HI·MACS

The shape of your ideas

HIMACS Fabrication Guidelines

Solid Surface Material

LX Hausys

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1. Safety Recommendations

Overview

For your own safety, read this section before operating any tools or equipment in various working conditions. Always comply with national and local safety regulations relating to the tools, equipment, and work areas you are using, and follow all legal requirements.
The information in this section outlines generally accepted minimum safety considerations within the surface fabrication and installation industry. It is not intended to be exhaustive, nor to limit or restrict the use of additional safety measures and methods.

1. Individual protective equipment

- First aid supplies should be readily available.
- Wear appropriate protective equipment, including dust masks, eye protection, and hearing protection.
- Prescription glasses are not a substitute for safety glasses.

- Wear gloves suitable for the task. (It is not recommended to wear gloves when handling rotating tools.)
- Wear steel-toed safety shoes.
- Never wear jewellery such as bracelets or chains, or loose clothing such as neckties, scarves, or long sleeves, as these can become caught in moving parts of equipment.
- Long hair should be secured in a protective hair cover.
- Follow the policy on limiting direct skin exposure to adhesive materials.
- Material Safety Data Sheets (M.S.D.S.) must be reviewed and understood by all employees.

2. Fire Prevention and Emergency Readiness

- Entrance and exit passageways must remain unobstructed and be clearly visible.
- Fire doors must be free from obstructions, such as security chains.
- Flammable products, such as solvents and chemicals, must be stored in explosion-proof cabinets. Refer to the M.S.D.S. for the exact storage method.
- Seaming materials (adhesives) must be stored in a cool place.
- Designate and clearly mark both smoking and non-smoking areas.
- A properly specified fire suppression or extinguisher system, including sprinklers, must be in place.
- Inspect all fire safety equipment regularly.
- Prepare a fire evacuation plan and assign responsibilities.

3. Working Environment

- Maintain a safe working area that is well ventilated, clean, dry, and well lit.
- Avoid working in damp, wet, or dirty conditions without proper preparation.
- Keep the work area at a stable temperature of 15–25 °C during operations.
- Ensure lighting is adequate for the working conditions and properly maintained.
- Maintain ventilation and dust extraction equipment, including routine cleaning or replacement of filters. Keep worktables and floors clean, swept, and organised.
- Designate a tool crib for hand tools, bits, and supplies to support production efficiency.
- Minimise obstructions on the floor.

- Eliminate slip hazards on floor surfaces, and immediately clean up spills to prevent accidental slips and falls.
- Keep water away from areas where HIMACS is being handled.
- Install and clearly mark water barriers for worker awareness.
- Keep all visitors at a safe distance from work areas, and ensure they are escorted by a trained manager.
- Keep children away from the work area at all times.

4. Electric Risk management

- Install electrical services that meet the specific requirements of the shop equipment.
- Clearly label and identify all shop circuits on the electrical panel.
- Maintain electrical breakers and panels in good working order.
- Ensure all equipment cords and electrical extension leads are in perfect condition, free from defects, fraying, or exposed wiring that could cause electric shock or short circuits.
- Keep electrical cords neatly rolled, and ensure outlets are clean and fully operational.
- Repair or replace any defective electrical equipment immediately upon identifying a fault.
- Use portable electrical hand tools that are Double-earthed, fitted with ground fault protection, and/or double-insulated.
- Ensure junction boxes and wiring comply with local regulations, and that they are fully covered and closed.
- Install and maintain operational emergency shutdown switches, both master and individual.

5. Equipment and Tool management

5.1 Right use

- Use the correct equipment for the job and for routine HIMACS production.
- Read the equipment instruction manual before operation to ensure correct, efficient, and safe use.

- Use only the recommended accessories.
- Hazards can occur when using improper accessories.
- Do not force equipment to operate beyond its designed performance or speed.
- Establish an appropriate operating and training system so that correct user information is maintained and passed on.

5.2 Care

- Avoid operating equipment with dull blades or bits.
- Maintain tools in the best condition, sharp and clean, for optimum performance and safety.
- Remove dust from equipment, accessories, and systems regularly.
- Clearly label or mark movable equipment and accessories.
- Mark moving or rotating parts on shop equipment.
- Install safety mechanisms on powered equipment for emergency shut-offs.
- Keep starter keys, master switches, and padlocks stored safely and maintained.

5.3 Safe Habits

- Inspect equipment for damage before each use.
- Ensure the switch is in the “off” position before plugging in.
- Remove adjusting keys and wrenches before switching on.
- Never leave tools running unattended; turn them off and wait until they come to a complete stop.
- Disconnect tools from all power sources before changing accessories (e.g., blades, bits, cutters) or before servicing.
- Do not overreach, lean on, or stand on equipment while it is running.
- Never use tools if you are in poor physical or mental condition due to fatigue, stress, alcohol, medication, drugs, or similar factors.

6. Material Handling

- HIMACS sheets must be carried by two people, one at each end of the sheet.
- Do not bend or flex the sheets.
- Wear heavy-duty gloves and, where appropriate, use lifting straps.
- Secure HIMACS sheets firmly to the worktale or structure using clamps or vices before working on them.
- Maintain proper footing and balance in all work areas at all times.

- Do not stack products too high; stack them in a way that is safe and easy to access.

7. Hazardous Risk

- Designate a specific area for the disposal of hazardous chemicals, waste seam adhesive, and similar materials.
- Establish a policy prohibiting the disposal of liquids, adhesives, or chemicals in general waste unless they have been catalysed.
- Store rags containing chemicals in a safe manner to prevent fire hazards.
- Place dust and material particles in a covered waste receptacle.
- If dust collectors are vented to the outside, obtain any necessary permissions beforehand.

> **Note**
>
> Each country has its own safety regulations, determined by its industrial characteristics and environmental conditions. Always identify and comply first with the safety rules applicable in the country where your work area is located.

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2. Sheet Information

Overview

All users are advised to review the HIMACS sheet information before starting work. Accurate dimension details will help calculate the required number of sheets and reduce material waste on your project. The visible appearance characteristics of each HIMACS sheet should also be considered when discussing the design with the client, as certain colours can influence the quality and aesthetic value of the finished work.

1. Standard dimension

The table below lists the standard dimensions of HIMACS sheets. Please refer to the ‘Remarks’ column for information on the specific HIMACS sheets available to you.

THICKNESS (MM)	WIDTH (MM)	LENGTH (MM)	REMARKS
6	760	2,490	A
	910	2,490	B
	1,350	3,680	B
	1,520	3,680	B
9	760	3,680	A, B, D, E
	910	3,680	A
	1,350	3,680	A
	1,520	3,680	A
12	760	3,680	C
	910	3,680	D
	1,350	3,680	D
	1,520	3,680	D
20	760	3,000	E
	930	3,100	F

Note on Availability

Not all colours are available in all sizes and thicknesses.
A. Only available in **Solids**, **Granite**, **Lucent**, **Concrete** (G554, G555, G556, G557)
B. Only available in **Solids**, **Granite**, **Concrete** (G554, G555, G556, G557)
C. Available in all colours.
D. Only available in **Solids**, **Granite**, **Concrete** (G554, G555, G556, G557)
E. Only available in **Solids**, **Granite**, **Lucia**, **Volcanics** , **Concrete** (G554, G555, G556, G557)
F. Only available in **Solids**, **Granite**

Additional Notes

- Certain colours may not be available in some countries. Please contact your local sales manager or distributor for detailed information.
- HIMACS sheets include an additional length and width allowance of up to 10 mm to protect the sheet from damage. Defects within this allowance are not grounds for a claim. Please refer to the **HIMACS Quality Inspection document.**
- Do not join HIMACS sheets with different standard dimensions or from different lot numbers. Please refer to the documents **HIMACS Sheet Number** and **HIMACS Seaming** (Bonding).

2. Colour and Texture Descriptions

Collection	Description
Solids	Pure, single colour without chips or veining.
Lucent	Translucent solid colour suitable for creating lighting effects.
Concrete	Modern textured colour inspired by a concrete finish.
Aurora	Premium trend colour featuring elegant, multicoloured veining, inspired by the dramatic natural phenomenon of the aurora.
Marmo	Premium colour with bold, random veining, inspired by natural marble.
Ultra	High-performance colour developed with Ultra Colour Technology, offering enhanced durability and ultra-thermoforming capability.
Granite, Lucia, Volcanics, Aster	A variety of colours with rich textures inspired by natural granite.
Gravilla	An enhanced version of Granite, featuring a softer and more detailed tone-on-tone pattern.
Terrazzo	A modern reinterpretation of traditional terrazzo, featuring large, high-contrast chips for a rugged and robust texture.

Note

Please consult your local HIMACS manager or distributor, and review a physical sample to experience the actual texture.

3. Colour icons and special notes

Considerations for Fabrication and Installation:

*	Some of the dark, heavily pigmented colours of HIMACS may require special care, as they can show scratches, dust, and signs of ordinary wear more readily than lighter or textured colours. For this reason, these colours are not recommended for surfaces subject to high levels of traffic.
☀	These colours are suitable for exterior use, offering strong resistance to sunlight (UV). Please refer to the document HIMACS Exterior Wall (Facade) Installation for details on suitability and warranty conditions for each colour.
≋	These randomly veined, elegant colours require specific fabrication and installation guidelines. Please refer to the document HIMACS Fabrication for Specific Colours to achieve the best aesthetic results.
◊	Lucent colours exhibit a higher level of translucency, which becomes more pronounced when combined with a light source. Please refer to the document HIMACS Fabrication for Specific Colours to achieve optimal lighting effects.
◊	Colours marked in this way display a dramatic semi-translucent veining effect when illuminated. Please refer to the document HIMACS Fabrication for Specific Colours to achieve the optimal lighting effect.
✧	Some colours feature a glittering or pearlescent effect. These colours require careful fabrication for the best results. Please refer to the document HIMACS Fabrication for Specific Colours.
▚	Due to the nature of the pattern, which includes large and high-contrast chips, distribution may be uneven. Specific fabrication and installation guidelines must therefore be followed.

Note

For guidance on selecting the ideal colour for your application, please consult your local
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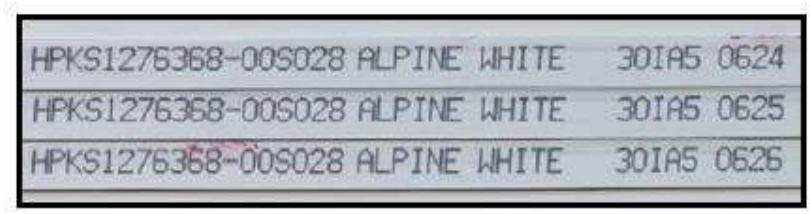
3. Sheet Number

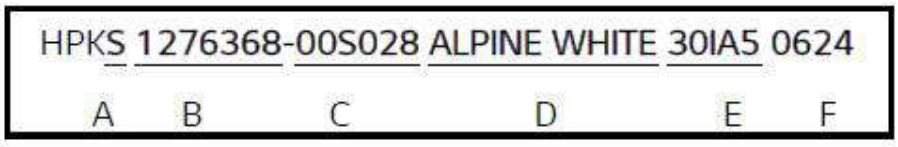
Overview

Each HIMACS sheet has a printed sheet number on its side edge. This number provides information about the product code, name, production line, production date, and the sequence of the sheet. Sheet numbers are useful for efficient storage, tracking complaints, and ensuring colour matching when joining sheets. Therefore, please ensure all personnel in your work area are trained to check and record the sheet number before working with HIMACS sheets.

1. Sheet number format

The sheet number is printed on the edge of the HIMACS sheet. See the example below:





A. Colour group

S	**Solids**	–
L	**Lucent**	–
G	**Granite / Gravilla**	Both **Granite** and **Gravilla** collections share this code
M	**Marmo**	From **M001 to M400**
T	**Marmo, Aurora, Concrete**	From **M401 onward**
W	**Lucia**	–
V	**Volcanics**	–
Y	**Aster**	–
Q	**Terrazzo**	–

B. Dimensions

12	76	368
Thickness = 12 m	Width = 76 cm (760 mm)	Length = 368 cm (3680 mm)

C. Colour code

S	028
S = Product group (each group has a different letter)	028 = HIMACS Colour

D. Colour Name

ALPINE WHITE
Colour name used in all communication

E. Lot / Batch number

3	0	I	A	5
Production reference number	Year of production : 2020	Month : September	Day : 10th	Internal production number
Only for LX Hausys internal use	Last digit of the year	A to L	1 to W (excluded I)	Only for LX Hausys

Alphabet “I” is excluded to avoid the confusion with Arabic numeral “1”

Months identification

Text	Month
A	JAN
B	FEB
C	MAR
D	APR
E	MAY
F	JUN
G	JUL
H	AUG
I	SEP
J	OCT
K	NOV
L	DEC

Days identification

Text	Date
1	1st
2	2nd
3	3rd
4	4th
5	5th
6	6th
7	7th
8	8th
9	9th
A	10th
B	11th
C	12th
D	13th
E	14th
F	15th
G	16th
H	17th
J	18th
K	19th
L	20th
M	21st
N	22nd
O	23rd
P	24th
Q	25th
R	26th
S	27th
T	28th
U	29th
V	30th
W	31st

F. Production sequential number

HIMACS sheets should be joined using sheets from the same LOT number to minimise colour differences at the joints. Therefore, the warranty does not cover colour variations resulting from the joining of sheets from different lot numbers.

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4. Handling, Storage and Transportation

Overview

For safe and efficient handling, storage, and transportation, please read this section before working with HIMACS products. HIMACS products may be supplied on heavy pallets, and individual sheets are too heavy for a single person to handle safely. To ensure HIMACS products remain stable and perform optimally over the recommended period, specific storage conditions are required for each product type. **Proper handling and storage will maintain HIMACS products in the best possible condition for your work.**

1. General handling guidelines

All HIMACS products should be inspected promptly upon receipt, and any defects should be reported to your supplier immediately.

- Handle HIMACS products with care at all times.
- Use appropriate personal protective equipment (PPE), such as gloves and safety shoes, and ensure proper handling equipment is used.
- Maintain a clean and organised workspace. Ensure that areas where HIMACS products are being moved are smooth and free from floor irregularities.
- When transporting HIMACS products within your warehouse or fabrication shop, move slowly but continuously.
- Forklift Handling:
    - Ensure the lifting arms are long and strong enough to lift heavy pallets safely from the front, allowing the pallet to be fully supported.
    - For standard container deliveries, unload from the head side using a forklift with sufficiently long arms for safe handling.
    - If lifting pallets from the side, use wide forklift arms to prevent bending or damage to the sheets. Due to the weight of the pallets, it is recommended to move one pallet at a time to avoid harmful bending.
- If suitable equipment for heavy pallets is unavailable, open the pallet on the vehicle bed and manually unload the HIMACS sheets one by one, following the handling guidelines for each product.

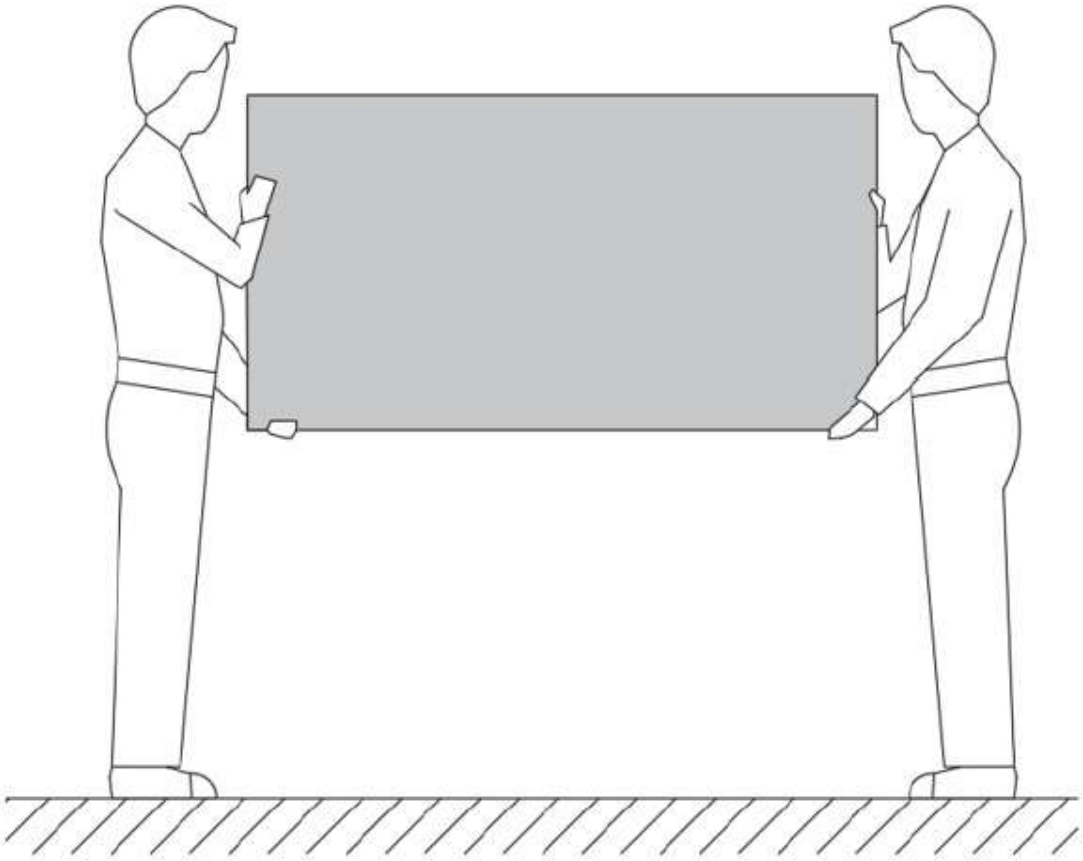
Note

Any Warping or damage resulting from incorrect handling, storage, or transportation is not covered by LX Hausys.

2. HIMACS Sheets

2.1 Handling

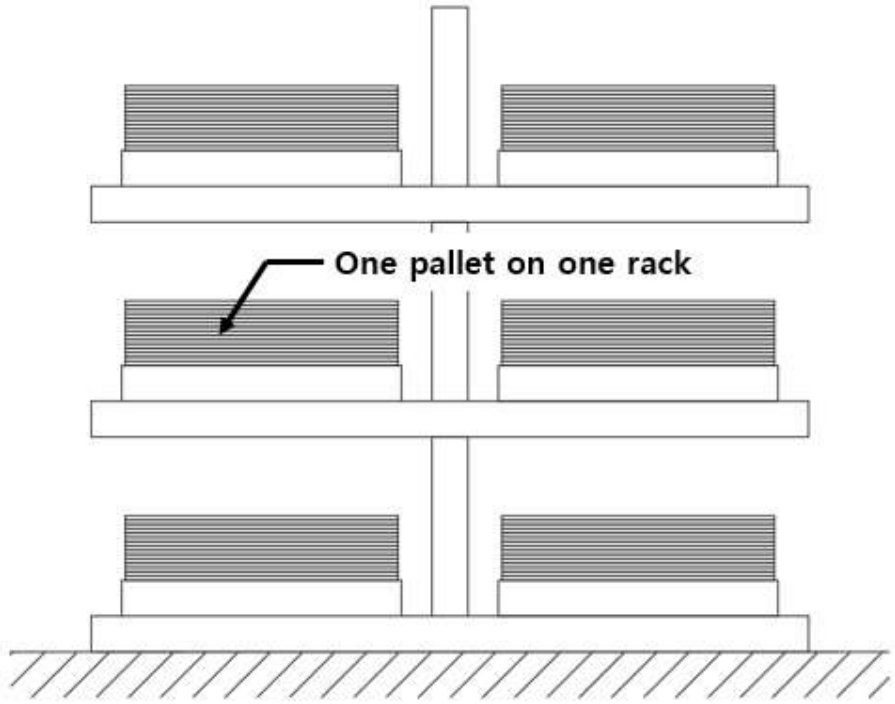
- Never attempt to handle individual HIMACS sheets alone.
- HIMACS sheets should be lifted by two people, one at each end.
- Always lift the sheets vertically on edge, with one hand underneath to support and one hand on top to control.
- Where possible, use a vacuum lifting system with suction cups.
- Avoid flexing the sheets while carrying, as this may cause damage.
- Never drag HIMACS sheets along the floor, as this can result in chipped or broken edges.



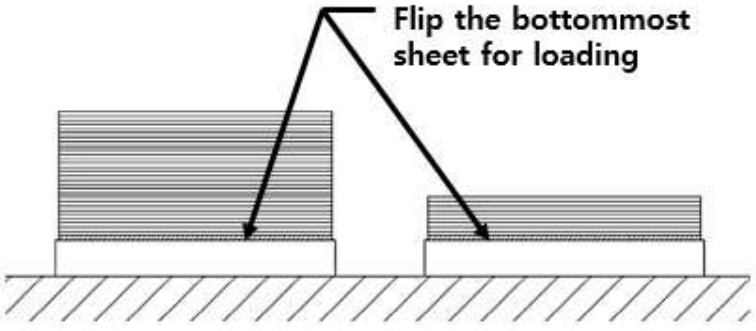
Preferred Manual Handling Method: Sheets should be handled by two people

2.2 Storage

- Store HIMACS sheets in a dry, well-ventilated indoor area with a temperature between 15ºC and 25ºC, such as a properly prepared warehouse.
- Protect sheets from any sources of damage, including direct sunlight, rain, and excessive heat.
- Implement a stock system that allows easy identification of sheet numbers, simple access, and safe handling. A first-in, first-out (FIFO) process is recommended.
- Shelving should be level, strong, and provide full underlayment support with rack supports every 600mm to prevent sheet distortion.
- Ideally, store one pallet per rack unit to ensure safe and stable storage. When placing a pallet in storage, open the steel transportation bands and remove the clear plastic wrap to minimise moisture accumulation.
- Always cover the top of the pallet with a protective wooden sheet to prevent the top sheet from becoming dirty or scratched.
- If it is necessary to stack multiple pallets temporarily, ensure there is sufficient support under each pallet to prevent distortion of the HIMACS sheets. Supports must be properly aligned to bear the full weight.
- Never leave sheets outdoors for extended periods.
- Do not remove the protective film during storage.
- For 12mm standard HIMACS sheets, LX Hausys flips the bottommost sheet on the pallet during shipment to reduce deformation. When storing leftover sheets or reloading pallets, the bottommost sheet should also be flipped to minimise deformation.

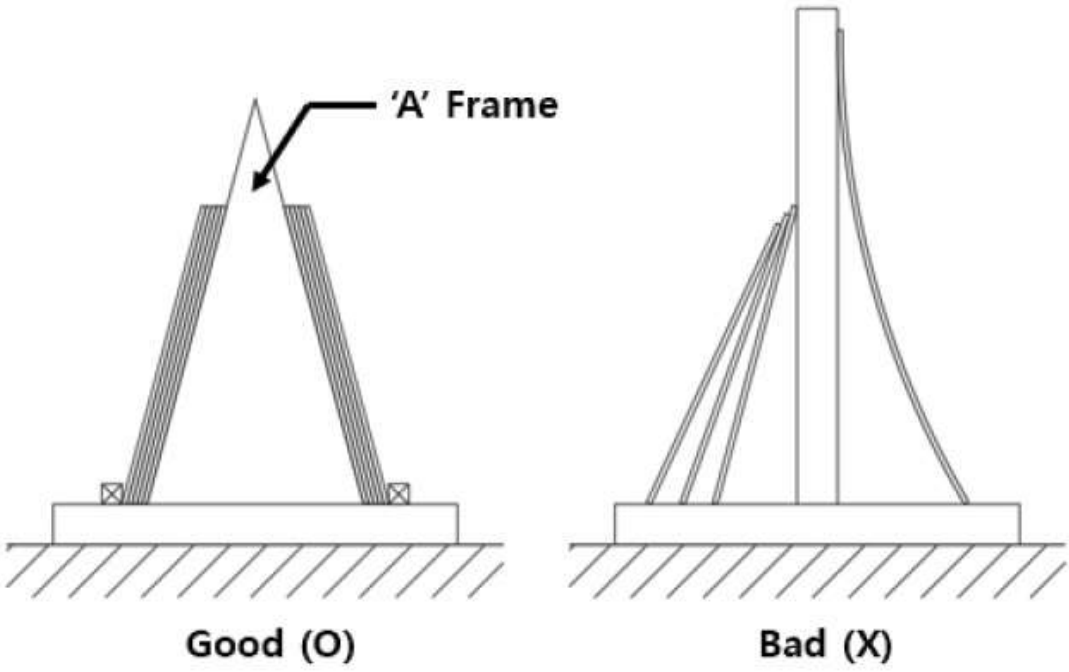


Best storage method:
Individual rack for pallet



Bottommost sheet is flipped for loading and transportation

- Vertical storage of HIMACS sheets is generally **not recommended.**
- However, under unusual or temporary conditions, an **'A' Frame** with full underlayment support or rack support at every 600mm may be used.
- When using an 'A' Frame, the entire surface of each HIMACS sheet should be leaned closely against the frame to prevent warping.
- Ensure there is no gap between sheets or between the sheets and the 'A' Frame, and that the sheets cannot slip during vertical storage.



Best vertical storage method :
"A frame" system

2.3 Transportation (Fabricated products)

- Fabricated items should be treated **as fragile** and protected with appropriate packing materials, such as bubble wrap.
- Edges and corners must be safeguarded using pasteboards or other shock-absorbing materials.
- Cutouts in fabricated items require additional support during packing to prevent breakage during loading, unloading, and transportation.
- Fabricated products are best transported **on edge** and stored on a specially designed a-support rack.
- Ensure that pallets loaded onto lorries are levelled and fully supported at all times.
- Avoid transporting HIMACS fabricated products in **open-top vehicles**, as this may cause extreme thermal movement and exposure to changing air conditions.
- Prevent any movement of products during transportation by securing them with clamps, straps, or blocks.

3. HIMACS Adhesives

- **HIMACS adhesives** require specific **storage, handling, transportation, and usage guidelines** to ensure both **performance and safety**.
- Store HIMACS adhesives in a **dry, well-ventilated indoor area** at temperatures between **8°C and 15°C**, such as a **dedicated cool cabinet**. Protect the adhesives from **sunlight, rain, high heat**, and other potential sources of damage.
- A **stock system** should allow **easy** LOT number **identification**, **convenient access**, and **simple handling** of adhesives. A **first-in, first-out (FIFO) process** is recommended to maintain quality.

Note

- **HIMACS adhesives** are **flammable materials**, and **safety** must always be the **primary consideration** when using them in your work area.
- The **storage environment** can affect the **performance and quality** of HIMACS adhesives. The **shelf life** of HIMACS adhesives is **five years from the date of manufacture**, provided they are stored under the **recommended conditions**.
- For **optimal performance**, it is recommended to use HIMACS adhesives **within one year of the manufacture date**.
- **LX Hausys shall not be liable** for any reduction in performance resulting from **poor or improper storage or handling** of HIMACS adhesives.

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5. Quality Inspections

1. Common Shipment Inspection

After off-loading, it is recommended to **inspect all goods** as follows:

- Confirm **quantities and colours** of all HIMACS products match the order.
- Verify **sheet number sequences** for multi-sheet projects. Please refer to the document **"3. Sheet Number "**.
- Check for potential **damage to factory-applied peel coats or packaging boxes**, which may indicate underlying damage to HIMACS products. For sheets, inspect for:
    - **Irregular edges or corners**
    - **Bending, twisting, or** Warping
    - **Noticeable thickness variation**

      (Inspect more carefully before fabrication.)
- If a **defective product** is found:
    - **Identify the material** and record the issue

- Take **photographs** to illustrate the defect
- Make a **detailed statement** including all relevant product information (**reference, traceability, format, etc.**)
- **Register the information** on the **HIMACS Distributors Service Portal** to submit the claim

2. HIMACS Sheet Inspection

2.1 Colour & Pattern Evaluation

Checking **colour consistency between sheets** and **within individual sheets** is an essential step when inspecting HIMACS products.

Due to the composition and manufacturing process of HIMACS sheets:

- Slight colour variations may occur **between different production cycles.**
- Each colour group has **its own unique aesthetic,** with inherent variations caused by chips, veins, and glitter elements within the same sheet.

Important:

LX Hausys does not guarantee colour matching between sheets from different lot numbers, nor a perfect match within colour groups that have their own **distinctive aesthetic variations**.
Ensuring the **best and acceptable colour match** is the responsibility of the **fabricator and installer**.
To achieve **optimal results**, LX Hausys strongly recommends following **strict guidelines** and referring to the **Sheet Information** to enhance **colour consistency** between and within HIMACS sheets.

2.2 Colour Match

- Check the sheet number printed on side edge of each sheet and use same LOT number sheets. Easy way is using the sheets on same pallet.

- Proceed to gluing test on 2 small pieces together and visually check the color matching result.
- The colour difference between solid color sheets in same lot number should be less than △E 0.8

2.3 Colour irregularities within a sheet

Solid Colour Sheets:

- If you notice **blotches within a sheet** during inspection, **contact your supplier** for further inspection and **replacement if necessary**.

Veined Colour Groups (Concrete, Aurora, Marmo):

- These colours have **intentionally irregular, randomly distributed veins**.
- The **natural aesthetic** created by these veins is **unique**, and **patterns on the face and/or edges will not be identical** within a sheet or between sheets.
- Sheets from veined colour groups should be **fabricated carefully following exclusive guidelines**.

Chip Colour Groups (Granite, Lucia, Volcanics, Aster):

- These sheets are designed with **irregularly distributed small or large chips**, which are a **key part of the design**.
- **Irregular chip distribution is not a defect.**
- If any **abnormal chip distribution** is observed within a sheet or between sheets of the same lot number, **contact your supplier** for inspection and **possible replacement**.

Glitter / Sparkling Effect:

- Some sheets contain **glitter chips** for a **sparkling effect**.
- Due to the **shape of the glitter chips**, the sparkling effect is **visible only on the face side**, not on edges or sections.
- **Missing sparkling effect on edges or sections is not considered a defect.**

Notes for Inspection and Colour Matching:

1. **Record the sheet number** printed on the **edge and back side**; this helps with **colour matching during fabrication**.
2. **Trial colour matching** can be quickly checked by **gluing two small pieces** with **cyanoacrylate adhesive (super glue)**.
3. Avoid inspecting under **bright lights** such as **direct sunlight**.
4. Do not join sheets of **different dimensions** or **different sheet numbers**; this will compromise **colour match**.
5. Only the **face, edges, and section (thickness direction)** are valid surfaces for **colour and pattern inspection**; the **back side** is not suitable for **quality checks**.

2.4 Dimensions

For standard dimension details, refer to the document “2. Sheet Information.”

HIMACS sheets may include an **additional size allowance of up to 10 mm** in both length and width. This buffer zone helps protect the primary usable area from direct damage, such as edge cracks or scratches, that may occur during transportation and handling.

The finish on the sheet’s edge section is **not suitable for joining**; therefore, the original edge should be trimmed before making any joins. Refer to the document “8. Cutting and Cutout” for detailed instructions.

2.5 Flatness

Any warping should be less than **2 mm per meter for 12 mm thick sheets, and 2.5 mm per meter for 20 mm thick sheets** upon delivery.

2.6 Face side effects

Minor defects (e.g., small stains, scratches, ripples, etc.) can be removed by sanding. However, if more serious defects are found, please contact your supplier for inspection and, if necessary, replacement.

2.7 Back side effects

HIMACS sheets are **one-sided materials.** Therefore, minor defects on the back side (e.g., small stains, scratches, ripples, etc.) do not affect the quality of the final finished product and can be removed by sanding.

However, if more serious defects are found, please contact your supplier for inspection and, if necessary, replacement.

3. HIMACS adhesive inspection

- Check the **label** for the **date of manufacture** and **colour**.
- Inspect for any **visible damage** to the **cartridge, tube, or accessories**.
- Check whether any **contents have leaked**.

4. HIMACS sheet specifications

Inspection Items	Colours	Specification
Colour, Pattern Irregularities	**Solids**	Less than ΔE < 0.8
	Other	Irregular distribution
Dimensions	Thickness	12 mm ± 0.4 mm20 mm ± 0.8 mm
	Width	Less than +10 mm to nominal value
	Length	Less than +10 mm to nominal value
Flatness	Convex Wrapping	12 mm: Less than 2 mm/m20 mm: Less than 2.5 mm/m
	Concave Wrapping	12 mm: Less than 2 mm/m20 mm: Less than 2.5 mm/m
Face Side	Dark Spots	Less than 2 impurities (diameter < 0.7 mm^2) per meter
Dark Spots	Light Spot	
Light Spot / pine holes	Pine Holes	None
Back Side	Pine Holes	Less than 50 impurities (diameter < 2 mm^2) per meter

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6. Recommended Tools

LX Hausys recommends using equipment, machinery, and tools with the appropriate power and performance for fabricating solid surface products. Although much general woodworking equipment, machinery, and tools can be used to fabricate HIMACS products, there are certain optimised features that provide better working conditions, higher quality results, and longer tool life.

This section provides a list of such equipment, machinery, and tools, along with their minimum essential specifications.

1. General workshop equipment

1.1 Dust Collection System

Dust produced during the fabrication of HIMACS products should be extracted and collected from the workplace to ensure health and safety, extend tool life, improve working conditions, and enha

- **A dust extraction/collection system** for the entire workshop.
- **Dust collection attachments** for each piece of equipment and tool.
- **Portable or mobile dust collectors** for use in any location.

1.2 Pneumatic system with flexible hose and air blow gum

An air blow gun is an effective way to remove dust and residues from HIMACS products without causing scratches, both before, during, and after fabrication and installation. Using an air blow gun for cleaning can also extend the life of your tools.

It provides a quick and easy method to clean your workplace and work clothes. For this reason, it is recommended to install a **pneumatic system with flexible hoses and air blow guns** positioned so they can reach any required location in your workshop.

1.3 Worktable

High-quality worktables are essential not only for safe and efficient work but also for achieving the desired quality in the finished products. The optimal size and quantity of worktables should be determined according to your business scale and primary applications.

Key requirements for good worktables include:

- **Strength and stability** – the worktable must be strong enough to support the weight of HIMACS sheets, finished products, and any work pressure applied during fabrication.
- **Frame materials** – robust wooden or steel frames are suitable for stability. However, to prevent scratches on HIMACS products, the contact surfaces of the tabletop should be covered with a material softer than HIMACS, such as wood. Sharp edges on the worktable must be avoided.
- **Clamping considerations** – the worktable should be designed to allow convenient and efficient clamping between the table and HIMACS products, or between multiple HIMACS pieces. The frame should minimise interference with clamping operations.
- **Flatness** – the worktable must be level, except where a specific design requires otherwise. Stable flatness is essential for high-quality results.

2. Cutting Process

2.1 Saws

Cutting full-size HIMACS sheets should initially be carried out using a **panel saw, beam saw, or table circular saw**.

The basic requirements for these saws are:

- **Table circular saws** with an **adjustable, accurate** rip fence and **sturdy in-feed and out-feed tables**.
- **Panel saws or beam saws** must always have a **dust collection system**, either integrated into the machine or connected to the workshop's system.
- Minimum motor power: **5 HP (3.75 kW)**.
- Blade speed: **3,000–4,000 RPM**.
- **Chop saws or mitre saws** capable of using saw blades with a diameter of **254 mm (10") or 305 mm (12")**.
- All saws must have **safety guards** in compliance with local safety regulations.

Do **NOT** use the following saw types:

- Handheld rip saws
- Portable jig saws (sabre saws)
- Chainsaws
- Hacksaws
- Saws that produce **excessive noise and vibration**
- Any **unsophisticated or unsuitable saw types**

On-site fabrication:
During on-site work, **portable circular power saws with a guide rail** may be used, provided the **edge is subsequently finished with a router**. However, the **most effective and efficient method** for on-site fabrication is to use a **router only**, together with a **straight edge and/or template**.

2.2 Saws Blade

Circular saw blades with triple-chip tungsten carbide teeth provide the **best possible cutting results** for HIMACS sheets. The **ideal specifications** for these blades are as follows:

- Blade diameter **254 mm (10")**: 80 teeth
- Blade diameter **305 mm (12")**: 96 teeth
- Tooth spacing: approximately **1 tooth per 10 mm** of circular arc
- hook angle: **negative, -5°**

Fig. 2-1. Saw blade with positive angle

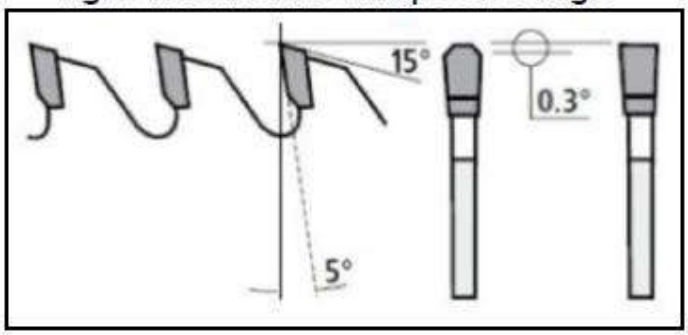
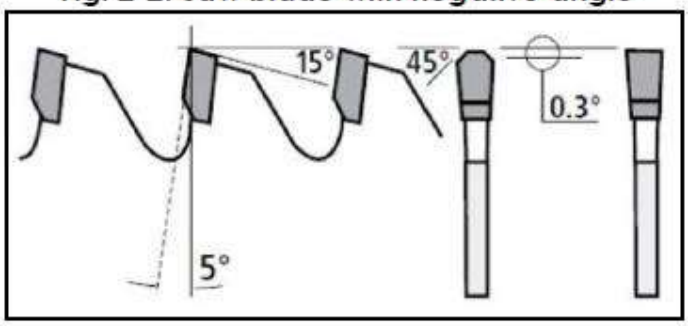


Fig. 2-2. Saw blade with negative angle



There are many optimised saw blades and brands suitable for solid surface materials. Consult the blade manufacturer to select the most appropriate blades for your cutting equipment and tools.

Notes:

It is important to avoid **stress fractures** when cutting HIMACS sheets, as these can lead to **cracks developing later**.

- If **small chips or cracks** appear during cutting, ensure that **edges are always finished** using a **router or spindle moulder**.
- Regularly **sharpen blades** to maintain **high-quality cuts**.
- For **mass production and greater precision**, consider using **automatic equipment** such as **CNC machines,** v-grooving **machines, and diamond blades**.

3. Routing and trimming

There is a wide range of routing and trimming processes due to the various applications of HIMACS products, and the required power of tools differs for each step. Therefore, refer to the following tool information for each stage of the process. The information provided is based on the tool manufacturers' specifications. Consult the tool manufacturer to select the most suitable tool for your specific task.

Router/Trimmer	Power	Main Task / Operations
Router 1	1400–1900 W (1.8–2.5 HP)	**Main Task:** General routing for 12 mm sheets **Operations:** Cutout, simple straight edge trimming, seaming preparation
Router 2	2200–2500 W (3 HP)	**Main Task:** Heavy duty and general routing for 12 to 20 mm sheets **Operations:** Cutout, all trimmings and profiling
Trimmer	700–950 W (1–1.25 HP)	**Main Task:** Minor trimmings **Operations:** Simple edge treatment such as edge bevelling

Routers should be capable of mounting router bits with a minimum 12 mm shank, which means the router must be equipped with a 12 mm collet chuck.

Higher power ratings of tools and machines result in more precise cuts and higher-quality fabrication. Therefore, consult the tool manufacturer and select the highest power rating available within the relevant tool category. Adequate power and RPM speed help minimise chipping and ensure accurate, high-quality cuts.

Solid surface materials are highly abrasive, and the fine dust can quickly damage electronic control contacts and bearings. It is always advisable to invest in routers with dust extraction or collection systems, or to provide good airflow and dust collection by other means. Additionally, it is important to have spare parts on hand, such as bearings, templates, and bushings.

Bits for Router & Trimmer

A variety of **router and trimmer bits** are available on the market. Different **shapes of bits** are required to achieve **specific design features**. **LX Hausys** recommends the following for routers and trimmers:

- Minimum **12 mm shank** for routers
- Minimum **6 mm shank** for trimmers
- Wide selection of tungsten carbide-tipped bits for straight cuts, profiling, and basin installation
- **Carbide grade C-3 (minimum) or C-4 (recommended)**
- **Profiling bits with ball bearing guides** (nylon bearings are preferred)
- Regularly **check and maintain the condition** of all bits. **Inspect bits before use** and ensure that **spare bits are available** in your workshop

Templates

Templates are essential for achieving accurate cutouts with the correct shape and smooth, clean surfaces. Templates can be made from HIMACS sheets and/or wooden materials such as MDF or plywood. LX HAUSYS recommends creating a variety of templates for sinks, lavatories, cooktops, and other applications. Templates should be stored in good condition, in a dry and clean area, to prevent deformation and allow repeated use.

4. Seaming (Clamping)

Several types of clamps are required to secure and join HIMACS products. For instance, a “basic” fabrication workshop typically needs between 500 and 1,000 hand-spring clamps, in addition to other types of clamps, to work on multiple projects simultaneously.

The suitable clamp type, size, and quantity should be determined based on your business scale and primary applications. Generally, 50 mm spring clamps and various sizes of bar (F) clamps are essential.

Please refer to the following clamps, which are suitable for the fabrication and installation of HIMACS products.

Type	Task / Action
Spring Clamps	Built-up / Profiling
C (G) Clamps	Narrow joint
Locking (C) Clamps	Sheet, shapes, basin fixation
Bar (F) Clamps	General usage
Vacuum Clamping System	Flatt Butt join

LX Hausys Recommends the Following Types of Clamps:

- Steel body with steel jaws, covered by a protective surface layer
- Stable fixing with easy and quick-release mechanisms

Useful Tip:

Before starting routing and jointing processes, place the clamps near your current work area. For efficient work, ensure a variety of clamp types and sizes are readily available in your workshop.

