical Information and make this available to them.

Note for fabricators of pressed glass laminate boards: Please ensure that at least the installation guidelines (chapter „15 Installation guidelines – Summary“) and the care and usage instructions (chapter „16 Care and usage instructions for the end user“) are handed over to your customers and to fabrication and installation companies.

Safety instructions and assembly manuals

Please observe the directions provided on the packaging, accessories and installation instructions as well as the handling instructions enclosed with the goods.

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 centre and professional association must be strictly observed. These always take priority over the instructions and recommendations given in the Technical Information.

Always use safety equipment such as

- Gloves
- Protective goggles
- Ear protection
- Dust mask

Adhesives and additional tools

Observe the safety regulations for the adhesives used and ensure that they are strictly observed.

Keep ancillary working materials, e.g. alcohol-based cleaners and other highly flammable substances, only in safe and well ventilated places.

Ventilation / extraction, production dust

Ensure good ventilation and extraction around the processing machines.

If production dust is inhaled, provide fresh air and in the event of symptoms seek medical advice.

Industrial health and safety and disposal

The products RAUVISIO crystal and RAUVISIO crystal slim are harmless to the environment. The dust created during processing 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 and RAUVISIO crystal slim does not present a specific risk of explosion.

Disposal code in accordance with the Waste Catalogue 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 behaviour

Because they are composed of acrylic and styrene copolymer, RAUVISIO crystal and RAUVISIO crystal slim have favourable fire behaviour and they are classified as being normally combustible in accordance with DIN 4102-B2. 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.

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.

2 RAUVISIO CRYSTAL – THE GLASS LAMINATE

2.1 Product description

Whether in the kitchen, in the bathroom or in the living room, glass is widely used nowadays in furniture design. Especially for furniture fronts, glass is a popular material due to its high-quality appearance and feel. However, this also involves a certain amount of production work.

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



Fig. 2-1 RAUVISIO crystal for surfaces with a glass visual 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 complete



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).

2.2 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.

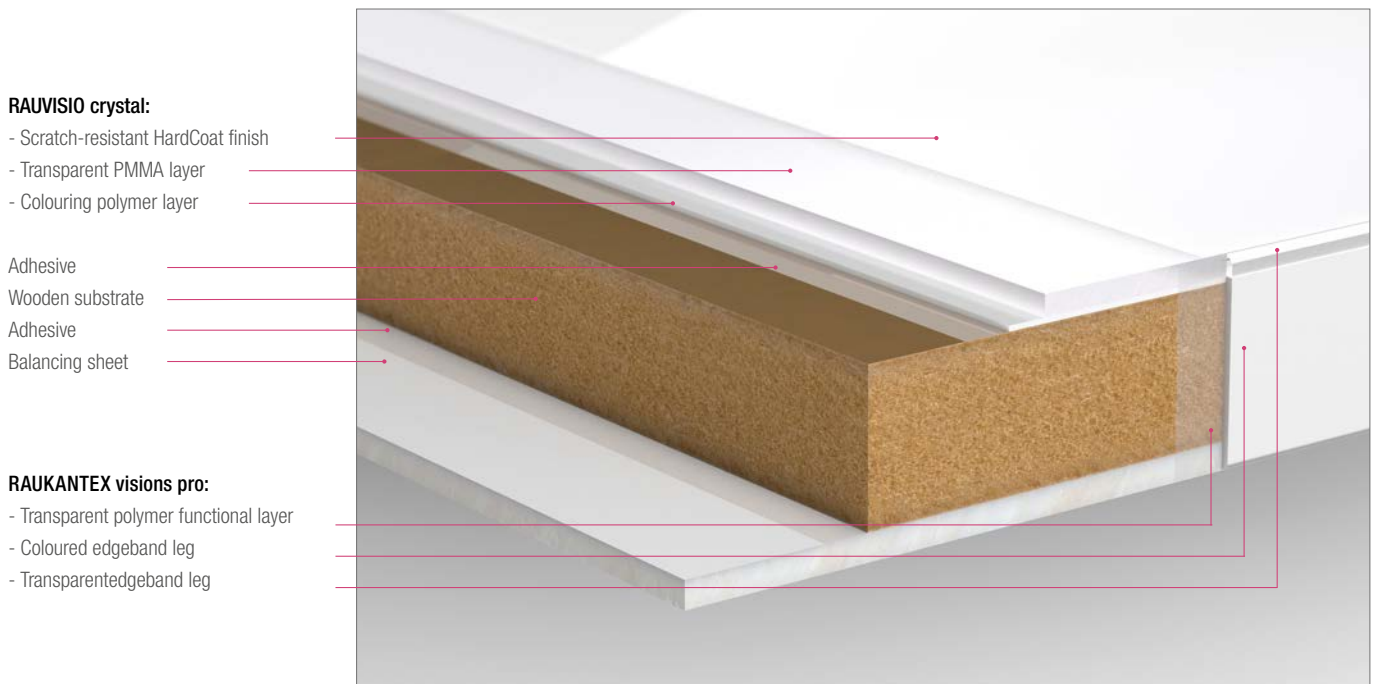


Fig. 2-2 RAUVISIO crystal composite with RAUKANTEX visions pro edgeband

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 and must only be removed after installation .
Glass laminate	Material thickness 2.0 mm	
	Scratch-resistant HardCoat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, high-gloss or matt, satin-finished glass visual effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass look Colour 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.
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 match to the surface & edgeband	Colour-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).

2.3 Individual components

All RAUVISIO crystal components can be ordered individually:

Laminate (high-gloss/matt)

RAUVISIO crystal is a 2 mm thick polymer glass laminate. Thanks to the combination of materials, RAUVISIO crystal creates a real-glass visual 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)

For the surface-wooden substrate system solution a technically coordinated balancing sheet has been developed, which is ideally designed on the basis of the technical properties of the sandwich structure. Thanks to the 2.0 mm thickness of the 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.

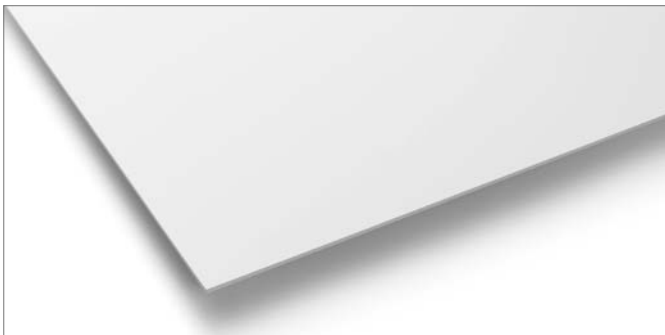


Fig. 2-4 Balancing sheet RAUVISIO crystal in the colour bianco

Edgeband collection

For RAUVISIO crystal, REHAU offers two perfectly coordinated edgeband designs. Thanks to the top transparent leg, RAUKANTEX visions pro in the duo design look creates the visual effect of a fine glass plate. RAUKANTEX color pure/pro, available with a high-gloss or matt finish, creates the glass visual effect 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 large format (1,300 x 2,800 mm).



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

2.5 The finished component RAUVISIO crystal complete

The REHAU surface configurator (www.rehau.com/boards; for US: www.rehau.allmoxy.com) can be used to have individually preassembled one-off fronts made in zero-joint quality from the RAUVISIO crystal components and matching edgebands.



Fig. 2-7 Finished component RAUVISIO crystal complete in the colour bianco



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.



Quality
Usability
Regular Product
Surveillance

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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 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: Colouring layer

RAUVISIO crystal slim does not require a substrate board, i.e. the transparent and colouring layers 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 has 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
- Easy cleaning with water and a microfibre 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. For horizontal applications, consultation with REHAU's Applications Engineering Department or approval for the respective purpose on your own authority is required.

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.**

3.2 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 colouring layers together make up the final thickness of 4 mm.

