Krion®

Fabricator Manual

PORCELANOSA SOLID SURFACE

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Introduction

In this guide you will find all of the necessary information for processing KRION™ elements correctly and safely. These are the correct procedures for guaranteeing customer satisfaction.

The processing procedures described are those that are recognized in Europe, the USA, Middle East and Africa. These instructions must be followed in order to take advantage of the 10-year SYSTEMPOOL installation guarantee. (See conditions at the end of this manual).

This manual is not intended to be fully comprehensive. Although the information it contains is sufficient for carrying out the majority of your projects, other more advanced processing techniques may exist. Please contact SYSTEMPOOL before attempting any technique that is not described in this manual.

Find out more about KRION™ processing. Contact your KRION™ supplier. SYSTEMPOOL will not accept any liability if these techniques are used with other products.

General Information about KRION™

KRION™ is a new generation of solid surface developed by Systempool, a company belonging to Porcelanosa Group. A material that is warm to the touch with an appearance similar to natural stone, KRION™ is made of two thirds natural minerals (ATH: alumina trihydrate) and a low percentage of high-resistance resins. This composition ensures exclusive characteristics, such as nil porosity, antibacterial properties without the need for any kind of additive, hardness, resistance, low maintenance and an easy-to-clean surface.

KRION™ is worked like wood. This means that the sheets can be cut, joined, and thermoformed to create curved items. KRION™ can be used in the manufacturing process to make cast objects, allowing for the creation of designs and projects that would be impossible with other materials.

SECTORS

All this makes KRION™ the perfect choice as a material for a wide variety of sectors including:

HOUSING: Thanks to its exclusive technical properties and aesthetic qualities, KRION™ is an ideal solution in homes.

DESIGN: KRION™ can be used to make customized products or in made-to-measure projects.

RESTAURANT & CATERING: KRION™ generates a sensation of warmth and comfort, perfect for restaurants of all kinds.

COMMERCIAL PREMISES & BUSINESSES: With its large format, broad design potential and wide selection of colours, KRION™ can be integrated in any setting, regardless of its shape.

APPLICATIONS

The KRION™ range's numerous different series can be used in a wide variety of applications.

PRODUCTS

OUTDOOR WALL CLADDING

INDOOR WALL CLADDING

FURNITURE

TRANSPORT: Its durability, imperviousness, resistance to the elements and to corrosion, and easy adaptability all make KRION™ an unparalleled choice for use in vessels.

PUBLIC & GOVERNMENTAL BUILDINGS: A highly adaptable material, perfect for designing surfaces and products of all kinds or for combining with other materials (ceramic, glass, metal, wood etc.), leading to the creation of settings with a highly distinctive appeal.

HOTELS: Hotel facilities of all kinds can be fitted out with KRION™, from the reception area to hotel rooms, restaurants, spas and gymnasiums.

HEALTHCARE: A warm-looking, seamless, anti-bacterial material that is hygienic, low on maintenance and easily repairable in situ.

RETAIL FURNITURE

KITCHEN COUNTERTOPS

BATHROOM EQUIPMENT

SIGNAGE

Characteristics

Natural

This material is made of two-thirds natural minerals (ATH – aluminium trihydride) and a low percentage of high-resistance resins.

Antibacterial

Resistant to germs & bacteria.
Does not allow the proliferation of germs and bacteria.
Very low volitile organic compounds. (VOCs)
Aseptic.
Suitable for use in operating rooms.

KRION™ does not allow bacteria or fungi to grow or spread. This is an intrinsic property of the composition of the material, without the need for additives to achieve this permanent effect.
This makes it an ideal material for locations with demanding hygiene and sanitation requirements, such as operating theatres or clean rooms.

BPA FREE

GREENGUARD GOLD

ANTI BACTERIA NON ADDITIVES

Ecological

KRION™ is an eco-friendly material, being made up of two thirds natural minerals. Other aspects which make it an environmentally friendly material are that it does not emit volatile organic compounds, and is easy to repair as it can be restored to its original appearance. This reduces the need for replacement, thereby complying with the durability requirements outlined in international environmental guidelines.

100% recyclable

KRION™ is also eco-friendly as it is 100% recyclable. All KRION™ products can be reprocessed and used again in the production cycle, thus avoiding further depletion of natural resources. Certain KRION™ ranges are manufactured with up to 35% recycled materials. Its lifecycle can also be prolonged by creating new products, compositions and designs from pre-used ones.

Characteristics

Ultra-white

KRION™ offers a degree of whiteness over 99.8%, which in combination with its high refraction index provides a pure, brilliant white that is unique among existing solid surfaces.

- Ultra white
- High degree of reflection.
- Natural purity, ultra white.
- High luminosity in the incidence of light.
- White ideal (CIE)
- Great stability of ringtones

Easy to clean

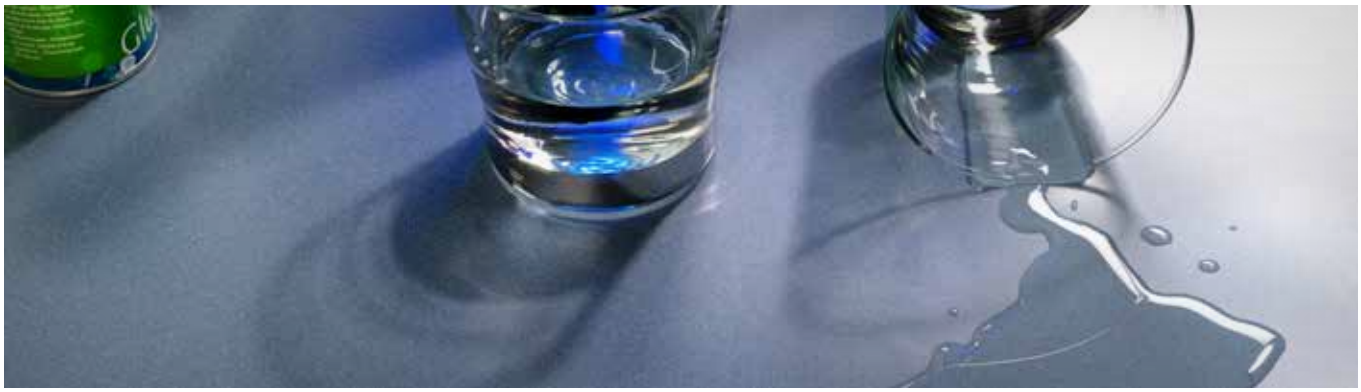
Any normal stain, superficial burn, graffiti or marker pen stain can be removed, immediately returning the surface to its original appearance simply by following the recommended cleaning instructions.

Food grade

KRION™ is a food-grade product and meets US and European standards, meaning it can be used in contact with foodstuffs.

The applying KRION™ is also ideal for rest areas, cafeterias or canteens.

Regulation 10/2011



Highly resistant to chemical attack

The material's resistance to chemical attack makes it ideal for use in laboratories, professional facilities and in all types of applications where it is necessary to easily return the surface to its original condition without effort.

Characteristics

Highly resistant to fire

The KRION™ product range is considered to be practically fireproof as it does not allow fire to spread. It is classified according to the UNE-EN 13501 standard as Euroclass B-s1-d0, where the values indicate:

B Very limited contribution to fire.
s1 Low amount and speed of smoke emission.
d0 No burning droplets or particles are produced.

KRION™ complies with the rule USA Class A:
A Very limited contribution to fire.
Low amount and speed of smoke emission.

It also complies with the German DIN 4102-I, in accordance with which standard KRION™ has a BI fire rating.

KRION™ complies with IMO standards for use on vessels.

Resistant to sunlight

KRION™ is a product that is extraordinarily resistant to deterioration caused by UV radiation. The most stable colour is white; please consult the manufacturer for information on other colours. Inappreciable change in colour (white colours) during 10 years

Specific study of the situation. Orientation,radiation

ΔE colour difference. A formula that determines the change of colour, measures three components: light, blue - yellow and green - red.

Resistant to extreme environments

KRION™ surfaces are capable of withstanding extreme environments, such as marine environments, exposure to steam, immersion in water or freezing conditions, amongst others.

Invisible joints

KRION™ items and sheets can be bonded together using specially formulated KRION™ adhesive for high-resistance seamless bonds.
KRION™ adhesive with an EXCLUSIVE FORMULA
Functionally seamless and hygienic.
Sink integration.

PHYSICAL AND CHEMICAL CONTINUITY.

Resistance of the seam.

- Tensile strength of the seamed KRION™ material: 40 Mpa.
- Tensile strength of the KRION sheet: 50 MPa.
- The PENCENTAGE OF TENSILE STRENGTH of the seamed material in respect to the sheet is 76%.

Characteristics

Freedom of design

KRION™ is a compact next generation mineral which allows curves to be formed - impossible to achieve with other materials. With KRION™ shapes and forms can be freely created, as the sheets may be thermoformed and joins are imperceptible.

Cast complementary items

Due to the exclusive formulation of KRION™, both cast pieces and sheets with imperceptible joins can be manufactured and combined to create sensational seamless designs.

Thermoformable

With KRION™ we can obtain specific curvatures by applying heat and force for a specific period of time.

- Allows for organic designs.
- 3D shapes are possible.
- The minimum permitted radius for thermoforming KRION™ varies depending on the colour.

Backlighting

KRION™ Lux can be used to create backlit spaces. By combining different thicknesses of the material, it is possible to create spectacular lighting effects.

IMPROVED TRANSLUCENT WHITE that does not alter the colour of the light source.

- Stone effect, when no light is applied.
- Uniformed light, when light is applied.
- Flexible design.
- Retro-illuminated logos.
- Different variations of retro-illumination:
  - -retro-illumination with full thickness.
  - -retro-illumination with reduced thickness.
  - -particle retro-illumination.

Otras características

A lightweight material

Because KRION™ has a lower density than other solid surfaces, like high-performance porcelain, artificial quartz or natural marble, it is easier to handle, for instance in the creation of countertops and more lightweight furniture, without relinquishing all the other properties of this solid surface.

Compressive strength

A compression test is a test used to determine a material's resistance or capacity to withstand a certain load without it breaking or becoming deformed. Thanks to its high compressive strength, KRION™ has a compressive performance on a par with stone. These values can be used by designers and/or architects to calculate the design parameters for structures.

Non porous

KRION™ is a non-porous material and so it prevents the build-up of bacteria. This makes it ideal for places with strict health and hygiene conditions, such as operating theatres or clean rooms.

Bending strength

Bending strength is a combination of tensile and compressive strength. This type of load can deform materials by making them sag. Many solid materials cannot withstand high loads and they crack. In contrast, KRION™ has a high bending strength. Thanks to the high bending strength of KRION™, it is easier to transport and it can be used to create aesthetically pleasing overhanging sections and surfaces with higher safety guarantees than other materials.

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Low thermal conductivity

Thermal conductivity is a physical property, determining a material's capacity to transmit heat. The lower the thermal conductivity, the higher the material's insulative capacity. Using KRION™ on walls or other surfaces contributes to the energy efficiency of rooms or façades.

Anti-static

Static electricity is a build-up of electrical charges on the surface of a material, sometimes generated by friction with another material. Many materials are classified according to their electrical resistivity. KRION™ is rated as being anti-static and very close to insulative, according to the ESD (Electrostatic Discharge Association).

Resistant to impacts

KRION™ has the highest capacity to absorb impacts of all solid surfaces. In impact tests using large-diameter balls (324 g) dropped from a height of 1.9 metres, it withstood ten consecutive impacts without breaking, demonstrating its very high resistance.

Sound insulation

Thanks to its intrinsic physical properties - a seamless, low-density material of varying thicknesses with no pores -, KRION™ helps to insulate noise. This is due to its density, nil porosity, different thicknesses, and lack of seams. More specifically, if the noise level is reduced by 10 decibels, the human ear hears just half the resulting intensity. KRIONTM can reduce the noise level by up to 14 decibels.

Formats 4

Details of the size of the sheets and different bowls can be found in the KRION™ 2016 General Catalogue and on our website: www.krion.com

General tips before beginning a work project 5

5.1- Preparation and installation tips.

Check that the pre-installation is suitable for the project to be carried out, making sure that:

The entrances to the installation area are large enough to manoeuvre the material, checking doors, hallways, lifts, elevators and staircases. This will condition the way that work is carried out.

The indicated measurements are correct. Templates should be used as a way of gathering data. These are useful when carrying out work.

The spirit levels, set squares and other levelling tools are suitable for installing KRION™.

The installation substrates (walls, ceiling, etc.) are suitable for the type of work being carried out. They must all be completely flat and level.

Check the position of the seams, making every effort to locate them in the least visible points. Take into account the recommendations contained in this manual about positioning seams and strengthening them.

Also take into account and check the following elements:

Plugs and sockets.

Doors and windows.

Gas and water pipes

Occupational safety and work conditions

6.1- Health and safety conditions.

We recommend that KRION™ installers work according to the instructions contained in this Guide and respect applicable Occupational Health and Safety legislation.

Safety instructions:

1. For your own safety, please read the instructions for all tools and take all necessary precautions.

2. Use tools with earth connections.

3. Keep the working area clean and tidy.

4. Keep visitors and children away from the working area.

5. Do not use excess force with tools.

6. Always use the right tool.

7. Wear suitable clothing. Loose clothing and elements such as necklaces or bracelets can be dangerous if they become trapped in machinery.

8. Always wear safety goggles or a suitable face mask when working, ear protection, safety boots, gloves and all other recommended safety equipment.

6.1- Health and safety conditions.

9. Use clamps to hold the sections you are working on in place whenever possible.

10. Make sure all tools are kept in good working order.

11. Use the recommended accessories.

12. Take steps to ensure that tools cannot be started up accidentally.

13. Do not step on tools.

14. Check all damaged components and repair immediately.

15. Never leave tools unattended.

16. Regularly check tools and machinery as per the manufacturer's instructions.

17. If you are taking medication, check with your doctor and/or chemist to see if it may have any adverse effect on your work (causing sleepiness, lack of attention, nervousness, etc.). If it does, avoid using tools and machinery.

18. Do not use tools and machinery under the influence of drugs or alcohol.

Occupational safety and work conditions

6.1- Health and safety conditions.

19. Make sure all drill bits and saws are kept sharp.

20. Keep all adhesives away from heat sources.

21. If you use a forklift, make sure it is kept in good working order and follow all safety instructions.

22. Do not allow children to enter the workshop.

6.2- Safety when applying the adhesive.

Use latex gloves to prevent it coming into contact with the skin.

Avoid contact with the eyes by using safety goggles.

The peroxide in the catalyser is corrosive to human body tissues.

Do not swallow the adhesive. If accidentally swallowed, drink two glasses of water and immediately call the National Toxicology Institute (91 562 0420). Keep the container. Do not induce vomiting

If this occurs, wash for at least 10 minutes under running water and then go to the nearest hospital.

6.3- Working conditions.

1. The optimum environmental temperature in workshops is 18º C, since at lower temperatures the adhesive will take longer to catalyse.

2. Before starting work, the sheets should be stored at a stable temperature for at least 12 hours to allow them to stabilise.

3. The working areas must have good lighting conditions.

4. In the area where KRION™ is bonded in workshops, keep dust and waste matter to a minimum since it might affect the quality of any resulting seams.

5. Dust and cut-offs must be removed using a vacuum cleaner.

6. Work benches where KRION™ is bonded must be totally level.

7. The KRION™ sheets must be stored in an area where they cannot be damaged.

Occupational safety and work conditions 6

6.4- Recommendations for use.

Always:

- It is important to make sure that elements made of KRION™ can always dilate freely.
- Always leave a space of at least 1 mm per linear metre to allow the material to dilate and contract.
- Do not fasten KRION™ mechanically to other surfaces (with screws, nails, staples, rigid adhesives etc).
- Use flexible adhesives (we recommend Butech P-404) to adhere KRION™ to other surfaces (polyurethane sealant, polyurethane foam, silicone, etc.).
- Always round off the inside and outside corners, edges and reinforcement strips, as this is where the greatest stresses are placed on the acrylic materials, the most common cause of breakage.
- Always sand the edges to remove any nicks or cuts.
- The KRION™ sheet must always be attached to the substrate using a flexible adhesive.

Never:

- Screw anything on to the KRION™ elements.
- Cut the KRION™ elements with a jigsaw.
- Bond KRION™ elements using adhesives other than those supplied by SYSTEMPOOL.
- The seams must not coincide with heat sources.
- Do not attach the KRION™ sheet to underlying boards without openings if there are any heat sources nearby.
- Do not handle KRION™ with dirty hands, especially when bonding sections.

Tools 7

7.1- Tools and equipment.

In general, the type of machinery used for carpentry and cutting marble is suitable for processing and working with KRION™.

Handling and installation are equally or even more important in obtaining a high quality level in projects made using KRION™.

Using machinery with the right power and suitable quality will ensure obtaining the best results, essential for this type of work. SYSTEMPOOL recommended Festool tools.

FESTOOL

Basic tools and machinery for processing KRION™:

Circular saw

Manual circular saw

Tools

7.1- Tools and equipment.

Milling machine/manual milling machine

Fret saw

Drill

Circular sander

Portable vacuum cleaner

Carpentry vice

Clamps

Oven and membrane press

Tools

7.1- Tools and equipment.

Vertical panel saw

Additional materials:

Spirit level

Ruler

Cyanoacrylate adhesive

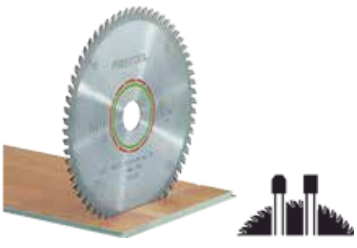
7

Hot wax pistol

Sanding disc

Milling bits

Cutting discs



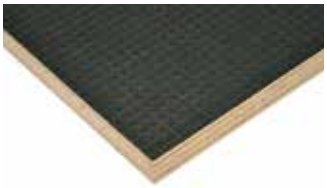
Tools

7.1- Tools and equipment.

Wood blocks

Wooden boards for templates

Material to make supporting frames



Silicone

P-404 sealant (Butech)

7

Pencil

Ruled notebook

Chisel

Sanding block

Tools

7.1- Tools and equipment.

Denatured alcohol

Dremel drill

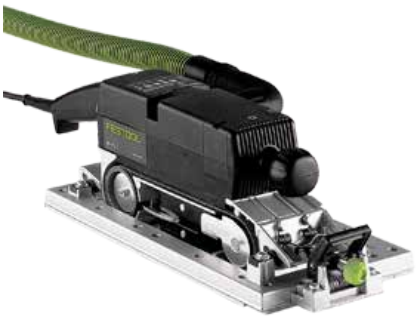
Trestles

Plane

Roll of paper

White cotton cloths (coloured cloths can leave traces of pigment in the seam) or paper

Band sander



3-way clip

Tools

7.2- Safety equipment.

Safety goggles

Protective footwear

Strong gloves

Back support

Ear protection

Protective dust mask

Helmet (for building sites)

Inspection on reception of the material

Although the sheets, bowls and adhesives are verified during manufacturing and before being dispatched, when you receive KRION™ in your workshop you must check that:

- There are no splits, cracks or chips.
- There are no scratches.
- The colour of each sheet is uniform.
- The colour is uniform on different sheets of the same colour.
- There are no stains (contamination).
- The sheets and bowls do not have holes, chips, grooves or pores.
- The particles are distributed evenly (in the Royal and Granite series).
- The real measurements coincide with the nominal measurements.
- The sheets are of a uniform thickness.
- The sheets do not have any deformations or buckling.
- The adhesives are not leaking and have not expired.
- The labels correspond to the product that has been delivered.

If any faults or defects are found in the goods received, immediately contact the corresponding branch to report the incident.

- SYSTEMPOOL will evaluate the situation and decide if it is necessary to replace the goods.
- SYSTEMPOOL will not replace or compensate the cost of products that have already been processed, nor the manufacturing costs or loss of income resulting from the delivery of non-compliant materials.

Slight variations in colour between batches are acceptable and should not be considered as defects.

The manufacturing process for KRION™ means that there may be slight variations between production runs. This is more likely between bowls and sheets, as they are produced in different ways.

For this reason, make sure you use sheets from the same batch for the same project.

Before starting a project, check that the colour of the different sheets to be used coincides.

8.1- Product inspection.

Bowls

Place the bowl face down on top of a completely flat surface. The sink must be in full contact with the surface. This will prove that the sink is completely flat.

This ensures a completely perfect fit in the KRION™ sheet.

Keep the 'instructions of use' leaflet that comes with each bowl so that it can be given to the customer/user once the product has been fitted.

Sheets

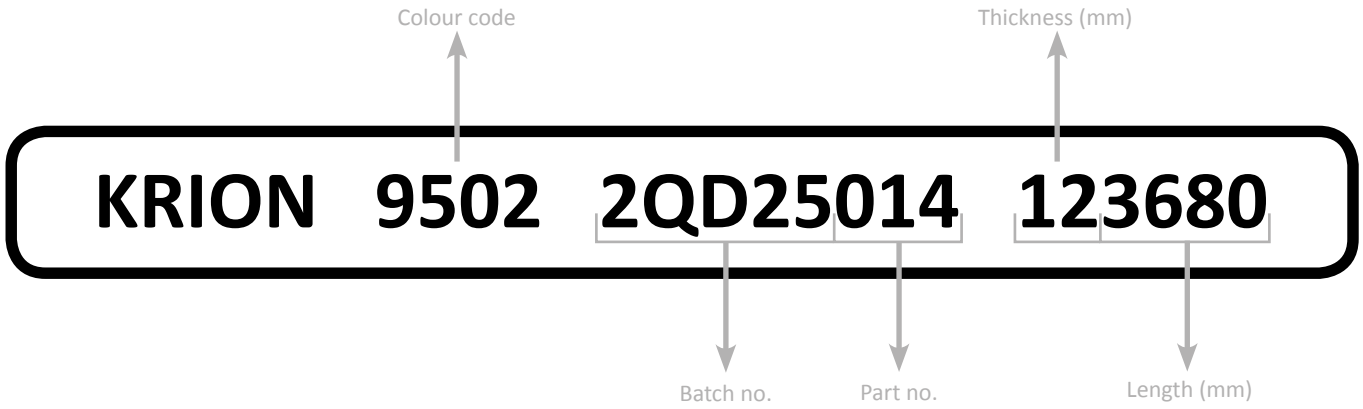
The KRION™ sheets must be inspected immediately after reception: inform your corresponding branch if you find any defects.

Batches 9

9.1- Batch number.

Different production runs of KRION™ of the same colour may have slight variations in tone due to environmental changes, different batches of raw materials, variations in the production process or other unforeseen circumstances.

To ensure the maximum similarity in colour between different sheets, whenever possible always use sheets with the same batch number (preferably successive).



Even when very slight differences do exist, they will be difficult to spot, even by trained specialists.

If you need to bond several sheets in the same project, inform the person taking the order. They will make sure that the sheets delivered are from the same batch.

Sheets from different batches can be used when there is a change of angle (corner).

9.2- How to conceal different batches in the same work project.

There are different ways of concealing the use of different batches of KRION™ in the same project:

- **Large panelling:** when it is impossible to complete a project using the same batch due to its size, use corners and changes in height to change the batch. The way light shines on surfaces with different angles means that small variations in colour will be invisible.

- **Panelling in general:** use the expansion joints to change the batch. The change of continuity will mean that no change in the colour will be visible.

- **Panelling in general II:** do not bond the sheets together; although part of the beauty of KRION™ lies in being able to make large, seamless sections, leave a tongue and groove space between the sheets to break up their visual continuity.

- **Recessed bowls:** it is more likely that there will be differences in tone between sheets and bowls. Leave the edge with an angle of 15º to conceal the change in colour. If this does not work, try with 30º.

  This is more likely to happen with colours with chips, as different production batches may have different concentrations and distributions

Transport & storage 10

The KRION™ sheets must be inspected immediately after reception: inform your corresponding branch if you find any defects.

To unload a pallet of KRION™ from a truck, use a hand pallet forklift with sufficient load capacity.

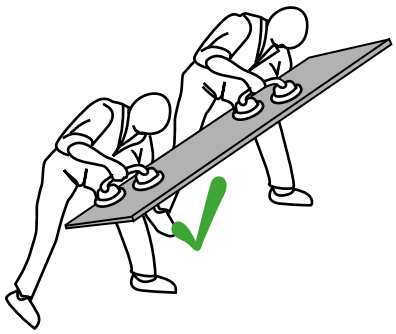
For example, a pallet with 12 sheets of KRION™ Lux measuring 3600x760x12mm (145x53 $^{3}/_{16}$"x1/2") weighs 750 (1653,47 lb) kilos.

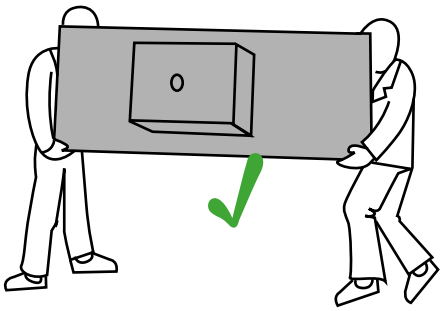
If you do not have a forklift, open the pallet on the vehicle and unload it manually. Whenever handling KRION™ sheets, move them one by one and always with the help of other people.

KRION™ sheets must be transported vertically to prevent them from breaking. When handling KRION™ sheets, you must wear gloves, protective footwear and goggles.

When transporting the sheets, suction pads and other lifting equipment should be used.

The sheets must always be transported by a minimum of two people.





Transport & storage

10.1- Moving.

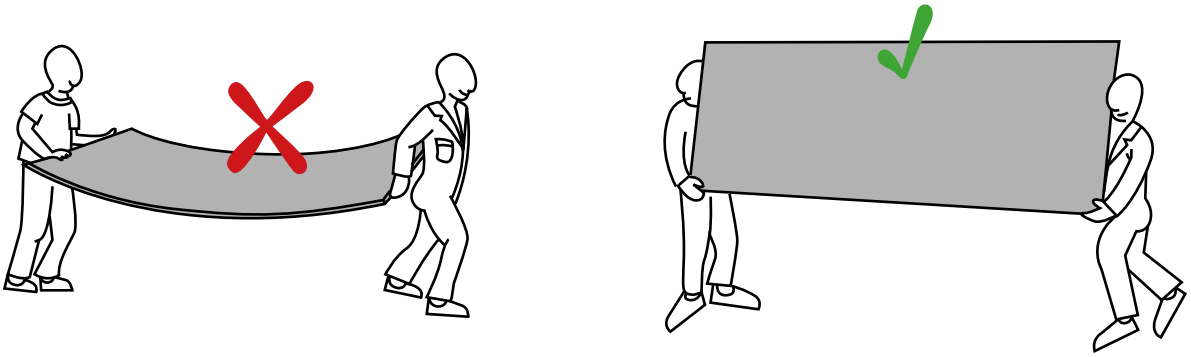
The sheets must be moved vertically using gloves, and never in a horizontal position.

When transporting the sheets, forklifts and clamps should be used.

Each sheet must always be transported by a minimum of two people.

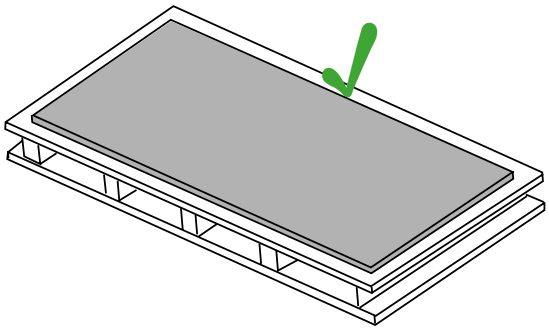
We recommend this to avoid causing damage and deformation to your KRION™ order.

Moulded KRION™ products (such as washbasins, sinks or shower trays) must be handled with care. The packaging protects them from minor knocks, but do not expose them to potential damage.



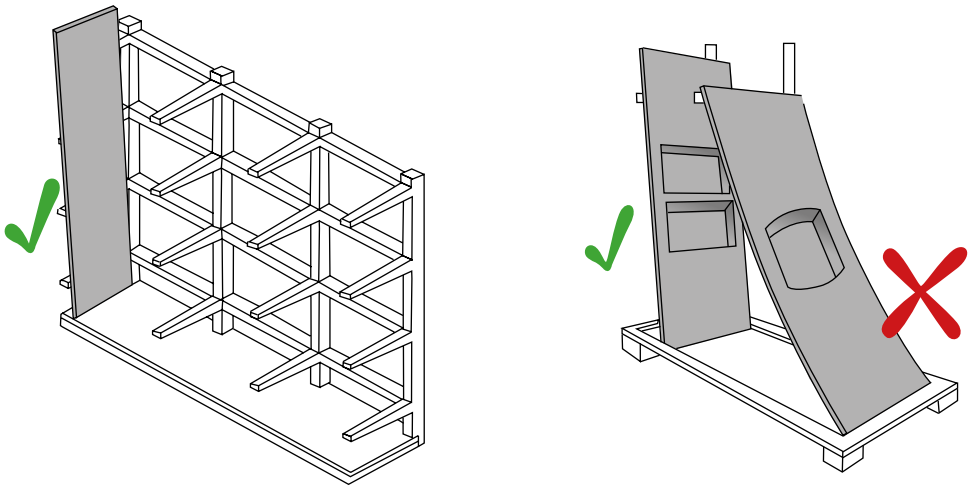
10.2- Storage.

The sheets should be stored horizontally on flat pallets.

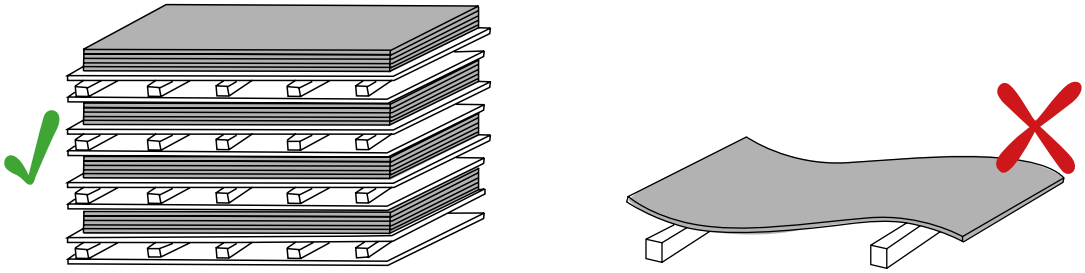


10.2- Storage.

The sheets must be stored on cantilever shelves that permit easy access to the different coloured sheets.

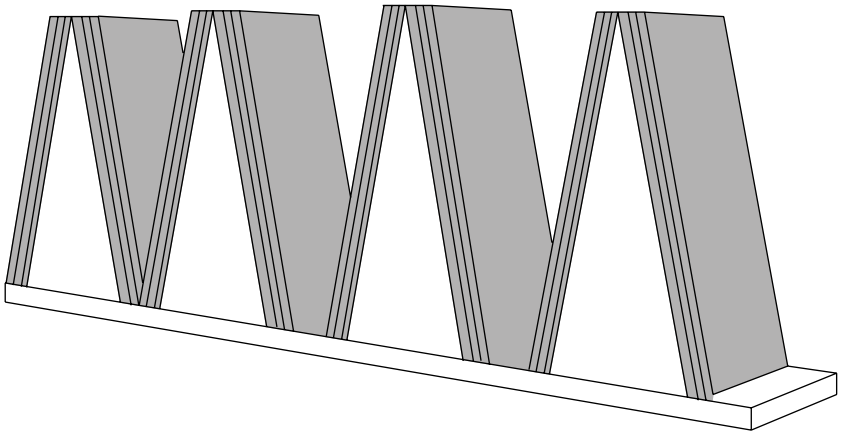


When stacked on the floor, make sure that it is level, the pallets are correctly aligned, and that they have sufficient supports.



To save space, KRION™ can also be stacked on one of its longer on an A-shaped structure.

When storing the sheets vertically, a structure such as the one shown in the diagram should be used.



Transport & storage

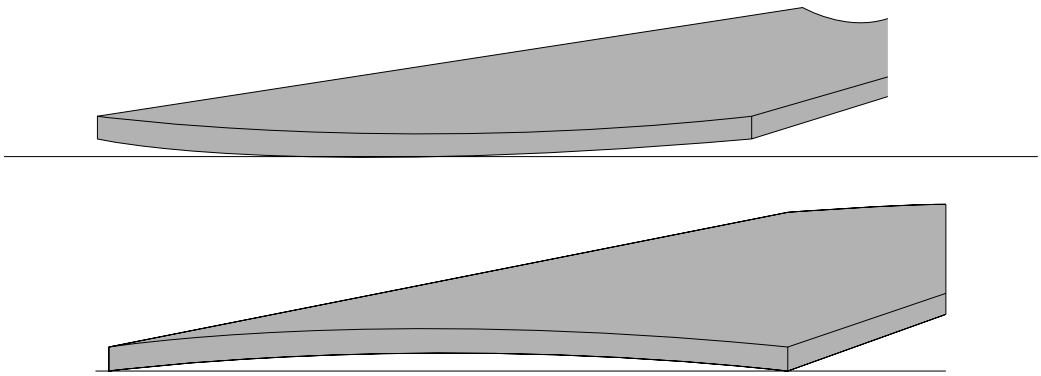
10.2- Storage.

Have the different batch numbers of stored sheets organized and easily locatable.

Boxes containing sinks and washbasins can be stored on shelves or on pallets.

KRION™ should be stored in a dry place away from sunlight, at a constant temperature and away from possible impacts. Do not allow the sheets to be stored in a position where they are under tension.

Do not leave KRION™ products directly on the floor of the workshop. They may warp due to the difference in temperature between the ground and the air:



KRION™ sheets must be stored in their original packaging. Any sheets that are left over should be stored in a vertical position to save space.

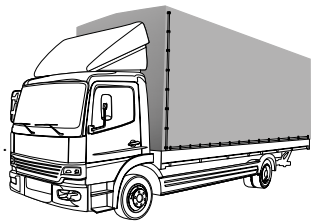
Finished products must be stored in a way that prevents them from being deformed.

We recommend packaging the finished KRION™ product properly before transportation to avoid deformation or other damage.

10.3- Transporting unfinished pieces.

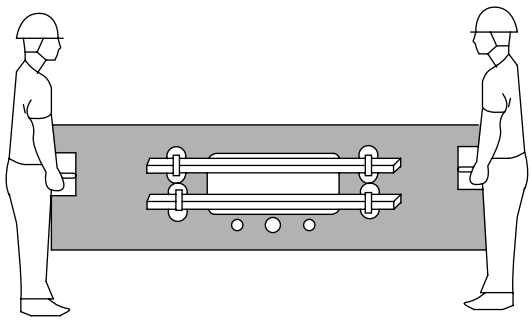
When you need to transport an element made of KRION™ from your workplace to where it is to be installed, take extra care:

- Treat the elements as fragile and valuable (which they actually are).
- Protect the sections with bubble wrap, cork and blankets.
- Fix the sections into place using clamps and straps in the vehicle so that they do not move during transportation.
- Use objects such as wood blocks, clamps or specially made sections to fix the elements in place in the truck when transporting them from your workshop to the customer's home.
- Never transport elements which are so large or heavy that:
  - They are difficult for two people to carry.
  - They do not fit in the transportation vehicle.
  - They can be deformed by the weight of any of their component parts.
  - They are fragile when handled.
  - They do not fit in the route from the street to where they are to be installed: check lifts, stairs, hallways, etc.
  - If special transportation is needed (evaluate the cost of transportation, risk of breakage and working time required to make the element in smaller sections).



Use fixing elements to prevent the countertops from splitting (with or without bowls).

Two straight wood or metal bars can be used to strengthen the countertop during transportation.



KRION™ Processing Operations

11.1- Cutting.

Cutting with fret saws

Remember the saying: "Measure twice, cut once."

Harmful gases can be released due to the high temperatures produced during cutting.

The saw must have the following features:

- High power.
- Discs with hard triple tungsten carbide teeth, only used for cutting KRION™.
- Diamond tipped discs produce a better cut. However, if used for dry cutting, they usually become clogged up.
- Discs with teeth at an angle of–5º (23 ºF) and +10º (50ºF) for cutting aluminium.
- The discs and safety guides must be adjusted according to applicable safety standards.
- Regularly sharpen the cutting discs. The cutting discs must have 8 teeth per 25 mm (1") diameter.
- The table below shows the most suitable cutting disc saws for working with KRION™.

Diameter (mm)	Cutting widths (mm)	Disc thickness (mm)	Opening (mm)	Number of teeth (mm)	Gap (mm)
160 (6 5/16")	2,2 (1/16")	2,2 (1/16")	20 (13/16")	48 (1 7/8")	9,8 (3/8")
200 (7 7/8")	2,8 (1/8")	2,2 (1/16")	30 (1 3/16")	64 (2 1/2")	9,8 (3/8")
250 (9 13/16")	3,2 (1/8")	2,6 (1/8")	30 (1 3/16")	80 (3 1/8")	9,8 (3/8")
300 (11 13/16")	3,2 (1/8")	2,6 (1/8")	30 (1 3/16")	96 (3 3/4")	9,8 (3/8")
350 (9 13/16")	3,6 (1/8")	3,0 (1/8")	30 (1 3/16")	112 (4 7/16")	10,2 (3/8")
400 (15 3/4")	4,4 (3/16")	3,6 (1/8")	30 (1 3/16")	128 (5 1/16")	10,5 (7/16")
450 (17 3/4")	4,4 (3/16")	3,6 (1/8")	30 (1 3/16")	144 (5 11/16")	9,8 (3/8")
500 (19 11/16")	4,4 (3/16")	3,6 (1/8")	30 (1 3/16")	160 (6 5/16")	9,8 (3/8")

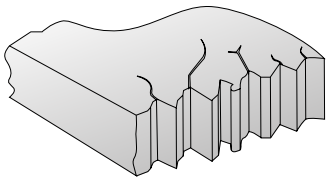
A panel saw is not suitable for making invisible joints, since it can cut unevenly and the cutting disc can leave tooth marks. Panel saws are suitable for cutting and preparing the sheets for milling.

To create an invisible joint, the cut edges should be milled with a hand-operated milling cutter, a CNC or Tupí milling cutter etc.

11.1- Cutting.

Cutting with fret saws

Vertical fret saws cause small cracks along the cut. As a result, these types of saws should only be used for trimming or preparing KRION™ before making special cuts or trimming, considering that the measurements must be at least 5 mm more. The saw blades must be made of hard metal.



Trimming may cause small cracks along the edges of the cut, which may extend and cause the product to break. A manual milling machine should be used for the final finish.

Make sure that there are no nicks in the KRION™ and the cuts are straight and clean.

Small cracks can cause breakage when the product is exposed to thermal or mechanical stress.

Cutting with a vertical saw

Cutting vertically will ensure a straight cut, but the cutting disc might leave tooth marks. The edge should therefore be milled with a hand-operated milling cutter, a CNC or Tupí milling cutter etc. for a joint that is imperceptible.

KRION™ Processing Operations

11.2- Milling.

Milling machines are essential for processing KRION™.

Below we detail the features of the most suitable machines for day-to-day work, although top quality, correctly sharpened metal bits must always be used.

Always used manual milling machines with round bases. This makes it easier to guide the cutting process, as on a round base, the centre of the milling bit is always the same.

Do not rush the cutting process.

Hastily produced cuts and milled sections lead to more imperfections and faults in the work. It will take longer to fix them than to cut them properly the first time.

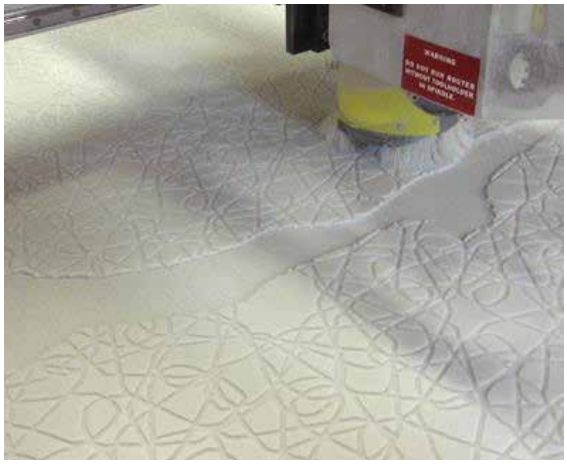
When edging, use templates and/or milling machines with bearings.
Diamond and hard metal milling machines are highly effective at cutting KRION™. Follow the specialist suppliers' recommendations. The table shows the suitable power and type of tool.

Operation	Minimum power	Milling bit
General work For example: cutting edges and seams, cutting openings	1400W	Twin blade 10 mm (3/8") carbide mill
More demanding types of work: For example: large openings, sheet contours (mill a quarter round)	2000W	Twin blade 10 mm (3/8") carbide mill
Detailed work: For example: profiling edges	900W	Carbide profiling mill

Note: Machinery manufacturers tend to have models with different power ratings. Preferably these should have a speed regulator.

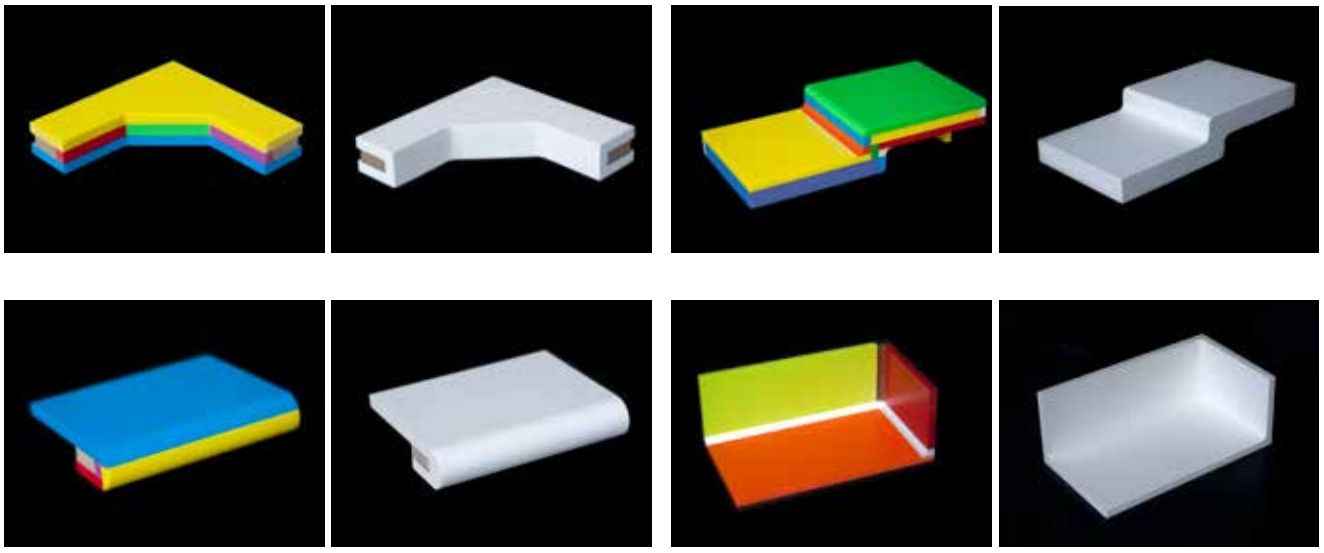
11.3- CNC (numeric control).

Numeric control machines are costly, but their performance and the possibilities they offer in terms of cutting, edging, folding, milling, profiling or cutting openings are far better than those obtained using manual tools.



Repeat cuts made using numeric control machines are nearly always perfect, unlike manual tools that are more likely to cause imperfections. CNCs make perfect cuts for the creation of seamless surfaces.

The cutting tips or milling machines should only be used for KRION™.



11.4- Considerations prior to bonding.

Material required:

- Plastic tape.
- Wood blocks.
- Clamps/grips.
- Cyanoacrylate adhesive.
- Milling machine.
- Sander.
- Sanding discs.
- Chisel.
- KRION™ adhesive.

Never bond KRION™ using a solid surface adhesive from another manufacturer.

Their different features may cause stresses leading to breakages.

Colour coincidence test:

1. Cut two strips from the different sheets you intend to use.
2. Bond them together using KRION™ adhesive, according to the instructions contained in this manual.
3. Sand until achieving the required finish.
4. Visually check that there are no differences between the sheets.

In series with large chips, the distribution and size of the particles varies. This is done to give the KRION™ a more natural appearance, similar to natural stone.

The dissimilarity between different sheets is part of the appeal of this series.

Whenever possible, bond correlative sheets. This will help the chips to coincide better.

If this is not possible, cut a 5 mm (3/16") strip and carry out a test. If the result is not satisfactory, cut another 5 mm (3/16") strip from another sheet and repeat the test.

You should obtain an acceptable coincidence after several attempts.

The sheets can also be rotated 180º (356ºF) so that they coincide better.

11.5- Preparing the seams.

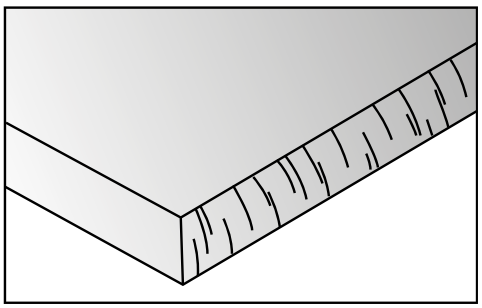
Note: The seams must always be parallel or perpendicular to the edge of the sheet, and always parallel to the edge of heat sources (vitroceramic hobs, ovens, etc.).

- Check the evenness of the colour and for any visual defects on the surface of the sheets.
- The processor will be responsible for visually inspecting the colour of the sheets.
- Do not use saw-cut material without first milling and/or sanding it. The room temperature should not be any lower than 18ºC (64,4ºF) or higher than 28ºC (82,ºF).
- When bonding sections from sheets with different batch numbers, there may be slight differences in colour.
- To reduce the risk of differences in colour, always use sheets with the same batch number for the same project.
- Remember to keep back a piece from the same batch for possible future repairs. For example, adhere a remnant under the kitchen units using silicone.
- Do not bond KRION™ surfaces that have been very finely polished or sanded. First sand the surface that will be in contact with the adhesive, using 240 or 320 grit sandpaper. Adhesive should not be directly applied to the smooth plasticized side of the sheets.

Material required:

- Safety goggles.
- Protective dust mask P100, P 120, P180, P240, P320 & P400 Sandpaper.
- Sanding block.
- Denatured alcohol.
- Clean white cotton cloths or paper.
- Wax paper or adhesive tape.
- KRION™ seam adhesive.
- Milling machine.

The illustration shows the appearance of a sheet after being sawed.
This finish should not be used bonding sheets together.

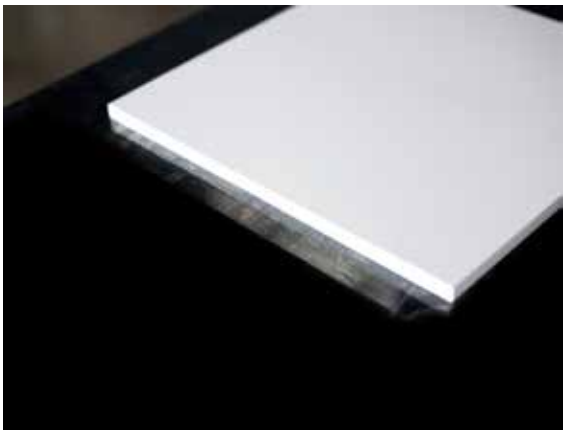


KRION™ Processing Operations

11.5- Preparing the seams.

To remove saw marks, use a milling machine to smooth the surface. Mill the sections one by one with matching edges to achieve an invisible bond.

Use wax paper or adhesive tape on the surface where the KRION™ is to be joined, to prevent the adhesive dripping beneath the material and bonding the sheets to the unit or working surface.



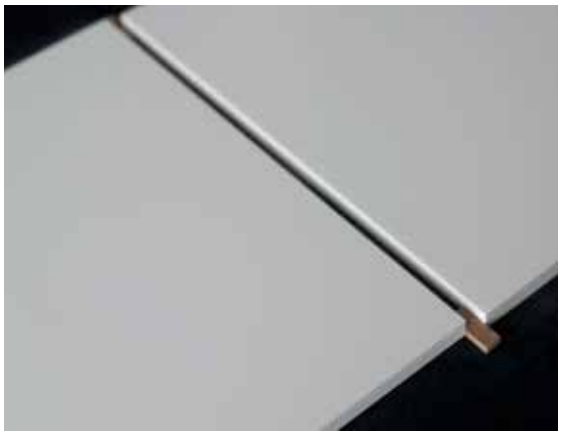
11.5- Preparing the seams.