5. Finishing (Sanding and polishing)

The quality and visual appearance of the surface are the main factors representing the overall quality of the final product, as customers will notice any defects on the finished surface first. A detailed finishing process, well-trained skills, and optimized tools and machines are essential for achieving a stable, high-quality finish.

The following tools and machines are recommended for the finishing process:

- Hand grinder
- orbital sander
- Random orbital sander
- Palm sander
- Hand belt sander
- Stationary belt sander (wide/long belt)
- Polisher

Good **finishing tools** should have the following features:

- **Minimal sanding scratch marks**
- **Easy and quick system** for attaching sanding discs and pads
- **Integrated dust collector** or dust extraction system

Some optimised tools can deliver more **efficient work** in a shorter time. When selecting finishing tools, you should also consider your **workshop conditions**, **market requirements**, and **personal skill level**.

- **Air sanders** are efficient for **high-volume workshops** due to faster sanding and longer tool life; however, they require a **pneumatic system** and have limited portability.
- **Electric sanders** are versatile and commonly used in many locations, but they must be **well maintained** to ensure long tool life.
- A **variety of tools** is needed to accommodate different finishing processes.
- **Stationary belt sanders** are ideal for achieving **stable, high-quality finishes** on large surface areas.

Sandpapers / Discs / Pads

HIMACS products can be finished in **three main types**:

- **Matte finish**
- **Semi-gloss finish**
- **High-gloss finish**

The **name and preferred texture** of each finish may vary between markets. The **aesthetic quality** of the finish depends on the **fabricator's skill**, the **quality of the tools used**, and the **overall finishing process applied**. Therefore, it is not possible to specify exactly which type or brand of abrasive or polishing product should be used, as expectations differ across markets.

When selecting **sandpapers**, consider the following features:

- **Aluminium oxide sandpaper** is typical for finishing HIMACS sheets.
- **Silicon carbide sandpaper** is suitable for **rough sanding**.
- **Sandpaper with holes** is required for **vacuum dust collection/extraction**.
- **Disc sizes** of 125 mm (5") to 150 mm (6") are typical for **hand tools**.
- **Strong or heavy backing paper** is recommended for **durability**.
- A wide range of **sandpaper grits or** micron **grades** is necessary to achieve the **desired finish**.

Requirements for Sandpapers

Grit	Micron (μ)
60	80
120 ~ 150	100
180 ~ 240	60
320 ~ 400	30
600	15
1000 ~ 3000	9 ~ 5

Polishing pastes and waxes can enhance the gloss level of a previously sanded surface, but they are recommended only for artistic or specialised applications.

6. Thermoforming

Heating machine (Oven)

There are two common types of heating machines:

- Machines using an air-heating circulating oven (convection oven)
- Machines using a heated plate oven

The type of heating machine is not critical; however, the working bed size should be considered based on the following:

- Standard dimensions of HIMACS sheets
- Working bed size of forming machines
- Size of main finished products for your business

The following parameters are essential for the correct selection:

- Heating temperature up to 190°C
- Uniform heating across the entire material
- Stable heating with the ability to maintain the target temperature
- Quick heating with efficient power usage
- Temperature control with 1°C precision

Generally, platen heating ovens provide better performance, ensuring uniform and rapid heating of entire sheets compared with air-circulating ovens (convection ovens).

> **Note**
>
> Heating HIMACS sheets using direct flame is not recommended. Methods such as forge or torch burners heat the material unevenly and can burn the sheets, resulting in failed thermoforming and reduced durability.

Forming machine (Oven)

There are three typical methods for forming HIMACS sheets. One is the manual method using male and female moulds, while the other two methods involve either a hydraulic press machine or a vacuum press machine.

The hydraulic press machine is suitable for small products, such as washbasins, while the vacuum press machine is ideal for larger items, such as worktop coverings or wall cladding.

For your consideration, refer to the following information (consult the machine manufacturer for further details):

- Select the appropriate **press type** and **working bed size** for your business.
- Minimum **40 tonnes of pressure** for a **hydraulic press machine**.
- Minimum **9 tonnes per square metre of pressure** for a **vacuum press machine**.
- Ensure the **vacuum press machine** has a suitable **working height** for the silicon membrane.
- Consider the **size of the main finished products** for your business.

Additional information to take into consideration

Additional tools needed for effective thermoforming

- **Protective gloves** with insulation to safeguard hands from heat.
- **Temperature meter** to calibrate the oven accurately.
- **Timer** to monitor and alert the heating duration.
- **Moulds** for forming, designed to fit the desired shape.

For **large thermoformed products**, a lower height **vacuum press table** is more efficient and convenient for handling **heated HIMACS sheets**.

There are many **brands of heating and forming machines** available on the market, and there is **no restriction on brand choice**. However, it is essential to ensure that the selected **equipment meets the performance requirements** for your specific work.

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7. Site Inspection & Job Plan

Good preparation through site inspection, accurate measurement, and the use of templates will help create a successful job plan. Careful planning can reduce material waste and save time. The characteristics of HIMACS sheets should be taken into account and incorporated into the job plan to prevent failure and to avoid shortening the lifetime of the finished products after installation.

1. Site Inspection

Installation site accessibility is one of the key factors in determining the **size of semi-finished products** produced in the workshop. Before starting any fabrication, **LX Hausys** recommends checking and analysing the following information about the installation site:

- **Parking and unloading areas**
- All **entrances** along the delivery route: doors, windows
- **Hallways**, lifts/elevator cars, stairs, and **ceiling heights**
- **Hallway corner angles**
- Any other **site conditions** that could create difficulties during **delivery or installation**

Installation requirements

The following information must be identified in advance to prevent **structural issues** and **installation defects**:

- **Wall condition**: flatness, cleanliness, slope, and any obstacles
- **Furniture condition**: correct levelling and stability of the frame structure
- **Electrical, plumbing, and heating element positioning**
- **Sufficient space** for the installation at the site
- Any other **site conditions** that could cause difficulties during installation

Detailed furniture evaluation (cabinets)

Verify that all furniture is installed in compliance with **industry best practice**:

- **Flatness**: Check and control the flatness of **base furniture**. Any deviation must be corrected before installation
- **Structural integrity**: Ensure the furniture can support the **weight of HIMACS**, as well as accessories such as sinks, cookware, and kitchen fittings, without compromising **safety for the end user**
- **Ventilation**: Dust covers, solid cabinet tops, corner cabinets, and "Lazy Susan" cabinets must be ventilated to prevent **trapped air**. In each case, the tops of these cabinets should be removed as much as possible without compromising the **structural integrity** of the cabinet

Template materials

Templates with strips are not essential for most general work with HIMACS sheets. Digital templates can also be used. For simple flat walls or straightforward countertop shapes, an accurate sketch with precise measurements is often more useful.

However, if accurate measurements and sketches cannot be guaranteed, for example due to irregular walls or complex furniture shapes, templates with strips are often the simplest, most accurate, and most efficient method for planning the job.

Points to Check for Templates and Sketches

The first step in **templating** is usually to sketch a **plan view** of the job, including:

- ☐ **Sink identification and location(s)**
- ☐ **Cooktop identification and location(s)**
- ☐ **Appliance identification** (e.g., slide-in range, refrigerator, dishwasher) and location(s)
- ☐ **Finished edge(s)**
- ☐ **Overhang(s) less than 150 mm** (six inches) at base cabinets
- ☐ **Overhang(s) more than 150 mm** (six inches) at base cabinets requiring support
- ☐ **Overhang(s) more than 150 mm** (six inches), including peninsulas that require support
- ☐ **Inside and outside corner(s)** including radius measurements
- ☐ **Pass-through location(s)** and edge treatment(s)
- ☐ **Backsplash and side splash type** (loose or coved) and dimensions
- ☐ **Special cut-outs** and any unusual conditions
- ☐ **Allowances for thermal expansion**

Template materials

Choose **rigid, lightweight materials** that are easy to handle, do not shrink, warp, or deflect, and offer a **long service life**. They should also be thicker than the **template guide**.

Suitable materials include:

-
    - **Plywood strips**
    - **Hardboard**
    - **Heavy cardboard sheets**
    - **MDF strips**
    - **Digital templates** (where possible)

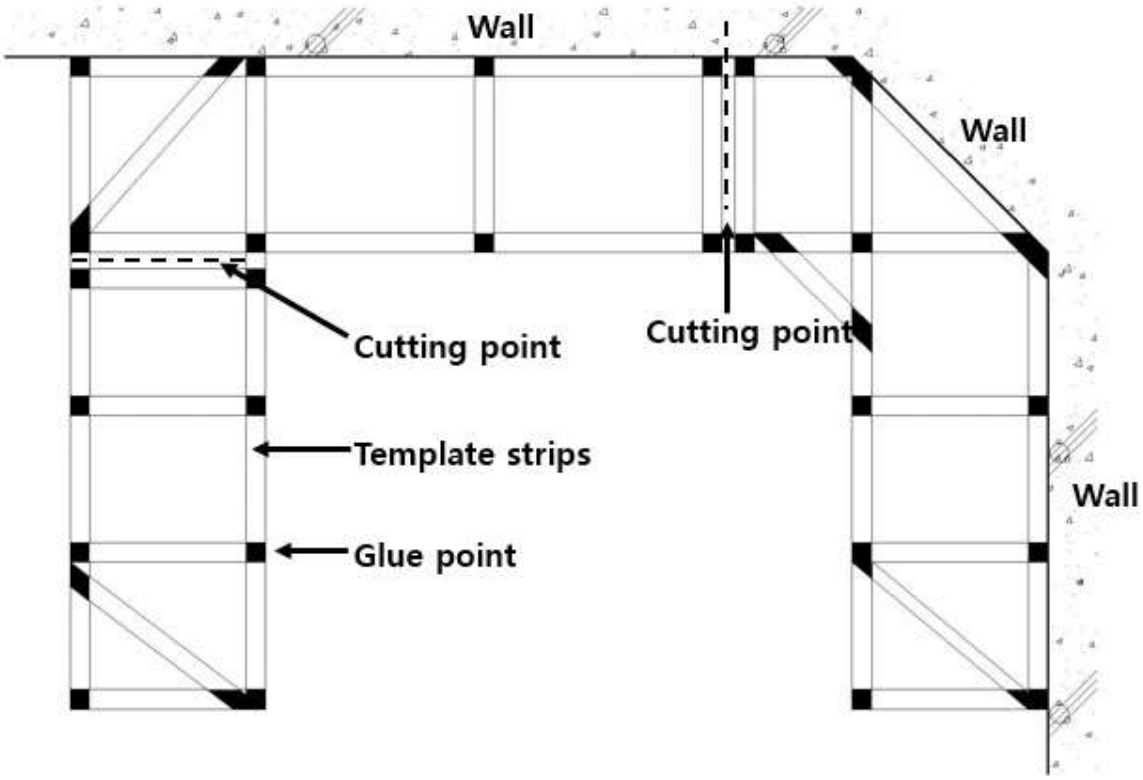
  Templates must be **strong enough** to maintain their **accurate shape** during transport from the site to the workshop without distortion.

Example of Kitchen Countertop Templating

1. Cut the **template material** to length and place it close to the wall.
2. Note the **largest gap** between the template strip and the wall on the template, and inform your customer of any **wall** Warping.
3. If the customer wants the **countertop to fit directly against the wall**, trim the template strip to fit. Check and trim again if necessary.
4. If the customer prefers to finish with **filler** such as **silicone sealant**, do not trim the strip; keep the template strip straight.
5. Repeat the process for all **wall sides**.
6. Lay out the remaining strips on the **cabinet** to match the exact size and shape of the **countertop**.
7. Once laid out, **secure the strips together** with hot-melt glue to form a single piece.
8. Ensure the **size, shape, and angles** are correct before gluing.
9. Add **diagonal strips** to strengthen the shape.

Notes:

- Record all **important information** on the **template**.
- Refer to the section **Check Points for Templates and Sketches** in this document and add any relevant notes.
- **Mark seam locations**. When deciding seam placement, refer to the section **Job Planning**.
- **Simulate the moving path** using the assembled template to determine the correct **semi-finished product size** with sufficient clearance.
- Refer to the section **Site Inspection**.



2. Job Planning

Good job planning is essential for a successful installation. Careful planning is required to calculate the correct quantity of HIMACS products, and it is strongly recommended to minimise the risk of installation failure.

Site inspection results, templates, and accurate measurements are key factors in effective job planning. In addition, material characteristics and seam locations must also be considered. All this information should be thoroughly reviewed and incorporated before starting your order, fabrication, or installation.

Thermal expansion and contraction

One of the main characteristics of **HIMACS sheets**, and solid surface materials in general, is their tendency to **expand and contract** with temperature changes. HIMACS sheets **expand** as the temperature rises and **contract** as the temperature falls. This property is expressed as the **thermal expansion coefficient value**.

- Thermal expansion coefficient value for HIMACS sheets is:

$$4.5 \times 10^{-5} \text{ or } 45 \times 10^{-6}$$

> This is the **average value** for HIMACS sheets; please refer to the **material test report** for each colour for more detailed information.

If **thermal expansion** is not considered, HIMACS sheets may **crack, break, or distort** after installation. Always ensure that the material can **expand and contract freely** without any barriers during installation.

Providing the **correct gap** between the structure and the HIMACS sheets is the solution. Before fabrication or installation, calculate the expected **expansion and contraction** of the HIMACS sheets and determine the **appropriate gap**. When performing this calculation, take into account:

- The **thermal expansion coefficient value** of HIMACS sheets
- The **temperature variation** within the building
- The **overall size** of the finished product
- Refer to the following **example for the calculation**

Example Calculation

Conditions:

1. Thermal expansion coefficient value (α) = 4.5×10^{-5}
2. Temperature difference (ΔT) = 60 °C (range from -15 °C to +45 °C)
3. Product length (L) = 1,000 mm

Formula:

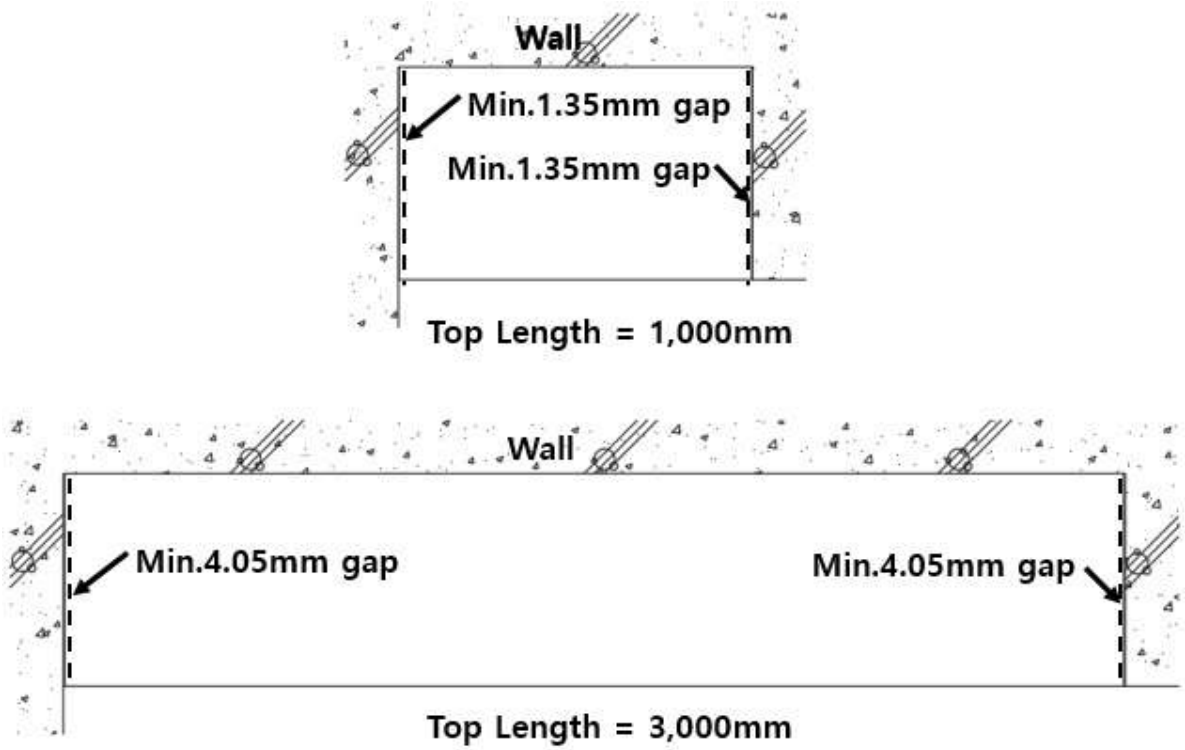
$\Delta L = \alpha \times \Delta T \times L$

Calculation:

$\Delta L = 4.5 \times 10^{-5} \times 60 \times 1{,}000$

$\Delta L = 2.7$ mm per 1,000 mm length

This means a **minimum gap of 1.35 mm per edge** is required.



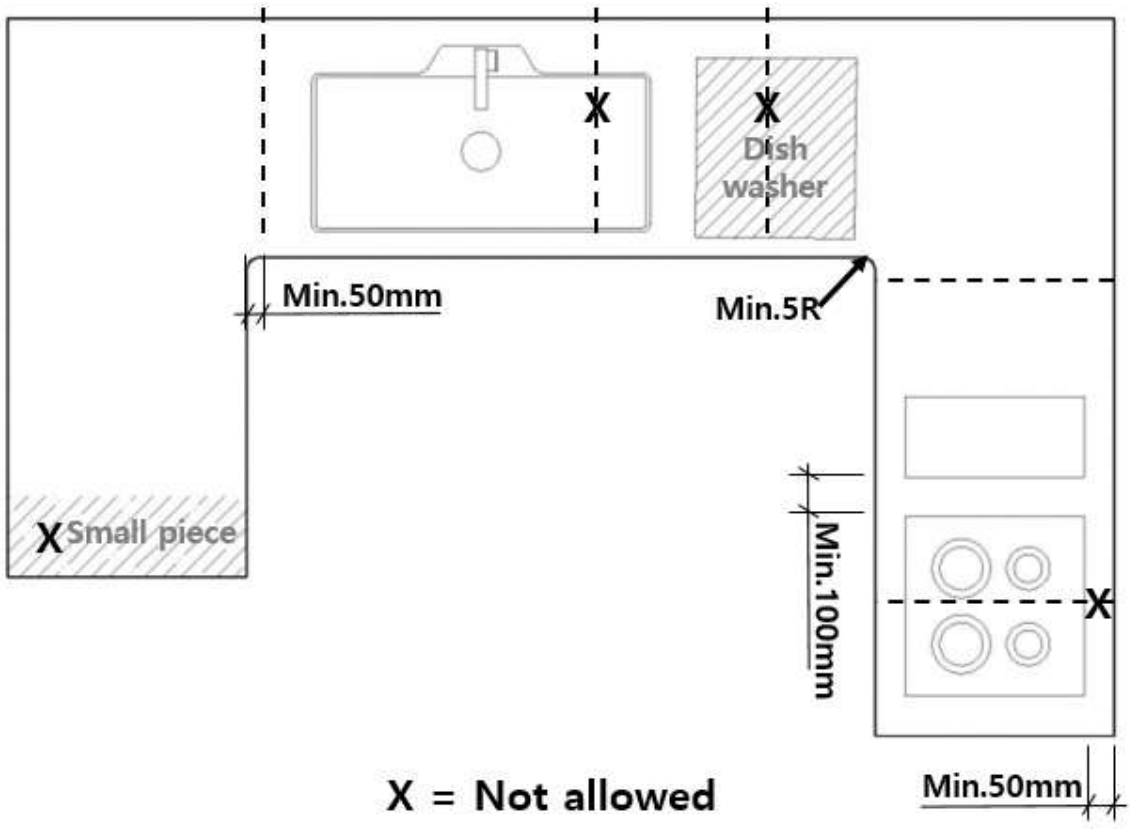
Expansion gaps on a Kitchen countertop

Seam and Cut-out Positioning

Proper seam and cut-out positions are essential for optimising **material yield** and ensuring the **durability of the installation**. Avoid placing seams in risky areas that may cause problems with performance or design. Position seams where they will minimise **HIMACS sheet usage**, following the recommendations below. Refer to Fig. Seam and Cut-out Position for guidance.

Recommendations:

- Never place a seam over a cut-out or in a **heat** or **wet zone** such as above a heating device, dishwasher, or washing machine.
- Keep seams at least **100 mm** away from any sink or other cut-out.
- Keep seams at least **300 mm** away from a hob cut-out.
- The distance from a hob cut-out to a **backsplash or** upstand should be at least **50 mm**.
- The distance from a hob cut-out to the **wall** should be at least **60 mm**.
- When laying out and fabricating a countertop, maintain a **minimum seam distance of 50 mm** from any inside corner.
- **Radius all inside corners** of “L” and “U” tops to a minimum of **5 mm**.
- Never join small pieces to extend the length of a countertop if the total length does not exceed the standard **HIMACS sheet length of 3,680 mm**.



Spare Material Consideration

Always allow for some spare HIMACS sheet quantity when planning fabrication and preparing materials.

If you face a shortage of HIMACS sheets during fabrication or installation and need to order additional products, it is not guaranteed that the distributor will have sheets from the same LOT number. Using sheets from the same lot number ensures the best possible colour match at the joints.

8. Cutting & Cutouts

Cutting and cutouts of HIMACS sheets directly affect the visible quality and durability of the finished products. Poor cutting surfaces can make seams more visible after joining and may lead to cracking along the seam. Improper cutouts, particularly at corners, can also cause cracks. Ensuring the long-term performance and service life of finished products made from HIMACS sheets starts with precise cutting and accurate cutouts.

1. Material Preparation

Preparation and checking before cutting are the last opportunity to validate and correct your job plan. Thorough preparation and organisation will ensure a profitable and efficient project.

1.1 Cutting List

A complete **cutting list**, including detailed information based on **site inspection, measurements, templates, seam position rules, and drawings**, is essential for efficient fabrication and installation. Maintaining the cutting list will also help **rectify defects** and respond to **customer complaints** if needed.

Essential information to include in the cutting list:

- **Project title** and intended use
- **Customer information**, including name and address
- **HIMACS sheet numbers**
- **Cutting sizes, shapes (drawings), and quantities** of fabricated individual pieces
- Consideration of **thermal expansion and contraction** in cutting sizes
- **Identification number** for each fabricated piece (marked on the back) and recorded in the cutting list
- Additional **special notes** as required

1.2 Conditioning

Before starting fabrication or installation, HIMACS sheets should be conditioned at room temperature (20°C ± 5°C) for a minimum of 24 hours. Conditioning is essential to achieve the original material performance and correct dimensions after fabrication.

2. Cutting

2.1 Factory Ends and Edge Cutting

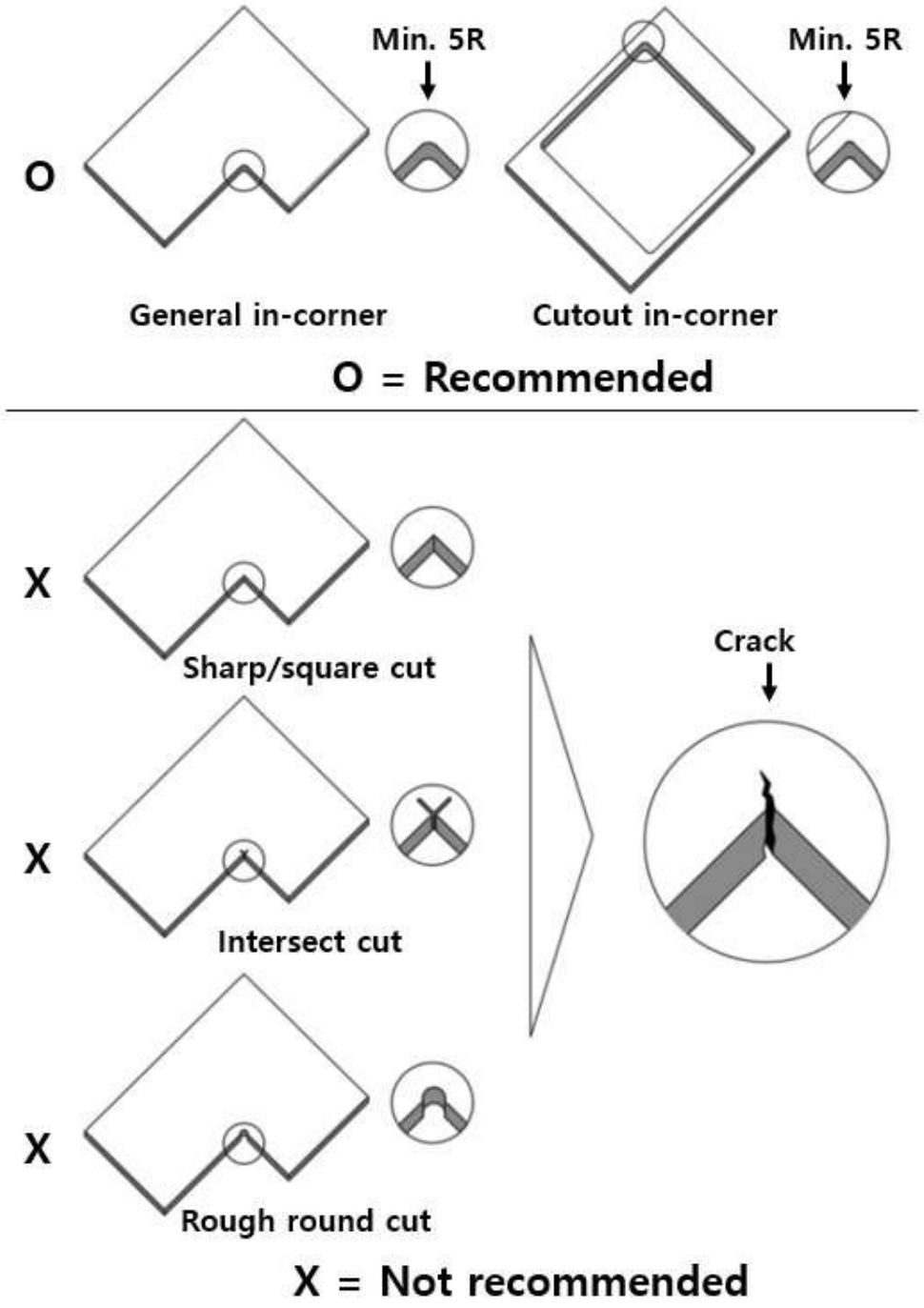
Factory ends and edges of HIMACS sheets are not suitable for direct fabrication without additional finishing. These edges may have been damaged, cracked, or contaminated during storage and transportation. The saw blades used at LX Hausys factories do not guarantee an optimal edge condition for seaming.

To ensure high-quality results, LX Hausys strongly recommends trimming factory ends and edges before fabrication. Removing these areas helps prevent visible defects and guarantees strong, durable seams.

2.2 Inside Corner Cutting

All inside corners of HIMACS sheets should have a minimum radius of 5 mm. The same minimum radius applies to all cutouts. Sharp or square inside corners are highly susceptible to cracking and breakage.

Rounded corners provide the best protection against damage, with larger radii offering greater durability. Never create sharp or square inside corners when working with HIMACS sheets.



Inside corner example

2.3 Key recommendations for cutting

There are many methods, machines, and tools available for cutting HIMACS sheets. For safe and accurate cutting, LX Hausys recommends the following minimum requirements:

- HIMACS sheets should be fully supported and securely fixed on the worktable during cutting.
- Only use machines and tools dedicated to solid surface materials.

- Portable circular saws should be used for rough cutting to size only. If a portable circular saw is used, the cut edge must be finished using an appropriate method to ensure high-quality seaming. Routing or sanding is recommended for edge finishing.
- When using hand tools such as routers or circular saws, always use cutting guides such as straight edges or templates to maintain accuracy.

3. Cutouts

3.1 General cutouts

Cutouts are subject to higher stress and must therefore be executed with great accuracy.

- Machine cutouts using a CNC router or a hand router with a template.
- Always ensure that corners are radiused, making the radius as large as practical (R ≥ 5 mm). Never leave sharp corners. See the Inside Corner Example.
- There are several methods for creating cutouts. Fabricators should select the method that best suits their workshop conditions and the specific project requirements.

CNC Machines

- CNC machines offer the most accurate solution, capable of producing large quantities of identical cutouts quickly. They can perform cutting and edge finishing in a single operation according to the designed shape.
- CNC machines require significant investment in equipment and skilled operators. Electronic drawings (e.g., AutoCAD files) are necessary for precise fabrication.

Handheld Router with Template

- Using a handheld router with an accurate template is generally a reliable method. Templates can be reused multiple times for identical cutouts.

Straight Edges

- Straight edges are suitable for single-use applications.
- Single-type sink or vanity basins can also serve as templates.
- With all methods, LX Hausys recommends careful evaluation of the work to be carried out before cutting.

3.2 Making template

An accurately made template is essential for successful fabrication of cutouts in HIMACS sheets. Templates can be made using various methods and materials.

Tools Required:

- 10 mm router bit
- 25 mm template guide

Using HIMACS Under-Mount Basins

1. Choose a suitable template material and cut it to the proper size.
2. Prepare the basin by wrapping its upper edge with masking tape. The tape should be applied flat, with no wrinkles.
3. Apply hot-melt glue to the flange of the basin, turn the basin upside down, and fasten it securely to the template material.
4. Once fastened, turn the assembly (basin and template material) upside down again.
5. Carefully drill a hole away from the flange—do not drill into the flange itself.
6. Install a flush-cut laminate trimmer bit in the router. Adjust the roller bearing so it sits approximately 1 mm below the bottom of the template material.
7. Carefully route around the inside edge of the basin using the router.
8. Detach the basin from the template and carefully remove all hot-melt glue from both the template and basin flange.
9. Sand and ease the inside edge of the opening.
10. Mark the template with an identification number or the name of the basin.

Using Supplier’s Paper Template

1. Prepare the paper template and locate the line indicating the shape and size of the basin (this is the inside edge line).
2. Draw an offset line 10 mm inside the edge line (matching the router bit diameter).
3. Carefully cut along the offset line using scissors, keeping the inside piece for later use.
4. Glue the inside paper piece onto MDF or plywood.
5. Cut the MDF or plywood by tracing the outside of the paper piece with a saber saw. Do not cut inside the paper piece. The inside MDF or plywood piece will be used in the next step.
6. Sand the inside piece to match the paper line and ease the edges until the shape perfectly matches the paper template.
7. Choose a suitable template material and cut it to size.
8. Glue or screw the prepared MDF/plywood piece onto the template material.
9. Carefully route around the piece using a router set with a 10 mm bit and 25 mm template guide.
10. Sand and ease the inside edge of the opening.
11. Mark the template with an identification number or the name of the basin.

3.3 Making cutouts for cooktops

Cutouts for heat-generating appliances require precise fabrication, proper heat insulation, and reinforcement to withstand stress. Heat from appliances can cause cracks or burns on HIMACS sheets. Therefore, LX Hausys recommends following the minimum fabrication methods below when making hob cutouts for residential cooktops.

It is not possible to provide guidance for all types of heat-generating appliances, especially commercial appliances operating at higher temperatures for extended periods. These require optimised and reinforced fabrication methods in consultation with the appliance supplier.

HIMACS sheets can withstand heat, but all cutouts must allow adequate ventilation or heat dispersion to keep the temperature below the critical performance limits.

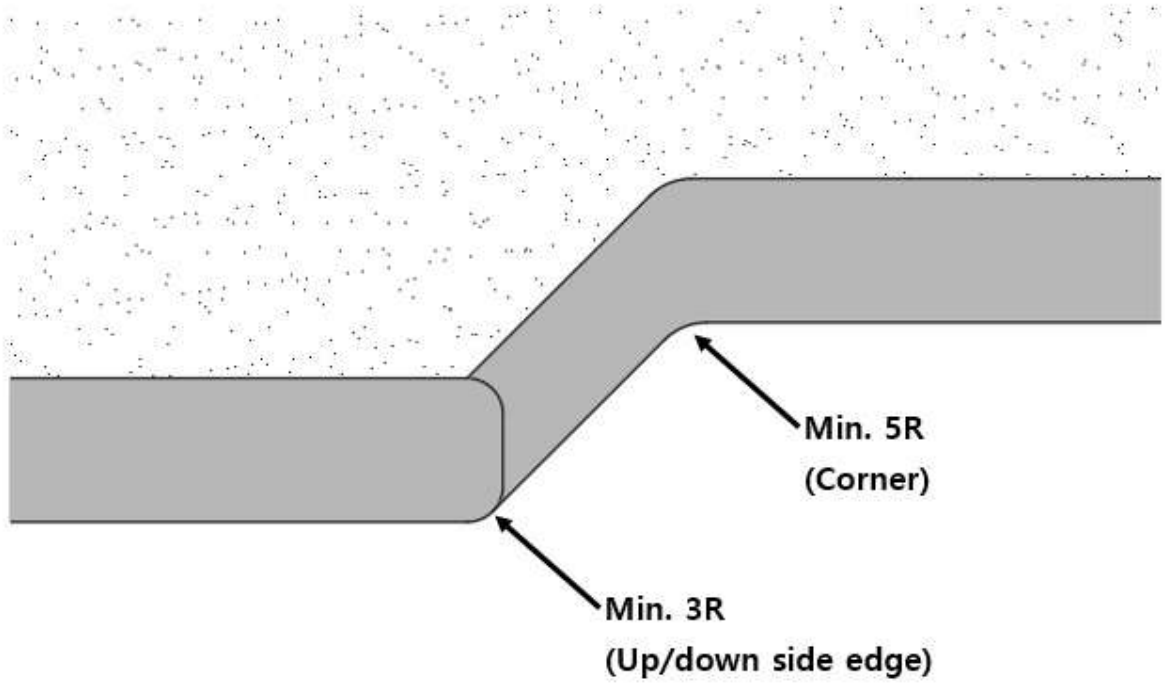
Cutout Size and Position

- Leave a minimum of **3 mm space** between the underside of the appliance and the edge of the HIMACS sheet whenever possible. Depending on the **hob type**, a filling piece may be required.

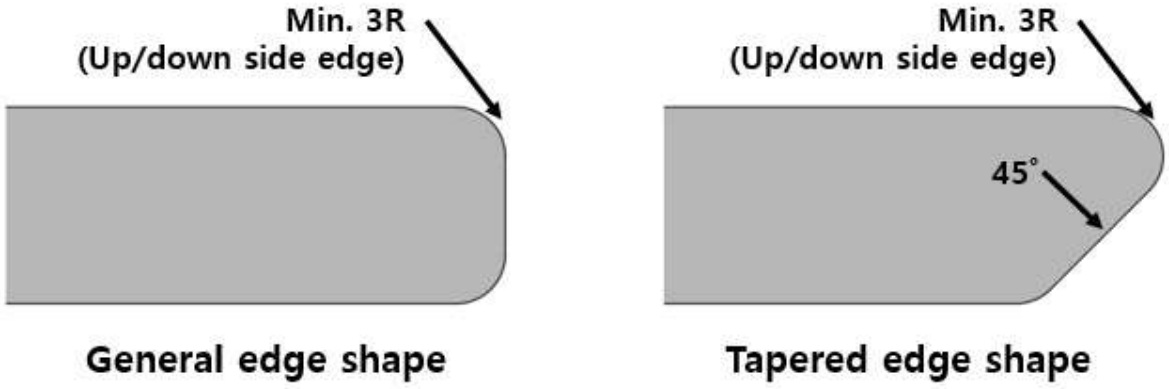
- Do not place a **joint or glue line** across any heating device. Fabricate the hob area as a single, unglued piece.
- Maintain a minimum **seam distance of 300 mm** from the hob cutout.
- Keep a minimum distance of **50 mm** between the hob cutout and the backsplash **or** upstand.
- Maintain a minimum distance of **60 mm** from the hob cutout to the **wall**.

Cutout Process

1. Place and **secure the template** at the correct position using clamps if using a hand router. Allow sufficient space at the **back for the backsplash** and at the **front for finished-edge treatment**.
2. Machine the **cutout** using a CNC router or hand router with a template. Do not use **jigsaws or hand saws** intended for masonry.
3. Always machine a **radius around the corners**, making it as large as practical (**R ≥ 5 mm**). Never leave a sharp corner.
4. **Ease all cutout edges** to a minimum radius of **3 mm**. For CNC users, perform a second pass to trim edges with a 3 mm radius (see Edge Trimming).
5. **Finish-sand the edges** using 180-grit sandpaper. Clean the sanded edges with denatured alcohol or **acetone** and a lint-free white cloth.
6. In some markets, a **tapered 45° edge** is commonly used for hob cutouts. This edge can be considered if it has been proven reliable in your market.



Edge Trimming



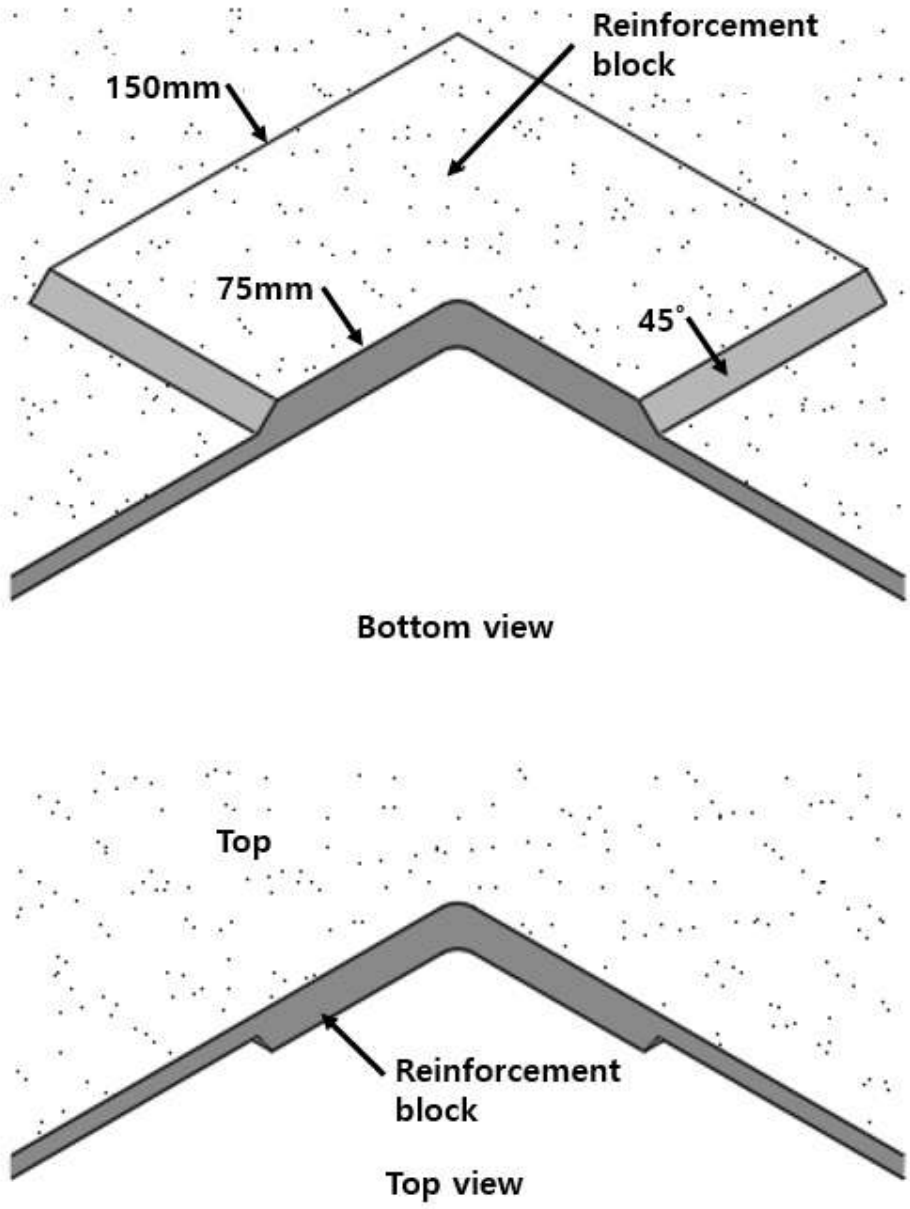
3.4 Protecting from Heat

Excessive heat can cause **cracks or burns** on solid surface tops. These issues can be prevented with adequate **reinforcement, insulation, and ventilation**.

Corner Reinforcing

1. **Prepare blocks:** Cut corner reinforcing blocks from HIMACS sheets, 150 mm × 150 mm. Applicable for **12 mm and 20 mm sheets**.
2. **Bevel and round edges:** Bevel all four edges at 45° and round each corner to a minimum **radius of 3 mm**.
3. **Clean blocks:** Wipe blocks with **denatured alcohol** or **acetone** using a lint-free white cloth.
4. **Prepare surface:** scuff-sand and clean the **underside of the HIMACS sheet** where the blocks will be adhered.
5. **Adhere blocks:** Apply joint adhesive and attach each block to the **underside of the cutout corners**.
6. **Position blocks:** Ensure 75 mm × 75 mm of each block extends into the **cutout area**.
7. **Clamp and remove excess adhesive:** Fully cover blocks with adhesive, clamp securely, and carefully remove any squeezed-out adhesive. Allow to harden.
8. **Trim excess:** Remove any excess block material from the **cutout opening** using a router.

9. **Ease edges:** Round the top and bottom edges of the cutout opening and all exposed block edges to a minimum **radius of 3 mm**.
10. **Finish-sand and clean:** Sand all edges using **180 grit**. Clean with denatured alcohol or acetone and a lint-free white cloth.