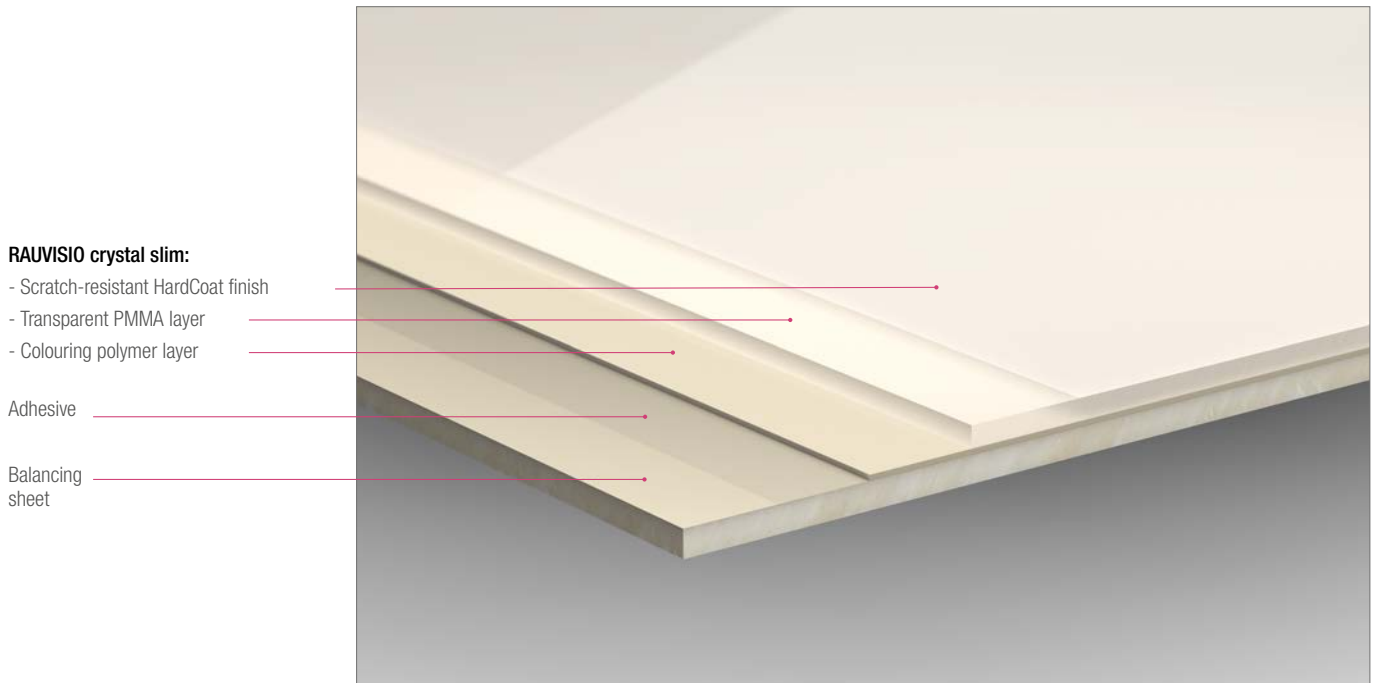


Fig. 3-2 RAUVISIO crystal slim system solution

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 and must only be removed after installation.
Glass laminate	Scratch-resistant HardCoat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, high-gloss or matt, satin-finished glass visual effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass look Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion
Balancing sheet	design match to the surface	Colour-coordinated balancing sheet, which on account of its properties keeps the overall system in balance in varying climatic conditions.

4 RAUVISIO CRYSTAL– THE MAGNETIC VERSION

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

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

4.1 Product structure of RAUVISIO crystal magnetic composite

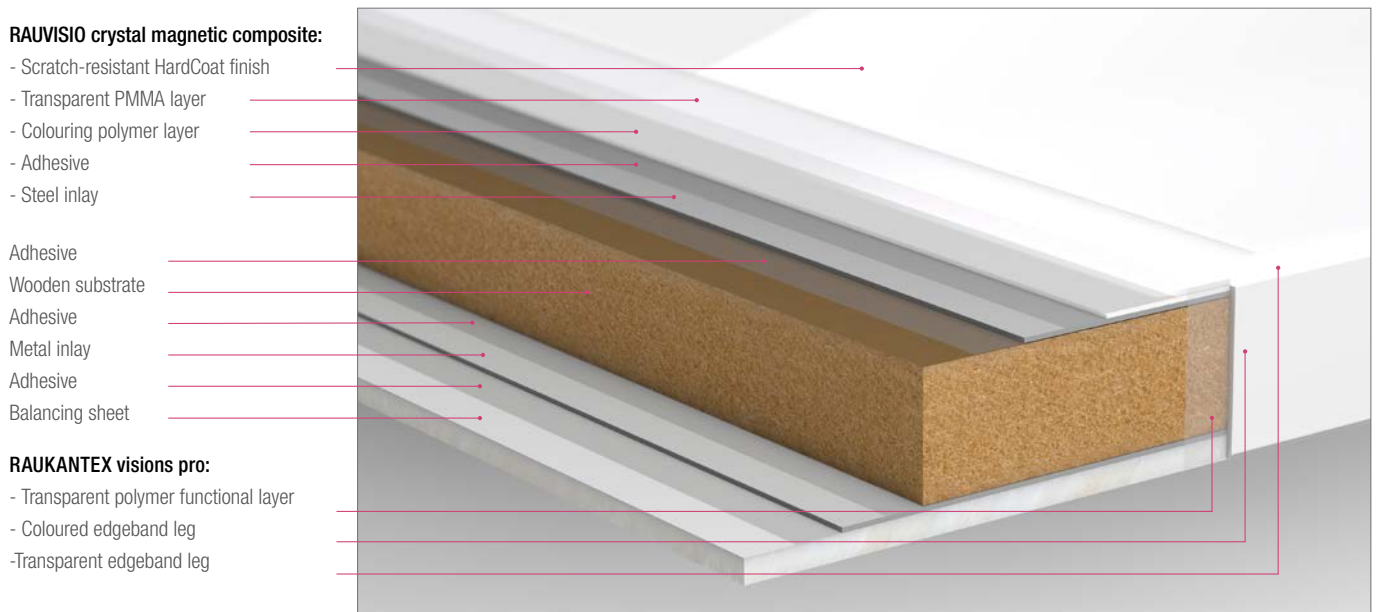


Fig. 4-1 RAUVISIO crystal magnetic composite system solution

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 and must only be removed after installation .
Glass laminate	Material thickness 2.0 mm	Increases chemical, abrasion and scratch resistance, achieving a reflective, high-gloss or matt satinized glass visual effect
	Scratch-resistant HardCoat finish	
	1.6 mm: Transparent PMMA layer	Depth effect, glass look
	0.4 mm: Colouring polymer layer	Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion to the substrate material Approval tested adhesive systems in conjunction with the respective components are used for the respective application.
Steel inlay	Steel 100 µm	The thin 100 µm inlay ensures the magnetic effect.
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.
Metal inlay	Aluminium 50 µm	The thin 50 µm inlay ensures the balance of the overall system.
Balancing sheet	Material thickness 2.0 mm design match to the surface & edgeband	Colour-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).

4.2 Product structure of RAUVISIO crystal magnetic slim

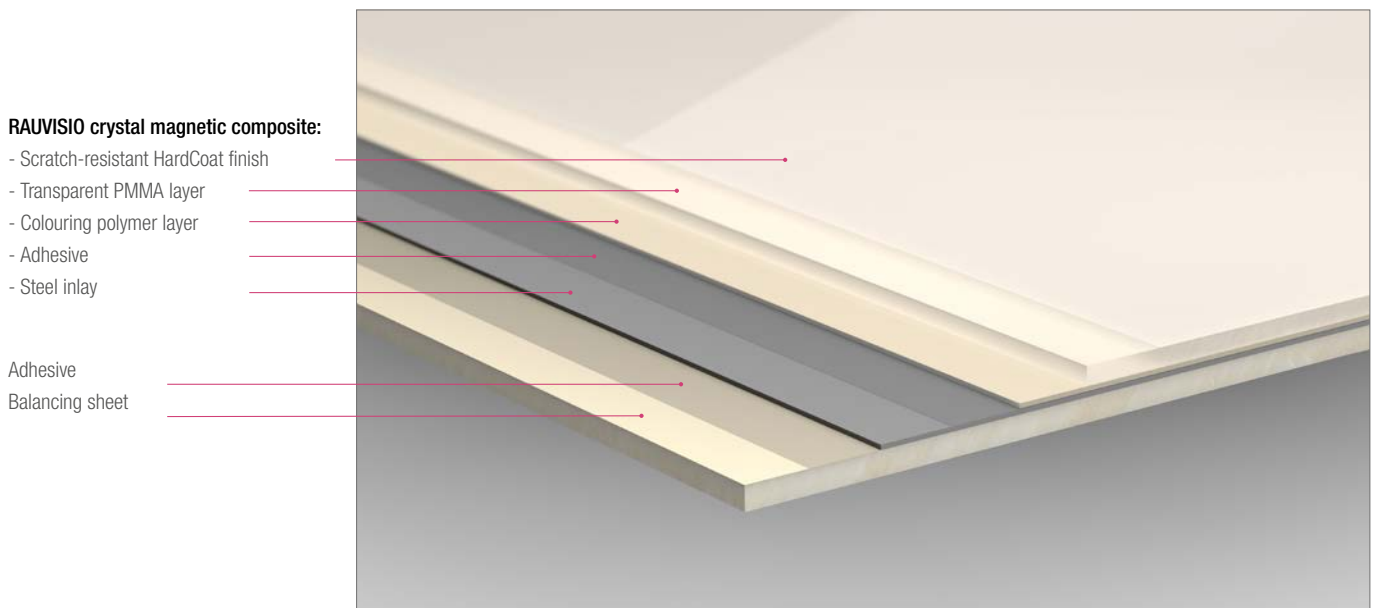


Fig. 4-2 RAUVISIO crystal magnetic slim system solution

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 not be removed until after installation.
Glass laminate	Scratch-resistant HardCoat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, high-gloss or matt, satin-finished glass visual effect
	1.6 mm: Transparent PMMA layer 0.4 mm: Colouring polymer layer	Depth effect, glass look Colour effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion
Steel inlay	Steel 100 µm	The thin 100 µm inlay ensures the magnetic effect.
Balancing sheet	design match to the surface	Colour-coordinated balancing sheet, which on account of its properties keeps the overall system in balance in varying climatic conditions.

5 RAUVISIO CRYSTAL MIRROR – THE POLYMER MIRROR

The polymer mirror is offered in the following product variants:

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

5.1 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 critical for the overall quality of furniture components.