Check beforehand that the sections to be bonded fit together correctly.

The best way to ensure that they fit together perfectly is to cut "twin edges".
To do so, the two sheets being bonded are fixed in parallel, then running the milling machine between both at the same time, so that the edges of both sheets are a mirror image of the other.

Milling "twin edges".

The two sheets are fixed on a level surface 10 mm (3/8") apart. To maintain this distance between the sheets, use pre-cut 10 mm (3/8") wood blocks.



Use a 12 mm diameter bit, to remove 1 mm (1/16") of KRION™ from each side, leaving the edges ready to create a perfect bond.

Fix a steel ruler to the working surface to guide the milling machine in a straight line. Adjust the distance from the edge based on the bit you plan to use and the size of the milling machine.

Check that the recently milled edges coincide perfectly, and that no marks are visible when connecting them. This will produce a seamless bond.

Important!: Only mill once. If you mill it more times, you will damage the seam.

If the edges are not perfect before making the bond, the final result will be faulty. Take time to work correctly without any mistakes. If the seam is not perfect before bonding, mill again and then check. Repeat as many times as necessary.

Check that there is a protective board on top of the working surface, to avoid causing irreparable damage to the surface.

Do not use blocks or wedges when milling, as this will not provide sufficient support for the KRION™ and the milling process will not be perfect.

Fix the sheets in place onto the working surface using clamps. Do not apply too much pressure, as this could leave marks on the KRION™ sections which will have to be sanded off. If you cannot mill using the twin edge process, you can mill both sections independently. The result will be just as good.

KRION™ Processing Operations

11.5- Preparing the seams.

Clean the areas to be bonded with a clean cloth and denatured alcohol.

Note: use good quality paper, as recycled paper is made using paper of different colours, and when combined with the alcohol may stain the seam.

Afterwards, avoid touching the edges with your bare hands, so as not to leave any remnants that may darken the seam.

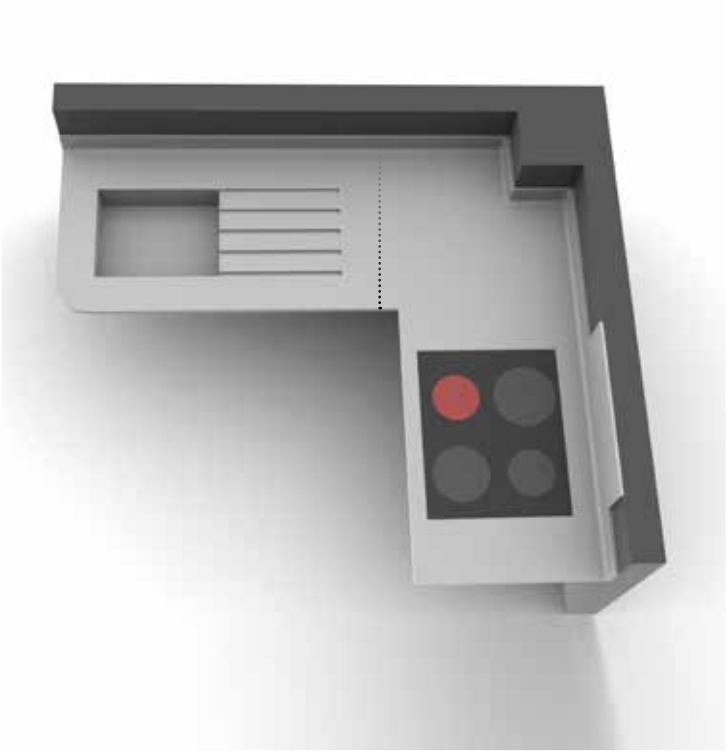
Fit the two pieces being bonded together with a gap of 3 mm between them.

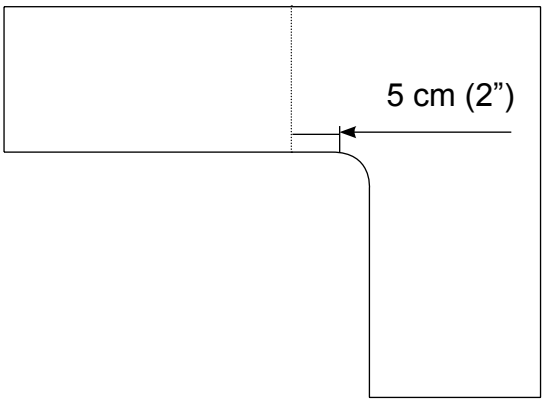
Remember:

- Measure and check measurements.
- Make templates if necessary.
- Cut leaving an extra 5 mm (3/16").
- Lightly sand the edges after cutting.
- Use a properly level cutting surface

11.5- Preparing the seams.

Leave at least 5 cm (2") between the internal angles and the seams, as seen in the diagram.





11.6- Mitering/Folding.

45º miter cuts make it possible to create different planes on the same sheet.

This is useful when creating rear trims and/or skirts.

KRION™ Processing Operations

11.6- Mitering/Folding.

All you need to do this is a 45º milling bit. If you use a 5 axis numerical control milling machine, the machining can also be done with a flat mill bit, angling the head as necessary.

The cut must be completely smooth for bonding purposes.

Attach a strip of adhesive tape under the line you are going to mill to keep the pieces in place, and to be able to work on them more easily.

Once you have machined the pieces, bond them using suitable KRION™ adhesive.

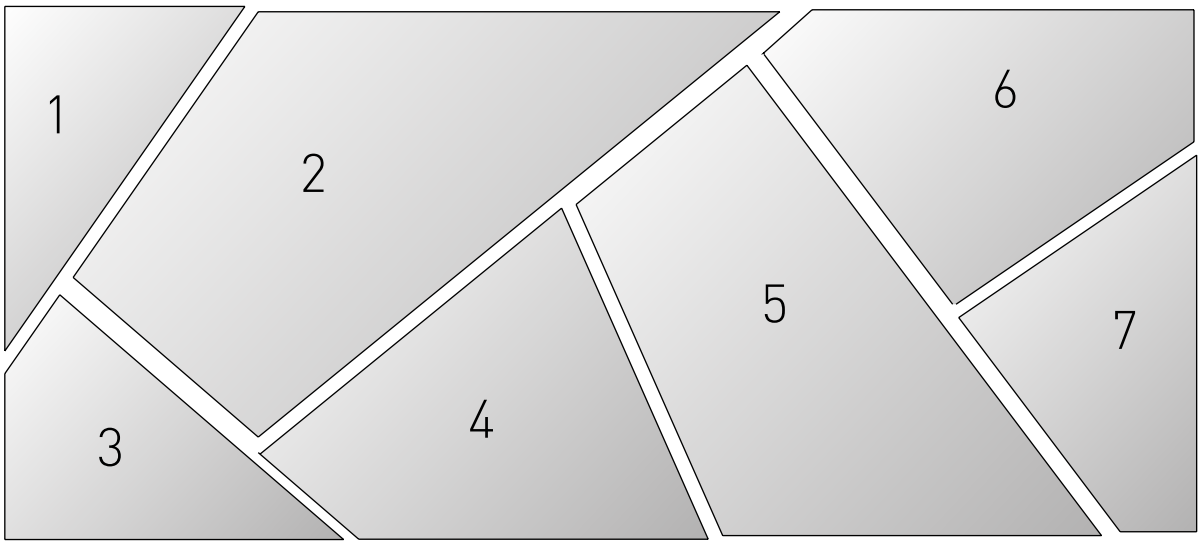
The folding technique is a further step, making it possible to create complex 3D shapes without any visible seams.

To create pieces using folding, it is essential to have a CNC machine with 3D programming abilities.

Planning and preparing beforehand are essential in order to achieve a good end result.

11.6- Mitering/Folding.

1.



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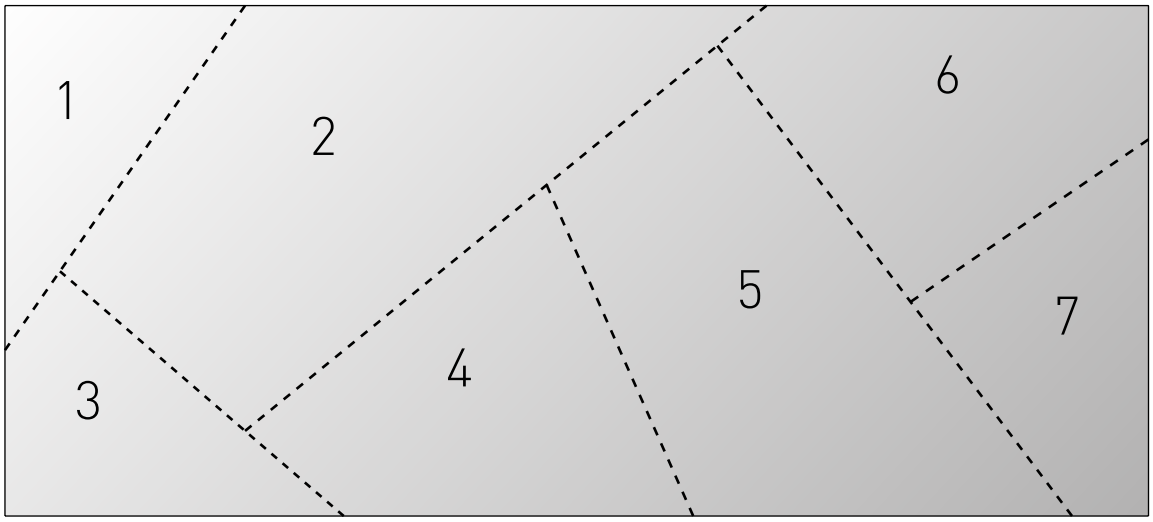

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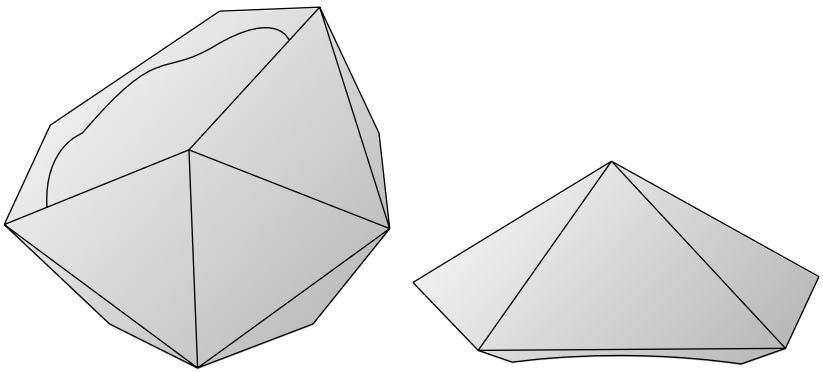


KRION™ Processing Operations

11.7- Preparing the adhesive.

The KRION™ adhesive should be stored horizontally in a cold, dark place, preferably a fridge, at a temperature of between 10ºC and 20ºC (50ºF to 68ºF).

Warning: ever keep food in refrigerators used for KRION™ adhesives. Never freeze KRION™ adhesive

Remember that KRION™ adhesive is for bonding different pieces of KRION™ together. Under no circumstances should it be used as an adhesive filler putty or to conceal faulty uneven cuts or machining.

The adhesive's composition is different from that of the KRION™ sheets, since it is designed to act specifically as an adhesive (with different mineral fillers and resins). As a result, it will age differently and, in time, badly cut joints might become visible.

Consequently, before applying the adhesive, check that the surfaces have been properly machined.

Align the edges of the two pieces of KRION™ to be bonded together, without applying adhesive, to check whether they have been properly machined and how snugly they fit together.

11.7- Preparing the adhesive.

Before using KRION™ adhesive, do the following:

1- Check that the colour code of the adhesive is the same as or is compatible with the colour code of the sheets.

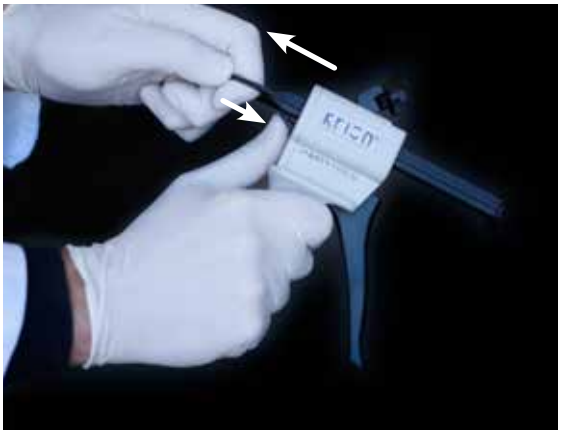
2 – Check the expiry date of the adhesive to make sure that it is not out of date. Do not use cartridges whose catalyst has leaked during the transportation process or whose cap at the bottom does not close properly.

Leave the cartridge in a vertical position for 10 minutes. In this way, if it has an air bubble inside it, it will be near the cap at the top and so it will be easier to bleed.

2

3- Pick up the special gun for dosing KRION™ adhesive.
With your thumb, hold down the stop and pull out the rod to make space for the tube of KRION™ adhesive.

3.1



3.2

KRION™ Processing Operations

11.7- Preparing the adhesive.

4- Fit the adhesive tube in the correct position in the slot in the gun.

4.1

4.2

4.3

5- Close the top cover of the gun so that the adhesive is held firmly in place.

5.1

11.7- Preparing the adhesive.

6- Remove the cap by twisting.

6.1

7- Press the trigger of the gun several times until liquid comes out of the two holes of the tube (the adhesive and catalyst).

7.1

8- Fit the mixing nozzle in the correct position on the adhesive tube. The holes in the nozzle must coincide with the holes in the adhesive tube

Twist the nozzle cap to close.

8.1

KRION™ Processing Operations

11.7- Preparing the adhesive.

9- Press the trigger until the adhesive comes out of the end of the nozzle.
Run some of the adhesive onto a piece of paper to check the mixture is correct.

10- The adhesive is ready for use.

10.1

11- After using the adhesive, push down on the stop on the gun with your thumb to relieve the pressure.

Remove the mixing nozzle and screw the cap back on. This will prevent the catalysed material inside the nozzle entering the tube and causing a blockage.

11.1

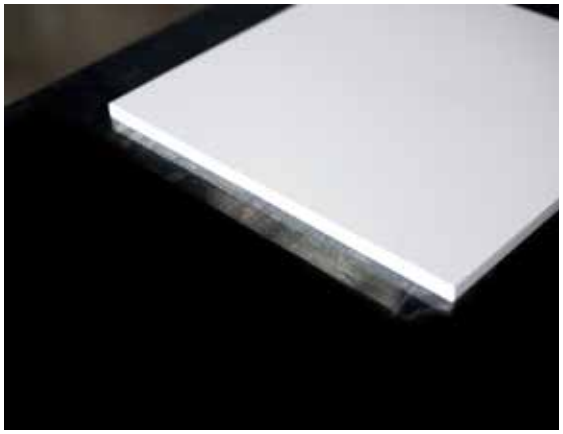
11.2

12- Remove the adhesive from the gun and place it horizontally in a cool, dark place (preferably a refrigerator).

11.8- Applying the adhesive.

Procedure

1. Place waxed paper around the seam to keep the adhesive in place and prevent it from adhering to the substrate.



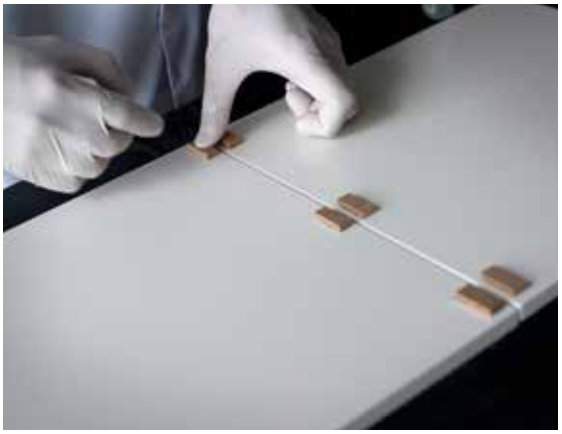
2. Clean the seam with alcohol and good quality paper (not recycled paper).

KRION™ Processing Operations

11.8- Applying the adhesive.

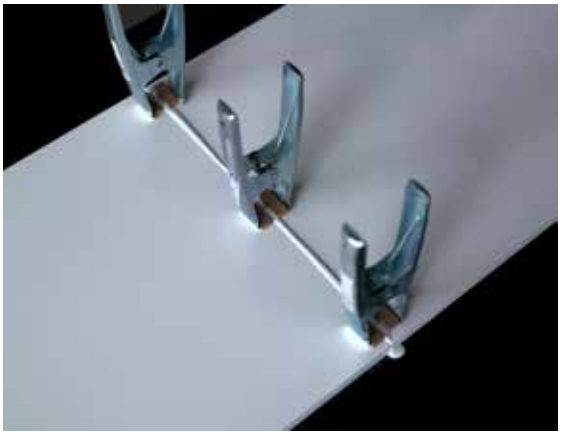
Procedure

3. Use hot wax or cyanoacrylate glue to attach wood or KRION™ blocks close to the area of the seam (the blocks should be fixed in place before applying the seam adhesive).



4. Fill the seam to 1/3 the thickness of the pieces being bonded.

5. Press the blocks in place using spring clips.



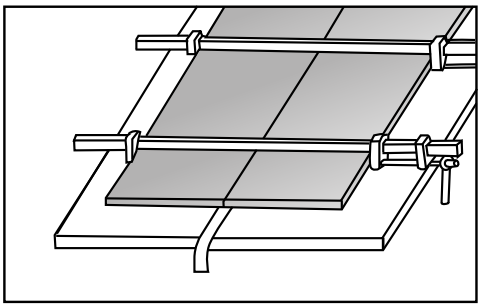
11.8- Applying the adhesive.

Procedure

6. Push the pieces being bonded together. The excess adhesive that appears on the surface should not be removed until it has hardened.

The adhesive should flow out evenly along the whole length of the seam. If you press too hard, all of the adhesive will be pushed out of the seam, resulting in a weak bond.

Pressure methods



Bar clamps:

Attach the clamps and tighten without forcing.
Leave for approximately 45 minutes at between 21 (69,8 ºF) and 24ºC (75,2 ºF) before loosening the clamps and removing the waxed paper.

Spring grips:

Press the blocks into place using spring grips.
Leave for approximately 90 minutes at between 21 (69,8 ºF) and 24ºC (75,2 ºF) before removing the clips and waxed paper.

Warning: never place seams close to heat sources. Keep them as far away from heat as possible, and parallel to the edge of the heat source (ovens, hobs, vitroceramic hobs, etc.).
Position the seals over the dishwasher whenever possible.

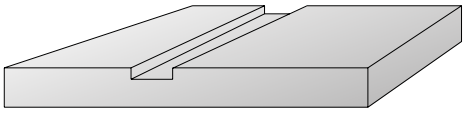
KRION™ Processing Operations

11.8- Applying the adhesive.

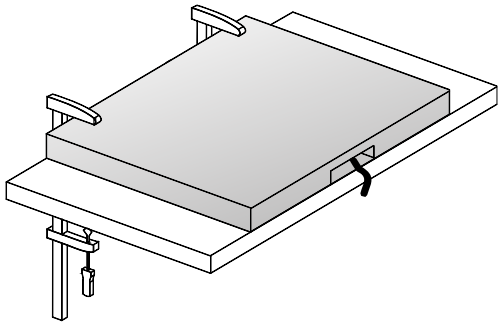
■ Procedure

Bridging blocks:

Sections with the shape shown below can be used to help adjust the two pieces being bonded.



Use the central groove to position the seam, and fix in place using grips or clamps.



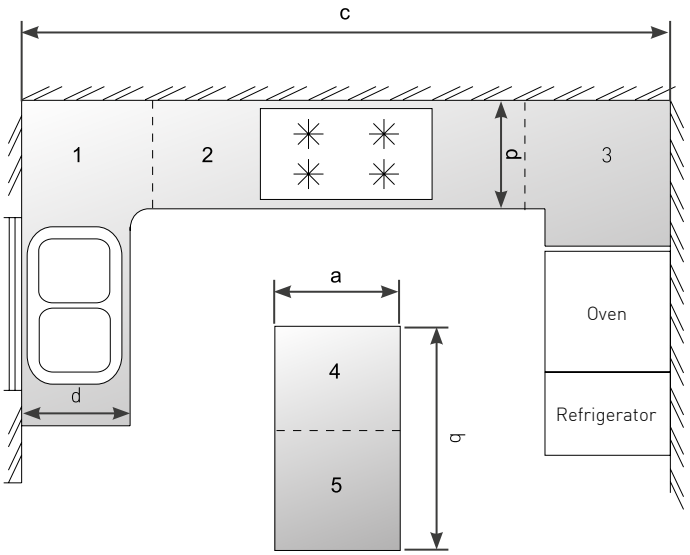
11.9- Positioning seams.

■ Precautions

Do not position seams in places subject to a high physical or thermal stress, such as corners or sections above ovens or very close to a hob. Remember the size of the final section, and the possibilities for transportation and accessing where it is to be installed.

Carefully plan the pieces that are going to be made in the workshop, as the integrity of the final piece will also depend on it. Do all of the work possible in the workshop. This will make the process easier, as you will have all of the necessary tools. Try to create the smallest possible number of seams, without creating sections that are difficult to transport.

Example:

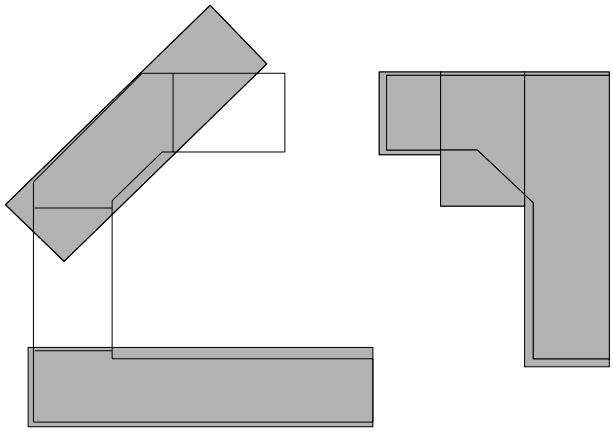


11.9- Positioning seams.

Precautions

If you have to bond sheets lengthways, bond them following the direction of the sheet whenever possible.

Use the following diagram as an example.



Whenever possible, do not position seams in corners.

Faults in the seam

If the seams you have created do not have the necessary consistency, it may be for any of the following reasons:

1. Due to having moved the bonded sheets to adjust the seam before the adhesive dried.
Make sure the seam is perfectly positioned before applying any pressure to it.

2. Due to not having added reinforcements to the underside of the seam.

3. Because too much pressure was applied when the sheets to be bonded were pressed together.
This causes the adhesive to flow out of the seam, meaning the bond will not be strong enough.

4. Due to not having rested the countertop on a proper base.

5. Due to having sanded the seam before the adhesive had dried.

6. Due to having used adhesive past its expiry date.
Although this seems simple, it is the most usual cause of bonding problems.

7. Due to changes in temperature while the adhesive was setting.
Try to keep as stable a temperature as possible in the room or workshop where you are working (air conditioning, heating, keeping the seam out of sunlight, etc).

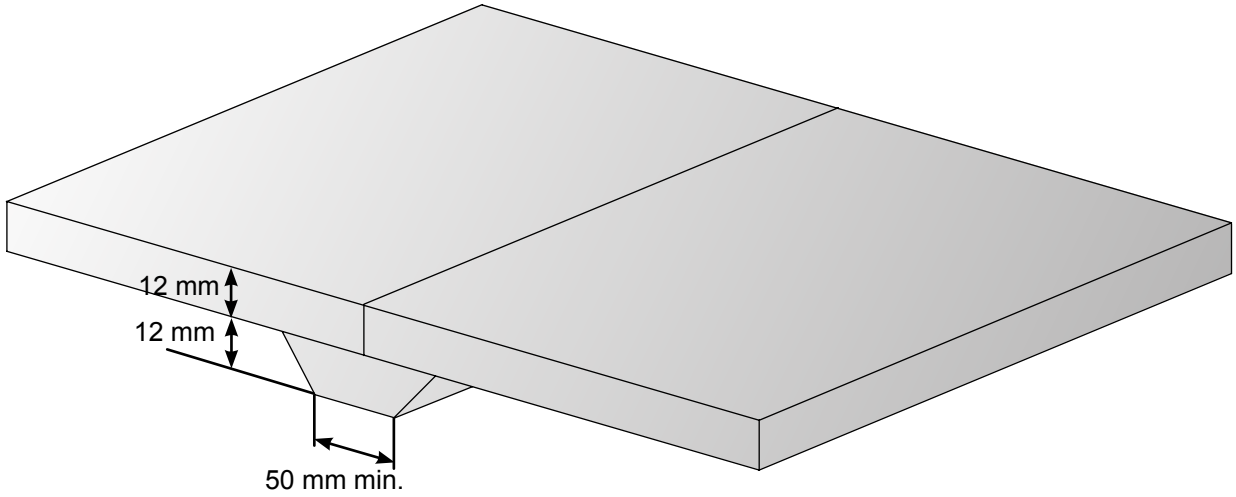
8. Due to the contamination of the seam before or while the adhesive was drying.
Clean the edges of the seam with denatured alcohol and a clean cotton cloth before applying the adhesive
Prevent other substances coming into contact with the adhesive while it cures.

11.10- Reinforcing seams.

Reinforcements must be used under KRION™ seams.

These reinforcements are generally a strip of KRION™ 50 mm (2") wide in the same thickness as the countertop .

The edges of these reinforcement strips must be mitered at a 45º angle to ensure maximum strength and to reduce stress caused by changes in temperature to a minimum. Smooth the edges of the reinforcement strips.



To attach these reinforcement strips to the bottom of the seam, first remove any excess adhesive left behind after bonding using sandpaper.

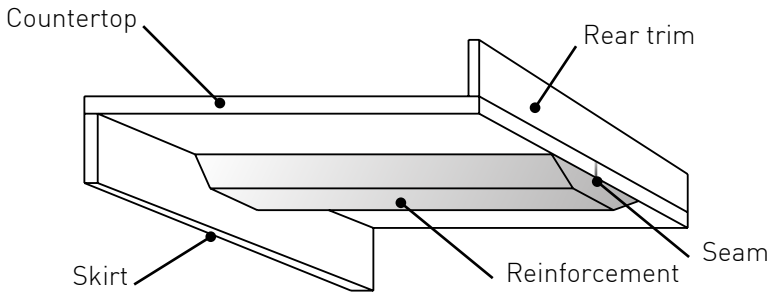
The upper edge of the reinforcement strip must be sanded to ensure it bonds more firmly to the countertop.

The whole contact area between the reinforcement strip and countertop must be covered with KRION™ adhesive to ensure a correct bond.

11.10- Reinforcing seams.

Make sure that the length of the reinforcement strip coincides with the length of the seam.

If the countertop has a front skirt, the reinforcement strip must reach it. The skirt and reinforcement strip must also be bonded using adhesive.



Remove any excess adhesive after application, before it dries, using a piece of paper or a spatula.

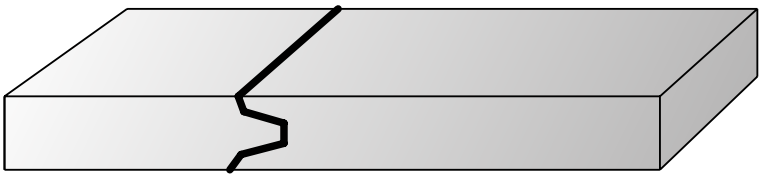
Different coloured KRION™ and KRION™ adhesive from the countertop can be used to reinforce the seams.

Do a test before carrying out the work, as some KRION™ colours, especially light colours, are slightly translucent, and adding material in a dark colour underneath could cause unwanted shadows.

You can attach the reinforcement strip at the same time as bonding the seam.

This will help you to level the two pieces: place the pieces with the visible side on the table, and attach the reinforcement strip underneath.

- Tongue and groove seam



This type of seam means there is more adhesive material in the seam, creating a stronger bond.

Using a tongue and groove seam, it is also easier to adjust the two pieces being bonded.

KRION™ Processing Operations

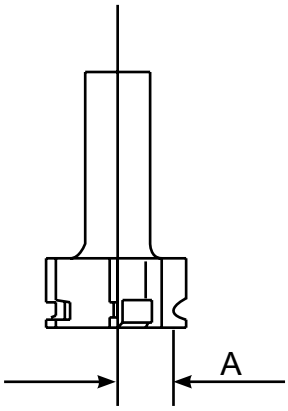
11.10- Reinforcing seams.

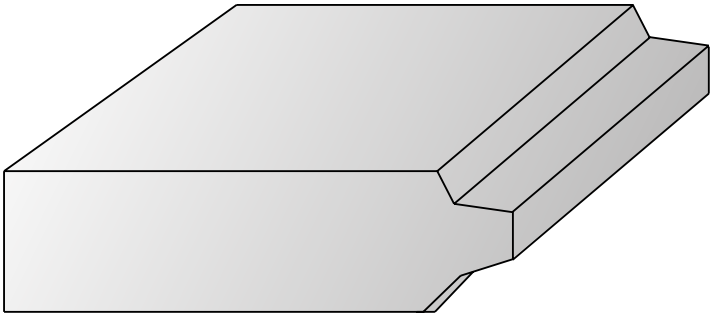
Tongue and groove seam

Put the sheets face down when milling to ensure that they fit together better.

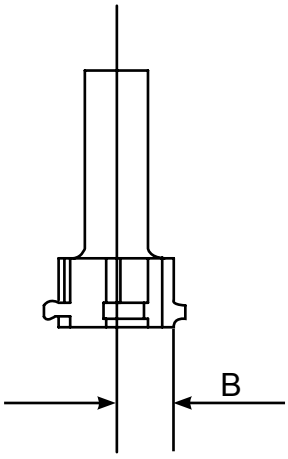
Additional milling bits are required when creating this type of seam. The sections are milled one at a time;

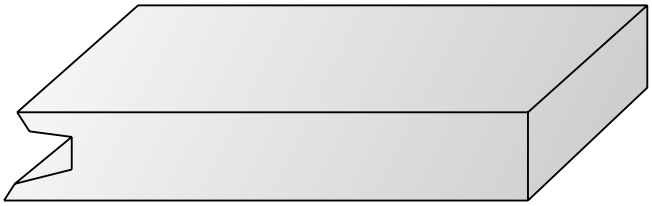
Part A:



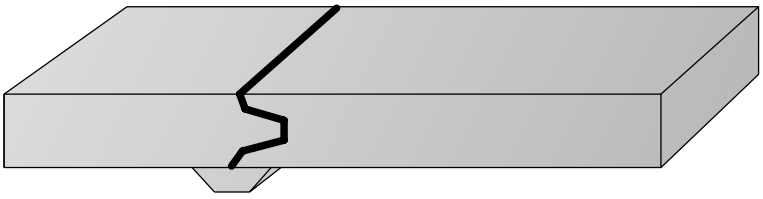


Part B:



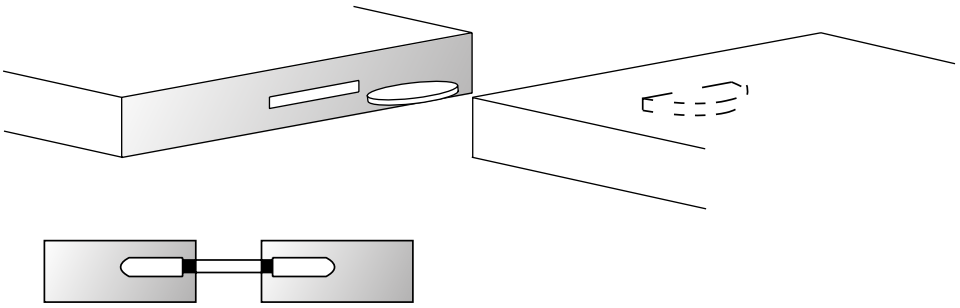


The tongue and groove seam is stronger than a straight 90º seam, although a reinforcement strip will still be necessary.



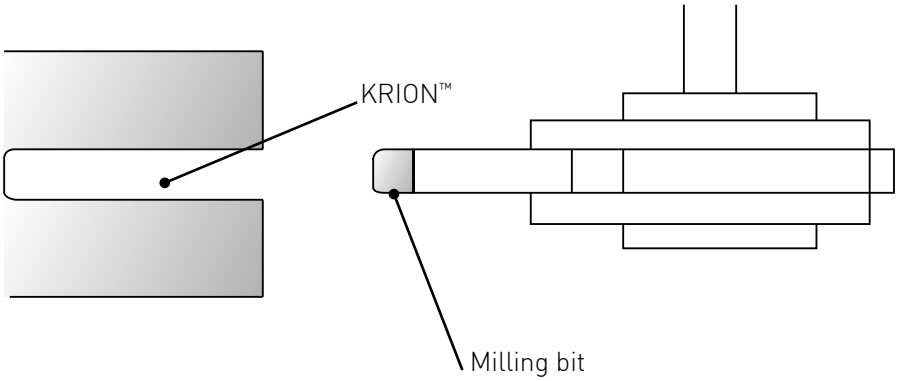
11.10- Reinforcing seams.

- Biscuit



To make a stronger horizontal seam, a biscuit joint can be used.

The biscuits can be made of methacrylate or the same KRION™ used to make the countertop.



1. Use a template to make sure that all of the biscuits are made in the right size.

2. Place adhesive tape along the whole length of the seam.

3. Fill the grooves in the biscuit with KRION™ adhesive.

4. Push the biscuit into one of the slots.

5. Add adhesive along the whole length of the seam.

6. Adjust the two pieces of KRION™ and press using the described methods.

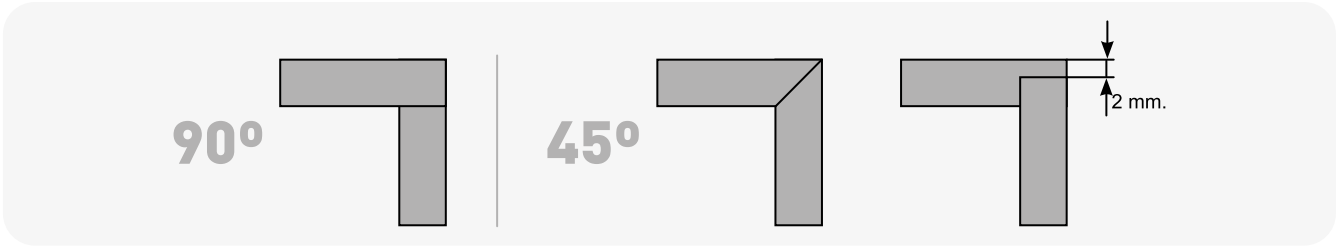
7. Wait for 20 minutes and then sand to remove any excess adhesive and give the surface its final finish.

8. Make sure that the edges of the milling bit are rounded to prevent 90º edges

Warning: never use this type of bond close to sources of heat.

KRION™ Processing Operations

11.11- Bonding angles by colour codes.



To ensure a better finish, miter the edges at a 45º angle or trim them down to a thickness of 2 mm (1/16") before bonding them. For bonds with a 90º butt joint, carry out prior tests to check the end result.

SYSTEMPOOL conducts tests of 90º bonds with all its different coloured sheets. The following list is merely a guideline. Remember, before embarking on a job, carry out tests if you want to bond seams at a 90º angle.

RECOMMENDED STUCK DEPENDING THE COLOR REFERENCE					
Ref Color		Standard Recommended stuck	Ref Color		Standard Recommended stuck
	0101 White Nature	45		6505 Taupe	45
	0102 Clear Nature	45		6506 Greggio	45
	0103 Day Nature	90		6508 Cotto	45
	0501 Dune Nature	90		6509 Moai	45
	0502 Camel Nature	90		6601 Fall Green	45
	0503 Earth Nature	90		6701 Blue Sky	90
	0504 Marfil Nature	90		6702 Atlantic Blue	45
	0901 Grey Nature	90		6703 Santorini Blue	45
	0902 Ash Nature	90		6704 Navy Blue	90
	0903 Night Nature	90		6901 Black Metal	90
	1100 Snow White	90		6902 Light Grey	90
	4102 Extreme White Light	45		6903 Grey	45
	4201 Yellow light	90		6904 Bright	45
	4401 Pink Light	45		6905 Ash Grey	45
	4601 Green Light	90		6906 Dark Grey	45
	4701 Blue light	90		6907 Deep Purple	45
	6101 Frost White	90		6908 Scommentto	45
	6203 Senape	45		6909 Colosseo Grey	45
	6201 Imperial Yellow	45		7103 White Star	45
	6301 Fruit	45		7201 Golden Star	45
	6401 Red Fire	45		7501 Greggio Star	45
	6403 Candy	45		7502 Moai Star	45
	6405 Happy Red	90		7701 Atlantic Blue Star	45
	6501 Cream	45		7903 Deep Purple Star	45
	6502 Pearl	90		7904 Black Star	45
	6504 Mocha	45		7905 Grey Star	45

11.11- Bonding angles by colour codes.

RECOMMENDED STUCK DEPENDING THE COLOR REFERENCE					
Ref Color		Standard Recommended stuck	Ref Color		Standard Recommended stuck
	8101 Crystal White	45		A101 Asteoid White	90
	8103 Iceberg White	45		A501 Asteroid Mocha	90
	8901 Crystal Black	45		A502 Asteroid Brown	45
	8904 Black Mirror	45		A503 Asteroid Dark	45
	9101 Cristal White +	90		A504 Asteroid Cream	45
	9102 Polar Stone	45		A505 Asteroid Taupe	45
	9103 Bright Rock	90		A901 Asteroid Grey	45
	9104 White Concrete	45		L501 Pompei	45
	9105 Elegant White	45		L503 Siracusa	45
	9505 Cream Concrete	45		L901 Segesta	45
	9506 Mocha Concrete	45		L902 Erice	45
	9507 Taupe Concrete	90			
	9903 Deep Granite	90			
	9904 Bright Concrete	90			
	9905 Elegant Black	45			
	9906 Black Mirror XL	45			

KRION™ Processing Operations

11.12- Compatibility of adhesives.

Original colour
Compatible colour

Adhesive compatibility

The different colours in the KRION™ range must be bonded with their own adhesive. The following list shows some compatible adhesives.

When compatible adhesives are used, perfect precision machining of the edge to be bonded is required.

Color ref.		Adhesive compatibility (high to low order compatibility)	
	0101 White Nature	0101	0102
	0102 Clear Nature	0102	0101
	0103 Day Nature	0103	1100
	0501 Dune Nature	0501	0504
	0502 Camel Nature	0502	6501
	0503 Earth Nature	0503	6504
	0504 Marfil Nature	0504	0501
	0901 Grey Nature	0901	L901
	0902 Ash Nature	0902	6904
	0903 Night Nature	0903	6907
	1100 Snow White	1100	0103
	4102 Extreme White Light	4102	8103
	4201 Yellow light	4201	
	4401 Pink Light	4401	
	4601 Green Light	4601	4701
	4701 Blue light	4701	4601
	6101 Frost White	6101	8101
	6201 Imperial Yellow	6201	
	6203 Senape	6203	6506-7501
	6301 Fruit	6301	
	6401 Red Fire	6401	
	6403 Candy	6403	
	6405 Happy Red	6405	
	6501 Cream	6501	6502
	6502 Pearl	6502	6501
	6504 Mocha	6504	0503
	6505 Taupe	6505	6906
	6506 Greggio	6506	6203
	6508 Cotto	6508	0501
	6509 Moai	6509	6908
	6601 Fall Green	6601	4601
	6701 Blue Sky	6701	
	6702 Atlantic Blue	6702	7701
	6703 Santorini Blue	6703	4701
	6704 Navy Blue	6704	7701
	6901 Black Metal	6901	
	6902 Light Grey	6902	9103
	6903 Grey	6903	9903
	6904 Bright	6904	0902
	6905 Ash Grey	6905	

Color ref.		Adhesive compatibility (high to low order compatibility)	
	6906 Dark Grey	6906	6907-7903
	6907 Deep Purple	6907	6505
	6908 Scommentto	6908	
	6909 Colosseo Grey	6909	
	7103 White Star	7103	
	7201 Golden Star	7201	4201
	7501 Greggio Star	7501	0504
	7502 Moai Star	7502	6909
	7701 Atlantic Blue Star	7701	6702
	7903 Deep Purple Star	7903	6905
	7904 Black Star	7904	8904
	7905 Grey Star	7905	0901
	8101 Crystal White	8101	9104-9105
	8103 Iceberg White	8103	0103
	8901 Crystal Black	8901	6907
	8904 Black Mirror	8904	6905
	9101 Cristal White +	9101	0101
	9102 Polar Stone	9102	0103
	9103 Bright Rock	9103	0102
	9104 White Concrete	9104	1100
	9105 Elegant White	9105	1100
	9505 Cream Concrete	9505	A504
	9506 Mocha Concrete	9506	A501
	9507 Taupe Concrete	9507	6906
	9903 Deep Granite	9903	6903
	9904 Bright Concrete	9904	0905
	9905 Elegant Black	9905	8904
	9906 Black Mirror XL	9906	6901
	A101 Asteoid White	A101	9101
	A501 Asteroid Mocha	A501	6908
	A502 Asteroid Brown	A502	0503
	A503 Asteroid Dark	A503	A502
	A504 Asteroid Cream	A504	0502
	A505 Asteroid Taupe	A505	6505
	A901 Asteroid Grey	A901	L901
	L501 Pompei	L501	0101
	L503 Siracusa	L503	6501
	L901 Segesta	L901	6903
	L902 Erice	L902	L901

11.12- Compatibility of adhesives.

Applying the adhesive and chemical welding paste

Warning: Do not use KRION™ adhesive to fill visible gaps or uneven joints.

Once the cartridge of adhesive has been opened, the maximum adjustment time is 20 minutes at a temperature of 20ºC (68ºF) to 26ºC (78,8ºF). The higher the temperature, the shorter the adjustment time.

KRION™ adhesive comes in a 50ml or 250ml cartridge.

The adhesive should only be used to bond pieces of KRION™ together. Do not use it to bond KRION™ to other material or substrates. After running the adhesive along the joint, slight pressure should be exerted to push the two pieces of KRION™ together. Do not exert too much pressure or the adhesive will be squeezed out of the joint, leading to a faulty bond.

After applying the adhesive to the joint, remove the mixing nozzle from the cartridge and seal it with its original cap.

Material required:

- Safety goggles.
- Dust mask.
- Sawing trestles.
- Clean white cloths (or paper).
- Denatured alcohol.
- Wax paper.
- Cutter or scissors.
- Hot glue.
- Wood blocks.
- Bar clamp.
- Spring clips.
- KRION™ adhesive or KRION™ chemical welding paste.

11.13- Expiry of adhesives.

The expiry date of the adhesives is shown on the label. Use the adhesive before it expires.

Adhesives expire because the catalyst loses its properties with the passage of time.

Store all the cartridges in a cool dark place (like a fridge). The recommended storage temperature is 10ºC to 20ºC (50ºF to 68ºF).

If they are exposed to too much heat, they will lose their properties faster.

Do not use cartridges whose catalyst has leaked during the transportation process or whose cap at the bottom does not close properly.

Once the adhesive's guaranteed shelf life is over, in some cases, if it was stored in optimum conditions (at a low temperature, in the dark etc.), it might be usable for longer, although SYSTEMPOOL does not recommend this or assume any related responsibility.
In such circumstances, test whether the adhesive is still in a usable condition (whether it has expired or not).

Try to use the adhesives in order, from the oldest to the newest, so that they do not expire.

An adhesive that has expired will cause problems.

- It will not catalyse.
- It will have catalysed in the tube and/or it will have lost its bonding strength.
- Its colour might have changed.

NEVER throw expired adhesives directly into the rubbish.

The adhesive's components, particularly the catalyst, are pollutant and inflammable.

Contact a chemical waste collection centre and they will tell you how to proceed.

As a general rule, catalysed adhesives are non-pollutant. As a result, the adhesive should be mixed with the catalyst to ensure that it can be safely disposed of.

In the case of a used cartridge, put it in the gun with its nozzle and eject all the contents onto a surplus piece of KRION™, then mix this with a stick. When the adhesive dries, it will be safer to dispose of.

Coefficient of linear expansion (α) 12

When an object rises or falls in temperature, it changes in length in an amount proportional to its original length and the temperature change (KRION™ has a α coefficient of 3,5 x 10^{-5}).

12.1- Precautions.

When a KRION™ top covering of certain dimensions is going to be used to cover a structural support and/or to be fitted between walls, columns etc., the coefficient of expansion and contraction of the different materials must be taken into account.

This is mainly necessary in the case of items to be fitted outdoors, in places like terraces, gardens, façades or pedestrian areas, or which will be exposed to sharp temperature changes, such as shower trays, basins, cold storage rooms, heating chambers etc.

KRION™ expands by approximately 0.7 mm per linear metre when its temperature rises by 20ºC (68ºF). In the case of an increase in temperature of 30ºC (86ºF), the surface will expand by 1 mm per linear metre.

Structural calculations that fail to take into account the need for expansion or contraction joints might lead to a broken KRION™ surface or a break in its seams. It is therefore crucial to take this factor into account in the final design.

12.2- Formula to calculate expansion / contraction.

The following formula can be used to calculate the expansion and contraction of KRION™:

$$\Delta L = \alpha\ K_{lux} \cdot \Delta T\ (tc - t0) \cdot L0$$

ΔL = linear increase or contraction in mm.

$\alpha\ K_{lux} = 3,5\ (10^{-5}) = 0,000035$

ΔT = temperature difference between the maximum (tc) and initial temperature (t0).

L_0 = total length in mm of the KRION™ material at the initial temperature (t0).

When projects involving KRION™ are being planned, it is important to take into account:

- The final application of the KRION™.
- Where the item will be fitted – e.g. outdoors or inside a house or building.
- The maximum and minimum temperatures that might be reached in the place where it is fitted or due to its conditions of use.

Coefficient of linear expansion (α)

12.2- Formula for calculating the expansion / contraction.

► Its exact location – whether it runs between between structural elements or not.

► It is also important to take into account the colour reference of the KRION™, its base support and whether there is ventilation or not, since these factors also influence the temperature that the surface might reach. When it is exposed to sunlight and other heat sources, a Snow White KRION™ (1100) surface laid on a wooden board can reach a 20% higher temperature than the environmental temperature of the place where it is located. Darker colours can reach even higher ones.

Dark-coloured KRION™ should not be used in items located outdoors or exposed to heat sources. Only Snow White KRION™ or pale colours should be used.

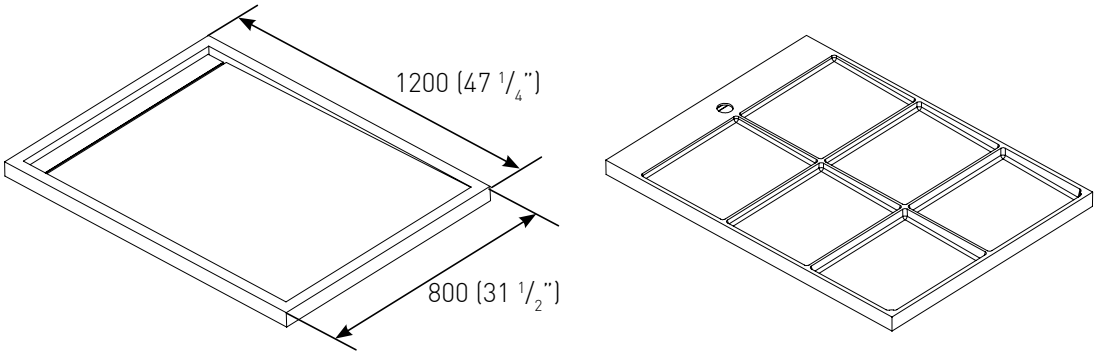
12.3 Examples of calculations .

12.3.1 · Shower tray fitted between walls or on a cement floor

Show trays are generally exposed to temperatures that range from 15 °C (59ºF) to 40 °C (104ºF), although occasionally these temperatures might oscillate between 5 °C (41ºF) and 65 °C (149ºF).