Corner reinforcement

Edge Insulating

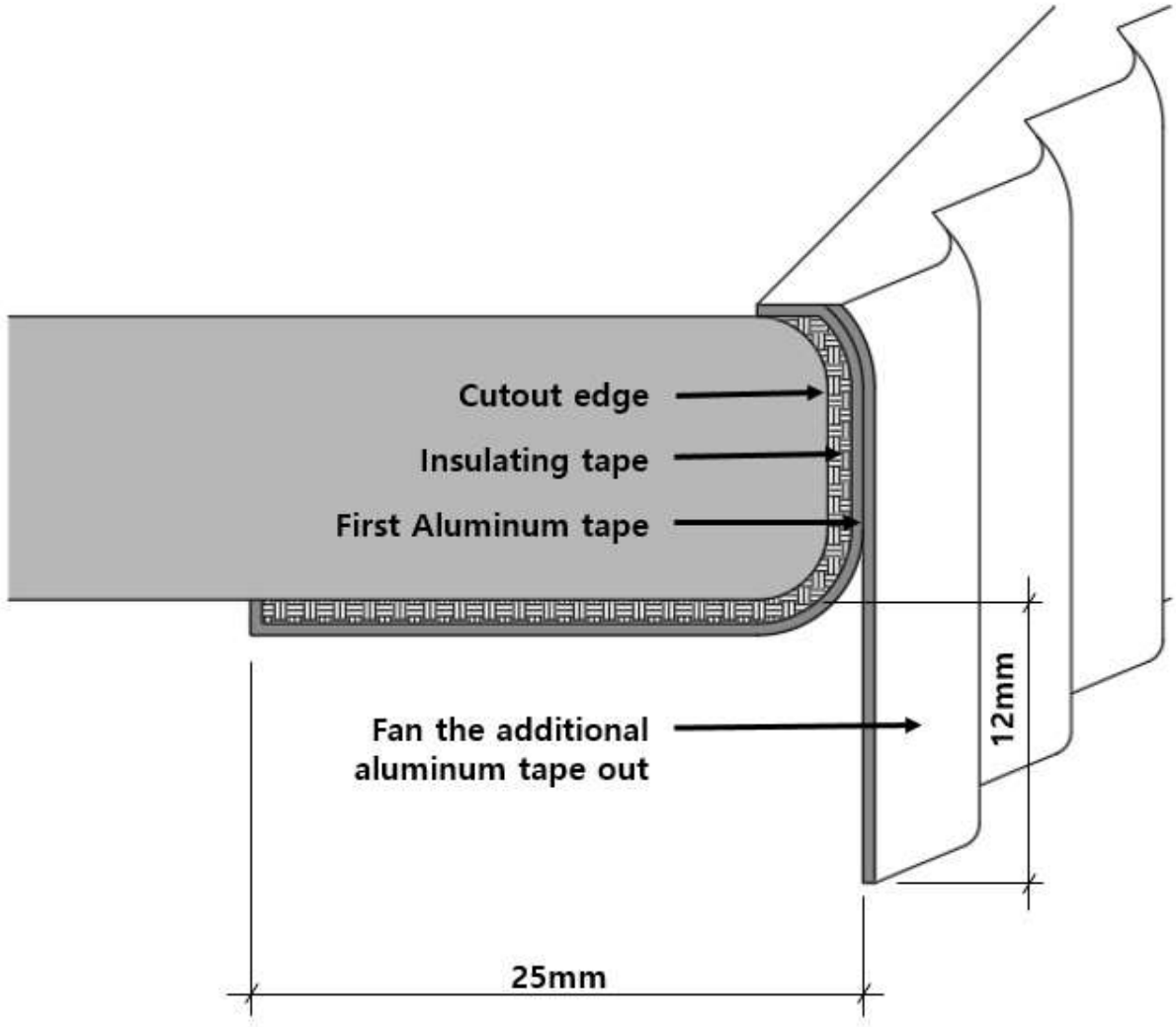
The **internal edges** of hob cut-outs must be protected with **heat-resistant materials**. Suitable options include:

- Self-adhesive **ceramic tape**

- **Neoprene tape**
- **Kaowool tape**
- **Nomex®**
- **Super Wool Paper®**
- Self-adhesive **aluminum reflective tape** (e.g., 3M, Tape No. 425)
- Other **heat-resistant materials** that provide sufficient protection for the specific residential or commercial heat-generating appliance can also be used.

Applying edge insulation and aluminum tape

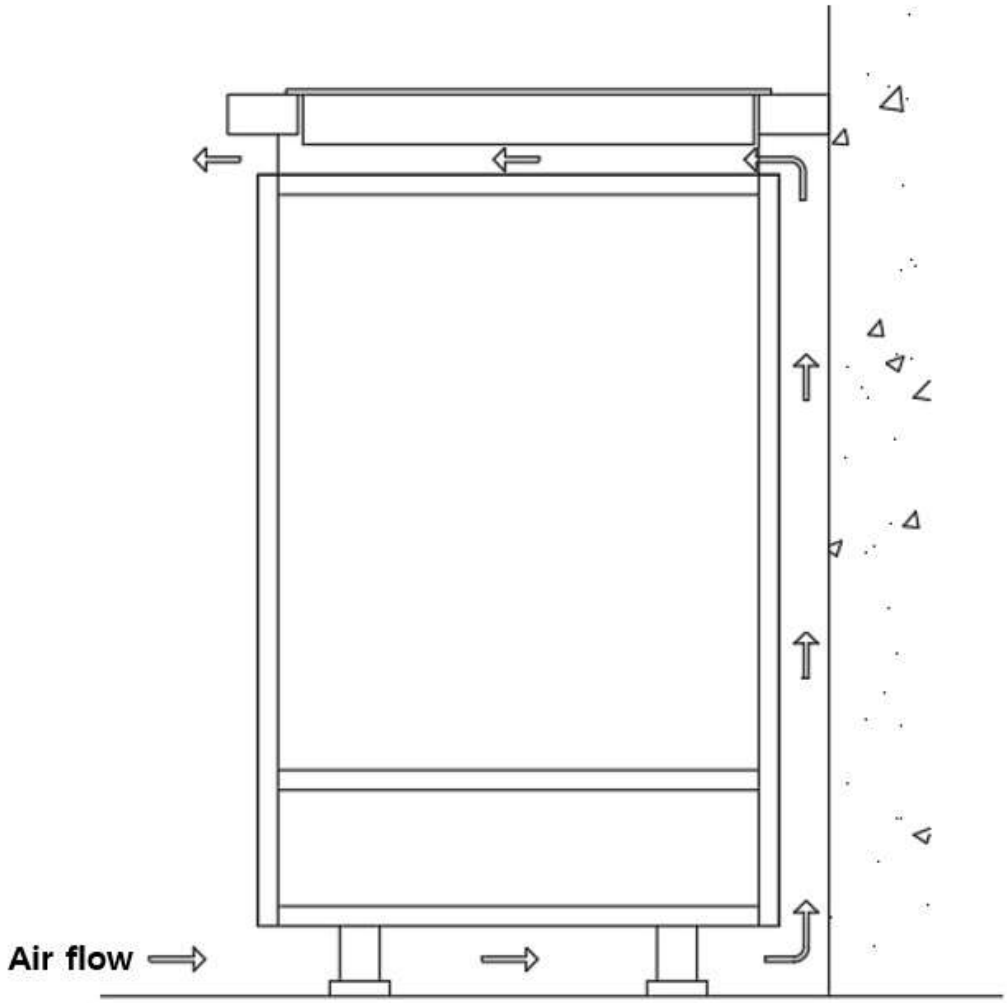
1. **Apply heat-resistant tape:** Carefully wrap self-adhesive **insulating tape** around the cutout edge and the underside of the top, extending up to **25 mm**.
2. **Use multiple layers:** Apply **multiple layers** of insulating tape whenever possible to increase heat protection.
3. **Cover with aluminum tape:** Place a layer of **aluminum tape** over the insulating tape.
4. **Add additional aluminum layers:** Apply one or more extra layers of aluminum tape on top of the first layer. Extend each aluminum tape layer at least **12 mm below** the cutout edge.
5. **Create a** heat sink effect**:** Fan out the aluminum tapes like **fins**. This increases the surface area, allowing heat to dissipate faster and reducing the risk of **cracks or burns**.



Insultation reinforcement

Ventilating

- Provide adequate **ventilation** in the cabinet housing the **cooktop**.
- Install a **vent and fan system** to help remove heat from the countertop area.
- Ensure **airflow** is sufficient to prevent heat buildup, which can cause **cracks or burns** in the HIMACS sheet.



Ventilation

This guideline has been created to provide technical information for successful fabrication and installation of HIMACS, and it is intended to be used in a safe environment considering their own discretion and risk by who has technical skill for fabrication and installation of HIMACS.

This guideline is continually revised to provide reliable and up-to-date information, replacing all previous versions of the guideline and technical information, however the usage and conditions of use are beyond LX Hausys control, LX Hausys cannot guarantee the suitability of material, fabrication and installation for all usage and conditions of use. Users should not regard or rely on this guideline as a complete, sole, up-to-date or absolute information. HIMACS users, fabricator and installer should review whether the design for HIMACS, fabrication method, installation method and required performance are suitable for the intended use and conditions of use. LX Hausys shall not be liable for any direct or indirect, commercial damages or losses caused by the fabrication and installation results of HIMACS using any or all these guidelines. In addition, the results of joining with other materials, and the fabrication and installation guidelines for other materials shall not be covered by LX Hausys.

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LX Hausys reserves the right to change the technical information and disclaimers in this guideline for technical development and further information, and the use of HIMACS or this guideline is considered to accommodate the information and changes provided in this guideline. Therefore, please check the changed details of this guideline from time to time.

9. Seaming

The primary objective in seaming is to achieve a flawless joint with no visible gaps. A perfect seam ensures structural integrity under normal use. Poorly executed seams may result in visible lines and potential cracking over time.

1. Edge Preparation

1.1 Machining HIMACS Sheets for Seam Joints

The process of machining two HIMACS sheets to form a seam joint may be undertaken using various methods.

Key Considerations:

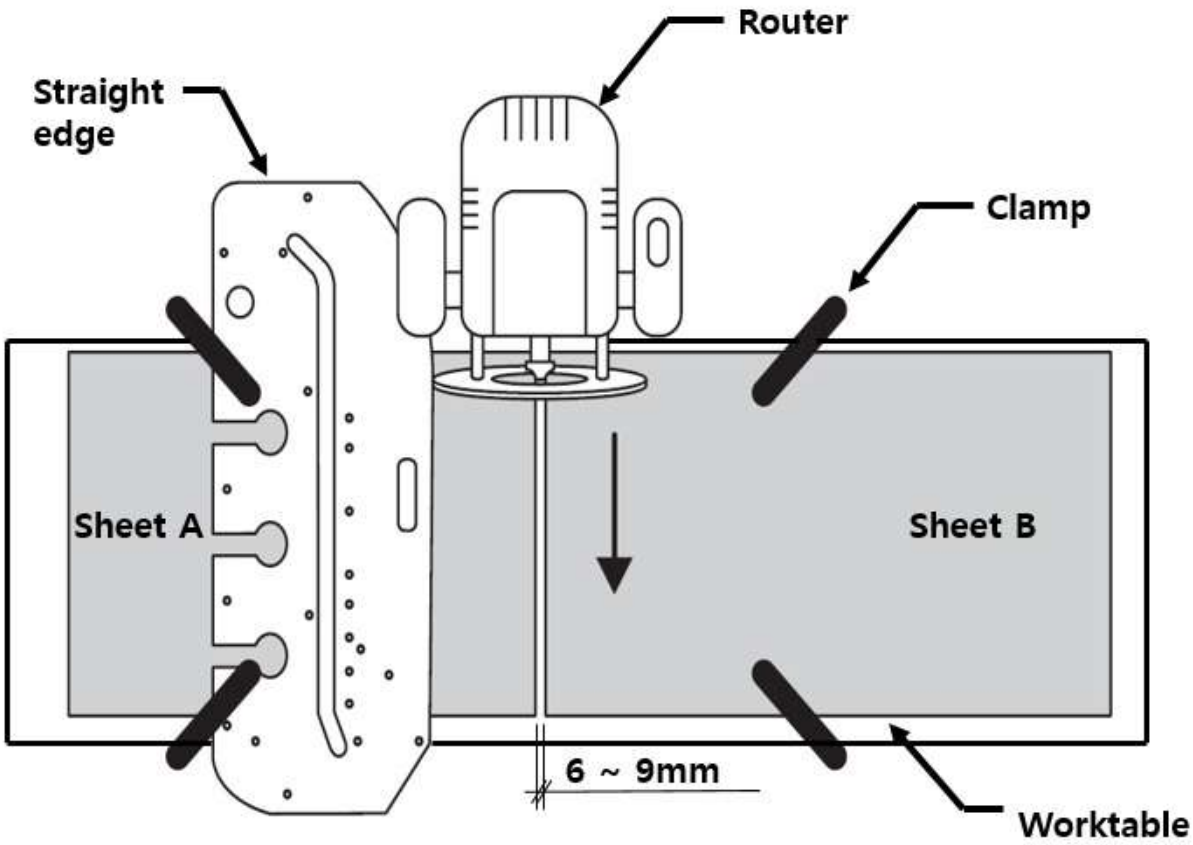
- The quality of the machined edge is paramount.
- Achieving a precise fit between the two machined pieces is the most critical aspect of preparation.
- Always strive to produce a seamless joint with no visible gaps by ensuring an exact fit.
- Prior to commencing preparation, confirm that the sheets to be joined are correctly positioned and manufactured in accordance with the production process.
- Bear the same batch number with consistent colour matching.

1.2 Mirror Cut

The most dependable method for creating a seam is the “mirror cut” technique, performed using a handheld router. This approach involves cutting both adjoining edges simultaneously in a single pass.

Procedure:

1. Ensure the work surface is free from dust or debris that could prevent the materials from being level, square, and perfectly aligned in the same plane.
2. Position the two pieces on a seaming table, leaving a gap of 6 to 9 mm between them, and secure them using G-clamps or screw clamps.
3. Fix a metal or compact straight edge to one of the sheets and to a sturdy, stable table. This straight edge will act as a guide for the router.
4. Fit a 12 mm double flute tungsten router bit into the handheld router. Move the router steadily in one direction, away from your body, cutting both sheets at once. Maintain a slow and consistent pace without pausing.
5. The 12 mm router bit will remove approximately 1.5 to 3 mm of material from each sheet, producing mirror-image edges.
6. After cutting, check that the joint aligns perfectly and mark the mating position with a pencil.



Mirror cut

1.3 Single Cut

An alternative method involves machining each edge separately using a standard workbench and a straight edge.

Procedure:

- Secure the workpiece to the bench and fix the straight edge to the sheet so that the router removes between 1.5 mm and 3 mm of material in total.
- Operate the router at a slow and steady pace without interruption.
- Repeat the process for the second sheet and then verify the accuracy of the joint.
- If the edges do not align correctly, one or both may need to be re-machined.

1.4 Other Cutting Methods

The use of CNC cutting and nesting programmes is becoming increasingly widespread. Such equipment is proving to be highly efficient, particularly for small-scale serial production or personalized requirements.

Recommendations:

- Ensure the router path is completely clear of clamps before commencing work.
- A square-based router enhances accuracy. With a single controlled pass, you can produce identical edges on both sheets to be joined, resulting in the best possible dry fit.
- Using a router bit with a wavy profile can help prevent discrepancies in thickness between the two workpieces.

1.5 Cleaning

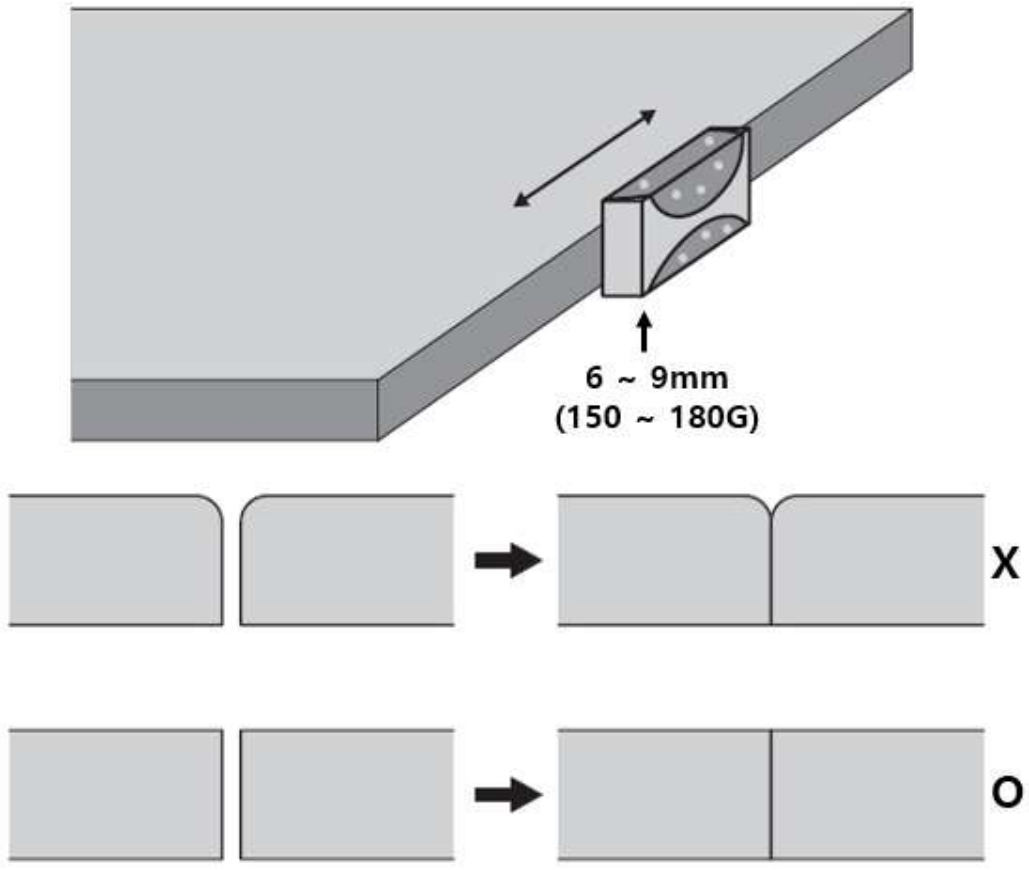
Following machining, both edges must be thoroughly cleaned and handled with care as outlined below:

- If the cut edges are rough, sand them using 150/180 grit abrasive paper. The edges should be sharp and clean after sanding.
- Remove any sheet identification numbers from the reverse side of the HIMACS sheets, as these may become visible through the seam.
- Clean the edges to be joined using a fresh, lint-free white cloth and denatured alcohol or acetone.
- Avoid using colored cloths or paper, as the alcohol may extract dyes that could stain the seam.

- Once cleaned, do not allow anything to met the edges. Even a single fingerprint can compromise the final seam quality.

Important Note:

The cloths used for cleaning must be genuinely lint-free. Not all white cloths are truly white.
Some are made from colored materials that have been bleached and may not yield consistent results. In certain cases, “white” cloths may have been treated with substances (such as fire-retardants used in children’s sleepwear) that could negatively affect the appearance or performance of the seam.



Edge Sanding

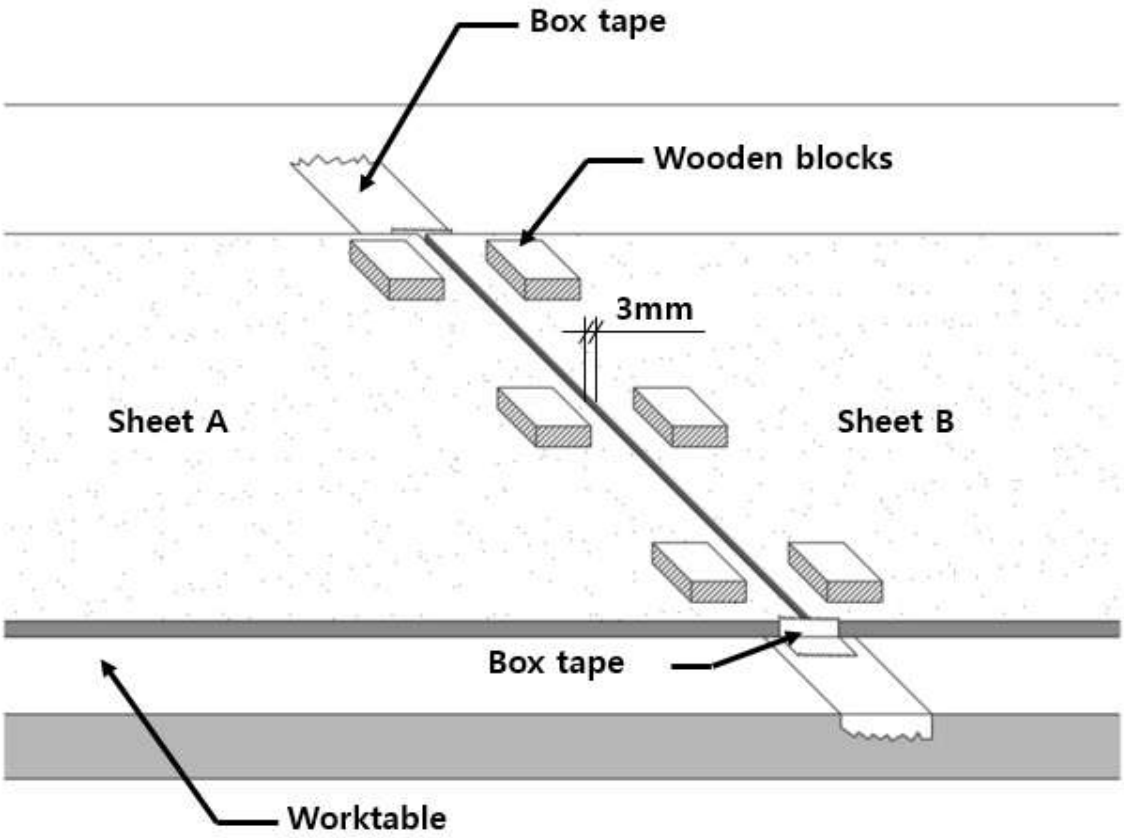
2. Standard Butt Seam

Bonding Preparation

Once the edges have been machined, sanded, and cleaned, they are ready for bonding.

Procedure

1. Ensure the work surface is free from any dust or debris that could prevent the sheets from being level, square, and perfectly aligned in the same plane.
2. Position both pieces to be bonded on a worktable that is large enough to fully support them.
3. Before applying adhesive, cover the tray beneath the seaming table with transparent tape or packing tape to catch any excess adhesive.
4. Clean both edges using a clean white cloth and denatured alcohol (acetone).
5. Adjust the sheets until the edge alignment is precise.
6. Once aligned, set the two pieces 3 mm apart.
7. Seal both ends of the HIMACS sheets with transparent tape or packing tape to prevent adhesive leakage.
8. Use a vacuum clamp system or alternative clamps such as G-clamps, screw clamps, or bar clamps to secure the seam. If not using a vacuum clamp system, affix small wooden blocks to both HIMACS sheets using hot melt glue to assist with clamping.
9. Prepare the HIMACS adhesive system and the appropriate clamping equipment.
10. Apply a continuous bead of adhesive along the entire length of the joint.
11. Press the sheets together so that a uniform bead of adhesive is expelled from the seam.
12. Inspect the seam to ensure adhesive has been evenly distributed along its full length. Any gaps in the bead indicate weak points; if present, repeat the process from step 10.
13. Clamp the assembly securely, but avoid over-tightening, as this may result in adhesive starvation and a weakened joint. The seam should be no wider than half the thickness of a sheet of paper.
14. Check the level of both sheets at the seam. If there is any discrepancy, adjust using a rubber mallet to ensure alignment.
15. Once the adhesive has fully cured and is firm to the touch, remove the clamps and any wooden blocks.
16. Remove excess cured adhesive using either a portable handheld router fitted with skis or a small block plane with a sharp blade. Avoid using chisels wherever possible.
17. Complete the process with final sanding.



Bonding setting's

Recommendations

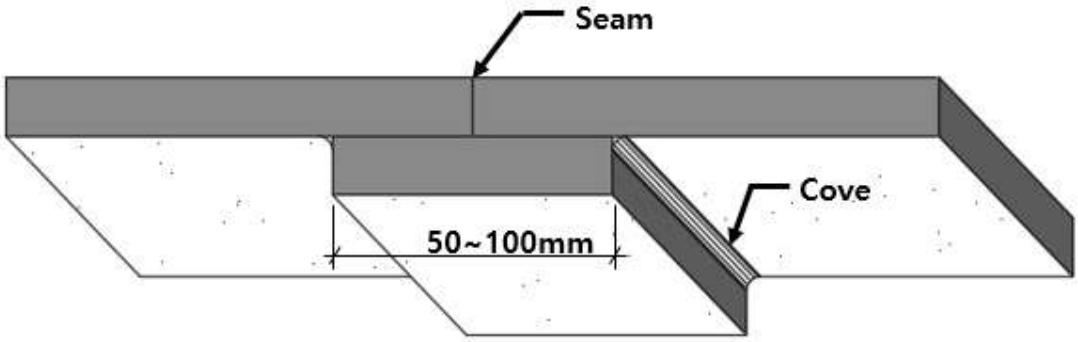
- Be mindful of clamping pressure. Excessive force is unnecessary and may result in a dry seam by squeezing out too much adhesive, thereby weakening the joint.
- Apply sufficient pressure to allow a consistent bead of adhesive to emerge from the seam.
- As the adhesive will shrink slightly during curing, avoid removing all excess from the joint immediately.
- Inspect the seam for any voids or air pockets and address these before the adhesive begins to set. Ensure the joint is tight and well-fitted.
- Any necessary adjustments must be made promptly, before the adhesive starts to harden.
- Allow the adhesive to cure for a minimum of 40 minutes under normal conditions, or until it is firm to the touch (e.g., resistant to a fingernail).
- Remove excess cured adhesive by levelling the seam using a router fitted with skis and a small levelling bit.
- Do not use a belt sander for this operation, as the heat generated may compromise the integrity of the seam.
- Complete the process by sanding all surfaces to a semi-gloss finish, in accordance with recommended guidelines.

3. Reinforced Seams

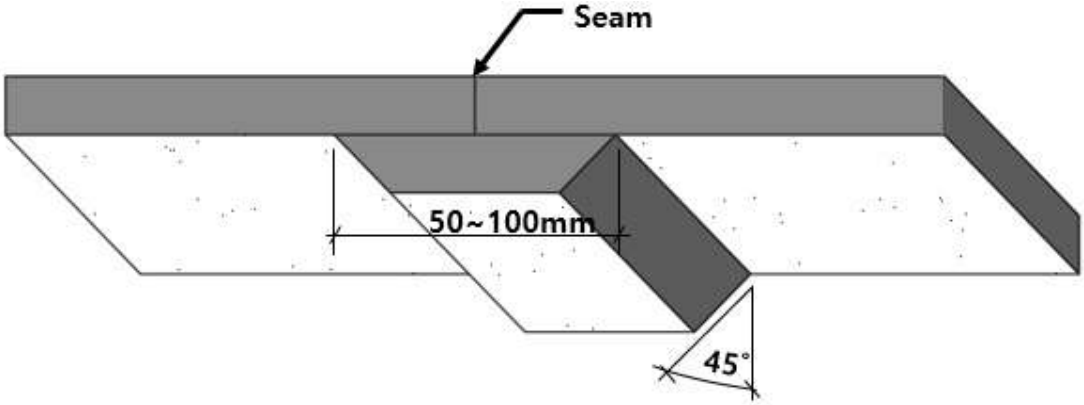
While properly executed standard butt seams are structurally sound, they remain the most vulnerable part of the assembly. To enhance their strength, it is advisable to reinforce the underside using offcut strips of HIMACS sheet. The reinforcement strip must be applied accurately along the full length of the seam's underside. It is recommended to use HIMACS strips of the same thickness and colour as the original sheets.

Procedure

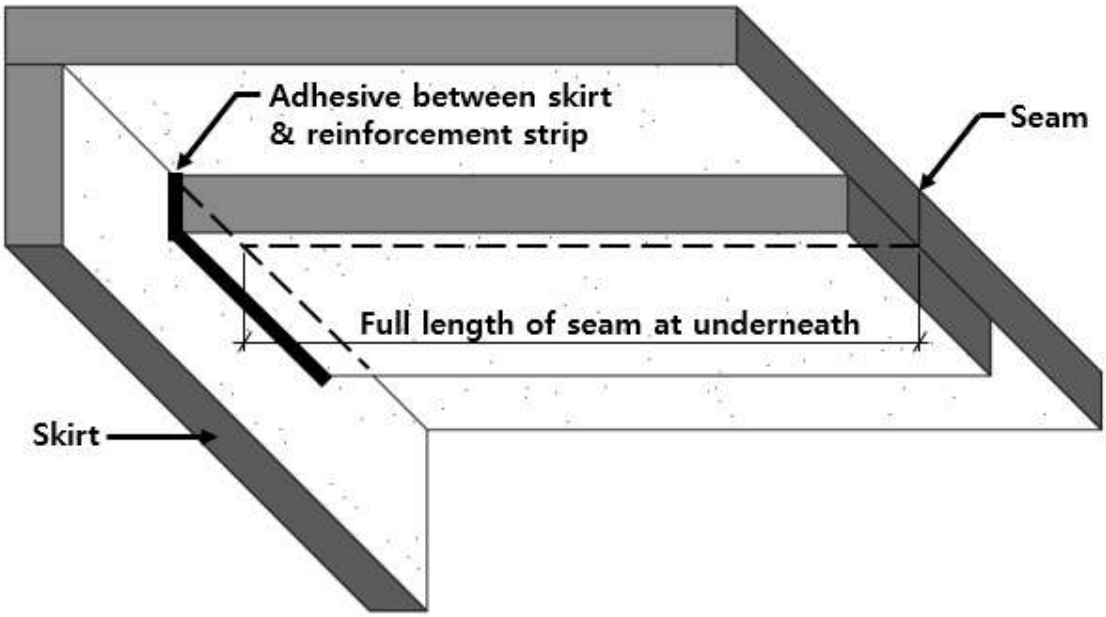
1. Invert the joined sheets.
2. Remove any cured excess adhesive from the reverse side using either a portable handheld router fitted with skis or a small block plane with a sharp blade. Avoid using chisels wherever possible.
3. Sand the reverse side with 150/180 grit abrasive paper and clean with denatured alcohol and a white cloth.
4. Prepare a reinforcement strip 50–100 mm wide and equal in length to the seam.
5. If the joint is likely to be exposed to heat, it is strongly recommended to bevel the edges of the reinforcement strip at a 45° angle.
6. Sand the surface of the reinforcement strip with 150/180 grit paper until smooth, then clean with denatured alcohol and a white cloth.
7. Use the same colour adhesive as used for the seam.
8. Apply adhesive to fully cover the surface of the reinforcement strip that will contact the sheet.
9. Position and attach the reinforcement strip evenly along the seam.
10. Press and clamp the strip firmly into place.
11. Ensure there are no voids or dry areas between the sheet and the reinforcement strip.
12. If a buildup strip (front skirt) is present, bond its ends to the reinforcement strip using joint adhesive.
13. Remove any excess adhesive that is expelled and smooth the edges to form a cove.
14. Complete the process with final sanding.



General
reinforcement section



Heating zone
reinforcement section



Joining with Skirt

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10. Sanding & Finishing

1. Material and Colour characteristics

Surface Finishing Guidelines

HIMACS sheets are factory-sanded prior to being covered with a protective film. This high-quality factory finish reduces the amount of final sanding required by fabricators, whether in the workshop or on-site.

However, the factory finish is not intended to serve as the final surface. All visible surfaces of the finished product must be properly sanded and/or polished by the fabricator or installer.

Please note that the recommended standard finish for HIMACS sheets is a semi-gloss finish. A high-gloss finish may also be applied, but it is best suited for artistic applications or installations that are not subject to frequent handling.

Avoid overstating the performance of any finish, especially when working with darker colours or satin/gloss finishes. For instance, dark or black colours are not recommended for a matte finish, as they tend to show fingerprints and oil marks from hand contact.

Important Note

Dark or richly coloured patterns require more meticulous and time-consuming finishing compared to lighter tones to achieve satisfactory results across all finish types. Therefore, it is essential to consult with and obtain agreement from the client during the project planning stage.
Additionally, as the gloss level increases through sanding and polishing, these patterns may exhibit more noticeable colour variation. For this reason, a low-gloss (matte) finish is strongly recommended for such designs. High-gloss or gloss finishes are not advised.
If a high-gloss or gloss finish is nonetheless selected, it is crucial to ensure that all sheets used originate from the same production batch and have closely matching production numbers to minimize visual inconsistencies.

High-gloss finishes, regardless of colour, are not recommended for surfaces in high-traffic or high-use areas, such as countertops, as they are prone to visible wear and scratching and require ongoing maintenance.

2. Tools and Machines

Sanding Equipment and Techniques

The best finishes are typically achieved using a random orbital sander powered by either air or electricity.

In most cases, a sanding pad with a diameter of 150 mm is used, as sandpaper discs of this size are widely available on the market. For larger surface areas, it is advisable to use the largest sanding pad available—up to 500 mm or 600 mm in diameter—when working with handheld machines.

Extensive sections of HIMACS sheets can be sanded using a wide belt sanding machine equipped with at least three belts in a row. This method allows for more accurate estimation of fabrication and labour costs.

Avoid using a handheld belt sander, as it generates excessive heat which may compromise the integrity of the seam. Additionally, belt sanders are highly aggressive and can remove material too quickly, potentially causing fabrication issues if more material is removed than intended.

For specialized applications or specific fabrication processes, wet sanding may be preferable, as it helps to reduce and control dust more effectively. Ensure that all equipment used is waterproof or water-resistant, and that water is used in an environmentally responsible manner—ideally with a recycling system.

Dust control is always recommended during any sanding operation.

3. Sanding Techniques For High Quality Results

The quality of the finish may vary depending on the skill of the operator. Achieving a high-quality result requires proficient sanding and polishing techniques.

To minimize or eliminate sanding marks or cloudy shadowing on the surface, LX HAUSYS recommends adhering to the following minimum standards for standard finishing:

- Prior to sanding, always inspect the surface condition of the HIMACS sheets.
- Vacuum the surface to remove any dirt or dust, ensuring it is clean and ready for sanding.
- If there are large or deep scratches that cannot be removed through sanding, they should be repaired or re-fabricated to avoid wasted time and compromised quality.
- Check the flatness of the sheets and seams. Any significant deviation should be corrected before sanding to ensure a high-quality finish.
- Use the same type of sandpaper throughout all finishing stages. Mixing sandpaper types is not recommended.
- Hard pads are suitable for flat and straight surfaces, while soft pads are preferable for curved areas.
- Ensure the sandpaper disc is centred on the sanding pad of the sanding and polishing machine. Follow the manufacturer’s instructions for proper use.
- Between each sanding stage, clean the surface using denatured alcohol and a clean white cloth. Removing dust between steps is essential for achieving optimal results.
- Apply consistent pressure and overlapping strokes in both directions across HIMACS surfaces. Complete one direction before beginning the next.

- Avoid excessive pressure during sanding; maintain even pressure and speed throughout.
- Do not focus on a single area, especially near seams and edges, as this may cause unevenness or dips.
- Regularly change or clean the sandpaper, as it will quickly become clogged.

> **Note:**
>
> As you progress towards a finer finish, sandpaper will clog more rapidly. If this is not managed properly, it may prevent you from achieving a consistent, high-quality gloss finish.

How to Achieve High-Gloss Finishes

- Use lower speeds during both sanding and polishing.
- Conduct visual inspections at each stage of the finishing process.
- Employ strong lighting to highlight imperfections such as swirl marks.
- Avoid disputes by thoroughly inspecting each project before final delivery.

In Case of Finishing Issues:

- Use random sanding motions, such as circular or figure-eight movements, to improve surface consistency.

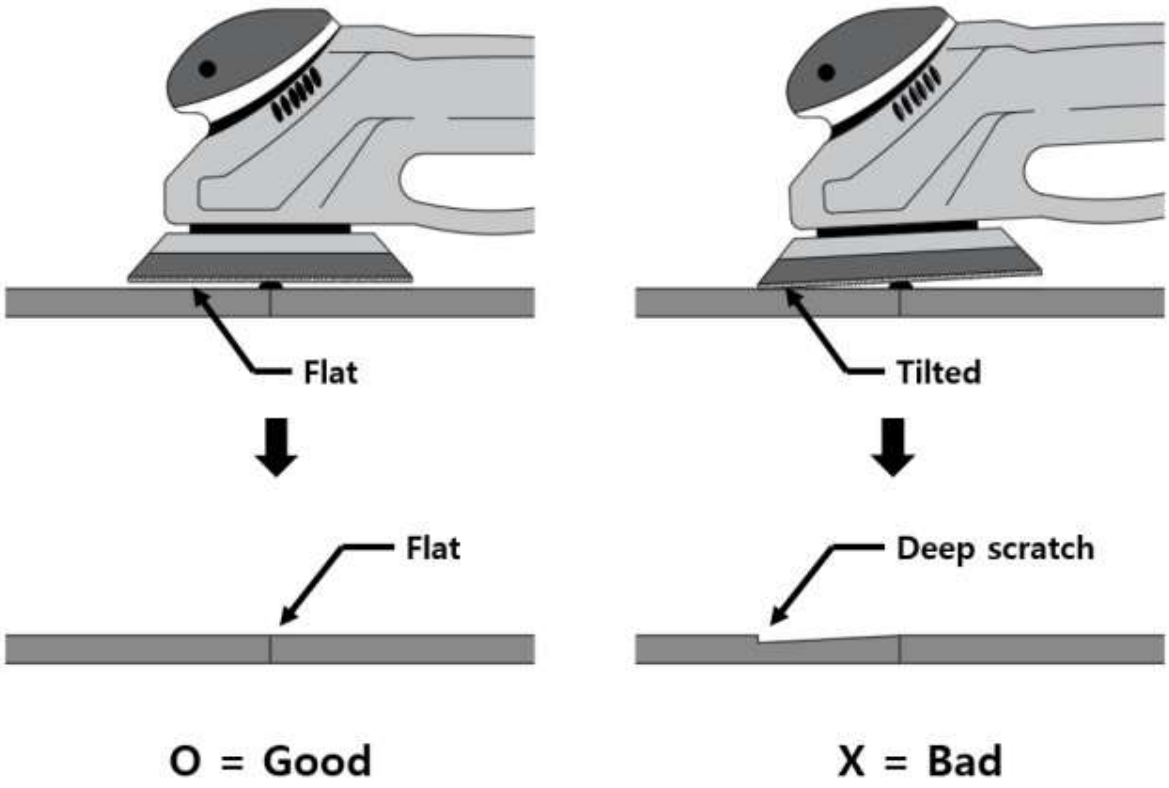
3.1 Uneven Seams Treatment

Levelling Uneven Seams

Uneven seams can be levelled using rigid 60 to 80 grit abrasive paper and a gear-driven orbital sander.

- Attach the abrasive paper to the sanding pad of the orbital sander and set it to a standard pattern.
- Carefully maintain the sanding pad flat against the surface during grinding to avoid deep scratches on the HIMACS sheets.

- Do not attempt to level the seam in a single pass.
- Avoid focusing solely on the seam area.
- Grinding is an aggressive process; excessive grinding can cause undulations due to dipping.
- Lightly grind a broader area around the seam for a few seconds, then inspect the result.
- Repeat this process until the seam is evenly levelled.



3.2 Sanding Method Recommendations

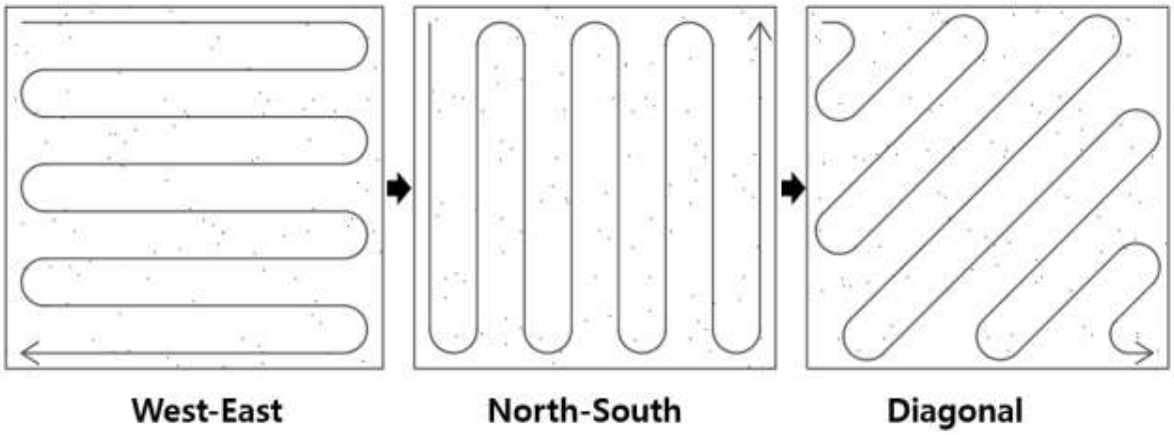
Using the Correct Abrasive Paper

Always follow the recommended sanding sequence.

How to Begin:

- Start the sanding process from your body position, moving from left to right (West to East).