Fig. 5-1 RAUVISIO crystal mirror complete – edged component

RAUVISIO crystal mirror:

- Scratch-resistant HardCoat finish
- Transparent PMMA layer
- Metallization on the rear side

- Adhesive
- Wooden substrate
- Adhesive
- Balancing sheet

RAUKANTEX color pure/pro:

- Transparent polymer functional layer
- Coloured edgeband leg

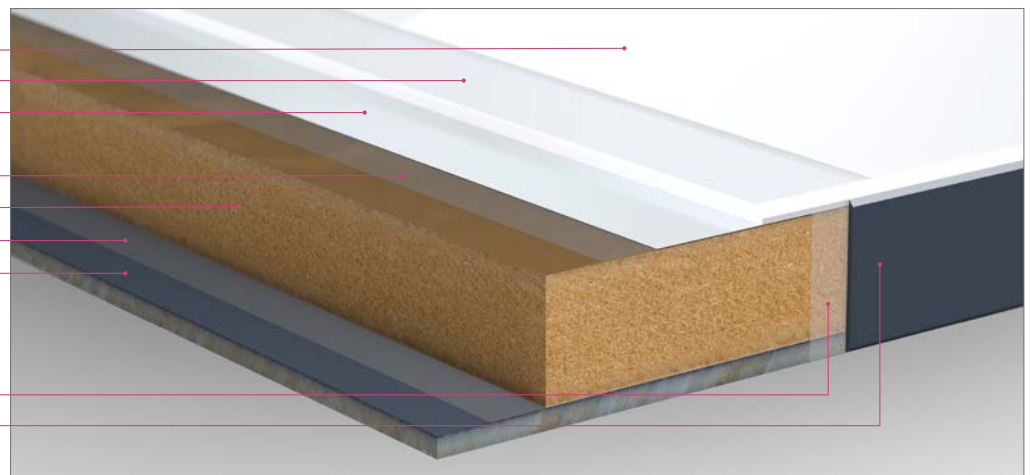


Fig. 5-2 RAUVISIO crystal mirror composite system solution with edgeband RAUKANTEX color pure/pro

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 not be removed until after installation.
Mirror laminate	Material thickness 2.0 mm Scratch-resistant HardCoat finish	Metallized on the rear side Increase in the chemical resistance as well as the abrasion and scratch resistance, achievement of a reflective, glossy or matt 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.
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 match to the edgeband	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).

5.2 Product structure of RAUVISIO crystal mirror slim

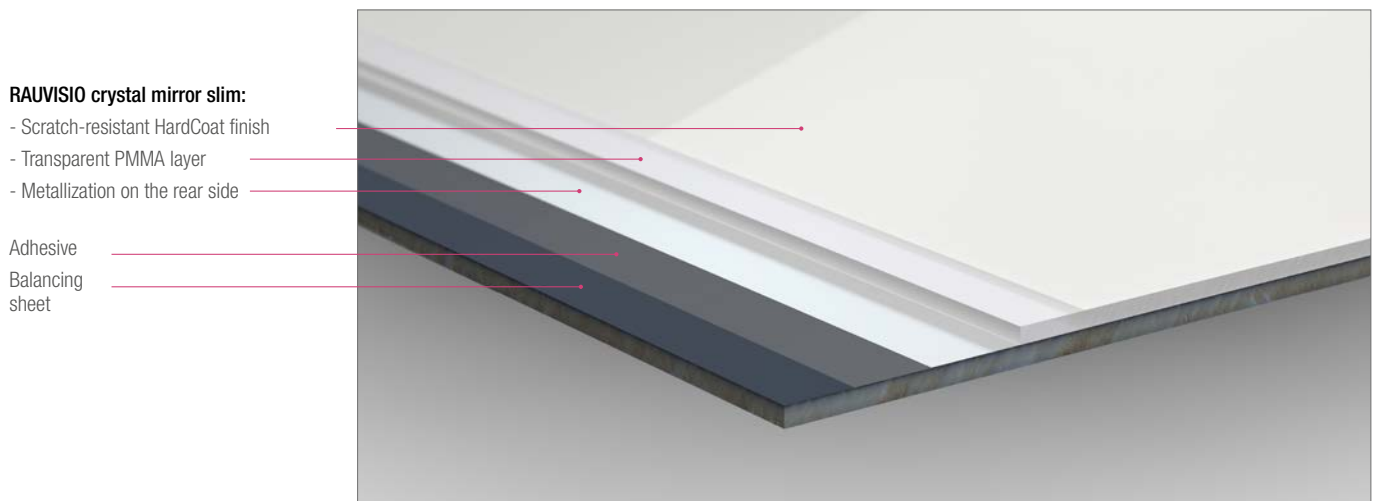


Fig. 5-3 RAUVISIO crystal slim mirror system solution

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 not be removed until after installation.
Mirror laminate	Material thickness 2.0 mm	Metallized on the rear side
	Scratch-resistant HardCoat finish	Increase in the chemical resistance as well as the abrasion and scratch resistance, achievement of a reflective, glossy or matt satinized glass visual effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion to the substrate material Approval tested adhesive systems in conjunction with the respective components are used for the respective application.
Balancing sheet	Material thickness 2.0 mm	Coordinated balancing sheet, which – on account of its properties – keeps the overall system in balance in varying climatic conditions.

5.3 Product features of RAUVISIO crystal mirror

The visual effect is comparable with glass mirrors, the high transmission factor of the acrylic material being decisive. On account of the material thickness and composition, optical faults can occur – the condition of the substrate and the adhesive system used are decisive in this case.



The material must not be exposed to temperatures > 50 °C. Otherwise there is a danger of surface impairments occurring and/or the planarity of the structure not being able to be guaranteed.

Adhesion

If the individual laminate is going to be bonded, PU 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.

Machining

Like all other RAUVISIO crystal products, RAUVISIO crystal mirror can be machined with the parameters described in this Technical Information publication (see chapter „11 PROCESSING OF RAUVISIO CRYSTAL“).

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 upwards**.

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 (see chapter „14 Technical data“).

6 RAUVISIO CRYSTAL VARIO – INDIVIDUAL COLOURS

6.1 Product structure of RAUVISIO crystal vario composite

RAUVISIO crystal vario is an addition to the standard collection to incorporate universal non-standard colours for small purchase quantities to meet customers' individual needs. RAUVISIO crystal's surface properties and depth effect remain completely intact despite the modified product structure.

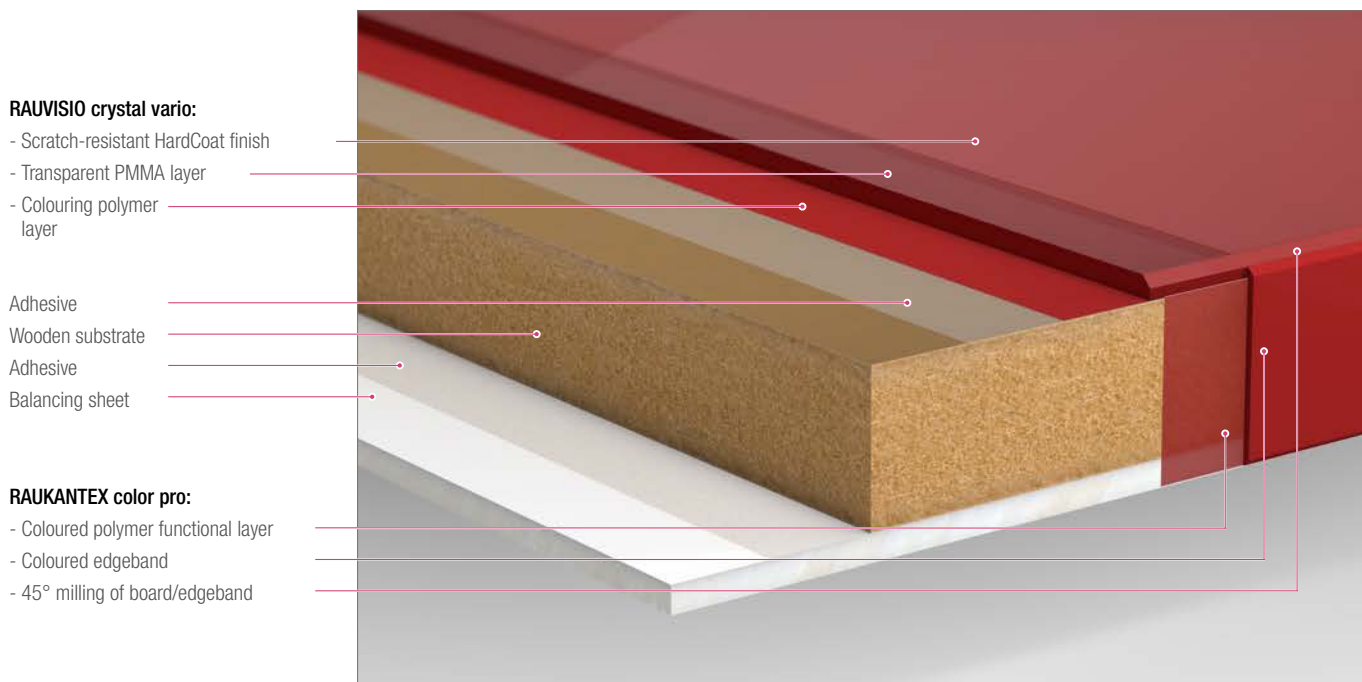


Fig. 6-1 RAUVISIO crystal vario composite system solution with RAUKANTEX color pro edgeband

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 and must only be removed after installation.
Glass laminate	Material thickness 2.0 mm	
	Scratch-resistant HardCoat finish	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, high-gloss or matt, satin-finished glass visual effect
	Transparent PMMA layer Colouring polymer layer	Depth effect, glass look Colour 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.
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	Coordinated balancing sheet from the standard colour collection, which – on account of its properties – in varying climatic conditions prevents the whole component from becoming warped beyond the customary tolerances of the wooden board materials industry (one-sided warming of the component must be avoided).