Let us take a 1200x800 (47 $^{1}/_{4}$") shower tray made of KRION™ and reinforced with the same material. Its longest linear value must be taken to calculate the expansion joint between the perimeter of the shower tray and the perimeter of the gap where the tray is fitted. This expansion joint must be filled with an elastomeric polyurethane sealant like P404 by Butech or similar.

$$\Delta L = \alpha \text{ Klux} \cdot \Delta T \text{ (tc – t0)} \cdot L0 = 0{,}000035 \cdot (65\text{-}20) \cdot 1200 = 1{,}89 \text{ mm}$$



The result is that the longest side will expand by 2mm (1/16"), in such a way that the shower tray has a length of 1202 mm (47 $^{5}/_{16}$") when it reaches a temperature of 65º (149 ºF).

If this possible expansion is distributed around the whole of the perimeter of the shower tray, a 1mm(1/16") expansion joint will suffice but, as an extra safety margin, a slightly bigger 2mm(1/16") joint should be left around the whole perimeter. A 2mm (1/16") gap should also be left between the tray and the wall covering adjacent to it.

These expansion joints should be filled with an elastomeric polyurethane sealant, like P404 by Butech or similar.

12.3 Several examples of calculations.

12.3.2 · Free-standing* table on an outdoor terrace.

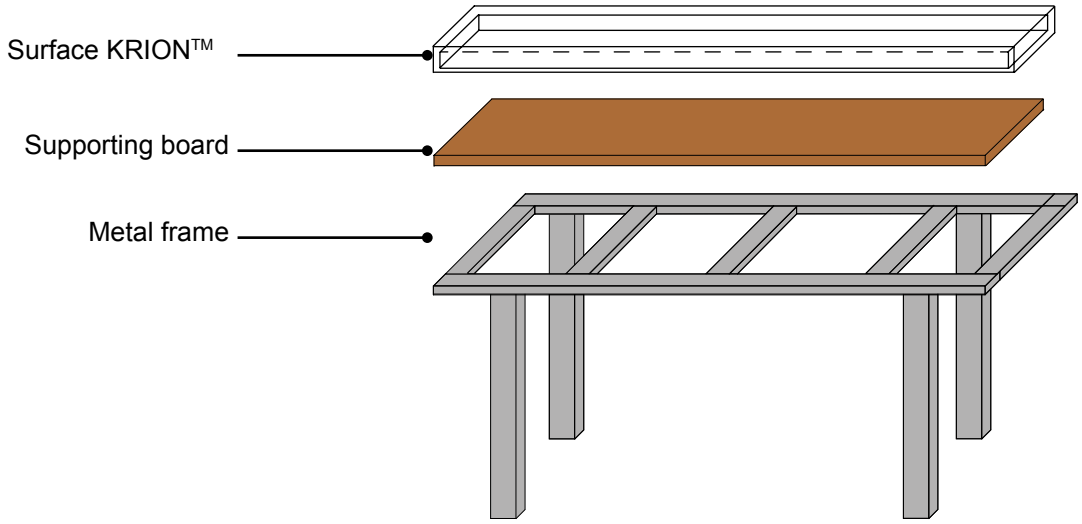
In this example, we are going to make a 2800x1100 (113 ºF) table made of 12mm-thick (1/2") Snow White KRION™ which will stand on an outdoor terrace.

The KRION™ will be laid on top of a phenolic plywood board, in turn supported by a metal frame. It is important to remember that MDF board is not suitable for outdoor use, since it is made of compacted fibre which can be affected by damp or rain, (deforming it and affecting the top surface).

Due to its outdoor location, temperatures can vary between -5 °C (23 ºF) and 45 °C (113 ºF).
*Free-standing: separate, not fixed to other structures (such as walls or columns).

With this data, the necessary calculations can be made for the design of the table. Since it does not run between two walls, we do not need to take into account the maximum temperatures that might be reached there.
In contrast, we do need to take into account scenarios in which temperatures drop and the KRION™ surface contracts on the wooden base board. In this case, a contraction joint is needed between the two materials.

We said that a minimum temperature of -5ºC (23 ºF) is normally reached in such places, but we will add another minus 10 degrees as a safety margin and take a value of -15ºC (5 ºF).



$$\Delta L = \alpha \, Klux \cdot \Delta T \, (tc - t0) \cdot L0 = 0{,}000035 \cdot (-15-20) \cdot 2800 = -3{,}43 \text{ mm}$$

The surface will be subject to a linear contraction of 3.43 mm (1/8") when the temperature drops from 20ºC (68 ºF) to -15ºC (5 ºF).

Coefficient of linear expansion (α)

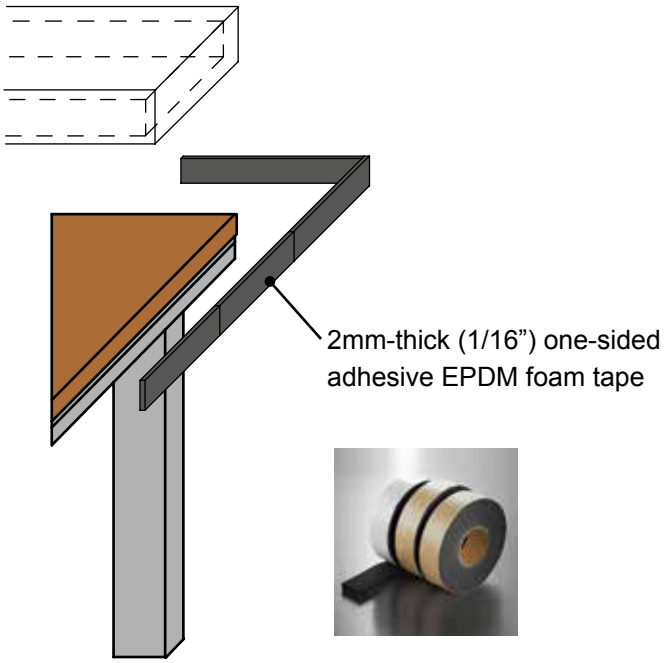
12.3 Several examples of calculations.

12.3.2 · Free-standing* table on an outdoor terrace.

The contraction can be evenly distributed by inserting a 2mm (1/16") joint between the supporting board and the KRION™ top surface.

This gap should not be left unfilled. It must be sealed with an elastic sealant like P404 by Butech or with one-sided adhesive EPDM, CR or SBR foam tape (sold in different widths and thicknesses).

If this gap is left unfilled, the surface could break due to impacts.



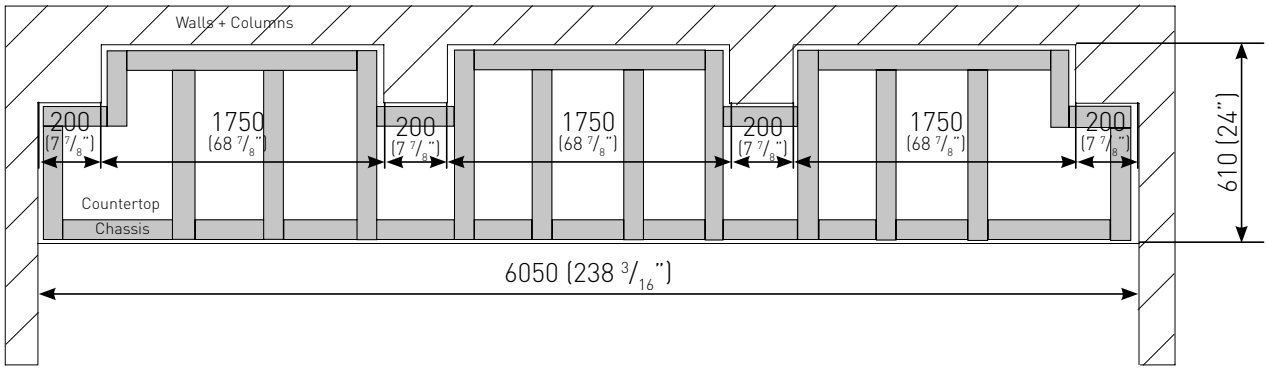
12.3 Several examples of calculations.

12.3.3 · Countertop on an outdoor terrace

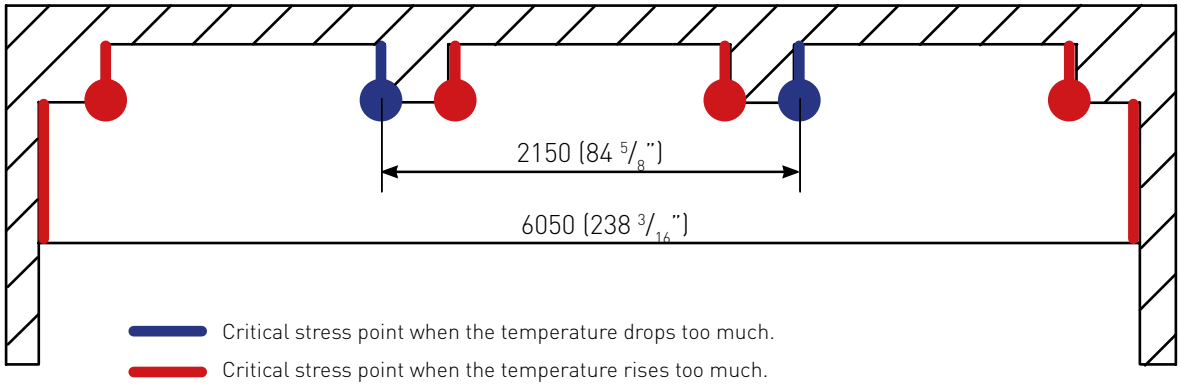
Let us imagine that we are going to make a big countertop that runs between several columns and stretches of wall. We decide to use 12mm-thick (1/2") Snow White (1100) KRION™.

The unit under the countertop is made of brick and the countertop is reinforced with a supporting metal frame (made of aluminium or galvanized iron etc.).

General plan of walls, columns and countertop



If a certain safety margin is applied, a minimum temperature of -10°C and maximum of 55°C can be taken. In this example, we have structural elements at both ends. This will mean that the surface of the countertop will expand against the columns and two side walls when the temperature rises and contract in relation to the two central columns and bottom frame when the temperature drops.



12.3 Several examples of calculations.

12.3.3 · Countertop on an outdoor terrace

The necessary joints can be planned by making the following calculations, taking a countertop with an approximate length of 6050 mm (238 $^{3}/_{16}$") at an initial temperature of 20°C (68 °F).

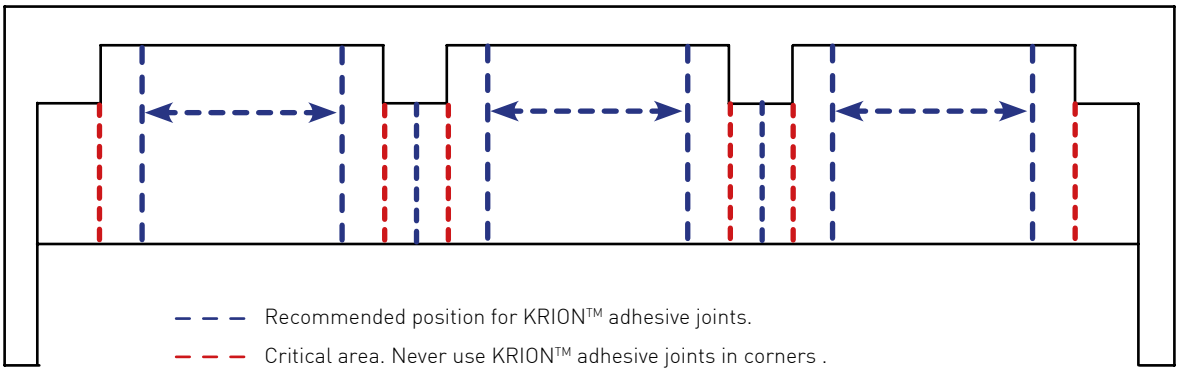
ΔT ↑ 55°C - 20°C = 35	6050 x 0,000035 x 35 = 7,41 mm (maximum expansion)
ΔT ↓ -10°C - 20°C = -30	6050 x 0,000035 x -30 = -6,35 mm (maximum contraction)
ΔT ↓ -10°C - 20°C = -30	2150 x 0,000035 x -30 = -2,25 mm(contraction central columns)

The results should be rounded up a little higher, leading to a maximum expansion of 10 mm (3/8"), a maximum contraction of -8 mm (11/16"), and a contraction of -4 mm (13/16") between the two middle columns.

The countertop's general design would be as follows:

- For a total expansion of 10 mm (3/8"), a 5mm-thick (3/16") single expansion joint round the whole perimeter of the countertop is required.
- Total length of countertop: 6040 mm (237 $^{13}/_{16}$"), made at a temperature of approximately 20°C (68 °F).
- A 4mm-thick contraction joint between the KRION™ top surface and supporting frame.

Joints made of KRION™ adhesive must always be used in places not subject to stresses. Do not use them in the corners of columns.



Another possibility is to create perpendicular intermediate expansion joints and thus reduce the expansion joint around the perimeter of the countertop, although aesthetically it will look better with a single 5mm-thick (3/16") expansion joint between the perimeter of the countertop and the walls and columns.

Given the countertop's 6-metre (1/4") length, this design almost verges on the need for intermediate expansion joints so as to avoid possible breaks.

Applications by thicknesses 13

KRION™ sheets come in a wide variety of formats and thicknesses. Although the quality of the sheets is the same, some thicknesses are not suitable for certain applications.

Format	Thickness
2500 x 760 (98 7/16" x 30")	6 (1/4")
2500 x 930 (98 7/16" x 36 5/8")	6 (1/4")
3680 x 760 (145" x 30")	6 (1/4")
3680 x 930 (145" x 36 5/8")	6 (1/4")
3680 x 760 (145" x 30")	9 (3/8")
3680 x 760 (145" x 30")	12 (1/2")
3680 x 930 (145" x 36 5/8")	12 (1/2")
3680 x 1350 (145" x 53 3/16")	12 (1/2")
3680 x 760 (145" x 30")	19 (3/4")

A standard 12mm (1/2") thickness is the most commonly used type. All the colours in the KRION™ range can be found in this thickness.

Other thicknesses, such as 6 mm (1/4"), 9 mm (3/8") and 19 mm (3/4"), are only available in certain colours and formats.

The following table contains examples of different applications and required thicknesses.

Use or application	1/4"	3/8"	1/2"	3/4"
Kitchen or bathroom countertops	✗	•	✓	✓
Urban or outdoor furniture	✗	•	✓	✓
Indoor furniture, tables, desks, shelves etc.	•	•	✓	✓
Wall coverings (indoors)	✓	✓	✓	✓
Cladding for façades, walls etc. (outdoors)	✗	✗	✓	✓
Decorative features, lighting	✓	✓	✓	✓
Large surfaces of up to 6 metres without expansion joints	✗	✗	•	•
Custom-made shower trays or bathtubs	✗	•	✓	✓
Surfaces subject to possible impacts or thermal shocks	✗	•	✓	✓
Floors subject to high traffic	✗	✗	✗	✗
As a cladding on small or medium-sized indoor items of furniture	•	✓	✓	✓
Revestimiento de Piscinas	✗	✗	✗	✗

✓ Suitable
✗ Not recommended
• Suitable, taking the necessary precautions in terms of expansion joints, the support etc. ,

Applications by thicknesses 13

Take into account the following points:

► KRION™ sheets of the same colour have the same expansion coefficient, whatever their thickness.

► If KRION™ is going to be used to reinforce the surface, it must be of the same colour as the sheets used to make the surface, because different colours could have slightly different expansion coefficients.

► The slimmer a sheet is, the stronger and more stable the structural support should be.

► Do not use materials for the support that might warp or break when exposed to damp or humidity or when in direct contact with water. This is fundamental in the case of outdoor items or indoor ones subject to a certain amount of moisture, as in bathrooms or on indoor terraces.

► When walls are covered in 6mm-thick (1/4") KRION™, it is important to check the flatness of the walls or supporting board very carefully. 6mm-thick (1/4") sheets are more flexible than other thicker ones, and so any possible unevenness in the wall will be more noticeable.

Bonding KRION™ to other materials 14

KRION™ can be bonded to a wide range of surfaces and materials. Methacrylate, wood, metal, glass, concrete, plaster and brick surfaces are all perfect candidates for covering with KRION™.

These surfaces must first be levelled.

A flexible, long-lasting adhesive is required.

Butech P-404 polyurethane sealant is the best option.

Other polyurethane-based sealants can be used to good effect.

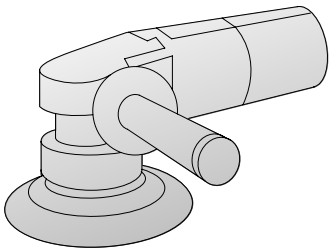
Only use P-404 sealant to bond KRION™ to walls when the substrate requirements are not particularly demanding. For example, do not use it to panel façades.

To create façades with KRION™, it is necessary to combine the adhesive with a mechanical support (metal profiles and/or anchors).

Coverings bonded with silicone are only acceptable when the sheets are supported on the floor or on a skirting board (more recommended).

Finish (Sanding and Polishing)

The KRION™ should then be sanded to ensure a smooth surface.



A random-orbit sander should be used for this process, using sanding discs of progressive grit sizes from a thick grit to a medium and then fine one.

Preferably, the sander should have a speed regulator and it should be possible to change the plate.

KRION™ can be polished for decorative purposes to achieve a glossy surface.

Insofar as is possible, the surface finish should fit in with the product's end use.

15.1- Sanding.

Generally, the sanding should be done using aluminium oxide or silicon carbide grit on a paper backing, working progressively from P80 through P120, P180, P240, P320 to P400 to achieve a matt finish. For a satin finish, use S500, P800 and S1000 abrasives.

The first step is to grind any surplus adhesive on the joints and to sand any angles between bonded sheets. This should be done with a hard or semi-hard sanding plate and thick wool sanding pads.

This grinding stage can also be done with a small hand milling cutter and profile wheels. In such an event, a P180-grit sanding disc can be used to start the sanding process instead of starting with bigger grits.

For darker colours, wet sanding should be used for the final phases with the P400, P600 and P1000 sanding discs. This will ensure a finer finish.

To rectify the edges, edge milling tools can be used, followed by a 3 (1/8") or 4mm (3/16") random orbit sander.

To ensure a top-quality finish, the sanding should be gradually done, without exerting too much pressure on the surface so as to prevent the sander or the KRION surface from getting too hot or circular scratch marks from appearing.

If the temperature along the joint is too hot, the adhesive will be more likely not to bond the sheets together properly.

Warning: With darker-coloured sheets, it is even more important to sand them properly using the grits in the right order so as to sand away any marks made by the previous sanding disc. In this way, any unevenness will be avoided and a more uniform surface will be achieved.

To grind the surface, the bigger the sander's orbit, the more material it will remove, but it will also make more scratches. (An 8mm (5/16") orbit is sufficient). For grinding purposes, a harder base should be used.

Once any unevenness has been removed from the surface and the adhesive joint, the KRION® should be sanded with a 3mm (1/8") or 4mm (3/16") random orbit sander.

15.2- Polishing.

Start by using the following sequence of sanding grits: P120, P180, P240, P320, P400 through to P600.

Then continue from S1000 to S2000 or even from S3000 to S4000.

The speed of the sander should be reduced when using finer abrasives with a 1000 grit size onward. This will prevent the surface from getting too hot.

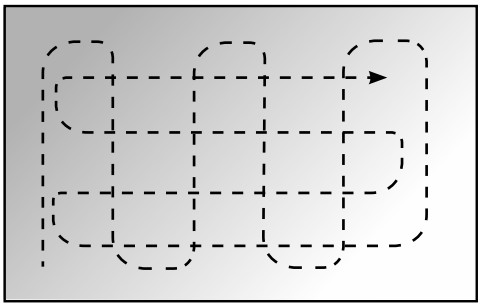
Polished or high-gloss finishes can be achieved by applying a polishing paste with a 5000,7000 or 11000 grit, using a sponge or wool polishing pad.

Polishing KRION™ manually or using a machine is mainly carried out for decorative purposes.

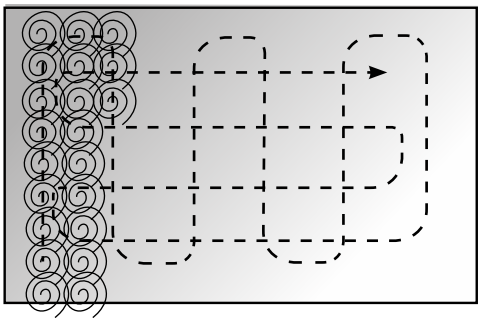
Clients may specify a different finish, although we always recommend a matt or satin finish, as this makes the day-to-day care of the surfaces easier.

A gloss finish is more fragile and difficult to maintain. Customers must be informed of this.

Carry out the successive sanding operations by working from the top to the bottom and from left to right, in small, overlapping circular movements, but without rounding the edges (the sanding process should be carried out in two steps, twice in each direction).

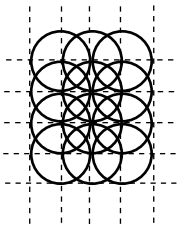


Sand the surface in a circular motion from top to bottom and from left to right, overlapping the sanding zones. Clean the sanding disc and the surface after each sanding cycle.



Finish (Sanding and Polishing)

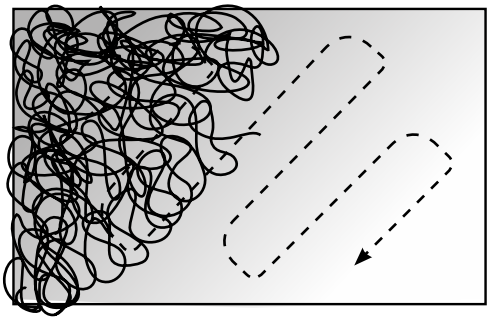
15.2- Polishing.



Note:

When working with a P80, P100 or P180 grit sanding disc, set the sander to the grinding mode (only available on some machines). With finer sanding discs, set it to the polishing or finishing mode.

When fine sanding discs are used, move the sander in random figure-of-eight movements, not from up to down or left to right, but diagonally. Use this same movement for finishing off the surface with a P1000-grit sanding disc (abrasive on a soft or sponge base).



Use slower speeds when using finer sandpapers.

Excessive speed with fine sandpapers may burn the surface and ruin the finish.

Sand with water if you have a sander powered by compressed air and you wish to polish the section.

Important observations:

- Do not apply too much pressure to the sander.
- Maintain the same pressure.
- Work at a constant speed with each particular grit size.
- Use the right tools. Replace the sanding plate if it shows signs of wear and tear or if it becomes deformed.
- Replace worn sanding discs.
- Use a rigid base with no profiles to sand horizontal surfaces.

Warning!

Do not use an electric sander to wet sand, given the high risk of electrocution and very serious potential consequences.

If you have to wet sand, use tools that work with compressed air.

15.2- Polishing.

Abrasive discs on a fibre backing (Scotch Brite type).

These discs can be used for the final sanding phase, after sanding with a P400 or P500 grit, to achieve a satin (semi-gloss) finish.

A matt or satin finish will show less wear and tear over the course of time. It is also makes the surface easier to clean and care for.

A kitchen countertop finished with a Scotch disc is an ideal choice.

Abrasive on a fibre backing (Scotch Brite type).

Discs with a fine grit

Sanding discs with a very fine grit (2000, 3000 or 4000) can be used to achieve a glossy finish.

The abrasive on these discs is generally on a flexible fabric or sponge backing.

Abrasive on a fabric/sponge backing

If you continue the work by applying a polishing paste with a wool pad, an even finer higher gloss finish can be achieved.

Although high-gloss finishes are more attractive, they are also more delicate and they require more care than a matt or satin one.

In the case of commercial applications or KRION™ subject to heavy use, clients should be advised to choose a matt or satin finish (particularly with dark colours). If your client wants a high-gloss finish on a dark colour and/or for an application subject to a high degree of wear and tear, warn them that the KRION™ will require more regular care. Do not give them false expectations, as this will be detrimental to any future relations.

Finish (Sanding and Polishing) 15

15.2- Polishing.

Discos de grano fino

Warning!
Always use vacuum systems when sanding, cutting or milling.

Whenever possible, use booths with extractor systems in their lower sections to remove KRION™ dust.

Portable vacuum cleaners are also useful when it is not possible to use an extractor booth.

Keep all filters and motors of extractor systems in good working order.

If extractor systems cannot be used, open doors and windows to ensure good ventilation.

Always wear a face mask to protect against dust.

If tasks are being carried out in the client's home (milling, cutting, sanding etc.), always use portable vacuum cleaners.

Always seal off the area where you are working to prevent dust from entering the rest of the house.

15.3- Recommendations depending on the finish.

Silicon carbide and/or aluminium oxide abrasive discs should be used for the sanding process.
For the final finish, continue with abrasive discs on a fibre backing (Scotch Brite type) for a satin finish or abrasives on a fabric backing with a sponge base for a glossy finish.

See the following table for a guide to the sequence of sanding and finishing discs for each type of surface. When a dark surface is being finished off, random orbit sanders with an orbit no larger than 3 (1/8") or 4 mm (3/16") should be used.

SANDING & FINISHING KRION					
Type of finish	Pale colours	Dark colours	Type of finish	Pale colours	Dark colours
MATT	P120 P180 P240 P320	**DO NOT ADVISED**	GLOSS	P120 P180 P240 P320 P400 Sanding discs 500 Sanding discs 1000 Sanding discs 2000 Sanding discs 4000	
SATIN	P120 P180 P240 P320 P400 Sanding discs 500 or Fibre S80	P120 P180 P240 P320 P400 Sanding discs 500 Sanding discs 1000 or Fibre S800			

Drilling (screwing) 16

16.1- Drilling and screwing.

Holes can be drilled using fixed or manual drills with high speed machined steel or hardened carbide bits.

For holes with a diameter of up to 10 mm (3/8"), high speed steel bits are used with a normal tip with an angle of 120º.

For holes with a diameter of up to 500 mm (19 $^{11}/_{16}$"), bits with a hardened carbide tip are used.

When inserting screws in the material, a PVC or brass plug must be used.

The same working conditions must be applied for working with glass or other fragile materials:

- The hole must be larger than the screw.
- A silicone spacer that allows for expansion due to temperature changes must be fitted between the KRION™, the screw and the material being attached.
- Elements must never be screwed directly onto KRION™ as this may cause splits and cracks

Inserts

If you have to mechanically attach KRION™ to any other material (such as a wall or wood), NEVER screw or nail a sheet of KRION™ onto it

Use inserts to screw in KRION™. Expansion inserts can be used directly in the KRION™.

To attach screwed inserts, drill 2 mm more than the diameter of the insert, then fill with adhesive.

17.1- Installing inserts.

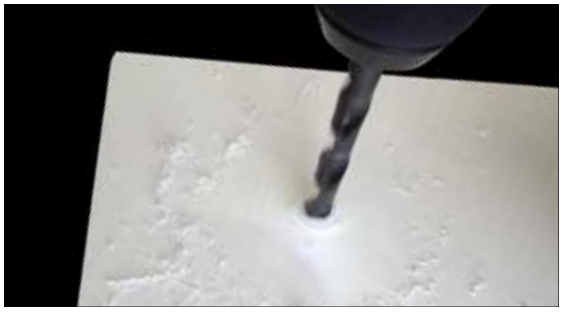
1

Use inserts with a closed base that are no thicker than the KRION™ sheet.

2

Use a metal bit with a 1mm wider diameter than the insert.

3



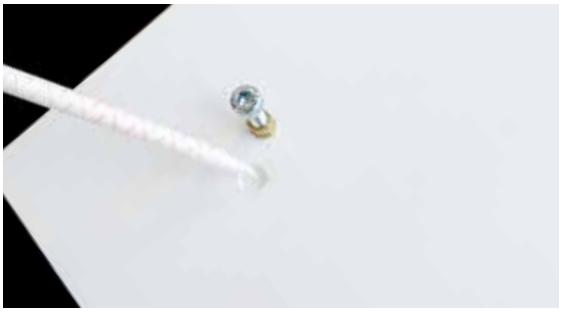
Make sure that the hole is the same depth as the insert. Never drill in hammer mode.

4

Clean away any remains from the drilling process.

17.1- Installing inserts.

5



Fill the hole to half its depth with KRION™ adhesive.

6

Use a threaded screw to fit the insert into the adhesive-filled hole so as to prevent the adhesive from blocking the thread.

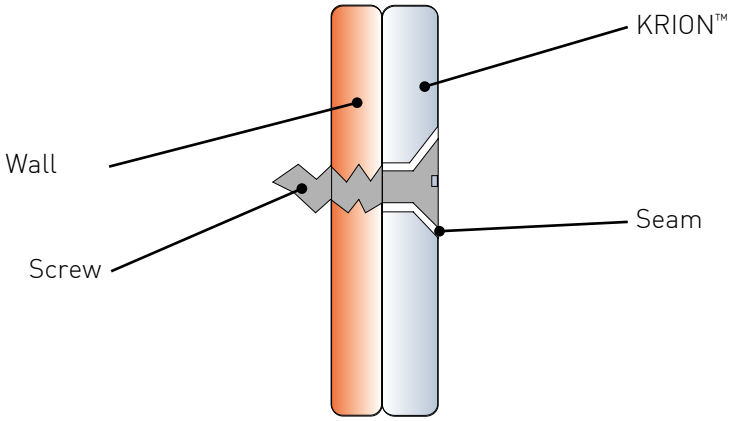
7

Remove the screw and sand away any surplus adhesive.

8

If you intent to attach KRION™ to something like a wall, you must first drill a hole, attach a plastic insert (to allow for expansion in the KRION™, screw and wall) and use screws that allow for a certain degree of movement.

► Plastic joint.



Inserts 17

17.1- Installing inserts.

Warnings

- Do not screw or nail KRION™ directly.
- Leave expansion joints.
- Round interior and exterior radii to eliminate stresses.
- Do not bond sheets cut with saws.
- Add reinforcements strips to seams and bowls.
- Leave room for the vitroceramic hob to expand.
- Work on flat tables.
- Respect working temperatures.
- Use flexible adhesive to attach KRION™ to another surface (Butech P-404).

P-404 is an adhesive sealant mastic with a single component polyurethane base. It polymerises in contact with air humidity, turning into an extremely elastic and adherent elastomer.

P-404 can be painted.

Any type of stain on a product made of KRION™ Lux can be cleaned easily. To do so, different methods are used depending on the type of stain.

KRION® LUX
PORCELANOSA SOLID SURFACE

Programme	Product	Composition	Exposure time	Exposure time
			24 hours	10 minutes
1	Acetic acid	98%	A	A
2	Acetic acid	10%	A	0
3	Citric acid	20%	0	0
4	Hydrochloric acid	37%	A	A
5	Hydrochloric acid	10%	A	A
6	Chromic acid	60%	C	A
7	Hydrofluoric acid	48%	C	B
8	Formic acid	99%	B	B
9	Nitric acid	70%	D	C
10	Nitric acid	10%	D	A
11	Orthophosphoric acid	85%	C	B
12	Orthophosphoric acid	25%	C	A
13	Sulphuric acid	96%	E	B
14	Sulphuric acid	10%	C	A
15	Sulphuric acid	10% (water solution)	C	A
16	Mixture of sulphuric and nitric acid	96% Sulphuric acid	E	C
17	Mixture of sulphuric and nitric acid	70% Nitric acid	E	C
18	Ammonia hydroxide	25% water solution	0	0
19	Potassium hydroxide flakes	Unaltered	C	0
20	Potassium hydroxide	40% water solution	C	A
21	Potassium hydroxide	10% water solution	A	A
22	Potassium hydroxide flakes	Unaltered	C	A
23	Sodium hydroxide	40% water solution	C	A
24	Sodium hydroxide	10% water solution	A	A
25	Unaltered ethanol	Unaltered	A	0
26	Isopropyl alcohol	Unaltered	A	0
27	Acetone	Unaltered	A	0
28	Amyl acetate	Unaltered	0	0
29	Benzene	Unaltered	A	0
30	Chloroform	Unaltered	D	A
31	Methylene chloride	Unaltered	D	A
32	Dioxane	Unaltered	A	0
33	Dymethilformamide	Unaltered	A	0
34	Etil ether	Unaltered	0	0
35	Furfural	Unaltered	A	0
36	Methyl ethyl ketone	Unaltered	A	0
37	Carbon tetrachloride	Unaltered	A	0
38	Toluene	Unaltered	B	A
39	Trichloroethylene	Unaltered	A	0
40	Xylene	Unaltered	A	0

KRION® LUX
PORCELANOSA SOLID SURFACE

Programme	Product	Composition	Exposure time 24 hours	Exposure time 10 minutes
41	Ethyl acetate	Unaltered	A	0
42	Silver nitrate	Saturated water solution	A	0
43	Ferric chloride	Saturated water solution	A	0
44	Iodine	2% water solution	A	0
45	Potassium permanganate	Saturated water solution	A	0
46	Copper sulphate	Saturated water solution	A	0
47	Sodium chloride	Saturated water solution	0	0
48	Sodium hypochlorite	Saturated water solution	A	0
49	Sodium sulphate	Saturated water solution	A	0
50	Zinc chloride	Saturated water solution	0	0
51	Petrol	Unaltered	A	0
52	Mixture of phenol and formaldehyde	48% phenol + 26%formaldehyde	E	A
53	Phenol	Unaltered	B	A
54	Methyl purple	10 g/l solution	B	B
55	Formaldehyde	36% water solution	A	0
56	Peroxide	30% Unaltered	0	0
57	Temrex	Dental laboratory disinfectant	A	0
58	Toothpaste	Unaltered	0	0
59	Hand cream	Unaltered	0	0
60	Olive oil	Unaltered	0	0
61	Yeast dissolved in water	Unaltered	0	0
62	Red wine	Unaltered	0	0
63	Vinegar	Unaltered	0	0
64	Lemon juice	Unaltered	0	0
65	Coffee	Unaltered	0	0
66	White wine	Unaltered	0	0
67	Milk	Unaltered	0	0
68	Tea	Unaltered	0	0
69	Nail lacquer	Unaltered	A	0
70	Nail lacquer remover	Unaltered	A	0
71	Lipstick	Unaltered	0	0
72	Watercolour	Unaltered	0	0
73	Pen	Unaltered	0	0
74	Bleach	Unaltered	A	0
75	Anti-limescale	Unaltered	A	0
76	Alkaline detergent	Unaltered	0	0
77	Acid detergent for metals	Unaltered	A	0
78	Merbromin	Unaltered	A	0
79	Shoe polish	Unaltered	0	0
80	Hair dye	Unaltered	A	0

Method 0: Non-abrasive detergent and soft sponge
Method A: Abrasive detergent and soft sponge
Method B: 600 grain sandpaper
Method C: 320 grain sandpaper
Method D: 150 grain sandpaper
Method E: With sandpaper and detergent supplied by the manufacturer

Thermoforming 19

Thermoforming is a process in which heat is applied to KRION™ for a certain amount of time until the sheets become flexible and curved shapes can be made.

Once the sheet has reached the required temperature throughout its whole thickness®, it is placed on a mould or support to shape it. It can be shaped to create a plane curve and/or to make it partially three dimensional.

The sheet to be thermoformed must be immobilized on the mould until its temperature drops to below 60ºC (140ºF). For this purpose, a "vacuum membrane" or "press" with a male and female mould is used.

Membrane à vide

Presse

For soft-looking shapes and large radii, a male and female mould can be used without the aid of a vacuum membrane or press.

19.1- Heating process – Temperature & time.

Always use heat resistant gloves with thermal protection of up to at least 200ºC (392ºF) to protect your hands and arms.

An apron, safety boots and protective goggles will also be needed to handle KRION™ sheets that have just been taken out of the oven.

Warning: Do not forget to remove the protective film before heating the sheet.

Sand the sheet to obtain a matt finish before heating it. This will help to prevent discoloration or breaks.

Sand the edges and corners of the sheet to prevent it from cracking or cutting the vacuum membrane.

For the heating process, generally speaking, a convection oven or one with electric heating plates will be needed. Ovens with heating plates can be single or double-surface ones (with a top and bottom).

For the heating process, the temperature and time must be very carefully controlled.

Thermoforming

19.1- Heating process – Temperature & time.

Thus to heat the sheets, always use ovens that ensure a stable uniform temperature across the whole surface during the entire heating time.

Never use heating methods that are unable to guarantee a uniform heat or cannot monitor whether a stable constant temperature is applied.

Electric oven with double-sided heating plate.

The whole sheet must be the same temperature throughout. If the temperature differs or is insufficient in some areas, the KRION™ might break when it is curved.

The temperature to which the KRION™ sheet must be heated will depend on the complexity of the intended design. This temperature will range between 130ºC (266ºF) and 165ºC (329ºF).

A basic design with very big radii can be thermoformed at just 130ºC (266ºF).

For smaller sharper radii, higher temperatures of around 160ºC (320ºF) will be needed.

The required heating time is that needed for the whole surface and thickness of the sheet to reach the programmed temperature. This can range between 10 and 40 minutes, depending on the thickness of the sheet and the type of oven being used.

It is important not to exert mechanical pressure on the surface during the heating process, since it might affect the surface colour.

19.1- Heating process – Temperature & time.

Heating rule for KRION™ sheets

Take a minimum heating time of 10 minutes and add 1 additional minute for each mm of the sheet's thickness. This is the rule for electric ovens with double-sided heating plates or convector ovens. If you use an oven with a single-sided heating plate, add a few more minutes.

Heating time by thicknesses		
Thickness of sheet	Heating time (convector oven or one with double-sided heating plate)	Heating time (oven with single-sided heating plate)
6 mm (1/4")	aprox. 16 min.	aprox. 20 min.
9 mm (3/8")	aprox. 19 min.	aprox. 25 min.
12 mm (1/2")	aprox. 22 min.	aprox. 30 min.
19 mm (3/4")	aprox. 29 min.	aprox. 40 min.

The sheets to be thermoformed and any straight sheets that will be adjacent to them should be heated in the same way.

Forced cooling of the sheets could affect their resistance, making them more fragile.

Leave the thermoformed KRION™ to cool to at least 60ºC (140 ºF) before taking it out of the mould.

The sheets to be thermoformed should have smooth milled edges to prevent them from breaking if nicks or tiny cracks from the cutting process are left.

For more complex shapes, a male and female mould should be used.

Vacuum membrane

If you have a vacuum membrane, this same membrane will act as a female mould (providing that the shape to be thermoformed is not too complex):

- It is always advisable to use male and female moulds, even in a membrane press.
- The moulds can be made of different materials, such as compact MDF, aluminium, resin fibre, high-density polyurethane etc.
- They should be solid and resistant to prevent them from becoming deformed. The material used to make the mould should also have a certain porosity, like MDF or high-density polyurethane. This is essential when working with vacuum membranes.
- A vacuum membrane may have to exert pressures of close to 10 tons (20000 lb). With hydraulic presses, pressures of over 20 tons (40000 lb) can be achieved.

Thermoforming

19.2- Thermoforming KRION™ Lux Light.

KRION™ Light sheets should be heated to the same temperature for the same amount of time. Differences in the way the sheet is heated may lead to differences in their translucence, and this will be visible when the surface is backlit.

If a straight sheet has to be bonded to a hot thermoformed one, the straight sheet must also be heated to ensure that it has the same degree of translucence as the curved one.

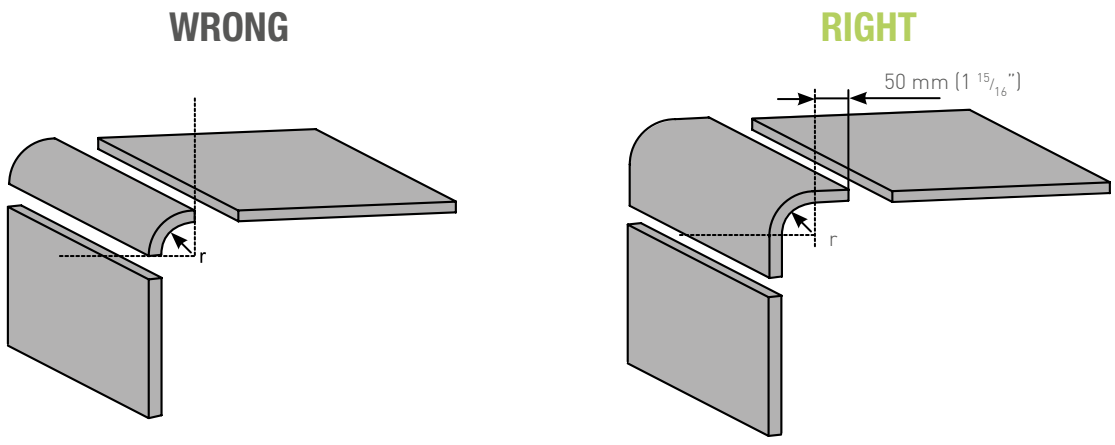
If the recommended curvature radii are exceeded, there could be big changes in colour and translucence.

Heat the sheets for as little time and at the lowest temperature possible to minimize any colour changes. With 12mm-thick sheets, try heating them for 15 minutes at 140ºC (284ºF) and increase the time gradually one minute at a time until you reach the necessary heat to make the required shape.

If the mould does not have a sufficiently smooth finish, this unevenness will be transferred to the thermoformed shape and it will be visible when backlit. To remove this unevenness, sand the KRION™ once thermoformed.

19.3- Minimum recommended radius.

Avoid just using the area of the radius. Always cut the thermoformed piece 5 cm (2") away from the area of the radius.



The radii shown in the following tables are the minimum internal ones for thermoforming each colour.

They have been tested until a visible change in colour close to the radius was observed or until the material broke.

19.3- Minimum recommended radius.

The radii shown in the following tables are internal radii of the curve.

SNOW SERIES		
Color Ref.	Color Description	Minimum internal radius
1100	Snow White	20 mm ($^{13}/_{16}$")

COLORS SERIES		
Color Ref.	Color Description	Minimum internal radius
6101	Frost White	40 mm (1 $^{9}/_{16}$")
6203	Senape	50 mm (1 $^{15}/_{16}$")
6501	Cream	80 mm (3 $^{2}/_{16}$")
6502	Pearl	40 mm (1 $^{9}/_{16}$")
6506	Greggio	50 mm (1 $^{15}/_{16}$")
6508	Cotto	50 mm (1 $^{15}/_{16}$")
6509	Moai	40 mm (1 $^{9}/_{16}$")
6703	Santorini Blue	40 mm (1 $^{9}/_{16}$")
6902	Light Grey	30 mm (1 $^{3}/_{16}$")
6903	Grey	50 mm (1 $^{15}/_{16}$")
6908	Scommetto	40 mm (1 $^{9}/_{16}$")
6909	Colosseo Grey	50 mm (1 $^{15}/_{16}$")

COLORS+ SERIES		
Ref Couleur	Description de la couleur	Rayon intérieur minimum
6201	Imperial Yellow	80 mm (3 $^{2}/_{16}$")
6301	Fruit	70 mm (2 $^{12}/_{16}$")
6401	Red Fire	70 mm (2 $^{12}/_{16}$")
6403	Candy	40 mm (1 $^{9}/_{16}$")
6405	Happy Red	50 mm (1 $^{15}/_{16}$")
6504	Mocha	50 mm (1 $^{15}/_{16}$")
6505	Taupe	50 mm (1 $^{15}/_{16}$")
6601	Fall Green	70 mm (2 $^{12}/_{16}$")
6701	Blue Sky	60 mm (2 $^{6}/_{16}$")
6702	Atlantic Blue	70 mm (2 $^{12}/_{16}$")
6704	Navy Blue	80 mm (3 $^{2}/_{16}$")
6901	Black Metal	70 mm (2 $^{12}/_{16}$")
6902	Light Grey	30 mm (1 $^{3}/_{16}$")
6904	Bright	50 mm (1 $^{15}/_{16}$")
6905	Ash Grey	90 mm (3 $^{9}/_{16}$")
6906	Dark Grey	50 mm (1 $^{15}/_{16}$")
6907	Deep Purple	60 mm (2 $^{6}/_{16}$")

LIGHT SERIES		
Color Ref.	Color Description	Minimum internal radius
4102	Extreme Light	50 mm (1 $^{15}/_{16}$")
4201	Yellow Light	90 mm (3 $^{9}/_{16}$")
4401	Pink Light	70 mm (2 $^{12}/_{16}$")
4601	Green Light	90 mm (3 $^{9}/_{16}$")
4701	Blue Light	90 mm (3 $^{9}/_{16}$")

NATURE SERIES		
Color Ref.	Color Description	Minimum internal radius
0101	White Nature	50 mm (1 $^{15}/_{16}$")
0102	Clear Nature	70 mm (2 $^{12}/_{16}$")
0103	Day Nature	20 mm ($^{13}/_{16}$")
0501	Dune Nature	50 mm (1 $^{15}/_{16}$")
0502	Camel Nature	90 mm (3 $^{9}/_{16}$")
0503	Earth Nature	50 mm (1 $^{15}/_{16}$")
0504	Marfil Nature	50 mm (1 $^{15}/_{16}$")
0901	Grey Nature	more than 90 mm (3 $^{9}/_{16}$")
0902	Ash Nature	more than 90 mm (3 $^{9}/_{16}$")
0903	Night Nature	40 mm (1 $^{9}/_{16}$")

Thermoforming

19.3- Minimum recommended radius.

STAR LUX		
Color Ref.	Color Description	Minimum internal radius
7103	White Star	60 mm (2 6/16")
7201	Golden Star	40 mm (1 9/16")
7501	Greggio Star	30 mm (1 3/16")
7502	Moai Star	50 mm (1 15/16")
7701	Atlantic Blue Star	70 mm (2 12/16")
7903	Deep Purple Star	50 mm (1 15/16")
7904	Black Star	50 mm (1 15/16")
7905	Grey Star	80 mm (3 2/16")

ROYAL LUX		
Color Ref.	Color Description	Minimum internal radius
8101	Crystal White	more than 300 mm (11 13/16")
8103	Iceberg White	80 mm (3 2/16")
8901	Crystal Black	more than 300 mm (11 13/16")
8904	Black Mirror	220 mm (8 11/16")

ROYAL + LUX		
Color Ref.	Color Description	Minimum internal radius
9101	Crystal White +	more than 300 mm (11 13/16")
9102	Polar Stone	more than 300 mm (11 13/16")
9103	Bright Rock	more than 300 mm (11 13/16")
9104	White Concrete	70 mm (2 12/16")
9105	Elegant White	80 mm (3 2/16")
9505	Cream Concrete	more than 90 mm (3 9/16")
9506	Mocha Concrete	more than 90 mm (3 9/16")
9507	Taupe Concrete	more than 90 mm (3 9/16")
9903	Deep Granite	more than 300 mm (11 13/16")
9904	Bright Concrete	more than 90 mm (3 9/16")
9905	Elegant Black	300 mm (11 13/16")
9906	Black Mirror XL	220 mm (8 11/16")

ASTEROID SERIES		
Color Ref.	Color Description	Minimum internal radius
A101	Asteroid White	220 mm (8 11/16")
A501	Asteroid Mocha	110 mm (4 5/16")
A502	Asteroid Brown	100 mm (3 15/16")
A503	Asteroid Dark	110 mm (4 5/16")
A504	Asteroid Cream	120 mm (4 3/4")
A505	Asteroid Taupe	260 mm (10 1/4")
A901	Asteroid Grey	260 mm (10 1/4")

To curve the Luxury series, temperatures of between 140ºC (284 ºF) and 155ºC (311 ºF) will be needed, except for Pompei, which must be heated to a maximum of 130ºC (266 ºF). (Do not exceed these maximum temperatures).

It is fundamental to heat both the sheets to be thermoformed and any adjacent straight sheets in the same way.

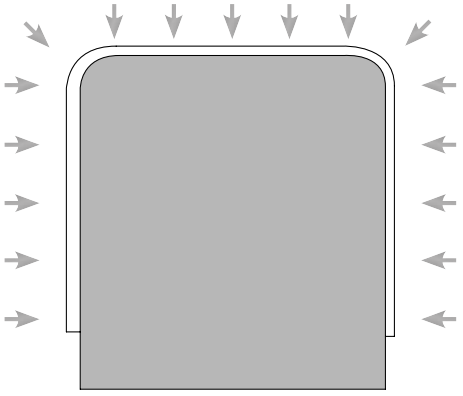
LUXURY SERIES				
Colour	Thickness of the sheet	Heating time	Minimum bending radius	Maximum temperature
L501. Pompei	12 mm (1/2")	15 min	R200 (7 7/8")	130ºC (266 ºF)
L503 . Siracusa		20-22 min	R150 (5 15/16")	140ºC (284 ºF) - 155ºC (311 ºF)
L901 . Segesta			R200 (7 7/8")	
L902 . Erice				

19.4- Thermoforming errors.