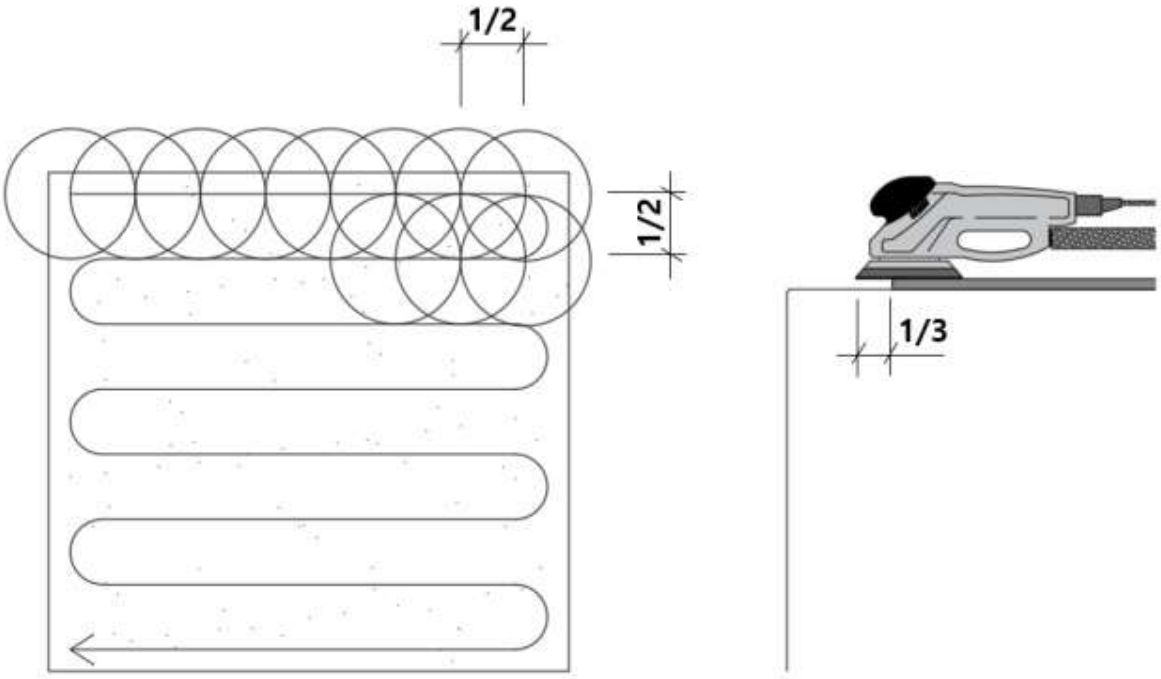
- Complete the sequence by returning to the starting point.
- Begin the second sanding pass from top to bottom (North to South) across the surface.
- Again, finish at the starting point.
- Perform a third sanding pass diagonally across the surface, ending at the starting point.
- Each sanding sequence should be repeated two to three times per grade of abrasive paper used.



Using the Correct Abrasive Paper

To achieve a consistent visual finish, operate the sanding machine slowly while maintaining a flat position. Apply continuous circular movements throughout the process. Each circular motion should overlap approximately 50% of the previously sanded line.

> **Example**
>
> If using a 150 mm sanding disc, ensure each pass overlaps by 75 mm.
> When working near edges, do not allow the sanding pad to extend more than 30% beyond the edge, as this will reduce sanding efficiency.



4. Finish Grade

Before applying any finishing method, ensure that all sanding procedures outlined in Section 3.2 have been fully completed and that the surface has been properly cleaned.

4.1 Matt Finish

A matt finish is only recommended for light-coloured HIMACS sheets. It is not advisable for darker shades or black, as these colours are more likely to show oil or fingerprints from handling, and may also develop cloudy marks during the sanding process.

LX Hausys cannot be held responsible for any dissatisfaction resulting from the use of this finishing method on unsuitable colours.

Sanding Action	Matt Finish
Step 1	Use abrasive grit between 120 and 150 (approx. 100μ)
Step 2	Remove dust and thoroughly clean the surface
Step 3	Use abrasive grit between 180 and 240 (approx. 60μ)
Step 4	Remove dust and thoroughly clean the surface
Step 5	Use a 3M Scotch-Brite® 7447 (Brown) pad
Step 6	Remove dust and thoroughly clean the surface

4.2 Satin & Semi-gloss Finish

A semi-gloss finish is the recommended standard for the fabrication of HIMACS sheets. However, it is important to note that there is no universally defined appearance for a semi-gloss finish. A satin finish may be used as an alternative where appropriate.

Sanding Action	Satin & Semi-Gloss Finish
Step 1	Use abrasive grit between 120 and 150 (approx. 100µ)
Step 2	Remove dust and thoroughly clean the surface
Step 3	Use abrasive grit between 180 and 240 (approx. 60µ)
Step 4	Remove dust and thoroughly clean the surface
Step 5	Use abrasive grit between 300 and 400 (approx. 30µ) – Satin Finish
Step 6	Remove dust and thoroughly clean the surface
Step 7	Use abrasive grit 600 (approx. 15µ) – Semi-Gloss Finish
Step 8	Remove dust and thoroughly clean the surface
Step 9	Use a 3M Scotch-Brite® 7448 (Grey) pad
Step 10	Remove dust and thoroughly clean the surface

4.3 Gloss / High Gloss Finish

Gloss and high-gloss finishes are not recommended for dark or black HIMACS colours.

While these finishes can enhance the aesthetic appeal of HIMACS products, it is important to note that scratches and wear from regular use are more visible at this level of gloss. Gloss and high-gloss finishes require frequent maintenance to preserve their appearance.

LX Hausys does not recommend these finishes for areas subject to heavy use or high footfall.

Furthermore, LX Hausys cannot be held responsible for any dissatisfaction resulting from the use of these finishes on colours deemed unsuitable.

Sanding Action	Gloss Finish
Step 1	Use abrasive grit between 120 and 150 (approx. 100μ)
Step 2	Remove dust and thoroughly clean the surface
Step 3	Use abrasive grit between 180 and 240 (approx. 60μ)
Step 4	Remove dust and thoroughly clean the surface
Step 5	Use abrasive grit between 300 and 400 (approx. 30μ)
Step 6	Remove dust and thoroughly clean the surface
Step 7	Use abrasive grit 600 (approx. 15μ)
Step 8	Remove dust and thoroughly clean the surface
Step 9	Use abrasive grit between 1000 (approx. 9μ) and 3000 (approx. 5μ)
	Polished Finish (High-Gloss)
Step 10	Remove dust and thoroughly clean the surface
Step 11	Use 3M Super Duty 2+2 White Pad with 3M Marine Paste Compound 06039 (White) or 3M Trizact 3000
Step 12	Remove polishing residue and clean the surface
Step 13	Use 3M Super Buff (Wool) Yellow Polishing Pad with M Finishing Material 81235 (White) or Trizact 5000
Step 14	Remove polishing residue and clean the surface

Note

Various polishing pads and compounds are available on the market. The pads and compounds listed above are provided as examples. Additional high-quality pads and compounds utilising the latest chemical technologies are also commercially available. The minimum standard for pads and compounds should be marine-grade or automotive-grade.
Please consult your supplier of polishing products and/or equipment for specific recommendations.
Most polishing compounds are not suitable for use on surfaces intended for food contact. Ensure that the finished surface is thoroughly cleaned and free from any compound residue.
Be aware that polishing generates significant heat. Apply moderate and consistent pressure while buffing to avoid overheating the surface or damaging the gloss finish.

HIMACS Colours That Require Particular Care

Category	Code	Colour
Solids	S005	GREY
Solids	S103	CONCRETE GREY
Solids	S109	STEEL GREY
Lucent	S302	OPAL
Lucent	S303	SAPPHIRE
Lucent	S304	RUBY
Lucent	S305	EMERALD
Granite	G002	GREY SAND
Granite	G004	WHITE QUARTZ
Granite	G010	BLACK PEARL
Gravilla	GM03	GRAVILLA MILLSTONE

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11. Thermoforming

1. Thermoforming

HIMACS Material Properties and Thermoforming Technology

HIMACS possesses unique material properties that allow it to be thermoformed into two- or three-dimensional shapes through a controlled heating process. This enables the creation of curved and complex designs. However, the 3D thermoforming process cannot be precisely standardised due to the diversity and complexity of potential applications.

Various parameters can influence the thermoforming process, each affecting the final appearance and characteristics of the finished product. Thermoforming is considered one of the most advanced fabrication techniques available for HIMACS, offering significant scope for creative expression.

To ensure optimal results in thermoforming, LX Hausys Europe GmbH, in collaboration withGLOBAL MACHINES / NABUURS DEVELOPMENT, provides a comprehensive range of tools and accessories tailored to support your thermoforming activities.

Please visit the website : www.globalvacuumpresses.com

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Definition: What is Thermoforming?

Thermoforming is a plastic manufacturing process that utilises pressure, heat, or vacuum force to stretch thermoplastic material over a mould, forming a three-dimensional shape, component, configuration, or other plastic product.

HIMACS belongs to the thermoplastics group due to its molecular structure. Through a preheating process, it can be transformed into a thermoelastic material, allowing it to be shaped accordingly.

Please note that **LX Hausys Europe GmbH** does not cover any material defects or unsatisfactory results arising from the thermoforming process under its warranty.

Safety

During the thermoforming process, HIMACS reaches very high temperatures. It is essential to protect all parts of your body and to ensure the safety of your colleagues and surroundings to prevent injury. All applicable safety rules and regulations in your area must be strictly observed.

Important Information Regarding HIMACS Quality

Although LX Hausys exercises great care throughout the manufacturing and post-production processes of HIMACS, it is strongly recommended that a visual inspection of the product be carried out prior to use.

It is also advisable to record the following details for quality assurance and traceability purposes:

- **Product traceability:** Sheet number / batch number
- **Thermoforming parameters:** Temperature / duration / pressure
- **Ambient conditions:** Temperature and any other relevant environmental factors

2. Material Characteristics

2.1. Condition Of Deformation

Thermoforming HIMACS Sheets

HIMACS sheets can be transformed from a rigid state into a flexible form through heating at the appropriate temperature and duration. This allows the material to be shaped without cracking or breaking. Therefore, achieving successful thermoforming results depends critically on using the correct heating conditions.

For HIMACS sheets with a thickness of 12 mm, the recommended heating temperature ranges between **155°C and 175°C**, with a heating time of **12 to 30 minutes**.

However, these parameters should be carefully adjusted based on:

- The thickness of the HIMACS sheet
- Ambient workshop temperature
- The performance and characteristics of the heating equipment used

It is important to note that **insufficient or excessive heating** can lead to thermoforming failure. Never exceed a temperature of **204°C**, as this may result in:

- Discolouration
- Burning
- Cracking
- Reduced durability of the final product

HIMACS sheets transition from a rigid to a flexible state when heated under appropriate conditions, allowing them to be shaped without damage. The key to successful thermoforming lies in applying the correct temperature and duration.

THERMOFORMING CONDITIONS

HIMACS THICKNESS	HEATING TEMPERATURE	HEATING TIME
6 mm	155 °C to 175 °C	6 to 20 minutes
12 mm	155 °C to 175 °C	12 to 30 minutes

These values should be fine-tuned based on factors such as sheet thickness, ambient workshop temperature, and the performance of the heating equipment used.

Important Note:

Do not exceed a temperature of204°Cwhen heating HIMACS sheets. Excessive heat may cause discolouration, burning, cracking, and a reduction in product durability.

Cooling Conditions for Thermoformed HIMACS Sheets

- Once HIMACS sheets have been heated and shaped, they must be cooled under appropriate conditions to maintain their integrity.
- The material remains pliable above **60°C**, and cooling too rapidly may cause thermal shock, potentially leading to cracking or breakage.
- To prevent unintended deformation or damage, thermoformed HIMACS sheets should remain secured under pressure on the mould until they have cooled to **60°C**.
- This cooling process should take place at room temperature over a period of approximately **40 to 60 minutes**.

2.2. Limitations of thermoforming HIMACS Sheets

- While thermoforming enables the realisation of imaginative and inspired designs, HIMACS sheets do have certain limitations that must be considered.
- The process may result in slight dimensional and visual changes, such as alterations in thickness, colour, or pattern.
- Excessive bending can lead to cracking, tearing, or chipping of the base material.
- When HIMACS sheets are thermoformed into curved shapes, the bent areas typically become thinner than the original sheet, and the pattern may stretch.
- A whitening effect—where the colour lightens, often turning white—can occur. This effect is more pronounced in tighter curves and darker colours.
- Fabricators must be aware of and adhere to the limitations of thermoforming HIMACS sheets. Particular care should be taken when working with darker or black colours.
- For guidance, refer to the recommended fabrication standards for **2D thermoforming**. As previously noted, **3D thermoforming** cannot be clearly standardised due to the wide variety and complexity of applications..

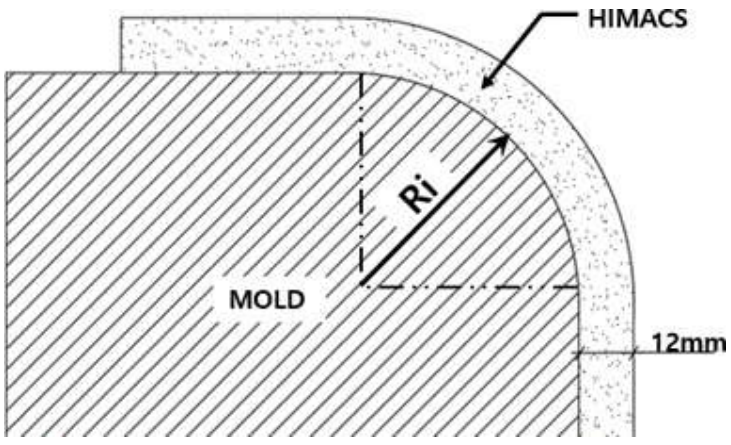
MINIMUM INSIDE RADIUS FOR 2D APPLICATION

HIMACS THICKNESS	PATTERN	Minimum inside radius (Ri)
6 mm	**Solids**	Ri ≥ 20 mm
12 mm	Ultra-Thermoforming – **Ultra**	Ri ≥ 6 mm
12 mm	**Solids** - **Lucent**	Ri ≥ 50 mm
12 mm	**Granite** – **Concrete***	Ri ≥ 60 mm
12 mm	**Aurora**, S728B	Ri ≥ 100 mm
12 mm	**Lucia** / **Marmo** / **Volcanics** / **Aster** / **Gravilla** / **Concrete***	Ri ≥ 200 mm
12 mm	**Terrazzo**	Not Recommended

*Please refer to the colour codes to identify the appropriate minimum internal radius specifications. For detailed guidance, consult Technical Data Sheet.

Important Notice – Lucia, Marmo, Volcanics, Aster
Please be aware that the Lucia, Marmo, Volcanics, and Aster series may be prone to chip cracking or chip loss, even when thermoformed with a radius of 200 mm or greater.

- Users should take this risk into account and carry out appropriate post-processing repairs if required.
- For this reason, **thermoforming of these series is not recommended**.



Inside radius description

2.3 Expansion & Shrinkage

Thermal Expansion of HIMACS Sheets

HIMACS sheets expand or contract in response to temperature changes.
The degree of expansion or contraction can be calculated.

When creating moulds or operating machinery, this dimensional change must be taken into account. If the moulds are too small, the edges may become misshapen. Similarly, expanded sheets may interfere with machine operation.
Therefore, it is essential to consider the thermal behaviour of HIMACS sheets—either through calculation or based on prior experience—before commencing the thermoforming process.

> **Information:**
> At a temperature variation of 100°C, thermoformed sheets will expand or contract by approximately ±4.50 mm per linear meter.

2.4 Formulation Change

> **Important Information:**
> Once heated, HIMACS sheets do not revert to their original composition. Reheating is strictly prohibited, as it adversely affects the material's bending properties.
> Subsequent heating cycles may result in mechanical failure, reduced performance, and noticeable colour alteration.
> For consistent and reliable results, HIMACS sheets must only undergo a single heating process. Reheating will compromise product integrity and is not recommended.

Thermoforming Restrictions on Seamed HIMACS Sheets

Warning:

Thermoforming must not be performed on seamed HIMACS sheets. The seam line is structurally weaker and may be compromised under heat and pressure.

- **Risk of Damage:** The seam line is prone to discolouration and tearing during thermoforming.
- **Material Incompatibility:** HIMACS adhesives may react differently to heat compared to the sheet material, increasing the risk of failure.
- **Structural Integrity:** The seam line does not possess the same thermal resistance as the original sheet, making it unsuitable for thermoforming applications.

Safety Precaution:
Always use non-seamed sheets for thermoforming to ensure product integrity and avoid performance issues.

Important Thermoforming Considerations

Overstating the thermoforming capabilities of HIMACS may lead to customer dissatisfaction. Individual tolerance for colour changes and whitening effects varies, and expectations should be managed accordingly.

Long-Term Effects of Improper Thermoforming:

- **Reduced Service Life:** Excessive or incorrect thermoforming can significantly shorten the lifespan of the finished product.
- **Delayed Defects:** Visual imperfections may not be immediately visible post-thermoforming. However, microcracks and changes in the material's formulation may develop over time.
- **Structural Integrity Risks:** These hidden defects can compromise the product's mechanical performance, leading to failures during regular use.
- **Aesthetic Degradation:** Colour inconsistencies and surface whitening may become more pronounced with age and environmental exposure.

Recommendation:
Strict adherence to HIMACS thermoforming guidelines is essential to ensure product durability, maintain aesthetic quality, and meet customer expectations over the long term.

3. Required Tools & Equipment For Thermoforming

To perform thermoforming correctly and safely, the following tools and equipment are required:

- **Personal Protective Equipment** (PPE): Suitable for handling hot surfaces, compliant with relevant health and safety regulations.
- **Heating Equipment:** A reliable device capable of delivering consistent and controlled heat.
- **Temperature Monitoring Device:** For accurate measurement and regulation of sheet temperature throughout the process.
- **Forming Equipment:** Such as a vacuum press or equivalent system.
- **Custom Moulds:** Appropriately designed and adapted to the desired shape and specifications.
- **Controlled Workshop Environment:** A workspace with regulated ambient conditions to ensure consistent thermoforming results.

Maintenance Advice for Equipment

To ensure safe operation and consistent product quality, regular maintenance of thermoforming equipment is essential:

- **Heating Devices:**
    - Inspect heating elements regularly for wear or uneven heat distribution.
    - Clean surfaces to prevent residue build-up that may affect performance.
    - Calibrate temperature settings periodically to maintain accuracy.
- **Temperature Monitoring Instruments:**
    - Verify calibration at scheduled intervals.
    - Replace batteries or sensors as needed to ensure reliable readings.
- **Forming Equipment (e.g., Vacuum Press):**

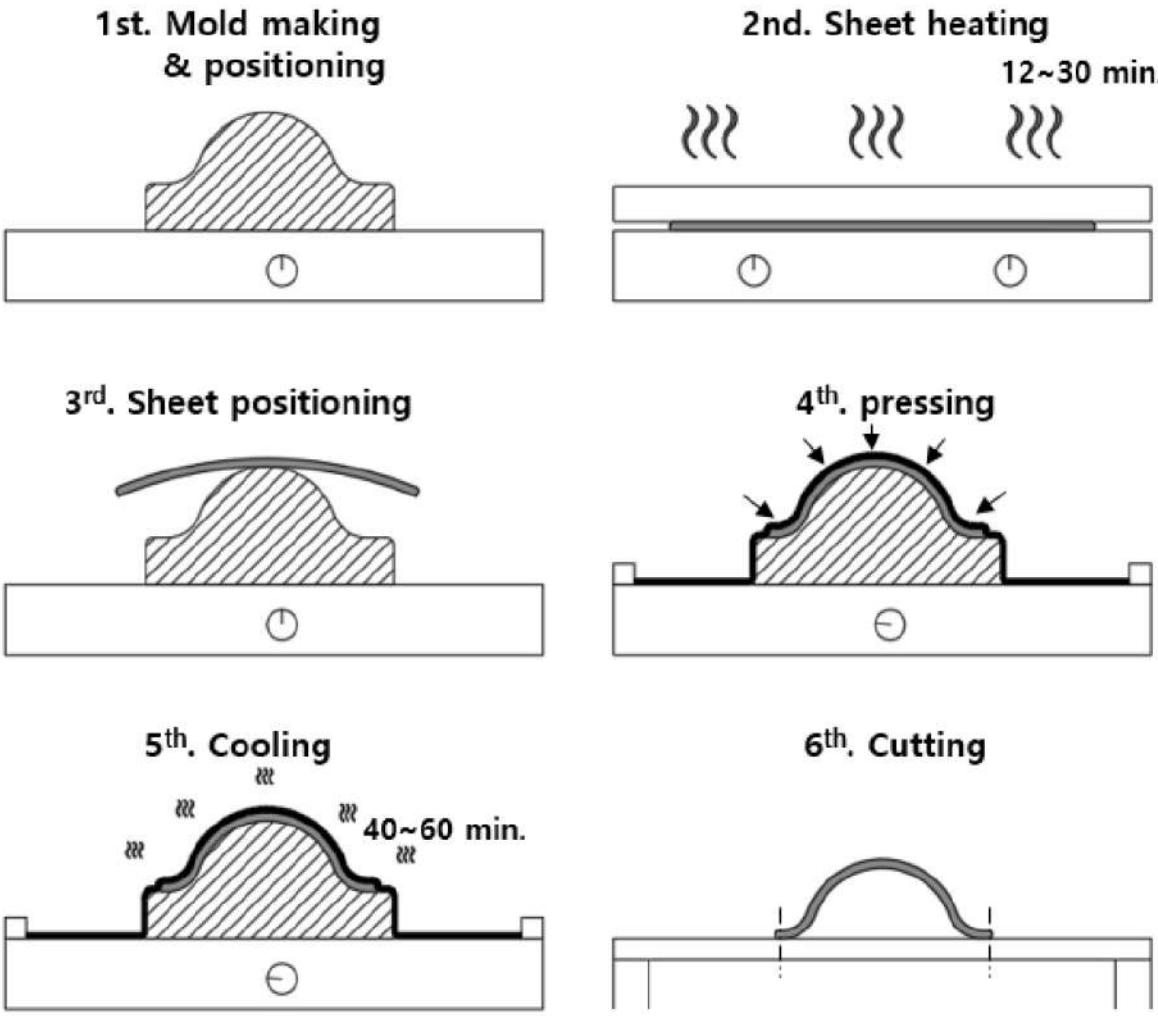
    - Check seals and vacuum lines for leaks or degradation.
    - Lubricate moving parts according to manufacturer guidelines.
    - Ensure control systems are functioning correctly.
- **Moulds:**
    - Clean thoroughly after each use to prevent contamination.
    - Inspect for cracks, Warping, or surface damage that could affect forming precision.
- **Workshop Environment:**
    - Maintain stable temperature and humidity levels.
    - Ensure proper ventilation and cleanliness to avoid dust or debris interfering with the process.

4. Basic Thermoforming Procedure

Thermoforming can be carried out using various methods and equipment; however, the fundamental process steps remain consistent. Please follow the recommendations outlined below:

1. **Review the Design**
   Examine the technical drawing and prepare the mould accordingly.
2. **Prepare the Sheet**
   Remove the protective film and cut the HIMACS sheet to the required dimensions.
3. **Edge Preparation**
   Smooth the edges of the cut sheet by sanding to prevent stress points during forming.
4. **Heating**
   Heat the sheet uniformly to the recommended forming temperature.
5. **Forming**
   Place the heated sheet onto the mould and apply pressure using a press or vacuum forming machine.
6. **Cooling**
   Allow the formed sheet to cool at room temperature for approximately 40 to 60 minutes.
7. **Trimming**
   Cut the thermoformed piece to the final size as per the design specifications.
8. **Assembly and Finishing**
   Join components as required and carry out final finishing operations.

- Refer to the following page for basic thermoforming process diagrams.



5. Mould Planning & Design For Complex Shapes

Thorough review of technical drawings and careful mould planning is the first and most critical step in achieving successful thermoforming with HIMACS sheets.

Certain shapes and dimensions may not be feasible in a single piece due to limitations in sheet format or equipment capability. Moulds may be designed for single-use applications or for long-term repetitive forming. As moulds represent a significant portion of the overall thermoforming cost, it is essential to optimise their design for both quality and cost-efficiency.

Design Tips for Complex Shapes

To ensure successful forming of intricate or non-standard geometries, consider the following:

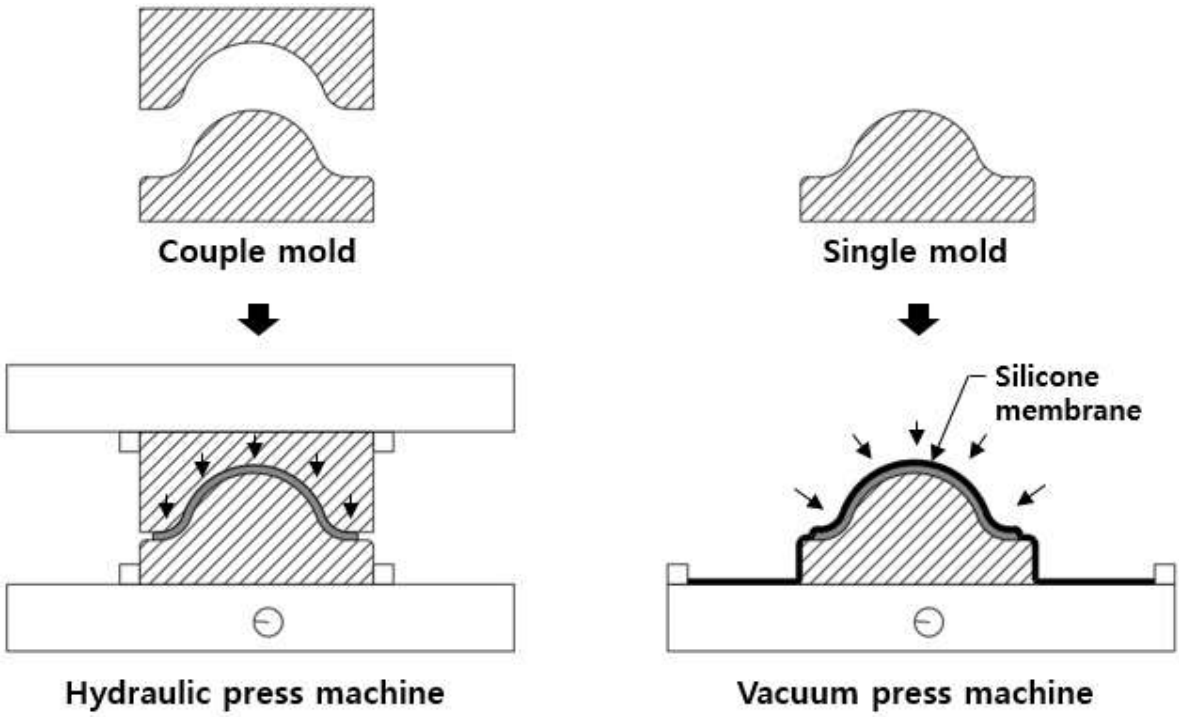
- **Segmented Moulds:** For large or complex shapes, design the mould in multiple sections to allow easier handling and more precise forming.
- **Draft Angles:** Incorporate appropriate draft angles to facilitate removal of the formed sheet without damaging the surface.
- **Uniform Wall Thickness:** Maintain consistent wall thickness across the design to prevent uneven heating and deformation.
- **Ventilation Channels:** Include vents in the mould to allow air escape during vacuum forming, ensuring better surface contact and detail reproduction.
- **Material Selection:** Use mould materials that can withstand repeated heating cycles without warping or degrading.
- **Reinforcement Zones:** Reinforce areas subject to high pressure or stress during forming to maintain shape integrity.
- **Test Prototypes:** Before full production, create prototype moulds to validate shape feasibility and adjust design parameters as needed.

5.1. Moulds Types

Mould Types and Forming Methods

The type of mould used in thermoforming depends on both the forming equipment and the mould's structural design.

- **Matched Moulds (Male/Female):**
  These are typically used with hydraulic presses or manual forming methods. While effective for simple or repetitive shapes, matched moulds are **not recommended** for complex 3D geometries due to limitations in flexibility and detail reproduction.
- **Single-Sided Moulds:**
  Used in conjunction with vacuum forming machines, single moulds are more suitable for producing **larger and more intricate shapes** with higher dimensional accuracy.
- **Application Considerations:**
  - Matched moulds are ideal for high-volume production of smaller, standardised items—such as compact washbasins—where the mould design has already been validated for repeat use.
  - For more complex or large-scale designs, vacuum forming with a single mould offers better adaptability and precision.



Moulds by pressing method

Mould Structure Types and Their Characteristics

Moulds used in thermoforming are generally classified into two structural types:

1. Rib-Type Moulds (Hollow Construction)

Constructed by assembling ribs made from MDF or metal.

Pros:

- Lightweight and easier to handle.
- Cost-effective for prototyping or short-term use.
- Faster to fabricate and modify.

Cons:

- Lower structural stability under high pressure.
- Limited durability for long-term or repeated use.
- May result in less precise forming for complex shapes.

2. Solid Moulds

Made from a single, solid block of material such as hardwood, or engineered composites.

Pros:

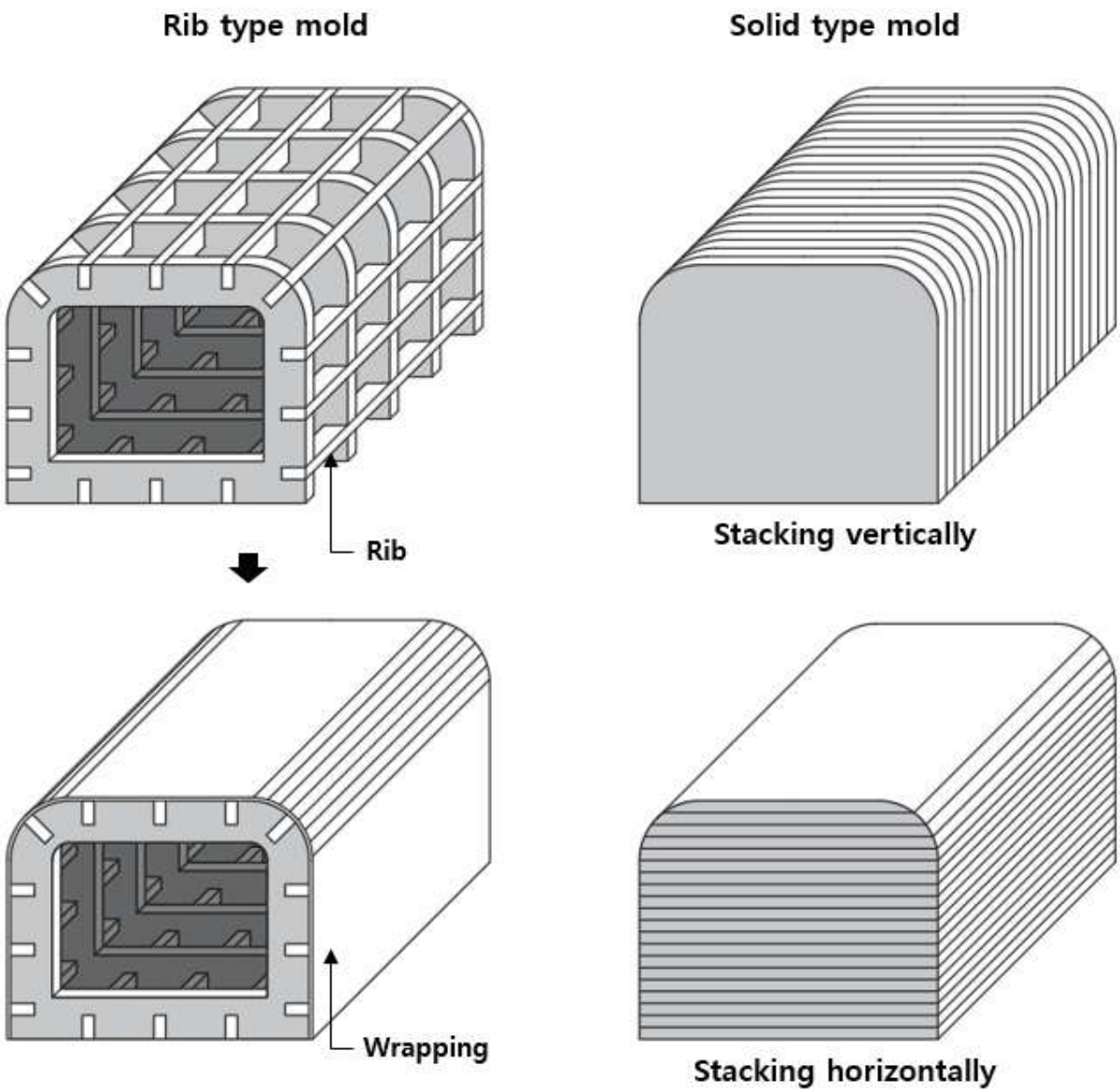
- High durability and stability.
- Suitable for repeated use and high-pressure forming.
- Provides better accuracy and consistency in shape reproduction.

Cons:

- Heavier and more difficult to handle.
- Higher initial cost and longer fabrication time.
- Less flexible for design changes or prototyping.

Recommendation:

- Choose the mould type based on the complexity of the shape, production volume, and equipment capabilities.
- For high-precision or long-term use, solid moulds are preferred.
- For lightweight, cost-effective solutions or prototyping, rib-type moulds may be more suitable.



Stacking Orientation for CNC Machining

- **Vertically Stacked Moulds:**
  These are easier to produce using 3-axis CNC machines and are suitable for simple 3D shapes. However, they are **not recommended** for long shapes due to potential deflection under pressure.
- **Horizontally Stacked Moulds:**
  More appropriate for complex 3D geometries, these moulds require 5-axis or multi-axis CNC machining. They offer better control over intricate contours and are preferred for advanced thermoforming designs.

5.2.Moulds Material

Mould Material Selection for Thermoforming

The choice of mould material plays a critical role in the success, efficiency, and cost-effectiveness of the thermoforming process. Commonly used materials include metal, wood-based products, and high-density polyurethane foam. Each has distinct advantages and limitations depending on the application.

1. Metal Moulds

Metal is the preferred material for high-volume, long-term thermoforming applications.

Advantages:

- Ideal for repetitive forming of large shapes.
- Offers excellent dimensional stability and long service life when properly manufactured.
- Maintains consistent shape and surface quality without deformation.

Considerations:

- Higher initial cost and longer production time.
- High thermal conductivity and capacity may cause the HIMACS sheet to cool too quickly, potentially leading to cracking or tearing.

Recommendation:

- Apply controlled, slow cooling techniques when using metal moulds.

2. Wood-Based Moulds (MDF, Plywood, Hardwood)

Wood is a popular choice due to its affordability and ease of fabrication.

Advantages:

- Low cost and quick to produce.
- Suitable for prototyping and short-term use.

Considerations:

- Wood grain may imprint on the HIMACS surface.

- Sensitive to moisture and temperature fluctuations, resulting in a shorter lifespan than metal.
- Requires additional surface finishing and careful handling.

Recommendations:

- Apply aluminium-filled epoxy paint to improve surface quality and durability.
- Store wooden moulds in a dry, temperature-stable environment, away from direct sunlight.

3. High-Density Polyurethane Foam

This material offers a lightweight alternative to metal and wood, with specific advantages for complex moulds.

Advantages:

- Easier to handle due to its low weight.
- Suitable for intricate designs when machined with precision.

Considerations:

- More expensive than wood.
- Requires advanced CNC machining (e.g., 5-axis) and skilled operation.
- Not porous—requires engineered air paths for vacuum forming.
- Not suitable for hydraulic press or manual thermoforming methods.

General Guidance:

- There are no strict limitations on mould materials, provided they meet the required performance criteria and pose no risk to users or the environment.
- Always consider the intended application, production volume, and forming method when selecting a mould material.

Comparison of Mould Materials for Thermoforming

Material	Advantages	Disadvantages
Metal	- Ideal for high-volume, long-term use - Excellent dimensional stability- Consistent surface quality	- High cost- Longer production time - Requires slow cooling to avoid sheet damage
Wood-Based (MDF, Plywood, Hardwood)	- Low cost- Quick and easy to fabricate- Suitable for prototyping	- Sensitive to moisture and temperature - Limited lifespan- May imprint grain on sheet - Requires surface finishing and careful storage
High-Density Polyurethane Foam	- Lightweight and easy to handle - Suitable for complex shapes with CNC machining	- Higher cost than wood - Requires advanced equipment and skilled operation - Not suitable for hydraulic press or manual forming - Needs engineered air paths due to non-porous nature

5.3 Mould Sizes

The mould must be produced in the correct dimensions. In certain instances, large-scale products may need to be divided into several smaller moulds.

Please refer to the following checkpoints when determining the final mould size.

The mould dimensions must not exceed any of the limits listed below:

- The size of factory-produced HIMACS sheets
- The working bed dimensions of the heating and pressing machines
- The maximum size manageable within your workshop

- The route available for transporting the mould from your workshop to the installation site

Conversely, the mould must be larger than the final shape following thermoforming. It should be capable of accommodating:

- Additional sheet material to allow for precise trimming after thermoforming
- Expansion of the sheet due to heat during the thermoforming process

5.4. Mould Shapes

Advanced techniques and a thorough understanding of HIMACS sheet properties are essential for producing a high-quality mould. A good mould is one that reliably delivers the desired shape with ease of use.

There is no fixed standard for mould creation. The fabricator's personal experience remains the most valuable asset in achieving a successful result.

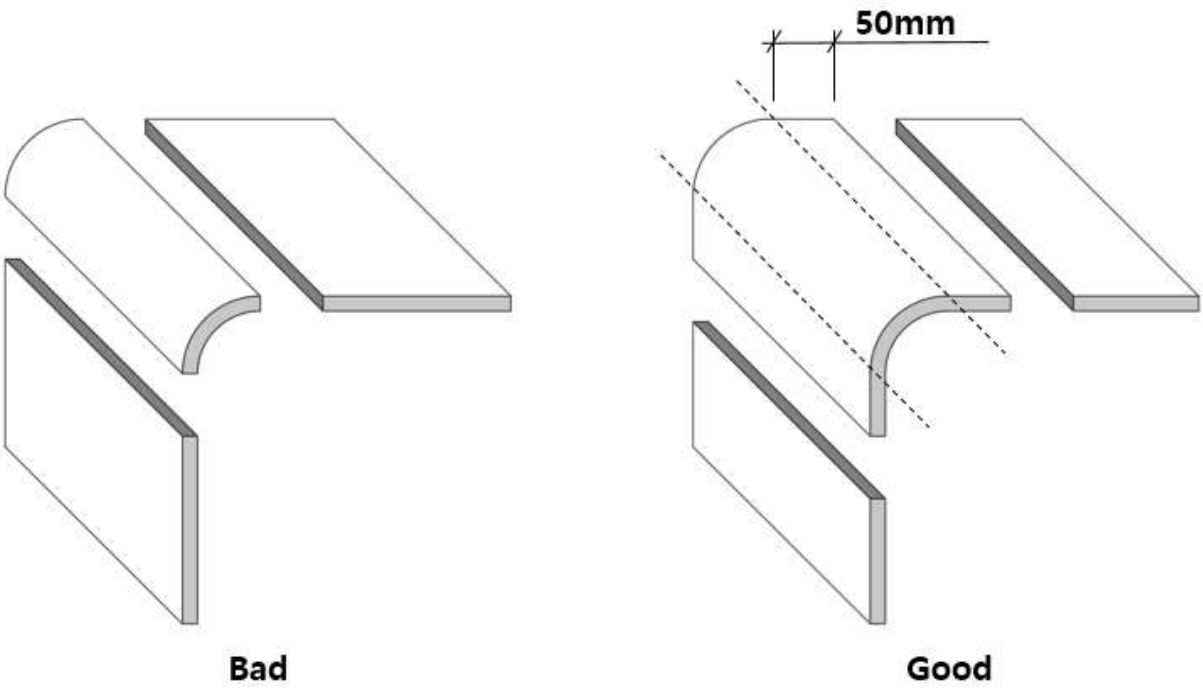
LX Hausys has provided some basic guidelines in this section to assist in mould fabrication. Please refer to the following recommendations.

It is imperative that moulds do not exceed the deformation limits of HIMACS sheets under any circumstances.

Corner Distance

To achieve seamless joints when connecting curved components or a combination of curved and flat surfaces, it is important to account for differing cutting angles and the challenges of clamping.

Therefore, when designing the mould, it is recommended to maintain a minimum of 50 mm of flat surface adjacent to the curved section. This facilitates easier and more accurate seaming during fabrication.