6.2 Product structure of RAUVISIO crystal vario slim

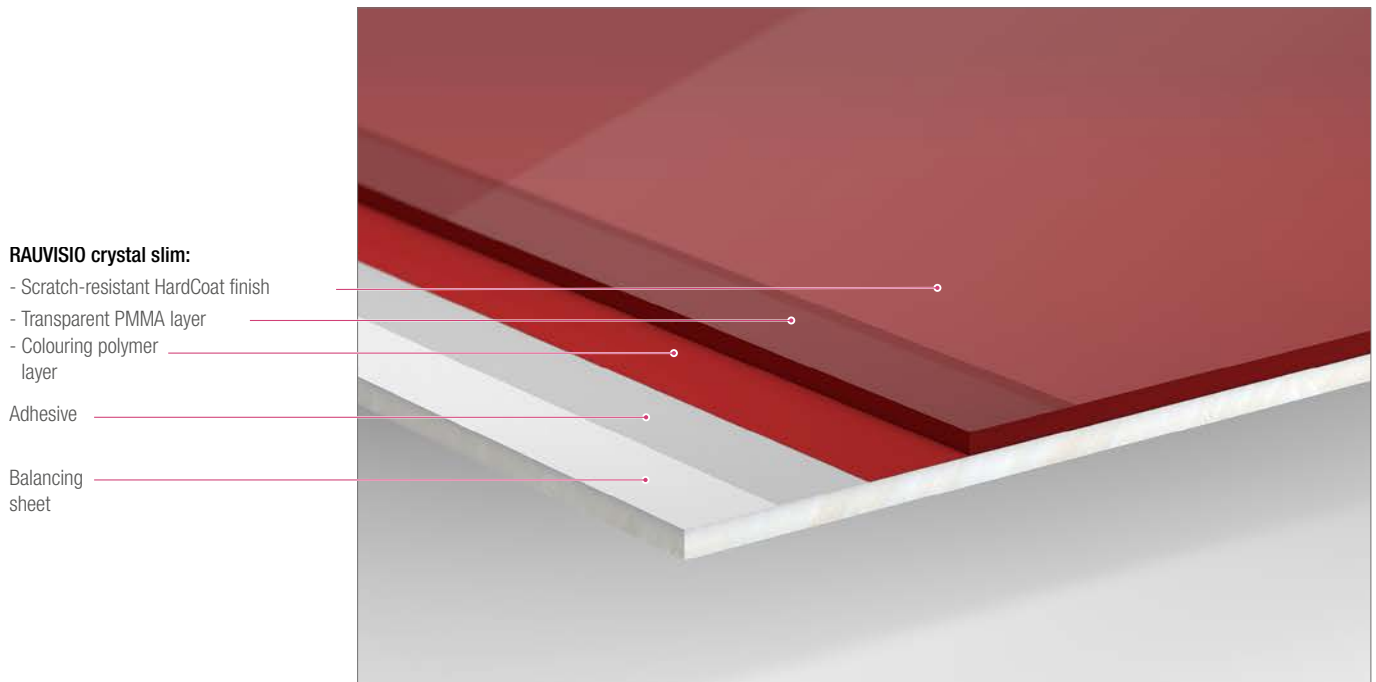


Fig. 6-2 RAUVISIO crystal vario slim system solution

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 and must only be removed after installation.
Glass laminate	Material thickness 2.0 mm	Increase in the chemical resistance, abrasion resistance and scratch resistance, achievement of a reflective, high-gloss or matt, satin-finished glass visual effect
	Scratch-resistant HardCoat finish	
	Transparent PMMA layer Colouring polymer layer	
Surface adhesive	PU surface adhesive	Ensures a secure adhesion
Balancing sheet	Material thickness 2.0 mm	Coordinated balancing sheet from the standard colour collection, which – on account of its properties – keeps the overall system in balance in varying climatic conditions.

7 RAUVISIO CRYSTAL DECOR – DECOR VARIANTS

RAUVISIO crystal decor is offered as a stylish decor in addition to plain colours and provides a decor layer by lining the reverse side of the transparent laminate. RAUVISIO crystal's surface properties and depth effect remain completely intact when the layer is added.

7.1 Product structure of RAUVISIO crystal decor composite

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

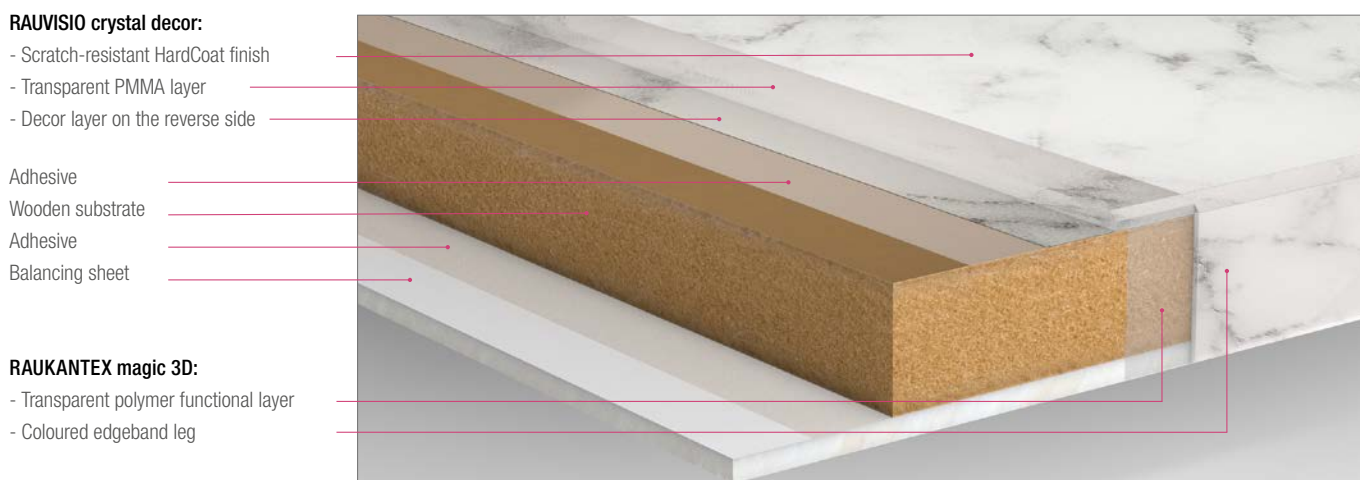


Fig. 7-1 RAUVISIO crystal decor composite system solution with RAUKANTEX Magic 3D edgeband

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 and must only be removed after installation .
Glass laminate	High gloss: Material thickness 2.0 mm	Increasing the chemical resistance as well as the abrasion and scratch resistance, achieving a high-gloss or matt appearance
	Matt: Material thickness 1.5 mm	
	Scratch-resistant HardCoat finish	
	Transparent PMMA layer	Depth effect, glass look
	Decor layer on the reverse side	Decor effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion to the substrate material. Approval tested adhesive systems in conjunction with the respective components are used for the respective application.
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	High gloss: Material thickness 2.0 mm	RAUVISIO crystal 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).
	Matt: Material thickness 1.5 mm	

7.2 Product structure of RAUVISIO crystal decor slim



Fig. 7-2 RAUVISIO crystal decor 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 and must only be removed after installation .
Glass laminate	High gloss: Material thickness 2.0 mm	Increasing the chemical resistance as well as the abrasion and scratch resistance, achieving a high-gloss or matt appearance
	Matt: Material thickness 1.5 mm	
	Scratch-resistant HardCoat finish	
	Transparent PMMA layer	Depth effect, glass look
	Decor layer on the reverse side	Decor effect
Surface adhesive	PU surface adhesive	Ensures a secure adhesion
Balancing sheet	Material thickness 2.0 mm	RAUVISIO crystal balancing sheet, which on account of its properties keeps the overall system in balance in varying climatic conditions.

7.3 RAUVISIO crystal decor product features

RAUVISIO crystal decor impresses with the same depth effect and glass visual effect as RAUVISIO crystal. A decor layer applied as a reverse-side lining to a transparent laminate is a welcome addition to the RAUVISIO crystal decor selection.



The material must not be exposed to temperatures > 60 °C! Otherwise there is a danger of surface impairments occurring and/or the planarity of the structure not being able to be guaranteed.

Adhesion

Different types of adhesive can be used to affix individual laminates – from PVAC glue and contact spray adhesive through to PUR adhesive. The fabricator should try out the adhesive and make checks themselves to test the quality of the bond.

The use of hybrid polymer adhesives is recommended for the adhesion of RAUVISIO crystal decor slim.



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

Machining

Like all other RAUVISIO crystal products, RAUVISIO crystal decor can be machined with the parameters described in this Technical Information publication (see chapter „11 PROCESSING OF RAUVISIO CRYSTAL“). When cutting RAUVISIO crystal decor, you must ensure that cutting pressure is applied in such a way that it runs through the decor and into the substrate and does not cause tears or detachment.

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 upwards**.

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 (see chapter „14 Technical data“).

8 TRANSPORT, PACKAGING AND STORAGE

8.1 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.

If you do not do this, the freight carrier's transport insurance is not liable!

8.2 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.

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 chapter „9.1 Unpacking“.
- When transporting the RAUVISIO crystal boards in horizontal position, deflection is not allowed.

8.3 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.

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 (see diagram). This is necessary to prevent bending or warping.

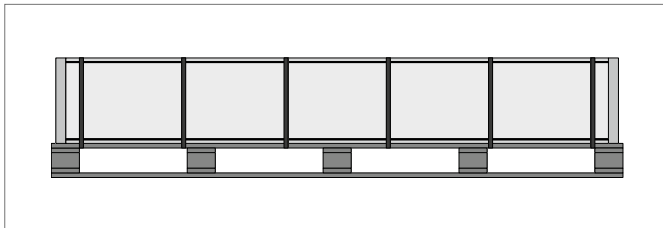


Fig. 8-1 Pallet packaging

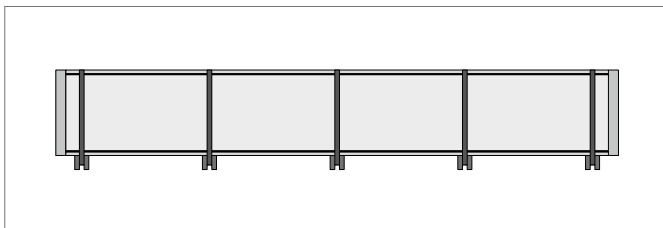


Fig. 8-2 5-batten storage

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

The material must be stored in closed, heated rooms where the room temperature is between 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 acclimatise to room temperature for at least 48 hours.