KRION™ Lux y KRION™ Stone

▶ Too much heat:
See temperature charts and heating times.
May burn and blister.

▶ Insufficient heat:
See charts.
May not curve correctly and split.



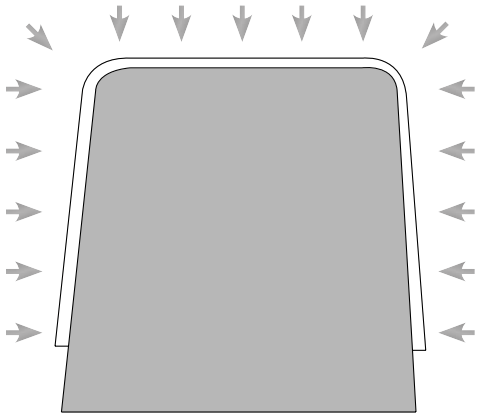
▶ Curves too fast:
May break, whiten or wrinkle.

▶ Uneven heating:
The sheet may split.

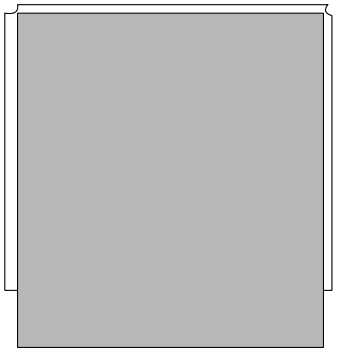
▶ Incorrectly prepared moulds:
Wrinkles may appear.

▶ No mould removing angle has been left:
It may not be possible to remove the section once it has cooled, due to contraction.
Leave a minimum angle of 5º to ensure the section can be removed from the mould without problems.

▶ Too much mechanical pressure on the surface to be heated:
May slightly alter the colour of the sheet.



▶ Moulds with sharp edges:
The KRION™ section and/or press membrane may break.

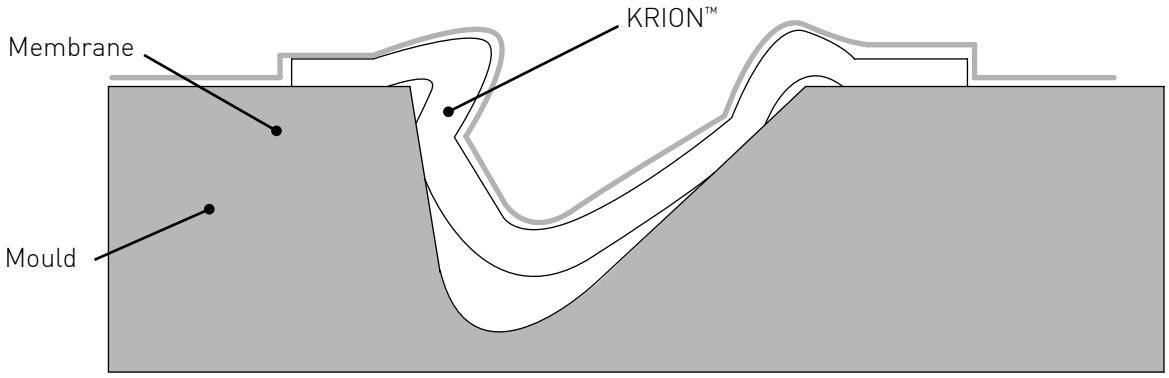


19.4- Thermoforming errors.

KRION™ Lux y KRION™ Stone

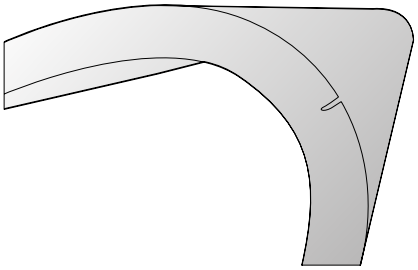
▶ KRION™ sections with sharp edges:
Round the edges slightly with a sanding block.

▶ Excessive curving.



The material will not attach to the mould correctly and it will not be possible to achieve the required shape.

If you force the material too much, it will snap and/or whiten.



▶ Stretched material:

Maximum stretching to avoid breakage: 25%

Maximum stretching to avoid whitening: 10%

▶ Compressed material.

▶ Moulds with rough finishes:
Surface finish of the section with wrinkles.

▶ Mould without lubrication (using talc):
The section may not fit properly as it cannot move.
When it cools, it may be difficult to remove it from the mould.

▶ Remove the section from the mould before it cools:
If it is still hot, it may bend in a different way than required by leaving it outside the mould.

▶ Heating the section too quickly:
Will only heat the surface and the sheet will break when curved.

19.4- Thermoforming errors.

KRION™ Lux y KRION™ Stone

▶ Uneven heating:
The sheet might break because some parts have not been sufficiently heated.

▶ Incorrectly positioned membrane:
The KRION™ does not adapt to the mould, leading to flawed results.

▶ KRION™ too thick:
The desired radii cannot be made.

▶ KRION™ sections bonded using adhesive:
The pressure may break the seam.
The heat may affect the quality of the bond.

▶ Incorrect positioning of the mould and/or KRION™ in the press:
Pressure is not applied correctly.
KRION™ does not fit the mould.

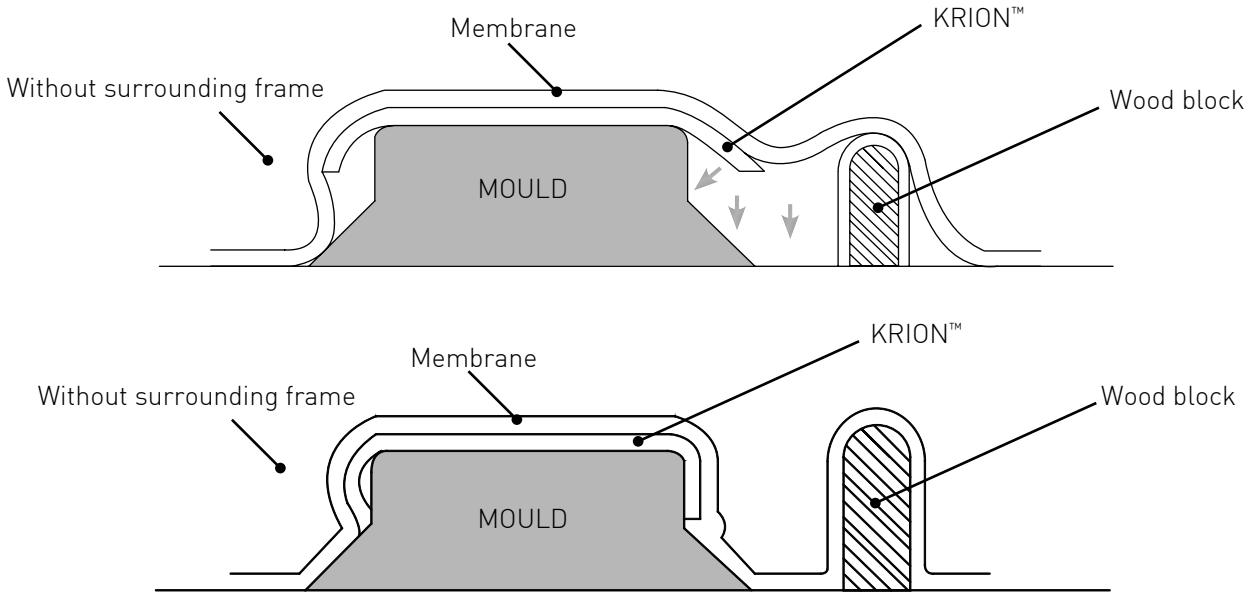
▶ Do not use male and female moulds:
The KRION™ section may not fit correctly.
KRION™ does not curve correctly.

19.5- Problems when thermoforming.

Problem	Reason
-Whitening:	- KRION™ too stretched. - KRION™ too folded. - Incorrect heating.
- Bubbles and blisters:	- Too much heat. - Heated too quickly.
- Burns or a change of colour in the sheet:	- Too much heat or mechanical pressure during the heating process. - Mould with rough surface.
- Rough patches:	- Curved to an excessive radius. - Insufficient heating. - Mould with sharp edges. - KRION™ section with sharp edges.
- Cracks:	- Curved to an excessive radius. - Insufficient heating. - Mould with sharp edges. - KRION™ section with sharp edges. - Mould with overly aggressive shapes.
- Wrinkles:	- Mould surface not sufficiently smooth. - Too much heat.
- Impossible to remove from mould:	- Give the mould a minimum angle of 5º in order to be able to remove the section once it has cooled (it will expand when heated, and contract when it cools).
- KRION™ does not curve to the required radius:	- See radius chart. - Heat to the indicated temperature. - Use male and female moulds. - Manual adjustment before adding the membrane. - Reduce the curving speed.
The KRION™ section does not fit the mould:	- Check that the radius is possible. - Tongue and groove moulds (a mould and counter-mould) are needed. - Manual adjustment helping to position the membrane.
Membrane breakage:	- Mould with sharp edges. - KRION™ with sharp edges. - Temperature too high. - The membrane is not elastic enough for the shape or height of the mould/piece.

19.6- Perimeter frames (vacuum membranes).

The system makes the membrane adapt from top to bottom. The diagrams below show the difference between the side that has the surrounding frame and the one that does not.



19.7- Thermoforming de KRION™ Stone.

The radii that can be obtained with KRION™ Stone will never be as prominent as those that can be achieved with KRION™ Lux. If you attempt to curve KRION™ Stone to a similar radius as KRION™ Lux, breakage will occur and the material will be wasted.

KRION™ Lux and KRION™ Stone have different compositions, meaning they behave in different ways.

The greater resistance to chemical and environmental agents of KRION™ Stone is offset by the fact that it cannot be thermoformed in the same way as KRION™ Lux.

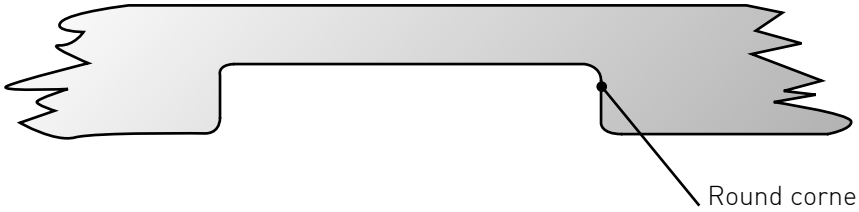
This should not be seen as a limitation; the different materials respond to different needs, and each has its strengths, depending on what it is used for.

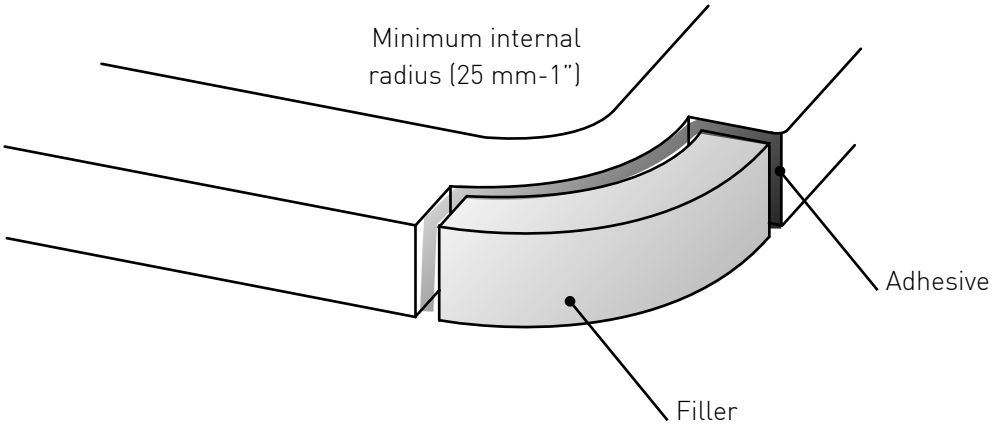
The smooth curves that can be achieved with KRION™ Stone can provide a touch of beauty for your projects, but it will not be possible to achieve the bold designs that are possible with KRION™ Lux.

Take this into account when planning your projects.

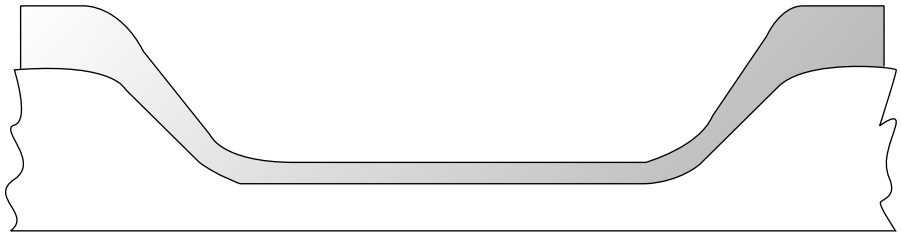
19.8- Trimming to achieve smaller radii.

By trimming to reduce the thickness of a KRION™ sheet, it is possible to obtain more prominent curvature radii:





The 12 mm (1/2") sheet is reduced to 6 mm (1/4"), and after thermoforming, a piece of KRION™ is added to return it to its original thickness and resistance.



In this case it will not be necessary (or possible) to add more material.

This is usually the case when the aim is to curve 18 mm (11/16") sheets more than is possible in principle.

The countertop will be strong and have a solid appearance, but the sink will be finer (12 mm - 1/2"), allowing you to achieve the required shape

19.9- Moulds for thermocurving.

The moulds can be made by hand or using CNC.

If you only have to make a few sections, the moulds can be made of high density polyurethane.

Stronger, more resistant moulds can be made with 12 mm MDF.

When making MDF moulds, make a block by stacking 12 mm layers until reaching the required thickness.

This will result in a stronger mould that will last longer and be less liable to deform than using a single thick board.

Using the block of MDF or polyurethane, machine until achieving the required shape.

If you need to make a lot of sections, you will need a mould in a more durable material, such as aluminium.

You can also make several moulds to increase productivity, making several thermoformed sections at the same time.

This also means that each mould will be used for less sections, increasing the amount of time they last.

19.10- Manual ovens.

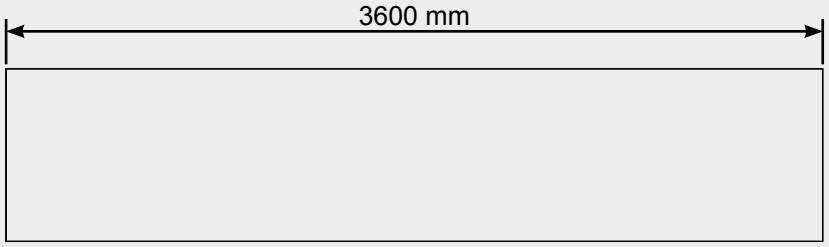
Small KRION™ sections can be heated in domestic ovens, providing they offer reliable temperature measurements and heat the KRION™ section constantly and uniformly.

An electronic thermometer is the best way of controlling excess oven temperatures.

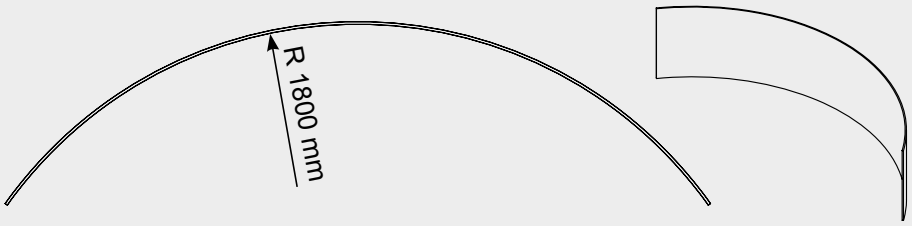
Thermal strips are useful if you do not have a reliable thermometer and your oven does not have a temperature control.

19.11- Cold bending radius of KRION™ Lux sheet.

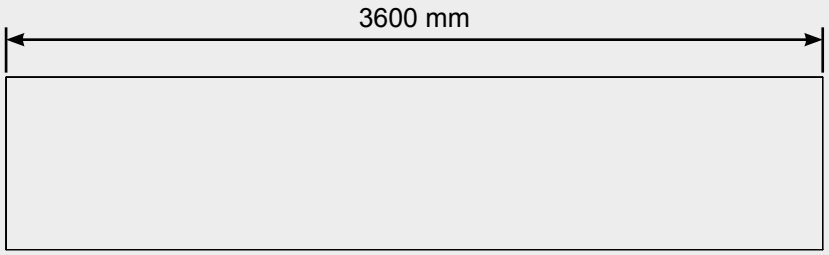
Thickness of sheet: 12 mm.
Length of sheet: 3600 mm.



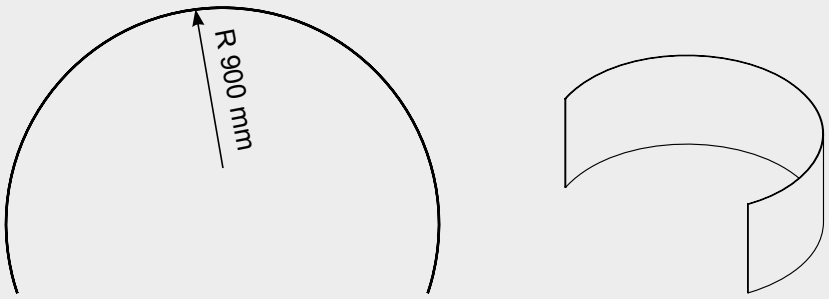
Bending radius: 1800 mm.



Thickness of sheet: 6 mm.
Length of sheet: 3600 mm.



Bending radius: 900 mm.



Backlighting KRION™ Lux Light 20

The colours in the Light series are naturally translucent.

Surfaces and coverings can be uniformly illuminated by backlighting the sheets.

Decorative designs and signs can also be incorporated in the illuminated surface by reducing the thickness of the sheets from 12 mm (1/2") to 3 mm (1/8"). The thinner the KRION™ sheet, the more light that will pass through it.

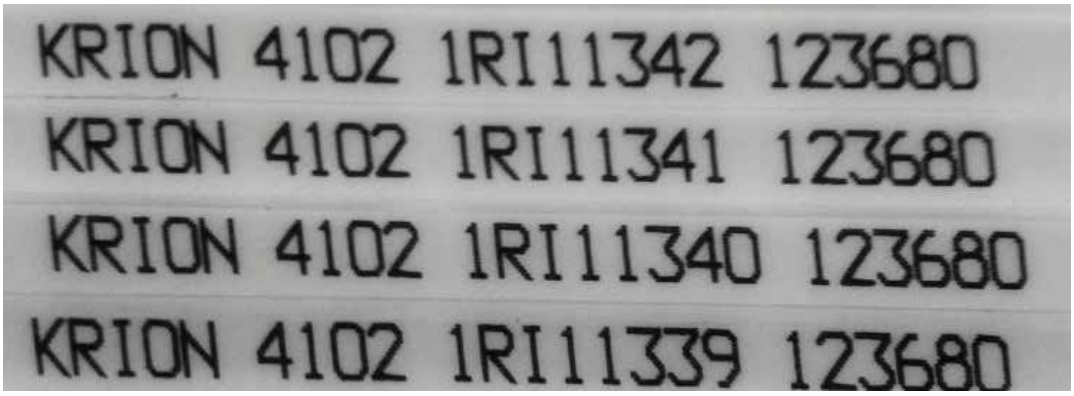
By using black vinyl (or any other opaque sheets), signs can be made with the KRION™.

Backlighting KRION™ Lux Light

20.1- Fabricating KRION™ Lux Light (control of the sheets).

Even though the same fabrication techniques are used with translucent colours as those applicable to other colours, certain extra considerations must be taken into account when the former are fabricated.

For each project or fabrication process, Lux Light sheets from the same manufacturing batch should be used and, whenever possible, sheets numbered in sequential order.



▶ When bonding two sheets from the same manufacturing batch that are not in sequential order, a prior test should be conducted.

▶ This consists of casting uniform light on the back of the two sheets to be bonded to check for possible differences in translucence or colour.

▶ Put the two sheets next to one another, on the same level. (It is not necessary to bond the sheets together when they are inspected).

▶ Observe the sheets carefully, standing in a position with little light, since any differences will be more noticeable.

▶ Always check the appearance of any fabricated KRION™ Light items both with and without the intended backlighting.

▶ By inspecting them both ways, it is possible to detect any variations in shade or translucence and to rectify them before proceeding to the final installation process.

20.2- Seams KRION™ Lux Light.

KRION™ Lux Light seams will always be visible, above all when the panel is backlit.

The adhesive, reinforcement strips and supporting frames will always be visible when you backlight the finished product.

These elements will create visible shadows.

Follow the indications given below to ensure a correct finish:

- Study the design and position of the seams carefully, positioning them in less visible, less well-lit places.
- The twin edges must be prepared with extreme precision to avoid hollows where excess adhesive may accumulate.
- The adhesive left at the back of the seam must be removed, as it has a different translucence to the sheet.
- Use the same sanded finish for the whole of the rear part, as different sanding grains provide different levels of translucence.
- Attach the seam reinforcement strips in areas where the KRION™ is supported on the substrate.
- One shadow will help to conceal another.
- Position the seams in less visible or less illuminated areas.

20.3- Thermoforming KRION™ Lux Light.

If you thermoform a section of KRION™ Light, remember that heating the sheet may cause differences in the translucence of different parts of the sheet if it is not heated uniformly.

If you have to bond a straight section to a hot thermoformed section, make sure that the straight section has the same translucence as the curved section.

If you exceed the recommended curvature radii, major changes will occur in the colour and translucence.

Heat the sheets for as short a time as possible to reduce changes in colour. Try for 12 minutes and gradually increase in 1-minute intervals until achieving a heat that allows you to carry out the required application.

If the mould does not have a sufficiently smooth finish, any irregularities will be seen when the section is backlit.

Any irregularities can be removed by sanding the section once it has been thermoformed.

20.4- Panelling KRION™ Lux Light.

If you have to panel walls that will be backlit, use a transparent mounting adhesive and experiment using a section before completing the project.

If the supporting wall does not have a uniform colour, these differences may be seen when the KRION™ is backlit.

Backlighting KRION™ Lux Light 20

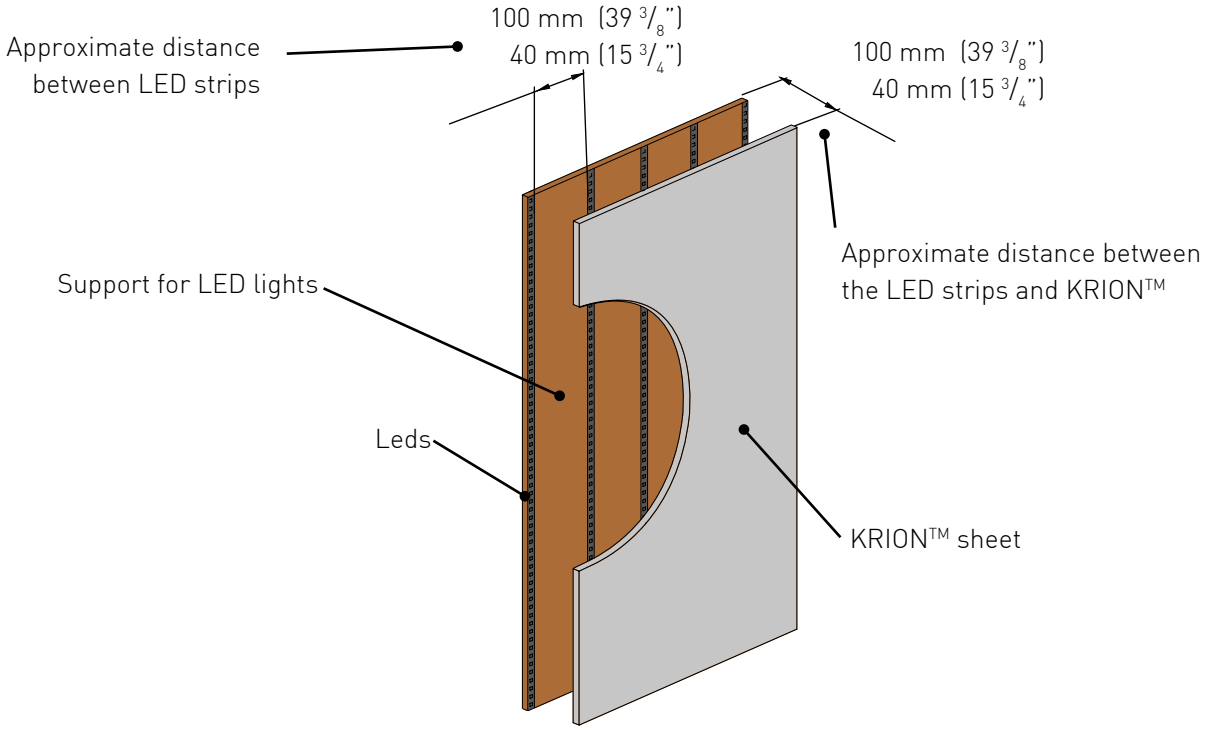
20.5- Illuminating KRION™ Lux Light.

Backlighting is not an exact science. Checks and tests will need to be conducted to guarantee optimum results.

It is important to test the type of light that will be used, the voltage and the distance from which the light is projected, depending on the characteristics of the project, the desired effect, and the ambient lighting (light pollution) in the place in question.

If LED strips are used, there should be a distance of 4 (15 3/4") to 10 cm (39 3/8") between the LEDs and the surface of the Lux Light KRION™. The LED strips can be placed at a distance of 8 (3 1/8") to 10 cm (39 3/8") from each other. (The exact distance will depend on the type and strength of the LEDs).

These figures are relative and they will be directly dependent on the strength of the LEDs and the way the light is angled.



The light from LEDs is unidirectional, and it is projected at a certain beam angle. If a fluorescent tube is used, light is generally emitted along the whole length of the tube.

If the light needs to cover a bigger distance (some 15 cm), the tubes should be fixed to a reflector panel to take greater advantage of the light. (This is also applicable to LED lights).

Light sources should not be used that generate high temperatures. Take into account the ventilation that will be required for the chosen type of lighting.

The power circuits and lighting should be easily accessible for any necessary maintenance or repair work to be carried out.

Removable lighting panels can be created, accessible from one side of the KRION™, or else the actual KRION™ sheet can be designed to be removable.

All this should be taken into account during the planning stage, and the project should be analysed and adapted to suit each specific location.

Trimming down KRION™ to incorporate backlighting 21

Non-translucent colours can be trimmed down to a thickness of 2 or 3 mm to achieve a translucent effect.

Experiment with the depth and type of lighting until the desired effect is achieved.

Kitchens

The following details explain how to build a perfectly assembled kitchen.

Take into account the need for rear trims, side panels, seams, the integration of bowls and vitroceramic hobs, supporting frames, reinforcements etc.

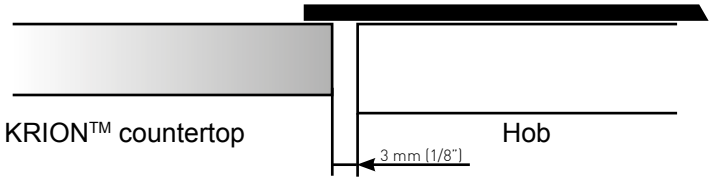
Cutting and preparing the material for installing hobs.

22.1- Thermal insulation – Necessary precautions.

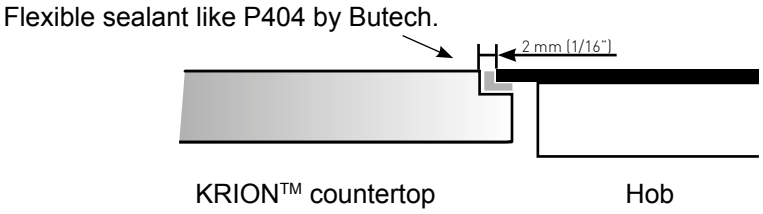
- Expansion gap – safety distances.
- Reinforcements.
- The area's protection (ceramic fibre + aluminium foil tape).
- Lower ventilation.

EXPANSION GAP AND SAFETY DISTANCES

A minimum distance of 3 mm should be left between the hob and the cut edge.



Preferably, hobs should not be integrated flush with the countertop. If this is done, a 2mm (1/16") margin must be left round the perimeter of the hob and this gap sealed with a flexible sealant like P404 by Butech. Never use rigid sealants.



A minimum distance of 700 mm (27 $^{9}/_{16}$") must be left between the seam where the KRION™ sheets have been bonded longitudinally or crosswise and any high heat source (such as a hob or oven).

Always maintain a minimum safety distance of 50 mm (2") between the hob and rear trim of the countertop.

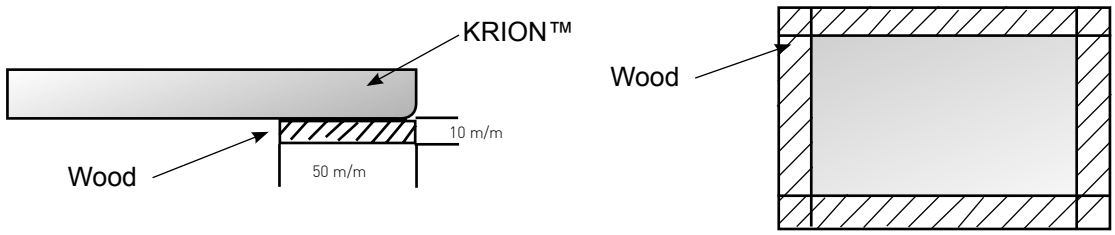
When the hob works with a combustion system (like gas), a bigger gap should be left due to flames that might exceed the diameter of large saucepans or frying pans.

Another solution to this problem is to incorporate a stainless steel plate to insulate and protect the rear trim and/or wall of the cooking area.

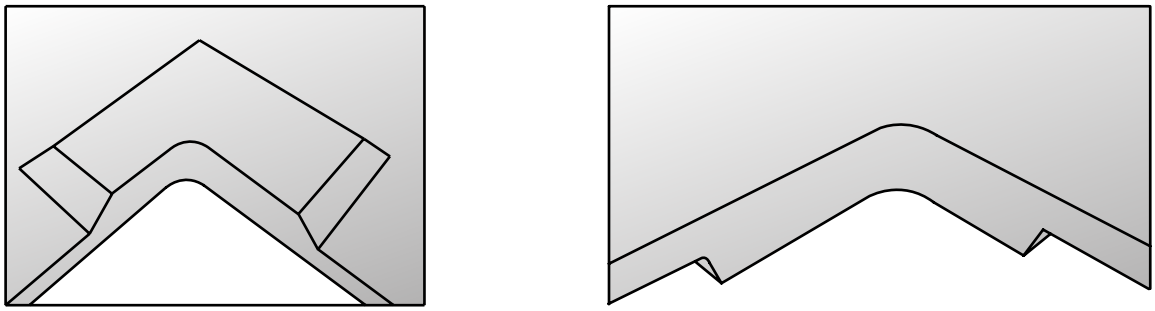
22.1- Thermal insulation – Necessary precautions.

REINFORCEMENTS

The whole perimeter of the gap left for the hob must be reinforced using, for example, a 10mm-thick (3/8") wood strip with a width of at least 50 mm (2"), sealing it at all times with flexible adhesive (type P404).



The gap left for the hob can also be reinforced with KRION™, always mitering the edge at a 45º angle (see close-up).

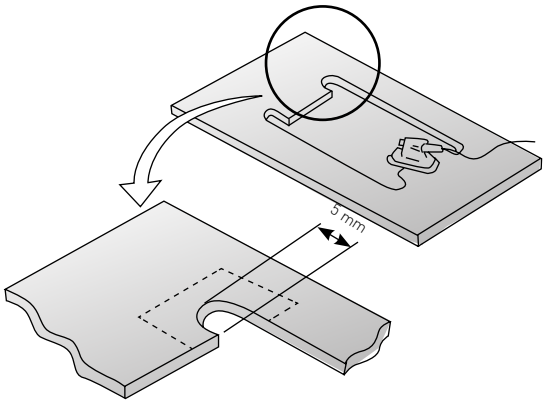


Bottom and top view of the gap reinforced with a 100x100mm (3 $^{15}/_{16}$"x3 $^{15}/_{16}$") piece of KRION™, with an edge mitered at a 45º angle, bonded with KRION™ adhesive. Reinforce the 4 corners of the gap in the same way.

The underside of seams between two sheets can also be reinforced with a (50 (2")-100mm(3 $^{15}/_{16}$")) KRION™ strip. The edges should also be mitered at a 45º angle.

PROTECTING THE SECTION

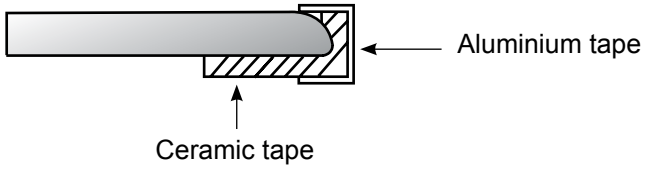
Using the same milling machine that was used to cut the gap, make a groove in it of at least 5 mm (3/16") as shown in the drawing.



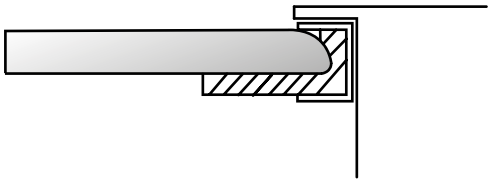
To prevent breakage caused by stress and to cool.

22.1- Thermal insulation – Necessary precautions.

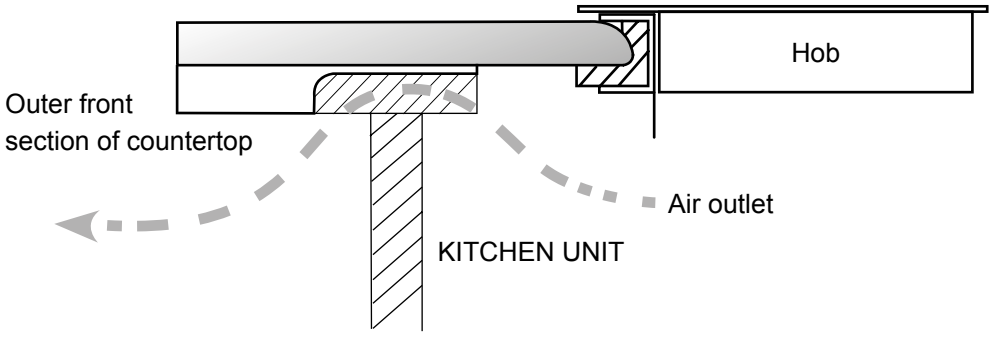
The edges of the sections should be sanded with P400 sandpaper and protected with heat-resistant tape (ceramic fibre tape), followed by an overlapping layer of heat-reflecting aluminium foil tape that surrounds the edge.



Overlap this with a new layer of heat reflecting aluminium foil tape to form an L shape, as shown in the picture.



Ventilation holes should be made in the front wall of the countertop, coinciding with the area where the hob is.



The entire underside of the countertop that holds the hob should be reinforced with wooden chipboard, bonded with an adhesive sealant.

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Do not forget to round the inner edges of the gap used to house the hob. A rough edge is always more fragile than a rounded one.

Kitchens

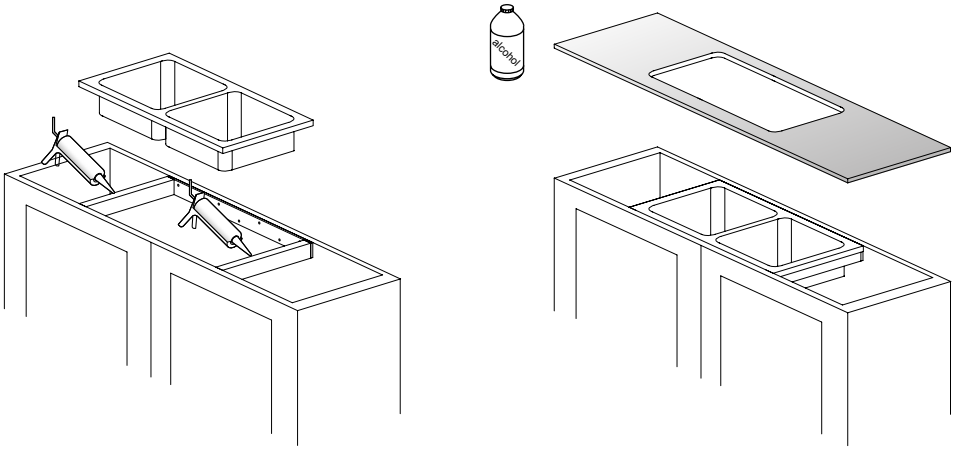
22.2- Recessing sinks (alternative).

1. Build a supporting frame over the sink unit.

2. Place the sink on top.

3. Cut a hole in the countertop using a template. Sand to remove scratches and sharp edges.

4. Position the countertop and attach it to the sink with silicone.



22.3- Recessing sinks (alternative II).

With insets. Without KRION™ adhesive: only silicone. Or with KRION™ adhesive.

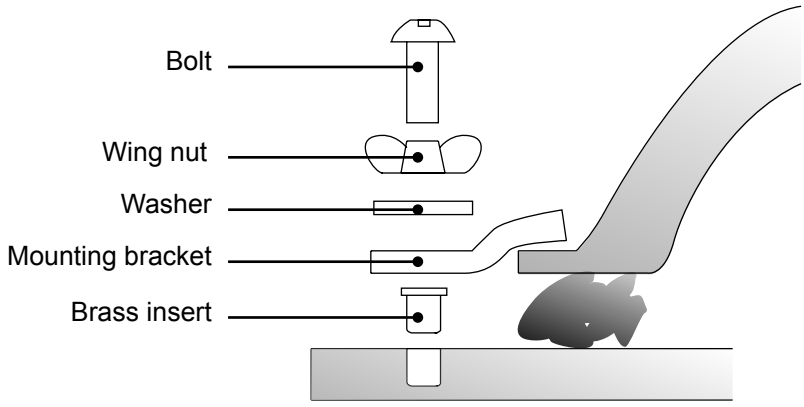
1. Cut the hole for the inset with a suitably sized bit.

2. Push in the expansion inset and tap it so that it adjusts to the opening.

3. Add silicone around the edge of the bowl and move it into place.

4. Add a rubber washer to protect the sections.

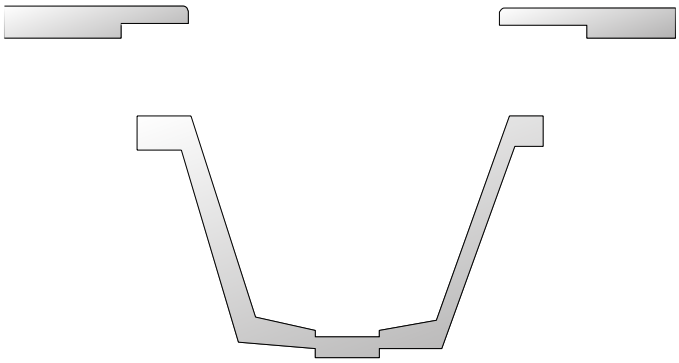
5. Screw in without using too much pressure.



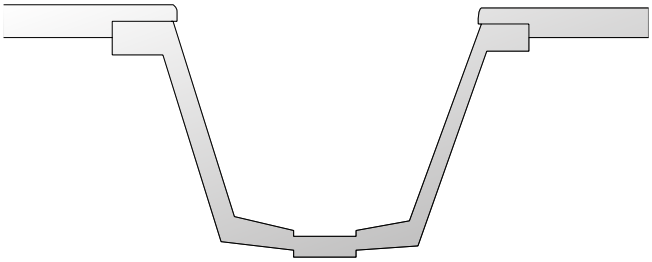
22.4- Recessing sinks (alternative III).

A sink can be recessed by slightly changing the method described in the first case

1. Cut an opening with the shape of the bowl in the sheet before attaching the bowl. The best tool in this case is a CNC machine.



2. Attach the bowl in the opening using adhesive.



22.5- Replacing bowls.

If your customer wants to change the bowl model once the countertop has been installed, there are two possibilities: the new bowl could be the same as the previous one, or it could be larger.

If it is larger, you will need to cut an opening in the countertop around the bowl to remove it and install the new one.

If the new bowl is not larger:

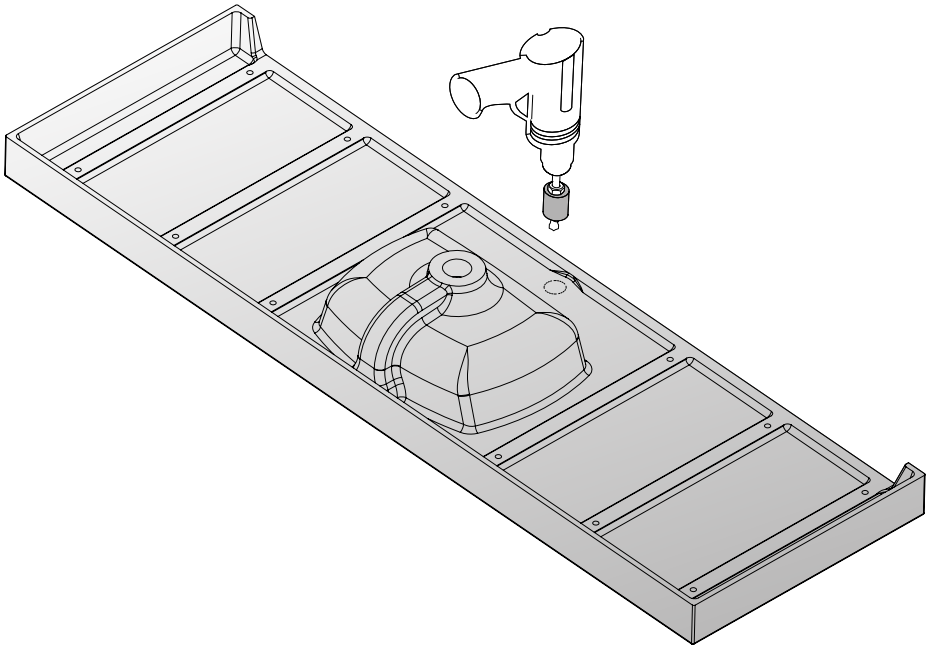
1. Remove the existing bowl .

2. Add KRION™ to cover the hole where the bowl was.

3 Add the new bowl according to the instructions described above.

22.6- Tap hole.

Using a drill bit or core bit make the hole for the tap, as specified in the installation manual. If the tap has screw-on parts like nuts or fastening screws, make sure that the diameter of the machined holes is 2 mm bigger than the screw or piece to be fitted.



Never reinforce the base of the tap with wood or materials that are not waterproof or damp-resistant.

KRION™ is a good material for reinforcing this area.

22.7- Use, cleaning and care.

Recommendations of use

In addition to cleaning the KRION™ surface, certain recommendations of use should be followed to keep it in optimum condition for longer.

AVOID EXCESSIVE HEAT

KRION™ can withstand high temperatures, but extreme heat can damage any surface. Do not expose it to extreme heat or sources of extreme heat. Make sure that cooking pots and frying pans do not overhang the edge of cooking hobs.

PLACE OBJECTS THAT HAVE BEEN TAKEN OFF THE HOB OR OUT OF THE OVEN ONTO A HEAT RESISTANT MAT

In the case of kitchen countertops, put objects that have been taken off the hob or out of the oven onto a heat resistant mat or similar particularly if they are made of cast iron.

DO NOT SLIDE HEAVY OR SHARP OBJECTS ACROSS THE SURFACE

KRION™ is a very hard material. However, as with any surface, be careful not to slide hard, heavy or sharp-edged objects across surfaces with a satin or glossy finish. Always use a chopping board to cut or chop food.

PREVENT OBJECTS FROM KNOCKING THE EDGES OF COUNTERTOPS.

KRION™ has a high resistance to impacts, thanks to its combination of raw materials. Nonetheless, the edges of KRION™ countertops should not be knocked. If they are, they can always be repaired by a KRION™ fabricator.

DO NOT POUR BOILING LIQUIDS DIRECTLY INTO THE SINK/BASIN

Although KRION™ is resistant to thermal shocks, boiling liquids should not be poured directly into the sink/basin. Wait until they cool or run the cold water at the same time. Do not leave hot recipients on the surface of the sink/basin. Leave them to cool first.

22.7- Use, cleaning and care.

Recommendations of use

DO NOT USE TAPS THAT DISPENSE VERY HOT WATER

Avoid the use of taps that provide instant supplies of very hot water. Such a high change in temperature might burn the person handling the taps and damage the sink/basin. Any damage by these taps to the KRION™ product is excluded from the warranty.

DO NOT SPILL NOXIOUS CHEMICAL PRODUCTS ONTO IT

Avoid the use of noxious chemical substances, like drain cleaners or paint stripper. If any such liquid is spilled onto the surface, clean it up as promptly as possible using plenty of soapy water to avoid damage. Do not expose KRION™ surfaces to strong chemical products for prolonged periods of time. Be particularly careful with solvents, acetates, oven cleaners, methyl chloride and drain cleaners. In the event of the surface's accidental exposure to these products, rinse with plenty of water.

Cleaning KRION™

All places, whether public or private, require cleaning and care, with the subsequent cost in human effort and cleaning materials for households, companies or public bodies.

A cutting-KRION™ material mainly formulated with natural materials using high-tech manufacturing processes, KRION™ helps to keep places where it has been fitted clean, aseptic and in perfect condition. This is due to its nil porosity, which prevents bacteria from spreading and allows for the creation of seamless surfaces with no joints or inaccessible corners. As a result, only minimum care is needed to keep the material in optimum condition.

As well as being easy to clean, KRION™ can swiftly be repaired on site. This is a huge advantage when compared with other materials, allowing you to keep your home or work facilities in perfect condition.

22.7- Use, cleaning and care.

Cleaning KRION™

KRION™ is an easy-to-clean material. Nonetheless, this does not mean that no cleaning is required. Although KRION™ does not absorb liquids due to its lack of pores, stains should be cleaned away immediately when they are swifter and easier to remove. Whenever the surface is cleaned, it must be dried thoroughly afterwards to prevent lime scale from building up or the remains of detergents and cleaning products.

The following is a detailed procedure to achieve effective cleaning of any kind of stain and it will help to keep the KRION™ surface as the first day:

1 REGULAR CLEANING AND STAIN REMOVAL.

1.1. This should be done with a cloth, sponge or microfibre cleaning towel and a cleaning agent, such as hot water or a surfactant household cleaner.

Dampen the cloth, sponge or microfibre cleaning towel and the KRIONTM surface with the cleaning agent, and rub the whole surface uniformly, using circular movements

1.2. When you have finished cleaning it, dry the surface well with a paper, cleaning towel or soft dry cloth. In this way, any remains of the cleaning product will be removed.

2 IF STAINS CANNOT BE REMOVED AS INDICATED IN POINT 1

2.1. Follow the above procedure again, but this time use a different cleaning product, such as a cream-based one with slightly abrasive microparticles. The cleaning product should be applied directly to the stain and then it should be rubbed in circular motion with the cleaning towel, cloth or sponge without applying pressure

2.2. When the stain has disappeared, the cleaning product can be applied to the whole KRION™ surface and it can be uniformly cleaned.

2.3 Afterwards, remember to rinse the surface with water and dry it well with a paper, cleaning towel or soft dry cloth so that no remains of the cleaning product are left.

Kitchens

22.7- Use, cleaning and care.

Cleaning KRION™

3 FOR MORE THOROUGH CLEANING OR TO REMOVE STAINS THAT PERSIST AFTER STEPS **1** AND **2**

3.1. A cleaning product specifically conceived to remove that particular type of stain should be used, together with a white microfibre scouring pad. Apply a suitable amount of the cleaning product to the stain and to a white microfibre scouring pad. Rub the stain, using circular movements, until it disappears. If necessary, apply some pressure to the scouring pad until the stain is removed.

3.2. Rinse away any remains of the cleaning product with plenty of water and dry the surface well with a paper, cleaning towel or soft dry cloth.

Optionally, for more uniform results, after this more specific cleaning process has been applied to the whole KRION™ surface, clean it all again by rubbing the surface in circular motion with a white scouring pad and the cleaning product from point 2. Then rinse the cleaning product away with plenty of water and dry the surface with a paper, cleaning towel or soft dry cloth.

22.7- Use, cleaning and care.