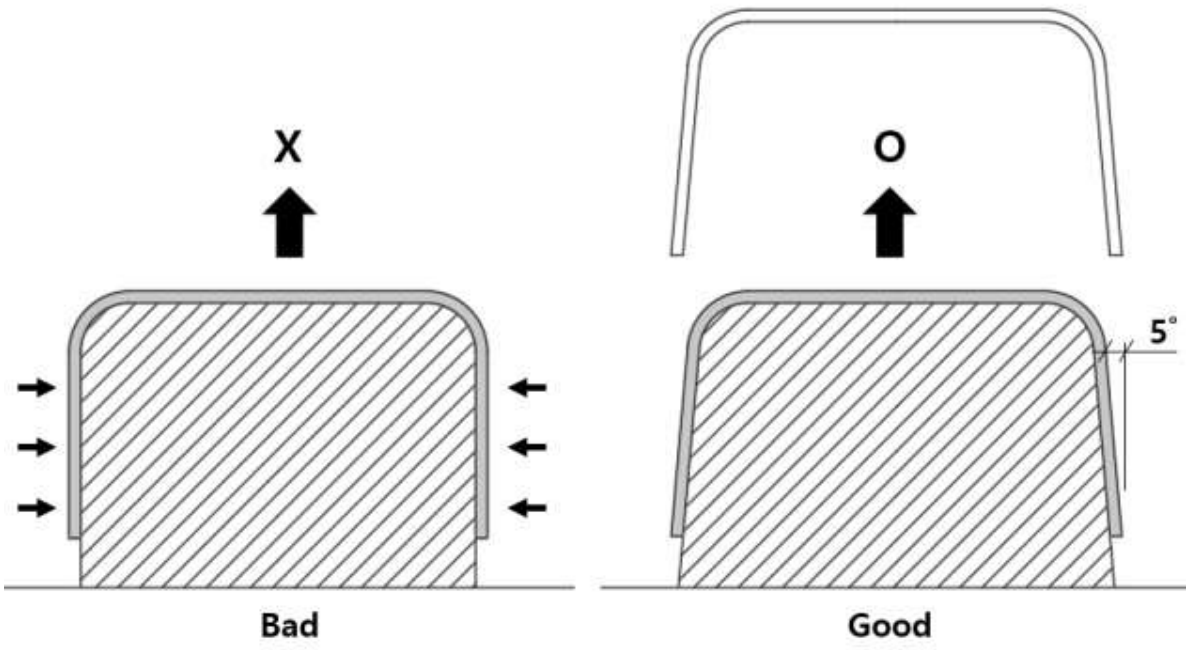


Release Angle

When forming a deep shape over a male mould, the material tends to shrink during the cooling process, resulting in the formed piece adhering tightly to the mould under significant pressure.

To facilitate easy removal of the formed piece, the mould must incorporate an appropriate positive release angle. A minimum of 5 degrees of positive angle is recommended. Refer to the relevant diagrams illustrating positive angle configurations.

If the deep shape cannot accommodate a positive angle, consider designing the mould in separable sections to enable effective release.

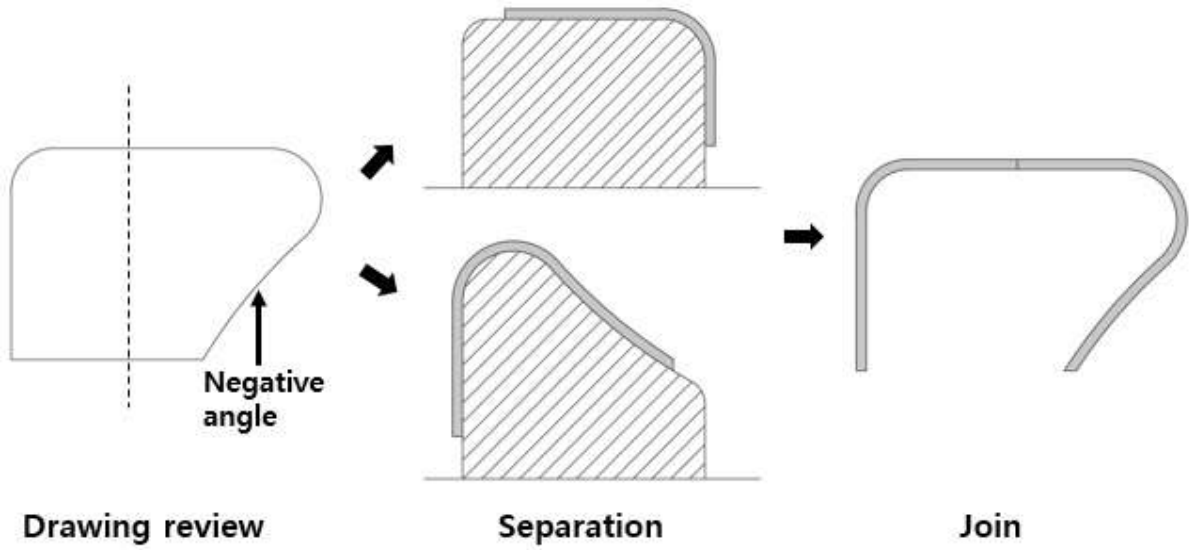


Negative Angle Shapes

The use of negative angle shapes in moulding is not recommended. Such shapes cannot be formed using paired moulds due to interference between the components.

Although vacuum forming machines can produce negative angle shapes, the release of the formed part is not feasible, often resulting in defective products.

The most effective approach for shaping negative angles is to divide the design into multiple moulds and subsequently join the individual formed sections.



Preventing Interference During Thermoforming

Any form of interference that restricts the movement of the sheet over the mould during thermoforming must be avoided and carefully considered during mould design.

For instance, when forming deep shapes using a female mould and a vacuum forming machine, sections of the sheet may become trapped between the membrane and the mould. This can prevent the sheet from fully conforming to the mould, resulting in an inaccurate shape or potential tearing of the material.

It is essential to thoroughly review the design drawings and anticipate the forming outcome to eliminate such interference.

In cases of complex geometries, mould separation may offer an effective solution. The more intricate the shape, the greater the need for dividing the mould into multiple components.

Troubleshooting Tips

Issue: Sheet does not fully form into the mould

Check for areas where the membrane may be pinching the sheet. Consider redesigning the mould with smoother transitions or separating it into multiple parts.

Issue: Sheet tearing during forming

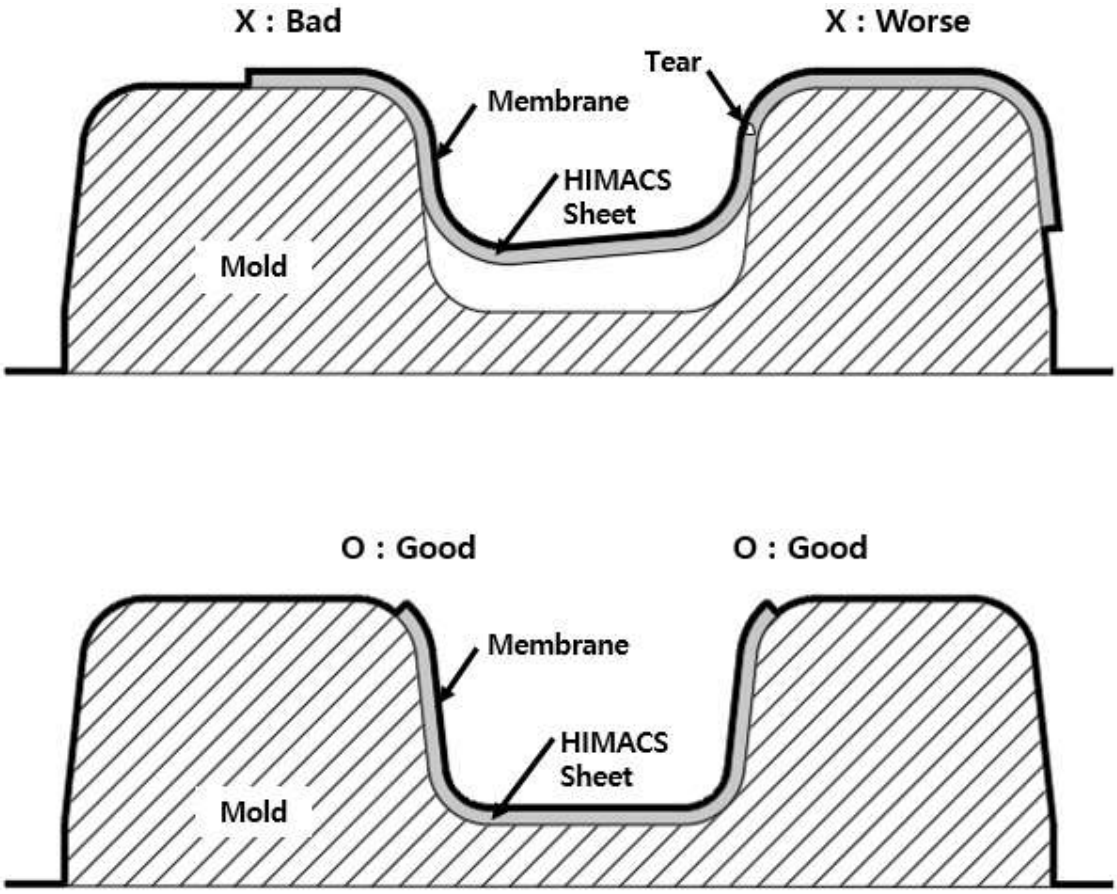
Verify that the sheet is not overstretched. Reduce the depth of the mould or adjust the heating parameters to allow more uniform material flow.

Issue: Inconsistent shape formation

Ensure the sheet is evenly heated and that vacuum pressure is uniformly distributed. Inspect the mould surface for any obstructions or irregularities.

Issue: Interference between mould and membrane

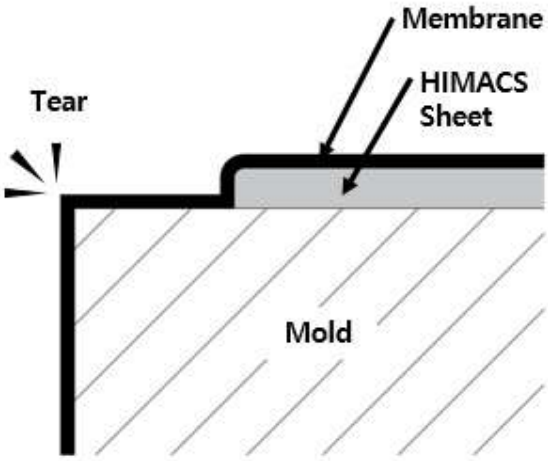
Simulate the forming process using CAD tools to identify potential conflict zones. Modify the mould geometry to allow unobstructed sheet movement.



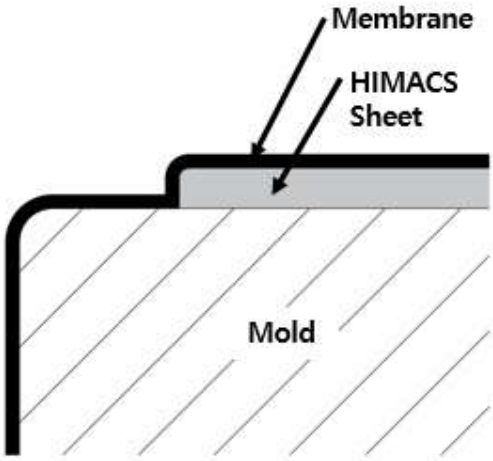
Surface Finish

The surface of the mould must be smooth and free from any residue. A well-finished surface minimises the need for post-processing, such as sanding.

Edges of the mould that come into contact with the membrane should be rounded to prevent tearing. The larger the radius of the rounded edge, the better the protection it offers to the membrane.


Membrane
HIMACS
Sheet
Tear
Mold

X : Bad


Membrane
HIMACS
Sheet
Mold

O : Good

Recommendations:

Membrane Protection During Thermoforming
The membrane used in vacuum forming machines plays a critical role in shaping the heated sheet material. To ensure its longevity and maintain forming accuracy, specific design considerations must be taken to protect the membrane from damage.

Key Guidelines for Membrane Protection:

- **Rounded Mould Edges**
  All mould edges that come into contact with the membrane should be smoothly rounded. Sharp or angular edges can cause stress points, leading to tearing or premature wear of the membrane. A larger radius is preferable to distribute pressure evenly.
- **Smooth Mould Surface**
  The mould surface must be free from residue, rough textures, or protrusions. A smooth finish reduces friction and prevents snagging, which can compromise the membrane during forming.
- **Avoid Undercuts and Negative Angles**
  Designs featuring undercuts or negative angles can trap the membrane, making release difficult and increasing the risk of tearing. If such shapes are necessary, consider mould separation or multi-part moulds to facilitate safe forming and release.
- **Controlled Heating and Pressure**
  Excessive heat or vacuum pressure can overstretch the membrane. Ensure that machine settings are calibrated to suit the material and mould geometry.
- **Regular Inspection and Maintenance**
  Inspect the membrane regularly for signs of wear, thinning, or damage. Replace it as needed to maintain forming quality and prevent unexpected failures.

5.5. Mould Positions

The positioning of moulds must be carefully considered to ensure optimal forming results. Proper alignment and orientation help prevent material distortion and ensure consistent shaping.

When placing moulds within the forming equipment, ensure they are securely fixed and evenly spaced to allow uniform heat distribution and vacuum pressure. Misaligned moulds can lead to uneven forming, material stress, or defects in the final product.

Always verify the mould layout against the design specifications before commencing the forming process.

6. Sheet Preparation

Preparation and Storage of HIMACS Sheets for Thermoforming

HIMACS sheets must be stored at **room temperature for a minimum of 24 hours** prior to thermoforming.

- If sheets have been stored or transported in **cold conditions**, significant dimensional changes may occur due to expansion and contraction. These variations pose a considerable risk during the forming process.
- Always **remove the protective film** before heating.
- Inspect the sheet **in accordance with HIMACS guidelines** to ensure it is free from defects and suitable for forming.
- Cut the sheet to the appropriate dimensions, taking into account **shrinkage, expansion, and trimming requirements**.
- During thermoforming, HIMACS sheets may shrink by approximately **4% to 7%**. To accommodate this, the material should be **oversized by at least 25 mm and up to 7% of the total dimensions**.
- **Sand or rebate the edges and corners** of the sheet to a minimum radius of **1.5 mm**. This rounding helps prevent tearing of both the membrane and the sheet material.

> **Important Notice:**
> Preliminary operations such as drilling holes, machining thickness, or joining components prior to preheating significantly increase the likelihood of thermoforming failure.
> It is therefore strongly advised to avoid any pre-processing activities other than cutting the sheet to the appropriate size and performing essential machining required to facilitate the thermoforming process.

Risks of Pre-Processing Prior to Thermoforming

Pre-processing operations such as drilling, thickness machining, or joining components before preheating HIMACS sheets can introduce several risks that compromise the success of the thermoforming process:

1. **Material Stress and Cracking**

   Pre-drilled holes or machined areas may act as stress concentrators. When the sheet is heated and formed, these areas are more prone to cracking or tearing due to uneven expansion and mechanical strain.
2. **Distortion of Final Shape**

   Any alterations made before heating can interfere with the sheet's natural flow and flexibility during forming. This may result in warping, misalignment, or an inaccurate final shape.
3. **Reduced Forming Accuracy**

   Joining or bonding sheets prior to thermoforming can restrict movement and prevent the material from conforming properly to the mould. This can lead to poor surface finish and dimensional inaccuracies.
4. **Increased Risk of Membrane Damage**

   Sharp edges or uneven surfaces created during pre-processing may damage the forming membrane, especially under vacuum pressure.
5. **Thermal Inconsistency**

   Machined or joined areas may respond differently to heat, causing inconsistent softening and unpredictable forming behaviour.

Recommendation:

To minimise these risks, it is strongly advised to limit pre-processing to:

- Cutting the sheet to the appropriate size
- Performing only essential machining that directly supports the thermoforming process
- All other operations should be carried out **after thermoforming** to ensure material integrity and forming precision

Helpful Tip

Mark a minimum of three referencpoint using a pencil on both the sheet and the mould. These alignment marks assist in accurately positioning the heated sheet onto the mould, thereby reducing the risk of misalignment and potential thermoforming failure.

Importance of Reference Points in Thermoforming

Reference points play a critical role in ensuring accuracy, consistency, and repeatability throughout the thermoforming process. Their proper use contributes to both the quality of the final product and the efficiency of production.

Key Benefits:

1. **Precise Alignment**
   Reference points allow for accurate positioning of the sheet on the mould and within the forming equipment. This ensures that the material conforms correctly to the intended shape and dimensions.
2. **Repeatability**
   Consistent use of reference points enables reliable reproduction of identical parts across multiple production cycles, reducing variability and waste.
3. **Quality Control**
   Reference points serve as benchmarks for inspection and verification. They help identify any deviations in shape, size, or alignment early in the process.
4. **Simplified Trimming and Assembly**
   Post-forming operations such as trimming, joining, or machining are more efficient and precise when reference points are used to guide cutting paths and alignment.
5. **Reduced Error Risk**
   By providing fixed markers, reference points minimise the likelihood of misplacement, distortion, or incorrect orientation during forming and finishing.

Best Practices:

- Integrate reference points into the mould design and CAD drawings.
- Ensure reference points are clearly marked and easily identifiable on both the sheet and the mould.
- Use symmetrical and strategically placed reference points to aid in balanced forming.
- Verify reference point alignment before heating and forming begins.

Thermoforming Allowance and Material Loss

An additional material allowance should be incorporated into the project to account for thermoforming requirements. The rate of material loss during thermoforming is considerably higher than in standard fabrication processes.

This loss can be minimised through the application of expert thermoforming techniques and experience. Proper planning and skilled execution are essential to optimise material usage and reduce waste.

7. Heating

Heating Procedure for HIMACS Sheets

Achieving successful heating is critical to the thermoforming process and depends on strict adherence to recommended guidelines and ensuring uniform heat distribution across the entire sheet.

Preparation and Heating Guidelines:

- Refer to **Section 2-1: Conditions for Deformation** prior to initiating the heating process.
- Maintain workshop ambient conditions between **15°C and 25°C**. A stable and uniform environment is essential for consistent heating and forming quality.
- Ensure the oven is **clean and free from dirt, residue, or stains**. Contaminants on the heating plate can cause surface defects on the sheet.
- Preheat the oven to the required temperature **before placing the sheet inside**.
- Position the sheet **centrally within the oven only once the target temperature has been reached and stabilised**. Do not insert the sheet during the temperature ramp-up phase.
- Use **appropriate protective equipment and handling tools** when managing heated sheets. Heated sheets are hot, flexible, and slippery. Large sheets must never be handled by a single person.
- Once the heating cycle is complete, **promptly transfer the sheet onto the mould** for forming.

Useful Tip for Heating and Colour Matching

When heating a small section of sheet using a plate heating maschine, it is advisable to use a **helper piece** to maintain a consistent gap between the upper and lower plates. This ensures uniform heating and prevents distortion.

Thermoforming may result in **slight colour variations** on HIMACS sheets. To achieve consistent colour across both flat and formed areas, consider heating the flat section alongside the thermoformed part.

Troubleshooting Tips for Colour Inconsistencies

Issue: Noticeable colour difference between flat and formed areas

Solution: Heat both sections simultaneously to ensure uniform thermal exposure. This helps balance pigment response and surface finish.

Issue: Discolouration or uneven tone after forming

Solution: Check oven cleanliness and ensure even temperature distribution. Contaminants or hot spots can affect surface appearance.

Issue: Colour mismatch between multiple pieces

Solution: Use sheets from the same production batch and apply consistent heating parameters across all parts.

Issue: Gloss or texture variation post-forming

Solution: Review heating time and temperature. Overheating or underheating can alter surface characteristics.

8. Forming

Forming Procedure for HIMACS Sheets

- Forming must begin **immediately after removing the sheet from the oven** to ensure optimal material flexibility.
- Ensure the mould is correctly positioned and that the **path from the oven to the forming machine is clear** of any obstructions.

- Carefully place the heated sheet onto the mould and **align it using the designated reference marks**.
- **Initiate the pressing process without delay**.

For Vacuum Pressing Machines:

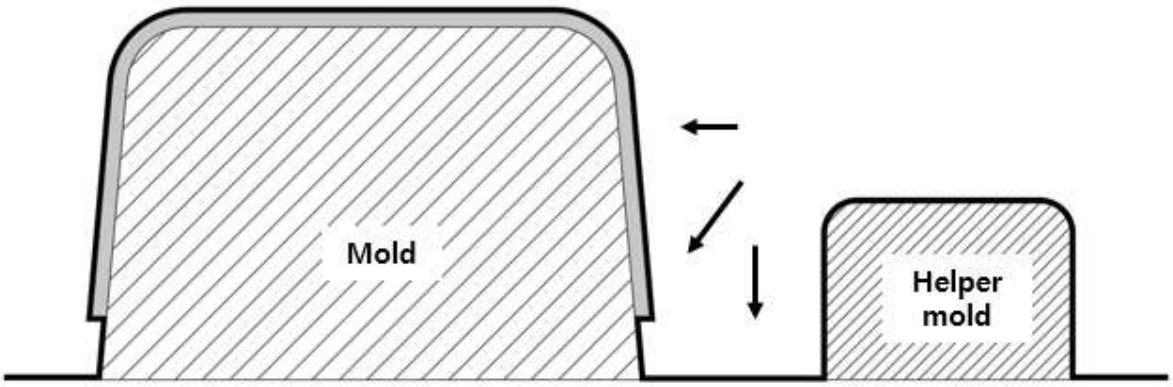
- Support the pressing process by **gently pressing the membrane by hand**.
- **Pull the membrane as needed** to prevent the formation of wrinkles at the start of pressing.

Cooling Guidelines:

- Allow the sheet to **cool naturally on the mould**.
- Maintain **pressure and do not remove the sheet** until its temperature has dropped to **60°C**.
- Avoid **rapid cooling**, as this may cause thermal shock, leading to **cracking or structural failure**.

Helpful Tip – Managing Wrinkles and Shape Accuracy

- If **excessive wrinkling occurs** or the formed shape is incorrect due to the membrane being larger than the mould, consider placing a **helper mould** adjacent to the primary mould during the forming process.
- This can assist in **stabilising the membrane** and improving the **accuracy of the final shape**.



9. Trimming and Finishing

Trimming and Finishing of Thermoformed HIMACS Sheets

Following thermoforming, most HIMACS sheets require **trimming** to achieve precise final dimensions. The **cutting angle** used for joining is particularly critical, as it directly influences the accuracy of seams and the overall shape. Therefore, the **trimming method** must be carefully considered during the mould design phase.

Trimming Techniques:

- **Simple 2D and 3D shapes** can typically be trimmed using a handheld router.
- **Complex 3D geometries**, such as irregularly curved surfaces, may require the use of a **CNC machine** and/or a **highly skilled fabricator**.
- In some cases, the **original mould** may be used as a trimming guide. However, this approach carries a risk of damaging the mould.
- To avoid this, consider **duplicating the mould** specifically for trimming purposes, especially when the forming mould needs to be reused.

Finishing Recommendations:

- A **careful sanding process** is essential to achieve a high-quality surface finish.
- Use **sandpaper with a soft backing** to prevent damage to the sheet.
- Refer to the official **HIMACS Finishing Guidelines** for detailed instructions on sanding and polishing procedures.

10. Material Thinning During Thermoforming

For Vacuum Pressing Machines:

Thermoforming may result in **material thinning**, particularly in areas subjected to significant stretching. This effect should be considered during the **design and moulding stages** to ensure structural integrity and consistent thickness across the final product.

Proper **mould design**, **heating control**, and **forming technique** are essential to maintain the desired mechanical properties of the HIMACS sheet.

Forming Small Curves Beyond Deformation Limits

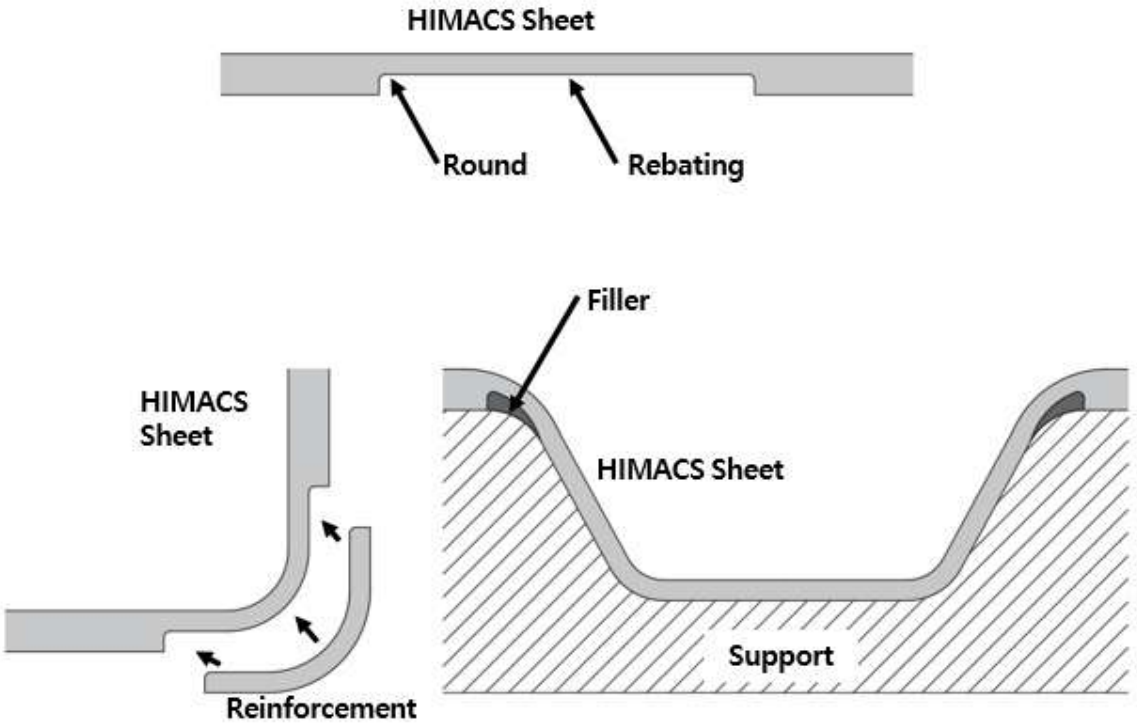
- When producing small curves that exceed the deformation limits specified in **Table 2-2: Minimum Inside Radius for 2D**, it is generally recommended to **join smaller components fabricated using a router**.
- This approach helps maintain **structural integrity** and **dimensional accuracy** where direct thermoforming is not feasible.

Thermoforming by Thickness Reduction

- In situations where joining is not feasible or permitted, **thermoforming by reducing the thickness of the HIMACS sheet** may be considered a suitable alternative.
- Thin sections can become **structural weak points** and must be adequately **reinforced and supported**.

Guidelines:

- Use a **router** to reduce the thickness of the HIMACS sheet.
- Avoid **forming square corners** in thinned areas, as these are prone to cracking during the product's service life.
- Ensure the **thinned surface is smooth and uniform** to facilitate proper forming.
- Proceed with the **thermoforming process once preparation is complete**.
- After forming, **reinforce, fill, and support all thin sections** to maintain structural integrity.



11. Summary: Thermoforming Guidelines for HIMACS Sheets

Preparation and Planning

- Always develop a **comprehensive plan** for the thermoforming process prior to commencing any project.
- Document **workshop conditions and outcomes** meticulously to support the enhancement of your thermoforming expertise.

Material and Equipment Handling

- Take note of the **condition and performance** of each HIMACS sheet used. Operate strictly within the specified parameters. Avoid using temperatures that are excessively high or low.
- Refrain from attempting to form shapes that **exceed the minimum radius limitations**.
- Do not apply the **recommended minimum radius for 2D shapes to 3D forms**. These recommendations serve only as general guidance. The success of thermoforming 3D shapes is largely dependent on their complexity.

- Utilise only the **recommended equipment**. Avoid heating methods that do not provide **uniform heat distribution**.

Workshop and Process Control

- Determine the **optimal thermoforming conditions** based on your specific machinery and workshop environment.
- Maintain the **workshop at room temperature** during the process.
- Ensure **heating time and temperature** are appropriately balanced according to your oven's capabilities.

Mould Design and Efficiency

- The creation of **high-quality moulds** is essential for improving thermoforming efficiency.
- Proficiency in **mould design and fabrication** contributes significantly to achieving a balance between cost, efficiency, and product quality.
- Select **mould materials** that are appropriate for the specific requirements of each project.
- Choose **mould types** that are compatible with your forming equipment.
- Employ **mould division techniques** to enhance operational efficiency.
- Follow **proven procedures rigorously** to ensure consistent success.

This guideline has been created to provide technical information for successful fabrication and installation of HIMACS, and it is intended to be used in a safe environment considering their own discretion and risk by who has technical skill for fabrication and installation of HIMACS.

This guideline is continually revised to provide reliable and up-to-date information, replacing all previous versions of the guideline and technical information, however the usage and conditions of use are beyond **LX Hausys** control, LX Hausys cannot guarantee the suitability of material, fabrication and installation for all usage and conditions of use. Users should not regard or rely on this guideline as a complete, sole, up-to-date or absolute information. HIMACS users, fabricator and installer should review whether the design for HIMACS, fabrication method, installation method and required performance are suitable for the intended use and conditions of use. LX Hausys shall not be liable for any direct or indirect, commercial damages or losses caused by the fabrication and installation results of HIMACS using any or all these guidelines. In addition, the results of joining with other materials, and the fabrication and installation guidelines for other materials shall not be covered by LX Hausys.

This guideline does not encourage to violate any laws, patents and licenses, and cannot be used as a basis for legal liability. All works on / from HIMACS must be performed in accordance with related laws and regulations.

LX Hausys reserves the right to change the technical information and disclaimers in this guideline for technical development and further information, and the use of HIMACS or this guideline is considered to accommodate the information and changes provided in this guideline. Therefore, please check the changed details of this guideline from time to time.

12. Drop Edges & Downturns

HIMACS offers exceptional machining capabilities, empowering fabricators to fully explore their design creativity when shaping edges. With a wide variety of router bits available and the use of high-quality adhesives, the possibilities for edge design are virtually limitless.
The expertise of the fabricator plays a critical role, particularly when executing intricate or advanced edge profiles. Furthermore, a high level of craftsmanship is essential for producing seamless joints, which are fundamental to achieving superior edge finishes—whether the design is straightforward or complex.

1. Consideration Between Design & Fabrication

Design and Fabrication of Drop Edges and Downturns

Drop edges and downturns offer a range of design possibilities. Certain styles may be more appropriate for specific HIMACS colours, particularly those featuring veining, pearl or glitter effects, large chips, or translucent properties.

The fabrication techniques outlined in this section are generally best suited to solid colours and granite finishes with small to medium-sized chips. Using incorrect or unsuitable fabrication methods can result in structural failures such as cracking due to stress. In some cases, improper techniques may lead to stress concentration or an increase in internal stress.

Correctly fabricated drop edges and downturns contribute to the structural integrity of the HIMACS sheet assembly. Therefore, it is essential that the design and fabrication methods are appropriately matched to ensure long-term durability.

Fabrication Risks in Drop Edges and Downturns

Proper fabrication of drop edges and downturns is essential to ensure the structural integrity and aesthetic quality of HIMACS surfaces. Failure to adhere to recommended methods can result in various issues, some of which may compromise the durability and performance of the final product.

#	Issue	Risk	Impact	Prevention
1	Cracking Due to Stress Concentration	Incorrect fabrication techniques, such as sharp internal corners or uneven bonding, can lead to stress concentration.	Cracks may develop over time, especially under thermal or mechanical load.	Use smooth transitions and ensure even adhesive application. Avoid abrupt changes in geometry.
2	Material Failure from Incompatible Design	Designs that do not match the physical properties of the selected HIMACS colour or pattern (e.g., veined, translucent, or large-chip finishes) may lead to failure.	delamination, Warping, or visible defects may occur.	Match design complexity with material characteristics. Use solid or fine-chip colours for high-stress areas.
3	Joint Weakness	Poorly executed joints, including misalignment or insufficient adhesive coverage, can weaken the structure.	Visible seams, reduced load-bearing capacity, and potential separation.	Ensure precise alignment and use recommended adhesives. Skilled craftsmanship is essential for seamless joints.
4	Thermal Expansion Issues	Inadequate consideration of thermal expansion during fabrication may cause stress build-up.	Buckling, cracking, or joint failure under temperature fluctuations.	Allow for expansion gaps where necessary and follow thermal guidelines for HIMACS materials.
5	Incompatibility with Colour Effects	Some fabrication methods may not be suitable for colours with special effects (e.g., glitter, pearl, translucent).	Visual inconsistencies, uneven finishes, or structural weaknesses.	Select fabrication techniques that complement the visual and structural properties of the chosen colour.

6	Improper Adhesive Use	Using non-recommended adhesives or incorrect curing procedures.	Weak bonds, discolouration, or joint failure.	Always use HIMACS-approved adhesives and follow curing instructions precisely.
7	over-machining or Excessive Routing	Excessive removal of material during edge shaping can reduce structural integrity.	Thinning, warping, or increased susceptibility to damage.	Follow machining guidelines and avoid unnecessary material removal.

2. Fabrication Of Straight Components

The fabrication of straight components requires precision and adherence to recommended procedures to ensure structural integrity and aesthetic consistency. Straight parts are typically easier to manufacture than curved or complex profiles, but attention to detail remains essential

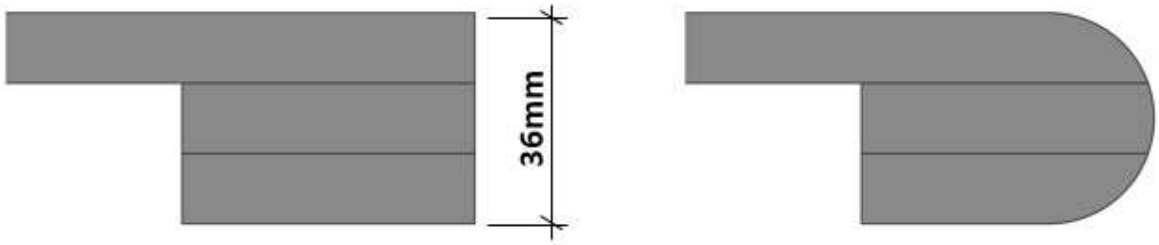
Key considerations include:

Topic	Guidelines / Recommendations
Material Preparation	Ensure HIMACS sheets are clean, dry, and free from surface contaminants prior to cutting or bonding.
Cutting Accuracy	Use appropriate cutting tools to achieve clean, straight edges. Maintain consistent feed rates and blade sharpness to avoid chipping or uneven cuts.
Edge Finishing	Straight edges should be smoothed and finished using recommended sanding techniques to achieve a uniform appearance and prepare the surface for bonding.
Bonding and Assembly	Apply HIMACS-approved adhesives evenly along the bonding surfaces. Use clamping tools to maintain alignment and pressure during curing.
Stress Management	Avoid introducing stress through improper handling or misalignment. Ensure that joints are properly supported and that thermal expansion is accounted for in the design.
Quality Control	Inspect the finished component for straightness, surface finish, and joint integrity. Any deviations should be corrected before final installation.
drop edge Fabrication	One of the most straightforward techniques for producing a drop edge involves stacking layers of HIMACS material beneath the primary sheet. This method is particularly suitable for the Solid and Granite colour ranges. For a 12 mm sheet, either two layers (24 mm total) or three layers (36 mm total) are stacked to achieve the desired drop edge profile.

Proper fabrication of straight components contributes to the overall durability and visual quality of HIMACS installations.

One of the most straightforward techniques for producing a drop edge involves stacking layers of HIMACS material beneath the primary sheet. This method is particularly suitable for the Solid and Granite colour ranges.

Typically, for a sheet with a thickness of 12 mm, either two layers (resulting in a total thickness of 24 mm) or three layers (36 mm) are stacked to achieve the desired drop edge profile.



Fabrication Process for 12 mm HIMACS Sheets

1. Preparation of Strips

- Cut the required strips slightly oversized.
- Sand the underside of each strip using 120-grit abrasive paper.
- Clean thoroughly using denatured alcohol and a lint-free white cloth.

2. Adhesive Application

- Apply an adequate amount of HIMACS joint adhesive to each strip.
- Spread the adhesive evenly using a wooden or plastic spatula to ensure full coverage.

3. Clamping and Curing

- Secure the strips using “A”-type spring clamps, spaced at intervals of 70 mm to 80 mm.
- Allow the adhesive to cure for approximately 45 minutes at a temperature of +20°C.
- Ensure that a visible bead of adhesive is expelled from the joint upon clamping, indicating sufficient adhesive application and proper bonding pressure.

4. Finishing Process After Adhesive Curing

- Level the surface using a circular table saw.
- Machine the desired profile using either a portable hand-held router or a table planer.
- Complete the process by sanding and polishing the surface to achieve a smooth, refined finish.

Limitations of the Stacking Method for 20 mm Sheets

- The stacking method is not advised due to inherent thickness tolerance, which may result in noticeable discrepancies when layers are stacked, potentially compromising structural and visual integrity.

Rebating for Extended Skirts and Aprons

- **Depth and Width of** rebate**:** Ensure the rebate dimensions are appropriate for the thickness and type of material being joined.
- **Tool Selection:** Use suitable routing or rebating tools to achieve clean, consistent cuts.
- **Adhesive Application:** Apply HIMACS-approved adhesive within the rebate to ensure strong bonding.
- **Alignment and Clamping:** Carefully align the components and use appropriate clamping methods to maintain pressure during curing.
- **Finishing:** Once bonded, sand and polish the joint area to achieve a smooth, uniform finish.
- Proper rebating enhances both mechanical strength and visual quality of long skirt and apron assemblies.

Application of Drop Edges for Deep Downturns

- Drop edges may be applied directly to the sheet edge, particularly for deeper downturns.
- Rebating the underside of the sheet to a depth of ~1–2 mm before assembly is most effective.

Advantages of the Rebating Method Over Boot Seam Fabrication

- Enhanced bond strength.
- Reduced impact of particle irregularities.
- Improved surface quality.
- Precise edge termination without additional guides or alignment templates.

Rebating

Boot seam

Rebating and Bonding Procedure for Drop Edges

- **12 mm sheet:** rebate ~13 mm × 2 mm
- **20 mm sheet:** rebate ~21 mm × 2 mm

Pre-Bonding Inspection

- Inspect all edges for broken chips, saw marks, or whitening.

Surface Preparation

- Sand the internal edges of the rebate and corresponding downturn edges using 150/180-grit abrasive paper.
- Clean thoroughly with denatured alcohol and a lint-free white cloth.

Adhesive Application and Clamping

- Apply enough HIMACS-approved adhesive.
- Secure the edge using screw clamps spaced at intervals of 70–80 mm.
- Confirm continuous adhesive beads along internal and external edges of the joint.

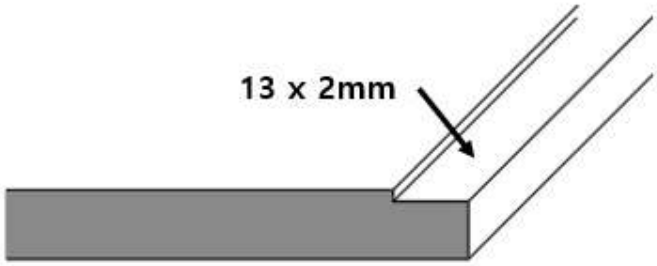
Finishing

- After curing, invert the sheet and remove any excess adhesive using a portable hand router fitted with a straight cutter and nylon bearing.
- Sand and polish the surface to achieve a smooth, professional finish.

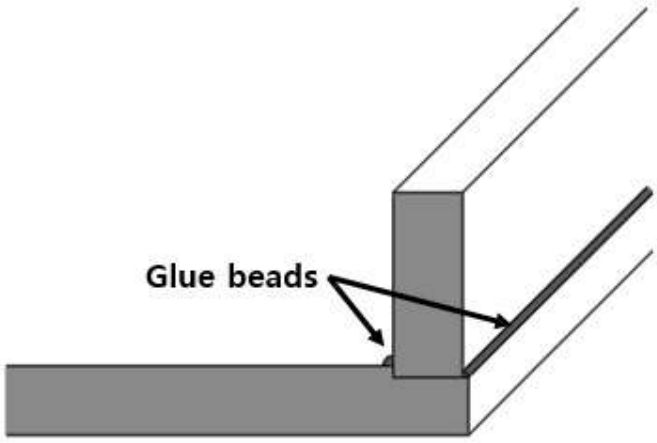
Rebating Guidelines for 12 mm HIMACS Sheets

When working with HIMACS sheets of 12 mm thickness, the required rebating depth varies depending on the colour family to ensure optimal visual consistency and edge quality:

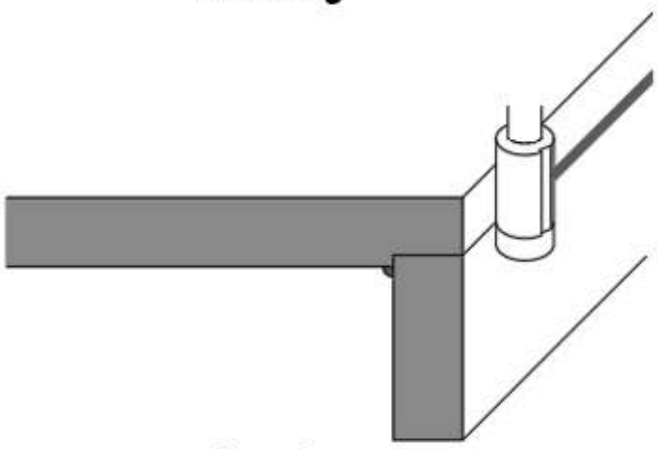
- **Large Chip Colour Families (Volcanics, Lucia):** Increase rebate depth to 5 mm.
- **Veined and Glittering Colour Families (Marmo, Perna, Sparkling):** Increase rebate depth to 9 mm for better visual consistency and edge quality.



Rebating



Bonding



Trimming

Boot Seam and V-Groove Edge Techniques

The **boot seam method** (non-rebated) and the v-grooving **technique** (45° cut) are alternative approaches for edge fabrication in HIMACS sheets.

- **Boot Seam (Non-Rebated):** Joins edges without a rebate. Simpler but less structural and visually consistent.
- **V-Grooving (45° Cut):** Forms a mitred joint. Effective for precise corners and concealing colour variations. Requires careful alignment, adhesive coverage, and finishing.