Prior to returning opened or partially used packaging units to storage it must be ensured that the cover plate is replaced 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 acclimatized 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 60 °C. Ensure that the storage/transport temperature does not exceed 60 °C.

9 BEFORE PROCESSING

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

Open the packaging with scissors.

Do not use a sharp blade!

1. Cut the packaging tape.
2. Cut the protective film away from sheets.
3. With 2 people, or 4 suction cups carefully lift the top board vertically, without sliding it, or carefully remove carton if individually packed.
4. Debris which can get trapped between the individual boards must be completely avoided or removed.

9.2 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 (see chapter „9.4 Documents for material warranty“):

- 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)
- 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 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 colour across production batches should be checked prior to processing.

A colour 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.

9.3 Conditioning



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

Processing is also performed at room temperature.

It must be ensured, particularly in the colder months, that all boards are acclimatized. If there is incomplete acclimatization of the laminate due to the stack size, the duration should be adjusted accordingly.

9.4 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.

10 PRE-REQUISITES FOR PRESSING

10.1 Processing individual laminates

In addition to the pressed version, RAUVISIO crystal can also be purchased as an individual laminate. In this case, however, suitable technical equipment must be ensured in order to be able to achieve sufficient quality.

10.1.1 Substrate material

Wooden substrates, lightweight boards or composite material substrates are suitable for use as a substrate for RAUVISIO crystal. In order to achieve the optimal surface finish it is critical that the correct substrate is selected for the intended application.

In principle the substrate should be chosen so as to ensure sufficient flatness. This is the basis for the planarity of the pressed end product.

Another factor for a good appearance is the surface structure of the substrate. A delicate surface structure favours a smooth and therefore high-quality surface.

MDF is the recommended substrate here. It has a very fine surface structure from which only very small fibres are pulled out during processing (sawing, milling, drilling, adhesion.) By comparison the quantity of fibres pulled out from a chipboard, OSB, or plywood panel is much greater leading to the chance that the unevenness will be visible through the laminate thereby "distorting" the surface. With chipboard, particles can drop out of the middle layer that then leave indentations in the laminate. This hazard does not arise when using an MDF substrate.



An MDF substrate is recommended for a high-quality surface finish.

10.1.2 Adhesive

In addition to selecting the suitable substrate, selection of the correct adhesive is important to ensure board quality. Single component PU hotmelts have become increasingly common in recent years. These adhesives can be easily applied to the board or substrate 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 bonding results are decisively influenced by the machinery parameters, ambient parameters and the materials used. These influencing parameters must be coordinated with one another in a sample production batch.

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

Ideally matched to all components while also offering the widest possible processing window, RAUVISIO FLAT-LAM PUR is recommended by REHAU for high-quality adhesion (for details see Technical Information F20602 RAUVISIO FLAT-LAM PUR').

Use of the adhesive RAUVISIO FLAT-LAM PUR is required in order to uphold warranty claims.



Ensure adequate adhesion/final 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.

For non standard applications bond strength should be independently checked and verified.

10.1.3 Balancing sheet

To ensure a homogeneous board that remains dimensionally stable when exposed to variations of temperature and moisture a balancing sheet is required. Without a balancing sheet, RAUVISIO crystal is very likely to show signs of warping.

Generally, a symmetrical structure is optimal to avoid warping. A special polymer balancing sheet has been developed that is similar to glass laminate in thickness and composition and thus has similar properties under varying climatic conditions, which minimizes warping. This must be used in general.

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 Applications Engineering Department. Please contact your REHAU sales office about this.

11 PROCESSING OF RAUVISIO CRYSTAL

11.1 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 whilst 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.

11.2 Preparing the individual laminates

11.2.1 Pre-treatment of the laminate and substrate

RAUVISIO crystal is provided with a Corona pre-treatment on the coloured 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.

11.2.2 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.

11.3 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.

11.3.1 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.

11.3.1.1 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.

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

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

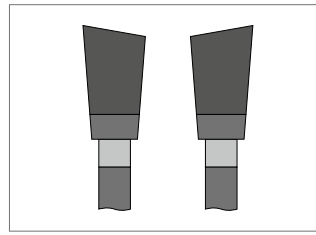


Fig. 11-1 Alternate tooth

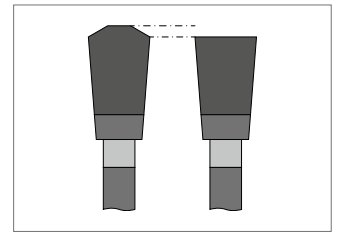


Fig. 11-2 Trapezoid-flat

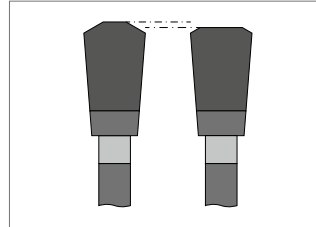


Fig. 11-3 Trapezoid-flat-chamfer

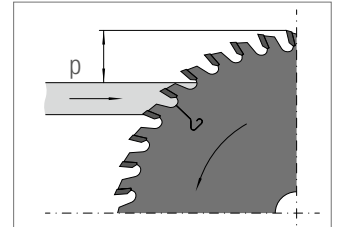


Fig. 11-4 Saw blade projection

Panel sizing saws

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 blade. 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 polyethylene protective foil-facing down.

The saw blade projection must be set depending on the diameter:

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

11.3.1.2 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.

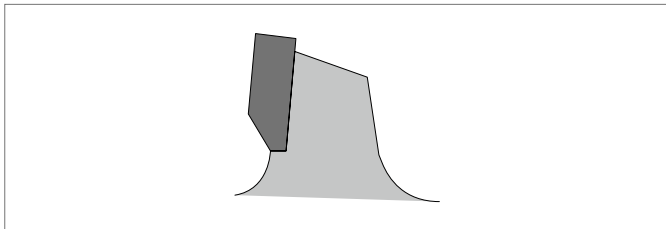


Fig. 11-5 Negative rake angle

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.

11.3.2 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

11.3.3 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.



Fig. 11-6 RAUVISIO crystal slim with surface milling

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

To create a matt 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 – pre-milling/reaming of the geometry with carbide cutters is necessary. Attention must be paid here to the fact that 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).



Fig. 11-7 RAUVISIO crystal slim with 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 (matte) or MCD polishing end-mills (high-gloss), 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. The compatibility of the systems used must be ensured with the aid of test samples. If you have any queries, your local Rehau sales office and the Rehau Applications Engineering Department will provide you with support.



Fig. 11-8 RAUVISIO crystal mirror slim backlit



Fig. 11-9 RAUVISIO crystal backlit

11.3.4 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 queries, your local Rehau sales office and the Rehau Applications Engineering Department will provide you with support.



Fig. 11-10 RAUVISIO crystal curved

11.3.5 Drilling

Dowel hole drilling in the polymer glass 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) through-hole 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 “12.5 Drilling” on page 39.

11.4 Machining RAUVISIO crystal magnetic



The machining of RAUVISIO crystal magnetic can produce sparks.

This must always be taken into account in the removal of the chips. It is also crucial to wear appropriate personal protective equipment and to observe the applicable fire protection regulations.

On account of the steel inlay, carbide-tipped tools with soldered cutting edges and a drawing cut are suitable for machining RAUVISIO crystal magnet. Diamond-tipped tools must not be used as the steel inlay can cause damage to the cutting edges.

The metal inlay generally leads to reduced tool life. Sizing with a saw cut, avoiding an additional milling operation, is therefore preferred.

Sawing

A carbide-tipped (HW) saw blade is recommended for cutting. A flat tooth with a chamfer has proved its worth.

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

Milling

A turnable end-mill insert and a solid carbide-tipped (HW) spiral finishing cutter with alternating twist Z2+2 is recommended.

Recommended speed: $n = 14000 - 18000 \text{ rpm}$
Recommended feed: $v_f = 5 - 10 \text{ m/min}$
Recommended cutting direction: Up-cut

To achieve the longest possible tool life, axis Z of the tool (oscillation) must be continuously adjusted during the milling. The degree of oscillation depends on the milling cutter used, but should be adjusted so that a uniform wear pattern results. The degree of oscillation should be between 5 – 6 mm. Cutting close to the final dimension is recommended, enabling a relatively low chip removal during milling and thus minimizing the wear. The use of two tools is recommended. One tool pre-mills the workpieces, while the second tool then mills the contour.

Drilling

A carbide-tipped dowel drill bit or a through-hole drill bit is recommended. To make clean entry/exit holes, it is recommended that the material is machined from both sides.

Recommended speed: $n = 4500 \text{ rpm}$
Recommended feed: $v_f = 1 - 1.5 \text{ m/min}$



Concealed hinge holes must be made with standard tools on account of the aluminium inlay on the rear side. No special tools are needed.

This relates only to the rear side of the component!

11.5 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.