■ Summary table

Nº	Type of stain	Cleaning element	Cleaning product	Alternative cleaning product
1	**Common stain or everyday cleaning**	Cloth, sponge or microfibre cleaning towel	Hot water	Surfactant household cleaner
2	**Tough stain**	Cloth, sponge or microfibre cleaning towel	Cream-based cleaner with slightly abrasive microparticles	
3	**Specific persistent stains**			
3.1	Oil, wine, coffee, milk, tomato, ketchup, sauces, curry, remains of food, tea, juice, fizzy drinks, alcoholic drinks	White microfibre scouring pad that does not scratch	Surfactant household cleaner	Cream-based cleaner with slightly abrasive microparticles
3.2	Lime scale, soap, toothpaste.	White microfibre scouring pad that does not scratch	Cream-based cleaner with slightly abrasive microparticles	Detergent for removing chalk, or apple vinegar
3.3	Dye, iodine, pencil, indelible pen, lipstick, cigarette burns, ink, nail varnish	White microfibre scouring pad that does not scratch	Cream-based cleaner with slightly abrasive microparticles	Alcohol or acetate
3.4	Mould, remains of food, and food stains from point 3.1 that have not been cleaned away for a long time	White microfibre scouring pad that does not scratch	Detergent containing sodium hypochlorite or bleach	Cream-based cleaner with slightly abrasive microparticles
3.5	Uncommon stains, shown in this list	White microfibre scouring pad that does not scratch	Cream-based cleaner with slightly abrasive microparticles	

22.7- Use, cleaning and care.

Cleaning sinks and basins (white)

The following is a detailed procedure to achieve effective cleaning of any kind of stain and it will help to keep the KRION™ surface as the first day:

THOROUGH CLEANING

To keep your washbasin/sink in optimum condition, it should be thoroughly cleaned from time to time. For this purpose, using circular movements, rub it with a damp cloth and a cream-based cleaner with slightly abrasive microparticles. For more persistent stains, rub it in circular motion with a cream-based cleaner with slightly abrasive microparticles and a white microfibre scouring pad. Finally, dry the surface thoroughly and your washbasin/sink will be as good as new.

DEPTH CLEANING

Once a month your washbasin/sink should be given a total clean. For this purpose, apply a cream-based cleaner with bleach to the whole of the surface and leave it overnight (approx. 12 hours). Next day, rinse it with plenty of water and rub it with a damp cloth. Finally, dry the surface thoroughly and your washbasin/sink will be as good as new. Do not leave the bleach in contact with the surface for longer than indicated as it may leave marks on it.

NOTA: For sinks/basins made from KRION™ sheets, follow the cleaning instructions for KRION™ surfaces (pag. 125).

Notes and precautions about cleaning

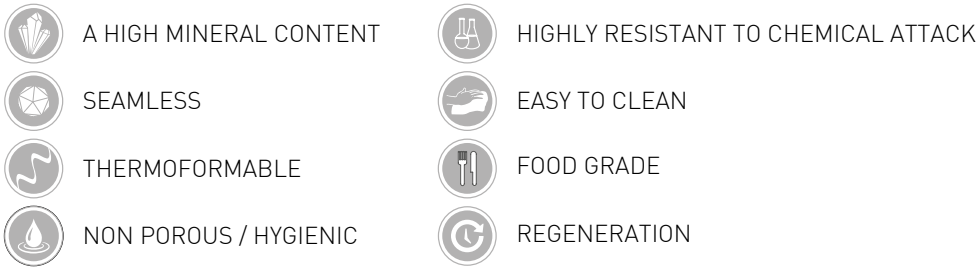
Do not use strong acid-based cleaners like hydrochloric acid or drain cleaners. Neither should acetate-based or industrial cleaning products or solvents be used. If one of these products is accidentally spilt onto the KRION™ surface, rinse it off immediately with plenty of water and clean the washbasin/sink thoroughly (point 2) to avoid damage. In the event of damage, the washbasin/sink can always be restored to its former condition through special repair methods.

This consists of the surface's partial restoration, which you can do yourself by consulting the KRION™ Restoration Technical Note or by contacting a K® Associate Quality Fabricator for them to restore it fully on prior submission of a quote.

22.7- Use, cleaning and care.

Maintenance

▶ KRION™ is an easy-to-clean material that only requires minimum care, thanks to its exclusive properties:



▶ Remove stains from KRION™ surfaces as soon as they occur when they are still easy to clean away.

▶ If the KRION™ is accidentally damaged, remember that it can be repaired or restored.

▶ In the event of a query about how to care for your KRION™ surface, contact a K® Associate Quality Fabricator or the KRION™ Customer Care Service.

Repairs

KRION™ can be completely repaired. Any imperfection affecting a product made of differences can be returned to its original appearance.

The different ways of repairing the material will depend on the type of damage the product has suffered.

If you have to add KRION™ to the damaged area, try to make sure it has the same batch number as the rest of the section, to minimise any differences in colour.

For this reason, we recommend that you keep a piece of differences from the same sheet used for the finished product to be used for any future repairs.

If you have made a kitchen, it is a good idea to attach a section measuring 100 (39 $^{3}/_{8}$") x 50 cm (19 $^{11}/_{16}$") beneath it with silicone in case it is needed in the future.

23.1- Scratches.

A white Scotch Brite pad can be used to restore the majority of white KRION™ surfaces. For other scratches, P240 sandpaper is usually sufficient.

In the case of large scratches, a rotary sander must be used, sanding the whole product.

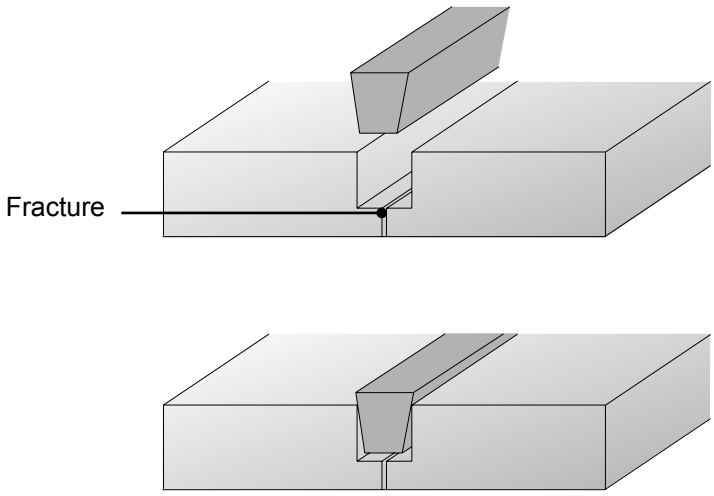
23.2- Cracks in KRION™.

It can be repaired by fitting an insert into the cracked patch.

1. First locate the end of the crack and drill a hole right through the sheet, using a 2 (1/16") to 4mm (3/16") drill bit. This will prevent the crack from continuing to open due to stress.

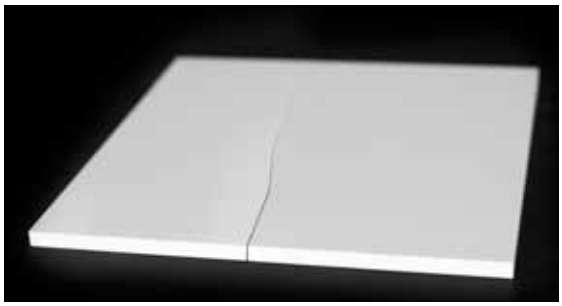
2. With a milling machine, cut out a straight section along the crack, leaving a 2 (1/16") to 3mm-thick (1/8") base.

3. The insert should be from the same batch as the original sheet. It must be hand finished and adjusted to give it a slightly conical shape, so as to ensure a seam with an optimum bond.



23.2- Cracks in KRION™.

1



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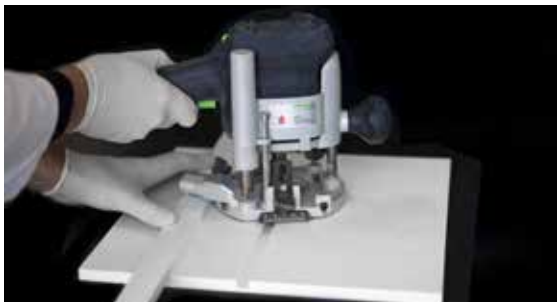
3



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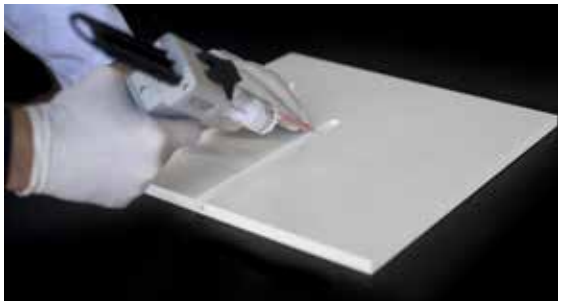

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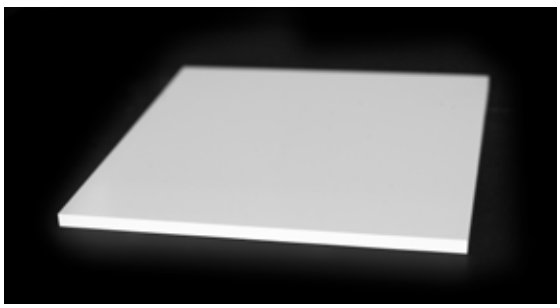
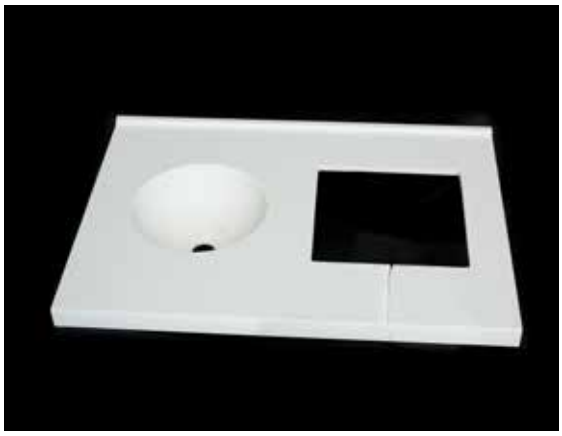


Repairs

23.2- Cracks in KRION™.

If the crack reaches as far as the sink or hob opening, a larger section must be replaced:



1. Draw a template of the shape being replaced. To ensure a more precise fit, the replacement section must be wedge shaped.

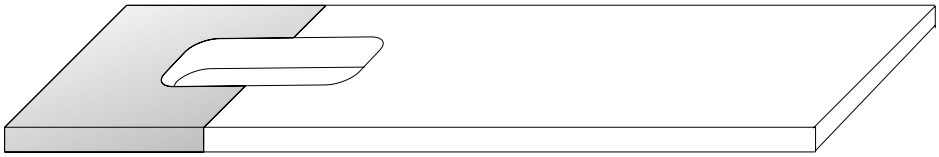
1

2. Remove the cracked section, make a piece to replace it and bond it using the normal procedures. Use a milling machine to finish the opening in the original shape. Sand the whole countertop and give it the required finish.

2

23.3- Replacing large sections of KRION™.

If the problem is so serious that it cannot be repaired, you may need to replace a part of the countertop.



Follow the procedures detailed above to cut, bond and sand the countertop.

If you cannot guarantee that the colour will match perfectly, inform the customer.

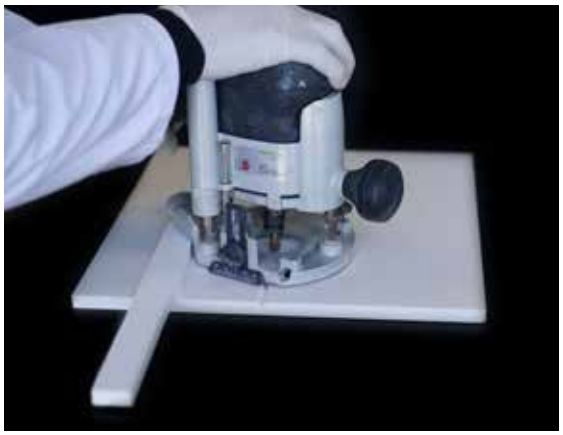
You could suggest using a completely different colour to create a contrast.

23.4- Broken seams in KRION™.

If a seam has broken or come loose, it can be repaired using a "V".

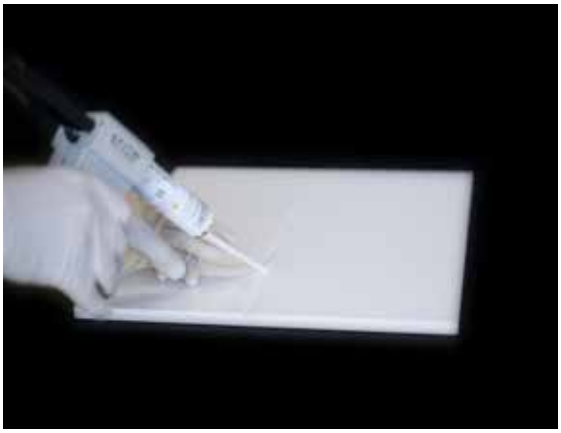
1. Mill the seam in a V shape. A CNC can be used, or a manual milling machine with a 45º bit.

1



2. Make a strip with a square base to create an insert in the same colour as the countertop, and bond it.

2.1



2.2

23.4- Broken seams in KRION™.

2.3

3. When the adhesive is dry, remove the excess material by sanding and then give it the required finish.

3

4. Add a reinforcement section beneath the new insert.

23.5- Holes in KRION™.

If the surface of the KRION™ has been damaged by a sharp object, it can be repaired using a set of complementary milling bits.

The first bit will make a hole in the surface, and the second will remove a "cap" that will fit perfectly in the opening.

Bond the cap in place, and once the adhesive is dry, sand it to achieve the correct finish.

1

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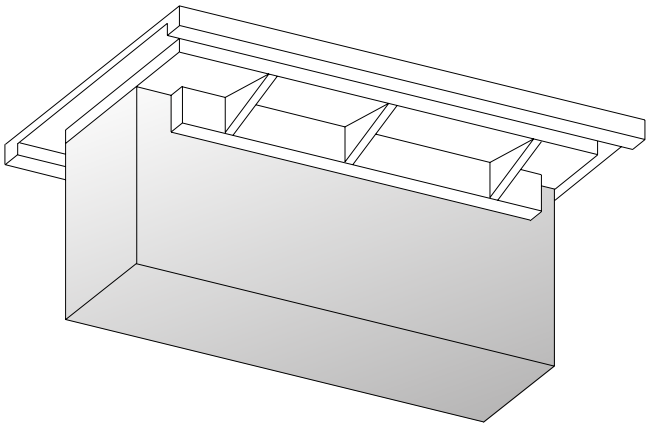
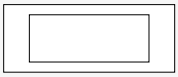
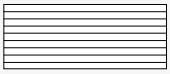
Countertops

24.1- Wall hung countertops.

To make wall hung countertops, it will be necessary to build a supporting frame.

The most suitable materials are wood, steel tubing, phenolic plywood and waterproof MD.



Typical supporting frame materials	
	Steel tubing
	Steel brackets
	Plywood

Triangular reinforcement brackets are the most advisable, as they will provide the strongest support.

As a general rule, position one bracket every 60 cm (23 $^{5}/_{8}$"). The brackets must be screwed onto the supporting plate, as the units are not normally strong enough to withstand the stress.

Attach the brackets to the countertop with P-404 (Butech).

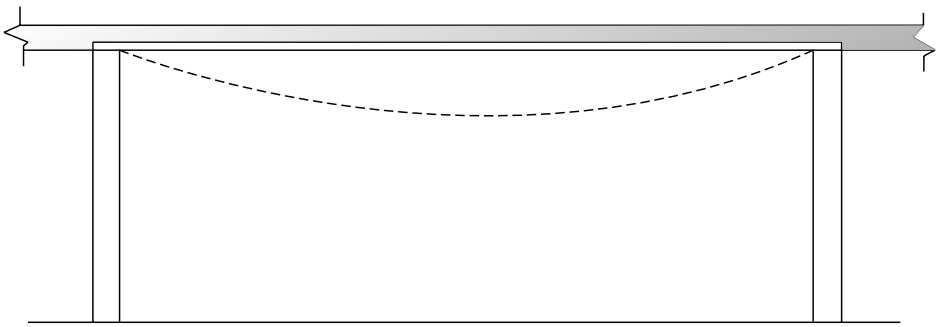
If the countertop has seams, they must be positioned on top of the units, as far away as possible from the edge.

Check that by applying a weight of 50 kg on the end of the suspended part, it does not bend more than 5 mm (3/16"). This will indicate whether the additional support is suitable for the weight and measurements of the countertop.

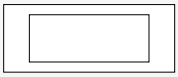
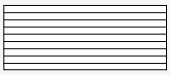
24.2- Unsupported sections.

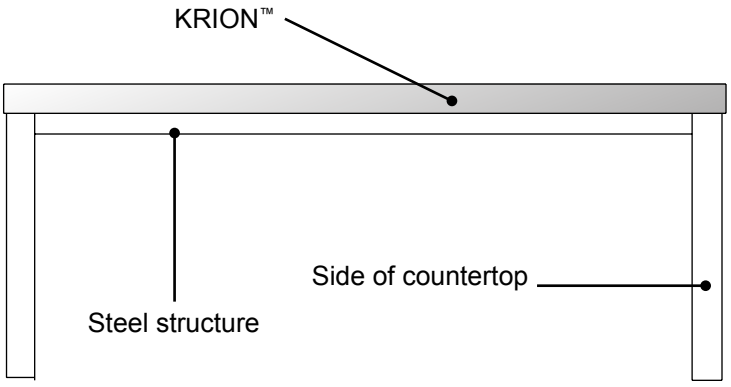
For sections that do not rest on units to provide mechanical support, it will be necessary to reinforce the supporting frame.

The larger the overhanging section, the more support will be necessary.



The most suitable materials are wood, steel tubing, phenolic plywood and waterproof MD.

Typical supporting frame materials	
	Steel tubing
	Steel brackets
	Plywood



Supporting frame 25

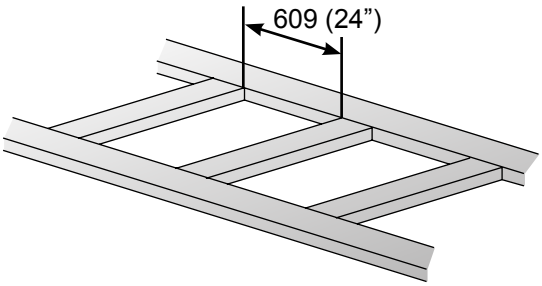
Kitchen and bathroom countertops made of KRION™ are hard wearing, but they need a supporting structure. KRION™ is a hard-wearing material, but to ensure a long useful life, the structures need supporting frames.

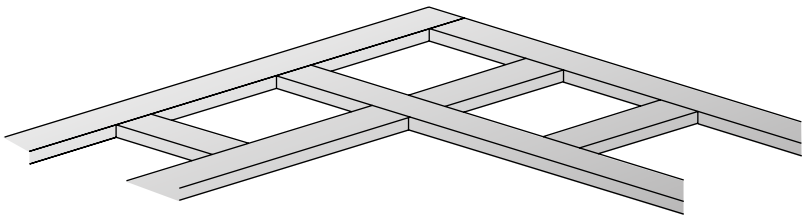
The supporting frames must be made of materials that are highly resistant to heat and humidity. The most recommended materials are phenolic plywood and waterproof MD.

Chipboard is not suitable for this purpose, as it has a relatively low resistance to heat and humidity.

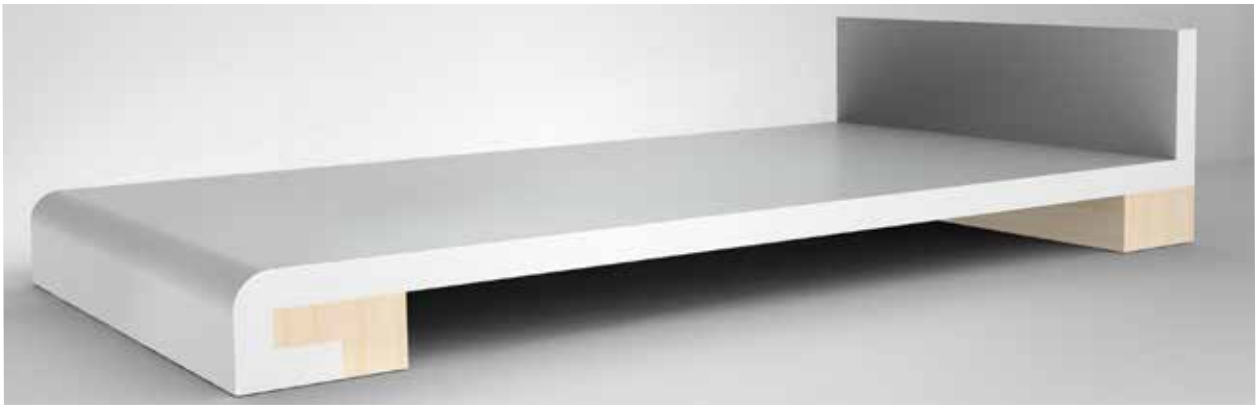
A supporting frame in a stepped shape is the best option for a KRION™ countertop.

Supporting boards without any openings prevent air from circulating and heat from dispersing, increasing heat stresses.





Internal corner of stepped frame



Build sections taking into account that the countertop must be supported at least every 40 cm (15 3/4"), that additional supports must be added to the sides of openings for sinks and washbasins, and that areas with seams must also be reinforced.

Do not support the KRION™ countertop directly on units, as these are generally not level. Also, this will prevent air from flowing freely beneath the countertop.

If air does not flow freely beneath the countertop, it may overheat and crack.

Adjust using shims and a spirit level until the upper section is completely flat.
The supporting frame must have supports on the front and rear.

Integrating bowls 26

KRION™ washbasins and sinks are calibrated and designed to be fitted on a flat surface. Before they are fitted, it is important to check that they are in perfect condition and that the surface to be bonded to the countertop is flat (rectifying any possible unevenness before fitting the basin).

Inside each basin, there is a leaflet with instructions of use and care. Keep this document and give it to the end customer once the countertop has been fitted.

The KRION™ countertop must be bonded to the supporting frame with a good quality flexible adhesive (like P404 by Butech), thus allowing the countertop to absorb expansion movements.

The supporting frame must have an even, level surface to ensure that the KRION™ is correctly supported. Also make sure that the silicone keeps them firmly attached.

A correctly levelled supporting surface will make it easier to create the seams and obtain better results.

Check that the drawers and doors can be opened correctly after installing the countertop. Make sure that the upper drawers do not hit the skirt.

Make the parts that will go on the front and back.

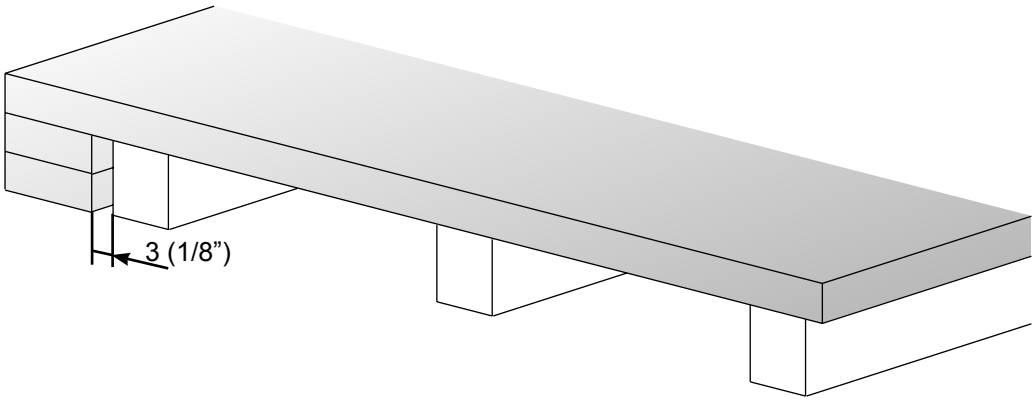
Then check the location of the cross-ties, taking into account elements such as openings, seams and units.

Assemble the supporting frame using mounting adhesive, nails, screws or biscuit-type joints.

Another way of making the countertop supporting frame is by using a whole board, and then using a manual or CNC milling machine to cut the openings needed for the sink and ventilation.

The supporting frame should never occupy the whole of the space under the KRION™. Leave a margin, particularly in areas exposed to damp and/or sharp temperature changes.

Integrating bowls



Always leave a gap of 3 mm (1/8") between the supporting frame and countertop skirt:

26.1- Location.

Only use a milling machine to make the bowl opening.

- Bonding.
- Edge finish (angles).
- Template.
- Manual press.

Note: Remember to sand the interior of the bowls with same grain sandpaper as the countertop

26.2- Fitting bowls into countertops.

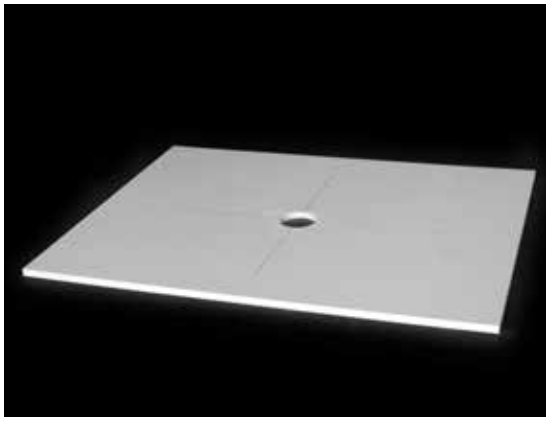
1. Place the KRION™ sheet face down on a working surface.

2. Using a nail or screwdriver, mark the longest and shortest axes on the back of the sheet.

3. Drill a hole with a core bit in the sheet that coincides with the centre of the washbasin drain, cutting a Ø 12 mm (1/2") hole to pass through the threaded bar.

3.1

3.2

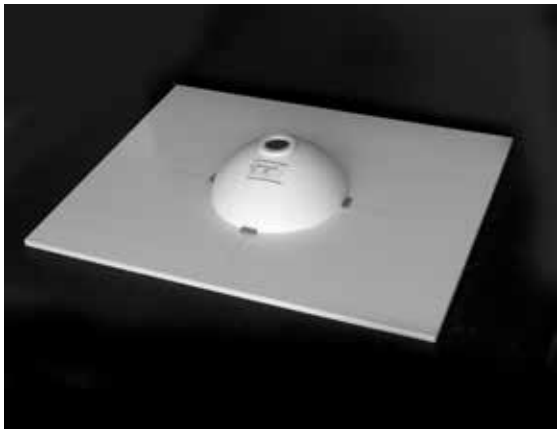


26.2- Fitting bowls into countertops.

4. Place the washbasin over the KRION™ sheet so that the marks on the rim coincide with the axes marked on the sheet.

4.1

4.2



* Centring blocks: fit small centring blocks in place using adhesive, so that it is easier to centre the washbasin.

5. Using a wooden block and 120-grain sandpaper, sand the lower edge of the KRION™ sheet where the washbasin is to be attached.

6. Sand the upper rim of the washbasin using 120-grain sandpaper.

6

7. Clean the connecting points with denatured alcohol.

8. Apply adhesive for sheet seams, completely covering the rim.

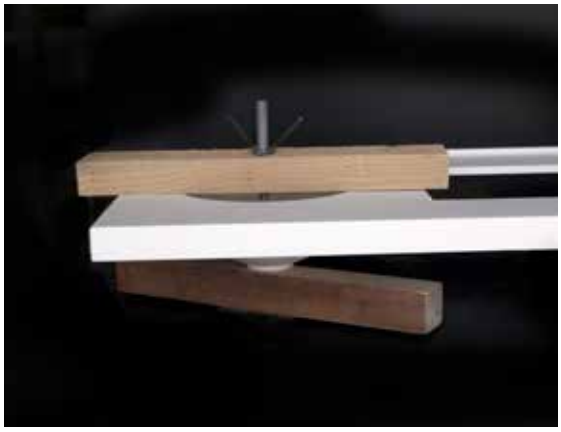
Integrating bowls

26.2- Fitting bowls into countertops.

9. Place the washbasin over the sheet, making sure that the marks coincide with the lines drawn on the back of the sheet.

10. Pass the threaded bar through the drain and hole in the sheet. Fit the washers for applying pressure on the upper surface of the sheet and bottom surface of the washbasin. Then start to screw in the two wing nuts from each end until the sheet and washbasin are held firmly in place.

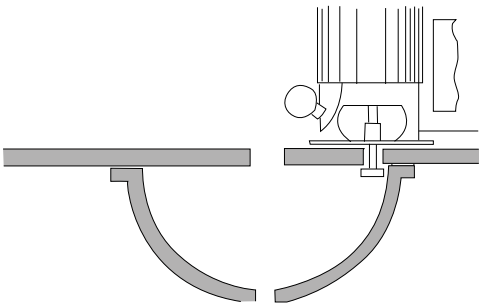
10



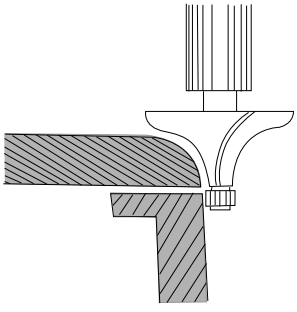
11. Turn the countertop around after the adhesive has hardened, using trestles for support.

12. Start to cut from the 12 mm (1/2") hole in the centre of the washbasin, milling clockwise using a bit for contouring with an oversized nylon bearing.

13. This will produce a finish with a straight edge.

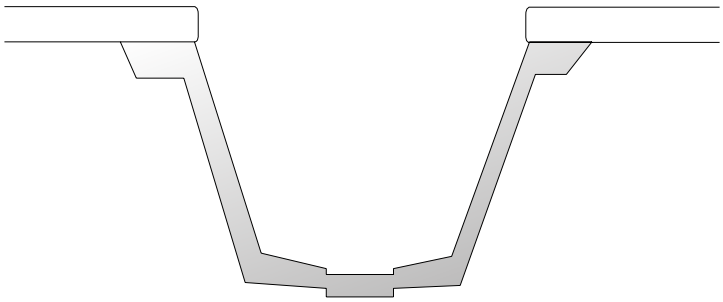


14. To obtain a blunt finish, repeat the milling operation with a suitable milling bit for contouring.

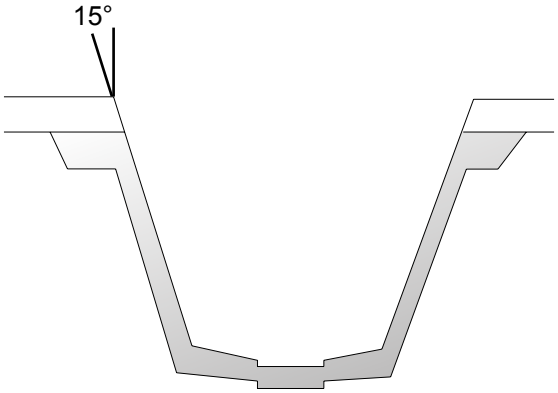


26.2- Fitting bowls into countertops.

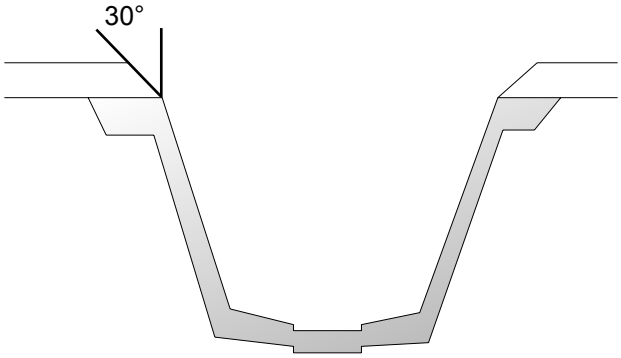
If you want a classic appearance, leave a slight rim from the sheet over the bowl, as shown in the following diagram:



In order to achieve a seamless single-surface appearance, mill the edge of the sheet at the same angle as the slope of the sides of the bowl.



To conceal possible colour differences between the sheet and bowl, cut the edge of the sheet at a sharper angle than the slope of the basin, for instance at 30º.



26.3- Recessing sinks (alternative).

1. Build a supporting frame over the sink unit.

2. Put the sink on top.

3. Cut a hole in the countertop using a template. Sand to remove any splinters and sharp edges.

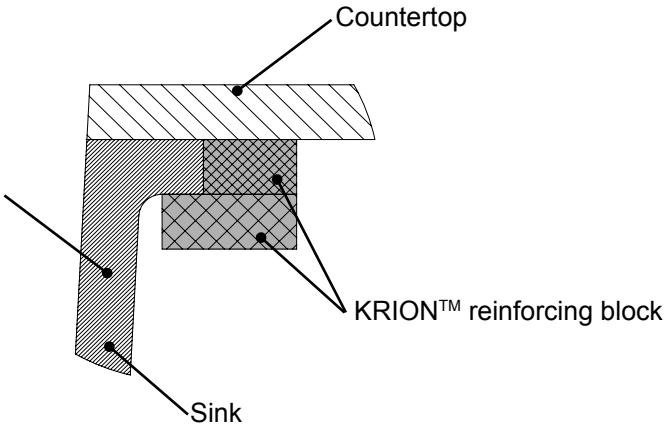
4. Put the countertop in place and attach it to the washbasin with silicone.

Integrating bowls

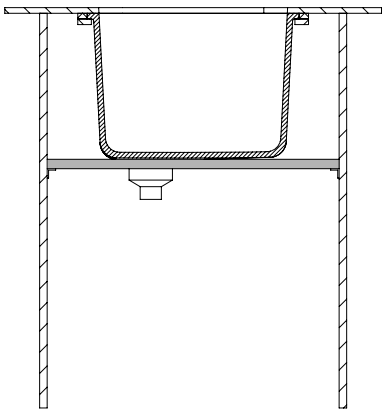
26.4- Reinforcing sinks.

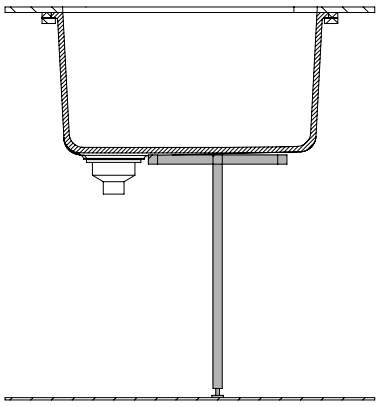
Sinks should always be reinforced once they have been bonded to the countertop, using reinforcing blocks and KRION™ adhesive.

Sinks not made of KRION™ should be fixed to the countertop using an elastic P404 sealant by Butech or similar. Never screw the sink to the KRION™.



In the case of large deep sinks, additional support will be needed, running underneath the sink to both sides or down to the base of the unit.





26.5 Sanding and finishing off basins.

After a basin is manufactured, the inside of the basin is finished off by sanding it with P400-grit sandpaper.

After a basin has been bonded to a countertop, the surface of the basin must be restored and finished off by sanding it progressively to a P400-grit sandpaper or higher if required. This is very important since it makes the cleaning and care of the basin easier.

26.6 Fitting an overflow connector (optional).

After a basin is manufactured, the inside of the basin is finished off by sanding it with P400-grit sandpaper.

After a basin has been bonded to a countertop, the surface of the basin must be restored and finished off by sanding it with P400-grit sandpaper or higher, if required. This is very important since it makes the cleaning and care of the basin easier.

The basins come with an overflow connector to connect the overflow to the drain of the basin. This is optional, depending on the type of drain trap that is fitted to the basin.

Fitting the overflow connector

This must be bonded to the surface of the basin, using p404 adhesive by Butech or similar.

Do not use silicon, KRION™ adhesive, hot-melt adhesive, any other non-elastic sealant or one with insufficient guarantees of a solid, long-lasting bond.

Sand the area with P130 or P150-grit sandpaper and clean it with denatured alcohol before bonding the overflow connector.

Rounding inner corners 27

When a gap is made in a KRION™ sheet, it is important to remove any sharp edges. This will reduce the stress to which the KRION™ is subject, minimizing the possibility of breaks. The edges should be rounded by sanding them until they have the same finish as the rest of the surface.

This is very important in the case of gaps exposed to extreme temperature changes or in places where there will be mechanical or flexural stresses due to surface loads.

Example: The gap in a countertop where a hob is fitted, gaps for recessing wall or ceiling lights, gaps for fitting a steam outlet in a Turkish bath, a gap for a tap fitting etc.

Warning ; When these gaps are made, do not use jigsaws, cutting discs or any cutting tool that might make cracks in the material as it cuts.

Use a milling cutter and a wood template of the same size as the gap to be made.

In the case of square gaps, the radius of the angles should be proportional to the thickness of the KRION™ sheet.

With 12mm-thick (1/2") sheets, a milling cutter with a 12mm (1/2") diameter or more will be needed to ensure that the radius of the angle is at least 6 mm (1/4").

If the angle is reinforced with KRION™ to give this section a total thickness of 24 mm (15/16"), the angle should have a minimum radius of 12 mm (1/2").

Skirts 28

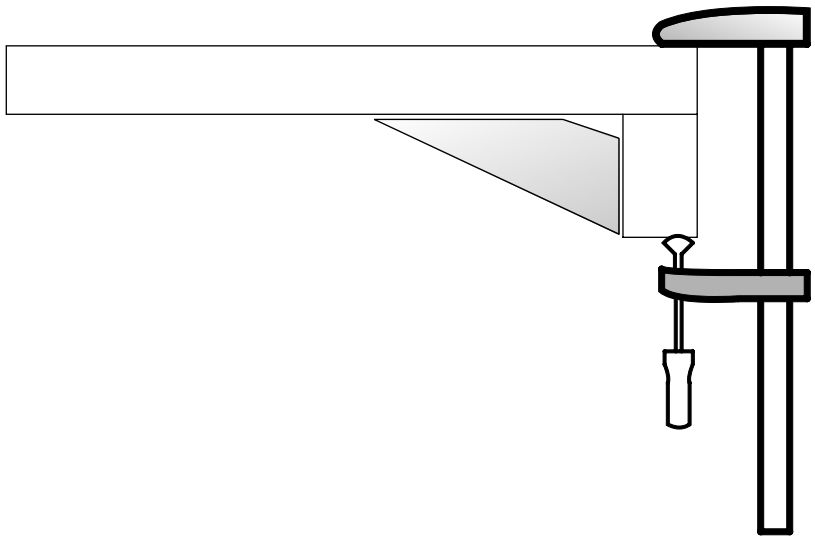
28.1- Skirts and front sections.

The most usual way of making a skirt for a countertop is by bonding a strip of KRION™ onto the upper part of the countertop. Whichever method you use, make sure you use enough KRION™ adhesive to completely cover the area of the bond.

The bonding area must be sanded before bonding on both sections to ensure they bond correctly.

Clean with denatured alcohol before bonding and do not touch with your bare hands.

Use clamps or grips to ensure that the sections stay in place while the adhesive dries.



There are different ways of carrying out this work.

In the case of curved thermoformed skirts, the basic instructions given are still valid, although the process will be more difficult than with straight front sections.

Make sure that the seams in the sheets used for the top of the countertop are at least 10 cm (3 $^{15}/_{16}$") from the seams between the sections used for the skirts. This will help to strengthen the countertop.

Skirts

28.1- Skirts and front sections.

We will now describe the ways of making the front section in greater detail.

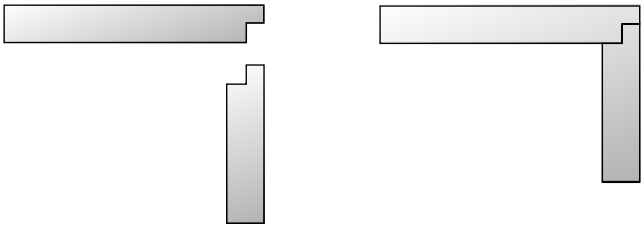
- Without mitered edges

In the case of seams without mitered edges, the skirt is bonded at 90º with respect to the top.

This is the easiest method that allows for the greatest productivity in your work

1. Position the skirt 1 mm (1/16") from the edge.
2. Join the two pieces.
3. Once the adhesive has dried, sand to remove any excessive adhesive and KRION™.

- Trimmed down



- Tongue and groove

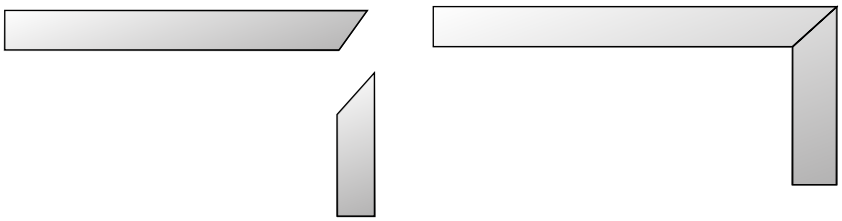
The tongue and groove joint makes the skirt more resistant, as it contains more adhesive than in other methods.

Use specific milling bits for tongue and groove joints.

28.1- Skirts and front sections.

Miter joints

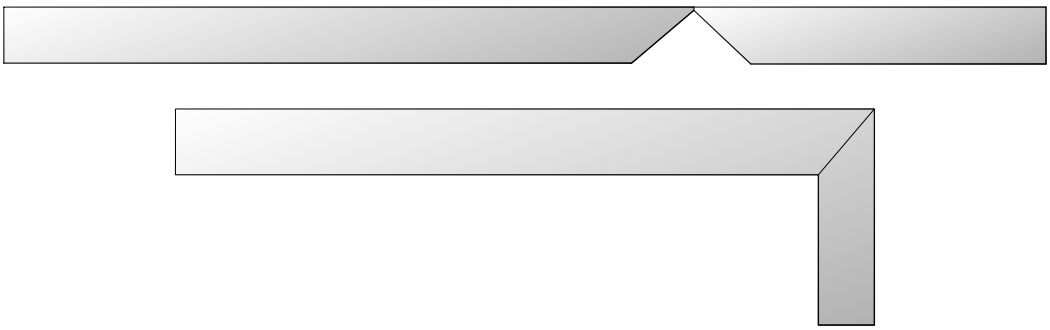
With miter joints, the two sections have their edges cut at 45º.



To do this, all that is required is a milling bit for 45º cuts. The cut must be completely straight to bond the sheets.

Another way of making a miter cut is as follows:

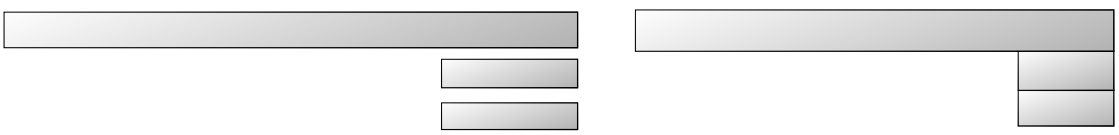
Put a strip of adhesive tape under the line you are milling to keep the sections in place, and make the skirts and rear trims from the same sheet.



Stack skirts

To make stack skirts, cut two or more strips of KRION™ of the same width and stack them until reaching the required thickness.

In colours with chips, the skirt will show the differences between the amount of chips in the upper or bottom part of the sheets. We do not recommend using seams of this kind with these series.



Using skirts of this kind, we achieve a more solid appearance.

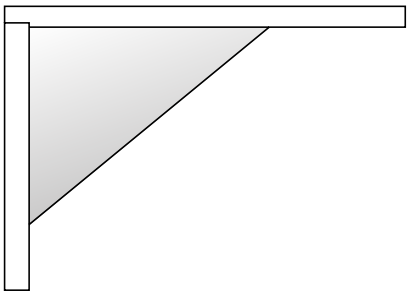
Large skirts 29

29.1- Large overhanging skirts.

In commercial premises, the front skirt is the part that is most exposed to wear.

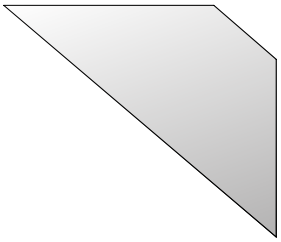
Skirts of more than 20 cm (7 $^{7}/_{8}$") will require an additional support to be added to the countertop.

Using spare pieces of wood or KRION™, we can create brackets to provide the additional support we need.



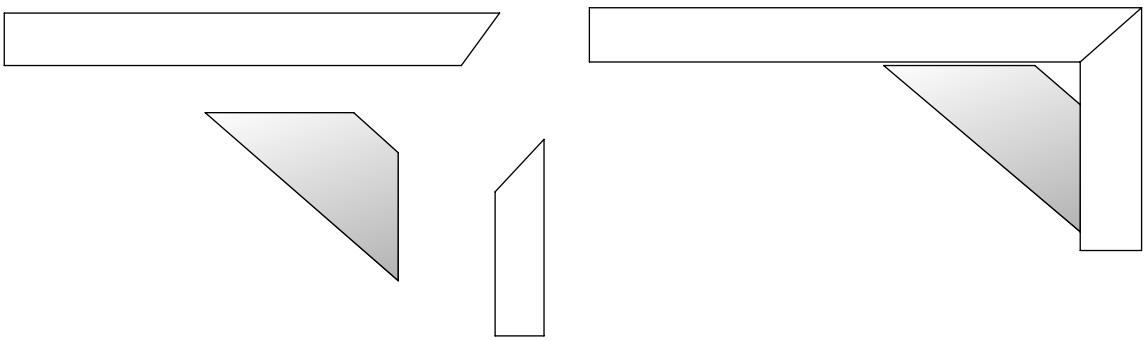
Brackets 30

Use wood or plywood brackets to support the skirts while the adhesive dries.



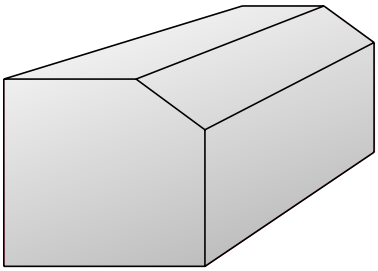
These must be as shown in the diagram: with a 90º angle and a rebate on their ends.

The rebate prevents the bracket from coming into contact with the adhesive, so it does not stick and contaminate the seam, which can cause incorrect bonding and the appearance of stains.

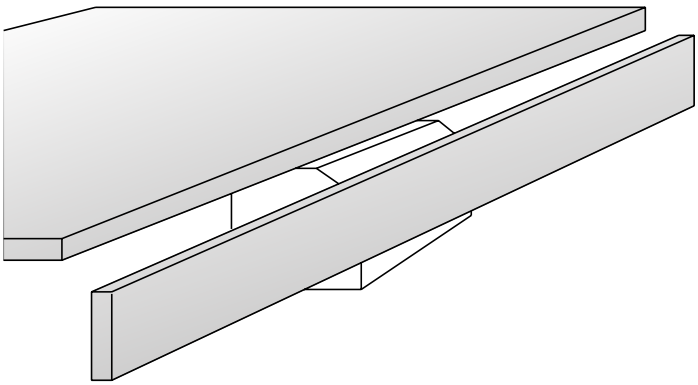


You can make these brackets if you have a template with a perfect 90º angle.

The brackets can be replaced by blocks made of wood or plywood.

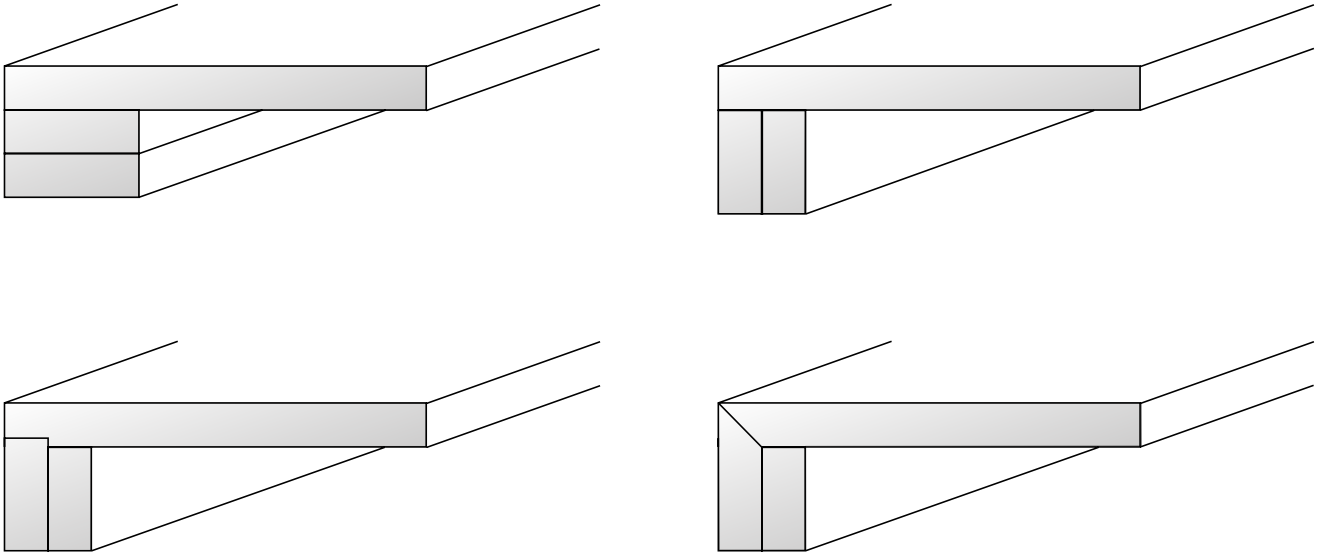


The brackets or blocks must be attached to the bottom of the countertop with hot wax. This means they can be easily removed once the work is complete.