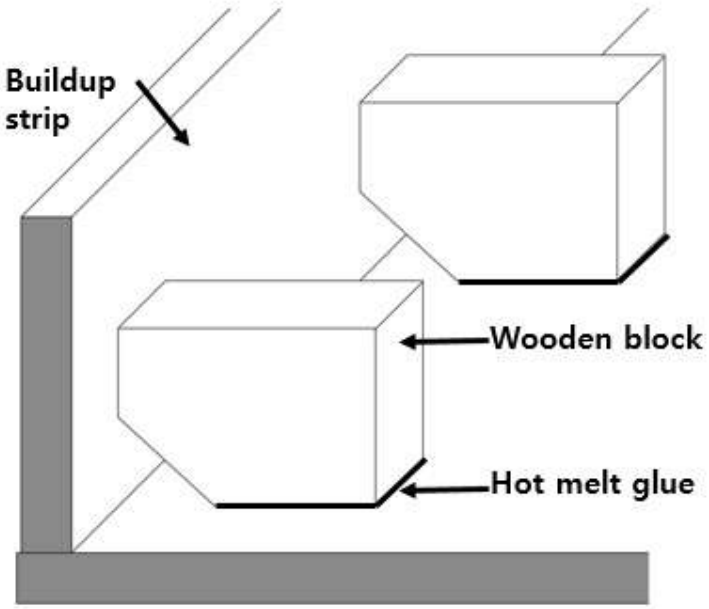
> **Note:**
>
> Both methods require careful execution to ensure proper alignment, adhesive coverage, and finishing quality.

Boot Seam Drop Edge Fabrication Procedure

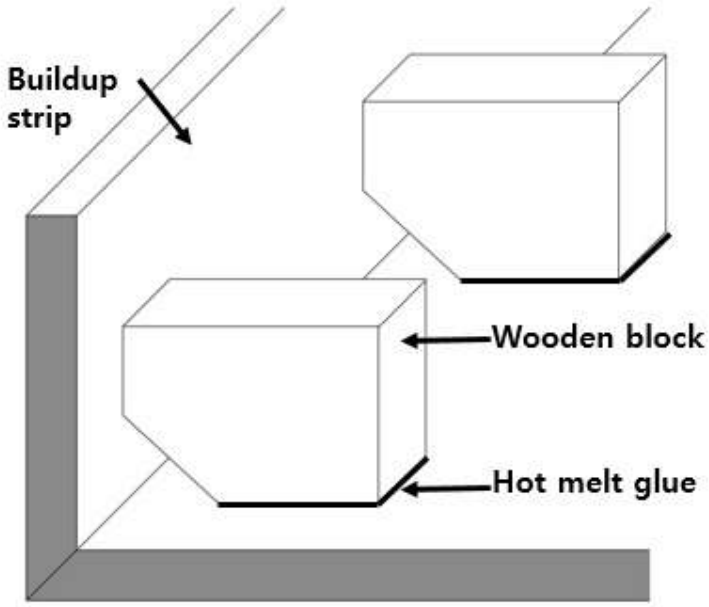
When fabricating boot seam drop edges, it is essential to inspect the underside of the HIMACS sheets for any defects prior to bonding. The underside of both the sheets and the buildup strips should be sanded using 120-grit abrasive paper to ensure proper surface preparation.

Wooden stop blocks secured with hot melt adhesive can be employed to assist in the accurate alignment of the buildup strips during assembly.

> **Note:**
>
> While this method is functional, the rebating technique is generally preferred, as it offers superior structural integrity and visual consistency.



The V-Grooving fabrication method is effective for concealing colour variations in certain shades that exhibit veins and/or glitter.



V-grooving fabrication

Without drip Edge

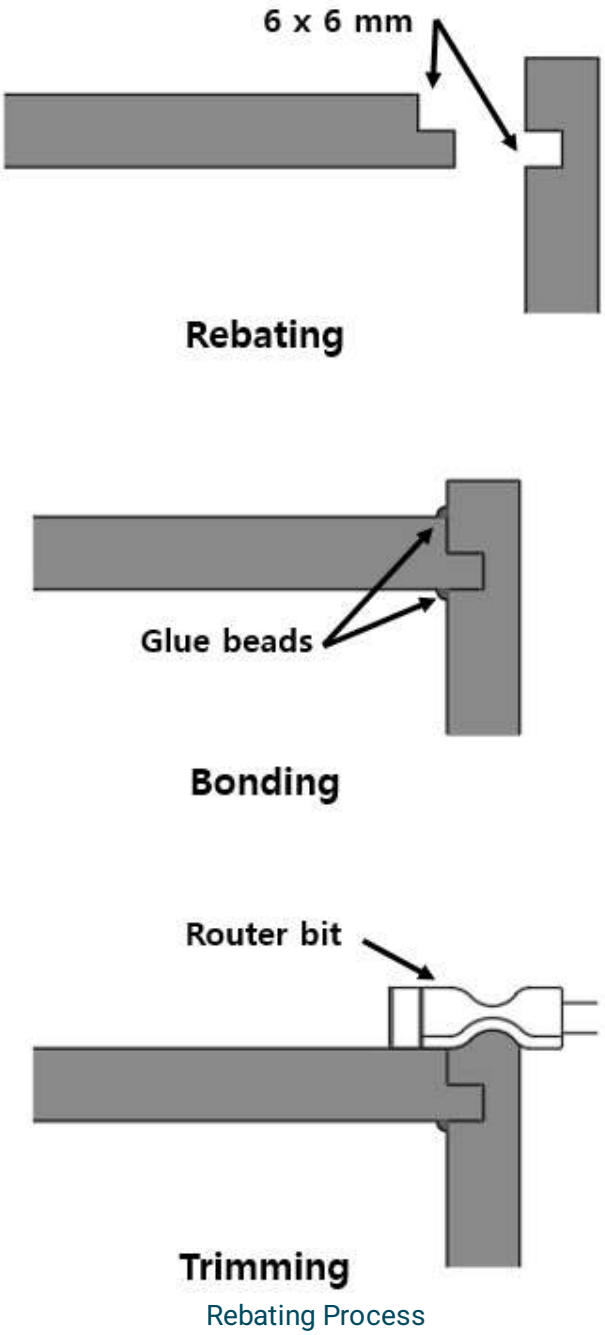
No-Drip Front Edge Fabrication

A no-drip front edge may be specified for any horizontal surface fabricated from 12 mm material.

Process:

1. Cut a rebate 6 mm deep and 6 mm high at the top of the front edge of the countertop surface.

2. Cut a corresponding groove in the apron material so that, when joined, the apron projects approximately 12 mm above the horizontal countertop surface.
3. Use joint adhesive to bond the apron to the countertop.
4. Once the adhesive has cured, use a router to round over the top edge and sand the surface as required.



Rebating Process

3. Manufacturing Internal Corners

Recommendations for Internal Corners of Worktops

- A minimum radius of 5 mm must be maintained for any internal corner in HIMACS sheets; a larger radii are preferable.
- The vertical joint line between the edge and the top seam should be at least 25 mm apart.
- All jointed sections of the edge must be reinforced with a HIMACS back block. The worktop should be fabricated 1.5 mm oversize to allow for precise edge trimming.

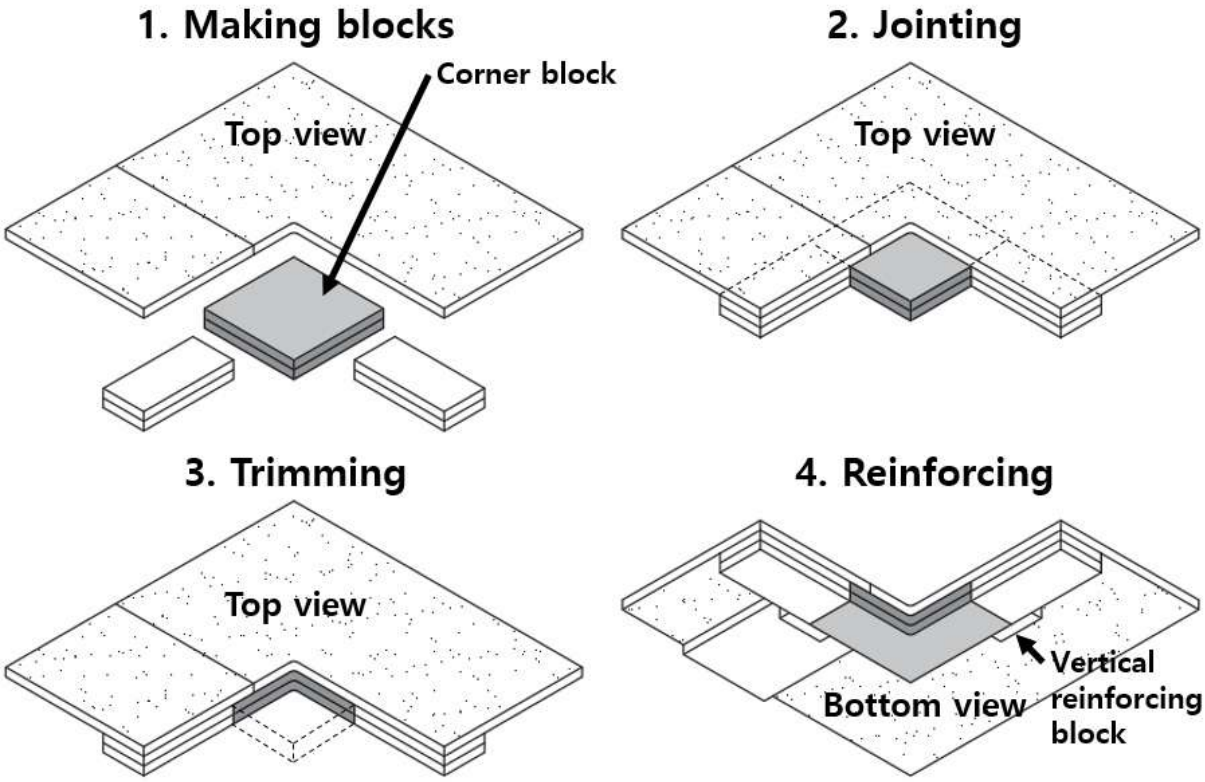
Fabricating an Internal Corner – Stacking Procedure

Begin by preparing blocks from HIMACS sheet. For the following conditions, a minimum block size of 130 x 130 mm is required:

- Edge depth: 50 mm
- Internal corner radius: 5 mm
- Distance from corner to seam line: 50 mm
- Distance from seam line to block edge: 25 mm
  (Total: 50 + 5 + 50 + 25 = 130 mm)

Steps:

1. Sand the underside of the blocks using 120-grit abrasive paper. Clean thoroughly with denatured alcohol and a white cloth.
2. Stack and bond the blocks and strips for the edge material on the underside of the internal corner, using a sufficient quantity of HIMACS joint adhesive.
3. Secure with “A” style spring clamps and allow to cure for approximately 45 minutes at +20°C. Ensure that a reasonable amount of adhesive is expelled from the joint once clamped.
4. If the corner structure is not sufficiently robust, reinforce the vertical joint line formed by the corner blocks and strips with a 50 mm wide, 12 mm thick HIMACS back block.
5. Once adhesive has fully cured, trim the blocks to match the shape of the internal corners and remove any excess adhesive using a router.
6. Complete the process by sanding and polishing the surface as required.
7.



Internal corner of cut out top

Internal Corner of Jointed Worktop

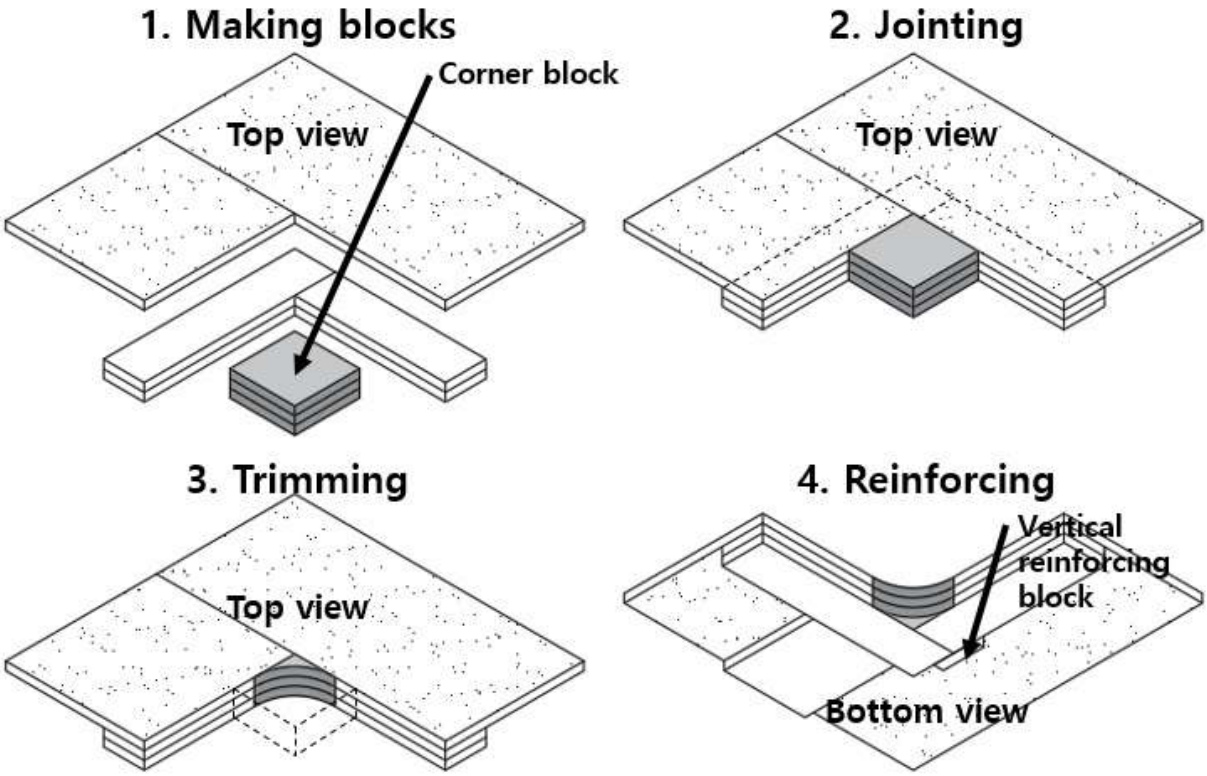
Begin by fabricating blocks from HIMACS sheet. For the following conditions, a minimum block size of 125 x 125 mm is required:

- Internal corner radius: 50 mm
- Distance from corner to seam line: 50 mm
- Distance from seam line to block edge: 25 mm
  (Total: 50 + 50 + 25 = 125 mm)

Steps:

1. Sand the underside of the blocks using 120-grit abrasive paper. Clean thoroughly with denatured alcohol and a white cloth.
2. Stack and bond the blocks onto the edge strips for the underside of the internal corner, using a sufficient quantity of HIMACS joint adhesive.
3. Secure with “A” style spring clamps and allow to cure for approximately 45 minutes at +20°C. Ensure that a reasonable amount of adhesive is expelled from the joint once clamped.

4. If the structure of the corner is not sufficiently robust, reinforce the vertical joint line formed by the corner blocks and strips with a 50 mm wide, 12 mm thick HIMACS back block.
5. Once the adhesive has fully cured, trim the blocks to match the shape of the internal corner and remove any excess adhesive using a router.



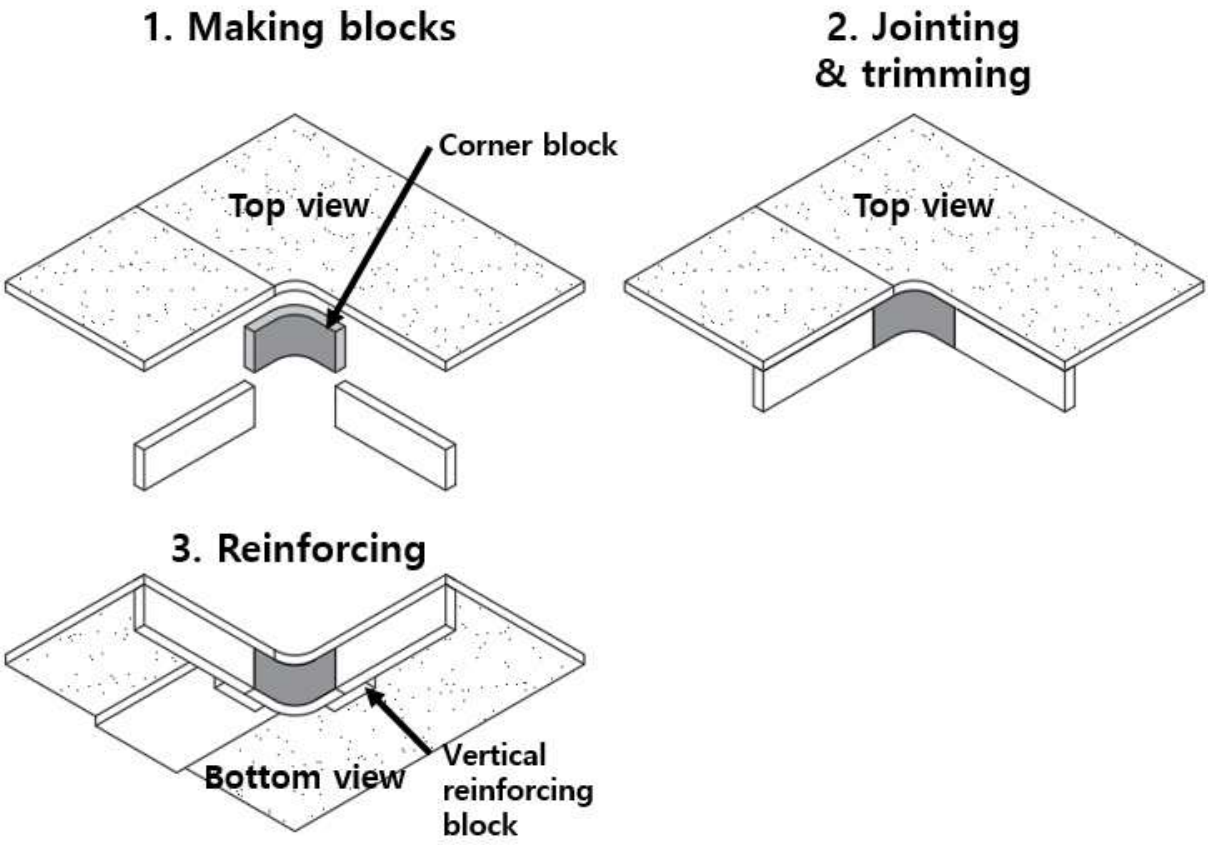
Internal corner of jointed top

Internal Corner with Extended Skirt

Steps:

1. Begin by fabricating a thermoformed corner block.
2. Sand the underside of the block using 120-grit abrasive paper. Clean thoroughly with denatured alcohol and a white cloth.
3. Bond the thermoformed block and edge strips to the underside of the internal corner using a sufficient quantity of HIMACS joint adhesive.
4. Secure with “A” style spring clamps and allow to cure for approximately 45 minutes at +20°C. Ensure that, once clamped, an adequate amount of adhesive is expelled from the joint.

5. If the structure of the corner is not sufficiently robust, reinforce the vertical joint line formed by the corner block and strips with a HIMACS back block measuring 50 mm in width and 12 mm in thickness.
6. Once the adhesive has fully cured, trim the blocks to match the shape of the internal corner and remove any excess adhesive using a router.
7. Complete the process by sanding and polishing the surface as required.

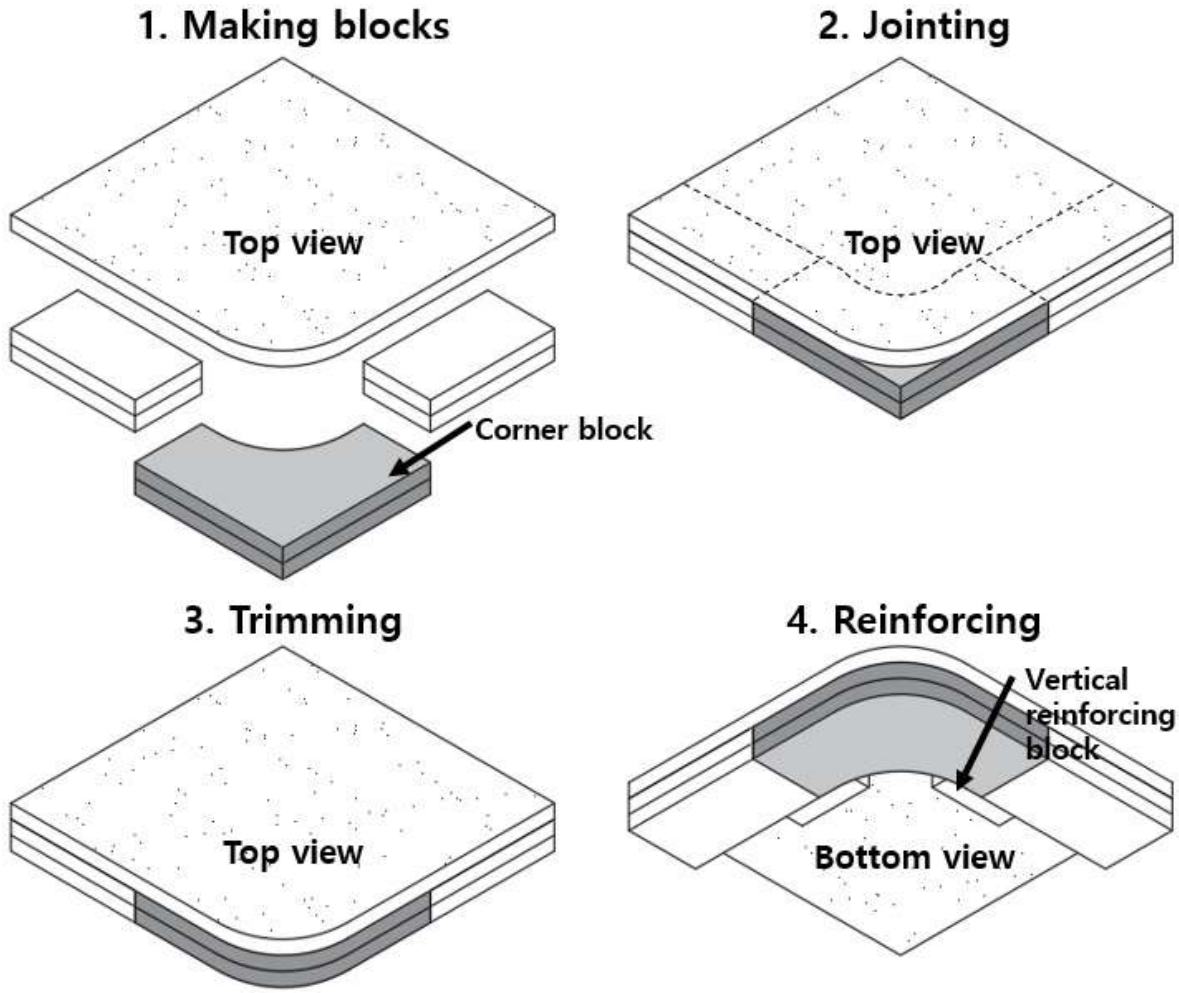


Internal corner with extended skirt of jointed top

4. Fabricating External Corner

- External corners may be fabricated using either the stacking method or the thermoforming method.
- The procedures and recommendations are identical to those for internal corner fabrication.
- If a small-radius external corner is required, the corner may be reinforced by cross-stacking the edge strips.

External corner by stacking method



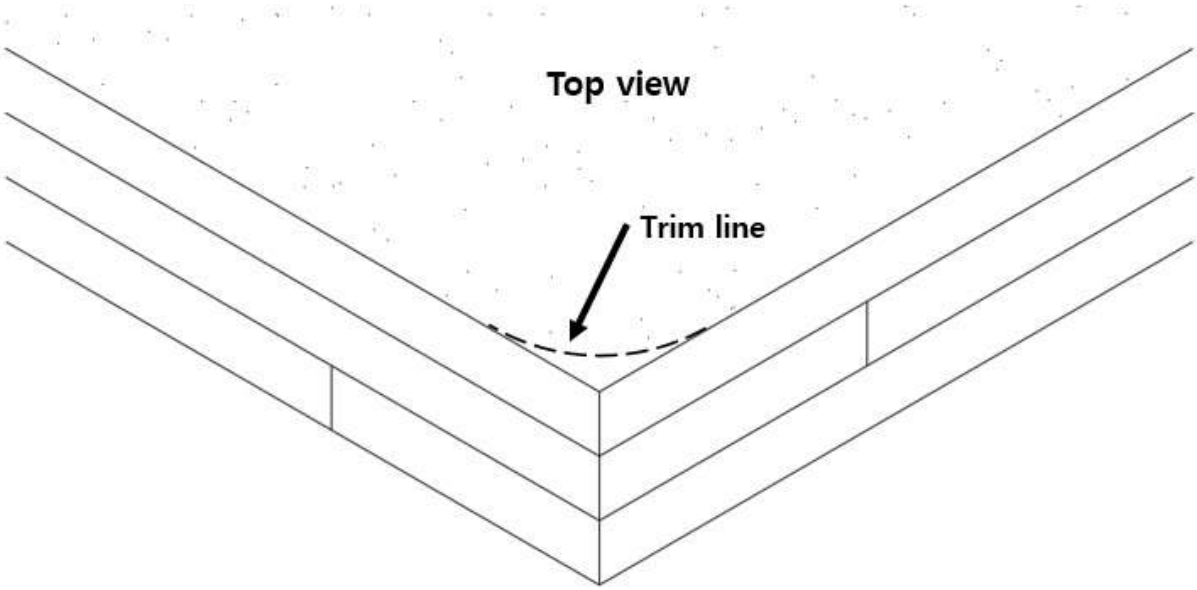
If a small-radius external corner is required, the corner may be reinforced by cross-stacking the edge strips.

Reinforcing a Small-Radius External Corner by Cross-Stacking Edge Strips

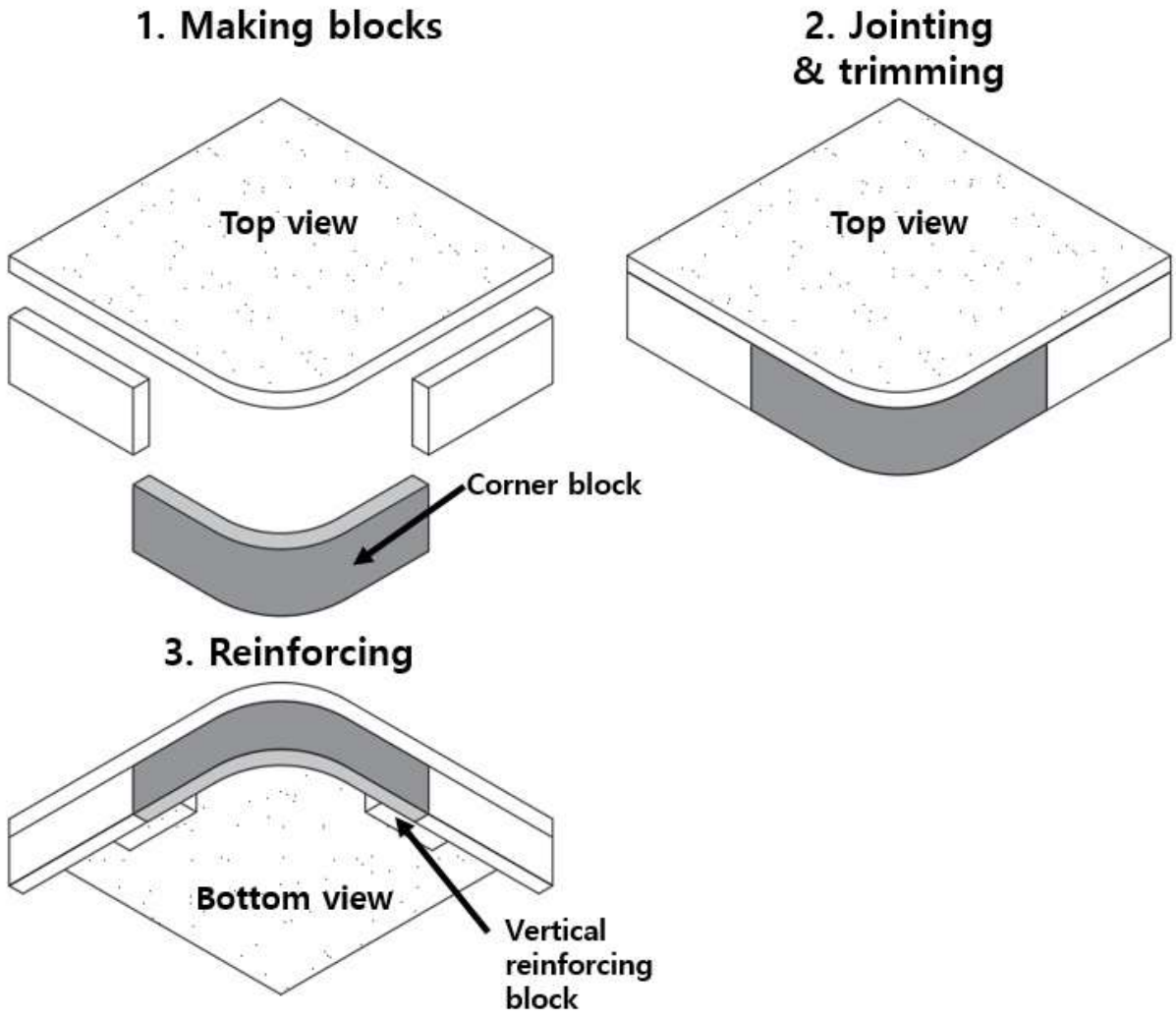
Steps:

1. **Preparation:** Cut the required number of edge strips from HIMACS sheet, ensuring suitable width and thickness.

2. **Sanding:** Sand the bonding surfaces of each edge strip with 120-grit abrasive paper. Clean thoroughly with denatured alcohol and a white cloth.
3. **Positioning:** Arrange the edge strips so that each layer is oriented perpendicular (crosswise) to the previous layer. This cross-stacking increases structural strength.
4. **Bonding:** Apply a sufficient amount of HIMACS joint adhesive between each layer.
5. **Clamping:** Secure the stacked strips using “A” style spring clamps. Allow adhesive to cure for approximately 45 minutes at +20°C. Ensure that excess adhesive is expelled during clamping.
6. **Shaping:** Once cured, trim the stacked edge strips to match the required small-radius external corner profile.
7. **Finishing:** Remove excess adhesive with a router. Sand and polish the corner to achieve a smooth, uniform appearance.



External corner by cross stacking method



External corner by thermoforming method

Minimum Recommendations for Fabricating Corners with HIMACS Sheets

- Always create the largest possible corner radius; never fabricate a square corner.
- Ensure adequate distance between the corner and the seam line on the worktop and minimize the number of joints at the corner.
- Employ sufficient reinforcement methods at the joints where possible.
- Provide additional structural support to ensure the stability of the corner.

Impact on Durability

Adhering to the recommended fabrication practices for corners—such as providing a generous corner radius, maintaining adequate distance between the corner and seam lines, minimising joints at the corner, and reinforcing with suitable support—significantly enhances the durability of the finished product.

Sharp or square corners are more susceptible to stress concentration, which can lead to cracking or failure over time.

Sufficient reinforcement and support help distribute mechanical loads more evenly, reducing the risk of structural weaknesses.

By following these guidelines, the likelihood of premature wear, damage, or failure is minimised, thereby extending the service life of the installation.

13. Backsplashes & Upstands

Various options are available for backsplashes (upstands), each with distinct designs and associated manufacturing costs. The chosen design can be fabricated using different manufacturing processes, depending on the selected method. This section outlines the minimum standard procedure required to achieve stable quality in backsplash fabrication.

1. Consideration For Design And Fabrication

Backsplashes offer a range of design options, serving both decorative and functional purposes in HIMACS installations. It is essential to select the correct fabrication method, as improper techniques can result in failures such as cracking due to stress concentration. Inappropriate fabrication may also lead to increased stress within the material.

Properly fabricated backsplashes contribute to the overall strength and durability of the HIMACS assembly. Therefore, it is important to ensure that the design and fabrication methods are appropriately matched to maximise longevity.

Certain backsplash designs are better suited to specific colours, particularly those featuring veining, pearl or glitter effects, large chips, or a translucent appearance. The fabrication methods described as example in this section are generally recommended for solid colours and granite colours with small to medium chips.

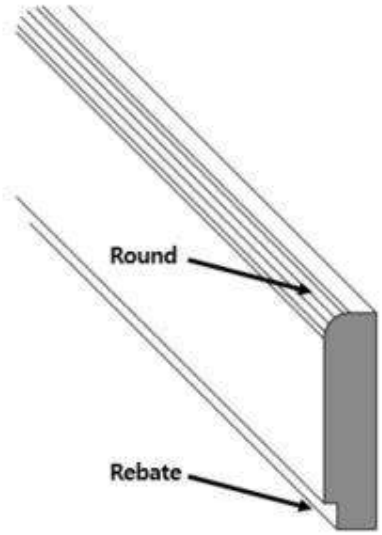
2. Fabricating Backsplashes

Standard Backsplash Installation

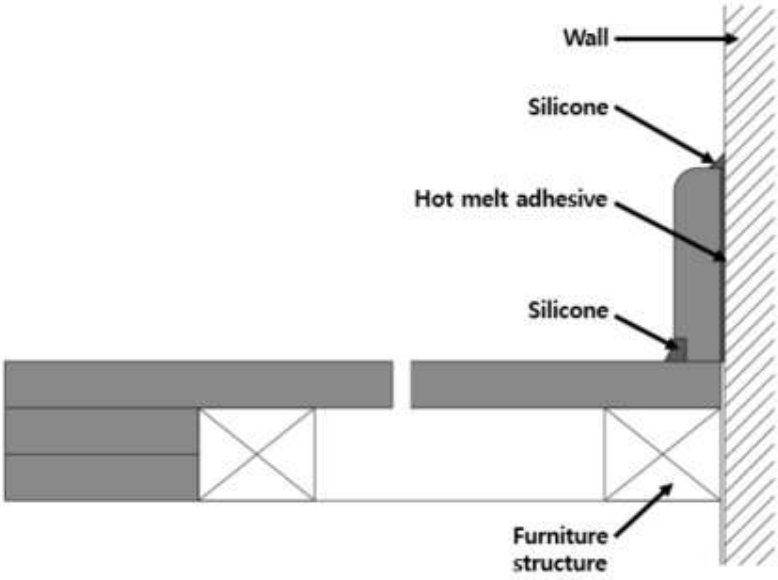
The standard backsplash consists of a HI-MACS strip, trimmed with a radius of 3 to 6 mm and fixed in place using an acrylic-based silicone adhesive. Rebating the underside of the backsplash enhances the durability of the silicone seal.

Procedure:

1. Verify the installed worktop and measure accurately to determine the required size for the backsplash.
2. Inspect and remove any obstructions from the wall and worktop surfaces.
3. Fabricate the backsplash to the correct dimensions. Rebate the underside to allow for stable application of silicone, and form a rounded edge.
4. Clean the edges of both the backsplash and the worktop to be joined, using denatured alcohol.
5. Prepare a colour-matched, mould-resistant silicone and apply a continuous, wide bead along the entire seam area of the worktop.
6. Apply hot-melt adhesive to the rear of the backsplash at intervals of 300 mm.
7. Position the backsplash accurately.
8. Apply silicone to the joint between the worktop and the backsplash.
9. Apply silicone to the joint between the backsplash and the wall.
10. Remove any excess sealant.



Standard backsplash



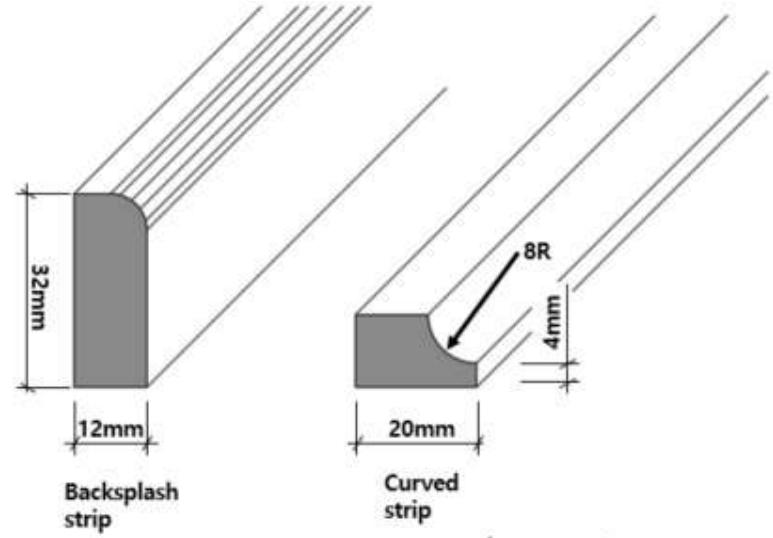
Installing standard backsplash

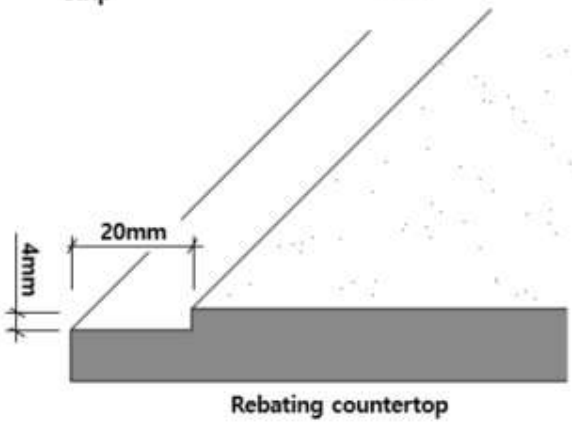
Standard Backsplash Installation

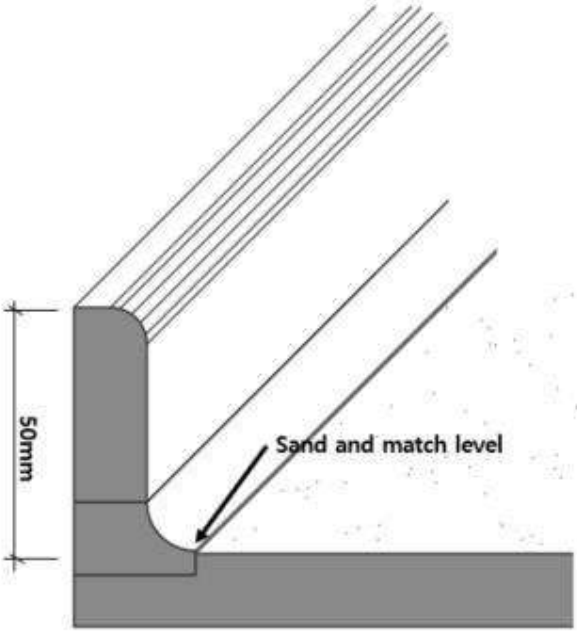
To prevent the accumulation of moisture or bacteria, a curved backsplash is recommended as the most effective solution, particularly in wet areas such as sinks or vanity units. This design also facilitates easy cleaning in a variety of other applications.

Procedure:

1. Fabricate a curved strip with an 8 mm radius at the edge and a width of 20 mm.
2. Cut a backsplash piece to a width of 32 mm and form a rounded edge.
3. Create a rebate on the rear of the worktop, measuring 20 mm in width and 4 mm in depth.
4. Bond the curved strip and backsplash together. Once the adhesive has cured, sand the joint.
5. Insert the curved backsplash into the worktop and complete the installation by trimming and sanding as required.





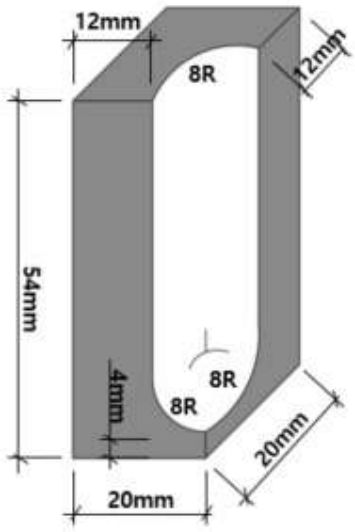


Setting Up an Internal Corner

To configure an internal corner, begin by preparing a corner piece according to the selected radius – in this case, radius R8. For a backsplash with a height of 50 mm, fabricate a block measuring 20 mm × 20 mm × 62 mm. Using a specialised router, shape the internal radius, or alternatively, use a router bit to plunge after the block has been correctly positioned and adhered.

Joining the Corner Block with a Curved Backsplash

This corner block may be integrated with a curved backsplash in order to preserve the structural integrity and aesthetic advantages of the curved design.

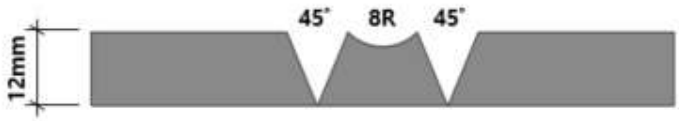


V-Grooving for 12 mm HIMACS Sheets

V-grooving is a precision machining technique employed to facilitate the creation of curved joints in solid surface materials, particularly sheets with a thickness of 12 mm. This method involves routing a V-shaped channel along the rear surface of the sheet, allowing it to be bent smoothly without compromising structural integrity or surface finish.

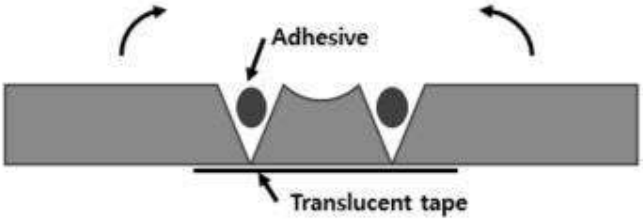
The process is especially beneficial in large-scale fabrication environments, where efficiency and consistency are paramount. By enabling rapid and repeatable formation of curved profiles, V-grooving significantly reduces manual labour and assembly time compared to traditional thermoforming or segmented bending techniques.