11.6 Edging with RAUKANTEX pro

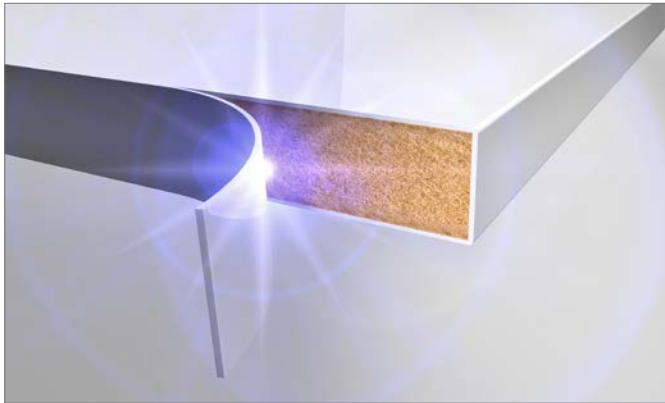


Fig. 11-11 Zero joint edging – RAUKANTEX visions pro

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 instructions/TLV RAUKANTEX pro (PMMA and ABS) as well as RAUKANTEX visions/magic 3D (V-M 25/01) and RAUKANTEX color. 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.

Optimum machine parameters, tool configuration and cutting speeds are to be established individually prior to production using a series of samples; the REHAU Applications Engineering Department will be happy to support you with this.

11.6.1 The 'duo solution' – RAUKANTEX visions pro



Fig. 11-12 RAUKANTEX visions pro

The RAUKANTEX visions pro 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).

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

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

When processing RAUKANTEX visions pro, it is particularly important to ensure sufficient application pressure in the narrow, transparent area of the edgeband onto the transparent area of the glass laminate, as well as synchronization between the edgeband infeed and the board feed, in order to obtain optimal transparency of the glass visual 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.

Transparent edgeband leg

Glass look in the edgeband area

Combined with RAUVISIO crystal surface

Possible variants:

Greenish colouring of the transparent edgeband leg for an improved glass visual effect



Fig. 11-13 Improved glass effect due to subtle colouring in the transparent area

Coloured edgeband leg

Design match to the surface and balancing sheet

Covering of the substrate board, balancing sheet and coloured 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.



Fig. 11-14 Variation through RAUKANTEX decorative designs



The 'DUO solution' RAUKANTEX visions pro 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.

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 **allround zero-joint edgebanding** and therefore perfect complete cladding of the wooden substrate with plastic elements.

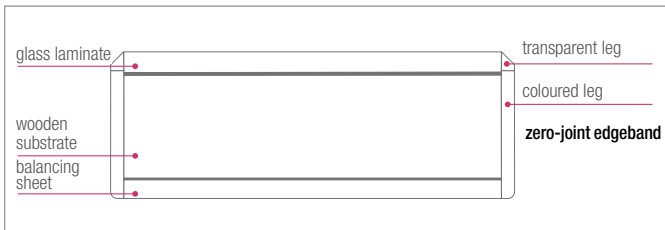


Fig. 11-15 RAUVISIO crystal – pressed system component with RAUKANTEX visions pro

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

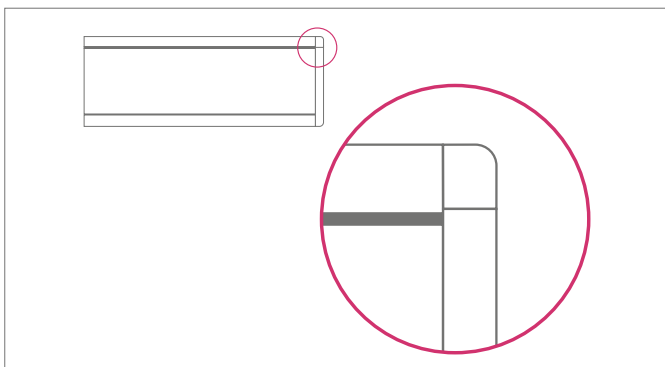


Fig. 11-16 RAUVISIO crystal polished radius

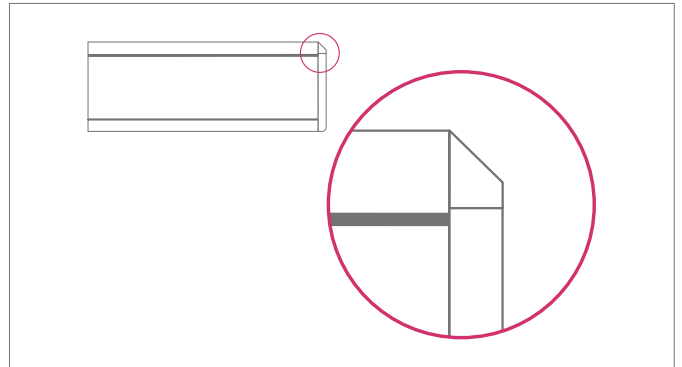
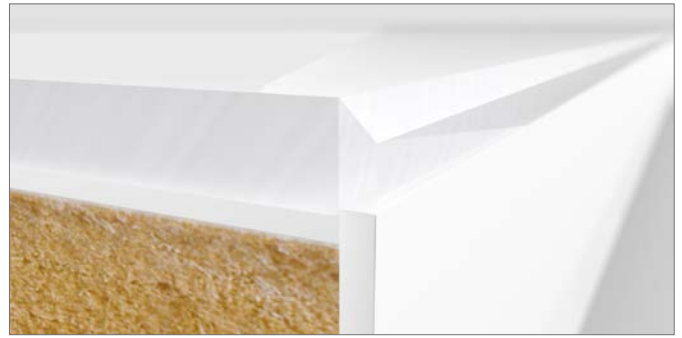


Fig. 11-17 RAUVISIO crystal 45° chamfer

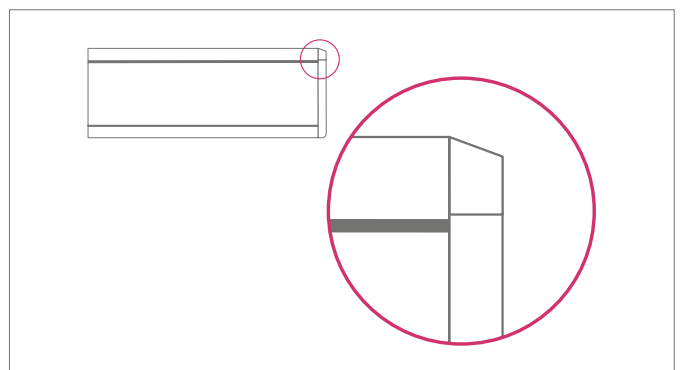


Fig. 11-18 RAUVISIO crystal 20° chamfer

To create a uniform gloss the PMMA edgeband material can be polished to a high gloss to match the laminate and edgeband surface, as a result of which a homogeneous, high-gloss surface appearance is created.

11.6.2 The 'uno solution' – RAUKANTEX color pure/pro



Fig. 11-19 RAUKANTEX color pure/pro high gloss version

An alternative to duo edgebanding with RAUKANTEX visions pro is edging with a colour-coordinated RAUKANTEX color (referred to below as the '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 gloss 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 an adhesion promoter primer edgeband, the uno solution remains an interesting edging option, particularly where zero-joint processing is impossible. The glass visual effect in the edgeband area is most effective when a 45° chamfer is milled on the edgeband and surface, thus revealing the glass laminate.



Fig. 11-20 45° chamfer on the edgeband and surface

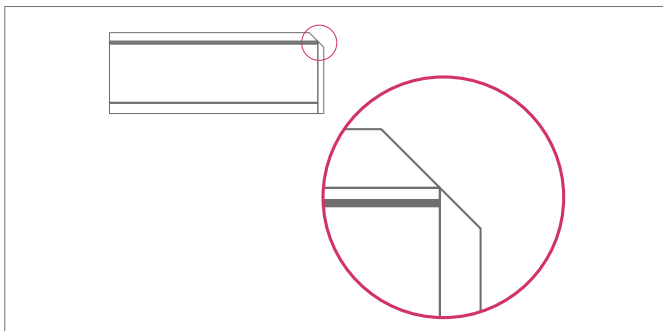


Fig. 11-21 45° chamfer on the edgeband and surface material

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

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 'uno solution' is available through the REHAU Express Collection as the zero-joint edgeband RAUKANTEX color pro with a polymer functional layer as well as the adhesion promoter edgeband RAUKANTEX color pure.

11.7 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.



Fig. 11-22 Laser-edged component

For fronts (nominal size 19 mm with duo edgeband), in collaboration with TÜV Rheinland 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



For the configurator for cuttings and laser-edged components go to www.rehau.com/boards

12 MACHINING ON THE CONSTRUCTION SITE

12.1 Sawing



RRAUVISIO 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.

12.1.1 Circular saw



REHAU recommends the following procedure for machining RRAUVISIO 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

12.1.2 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

12.2 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.

12.3 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

12.4 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

12.5 Drilling



Flexible on-site holes can be drilled easily.

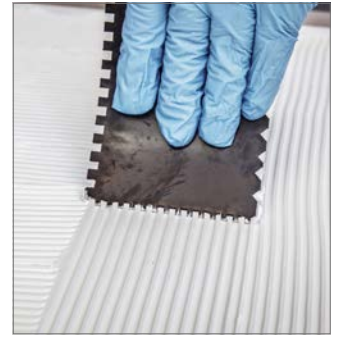
The following recommendations apply for drilling:

- Use a plastic drill bit
- 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 centring 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).

12.6 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.