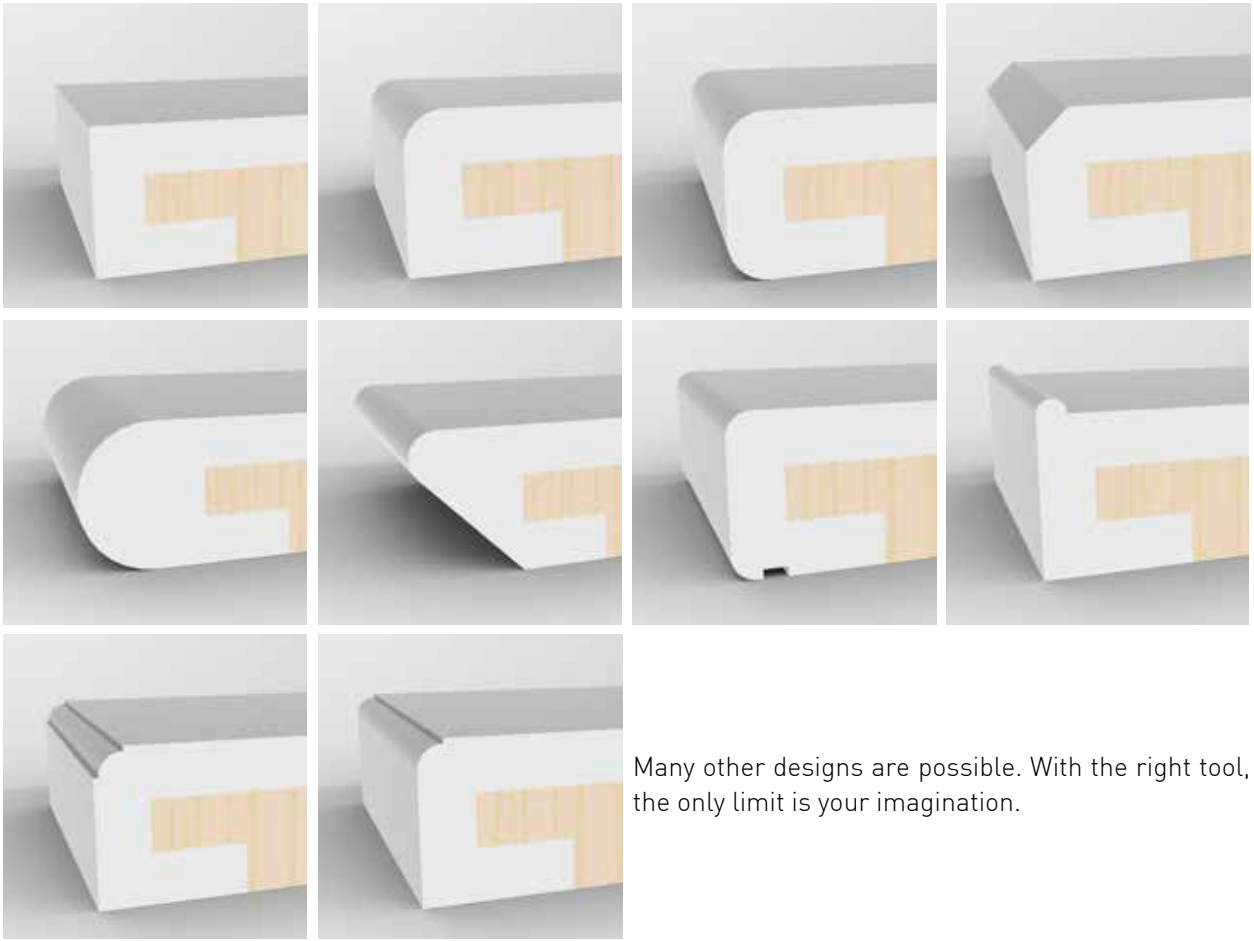


Brackets 30

Other images of skirts:



Using KRION™, it is possible to create all of these designs for the skirt.



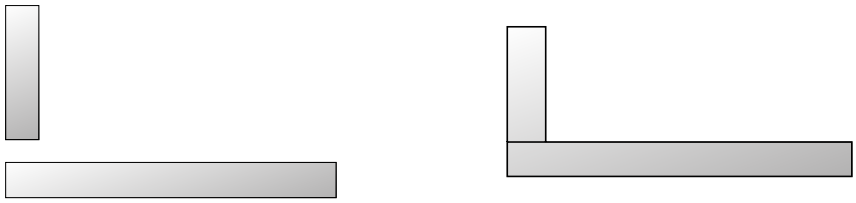
Many other designs are possible. With the right tool, the only limit is your imagination.

Rear trims 31

Rear trims can be straight or curved.

To create a straight rear trim, use any of the following methods:

- Without mitered edges



In this case, the rear trim is bonded to the top at a 90º angle.

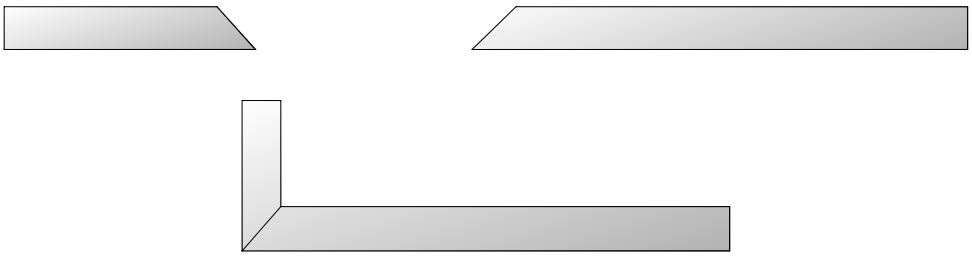
This is the easiest and most productive method:

1. Attach the pieces.

2. Once the adhesive has dried, sand to remove any excessive adhesive and KRION™.

- With mitered edges

Cut the two pieces to be connected with 45º angles and attach them using adhesive.

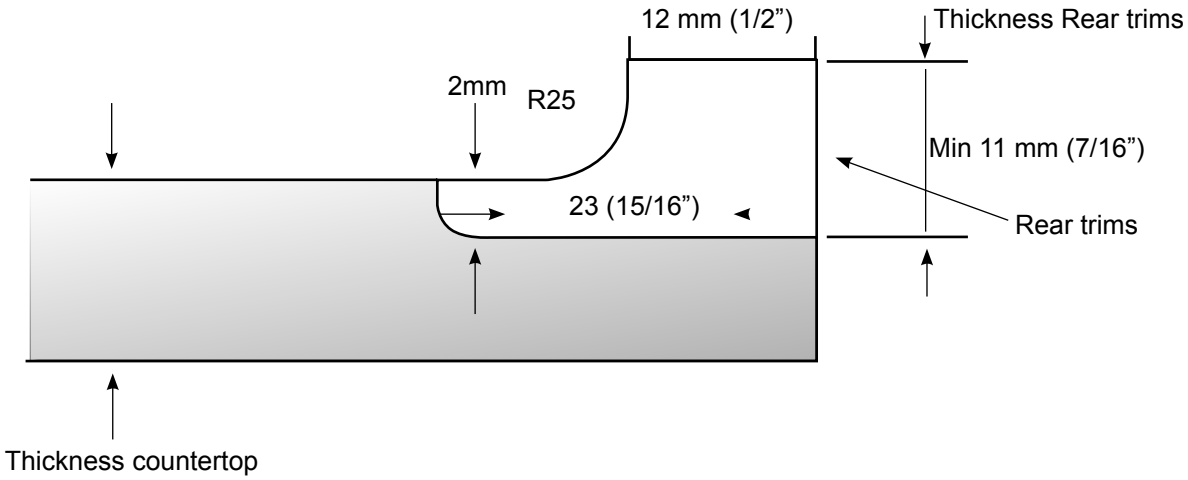


- Curved rear trim

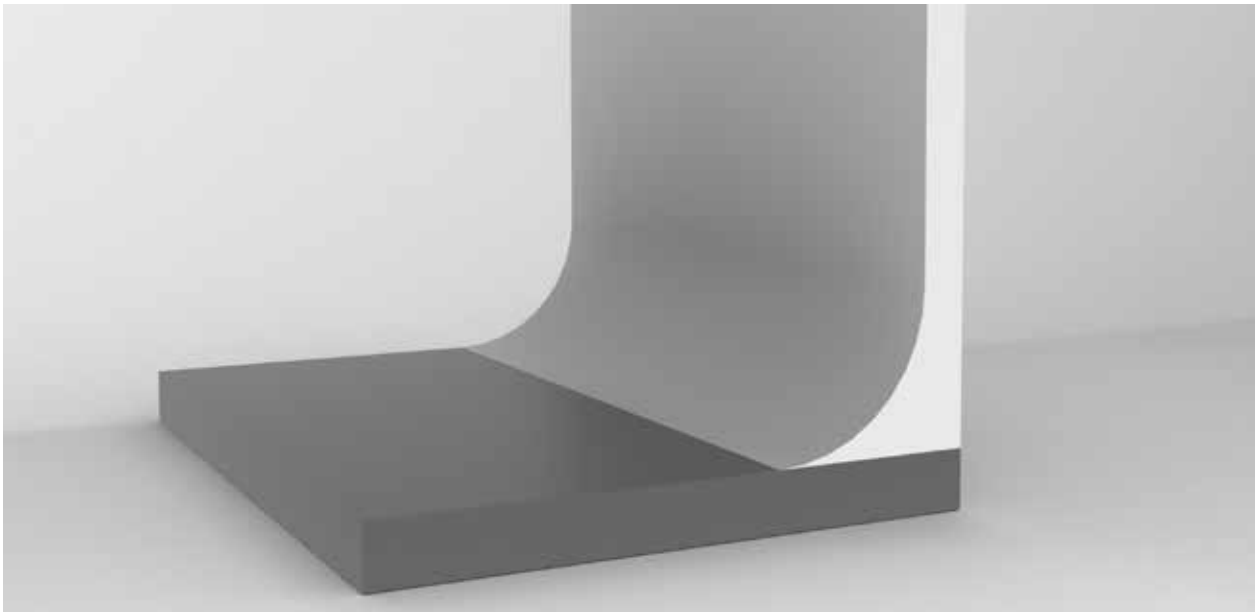
To create this type of joint, a piece is added between the sheet and the trim section. The piece is a quarter round that replaces the 90º joint, so that its base is embedded 2 mm (1/16") into the countertop, while the other end supports the rear trim (with the same thickness).

For interior corners, leave a minimum radius of 10 mm (3/8").

Rear trims

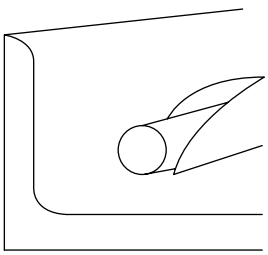


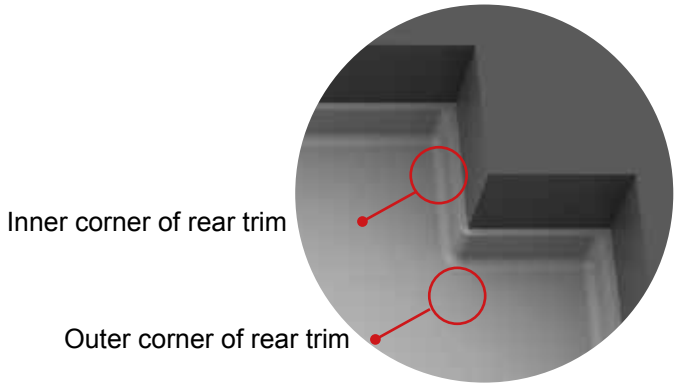
The following diagrams show the different component parts of a curved rear trim and a rounded interior corner:



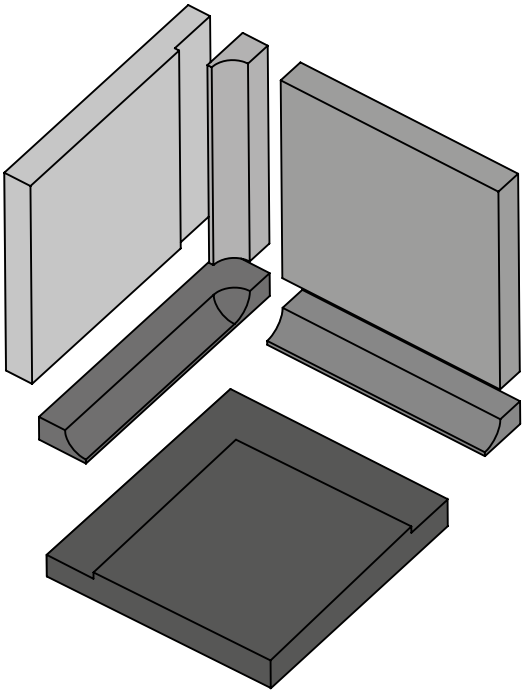
Note: these diagrams only show one way of making rear trims. Other techniques can be used.

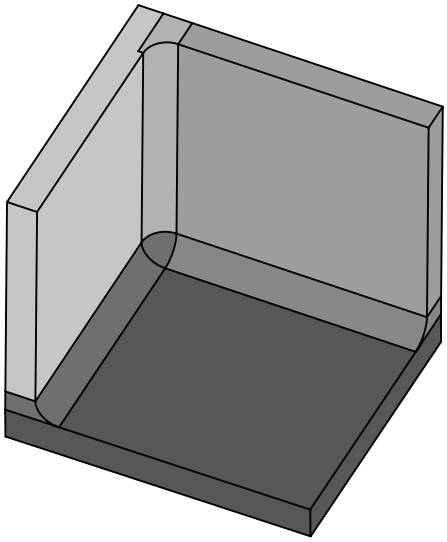
Use a rounded sanding block or a specific sander for correctly finishing the interior curve:



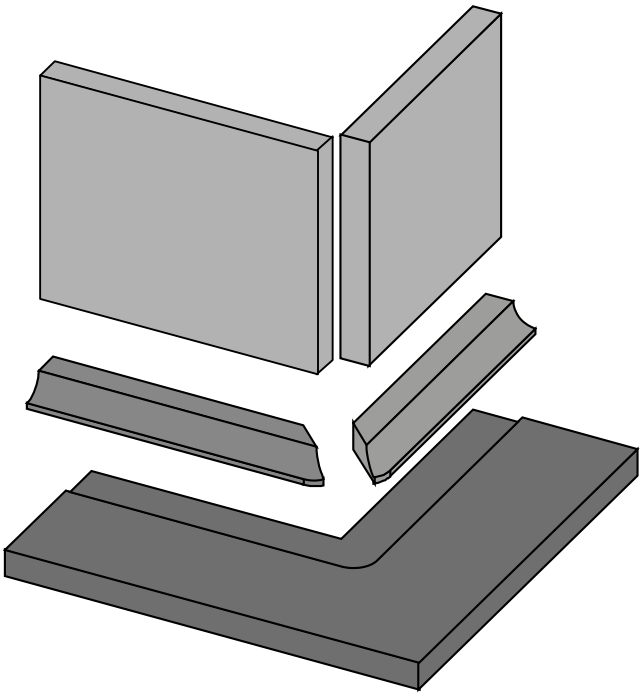


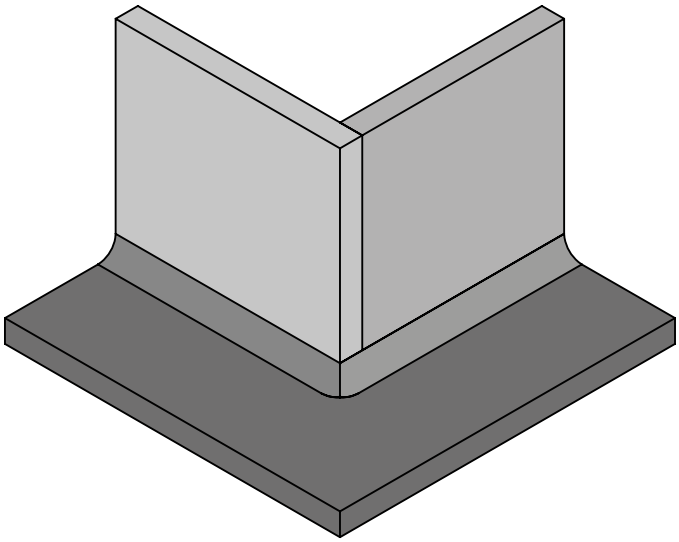
Inner corner of rear trim





Outer corner of rear trim



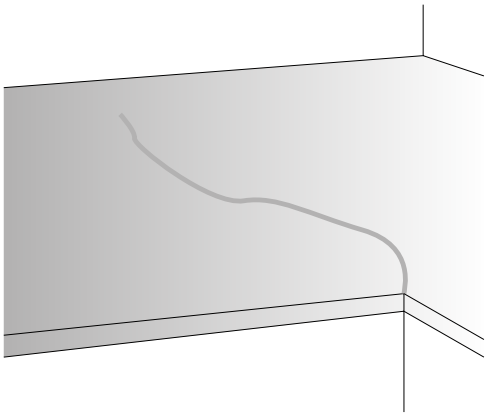


Inner corners

32.1- Interior corners.

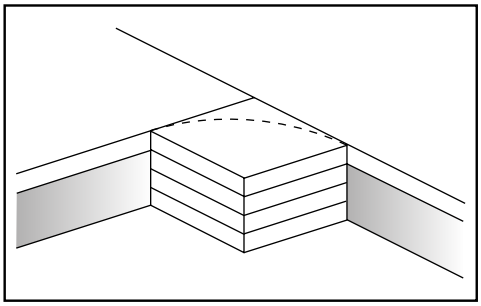
Interior corners must be given a rounded finish.

Straight angles cause stresses on the countertop that may cause breakage.

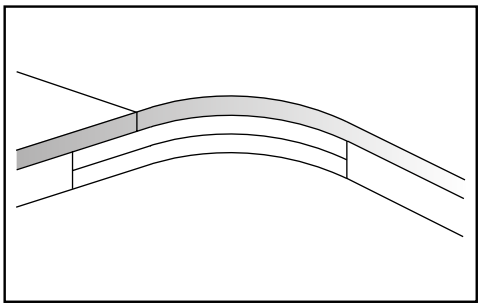


This operation must be reinforced to guarantee the useful working life of the countertop.

The construction method consists of making a front stack section with a square central piece occupying the whole area of the corner.



Next, mill the edge along the radius of the curve (use a template) and install the skirts for the adjacent areas.



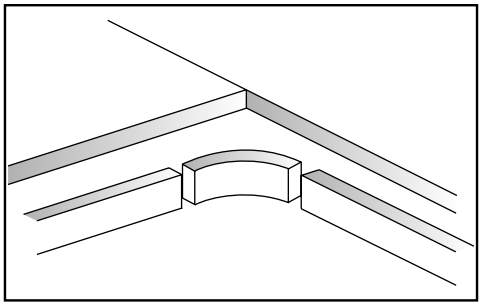
32.2- Thermoformed corners.

Interior corners must be given a rounded finish.

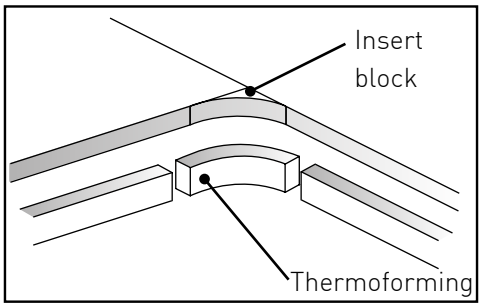
Straight angles cause stresses on the countertop that may cause breakage.

Interior corners can be made with thermoformed skirts using the following method:

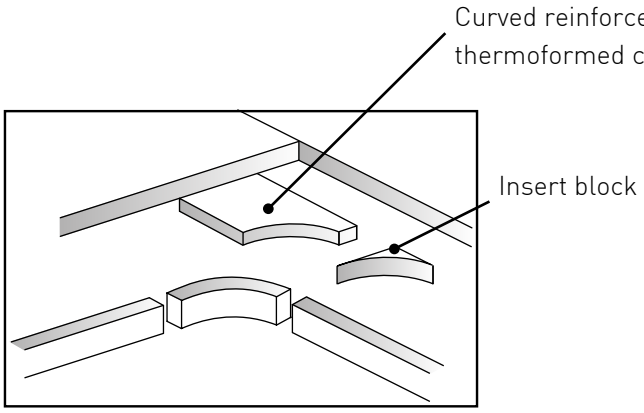
1. The skirt must be made with the required radius.



2. Then you will have to make a connecting piece between the countertop and skirt.



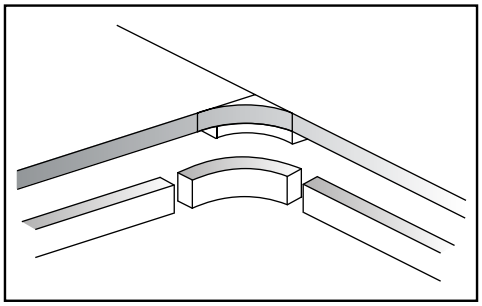
3. To end the process of making parts, make a reinforcement for the lower area.



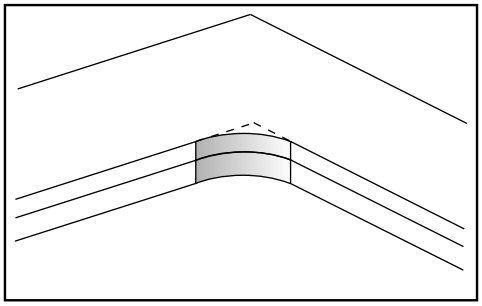
Inner corners 32

32.2- Thermoformed corners.

4. Attach the reinforcement and filling sections using the normal methods.



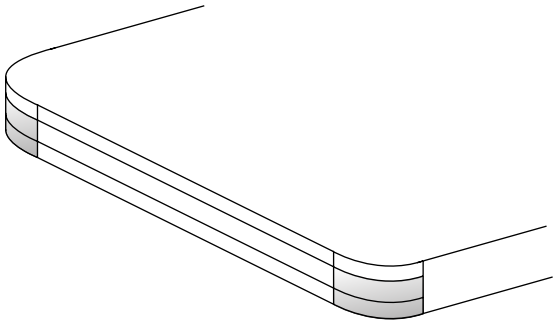
5. Attach the skirt and connect it to the adjacent skirts.



External corners 33

As far as possible, the external corners must also be rounded to avoid stresses that may cause breakage.

If making a structure such as the one shown in the diagram, several strips of KRION™ must be used, and once the adhesive has dried, shaped with the milling machine.

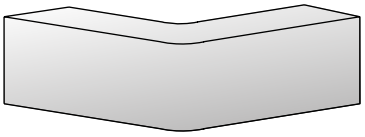


Thermoformed and stacked 34

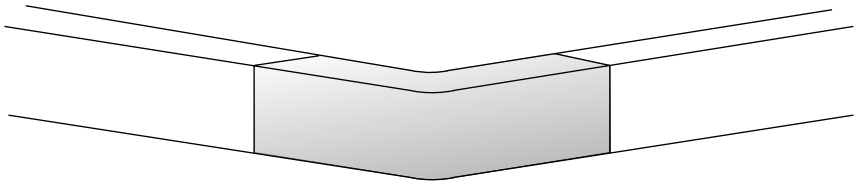
34.1- Thermoformed.

Mill the top of the countertop to the desired radius, and thermoform the skirt with the same radius.

1. Check that it fits perfectly.



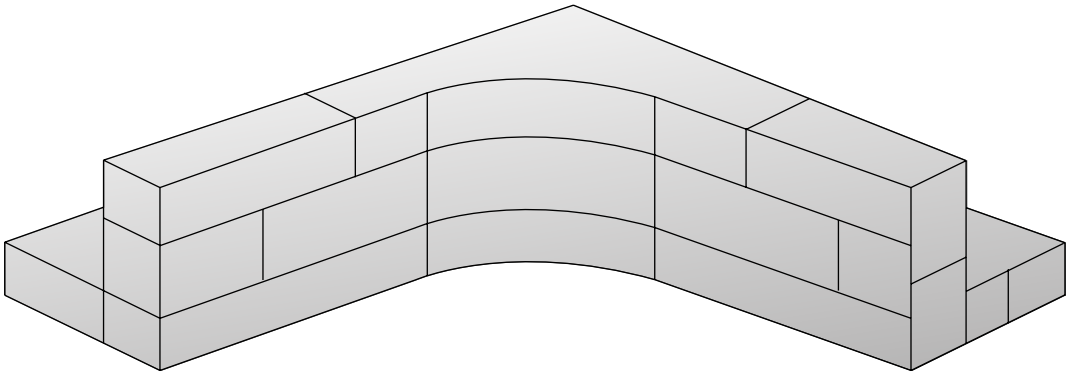
2. Finally, attach the sections using the indicated methods.



3. Once the adhesive is dry, sand until the seam is no longer visible.

34.2- Stack.

Several KRION™ sections can also be joined to produce a finish with a more solid appearance.



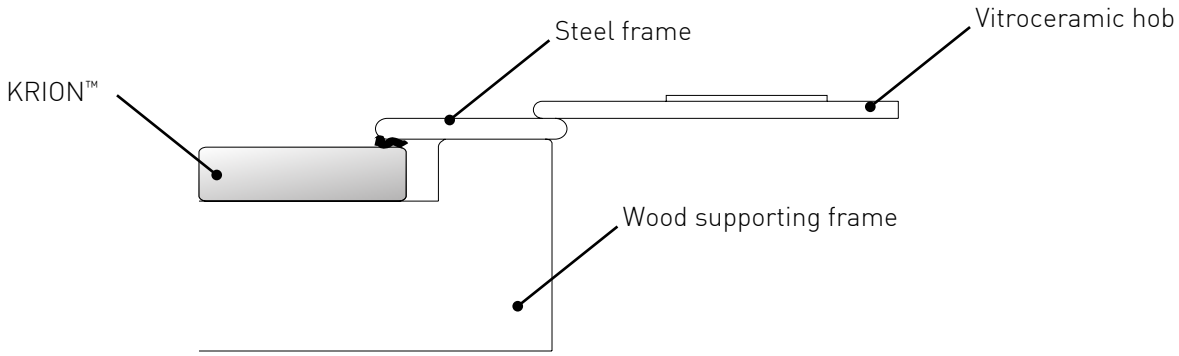
Mill the sections before creating the seams with a template, and make sure that the radii coincide perfectly. Level off the front section and curves by sanding as necessary.

Steel frame 35

To reduce the KRION™ sheet's exposure to heat from the hob, a steel frame can be used.

Supporting it on the wood base means that:

1. The vitroceramic hob will not come into contact with the KRION™ countertop.
2. There will be more ventilation space.



Use ceramic tape and aluminium tape to insulate the KRION™ sections closest to the vitroceramic hob.

Use the ceramic tape and aluminium tape provided by SYSTEMPOOL as these have been tested with our products and are the only ones that are valid for guarantee purposes.

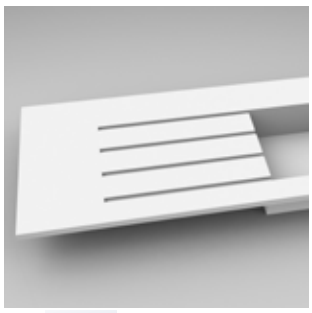
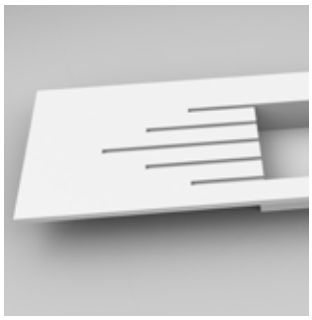
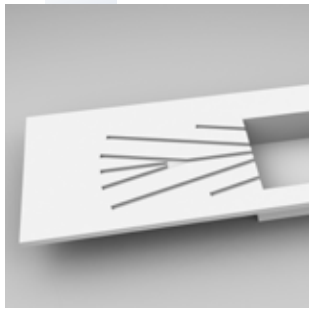
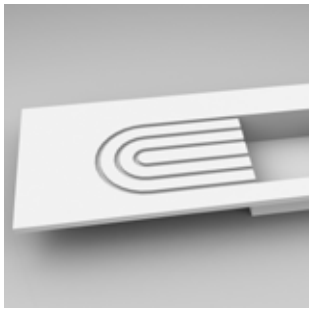
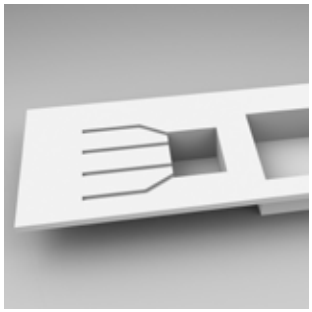
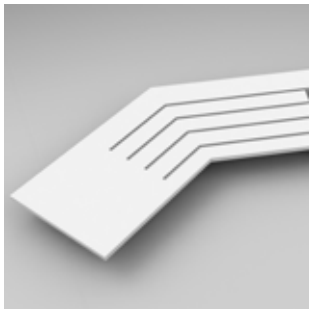
Note: Alternatively, this frame can also be made of KRION™. Try using a different colour to create a colour contrast.

If you do not take these precautions, the countertop will crack due to the thermal stress created by the heat.

Draining boards

To make them, you must have a template with the necessary shape.

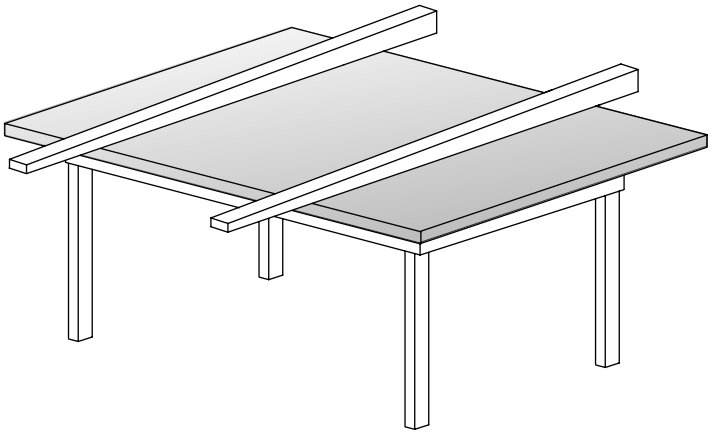
You must attach guides to the countertop so that the milling machine moves in the correct direction.

Lineal		Diagrama	
Fractar		Circuito	
Afluente		Quebrada	

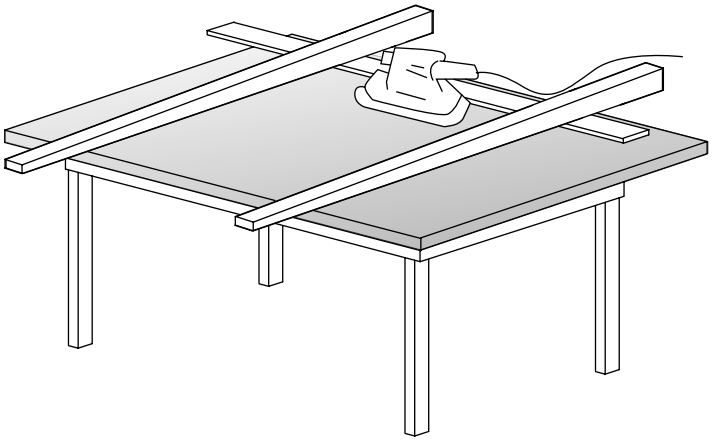
Draining boards 36

36.1- Make a slope for the draining board.

To create the slope for the draining board, first cut two wood strips with the same length as the drainer, and recess them to the required angle.



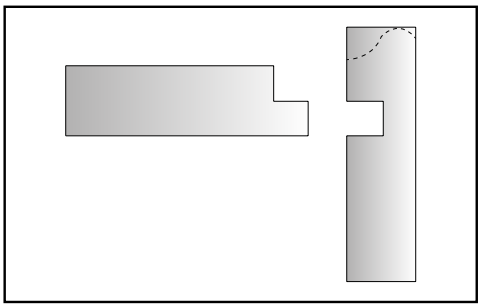
Use a guide to ensure the milling machine moves in the correct direction.



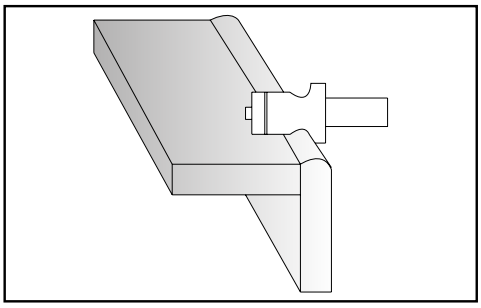
Non-spill edge

Option A)

To create a non-spill edge, the front skirt must be bonded using a tongue and groove joint higher than the upper edge of the countertop, as shown in the diagram.

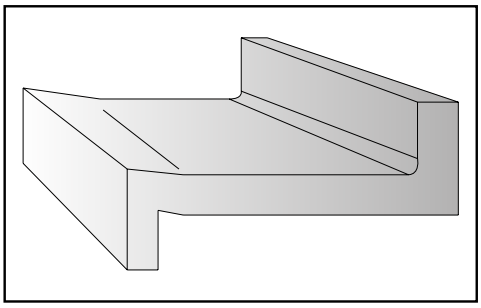


Once the adhesive has dried, mill the edge horizontally to achieve the required finish.



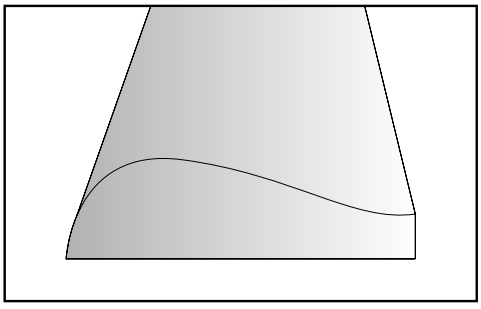
Option B)

You can also create a non-spill edge by slightly curving the edge of the sheet upwards.

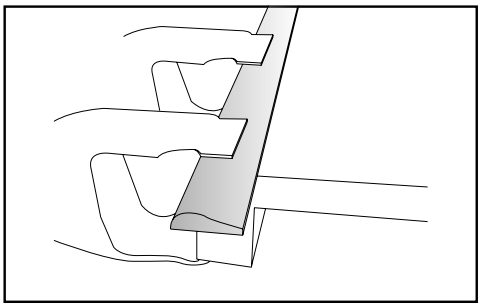


Option C)

1. Make a section with the shape shown in the diagram.



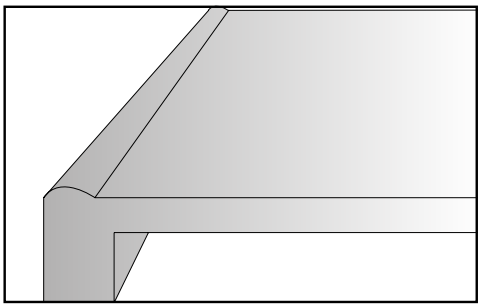
2. Attach it to the edge of the countertop.



Non-spill edge 37

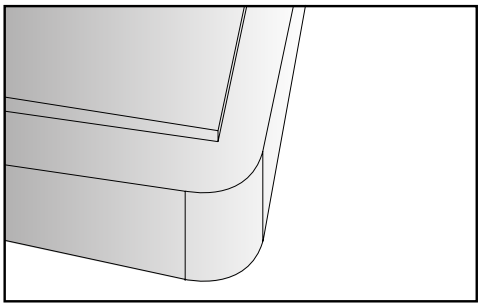
Option C)

3. Sand until the adhesive has been removed and add the skirt chosen by the customer.



Option D)

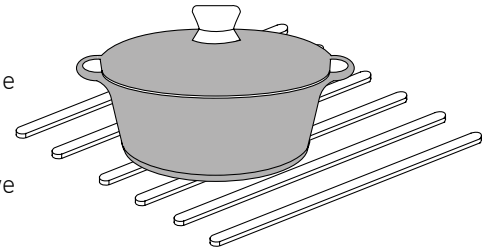
1. Rebate the edge 2 cm (13/16") from the edge to create a depression.



Inox bars 38

38.1- Stainless steel bars.

To achieve better protection against extreme heat (pots, items removed from the oven, etc.) you can add steel bars or balls.

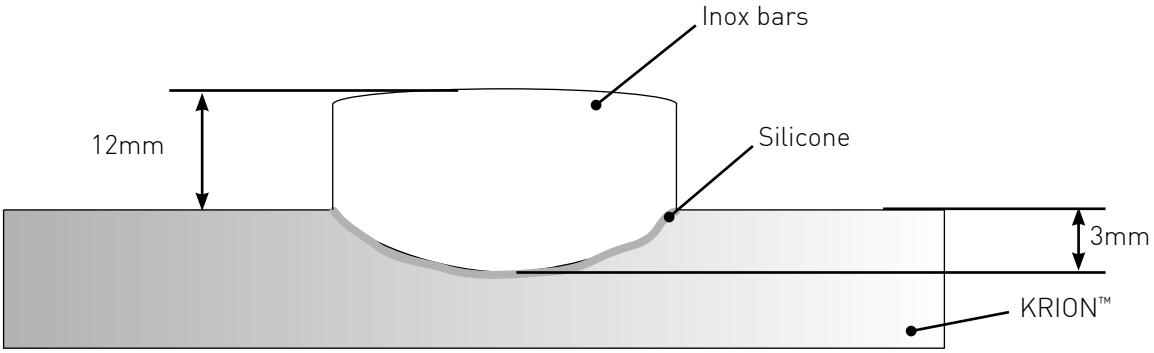


DO NOT use iron bars or materials containing iron, as these will damage the countertop.

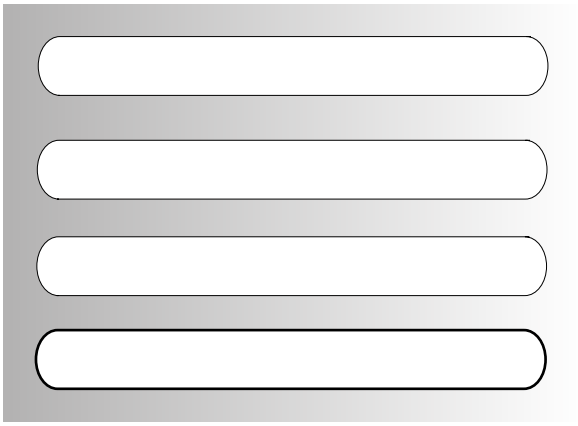
By inserting them into the countertop and adhering them with silicone, we will achieve the desired effect.

They must be inserted 3 mm (1/8") into the countertop.
Round the tips so that they have the same radius as the bar.

A diameter of 12 mm (1/2") is ideal for this purpose, although other sizes can also be used.
Carry out tests before deciding on a size and shape.



Separate the bars between 5 (2") and 10 cm (3 $^{15}/_{16}$").



Remember that steel also expands.

Leave a margin of 2 mm (1/16") to avoid damaging the KRION™ countertop when its temperature increases.

Protectors 39

39.1- Countertop protectors.

A small sheet of KRION™ (for example, measuring 30-11 $^{13}/_{16}$" x 20 cm-7 $^{7}/_{8}$") can be used as a perfect substitute for steel bars.

Give your projects added value by always giving this element to your customers as a free gift.

39.2- Cutting board.

A spare piece of KRION™ can be used to make this element.

Improve your professional image by giving a cutting board as a free gift with every countertop you install.

Make them by bonding two 12 mm (1/2") sheets to create a surface of 24 mm (15/16").

It will be useful as replacement material if you have to make any repairs in the future.

Remember that these elements should not be washed in a dishwasher, as they may be damaged and not last as long.

Templates 40

Templates are very useful for making openings for bowls, or for taking the measurements of the kitchen countertops you are going to make.

Templates can be made out of the following material:

- Wood.
- Phenolic plywood.
- DM.

Keep all bowl opening templates together to ensure they are not lost.

When taking measurements for the installation, use a cardboard template so that you have a full size replica of the shape of the countertop.

Make any notes on the cardboard you need in relation to the countertop you are making.

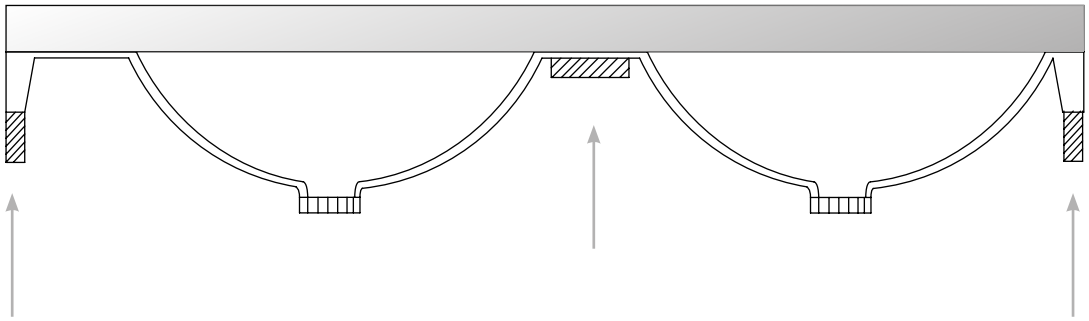
A template for the kitchen can also be made by joining wooden strips together.

Do not forget to take note of the measurements and all of the important details. These will be necessary so that the kitchen fits in its final position

Bathrooms (countertops, washbasins and shower trays) 41

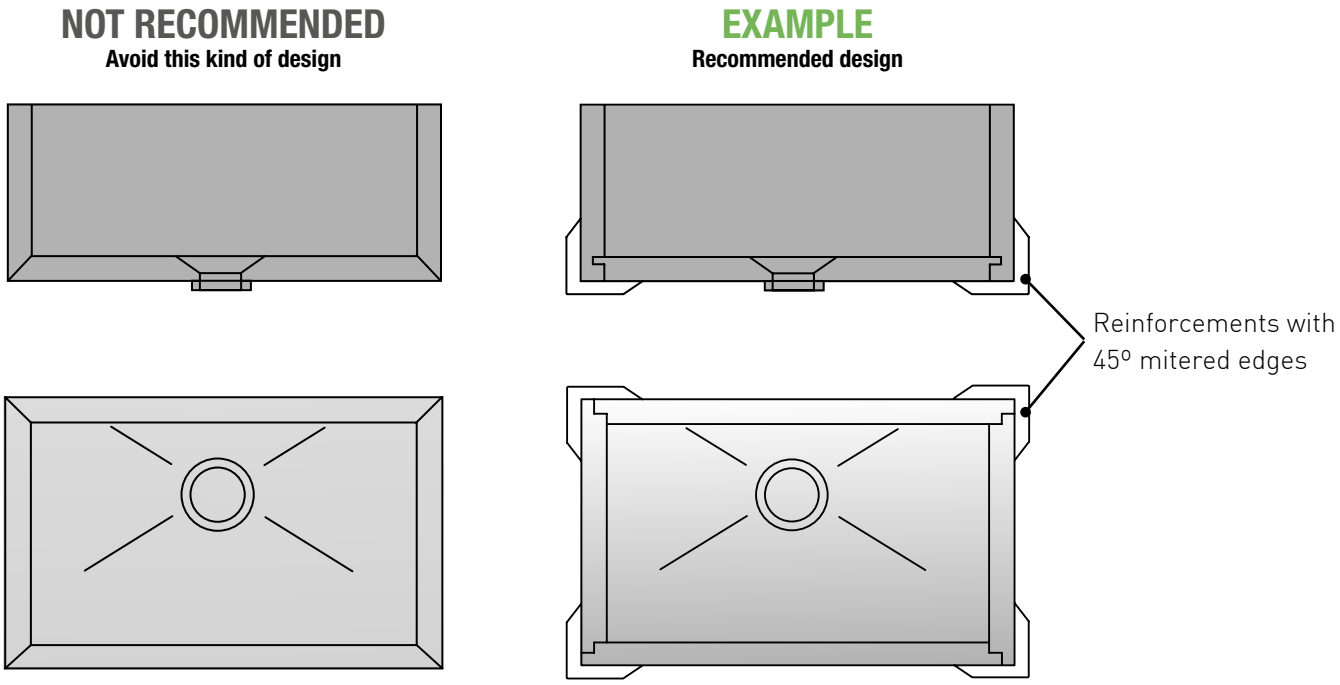
COUNTERTOPS

If you are making countertops for bathrooms positioned between two walls, make sure that they are correctly supported on wall brackets with a support between the bowls:



WASHBASINS

If rectangular washbasins are made, never create 45° mitre joints. Always remember that washbasins can sometimes be subject to thermal shocks.



Reinforce the seams with KRION™. Reinforcements subject to thermal shocks should always have 45° mitered edges.

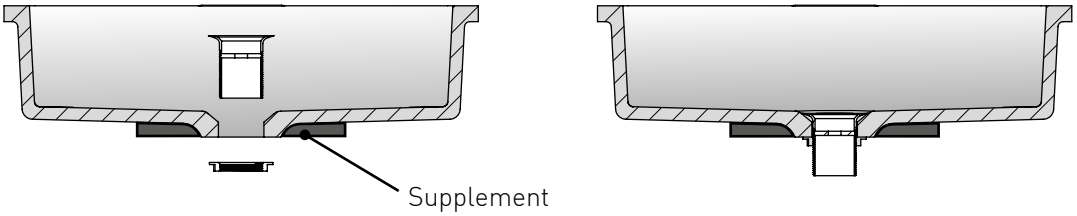
Bathrooms (countertops, washbasins and shower trays)

WASHBASINS

When washbasins are made of KRION™, make sure that:

▶ The base slopes down to the drain valve so that water drains away properly (with a minimum slope of 1 to 1.5º).

▶ The drain hole is made so that the drain trim is flush with the bottom of the basin or slightly below it.



▶ Make sure that the underside where the drain outlet goes has a flat surface. A 6mm-thick (1/4") section of KRION™ can be used to ensure a flat surface.

SHOWER TRAYS

Shower trays are occasionally subject to thermal shocks (hot and cold water) and to loads of up to 100 kg on their top surfaces. As a result a series of precautions must be taken when designing and fitting shower trays.

For the sake of brevity, we will not list all the possible shapes and designs, but we will provide a series of tips and warnings so as to ensure a successfully fitted KRION™ shower tray.

The example shower tray shown in this section is inspired by the RAS shower tray from the SYSTEMPOOL catalogue. Read this section carefully and take note of all indicated warnings.

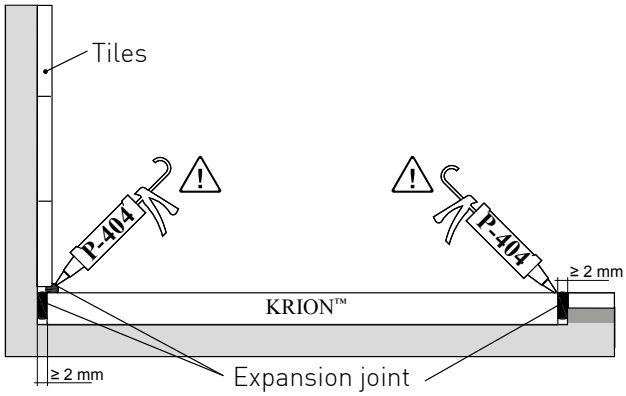
TAKING MEASUREMENTS FOR TRAYS:

▶ Visit the worksite to check the measurements of the tray to the made and the conditions of the shower area (the available space, possible columns, position of the drain, available depth etc).
The shower tray can be fitted between walls, recessed in the floor, semi-recessed or surface mounted on the finished floor.