However, successful implementation of V-grooving requires investment in specialised routing equipment capable of maintaining consistent depth and angle across the groove. Precision control is essential to avoid material failure or visible surface distortion. Operators must also ensure proper alignment and adhesive bonding during final assembly to maintain the mechanical strength and aesthetic quality of the curved joint.

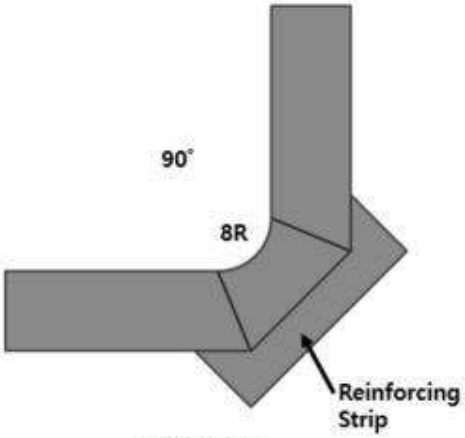


V-grooving

Reinforcing Strip



Adhesive and folding



Reinforcing

This guideline has been created to provide technical information for successful fabrication and installation of HIMACS, and it is intended to be used in a safe environment considering their own discretion and risk by who has technical skill for fabrication and installation of HIMACS.

This guideline is continually revised to provide reliable and up-to-date information, replacing all previous versions of the guideline and technical information, however the usage and conditions of use are beyond LX Hausys control, LX Hausys cannot guarantee the suitability of material, fabrication and installation for all usage and conditions of use. Users should not regard or rely on this guideline as a complete, sole, up-to-date or absolute information. HIMACS users, fabricator and installer should review whether the design for HIMACS, fabrication method, installation method and required performance are suitable for the intended use and conditions of use. LX Hausys shall not be liable for any direct or indirect, commercial damages or losses caused by the fabrication and installation results of HIMACS using any or all these guidelines. In addition, the results of joining with other materials, and the fabrication and installation guidelines for other materials shall not be covered by LX Hausys.

This guideline does not encourage to violate any laws, patents and licenses, and cannot be used as a basis for legal liability. All works on / from HIMACS must be performed in accordance with related laws and regulations.

LX Hausys reserves the right to change the technical information and disclaimers in this guideline for technical development and further information, and the use of HIMACS or this guideline is considered to accommodate the information and changes provided in this guideline. Therefore, please check the changed details of this guideline from time to time.

14. Fabrication for Specific Colours

Fabrication Considerations for HIMACS Sheet Materials

The distinctive visual characteristics of HIMACS sheet materials are a direct result of their unique manufacturing process. As such, conventional fabrication techniques—such as standard field seaming, edge finishing, and backsplash installation—are not appropriate for these products.

Traditional methods that perform adequately with solid colours or fine particulate compositions often fail to deliver satisfactory aesthetic results when applied to HIMACS materials. Consequently, it is essential to adopt fabrication techniques that are specifically suited to the colour and pattern of the sheet being used.

This section outlines the recommended fabrication approaches for various HIMACS colour ranges, ensuring optimal visual continuity and structural integrity.

1. Fabrication Guidelines for Marmo & Aurora Series

Marmo and Aurora are HIMACS products designed to emulate the natural aesthetics of marble. These materials are distinguished by their irregular and varied vein patterns—ranging from strong to subtle, large to small, and long to short—across both the surface and edges. These variations are inherent to the manufacturing process and are considered a characteristic of the product, not a defect.

Due to the complexity and inconsistency of the vein patterns, even sheets from the same batch may exhibit differences in colour and pattern. Long veins may not align perfectly across seams, which can result in visible inconsistencies at the joints. To mitigate this, fabricators must employ recommended seaming techniques or their own advanced methods to achieve the best possible visual outcome.

Fabricators and installers can reduce the visibility of seams by carefully assessing the distribution of vein patterns on each sheet and strategically planning the positioning and cutting. However, it should be noted that seamless integration, as seen with solid colours or granite-style materials, is not achievable with **Marmo** and **Aurora** due to their unique patterning.

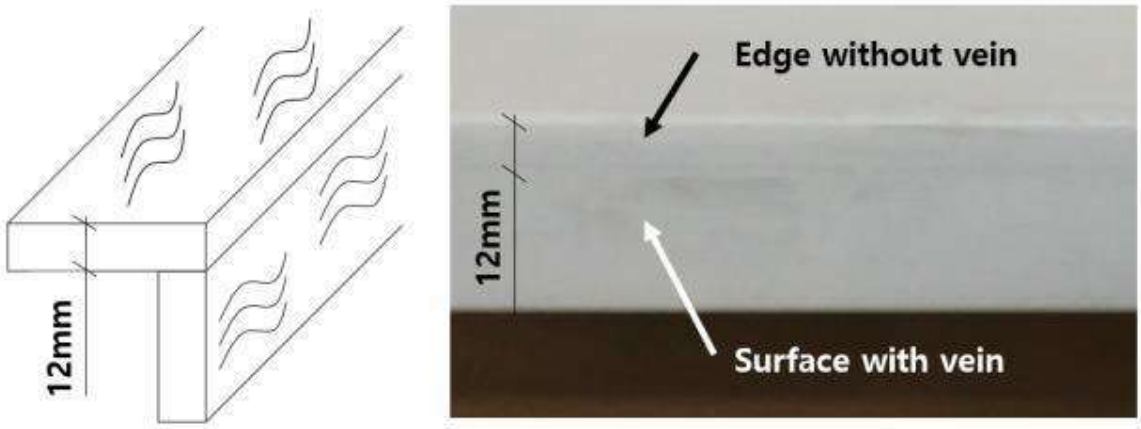
Customers must be informed prior to fabrication that visible seams may be present in the finished product. It is essential to explain the potential for increased material waste and to discuss the required quantity accordingly. Customer complaints regarding visible seams caused by vein pattern mismatches are not covered under the LX Hausys product quality warranty.

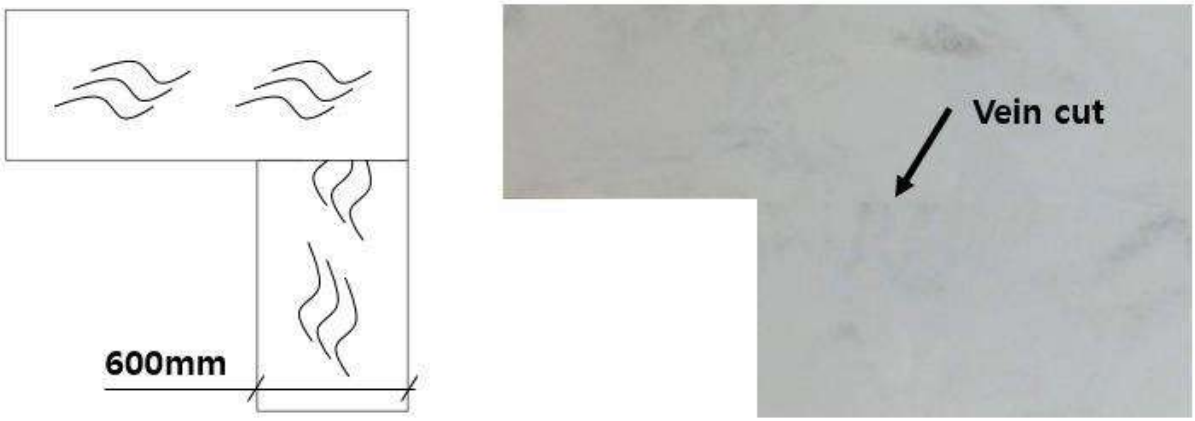
Given the high degree of variation in colour, shading, and pattern - often more pronounced than in sample swatches - it is advisable to allow customers to inspect the actual material and review proposed seaming layouts. To ensure alignment with customer expectations, LX Hausys recommends obtaining signed confirmation of understanding prior to fabrication.

For optimal aesthetic results, LX Hausys strongly recommends adherence to the specified fabrication and installation methods outlined for the **Marmo** and **Aurora** series.

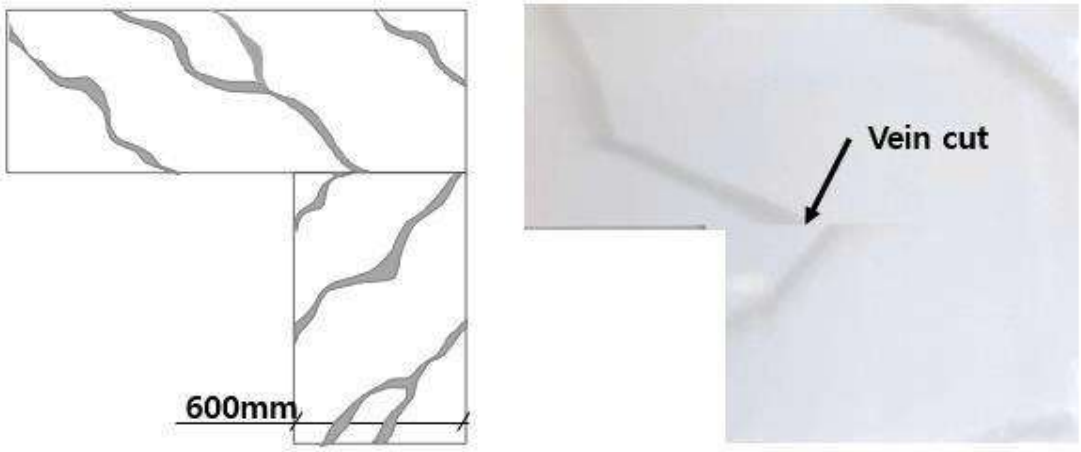
Quick Reference: HIMACS Marmo & Aurora Fabrication Guidelines

- Material Characteristics:
    - Irregular marble-like vein patterns are intentional and not defects.
    - Pattern and colour variation may occur within and between sheets.
- Seaming Challenges:
    - Long veins may not align perfectly, causing visible seams.
    - Seam visibility is more pronounced than with solid or granite colours.
- Fabrication Recommendations:
    - Use recommended or advanced seaming techniques to improve aesthetics.
    - Assess vein distribution before cutting and positioning sheets.
- Customer Communication:
    - Inform customers in advance about potential visible seams.
    - Explain increased material waste and confirm required quantities.
    - Encourage customers to view actual sheets and seaming layout.
    - Obtain signed confirmation of understanding to manage expectations.
- Warranty Note:
    - Visible seams due to vein mismatch are not covered under LX Hausys product warranty.





Difference from cut and veined product direction



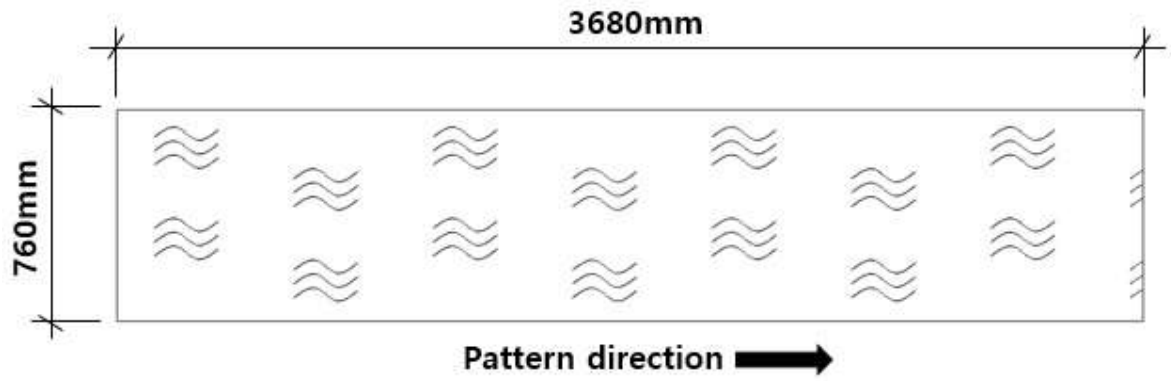
Veined product aspect

Fabrication Details

Seam Alignment for HIMACS Marmo and Aurora Materials

Due to the manufacturing characteristics of HIMACS **Marmo** and **Aurora** sheets, the marble-like vein patterns exhibit a distinct directionality along the length of the material. To achieve a visually cohesive seam design, it is essential that sheets are joined with the vein patterns aligned in the same direction.

Fabricators should verify the directionality by inspecting both the distribution of the vein pattern on the surface and the directional arrows marked on the reverse side of each sheet. Proper alignment ensures a more natural and aesthetically pleasing finish.

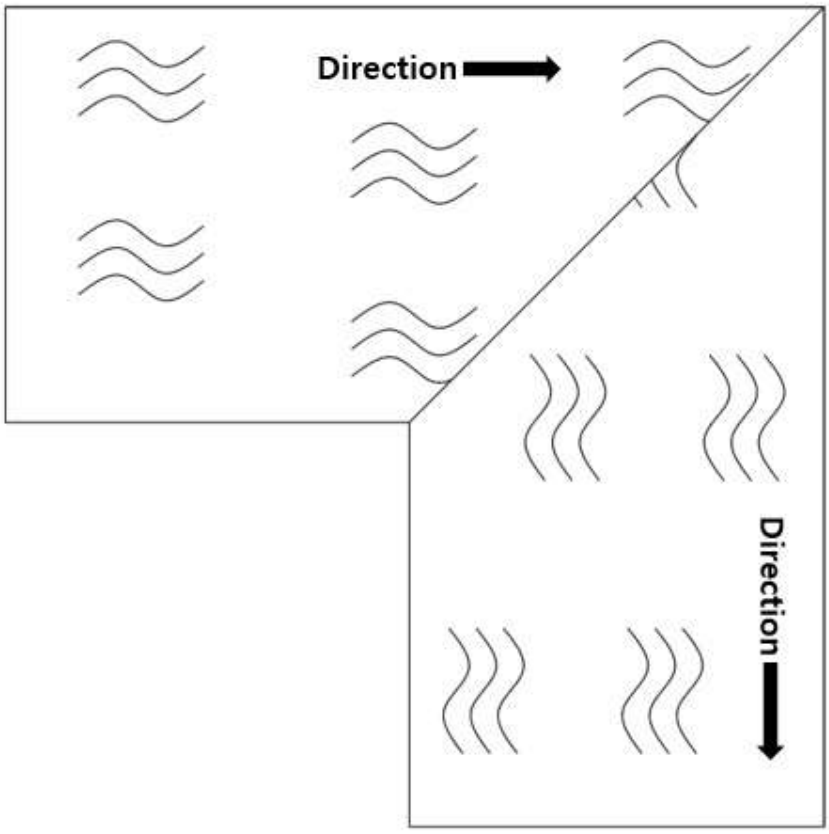


Design pattern on standard sheet

Seaming Considerations for "L"-Shaped Configurations

In "L"-shaped installations, the marble-like vein pattern of HIMACS **Marmo** and **Aurora** materials is interrupted at the joint, often resulting in a visible seam. To minimise this visual disruption and enhance the overall seam design, it is recommended that the vein pattern direction be carefully aligned across adjoining sheets.

Proper alignment of the pattern direction contributes to a more cohesive and aesthetically pleasing finish, even in complex configurations.

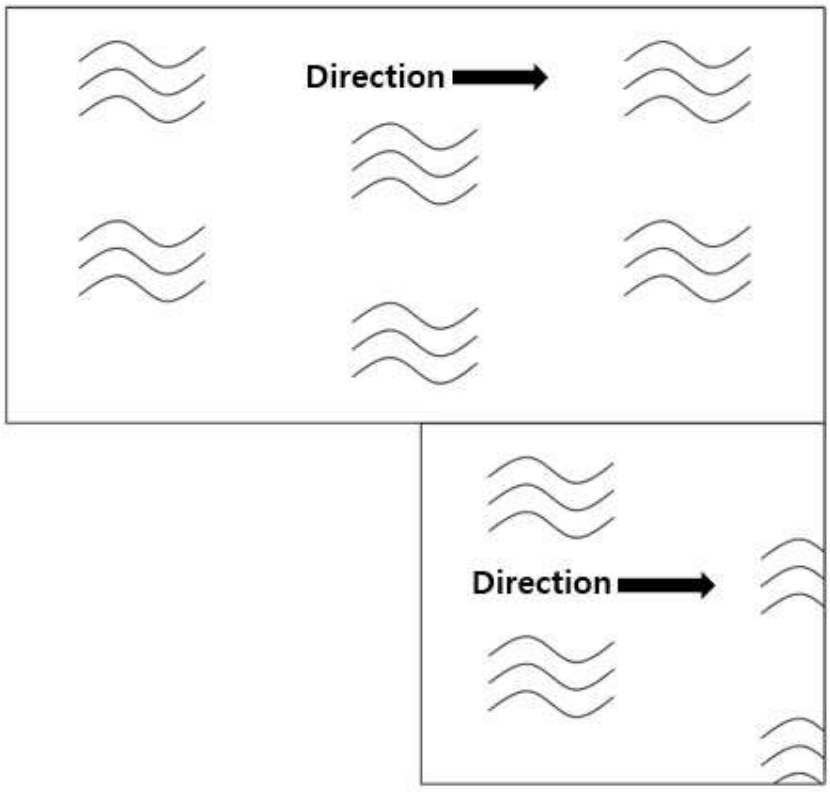


Parallel Joining Recommendations for HIMACS Aurora “M6XX” Series

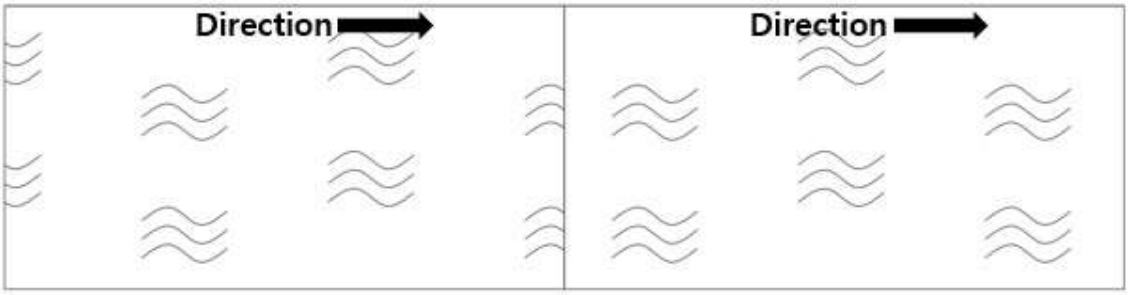
When the length of one side to be joined is less than 760 mm—the standard sheet width—a parallel join may offer a more effective solution. It should be noted that the edge sections of Aurora “M6XX” series sheets may appear slightly darker than the central area due to inherent material characteristics.

To minimise visible colour variation at the seam, it is recommended to trim 50 to 100 mm from the edge of the standard sheet before performing the join. This approach helps achieve a more uniform appearance across the joined surfaces.

Refer to the “Side-to-Side Join” section for further guidance on this method.



“L” shape with parallel join



End join

Seam Design Guidance for Marble-Effect Materials

To achieve a more refined and visually consistent seam design when working with marble-effect materials such as HIMACS **Marmo** and **Aurora**, it is recommended to align the direction of the vein pattern across adjoining sheets. Proper pattern alignment enhances the overall aesthetic and reduces the visibility of seams.

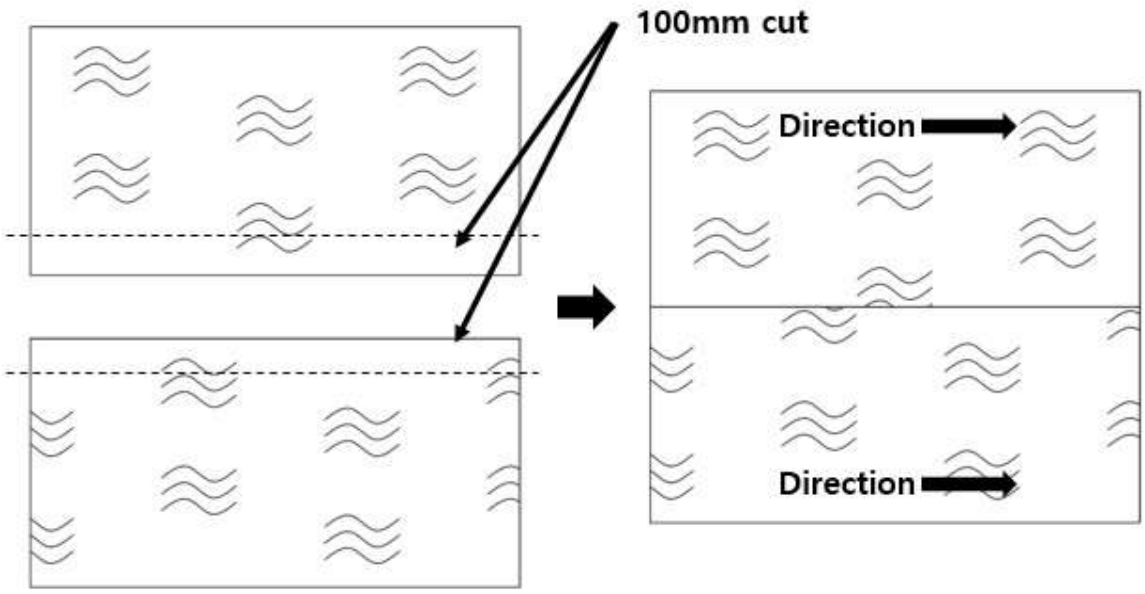
Seam Design and Colour Matching for Aurora “M6XX” Series

For improved seam aesthetics, it is recommended to align the marble-like vein pattern in a parallel direction across adjoining sheets. In the Aurora “M6XX” series, the outer edges of the sheet may appear slightly darker than the central area due to natural variation in the material.

To minimise visible colour differences at the seam, it is advisable to trim 50 to 100 mm from the edge of the standard sheet prior to joining. This practice helps achieve a more uniform appearance and enhances the overall finish.

Benefits of Trimming Sheet Edges Before Joining

1. **Improved Colour Uniformity**
   The outer edges of Aurora “M6XX” sheets may appear slightly darker than the central area due to natural variation in the material. Trimming 50–100 mm from the edge helps eliminate this darker section, resulting in a more consistent colour across the seam.
2. **Enhanced Seam Aesthetics**
   By removing the edge portion, the joined surfaces better match in tone and pattern, reducing the visual impact of the seam and contributing to a more refined finish.
3. **Better Pattern Continuity**
   Trimming allows fabricators to work with the more uniform central area of the sheet, making it easier to align the marble-like vein patterns for a seamless appearance.
4. **Reduced Risk of Customer Complaints**
   Minimising visible colour and pattern differences at the seam helps meet customer expectations and reduces the likelihood of dissatisfaction with the final product.
5. **Professional Finish**
   This practice reflects attention to detail and adherence to best fabrication standards, reinforcing the quality of workmanship.



Side to Side join

Edge Treatment Recommendations for HIMACS Marmo and Aurora Sheets

Due to the manufacturing characteristics of HIMACS **Marmo** and **Aurora** materials, the marble-like vein pattern and colour at the sheet edge may differ slightly from the appearance of the main surface. To achieve a more refined and visually cohesive edge design, it is advisable to conceal the sheet edge wherever possible.

Recommended methods include:

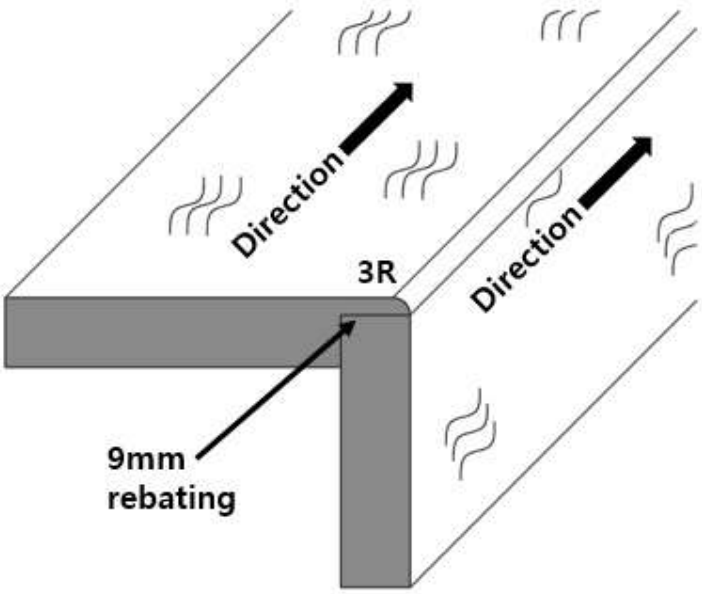
- v-grooving (45° Cut and Join): This technique effectively hides the edge by creating a seamless transition between surfaces, offering the most aesthetically pleasing result.
- 9 mm rebating**:** A practical alternative that also helps minimise the visibility of edge variation.
- stacked edge**:** While this method may produce a slightly different appearance compared to the main surface, it generally blends well with **Marmo** and **Aurora** patterns and is suitable for a wide range of edge designs.

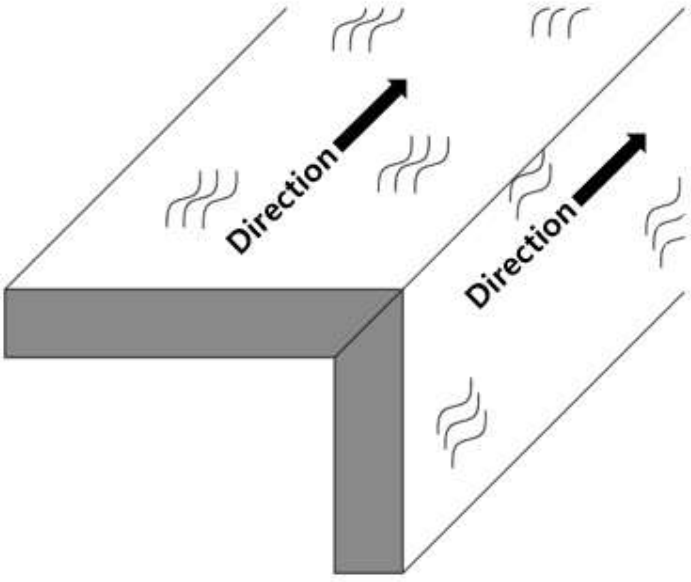
These approaches help maintain the natural look of the material and improve the overall finish of the fabricated product.

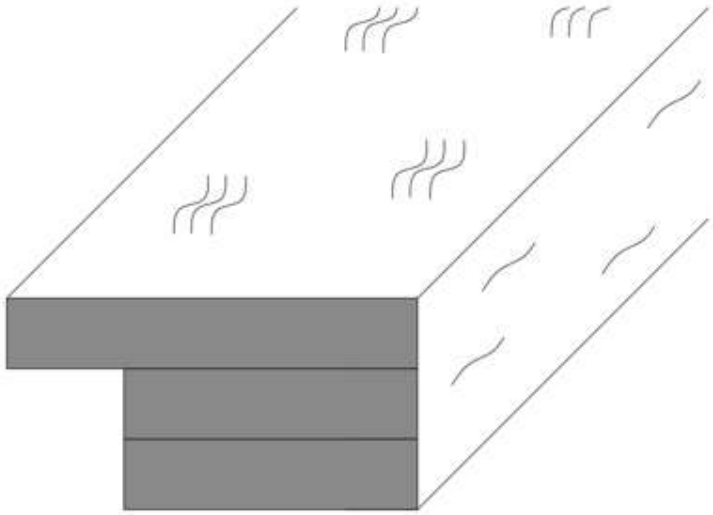
Sanding Precautions for Long Vein Patterns in HIMACS Materials

HIMACS sheets featuring long vein patterns have these details formed with a slightly shallower depth than typical marble-effect surfaces. Excessive sanding may result in the removal or distortion of the vein pattern.

To preserve the visual integrity of the material, avoid deep sanding—particularly around join lines. Instead of levelling the join through sanding, it is recommended to minimise any height discrepancy at the seam during the initial fabrication and assembly stages. This approach helps maintain the continuity and appearance of the long vein design.







2. Fabrication Guidelines for Glitter and Pearl components

Edge Fabrication Guidance for Glittering Colours (e.g., Perna) in HIMACS Sheets

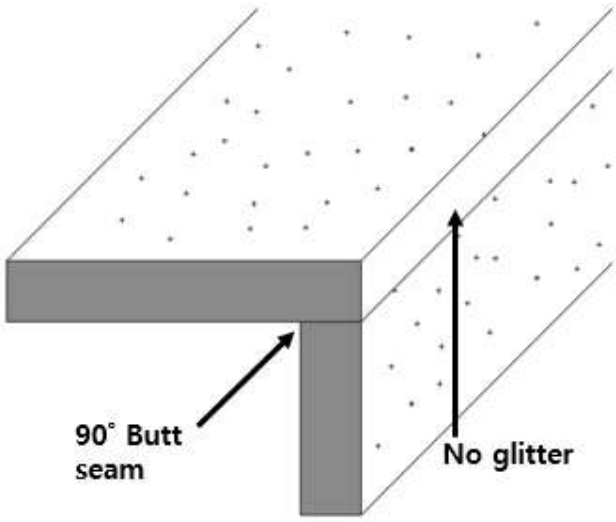
- Certain HIMACS colours, such as **Perna**, feature a glittering or pearlescent effect that is visible only on the main (plane) surface of the sheet. This effect does not appear on the sheet edge, which is a characteristic of the manufacturing process and **not a defect**.
- To achieve the best visual result when fabricating edges with these colours, it is recommended to **conceal the sheet edge** wherever possible. The following methods are advised:
    - **V-Grooving (45° Cut and Join):** This technique effectively hides the edge, ensuring a seamless appearance and maintaining the glittering effect on visible surfaces.
    - **9 mm Rebating:** Also useful for minimising the visibility of the edge where the glittering effect is absent.

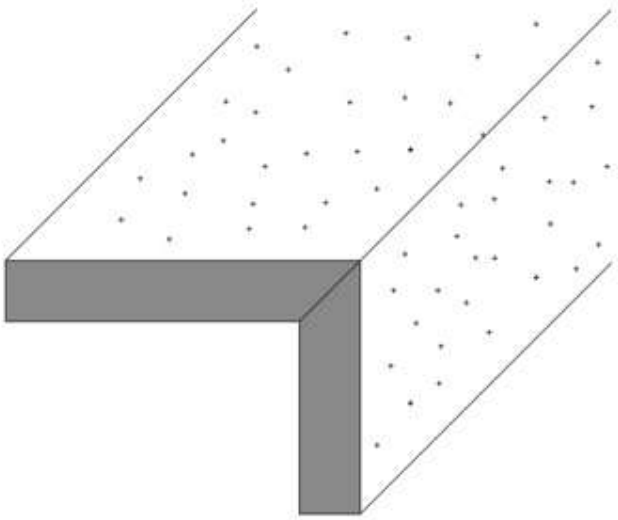
- **Stacked Edge:** While this method does not replicate the glittering effect on the edge, it remains suitable for a variety of edge designs and generally blends well with the overall appearance.

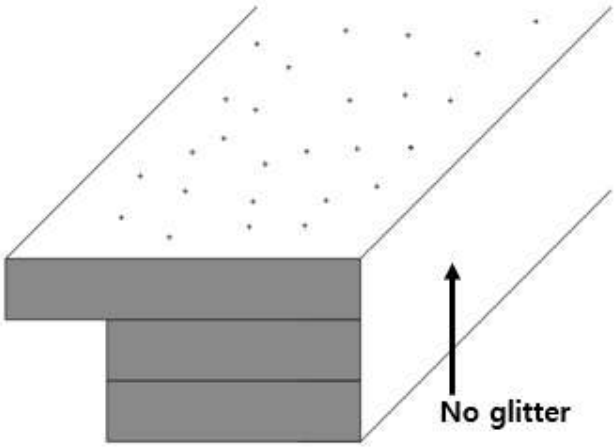
- A simple 90° butt seam is **not recommended** for glittering colours, as it will not display the desired effect on the edge.

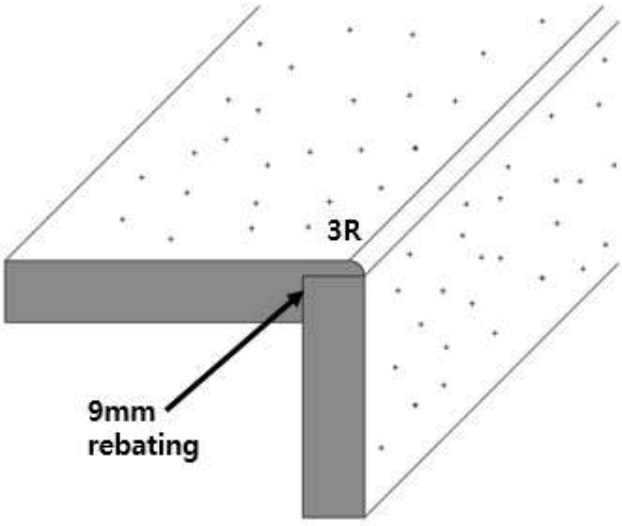
Why a 90° Butt Seam Is Not Recommended

- **No Glittering Effect on the Edge:**
  The glittering or pearlescent effect is only present on the main (plane) surface of the sheet, not on the edge. When a 90° butt seam is used, the exposed edge will lack the glittering effect, resulting in a visible and aesthetically inconsistent join.
- **Noticeable Visual Discrepancy:**
  The difference between the sparkling surface and the plain edge becomes obvious at the seam, drawing attention to the join and detracting from the overall appearance.
- **Unprofessional Finish:**
  The absence of the glittering effect on the edge can make the finished product look incomplete or poorly fabricated, especially when compared to methods that conceal the edge.
- **Better Alternatives Available:**
  Techniques such as V-grooving (45° cut and join) or rebating hide the edge, ensuring the glittering effect is maintained on all visible surfaces and providing a more seamless, high-quality finish.






No glitter


3R
9mm
rebating

3. Fabrication Guidelines for Lucent & Semi-Lucent series

Fabrication Guidance for Translucent Colours (Lucent and Semi-Lucent) in HIMACS Sheets

Certain HIMACS colours exhibit a translucent effect when illuminated with an LED backlight. Due to the refraction of light, seam lines and corners may appear shaded. This shadowing is a natural characteristic of these materials and not a defect. For a full list of applicable colours, please refer to the sample book.

Seam and Corner Recommendations

The use of a simple 90° butt seam for edges and corners is not recommended, as it tends to accentuate shadowing.

To achieve the best translucent effect, it is advisable to conceal the sheet edge wherever possible. V-grooving (45° cut and join) is the preferred method, as it minimises visible shadows at seams and corners.

Customer Communication

Prior to fabrication, it is important to inform customers about the potential for shadowing at seams and corners, as well as the influence of light and structural design on the final appearance.

Discuss the positioning of seams and the overall structure to ensure customer expectations are managed

Quick Reference: Fabrication of Translucent Colours (Lucent and Semi-Lucent)

Material Characteristics

• Translucent effect is visible with LED backlighting.
• Shadows at seams and corners are caused by light refraction—this is a natural feature, not a defect.

Seam & Corner Recommendations

• Avoid simple 90° butt seams for edges and corners, as these accentuate shadowing.
• Use V-grooving (45° cut and join) to conceal sheet edges and minimise visible shadows.

Customer Communication

• Inform customers in advance about possible shadowing at seams and corners.
• Discuss seam positions, lighting, and final structure before fabrication to manage expectations.

Reference

• For a list of suitable colours, consult the HIMACS sample book.

Guidance for Fabricating Lucent and Semi-Lucent HIMACS Products

> **Important Note:**
>
> Due to the light-transmitting properties of Lucent and Semi-Lucent HIMACS sheets, visual differences in translucency and colour may become apparent at the seams after bonding. These variations can occur even with minor differences in light intensity or component composition, provided these are within manufacturing tolerances.

Best Practice Recommendations

• Always use sheets from the same production lot, ensuring closely matching batch numbers.
• Prior to bonding, check the translucency of all sheets under the intended lighting conditions. Only proceed if no visible differences are detected.
• For veined patterns, be aware that variations in vein distribution may affect both the density of the visible pattern and the transmission of light when backlit. This is a natural characteristic of the product and not a defect.
• Test veined sheets with backlighting before bonding and plan fabrication and installation with careful consideration of vein distribution.

Lighting Condition Tips

• Assess all sheets under the actual lighting setup (including LED backlighting) that will be used in the final installation, as different light sources and intensities can highlight variations.
• Ensure lighting is evenly distributed across the surface to minimise the appearance of seams and colour differences.
• Avoid strong spotlights or uneven lighting, which can exaggerate shadows at seams and corners.
• If possible, conduct a trial assembly with backlighting in the workshop to confirm the visual effect before final installation.

4. Fabrication Guidelines for Irregular-pattern products with large and small chips (Lucia, Volcanics, Aster, Terrazzo)

Guidance on Chip Distribution and Appearance for HIMACS Products

This product is characterised by a rugged, robust texture created through the irregular distribution of large, high-contrast special chips.

LX Hausys is committed to providing a diverse range of contemporary chip designs. The natural and deliberately uneven distribution of chips—a defining feature of the design—means that variations in chip placement may occur both between different sheets of the same pattern and within a single sheet. Such differences may be noticeable between flat surfaces or between surfaces and edges and may result in perceived colour variation.

These variations are an inherent aspect of the product's design and should not be regarded as defects.

Impact of Chip Distribution on Appearance

• **Visual Variation:**
The irregular and intentional distribution of large, high-contrast chips creates a distinctive, rugged texture. This means that the appearance of the surface can vary not only between different sheets of the same pattern, but also within a single sheet.

• **Surface and Edge Differences:**
Variations in chip density and placement may be noticeable between flat surfaces and edges, potentially resulting in perceived colour differences or pattern inconsistencies.

• **Design Intent:**
These variations are a deliberate feature of the product's design, intended to provide a natural and dynamic visual effect. They are not considered defects.

• **Customer Expectations:**
It is important to inform customers that such differences are inherent to the material and may be more pronounced in certain installations, especially where sheets are joined or where edges are exposed.

Edge Finishing and Seam Recommendations for Large-Chip and Special-Chip HIMACS

Due to the manufacturing process, large chips within HIMACS sheets tend to migrate towards the surface, resulting in a different chip distribution between the surface and the reverse side when viewed from the edge. For a comprehensive list of available colours, please consult the sample book.

Seam and Edge Guidance:

• To achieve a high-quality edge finish with large-chip or special-chip patterns, it is advisable to avoid exposing the cross-section of the sheet, as this area often displays a noticeable difference in chip density.

• The most effective method is V-grooving (45° mitre cutting and bonding), which conceals the cross-sectional chip distribution and provides a seamless appearance. This is the recommended fabrication technique for all large-chip and special-chip designs.

• Alternatively, a cut-back method may be used to minimise the exposure of the cross-sectional area.

Client Communication and Fabrication Planning:

• As the surface of large-chip and special-chip patterns naturally exhibits non-uniform chip distribution, it is essential to inform clients of this characteristic prior to fabrication, to manage expectations regarding potential differences at seams or between sheets.

• During fabrication and installation, always inspect the chip layout and plan the work to achieve the most consistent appearance possible.

Step-by-Step Guide: Edge Finishing and Seam Planning for Large-Chip & Special-Chip Patterns

1. **Understand Material Characteristics**
   • Large chips tend to migrate towards the surface during production, resulting in different chip distributions between the surface and the reverse side.
   • Variations in chip density may be visible between flat surfaces and edges, or at seams.
2. **Plan Sheet Usage**
   • Refer to the sample book for the list of available colours and patterns.
   • Inspect all sheets prior to fabrication to assess chip layout and distribution.
3. **Edge and Seam Preparation**
   • Avoid exposing the cross-section of the sheet, as this area often shows a noticeable difference in chip density.
   • For best results, use V-grooving (45° mitre cutting and bonding) to conceal the cross-sectional area and achieve a seamless appearance.
   • Alternatively, apply a cut-back method to minimise the exposed cross-section if V-grooving is not feasible.

4. **Client Communication**
   • Clearly inform clients that non-uniform chip distribution is an inherent feature of the product and not a defect.
   • Explain that differences at seams or between sheets are to be expected due to the design.
5. **Fabrication and Installation**
   • During fabrication, continually inspect chip layout to ensure the most consistent appearance possible.
   • Plan joins and edge treatments to optimise visual uniformity across the installation.

15. Basin Installation

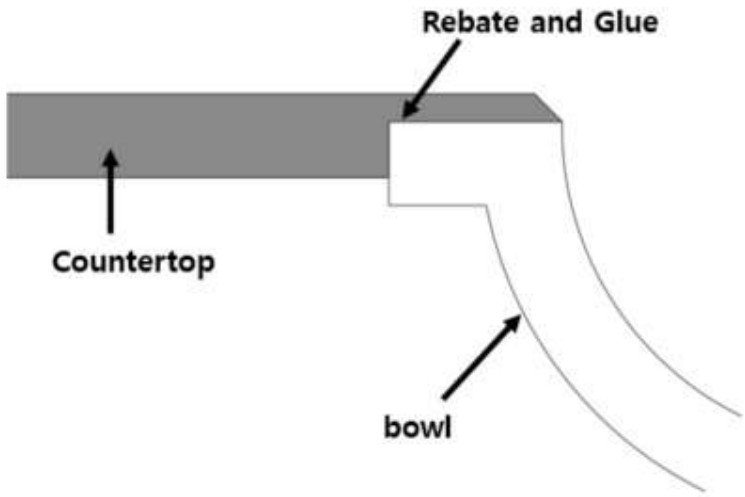
Installation of HIMACS Cast and Thermoformed Sinks and basins
HIMACS cast sinks and basins, as well as thermoformed sinks and basins, may be installed using the under-mount technique, either with or without a rebate. The following section outlines the minimum standard procedure required to ensure a consistently high-quality and stable installation.