12.7 Grouting of RAUVISIO crystal slim



- Remove the protective foil after the adhesive has cured



- Grout the joints with a matching coloured silicone



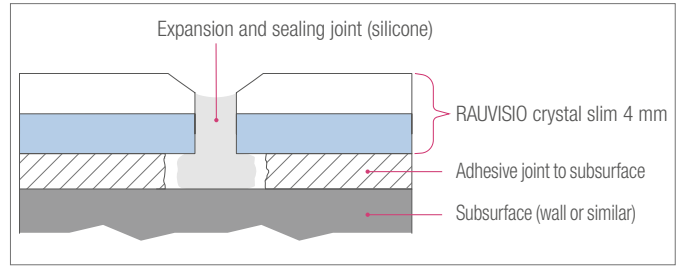
- Screenshot the silicone



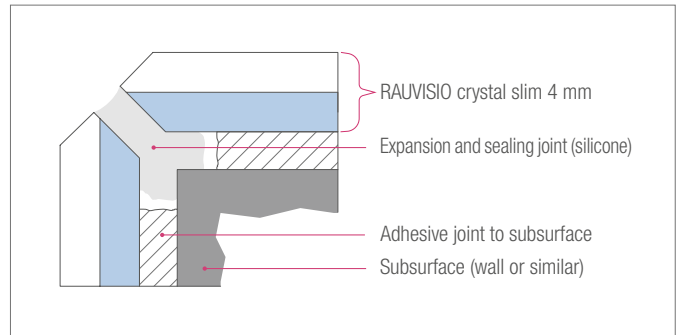
Finished

12.8 Transitions between RAUVISIO crystal slim panels

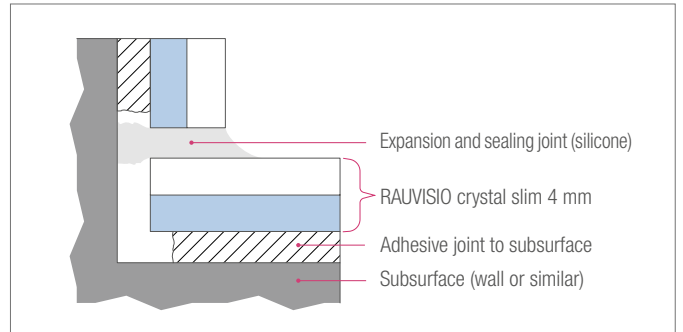
Joint in detail:



Outside corner in detail:



Inside corner in detail:



13 APPLICATIONS 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.

13.1 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 in the production process, using conventional woodworking processes. Whether you are sawing, milling, drilling or edging with matching REHAU edgeband solutions, a complete glass-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.



Fig. 13-1 RAUVISIO crystal as a front application

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



Fig. 13-2 RAUVISIO crystal slim as an infill material

13.2 Backsplash application

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



Fig. 13-3 RAUVISIO crystal as a backsplash

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 chapter „14 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.

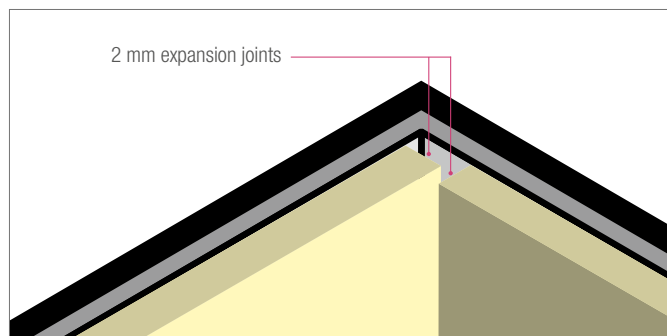


Fig. 13-4 Expansion joints

RAUVISIO crystal is a thermoplastic polymer material and therefore only suitable for maximum surface temperatures of 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.

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

In the event of improper use, e.g. if the hobs are not covered or are not fully covered for long periods when switched on or if there is 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.

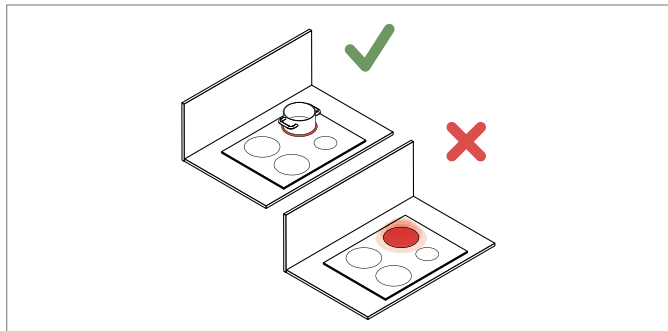


Fig. 13-5 Proper and improper use

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

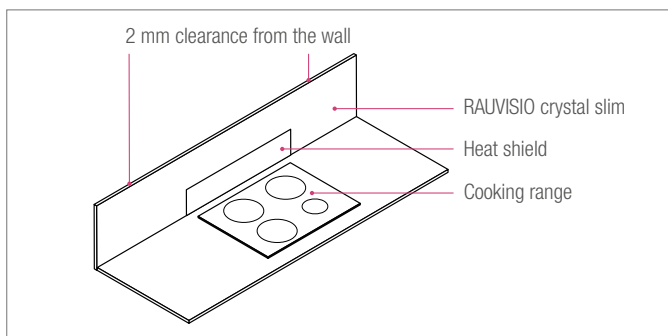


Fig. 13-6 Heat shield and clearance between the back panel – RAUVISIO crystal

For the two-dimensional mounting of RAUVISIO crystal to the back panel, use of the polymer hybrid adhesive Sikaflex® AT Connection 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.

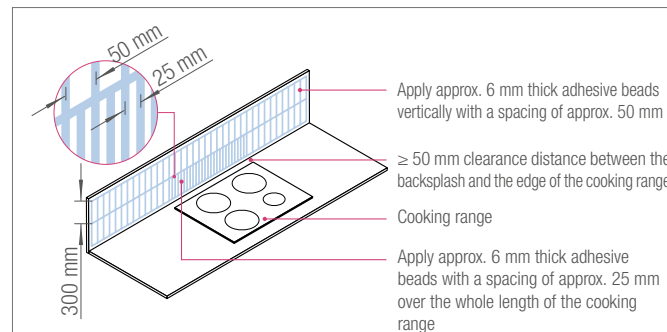


Fig. 13-7 Mounting of RAUVISIO crystal to the back wall

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.

The current guidelines of the Central Federation of the German Construction Industry/Trade Association for Tiling and Natural Stone ("Zentralverbund Deutsches Baugewerbe/Fachverband Fliesen und Naturstein") for the "execution of bonded waterproofing with tiled or panelled coverings in indoor areas" must be observed and complied with to ensure that water cannot penetrate and cause structural damage. 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.

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

13.3 Bathroom and shower wall panelling

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).

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

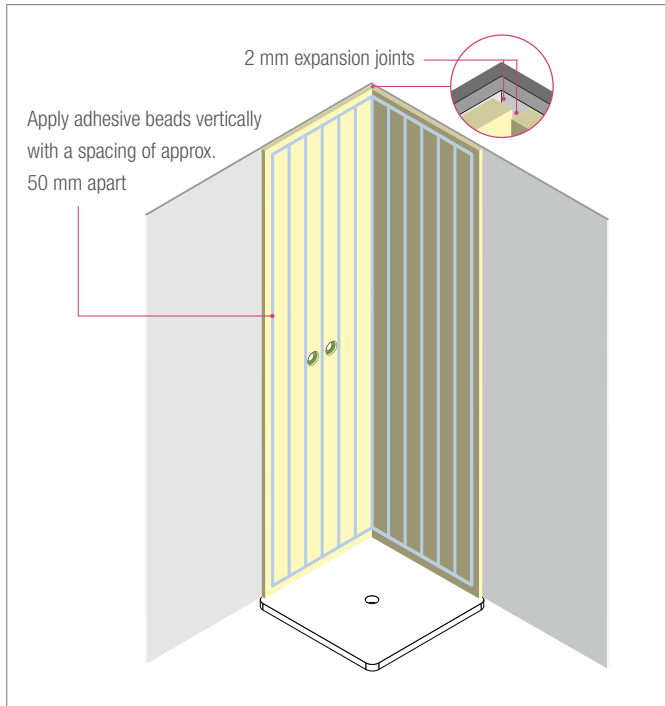


Fig. 13-8 Expansion joints and the mounting of RAUVISIO crystal slim to the wall

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. Sikaflex® AT Connection) 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.

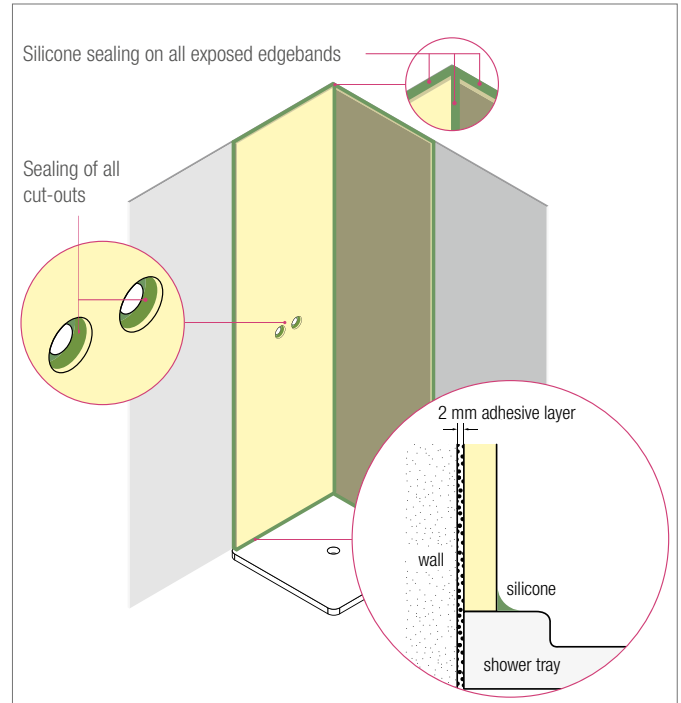


Fig. 13-9 Silicone jointing



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

The current guidelines of the Central Federation of the German Construction Industry/Trade Association for Tiling and Natural Stone ("Zentralverbund Deutsches Baugewerbe/Fachverband Fliesen und Naturstein") for the "execution of bonded waterproofing with tiled or panelled coverings in indoor areas" must be observed and complied with to ensure that water cannot penetrate and cause structural damage. REHAU accepts no liability for damage resulting from improper or unprofessional processing.