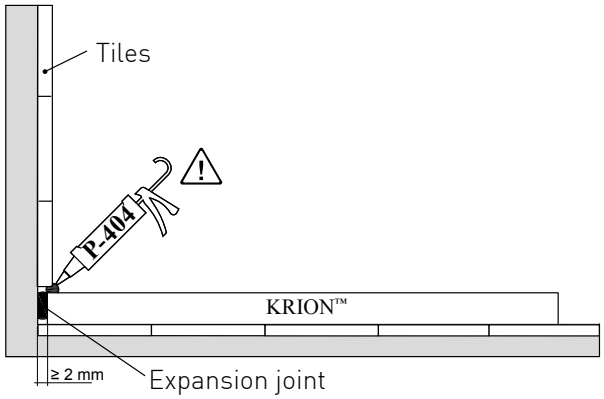
▶ Make sure accurate measurements and notes are taken of the area and design required by the customer, always leaving a margin of 2 (1/16") or 3 mm (1/8") around the perimeter of the tray for the expansion joint (otherwise the tray might break).

SHOWER TRAYS

Recessed/integrated into the floor



Surface mounted on the finished floor (recommended)



▶ The recessed installation method is dependent on the available depth of the floor and on the length of the final design. Bear in mind that the basin area of the shower tray should have a minimum slope of 1 to 1.5º so that water drains away properly.

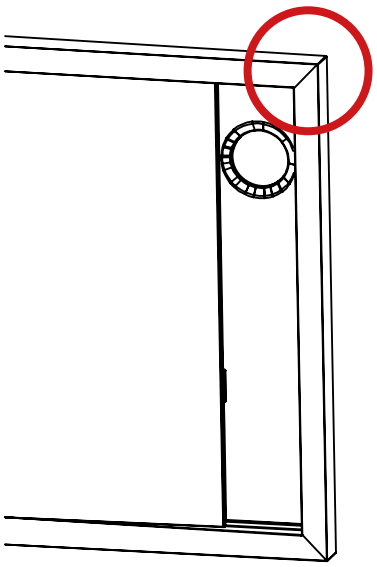
The size of the drain valve and height of the downpipe can also limit the possibility of this kind of installation system.

It is always better to design a shower tray with a bigger diameter drain valve (90 mm for instance) so that water drains away faster.

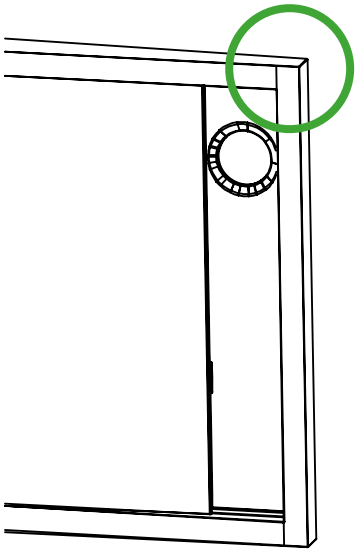
POSITIONING SEAMS AND REINFORCEMENTS:

▶ Never position seams close to corners mitered at a 45º angle.

NOT RECOMMENDED



RECOMMENDED EXAMPLE

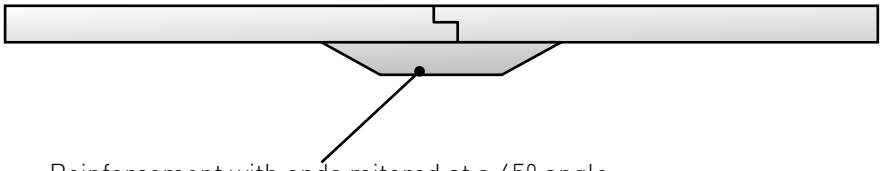


Bathrooms (countertops, washbasins and shower trays)

SHOWER TRAYS

When washbasins are made of KRION™, take care to:

► Reinforce the KRION™ seam, mitering the edges of the reinforcement strip at a 45º angle.

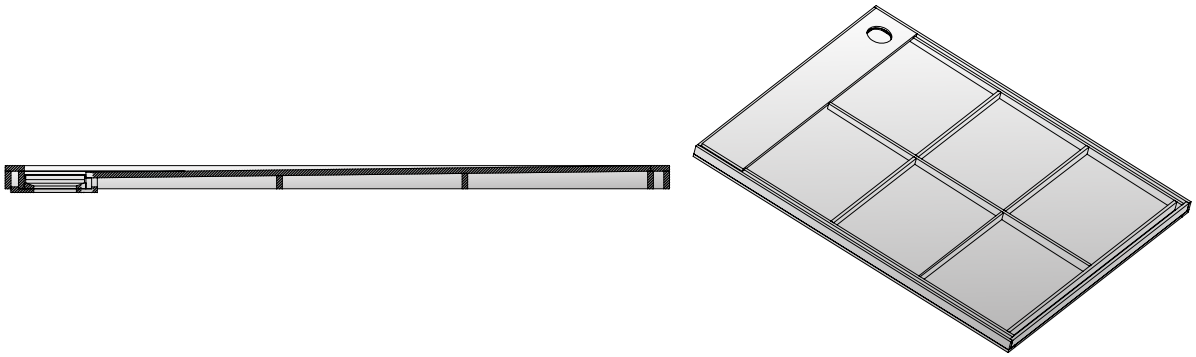


Reinforcement with ends mitered at a 45º angle

► As a general rule, when a shower tray is being designed, avoid too much of a difference in the thicknesses of sections exposed to thermal shocks (cold/hot water).

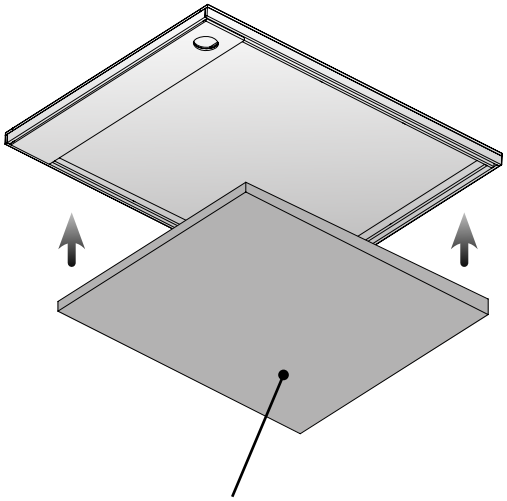
Reinforcement points are necessary and they lead to differences in the thickness of the tray. Do not forget to miter the edges at a 45º angle, particularly if they are situated in areas subject to thermal shocks.

► Reinforce the load-bearing area of shower trays with supporting crosspieces that rest on the levelled base.

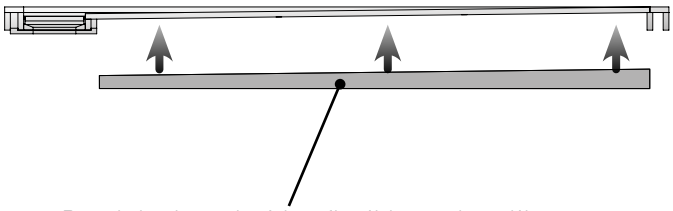


Another way of stabilizing the load-bearing area is to use high-density waterproof polyurethane board, adapting it to the size of the gap underneath the tray and levelling it until the tray rests on top of it.

SHOWER TRAYS

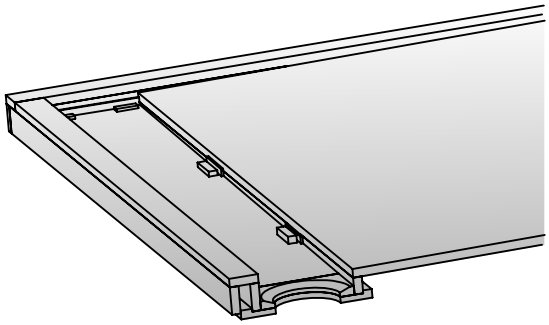


Bond the board with a flexible sealant like P404 by Butech.



Bond the board with a flexible sealant like P404 by Butech.

▶ The drain hole should be made in such a way that the valve is flush with the surface so that water drains away properly. It is always preferable to design the tray so that it includes a larger diameter drain valve (for instance 90 mm) so that it has a bigger drainage capacity.



FITTING THE SHOWER TRAY (PRE-INSTALLATION SHEET):

When KRION™ washbasins are made, take note of the following:

The document "Installing KRION™ shower trays" can be downloaded from the "Technical Data Sheet" section of our website **http://www.krion.com/en/affinity**.

The document contains the minimum instructions needed to install trays properly. (Failure to follow these instructions might result in a broken tray).

Print out this technical data sheet and hand it to the customer or person responsible for fitting the KRION™ shower tray and make sure that the said instructions have been fully understood. This technical installation sheet is also shown on the following page.

Unique Series

42.1- Unique shower tray.

The shower trays are available in 6 sizes, all with a 90 mm (3 $^{9}/_{16}$") drain diameter (including a drain trim cover in KRION® Snow White, not including the syphon-valve).

All of the shower trays have support points on their entire base, and are ready for installation on firm, level surfaces.

Important: follow the fabrication recommendations and installation instructions detailed in the document "Pre-installation of KRION® Shower Trays."

Simple installation (original shower tray measurement or reducing its size – cutting)

▶ Any of the shower trays in the Unique Series can be installed with their original sizes or be trimmed to ensure a perfect fit.

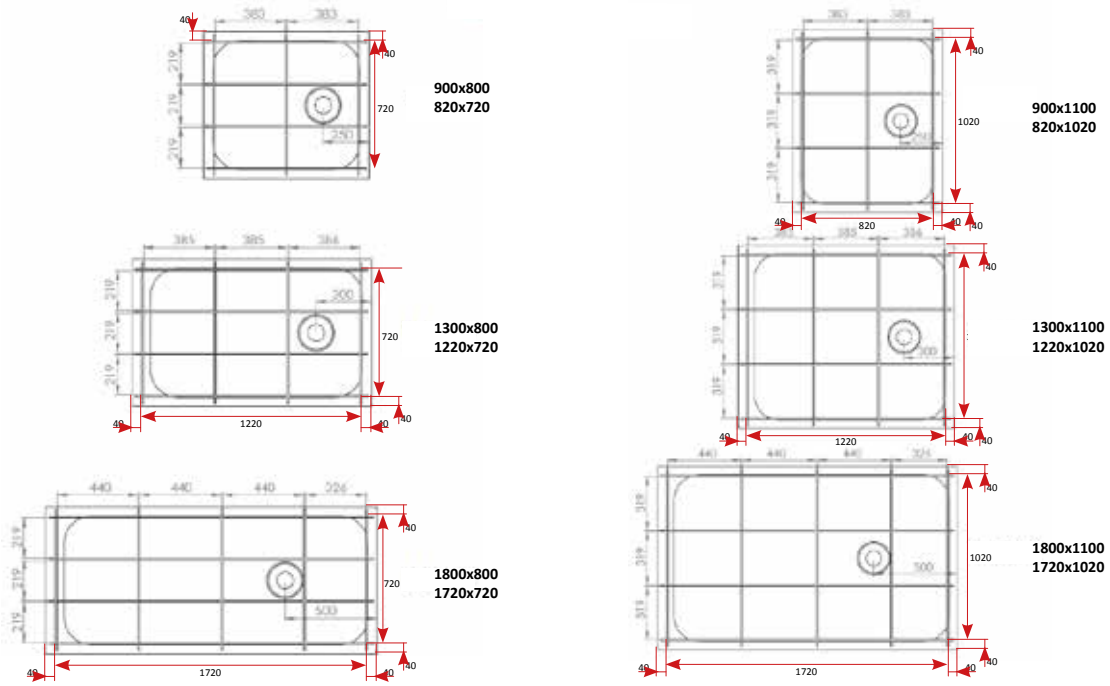
▶ The Unique shower trays can be trimmed down by a maximum of 40 mm (1 $^{9}/_{16}$") on each of their sides. It is very important not to break or cut any of the support points on the bottom of the shower trays.

▶ If you need to reduce the size of a shower tray, cut and profile the edges using a manual milling machine or CNC machine.

▶ Do not use jigsaws to cut the shower tray as this may cause cracks.

▶ The edges of the cut must be rounded to a radius of 1 (1/16") or 2 mm (1/8"), and sanded using P320 grain sandpaper.

The cutting points are marked in red, together with the maximum distance that can be cut for each of the Unique shower trays.



42.1- Unique shower tray.

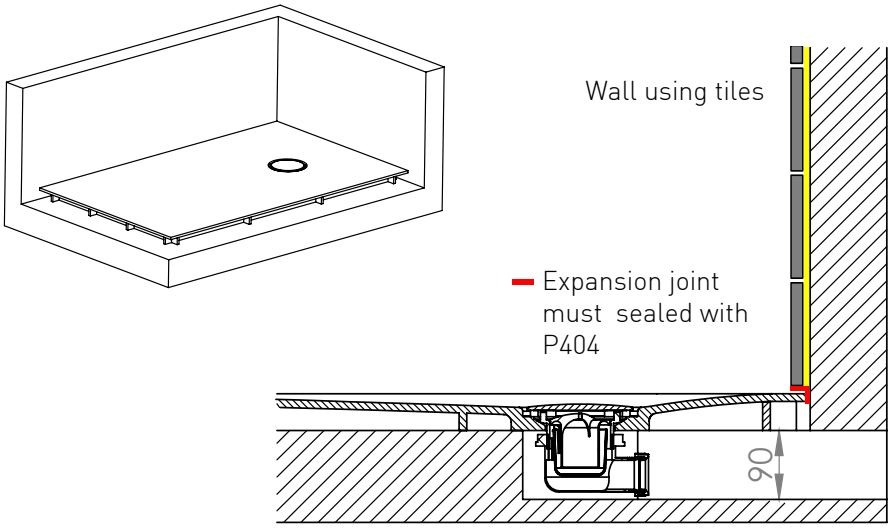
Simple installation of a Unique shower tray: precautions

Shower trays made of KRION™ must be installed paying special attention to a series of precautions.

Depending on its application and use, a shower tray may be exposed to extreme water temperatures ranging from 3ºC (37,4ºF) to 65ºC (149ºF), although the usual temperature range is between 15ºC (59ºF) and 40ºC (104ºF).

Extreme temperature variations may cause the material to shrink and expand slightly (the expansion coefficient of KRION™), and so the following precautions must be taken into account:

- All of the support points under the shower tray must be placed on a solid, level surface.
- The shower tray must never be attached to the floor or walls using cement adhesive or any other non-elastic type of bonding product.
- If the shower tray is recessed into the floor or between walls, a minimum expansion joint of 2 mm must be left around its entire perimeter.
- This expansion joint must be sealed with P404 from Butech® or similar (a single component polyurethane based elastic sealant). Never use a non-elastic sealant or cement adhesive.
- The walls of the shower can be finished using tiles or any type of stone. If the bottom part of the wall covering rests on the KRION™ shower tray, leave an open joint of 2mm (1/16") between the wall covering and the shower tray. This joint must also be sealed with P404 or similar; do not use cement adhesives or non-elastic products.



The person installing the shower tray must be aware of and follow these installation instructions. For this reason it is very important to provide the person carrying out the work with a copy of the Technical Data Sheet for installation.

This sheet is included with every shower tray from the Unique Series, or if you prefer you can print it from the KRION™ Affinity website or from this manual (http://www.krion.es/en/affinity).

Unique Series

42.1- Unique shower tray.

Fabrication together with other KRION™ elements

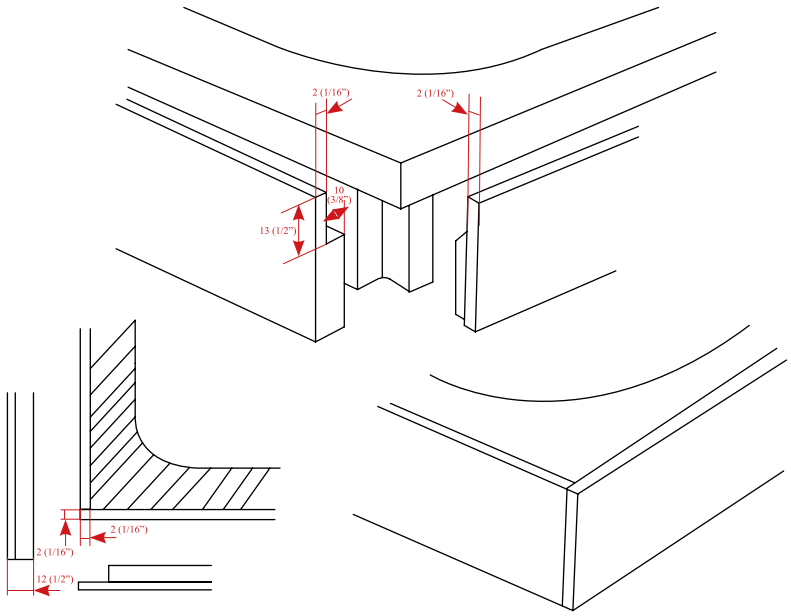
▶ All Unique shower trays must be installed on a solid, completed floor surface.

▶ The front part of the shower tray will be open, and it can be closed with the same KRION™ colour (Snow White 1100) or combined with another colour reference from the KRION™ Lux series.

▶ Bear in mind that there could be a slight difference in shade between the panel of Snow White 1100 and the Unique elements. As a result, the joints and seams should be finished in a way that conceals any possible change in shade between the panel and the Unique shower tray.

▶ To obtain an invisible joint, the outer edges of the shower tray should be milled before attaching the panels.

▶ The following diagram shows a design for panelling the shower tray with one front panel and one side panel, machining a rebate in the seam to a thickness of 2 mm (1/16").

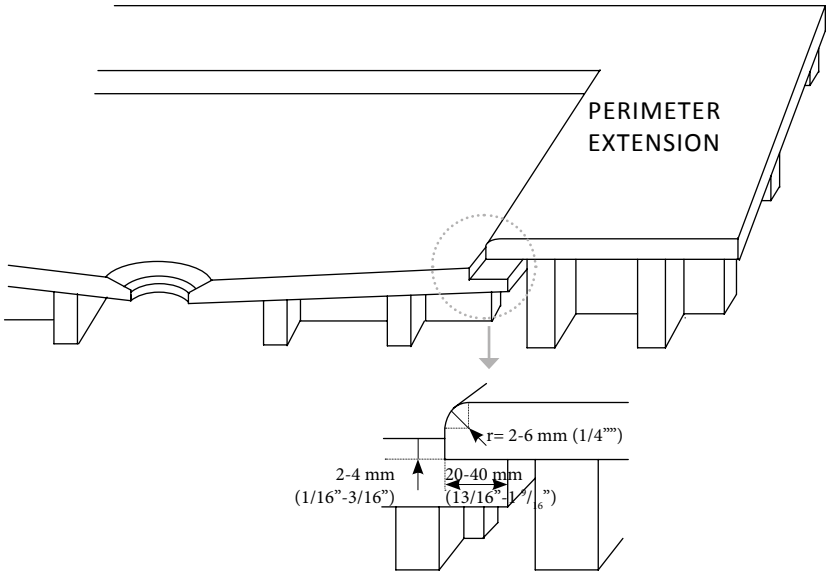


42.1- Unique shower tray.

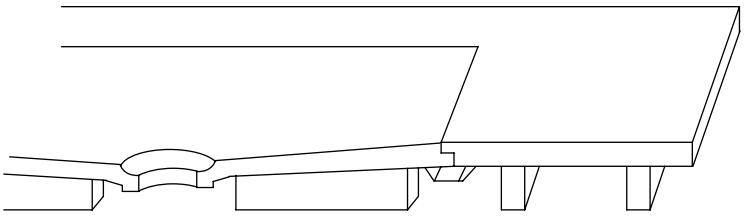
Fabrication together with other KRION™ elements

To increase the surface of the shower tray, its edge should be machined, attaching the perimeter section with a rounded finish.

The extension should always be added above the height of the shower tray, as this will improve water run-off from the shower, and will help to reduce any possible difference in shade between the shower tray and the Snow White (1100) panel.



The surface of the shower tray can also be extended by bonding an outer perimeter to it at the same height.



Bear in mind that this method may result in a slight difference in shade being visible between the Unique shower tray and the panel used for the perimeter.

The outer perimeter must be fabricated with correctly levelled support points in contact with the floor. The recommended distance between the support points is 300 (11 13/16") – 350 mm (13 3/4"), and should never be any more than 400 mm (15 3/4").

The shower tray and the outer perimeter extension must be supported on a solid, level surface to prevent any stresses that may damage the structure or surface of the shower ensemble.

42.1- Unique shower tray.

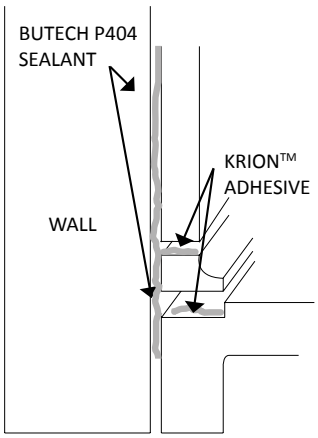
Expansion joint – Installing the shower ensemble

When fabricating the shower ensemble, make sure that there is a minimum gap of 2 mm (1/16") around the entire perimeter of the KRION™ and the walls or floor where it is to be installed.

This gap will act as an expansion joint and must be sealed with P404, a polyurethane product from Butech or similar. Do not use non-elastic sealants or cement adhesives.

Before installing the ensemble, make sure that the supporting surface is solid and level.

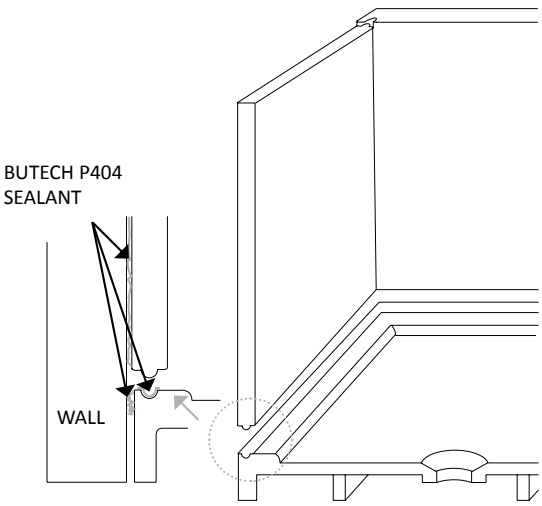
The walls can be covered in several different ways, but it is important to always respect the expansion joints between the shower tray and the panels used to cover the walls.



In this case, a rounded joint with a radius of 10 mm (3/8") has been used.

Bear in mind that in order to obtain invisible seams, the sections must be machined with the right tools, and cleaned throughout the entire process of applying KRION™ adhesive. Check these procedures in the Official Fabricator's Manual.

The recommended surface finish for the shower tray to ensure an improved non-slip effect is P180 to P240.



In this other example, the Unique shower tray and the panels used to cover the walls have been machined with a tongue-and-groove joint, and the seam between them has been sealed with P404 or similar (a polyurethane single-component elastic sealant).

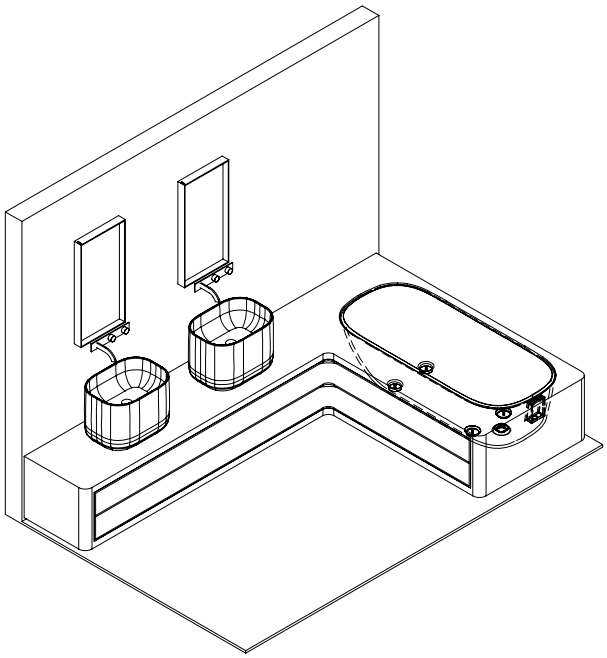
P404 is a sealant with excellent properties that ensure perfect insulation and water resistance.

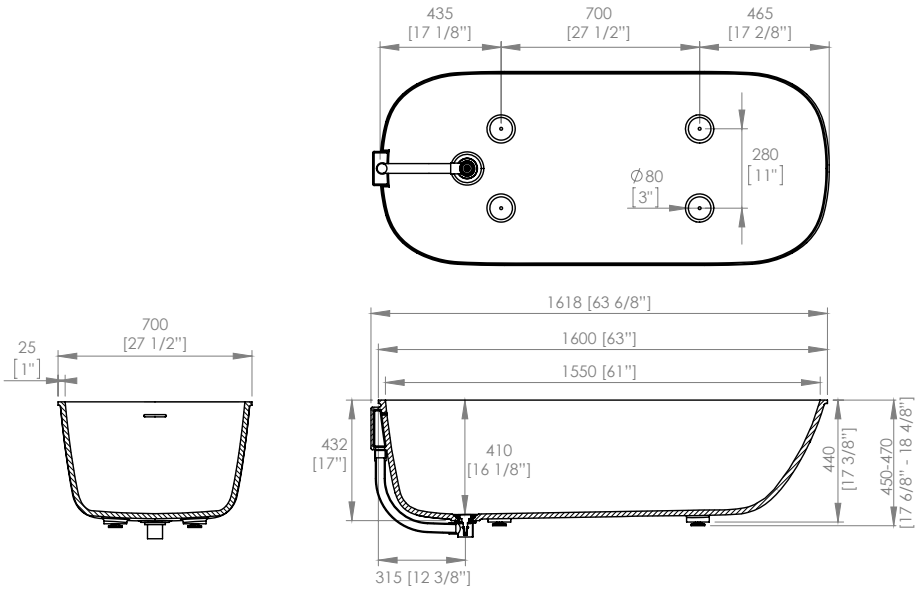
Use the same P404 sealant to attach the panels to the walls being covered. Check the "Wall Coverings" section in the Fabricator's Manual

42.2- Unique bath.

The UNIQUE bath measures 1550 x 650 cm (61"x 25 $^{9}/_{16}$"), and is made of KRION™ Lux Snow White (1100).

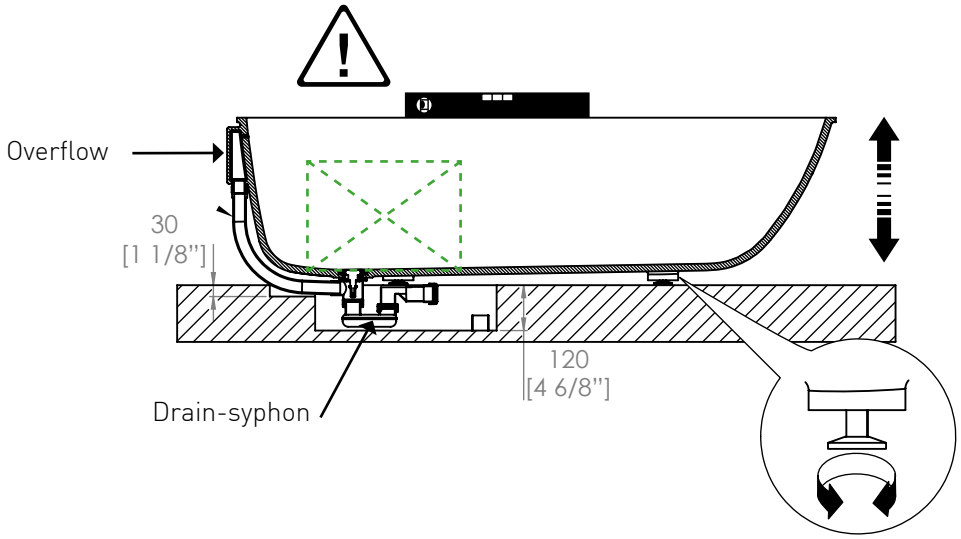
The bath has an overflow ready for connection, together with four support points with adjustable feet.





42.2- Unique bath.

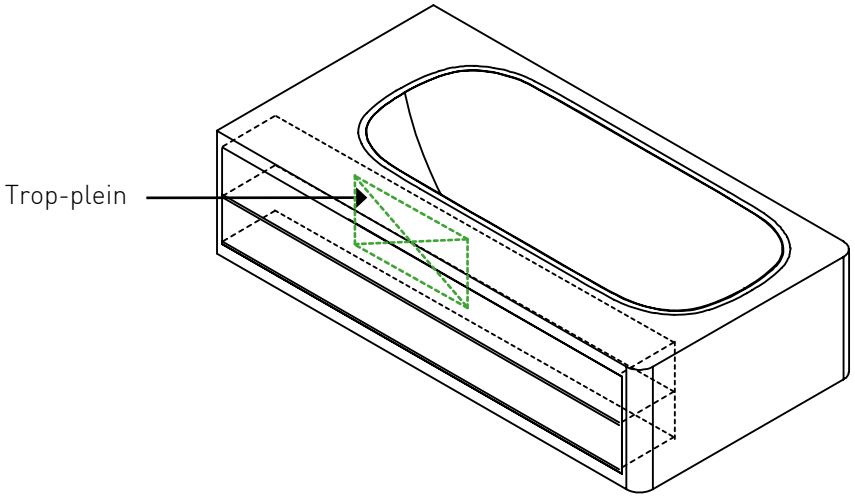
- Access panel



Include an access panel when fabricating the bath ensemble, to provide access to the drain syphon if any maintenance work needs to be carried out in the future.

We can also use this panel to adjust the level of the bath's 4 supporting feet.

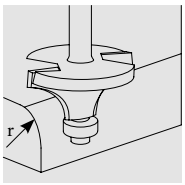
It is very important that the 4 feet are positioned on a solid surface, to prevent any excess stress on the seam between the bath and its perimeter extension.



42.2- Unique bath.

Access panel

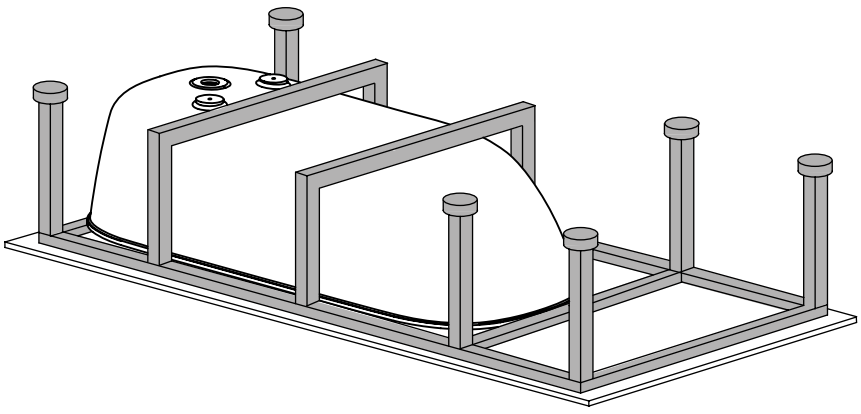
As with the Unique shower tray, there may be a slight difference in shade between the bath and the KRION™ 1100 panel. To achieve a smoother integration between the bath and surface, we suggest milling a radius of 15".



It will be necessary to calculate and manufacture a metallic frame or structure to support the weight of the ensemble, taking into account the volume of the water in the bath and the weight of the customer when using the finished product.

Bear in mind that humidity levels are generally higher in bathrooms. If you are planning to use wooden boards as an accessory for the support together with the frame (between the frame and the KRION™), then this must be phenolic plywood board, marine plywood or similar.

Use P404 sealant from Butech or similar to bond the board and/or the frame to the KRION™ panels.



42.3- Unique washbasins.

Three types of Unique washbasins are available: recessed, semi-recessed and on-top.

OVER COUNTERTOP

IN COUNTERTOP

UNDER COUNTERTOP

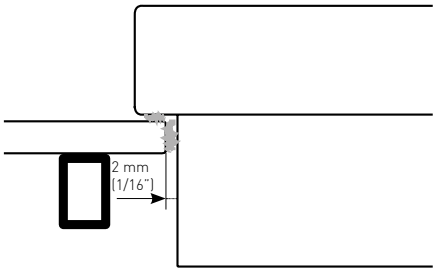
Installing semi-recessed and on-top models

In the case of semi recessed and on-top washbasins, always use a P404-type elastic sealant or similar to bond the washbasin to the countertop. KRION™ adhesive must not be used to bond these models.

Reinforce the lower perimeter of the washbasins. With the semi-recessed model, make sure there is a gap of 2 mm (1/16") between the washbasin itself and the hole in the countertop.

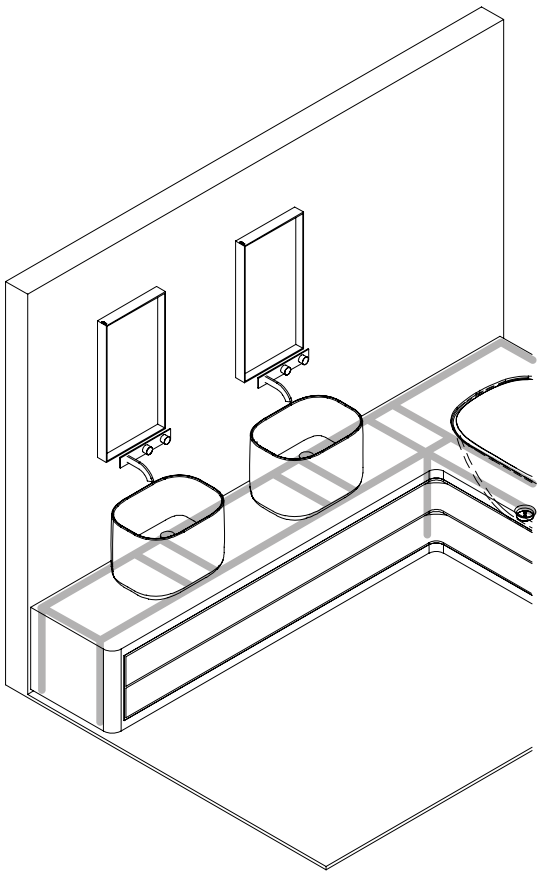
Smooth and sand the edges of the hole cut in the countertop before bonding the washbasin.

Apply the sealant making sure that the seal is perfectly waterproof, to prevent water dripping down inside the unit (clean and remove any visible remnants of sealant around the edge of the washbasin).



42.3- Unique washbasins.

Installing semi-recessed and on-top models



When the countertop has been configured with “B812 52X38 ON TOP” and “B813 55X40 ON TOP” type bowls, the part of the frame that coincides with their position must be reinforced.

Luxury Series

Sheets in the KRION™ Luxury series are specially designed to feature a random pattern of veins and chips, with an appearance similar to natural stone. The veins run in one main direction, with some random secondary lateral variations. They range from subtle veining to a more marked noticeable pattern.

The general surface pattern might undergo variations throughout the thickness of the sheets.

Due to these and other technical characteristics of the Luxury series, this guide has been created to help in the fabrication process. For visual results of an acceptable standard, follow the instructions in this guide.

L503 . Siracusa

L901 . Segesta

L902 . Erice

L501. Pompei

43.1- Technical characteristics.

▶ The edges of the sheets differ in appearance from the top surface.

▶ The veins and chips form a random pattern, running in one main direction across the sheets.

▶ This product has a lower thermocurving radius than other KRION™ products.

▶ The veined pattern varies throughout the thickness of the sheets.

▶ Depending on the sanding and final finish, the general appearance may vary.
A surface with a satin or gloss finish will be slightly darker and the veining and chips will be more clearly defined.
A surface with a matt finish will have a lighter, less well-defined appearance.

▶ The underside of the sheets differs in appearance from the top surface. The veined pattern is much stronger and more pronounced. Do not process the sheets on this side unless you seek this specific appearance.

43.2- Fabricating processes.

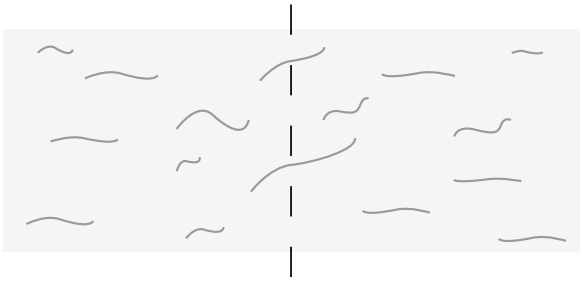
Choosing the sheet, direction of the veined pattern and combination of veins

Take your time when selecting the right parts of the sheets. Look for veins that run in the right direction and an appropriate veined pattern in order to ensure good visual results.

It is the fabricator's responsibility to choose the right patterns on the sheets so that the whole ensemble meets customer expectations.

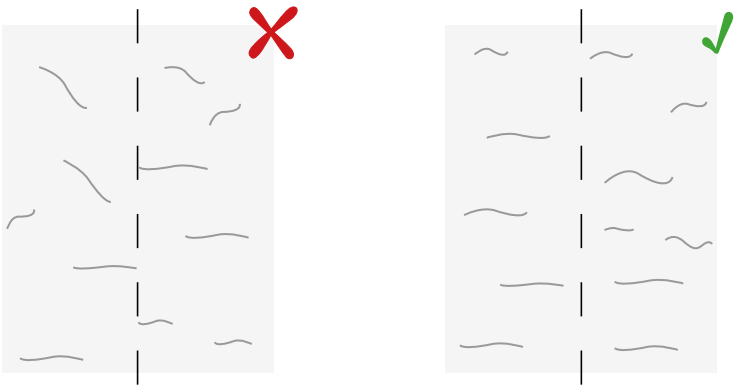
Presenting the customer with samples of possible combinations of bonded sheets, front panels, rear trims, etc. will help them know what to expect.

When two sheets are bonded together, always make sure the pattern runs in the same direction.



On the side of the sheets, the KRION™ Luxury series bears an arrow showing the direction of the veined pattern and the batch number.

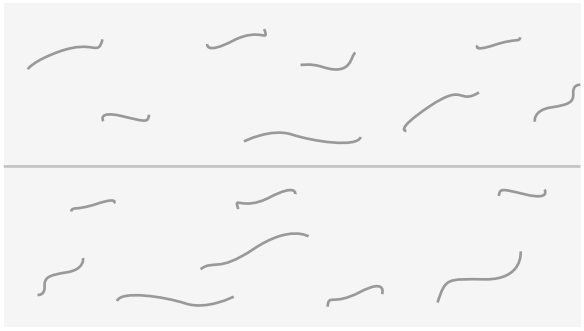
A certain lack of continuity in the veined pattern might be noticeable near the seam between two sheets. The more pronounced the pattern is, the more noticeable this will be.
Choose areas with a softer veined pattern for the meeting point between sheets.



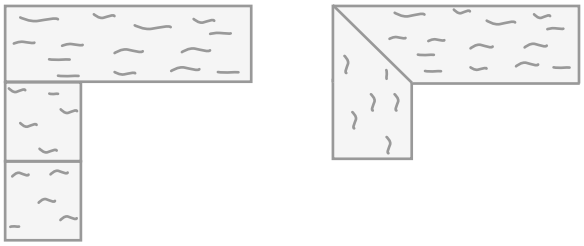
43.2- Fabricating processes.

Choosing the sheet, direction of the veined pattern and combination of veins

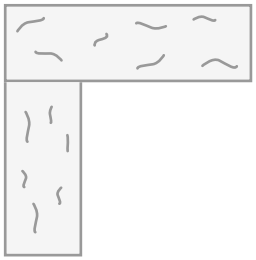
If the project requires a width of more than 750 mm (29 $^{1}/_{2}$"), for a kitchen island for instance, the best way to bond the sheets is to position them beside one another, ensuring that the veined pattern runs in the same direction. Always make sure that there is no abrupt interruption in the veined pattern at the meeting point of sheets or ensure that any abrupt interruption coincides with places where the solid surface will be cut to recess a sink, kitchen hob or other item.



When an L-shaped countertop needs to be made, it is important to analyse which of the two methods to choose:



The following method is not advisable (the veined pattern of one sheet does not tie in with the veining of the adjoining one). This method can be valid providing that the meeting point between the two sheets has no veins or the veined pattern is a very soft one, thus avoiding a clearly noticeable seam.



43.2- Fabricating processes.

Choosing the sheet, direction of the veined pattern and combination of veins

The manufacturing and fabricating techniques used with the Luxury series are the same as those described in the Official KRION™ Fabricators' Manual, with the exception of one important difference:

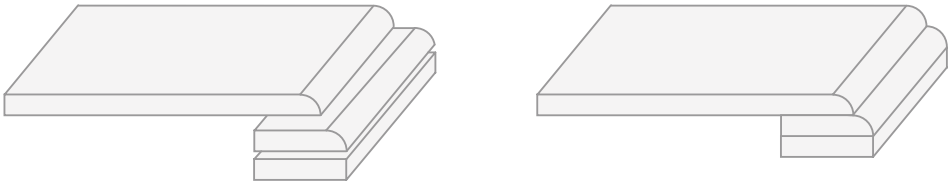
The edges of sheets from the Luxury series differ in appearance from the top surface.

When the edges are observed, random lines can be seen that coincide with the position of the different veins. These lines are impossible to predict. They might be anywhere on the edge to be cut.

When a curved rear trim (quarter round) is made or the sheet is cut to recess a sink, this effect may also occur.

FRONT PANELS

When a front panel is fabricated in "Stack" mode, this may also be observed:

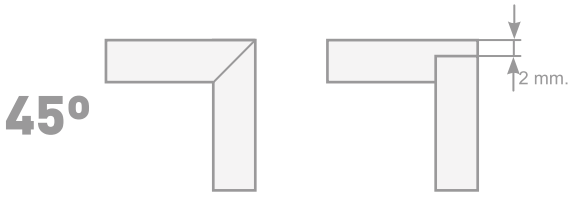


Bear this in mind and make some samples so that the customer knows what to expect.

"Stack" front panel

If the panel is cut at a 45º angle (with a mitre joint), the continuity of the veined pattern is ensured.

Another way is to make a rebate, leaving a thickness of 2 mm (1/16"), thus minimising any change in the edge's appearance.

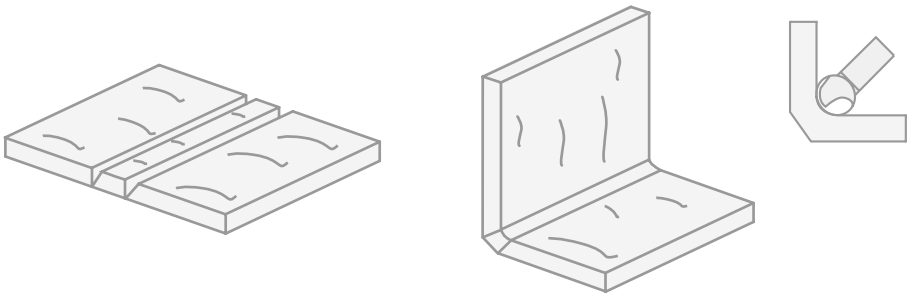


43.2- Fabricating processes.

Creating “Stack” front panels, curved rear trims and recessing bowls

	Radio 3	Radio 6
L503 . Siracusa		
L901 . Segesta		
L902 . Erice		
L501. Pompei		

REAR TRIMS



If a cove trim is required without the end appearance being affected in any way, use the v-grooved or folding method. In this way the material is not over-trimmed, thus ensuring no change in the surface pattern and hence continuity.

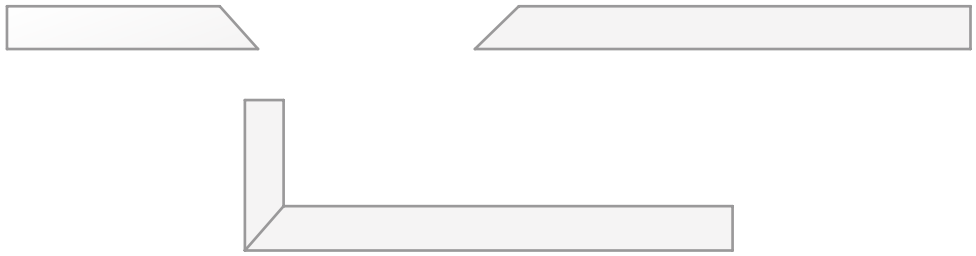
Pieces can also be joined at right angles with a perfect seal using KRION® adhesive.

43.2- Fabricating processes.

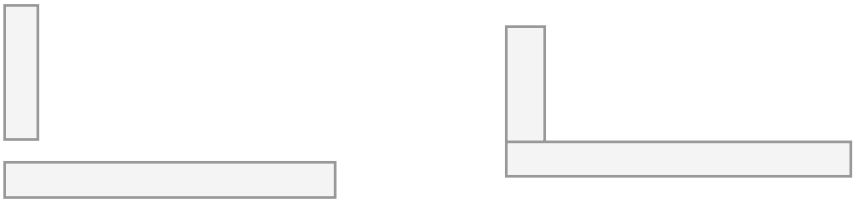
Creating "Stack" front panels, curved rear trims and recessing bowls

WITH A MITRE JOINT

Cut the two pieces to be joined with a 45º angle and bond them with adhesive.



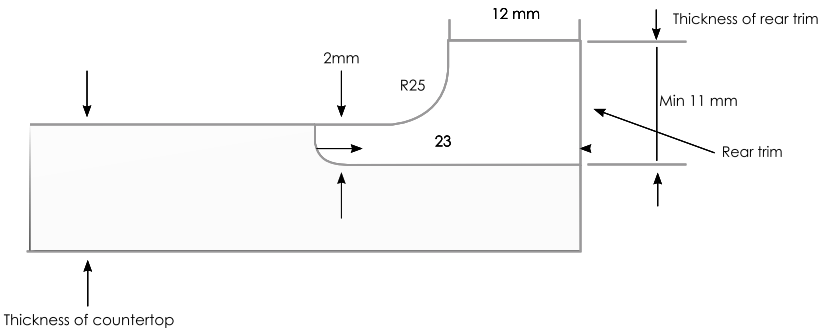
BUTT JOINTS



CURVED REAR TRIM

To create this type of joint, a piece is added between the sheet and the trim section. The piece is a quarter round that replaces the 90º joint, so that its base is embedded 2 mm (1/16") into the countertop, while the other end supports the rear trim (with the same thickness).

For interior corners, leave a minimum radius of 10 mm.



43.2- Fabricating processes.

Creating "Stack" front panels, curved rear trims and recessing bowls

CURVED REAR TRIM

If you decide to choose this option, there may be veins or a colour concentration inside the sheet that may influence the uniformity of the pattern.

Warn the customer of this and make some samples so that they know what to expect.

Curved rear trims

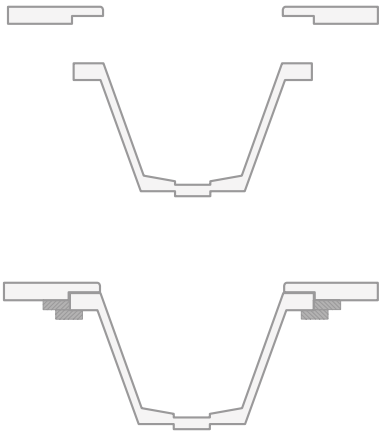
Recessed washbasins and sinks

Recessed bowls

Bear this in mind and make some samples so that the customer knows what to expect.

Look at the following pattern. The sheet can be trimmed down to recess the bowl and reduce any noticeable change in the edge's appearance.

It can be trimmed down to leave a thickness of 5 mm, always taking the precaution of reinforcing the seam on the underside.



Making front panels with a mitre joint or rebate

Front skirts with a 45º mitre joint are the ones that best blend in, leading to a block-like appearance and continuous veining.

An edge with a bending radius of no more than 2 mm (1/16") is advisable, because when this section is trimmed down, its appearance might be altered, leading to an abrupt change in the veined pattern.

Thermocurving Luxury

It is very important to heat the pieces to be thermocurved and the parts that will be adjacent to them in the same way.

Only limited minimum radii can be thermocurved with this series, since the sheets are designed to feature a multitude of chips of differing sizes that might jut out or come loose from the surface of the curved section.

Heating temperatures of 140ºC (284ºF) to 155ºC (311ºF) are required, depending on the radius, with the exception of Pompei, whose maximum is 130ºCM (266ºF). Make sure that these maximum temperatures are not surpassed.

Colour	Thickness of the sheet	Heating time	Minimum bending radius	Maximum temperature
L503 . Siracusa	12 mm (1/2")	20-22 min	R150 (5 15/16")	140ºC (284 ºF) - 155ºC (311 ºF)
L901 . Segesta			R200 (7 7/8")	
L902 . Erice			R200 (7 7/8")	
L501. Pompei	12 mm (1/2")	15 min	R200 (7 7/8")	130ºC (266 º F)

Sanding and finishing off the surface

The general end appearance may vary depending on the progressive sandpapers that are used and the final finish given to the surface.

With a satin or gloss finish, the result will be slightly darker, with more clearly defined veining and chips. With a matt finish, the pattern will be lighter and less well defined.

Also bear in mind that the pattern of the veins varies throughout the sheet. Thus if a specific area of the surface is over-sanded, some veins might fade and other new ones appear.

Sand the whole surface uniformly, paying special attention to thermocurved areas.

43.3- Backlighting (L501 Pompei).

L501 Pompei is a model from the Luxury series with a certain translucency. This makes it ideal for projects involving backlighting.

Unlike the Lux Light series, if different thicknesses of L501 sheets are created, thinner areas will be more translucent with a difference in the appearance of the veins.

Walls coverings

If you have to attach KRION™ to an unlacquered steel or glass substrate. Polyurethane sealant can also be used (P-404).

If adding some type of mechanical fixing (recommended), drill a hole in the KRION™ sheet and insert a flexible rubber tube so that the metallic anchor does not cause the sheet to crack.

44.1- Wall coverings.

6 (1/4") or 12 mm (1/2") KRION™ sheets are ideal for many different types of wall coverings.

They are easy to install and can be attached to nearly any type of solid substrate:

- Waterproof plasterboard.
- Water resistant plywood.
- Phenolic plywood.
- MDF.
- Solid tiling.
- Plasterboard.

Take the following factors into account when installing wall coverings:

1. Cut the sheets to cover the walls and check if the dimensions are correct. Leave a gap of at least 3 mm (1/8") for expansion (1.5 mm-1/16" per linear metre). Remember to also leave a gap in the corners at the top and bottom of the sheet.

2. Clean the back of the KRION™ sections with denatured alcohol and a white cotton cloth.

3. Apply a continuous strand of adhesive at a distance of 25 mm (1") from the edge around the perimeter.

Apply beads of silicone of approximately 30 mm (1 $^{3}/_{16}$") at a distance of approximately 200 mm (7 $^{7}/_{8}$") from each other on the sheet. Apply a continuous strand of silicone 20 mm (13/16") from the edges of any openings (for plugs and other elements).

43.1- Wall coverings.

Make sure that the supporting wall is clean from dust, grease and other substances that may affect the structural integrity of the panelling.

Avoid using KRION™ to panel walls or surfaces with humidity or water leaks.

This will cause a wide range of problems: incorrect adhesion, bulging of the wall, breakage of the seams (we recommend P-404 polyurethane sealant from Butech™).

You can use double-sided adhesive tape, silicone or hot wax to attach the KRION™ sections to the substrate until the adhesive dries (P-404).

Hold in place with the specified adhesives either manually or using mechanical means until the adhesive (P-404) dries. Otherwise, it will not be possible to guarantee correct adhesion to the wall.

Push the KRION™ panels firmly in place against the wall to make sure that the adhesive spreads correctly, using your hands, shoulders, body, head and feet.

Never lift large KRION™ panels on your own: always work in pairs to avoid accidents.

KRION™ panelling must not touch the floor. Use wood blocks or wedges to keep the panels raised by around 4 mm (3/16").

Fill this 4 mm (3/16") gap with silicone.

44.2- Rebate/tongue and groove vs invisible seam.

When planning to cover large surfaces with KRION™, it is important to take into account that expansion joints will be necessary.

These can be inserted in the corners, points where different materials meet, ceilings, etc.

It will be necessary to consider for each specific application whether to create a seamless surface by bonding sheets together with adhesive, or if it is better to fit sheets side by side with open joints.

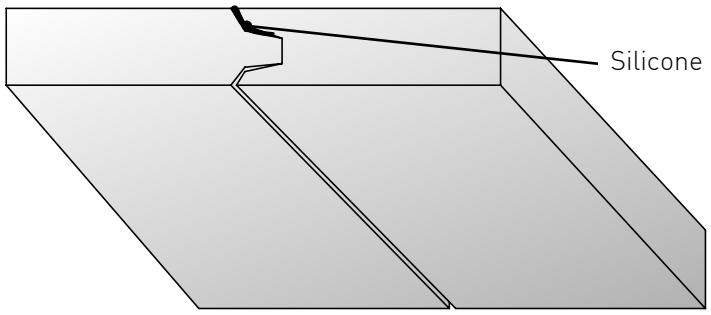
Open joints can be an attractive option if designed correctly (straight joints, designs, etc.). This will also mean that the KRION™ sheets can move more freely with temperature changes.

This type of mounting method will require less installation time, as it will not be necessary to prepare the edges of the sheets to bond them, use adhesive to bond them, or sand them to create a final finish with invisible seams.

Also, it will take time to make the tongue and groove edges. This can be done with a milling machine and bit for creating tongue and groove joints (male and female milling bits).

This can also be done with a CNC machine.

Apply silicone to the back of the tongue and groove seams. This will keep the panels together and allow them to move freely.



44.3- Levelling walls.

If the supporting wall is not perfectly flat, this must be done by the installer.

Use wooden strips or waterproof plywood boards to achieve a straight, flat substrate for panelling.

This will take longer, but if the substrate is not suitable, the resulting work will not be high-quality.

44.4- Seams.

It is important to correctly study the number and position of the seams for several reasons:

- Seams close to heat sources are potential breakage points.
- Minimising the number of seams means leaving less room for error and results in a more resistant structure.
- Carrying out a thorough study before beginning the project reduces the amount of work and material involved, which is important when quoting prices for projects and being competitive.
- It will also allow us to manage our time more efficiently and optimise costs.

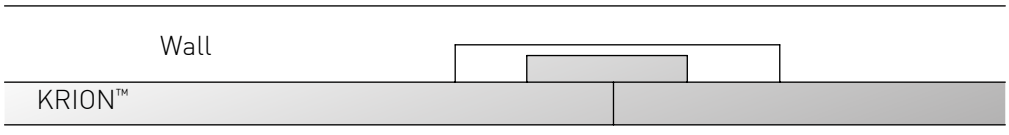
44.5- Expansion.

As a general rule, leave a 1 mm expansion gap for each metre built out of KRION™.

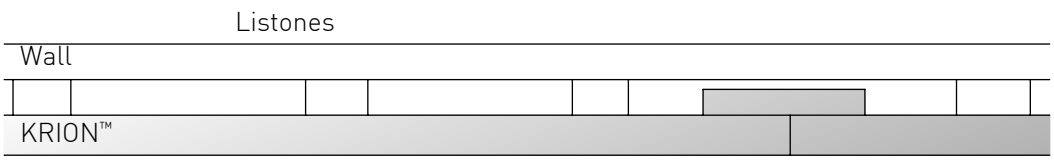
44.6- Seam reinforcement.

The seams must be reinforced from behind to ensure a correct bond.

You may need to cut a groove into the supporting wall so that the reinforcement strip fits.



Also, if you use strips to level the wall, you can use the gaps between them to position the reinforcement strips.



Internal corners in panelling

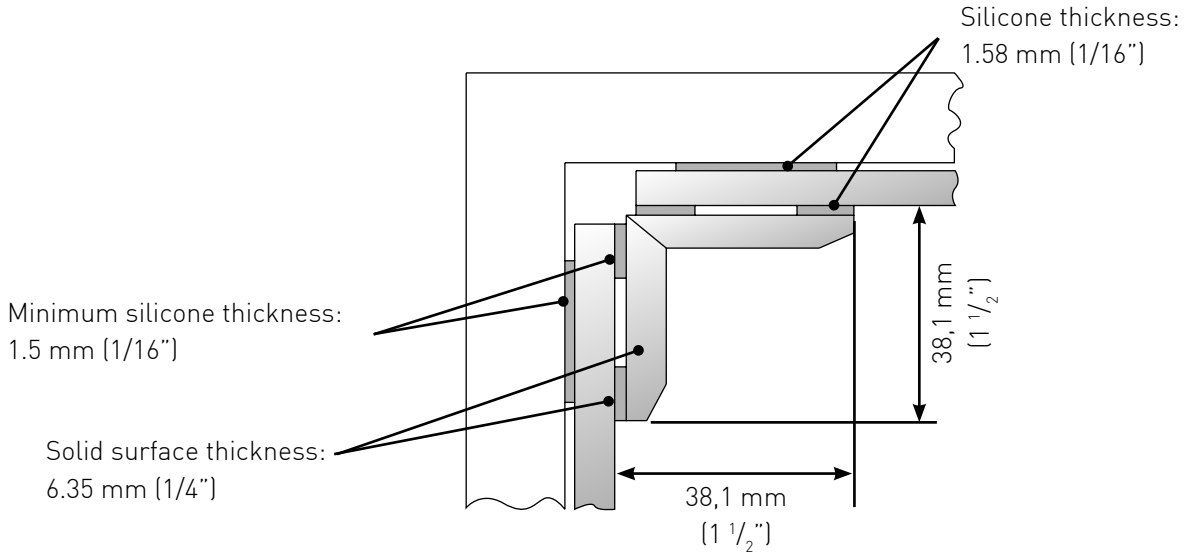
There are several solutions available to create internal corners and also leave a gap for the KRION™ to expand.

Use silicone to fill in the gaps, which will allow the material to expand.

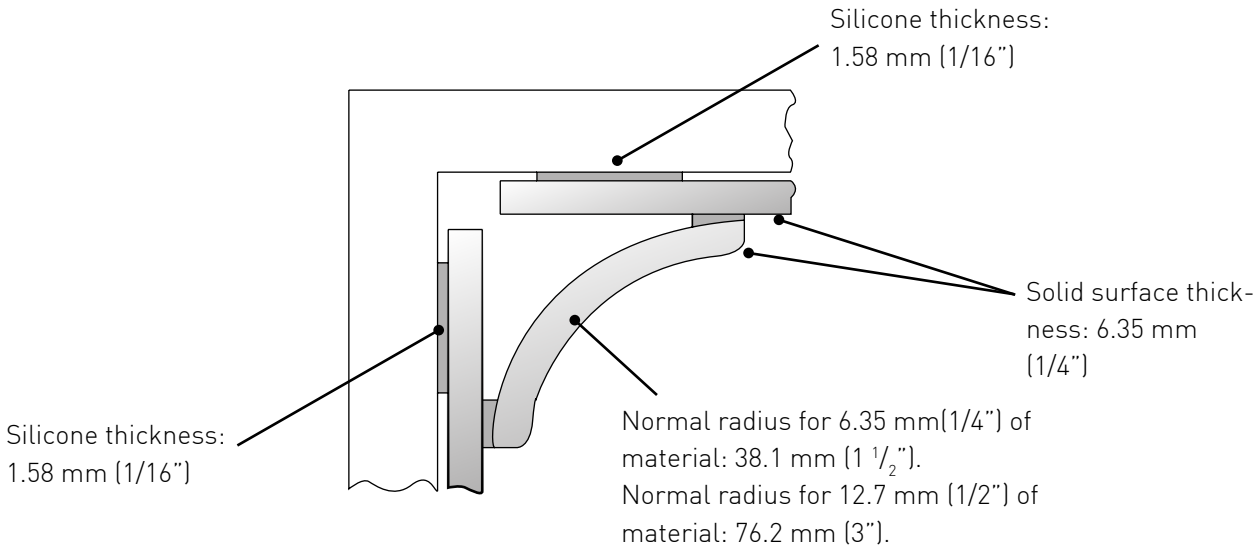
Make the corner section and cut it to the required size.

Finally, attach it in place and bond it to the walls of the KRION™ using silicone.

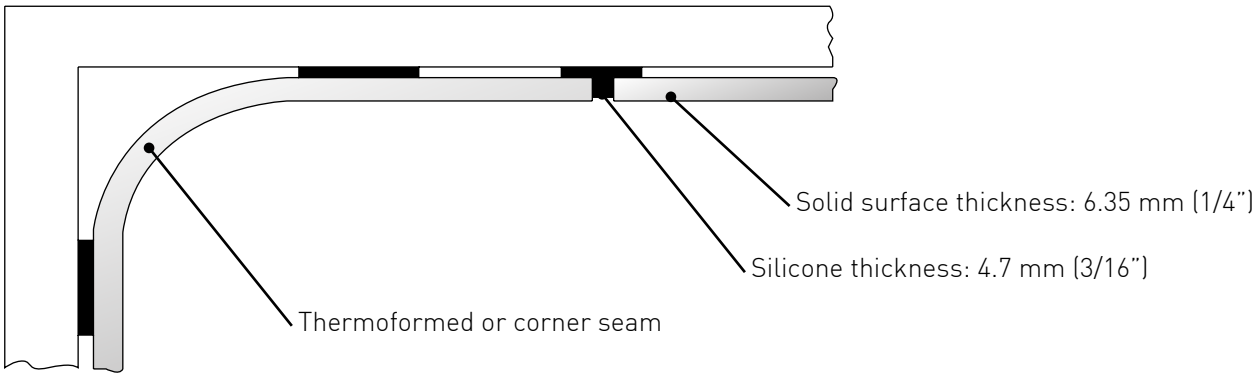
Option 1: Create a corner by connecting two strips using a mitered corner.



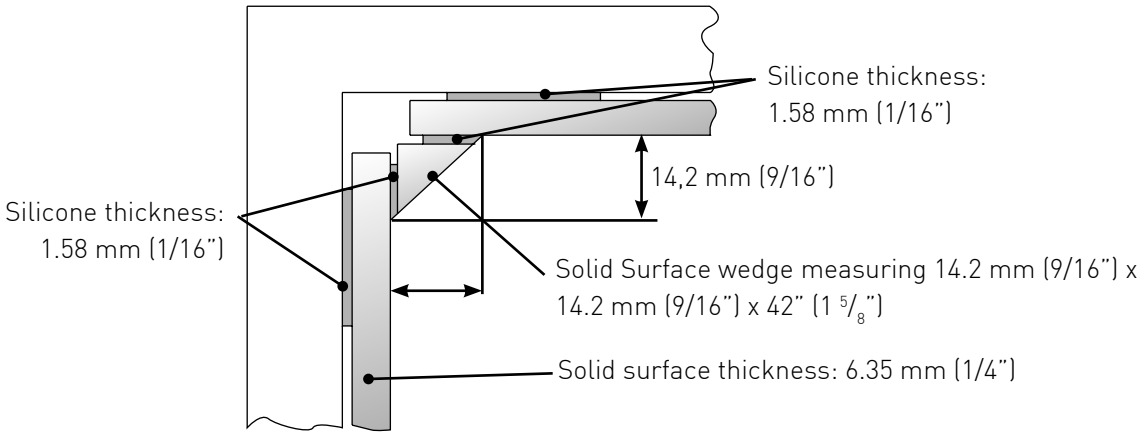
Option 2: Thermoform a section with the correct radius.



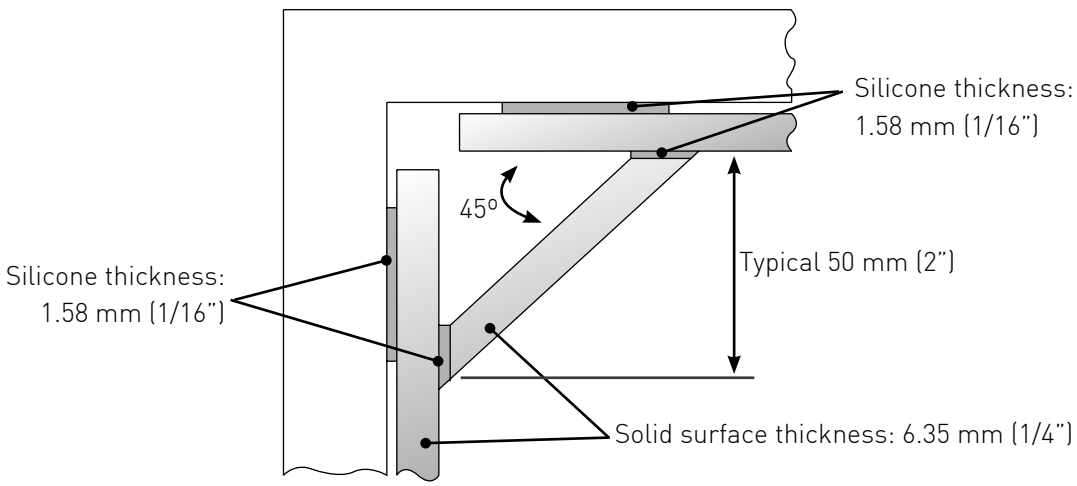
Option 3: A variation of the previous option is to thermoform a large section and to position the expansion joint far from the corner.



Option 4: Make a solid 24 mm (15/16") strip joining two 12 mm (1/2") strips together, and bevel to 45º.

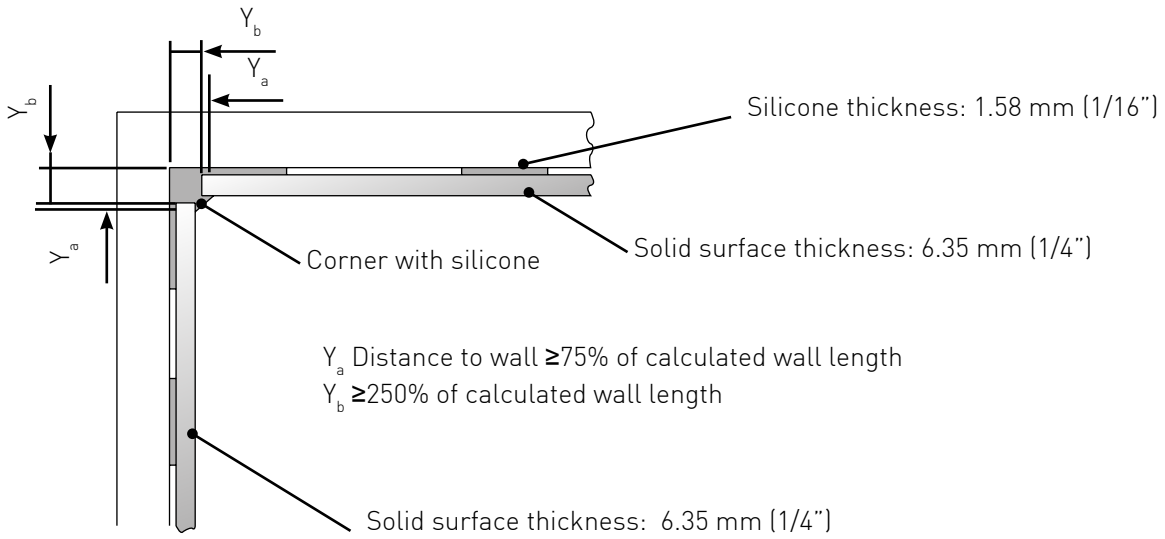


Option 5: Use a strip of KRION™ and bevel the edges to 45º.

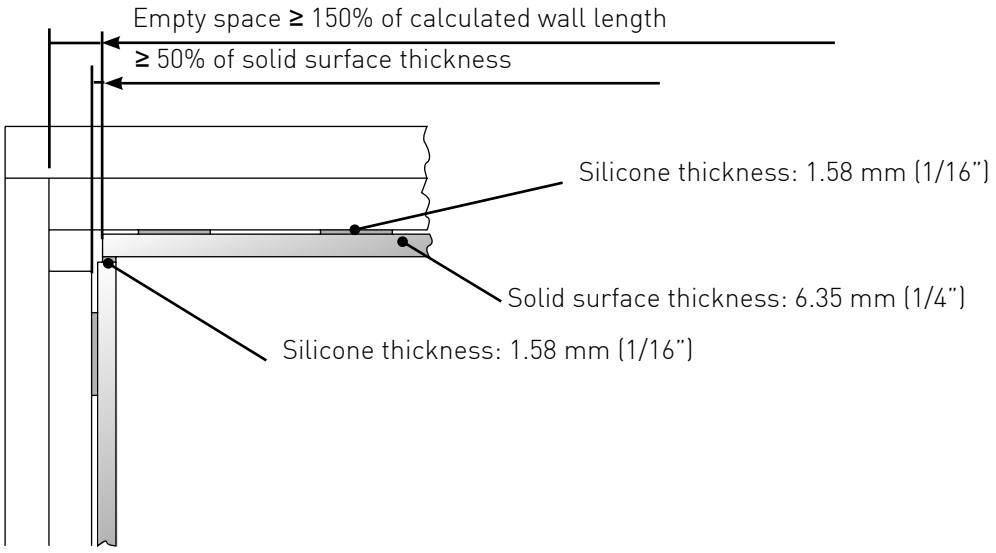


Internal corners in panelling 45

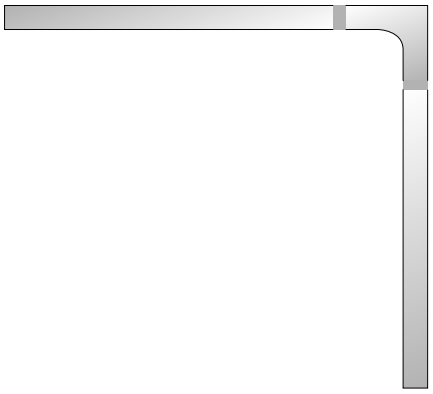
Option 6: Fill in the corner with silicone without adding KRION™ sections.



Option 7: Overlay one KRION™ wall over another and fill the space with silicone.



Option 8: Make a 24 mm (15/16") strip by connecting two 12 mm (1/2") strips and mill a quarter round.



Shelves 46

KRION™ can be used to create window ledges or shelves.

Make sure you leave a gap of 2 mm (1/16") between the KRION™ and the wall to allow for expansion movements.

Attach the shelf with flexible adhesive to allow for movement (P-404, outdoor silicone, etc.).

Do not leave sharp edges and make sure the shelf has a solid support.

Sunlight / UV 47

47.1- Exposure to sunlight.

KRION™ is extremely resistant to outdoor conditions.

UV rays do not affect the resistance of KRION™ surfaces or cause any damage.

With some dark colours, prolonged exposure to sunlight in extremely sunny climates may slightly age the pigment, causing some whitening.

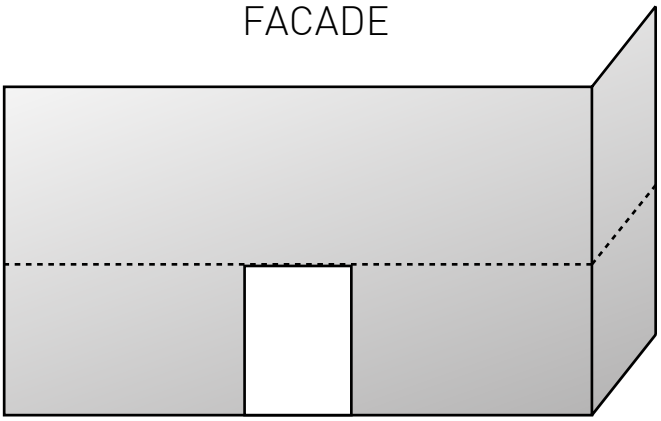
This can be solved by gently sanding the KRION™, as it has a uniform composition throughout its entire thickness. This will recover its initial beauty without any major effort.

Colours from the series with a high contrast between the colour of the resin and chips will absorb sunlight differently, heat up differently, and may lead to deformations and breakage of the seams

If you are creating projects that will be exposed to sunlight, do not forget to properly study the expansion joints, as in these cases the KRION™ will expand and contract more.

External panelling made of KRION™ cannot be made without joints. Visible expansion joints must be included.

Avoid exposing these colours to direct sunlight.



For further information, see http://www.krion.com/en/affinity/

Inlays 48

Well designed inlays can add a unique appearance to creations in KRION™.

An inlay is an opening made in the material that is then filled with other materials.

Use a manual milling machine for simple inlays, and a CNC machine for more complicated projects.

The materials that are compatible with KRION™ are:

- KRION™.
- KRION™ adhesive.
- Epoxy resin.
- Methacrylate.
- Stainless steel.
- Aluminium.
- Brass.
- Wood.
- Ceramics.
- Glass.
- Tiling.

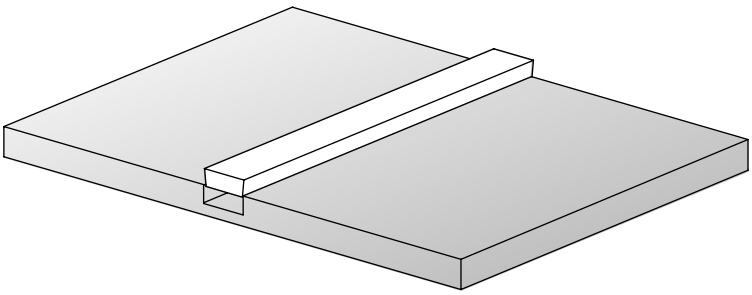
Materials that expand or contract differently to KRION™ sheets, such as iron, must not be used.

Round all interior corners, avoiding angles that may cause unwanted stresses.

If you insert different materials into KRION™, use a flexible adhesive that allows the materials to move in different ways.

Example:

Inserting a strip of KRION™.



Inlays

Do not use inserts in sheets less than 12 mm (1/2") thick.

A 6 mm KRION™ sheet can be used to obtain the inserts required.

Warning!
The strip must not be inserted into the groove completely.

Make the slot 1 mm (1/16") smaller than the strip of KRION™ you are going to insert.

The slot must be 1 mm (1/16") deeper than the thickness of the material being inserted.

Example:
If the strip you intend to insert measures 700 mm (27 $^{9}/_{16}$") wide x 6 mm (1/4") thick, make the slot 699 mm (27 $^{1}/_{2}$") wide and 5.5 mm (1/4") deep, so that it can then be sanded manually to achieve a perfect fit.

Never leave 90º corners: always round off interior and exterior edges.

- ▶ Slightly reduce the lower edges of the strip.
- ▶ Clean the opening and strip with denatured alcohol.
- ▶ Fill the slot with adhesive and push the strip until it slides in fully.
- ▶ Keep the pressure on by using grips or clamps.

Once the adhesive is dry, sand to remove the excess KRION™ and adhesive.

48.1- Inserts with adhesive.

Using liquid inlays makes it possible to achieve a more complex, artistic finish to your projects.

First, mill the chosen design.

A CNC machine will allow you to create beautiful, highly detailed designs.

A depth of 2 mm (1/16") is sufficient for this type of work.

Never leave 90º corners: always round off interior and exterior edges.

Clean the opening with denatured alcohol.

Fill in the milled openings with KRION™ adhesive, taking care to avoid air bubbles that will ruin the final finish.

As a safety measure, add extra adhesive to ensure that the design is completely covered.

48.1- Inserts with adhesive.

Sand off the excess adhesive once it is dry.

KRION™ adhesive is less resistant to sanding than KRION™ sheets, so take care not to apply excess pressure on the adhesive, as this may cause holes and depressions.

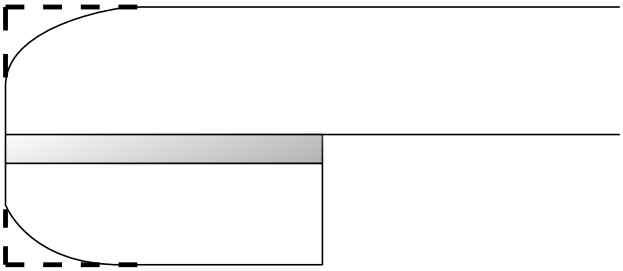
If you fill in a cavity with KRION™ Lux adhesive, it cannot be any wider than 4 mm.

Greater widths will cause air bubbles that will ruin the final finish, as it is difficult to apply adhesive perfectly on large open surfaces.

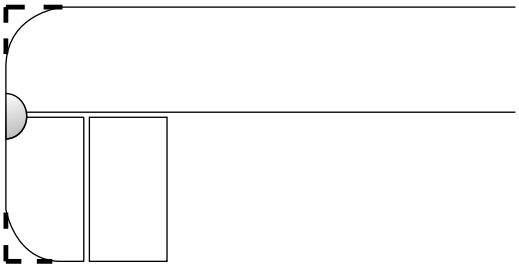
48.2- Inlays in stacked skirts.

Inlays can be used to decorate the skirts of your countertops.

1. Use a strip of KRION™ in the required thickness and bond it between the upper sheet and the strip that increases the thickness of the skirt:



2. Mill a groove on the skirt seam and fill it with adhesive in a different colour.



This will serve as a decorative element and help to conceal the seam between the sections.

48.3- Sublimation.

By working at a high pressure and high temperature, an image can be inserted in the KRION™ sheet through sublimation. The surface can also be thermoformed without the said image being affected.

The KRION™ should be given its required surface finish before it is heated to transfer the image.

Quality 49

made with KRION® PORCELANOSA SOLID SURFACE

To ensure that your work is of the necessary high standard synonymous with Porcelanosa Group, follow the guidelines in this manual.

Devote time to planning, measuring and fitting KRION™ parts.

Pay attention to the finish, since customer satisfaction will be dependent upon this last step.

One of the most important operations in processing KRION™ is the creation of seams.

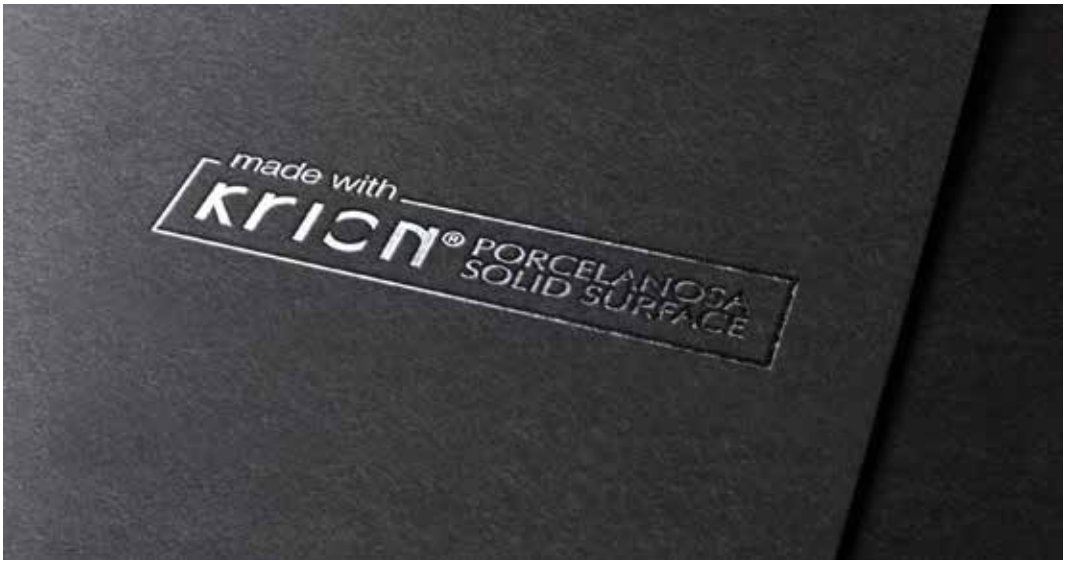
Take great care during this stage of the process in order to ensure a professional finish.

Bear in mind that one of the most important reasons why customers choose KRION™ for their homes or workplaces is because it offers the possibility of continuous sections of KRION™ with invisible seams.

With a view to guaranteeing customer loyalty, make sure that you provide a HIGH STANDARD of work and are friendly and attentive to customers. Clarify all questions of a technical or maintenance-related nature.

Although you are a skilled fabricator who is highly familiar with all aspects of KRION™, remember that your customers are not and so you should be attentive and understanding.

Your customers confide in the quality and image of Porcelanosa Group and they invest in its products. As a result, whenever you install KRION™, stick the "KRION™ Porcelanosa Solid Surface" monogram in a visible place.



Ventilated façade 50

The ventilated façade systems are supplied by Butech. For further information please use the "KRION™ technical-note" in ventilated façades.

Hotel Rafinity / Casablanca · Morocco (Building)

Bershka / Jordi Castel, Jefe de proyecto / Madrid · Spain

Pole Optique / Burdeos · France (Building)

Customer satisfaction 51

51.1- Guaranteeing customer satisfaction.

PROVIDE INFORMATION ABOUT MAINTENANCE

Always leave your customers a copy of the "KRION™ Maintenance Guide" which details cleaning methods, care tips, how to remove minor scratches and other advice to guarantee a long life for the newly fitted product.

USE VACUUM CLEANERS

Try not to fill the whole of the customer's home with dust when working with KRION™. Portable vacuum cleaners will help you to clean up the dust produced when cutting, sanding and polishing.

LEAVE EVERYTHING CLEAN WHEN YOU HAVE FINISHED

Remove your tools, paper and waste material before leaving the customer's home. Sweep up areas where there is dust, and try to leave the area as you found it.

USE BLANKETS OR CARDBOARD

Remember that your customers have paid significant amounts of money for the floor they feel most comfortable with (tiles, parquet, marble, etc.).

Avoid scratching it when dragging elements made of KRION™ (countertops, furniture or structures), when leaving machinery in place or moving KRION™ elements over it by using blankets. This will allow you to move heavy elements with less efforts, protecting your customers' floors at no cost to you.

MAINTENANCE MANUAL

Always provide your customers with a copy of the KRION™ maintenance manual and explain the essential points to them.

51.2- Code of conduct.

- Always address the client in an appropriate manner.
- Wear clean clothing.
- Take care of your personal image and hygiene.
- Use appropriate language.
- Do not smoke in the customer's house.
- During lunch breaks, do not eat in the customer's house.
- Behave in a polite, friendly manner.
- Do not consume drugs or alcohol.

Comments and care instructions 52

Save a piece of the sheet used to make the kitchen for any future repairs.

Do not pour boiling water directly onto the KRION™ washbasin as this may cause it to break in the area around the bond or drain.

Open the cold water tap when pouring in boiling water.

Do not overtighten drains, taps and other items as the expansion produced may cause breakage.

Never stand on a structure made of KRION™ (countertops, units, countertops etc.) as your weight may cause it to break.

If your customer asks for a project made of KRION™ that does not comply with the measurements and precautions detailed in this manual, write a document explaining the construction details that are not being respected and send copies by certified mail to the customer (or their architect), to SYSTEMPOOL and the Porcelanosa showroom you work with.

If they decide to go ahead with the project, inform them that the job will be carried out at the customer's responsibility.

See our website – **www.krion.es** - for updates of our technical data sheets and to consult details of new additions to the KRION™ range, the minimum radius for thermoforming, recommended bonding angle and compatibility of different adhesives.

KRION® PORCELANOSA SOLID SURFACE

WARRANTY CERTIFICATE FOR SOLID-COLOURED KRION™ MATERIALS FITTED OUTDOORS

version: 17.02.16

KRION™ Porcelanosa Solid Surface is a cutting-edge material that complies with all the required quality criteria and standards relating to solid surfaces. It is made in a rigorously controlled manufacturing process. The quality of KRION™ is monitored throughout the whole production process as per the quality management requirements of the ISO 9001 standard, the environmental management requirements of the ISO 14001 standard and, above all, those established by KRION™ Porcelanosa Solid Surface. KRION™ for outdoor use is sold in the form of KRION™ sheets. In the event of a problem of any kind during the period of validity of this warranty, please read this document carefully.

COVER

When KRION™ is used outdoors, it can be affected by important factors not attributable to the material itself. As a result, this warranty only covers KRION™ that is used outdoors when it has been handled by a GOLD or PLATINUM-level K® Associate Quality Fabricator, since these specialists have the infrastructure, experience and necessary knowhow to carry out projects that take into account the above factors in such a way that the latter do not affect the KRION™.

SYSTEM-POOL S.A. provides the following limited warranty for KRION™ materials used to make end products installed outdoors. This warranty is applicable worldwide, with the pertinent national legislation prevailing in all cases. At its discretion, the company will **solely and exclusively** repair or replace the KRION™ materials free of charge under the following terms and conditions, providing that they have been fabricated and fitted by a GOLD or PLATINUM-level **K® Associate Quality Fabricator** who holds this level at the time of the fabrication. This warranty covers the Snow Series, Colors Series, Colors+ Series, and Light Series

TERMS & CONDITIONS

1.- This point contains the terms and conditions of the warranty covering KRION™ materials in the event of manufacturing defects.

SYSTEM-POOL S.A. provides a 10-year limited warranty for KRION™ materials (sheets) used to make end products. This limited warranty covers the repair or replacement of manufacturing defects in the KRION™ materials free of charge, at the manufacturer's discretion, providing that the KRION™ was fabricated and fitted by a GOLD or PLATINUM-level **K® Associate Quality Fabricator**.

All the said installed fittings and/or products made of KRION™ must have been manufactured and installed in accordance with the Fabricator's Manual. This warranty shall apply from the date on which the product was first fitted. Unless there is evidence to the contrary, this date shall be that shown on the end customer's sale invoice.

2.- Our limited warranty for **KRION™ materials** does not cover defects, damage or mistakes made by the fitter, user or any other person in the following cases:

- Damage caused during the transportation process.
- Damage or defects caused by a faulty design.
- KRION™ used in saunas, steam baths or as flooring.
- Damage or defects due to faulty fabrication.
- If adhesives by other manufacturers were used in the fabrication process.
- A faulty installation process or non-compliance with the instructions in the Technical Notes, Fabricator's Manual and Sales Guides drafted by SYSTEM- POOL S.A.
- KRION™ not located in the original place where it was fitted.
- Damage caused by optional equipment not supplied by SYSTEM-POOL S.A.
- Modifications made subsequent to the installation of the end product for any reason which were not authorized by SYSTEM-POOL S.A. (Including those made in order to comply with Local Legislation).
- Negligent use and/or misuse, whether physical, chemical or mechanical.
- Residential or commercial use, improper or insufficient maintenance and care, and marks caused by normal wear and tear to the materials.
- KRION™ materials can be subject to a certain amount of wear and tear or marks during normal use. This is not deemed to be a defect.
- Extreme heat as a result of insufficient insulation or temperatures of over 75ºC for prolonged periods of time.
- Boiled liquids spilled onto it, without running cold water at the same time.
- Colour changes in KRION™ materials of less than the ΔE shown in the KRION™ Technical Note on Resistance to UV Rays.
- Uneven exposure to climatic conditions.
- Acts of God (lightning, earthquakes, floods, hail etc.).
- Fires.
- Force majeure. Wars, vandalism.

3.- KRION™ materials are highly stable when exposed to sunlight. Even so, with the passage of the years, there can be a slight change in colour. Changes in colour are measured in ΔE units, as specified in the *KRION™ Technical Note on Resistance to UV Rays*. For colours included in the collection for façades, SYSTEM-POOL S.A. guarantees that no signs of delamination, flaking or lumps shall appear during the 20 years following the material's initial installation. These colours are described in the *Technical Note on Colours in the Collection for Façades*.

4.- The manufacturer's liability is limited to the repair or replacement, free of charge and at the manufacturer's discretion, of manufacturing defects in the KRION™ materials, excluding any handling, fabricating, replacement or installation costs. If SYSTEM-POOL S.A. deems that it is not able to repair or replace the faulty KRION™ covered by this warranty, it shall be solely liable for returning the original amount paid for the said material. The owner shall accept any additional bonding joints or slight colour variations that might be necessary as a result of the repair process. This warranty shall not cover the cost of any required work prior or subsequent to the repair, replacement or maintenance of the KRION™ because easy access to its different parts has not been envisaged.

5.- This warranty only covers KRION™ materials (*KRION™ sheets*). The adhesive used to bond the KRION™, and the related assembly system and installation process are not covered by it.

6.- Under no circumstances shall this warranty cover possible direct or indirect damage to persons or things that is not attributable to manufacturing defects in the KRION™. If faulty KRION™ has been fabricated or fitted, any financial compensation shall be excluded unless the express written authorization of SYSTEM-POOL S.A. has been given. Neither shall this warranty cover losses of commercial profits, the interruption of business activities, or any other loss, whether or not it is the outcome of a manufacturing defect by SYSTEM-POOL. S.A. and even if SYSTEM-POOL. S.A. was warned of the possibility of such damage. SYSTEM-POOL. S.A. cannot be held liable for the choice of KRION™ materials, related design, and engineering calculations needed to carry out projects.

7.- Marketing samples of KRION™ materials that you may have seen before buying the product are only representative. They are not an exact replica of what will be fitted. Slight variations in colour and shade are common with solid surfaces. This does not affect the performance of the product and neither can it be deemed to be a defect.

8.- Claims for and the notification of possible defects must be made in the store where the materials were purchased within a maximum of two months of their appearance by presenting the warranty and proof of purchase. If you are unable to contact the store where it was purchased, you should contact any official distributor, a K® Associate Quality Fabricator or, in the final instance, SYSTEM-POOL. S.A.

9.- If a repair or replacement is made under this warranty, the period of validity of the said warranty shall continue from the original installation date and not from the date of the repair or replacement.

10.- SYSTEM-POOL S.A. is the only authorized body able to certify and confirm fabricators as being **K® Associate Quality Fabricator**.

LEGAL FRAMEWORK

This certificate, together with the sales invoice, is the only valid warranty given by SYSTEM-POOL, S.A. for KRION® materials used in all fittings installed as from 01/01/2016. No amendment to the warranty shall be accepted. In the event of a dispute in the interpretation and/or application of this warranty, the Law Courts of Vila-real (Castellón, SPAIN) shall be the only competent body for its legal settlement.

KRION® PORCELANOSA SOLID SURFACE

WARRANTY CERTIFICATE FOR KRION™ MATERIALS FITTED INDOORS

version: 17.02.16

KRION™ Porcelanosa Solid Surface is a cutting-edge material that complies with all the required quality criteria and standards relating to solid surfaces. It is made in a rigorously controlled manufacturing process. The quality of the KRION™ is monitored throughout the whole production process as per the quality management requirements of the ISO 9001 standard, the environmental management requirements of the ISO 14001 standard and, above all, those established by KRION™ Porcelanosa Solid Surface. KRION™ is sold in the form of KRION™ sheets or cast KRION™ items. In the event of a problem of any kind during the period of validity of this warranty, please read this document carefully.

COVER

SYSTEM-POOL S.A. provides the following limited warranty for KRION™ materials used to make end products fitted indoors. This warranty is applicable worldwide, with the pertinent national legislation prevailing in all cases. At its discretion, the company will **solely and exclusively** repair or replace the KRION™ materials free of charge under the following terms and conditions, providing that they have been fabricated and fitted by a GOLD or PLATINUM-level **K® Associate Quality Fabricator** who holds this level at the time of the fabrication.

TERMS & CONDITIONS

1.- This point contains the terms and conditions of the warranty covering KRION™ materials in the event of manufacturing defects.

• KRION™ Sheets
SYSTEM-POOL S.A. provides a 10-year limited warranty for KRION™ materials (sheets) used to make end products. This limited warranty covers the repair or replacement of manufacturing defects in the KRION™, free of charge and at the manufacturer's discretion, depending on the time that has elapsed since the purchase date and providing that the materials were fabricated and fitted by a **K® Associate Quality Fabricator**. The prior written agreement of SYSTEM-POOL S.A. shall be needed for all repair or replacement work and it must be carried out by the person(s) designated by SYSTEM-POOL S.A. From the first to the third year, SYSTEM-POOL S.A. shall cover the cost of 100% of the materials and 100% of the labour. From the fourth to the sixth year, SYSTEM-POOL S.A. shall cover the cost of 75% of the materials and 50% of the labour. From the seventh to the ninth year, SYSTEM-POOL S.A. shall cover the cost of 50% of the materials and 25% of the labour. The tenth year it shall cover the cost of 25% of the materials and none of the labour costs. These percentages shall apply in all cases, provided that the fault is attributable to a manufacturing defect in the KRION™ materials made by SYSTEM-POOL S.A.

• Cast KRION™ items
SYSTEM-POOL S.A. provides a 24-month warranty for all cast KRION™ items that it sells. This limited warranty covers the repair or replacement of manufacturing defects in the KRION™, free of charge and at the manufacturer's discretion during the period of validity of the said warranty.

All the said installed fittings and/or products made of KRION™ must have been manufactured and fitted in accordance with the *Fabricator's Manual*. They must have been used and cared for in accordance with the *Guide to Use, Cleaning and Care available* on the web page www.krion.com. This warranty shall become valid as from the date when the product was first installed. Unless otherwise proven, this shall be the date shown on the end customer's sales invoice.

2.- Our limited warranty for **KRION™ materials** does not cover defects, damage or mistakes made by the fitter, user or any other person in the following cases:

- Damage caused during the transportation process.
- Damage or defects caused by a faulty design.
- KRION™ used in saunas, steam baths or as flooring.
- Damage or defects due to faulty fabrication.
- If adhesives by other manufacturers were used in the fabrication process.
- A faulty installation process or non-compliance with the instructions in the *Technical Notes, Fabricator's Manual and Sales Guides* drafted by SYSTEM- POOL S.A.
- KRION™ not located in the original place where it was installed.
- Damage caused by optional equipment not supplied by SYSTEM-POOL S.A.
- Modifications made subsequent to the installation of the end product for any reason which were not authorized by SYSTEM-POOL S.A. (Including those made in order to comply with Local Legislation).
- Negligent use and/or misuse, whether physical, chemical or mechanical.
- (Residential or commercial) use, improper or insufficient care, and marks caused by normal wear and tear to the materials.
- Extreme heat as a result of insufficient insulation or temperatures of over 75ºC for prolonged periods of time.
- Boiled liquids spilled onto it, without running cold water at the same time.
- Acts of God (lightning, earthquakes, floods, hail etc.).
- Fires.
- Force majeure. Wars. Vandalism.

3.- In the case of cast basins and sinks, a slight difference in colour is permissible between the basin or sink and the countertop made of KRION™ sheets (i.e. of an ΔE less than or equal to 2), provided that they are both the same colour model and have been fitted as indicated in the Fabricator's Manual.

4.- The manufacturer's liability is limited to the repair or replacement, free of charge and at the manufacturer's discretion, of manufacturing defects in the KRION™ materials, excluding any handling, fabricating, replacement or installation costs. If SYSTEM-POOL S.A. deems that it is not able to repair or replace the defective KRION™ materials covered by this warranty, it shall be solely limited to returning the original amount paid for the KRION™. The owner shall accept any additional bonding joints or slight colour variations that might be necessary as a result of the repair process. This warranty shall not include the cost of any required work prior or subsequent to the repair, replacement or maintenance of the KRION™ because easy access to its different parts has not been envisaged.

5.- This warranty only covers the KRION™ materials (*KRION™ sheets and cast KRION™ items*). The adhesive used to bond the KRION™, and the related assembly system and installation process are not covered by it.

6.- Under no circumstances shall this warranty cover possible direct or indirect damage to persons or things that is not attributable to manufacturing defects in the KRION™ materials. If faulty KRION™ has been fabricated or fitted, any financial compensation shall be excluded unless the express written authorization of SYSTEM-POOL S.A. has been given. Neither shall this warranty cover losses of commercial profits, the interruption of business activities, or any other loss, whether or not it is the outcome of a manufacturing defect by SYSTEM-POOL. S.A. and even if SYSTEM-POOL. S.A. was warned of the possibility of such damage. SYSTEM-POOL. S.A. cannot be held liable for the choice of KRION™ materials, related design, and engineering calculations needed to carry out projects.

7.- Marketing samples of KRION™ materials that you may have seen before buying KRION™ are only representative. They are not an exact replica of what will be fitted in your project. Slight variations in colour and shade are common with solid surfaces. This does not affect the performance of the product and neither can it be deemed to be a defect.

8.- Claims for and the notification of possible defects must be made in the store where the materials were purchased within a maximum of two months of their appearance by submitting the warranty and proof of purchase. If you are unable to contact the store where it was purchased, you should contact any official distributor, a K® Associate Quality Fabricator or, in the final instance, SYSTEM-POOL. S.A.

9.- If any repair or replacement is made under this warranty, the period of validity of the said warranty shall continue from the original installation date and not from the date of the repair or replacement.

10.- SYSTEM-POOL S.A. is the only authorized body able to certify and confirm fabricators as being **K® Associate Quality Fabricators.**

LEGAL FRAMEWORK

This certificate, together with the sales invoice, is the only valid warranty given by SYSTEM-POOL, S.A. for KRION™ materials used in all fittings installed as from 01/01/2016. No amendment to the warranty shall be accepted. In the event of a dispute in the interpretation and/or application of this warranty, the Law Courts of Vila-real (Castellón, SPAIN) shall be the only competent body for its legal settlement.

KRION®
PORCELANOSA SOLID SURFACE

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