14 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.

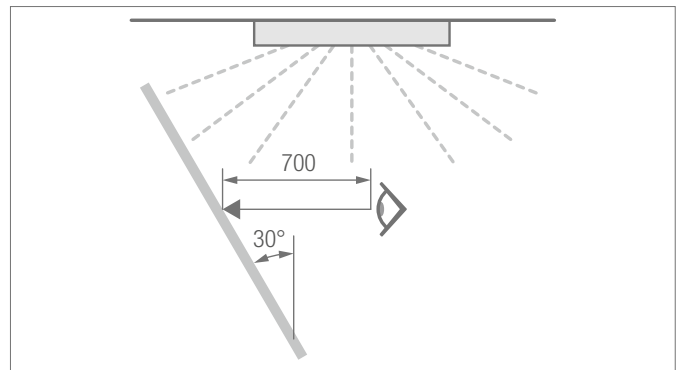
The HardCoat PMMA surface of the glass laminate is protected by a special PE foil that must not be removed until after installation.

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

Visual characteristics	Test standard	Requirements	Test result
Surface gloss level	AMK-MB-009, 09/2010	Measurement with 60° geometry	High-gloss: ≥ 85 GLE Matt: ≤ 6 GLE
Colour/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 the blue scale	\geq level 7
	Assessment according to DIN EN ISO 105 A02	Assessment according to the grey scale	\geq level 4
Surface	AMK-MB-009, 09/2010 based on EN ISO 7823-2 ¹⁾	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

The following boundary conditions apply:

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



¹⁾ This standard applies to the extrusion process only. Downstream steps in the process are not affected.

Surface and colours within tight application-compliant tolerance limits – defined tolerance limits are colour-tone 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 table 'Substances' Page 50
Scratch resistance	DIN 68861 / T4	High gloss: 4C Matt: 4B	Fulfilled
Micro-scratch resistance	DIN CEN TS 16611 (Proc. A/B)	Procedure A: High-gloss/matt: max. 5% Procedure B: High-gloss/matt: 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 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⁾	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

¹⁾ 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.

²⁾ Only RAUVISIO crystal slim

Component tests on the edged component

The scope of supply by REHAU comprises RAUVISIO crystal as of the individual laminate and pressed board with or without edging. The details below relate to the finished edged component pressed by REHAU with RAUKANTEX visions pro. 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 vapour	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 acclimatisation	passed

¹⁾ The component tests refer to the AMK parts specified in the AMK table with the respectively stated status.

Material properties	Test standard	Technical data
Raw density of glass laminate/decor variant	DIN EN 323 DIN EN 323	1.18 kg/dm ³ /decor: 1.19 kg/dm ³ 1.16 kg/dm ³
Raw density of balancing sheet		
Fire behaviour	DIN 4102/1	B 2
Material purity / sand content	Residue on ignition	≤ 1 %
Shore hardness D	DIN ISO 7619-1	91 ± 3
Vicat softening temperature	DIN EN ISO 306 – Meth. B50	≥ 99 °C
Glass laminate & balancing sheet		

An overview of the specific data of RAUVISIO crystal:

Product data	Test standard	Laminate	Slim (4 mm panel)	Composite (pressed board)	Complete (edged component)
RAUVISIO crystal – surface					
Total thickness of 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])				19.0 mm ± 0.4 mm	19.0 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 ¹⁾	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 ¹⁾	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)			

¹⁾ 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 magnetic:

Product data	Test standard	magnetic slim	magnetic composite
Thickness	as per technical drawing based on DIN 438-2	4.2 mm ± 0.2 mm	19.4 mm ± 0.4 mm
Width	as per technical drawing based on DIN 438-2	1250 mm ± 1.5 mm	1250 mm ± 1.5 mm ¹⁾
Length	as per technical drawing based on DIN 438-2	2800 mm ± 5 mm	2800 mm ± 5 mm ¹⁾
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
Surface weight	–	~ 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

¹⁾ The projection in the MDF substrate can be up to 10 mm (standard size 2805 mm x 1255 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 ± 0.1 mm	4.0 mm ± 0.2 mm	19.0 mm ± 0.4 mm	19.0 mm ± 0.4 mm
Width	as per technical drawing based on DIN 438-2	1220 mm ± 1.5 mm	1220 mm ± 1.5 mm	1220 mm ± 1.5 mm	¹⁾ Dimension ± 0.5 mm
Length	as per technical drawing based on DIN 438-2	2440 mm ± 5 mm	2440 mm ± 5 mm	2440 mm ± 5 mm	¹⁾ 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	15 mm
Surface weight	–	~ 2.38 kg/m ²	~ 4.75 kg/m ²	~ 16.1 kg/m ²	~ 16.1 kg/m ²

¹⁾ 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 for RAUVISIO crystal vario:

Product data	Test standard	Laminate vario	vario slim	vario composite
Thickness	as per technical drawing based on DIN 438-2	2.0 mm ± 0.1 mm	4.0 mm ± 0.2 mm	19 mm ± 0.4 mm
Width	as per technical drawing based on DIN 438-2	1010 mm ± 1.5 mm	1010 mm ± 1.5 mm	1010 mm ± 1.5 mm ¹⁾
Length	as per technical drawing based on DIN 438-2	2800 mm ± 5 mm	2800 mm ± 5 mm	2800 mm ± 5 mm ¹⁾
Angle deviation	as per technical drawing based on DIN 438-2	± 0.3°	± 0.3°	± 0.3°
Edge defects	as per technical drawing based on DIN 438-2	15 mm	15 mm	15 mm
Surface weight	–	~ 2.38 kg/m ²	~ 4.75 kg/m ²	~ 16.1 kg/m ²

¹⁾ The projection in the MDF substrate can be up to 10 mm (standard size 2805 mm x 1015 mm)

An overview of the specific data of RAUVISIO crystal decor:

Product data	Test standard	Laminate decor	decor slim	decor composite
Thickness	as per technical drawing based on DIN 438-2	High gloss: 2.2 mm ± 0.2 mm Matt: 1.7 mm ± 0.2 mm	High gloss: 4.2 mm ± 0.3 mm Matt: 3.7 mm ± 0.3 mm	19 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 ¹⁾
Length	as per technical drawing based on DIN 438-2	2800 mm ± 5 mm	2800 mm ± 5 mm	2800 mm ± 5 mm ¹⁾
Angle deviation	as per technical drawing based on DIN 438-2	± 0.3°	± 0.3°	± 0.3°
Edge defects	as per technical drawing based on DIN 438-2	15 mm	15 mm	15 mm
Surface weight	–	High gloss: 2.68 kg/m ² Matt: 2.1 kg/m ²	High gloss: 5.2 kg/m ² Matt: 4.7 kg/m ²	High gloss: 16.1 kg/m ² Matt: 15.1 kg/m ²

¹⁾ The projection in the MDF substrate can be up to 10 mm (standard size 2805 mm x 1305 mm)

15 INSTALLATION GUIDELINES – SUMMARY



Damage to the RAUVISIO surface due to improper handling

Observe the following instructions to avoid causing damage to property.

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).

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

Do not store large-sized boards or preassembled boards in damp rooms and not directly on the ground.

Do not store large-sized boards or preassembled boards in the open air nor in areas with UV radiation sources.

Acclimatize 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 acclimatized on all sides for at least 48 hours.

Do not deposit any objects on large-sized boards or preassembled elements, because this could cause damage.

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.

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.

For the two-dimensional mounting of RAUVISIO crystal slim (e.g. for a backsplash application), adhesion with polymer hybrid adhesive (Sikaflex® AT Connection) 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.

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 acclimatized material must not be installed at temperatures below 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, interim storage prior to installation is allowed only in the original packaging in frost-free enclosed rooms.

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 (RAUKANTEX visions pro or RAUKANTEX color pure/pro).

All drill holes in the wooden substrate boards must be sealed so that they are watertight during installation.

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.

The following elements can cause scratches during cleaning: Grains of sand or similar, scrubbing utensils/cleaning sponges, etc.

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.

16 CARE AND USAGE INSTRUCTIONS FOR THE END USER



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

RAUVISIO crystal is an impact-absorbing and resistant surface material made from acrylic. It is suitable for vertical indoor use.

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



RAUVISIO crystal is easy to clean - most dirty marks and fingerprints can be removed with water and a microfibre cloth. In addition, normal household liquid cleaners can be used to clean the surface.



Fig. 16-1 RAUVISIO crystal is easy to clean



RAUVISIO crystal has an outstanding visual depth effect. The surface has a high-gloss, scratch-resistant and abrasion-resistant coating, avoiding signs of normal domestic wear and tear as far as possible.



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. With 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.

Assessment as per DIN EN 12720 (07/2009)

Chemical durability	Result
5	No visible change
4	Just noticeable change in gloss or colour
3	Slight change in gloss or colour; 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

Substances	RAUVISIO crystal high-gloss		RAUVISIO crystal matt	
	D	Result	T	Result
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
Blackcurrant 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 as per DIN EN 12720:2009-07

NOTES

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