1. Installation Types

When the HIMACS sheet and basin are of the same colour, it is strongly recommended to use the rebate method during installation.

Benefits of the Rebate Method

- **Seamless Appearance:** The rebate method allows the sink or basin to sit slightly recessed into the worktop, creating a flush, visually continuous transition between the basin and the surrounding surface—especially effective when both are the same colour.
- **Enhanced Hygiene:** By eliminating exposed edges and lips, the rebate method reduces areas where dirt and moisture can accumulate, making cleaning easier and improving overall hygiene.
- **Improved Strength and Stability:** The rebated edge provides additional support for the sink or basin, resulting in a more secure and durable installation.
- **Superior Aesthetics:** This technique conceals the joint line, minimising visible seams and enhancing the overall finish, which is particularly important for high-end or colour-matched installations.
- **Professional Standard:** The rebate method is widely regarded as best practice in solid surface fabrication, reflecting a higher standard of workmanship.



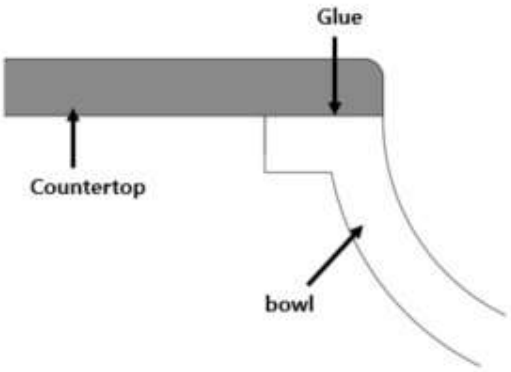
Under mount with rebating

Butt Seam Under-Mount Installation for Contrasting Colours

When the HIMACS sheet and basin are of different colours, a straightforward butt seam under-mount installation may be used. It is essential to ensure that all bonding surfaces are properly smoothed prior to assembly to achieve a secure and visually acceptable finish.

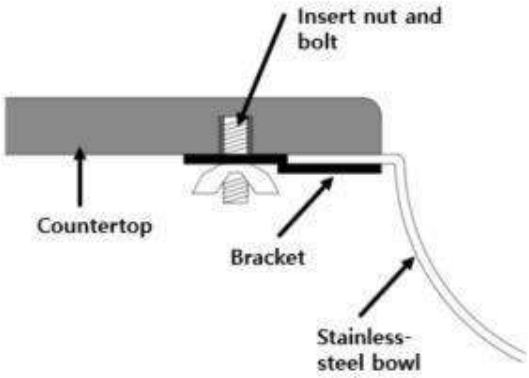
Advantages of the Butt Seam Method

- **Simplicity and Speed:** The butt seam technique is straightforward and quick to execute, making it ideal for installations where efficiency is a priority.
- **Suitable for Contrasting Colours:** This method is particularly appropriate when the sheet and basin are of different colours, as it creates a clear, intentional transition between the two components.
- **Minimal Material Preparation:** The process requires only that the bonding surfaces are properly smoothed, with no need for complex edge profiling or additional fabrication steps.
- **Cost-Effective:** With fewer fabrication requirements, the butt seam method can reduce both labour time and material wastage.
- **Reliable Bonding:** When executed correctly, the butt seam provides a secure and durable join suitable for everyday use.

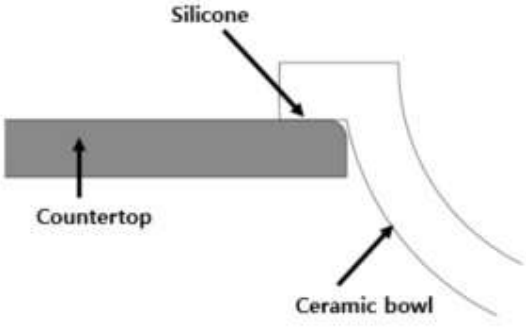


Under mount without rebating

Alternative basin types, such as stainless steel or ceramic, may be installed as illustrated in the figures showing an under-mounted stainless-steel basin and a top-mounted ceramic basin



Under mount stainless – steel basin



Top mount ceramic basin

General Considerations for Solid Surface Countertops

- **Material Compatibility:** HIMACS is non-porous and can be machined precisely, making them suitable for both under-mount and top-mount installations.
- **Thermal Expansion:** Allow for slight movement due to temperature changes, especially around adhesives and sealants.
- **Surface Integrity:** Avoid excessive force or heat during installation to prevent cracking or Warping.

When installing stainless **steel and ceramic basins** on solid surface countertops, it's important to respect the following key aspects to ensure durability, hygiene, and aesthetic quality:

Stainless Steel Basin (Under-Mount Installation)

1. **Cut-Out Accuracy**
    - CNC or template-guided cutting is recommended for a precise fit.
    - Edges should be smooth and sealed to prevent water ingress.
2. **Support & Fixing**
    - Use corrosion-resistant clips or brackets.
    - Reinforce the basin with adhesive suitable for solid surfaces (e.g., two-part epoxy or polyurethane).
3. **Sealant Application**
    - Apply a continuous bead of waterproof silicone between the basin and countertop underside.
    - Avoid excess sealant that could interfere with the flush finish.
4. **Finish Protection**
    - Use protective film or padding during installation to avoid scratches.

Ceramic Basin (top-mount installation)

1. **Cut-Out Dimensions**
    - Ensure the cut-out allows the basin rim to sit evenly on the surface.
    - The rim should cover the cut edge completely.
2. **Weight Distribution**
    - Ceramic is heavier; ensure the countertop is adequately supported underneath.
3. **Sealant & Adhesion**
    - Apply a sanitary-grade silicone around the rim to prevent water seepage.

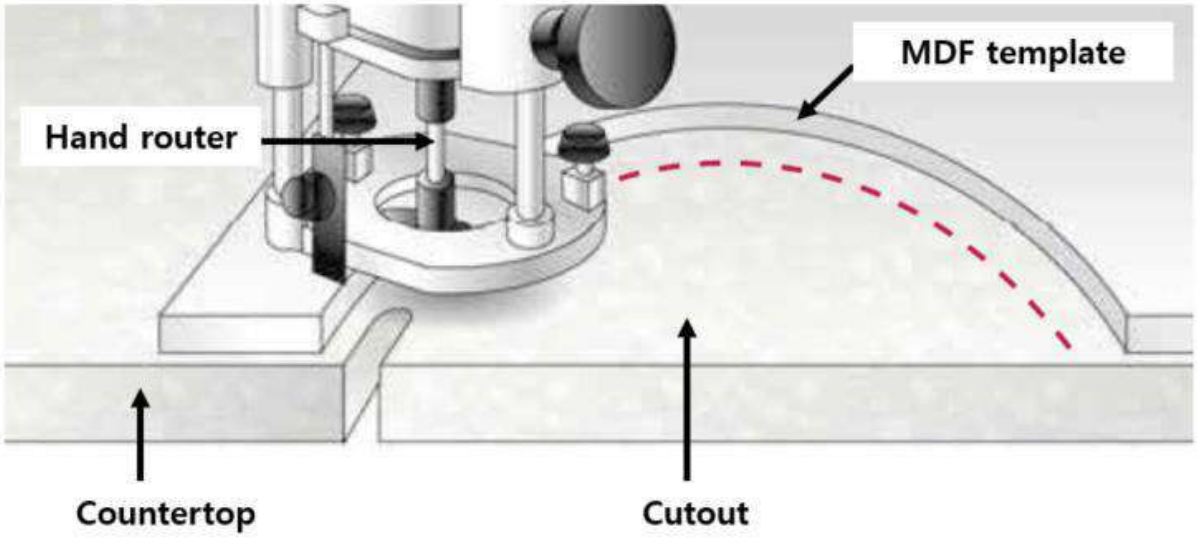
- Avoid adhesives that may stain or react with the ceramic glaze.

4. **Handling & Alignment**
    - Handle with care to prevent chipping.
    - Align the basin before sealing to avoid repositioning once the adhesive sets.

2. Installation Details

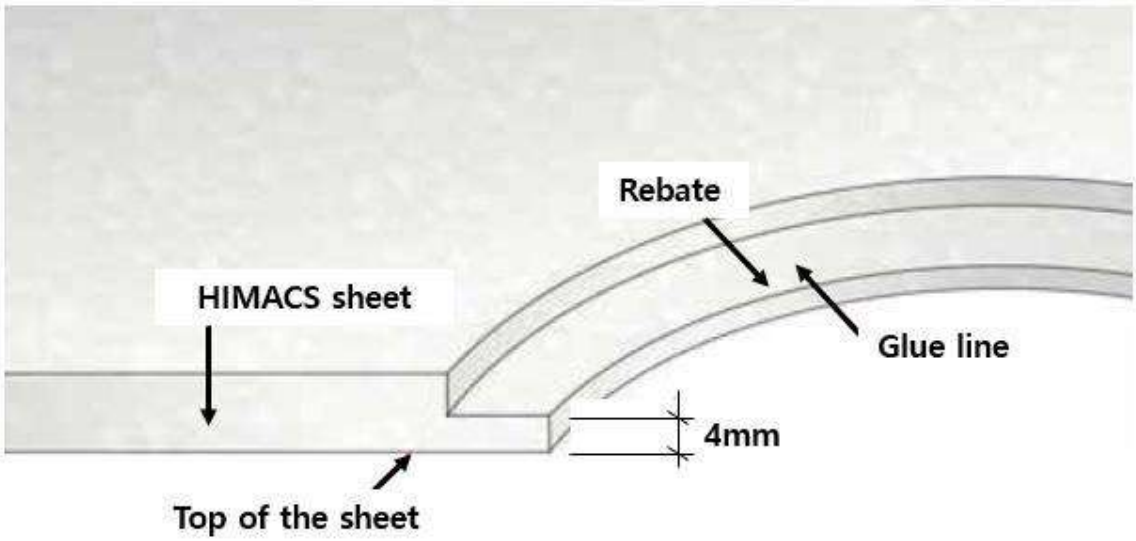
2.1. Basin Installation with Rebate

1. **Template Preparation**
   Utilise a pre-fabricated cut-out template made from MDF or any other suitable timber material.
2. **Cut-Out Calculation**
   Ensure that the final cut-out in the solid surface sheet is smaller than the internal diameter of the basin. An overhang of approximately 2 to 3 mm is acceptable.
3. **Template Positioning**
   Position the cut-out template accurately and secure it firmly using clamps.
4. **Workpiece Alignment**
   Confirm that the workpiece is aligned correctly and adequately supported to prevent movement during routing.
5. **Routing Procedure**
   Perform the cut-out using a hand router with a minimum power rating of 1.8 kW. The router must be compatible with a 12 mm shank and equipped with a 10 mm and a 30 mm sleeve guide. Route in a clockwise direction for optimal control and finish.



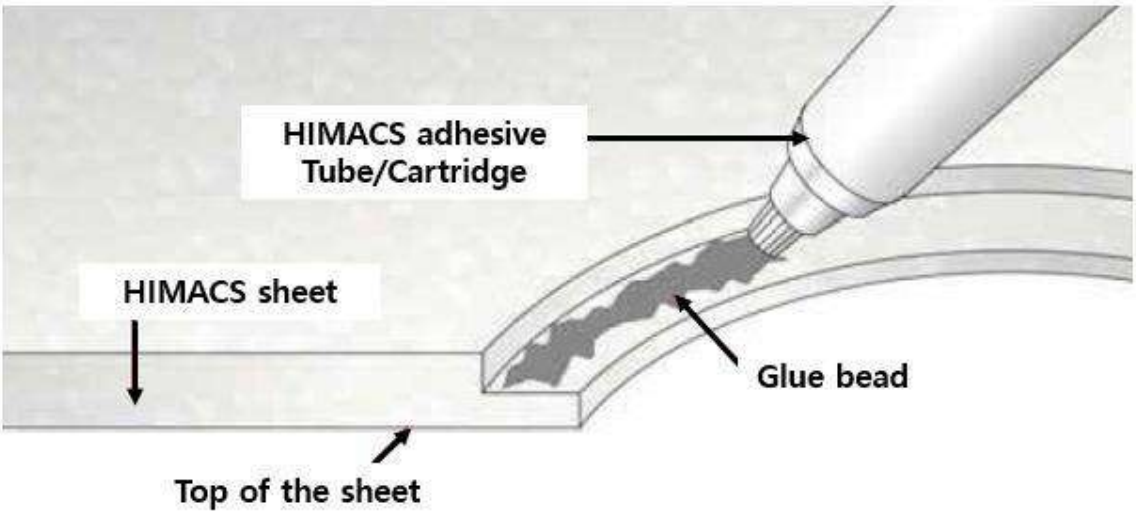
Rebate Preparation and Cleaning Procedure

1. **Template Replacement**
   Remove the cut-out template and position the rebate template accurately.
2. **Routing the Rebate**
   Utilise a sharp 20 double-flute carbide router (side and bottom cutting) fitted with a 30 mm sleeve guide. Adjust the router depth to ensure a minimum of 4 mm material thickness remains in the HIMACS sheet.
3. **Template Removal and Cleaning**
   Once routing is complete, remove the rebate template. Clean the area thoroughly using denatured alcohol and a clean white cloth or white industrial-grade paper.
4. **Surface Preparation for Bonding**
   Clean both the rebate and the edge of the basin to be bonded, ensuring all dust, grease, and pen marks are removed. Denatured alcohol and a white cloth are recommended for best results.
5. **Handling Precautions**
   Avoid touching the cleaned surfaces with bare hands. If contact occurs, clean the area again to prevent contamination, which may become visible in the adhesive line.



Adhesive Preparation and Application

6. **Adhesive Preparation**
   Prepare the HIMACS adhesive in accordance with the manufacturer's instructions.
7. **Component Mixing**
   If using a tube-type adhesive, fill the tube with the filler component followed by the hardener.
8. **Air Removal and Sealing**
   Expel any trapped air from the tube and seal the top securely using the designated plug.
9. **Mixing Procedure**
   Place the tube in an orbital sander and mix thoroughly for a minimum of 1.5 minutes, moving the tube alternately to the left and right.
10. **Mixing Verification**
    Ensure the adhesive is fully and evenly mixed before application.
11. **Application**
    Apply the adhesive in a continuous bead along the rebate or around the edge of the basin to ensure a uniform bond.

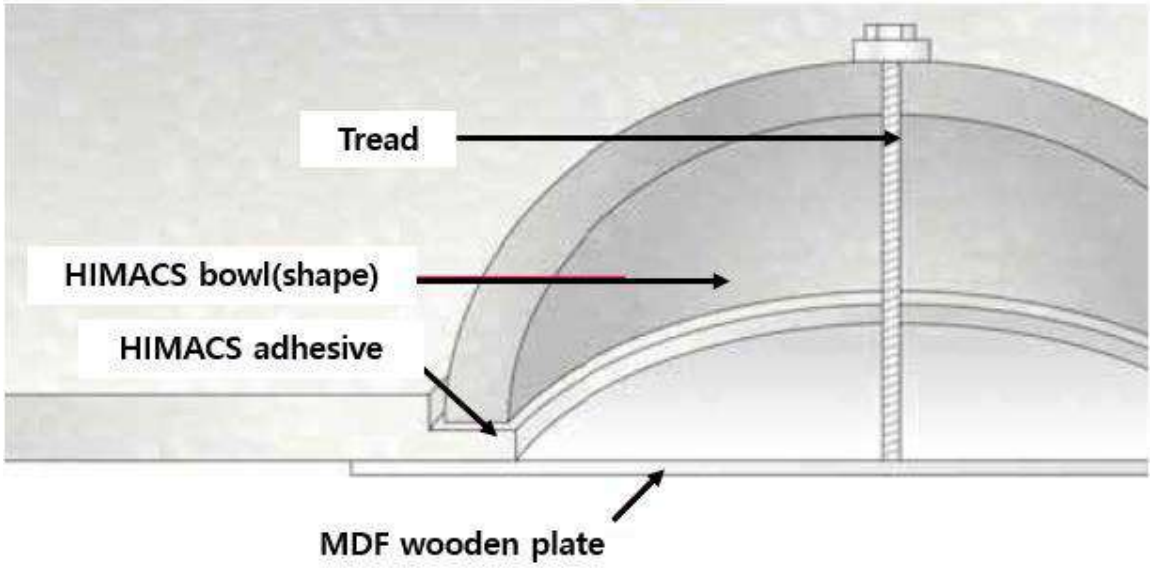


Basin Positioning, Clamping, and Bonding Procedure

12. **Basin Placement**
    Invert the basin and carefully position it into the rebate.
13. **Alignment Check**
    Ensure the drain hole is correctly aligned for the final orientation of the sheet. Confirm that the basin is squarely positioned within the rebate.
14. **Securing the Basin – Clamping Tips**

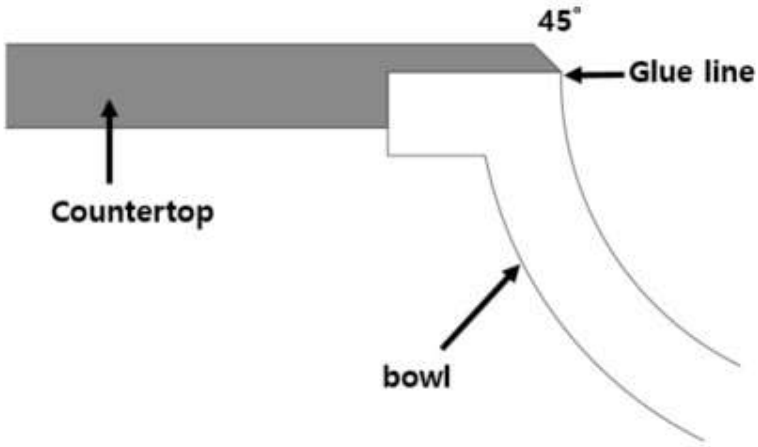
- Use clamps or a threaded rod inserted through the drain hole to hold the basin in place.
- Protect the basin and sheet by placing a thick wooden plate between the clamp and the surface.
- Apply additional clamps at the front if necessary to maintain even pressure.
- Do not overtighten: excessive force may deform the basin or damage the solid surface.
- Check that the basin remains level and centered throughout the clamping process.

15. **Adhesive Curing**
    Allow the HIMACS adhesive to cure undisturbed for a minimum of 35 minutes at a room temperature of at least +17°C.



Finishing the basin Installation

16. **Clamp Removal and Sheet Reorientation**
    Remove all clamping systems and carefully turn the sheet over.
17. **Trimming the Cut-Out**
    Use a tungsten carbide profile router bit with a nylon bearing and a 12 mm shank to trim the cut-out. Always use a 45° profile and begin precisely at the adhesive joint between the basin and the sheet.
18. **Profile Selection**
    Avoid using a radius profile, as it may accentuate any slight colour variation between the basin and the sheet, even when both are of the same colour.
19. **Sanding and Finishing**
    Sand the trimmed area and complete the finishing process according to standard surface preparation procedures.



2.2. Basin installation without rebate

This method is used when a rebate is not required, offering a simplified installation process while maintaining a secure and hygienic bond between the basin and the solid surface sheet.

Installation Procedure

1. Marking the Basin Position

- From the rear side of the solid surface sheet, accurately mark the intended position of the basin.
- Ensure the alignment is correct, particularly with respect to the drain hole, as this will be critical when the sheet is turned over.

Cutout and basin Positioning Procedure

1. Template Placement
Position the cutout template accurately and secure it firmly using clamps.
Tip: Double-check alignment before proceeding to avoid errors during routing.

2. Workpiece Support
Ensure the HIMACS sheet is properly aligned and supported to prevent movement or vibration during cutting.

3. Routing the Cutout

Use a hand router with a minimum power rating of 1.8 kW, compatible with a 12 mm shank. Fit a 10 mm single-flute carbide router bit with a 12 mm shank and a 30 mm sleeve guide.

Tip: Confirm the router bit's working length is suitable for the sheet thickness.

4. Sanding the Back Surface

Sand an approximately 80 mm wide strip adjacent to the cutout on the reverse side of the HIMACS sheet. Use a random orbital sander with 100- and 60-micron sandpaper (equivalent to 150/180 grit).

Tip: Sand evenly to ensure a smooth bonding surface.

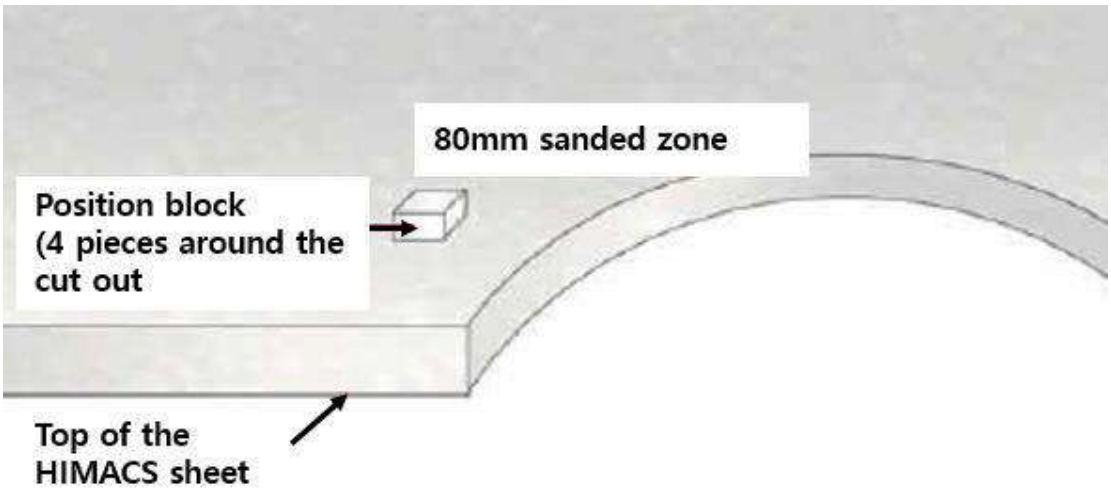
5. Surface Preparation

Remove all visible marks and scratches from the pre-sanded area to ensure optimal adhesion.

6. Basin Repositioning and Fixing

Reposition the basin accurately. Attach 3–4 positioning blocks (approx. 2 cm x 2 cm), made from HIMACS or wood, using hot-melt adhesive.

Tip: These blocks are temporary and should be removed after bonding is complete.



Preparation and Bonding Instructions

1. Surface Cleaning

Clean the sheet and the edge of the basin to be bonded, removing all dust, grease, and pen marks. Use denatured alcohol or acetone with a clean white cloth.

Tip: Avoid coloured cloths, as dyes may transfer and contaminate the surface.

2. Handling After Cleaning

Do not touch cleaned surfaces with bare hands. If touched, clean again to prevent visible contamination in the glue line.

Tip: Use gloves to minimise accidental contact.

3. Adhesive Preparation

Select a HIMACS adhesive cartridge (45ml or 250ml) in the correct colour (refer to the sheet/adhesive colour chart). Dispense a small amount without the mixer tip to ensure both components (hardener and base) are flowing. Attach the mixer tip and discard the first 2 cm of mixed adhesive before use.

Tip: If only one component is dispensing, check for blockages or cartridge damage.

4. Adhesive Application

Apply adhesive in a continuous bead, ideally along the edge of the basin.

Tip: Avoid breaks in the bead to prevent weak spots in the bond.

5. Positioning the Basin

Invert and position the basin carefully. Ensure the drain hole is correctly aligned and the basin is square.

Tip: Dry-fit the basin before applying adhesive to confirm alignment.

6. Securing the Basin

Clamp the basin using either clamps or thread through the drain hole, protected by a thick wooden sheet. Use additional clamps at the front if needed. Do not overtighten.

Tip: Over-tightening may distort the basin or squeeze out too much adhesive, weakening the bond.

7. Curing Time

Allow the adhesive to cure for at least 35 minutes at a minimum room temperature of +17°C.

Tip: In colder environments, extend curing time or use a heat source to maintain temperature.

8. Cleaning Excess Adhesive

Do not clean uncured adhesive with acetone or denatured alcohol, as this may weaken the bond.

Tip: Wait until fully cured, then remove excess with a plastic scraper or sanding tool.

9. Mechanical Fixings

Install additional mechanical fixings in a four-corner cross-level configuration for added stability.

Tip: Ensure fixings do not interfere with the adhesive bond line.

Post-Bonding Finishing Procedure

1. Remove Clamping System
Carefully take off all clamping devices and turn the HIMACS sheet over to expose the front surface.

2. Trim the Cutout
Use a tungsten carbide profile router bit fitted with a nylon bearing and a 12 mm shank (e.g., Titman XC201-12,7-12-25*12) to trim the cutout precisely.
Tip: Ensure the router is stable and the bearing runs smoothly along the edge to avoid chipping.

3. Sanding and Finishing
Sand the trimmed area to a smooth finish, using appropriate grit levels for the desired surface quality.
Tip: Begin with a coarser grit and progress to finer grades for a polished result.

Installation Guidelines for Alternative basin Types

1. Cut-Out Preparation
Utilise a dedicated template to create a reduced-size cut-out in the worktop. This ensures the basin fits appropriately and allows the flange to be securely affixed to the surface.

2. Edge Finishing
Apply a radius to both the upper and lower edges of the sheet thickness. Finish the edges by sanding with 150/180 grit sandpaper, or alternatively, 100/60-micron sandpaper, to achieve a smooth surface.

3. Mounting Methods

- **Top-Mounted Installation:** Position the sink from above into the prepared cut-out and secure it using an elastic adhesive, such as silicone.
- **Undermounted Installation:** Install the basin from beneath the worktop using elastic adhesive (e.g., silicone) in conjunction with supplementary mechanical fixings.

Important Considerations

All kitchen sinks must be provided with additional structural support during the installation of the countertop. Although HIMACS kitchen sinks are lighter than cast iron models, their overall dimensions mean that, when filled with water, dishes, and cookware, the total weight is considerable.
Due to the wide range of sink and cabinet configurations available, LX Hausys does not recommend a specific support product. However, installation guidelines for cast iron sinks may serve as a useful reference for determining the appropriate type of support required.

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16. Structure & Installation

Substructure and Support Requirements for HIMACS Sheets

HIMACS sheets, as well as most solid surface materials, must be adequately supported to prevent cracking or deformation. Although HIMACS exhibits commendable hardness, extensive widths and long spans without appropriate support may result in downward bending.

Furthermore, the seam line alone cannot guarantee long-term durability for the end user if sufficient structural support is not provided.

This section outlines the minimum recommended practices for establishing a stable substructure and ensuring proper installation.

1. Substructure

Recommended Support Materials and Substructure Requirements

Depending on the specific application, the following support materials are recommended:

Metal Profiles:

- Steel or stainless-steel profiles – suitable for high-load areas and environments requiring corrosion resistance.
- Aluminium profiles – lightweight and resistant to moisture, ideal for general structural support.

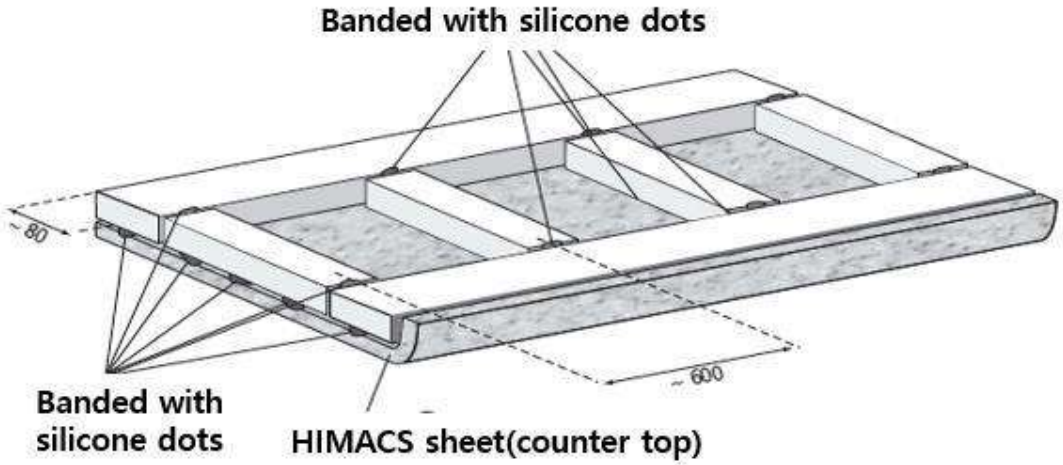
Wood-Based Panels:

- Moisture-resistant MDF (Medium-Density Fibreboard) – commonly used in interior applications where moderate strength and moisture resistance are required.
- Moisture-resistant plywood – offers good structural integrity and is suitable for areas exposed to humidity.
- Moisture-resistant particle board – cost-effective and suitable for low to moderate load-bearing applications.

Construction Boards:

- Plasterboard – appropriate for dry environments and vertical applications.
- Cement board or fibre cement board – recommended for wet areas due to their superior moisture resistance and durability.

It is imperative to ensure that the substructure is designed to meet the mechanical and environmental demands of the intended use. For kitchen installations—such as countertops—a robust substructure frame is strongly advised to ensure long-term stability and performance.



Reinforcement Methods for HIMACS Installations

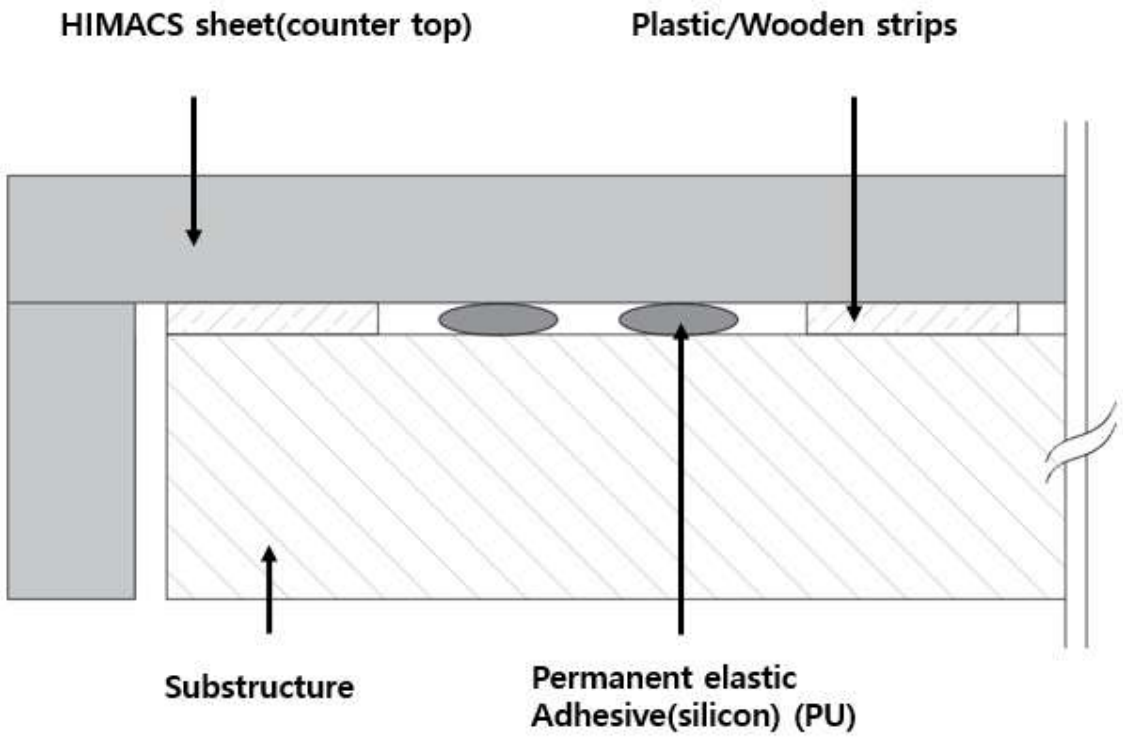
To ensure structural integrity and long-term performance of HIMACS surfaces, especially in applications subject to permanent or substantial loads, the following reinforcement techniques are recommended:

1. **Integrated Substructure Reinforcement**
   Incorporate rigid support elements directly beneath the HIMACS sheet. These may include:

- Aluminum or steel profiles: Positioned longitudinally and/or transversely to distribute weight evenly.
- Plywood or MDF panels: Bonded to the underside to provide a continuous support base.

2. **Cross-Bracing**
   Install cross-bracing within the substructure to prevent lateral movement and maintain flatness. This is particularly important for wide spans or unsupported sections.
3. **Load Distribution Plates**
   Use load distribution plates or panels beneath areas subject to concentrated loads (e.g., under heavy appliances or sinks). These help spread the weight across a larger surface area.
4. **Mechanical Fixings**
   In addition to adhesive bonding, mechanical fixings such as screws or brackets may be used to secure reinforcement components to the base structure, ensuring stability under dynamic or long-term stress.

5. **Foam-Based Double-Sided Tape**
   Where applicable, foam-based double-sided tape can be used between reinforcement elements and the HIMACS sheet to maintain flatness and absorb minor movements or vibrations.



Substructure Construction Guidelines

- Substructure strips fabricated from wood or particle board should have a minimum width of approximately 80 mm and a material thickness of approximately 26 mm, or as determined by the static load calculations relevant to the material employed.
- Rebates for reinforcement strips must be incorporated during the material preparation phase of the substructure construction. These should be clearly specified, particularly when specialised components are to be outsourced to metalworking facilities.
- The substructure design will vary depending on the specific material and project requirements.

Rebate Preparation Process for Reinforcement Strips

Rebate preparation is a critical step in ensuring that reinforcement strips are properly integrated into the substructure of a solid surface installation. A rebate is a recessed groove or channel cut into the material to accommodate a secondary component—typically a reinforcement strip—allowing it to sit flush with the surrounding surface.

1. **Planning and Design**

- Determine the location and dimensions of the reinforcement strips based on the structural requirements of the installation.
- Ensure that the rebate dimensions correspond precisely to the width and thickness of the reinforcement material to achieve a secure and flush fit.

2. **Material Preparation**

- Mark the rebate positions on the substructure material (e.g., wood, particle board, or MDF).
- Use appropriate tools such as a router, circular saw, or spindle moulder to cut the rebate to the required depth and width.

3. **Integration of Reinforcement Strips**

- Insert the reinforcement strips into the prepared rebates.
- Secure them using suitable adhesives or mechanical fixings, depending on the material and load-bearing requirements.

4. **Outsourcing Considerations**

- For projects requiring metal reinforcement (e.g., aluminum or steel), rebate specifications must be clearly communicated to external metalworking providers.
- Ensure that tolerances and finish quality meet the standards required for seamless integration with the HIMACS sheet.

5. **Quality Control**

- Inspect the rebate and reinforcement assembly for alignment, fit, and structural integrity.
- Confirm that the reinforcement does not interfere with the flatness or bonding of the HIMACS surface.

It is the responsibility of the fabricator to select an appropriate construction method tailored to the individual project, considering the performance characteristics of HIMACS material and the specific demands of the application. For guidance on particular use cases, project management support is available from LX Hausys Europe GmbH.

2. Overhang Solutions Suitable for 12 mm Sheet

When designing countertops with overhangs that extend beyond the base cabinetry, the following recommendations apply specifically to installations using 12 mm HIMACS sheets:

- **Overhangs up to 50 mm**
  No additional structural support is required.

- **Overhangs between 50 mm and 150 mm**
  If the overhang is subject tono load, additional support is not necessary.However, if the overhang is expected to bearany load, a second layer of HIMACS sheet must be installed beneath the countertop. This additional layer must extend continuously under the overhang and be securely anchored to the base cabinet(s) to ensure structural integrity.

- **Overhangs up to 300 mm**
  - **Support Requirements:** Corbels must be installed at intervals of no more than 600 mm for overhangs exceeding 150 mm in width, or where unusual loading conditions are anticipated.
  - **Edge Treatment:** A properly fabricated edge detail enhances the structural integrity of the overhang and conceals the supporting components. One of the most straightforward methods for creating a drop edge is to stack additional layers of HIMACS beneath the primary sheet. This technique is suitable for the Solid and Granite colour families.
  - **Typical Configurations:**
    - Two layers (24 mm total thickness)
    - Three layers (36 mm total thickness)

- **Overhangs up to 600 mm**
  - **Support Requirements:** Supporting legs or columns must be positioned at intervals of no more than 600 mm for overhangs exceeding 300 mm in width, or where unusual loading conditions are anticipated.
  - **Edge Treatment:** As with shorter overhangs, a reinforced edge detail is essential. The stacking method described above remains applicable and effective for this range.

Overhang Dimensions	Additional Structure	Limitation
50 mm	Not required	X
50 mm to 150 mm	Not required	No Additional Weight
50 mm to 150 mm	Additional layer of HIMACS	With Additional Weight
150 mm to 300 mm	Corbels every 600 mm	X
300 mm to 600 mm	Supporting leg or support column every 600 mm	X

Overhang Support Ratio Guideline

- A maximum of **one-third** of the total width may extend unsupported beyond the base structure.
- The remaining **two-thirds** of the width must be fully supported.
- If this ratio cannot be maintained, corbel **brackets** must be installed beneath the overhang to provide adequate structural support.

Bracket Installation and Overhang Support Instructions

When installing support brackets for overhangs, the following procedures must be observed to ensure structural integrity and material protection:

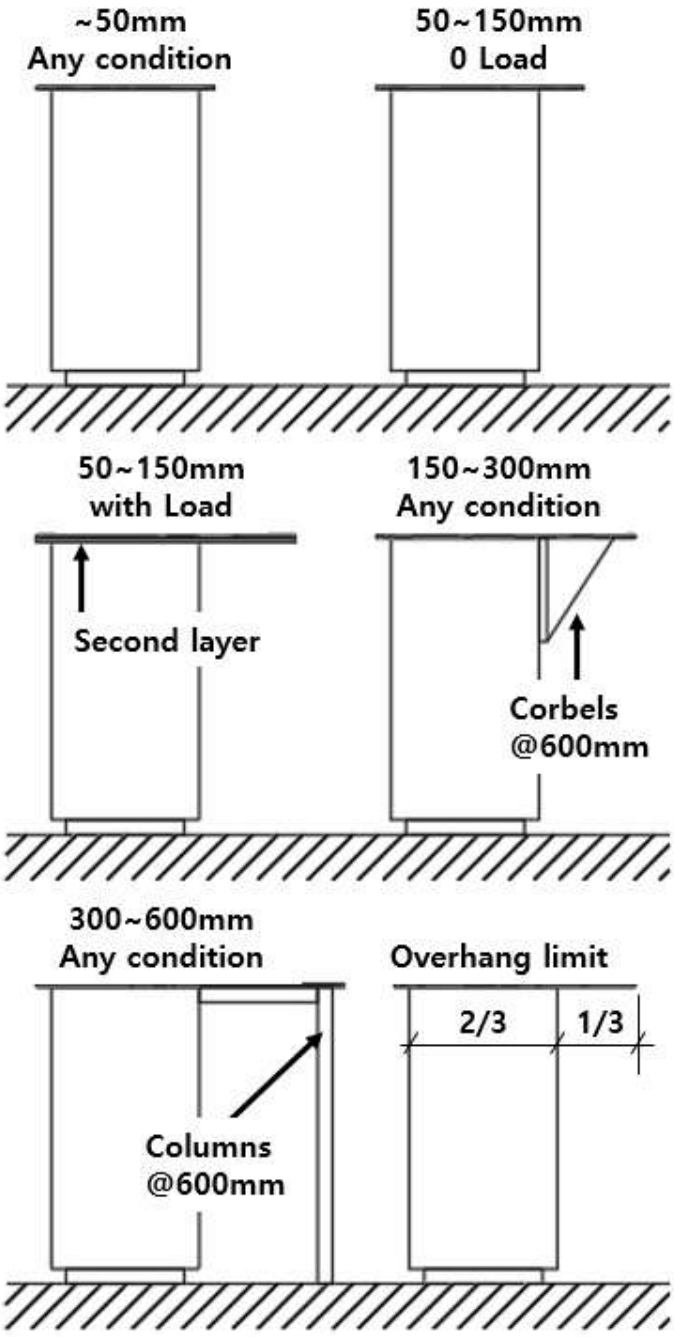
Do not affix brackets directly to the HIMACS material.

Instead, incorporate a piece of hardwood within the perimeter or lattice support structure. Fasteners or screws should be used only if they do not exceed the thickness of the hardwood component.

- For metal supports, apply silicone at all junction points to prevent direct contact and allow for flexible bonding.

- **Alternative Support Method:** A full substrate beneath the overhang, combined with a web support structure positioned above the base cabinets, is also considered an acceptable method of reinforcement.

  Choose the installation method and fittings that are most appropriate for the specific requirements of your project. The selected approach must ensure compliance with all relevant performance and structural criteria.



Overhang solutions
for 12 mm sheet

Criteria for Selecting Installation Method and Fittings

1. **Project-Specific Load Requirements**

- Assess whether the surface will be subject to static or dynamic loads (e.g., heavy appliances, frequent use).
- Choose reinforcement methods (e.g., corbels, brackets, substrate layering) based on anticipated weight distribution.

2. **Overhang Dimensions**

- Determine the extent of any overhangs and apply the appropriate support strategy:
    - Up to 50 mm: No support required.
    - 50–150 mm: Support required only under load.
    - 150–600 mm: Corbels or columns required at 600 mm intervals.

3. **Material Compatibility**

- Ensure that adhesives, fasteners, and support structures are compatible with HIMACS material properties.
- Use silicone at junctions with metal components to prevent stress and allow for thermal expansion.

4. **Substructure Composition**

- Select suitable substructure materials (e.g., hardwood, MDF, metal) based on environmental conditions and mechanical performance.
- Incorporate rebates or lattice supports where necessary.

5. **Aesthetic Considerations**

- Choose edge treatments and support methods that maintain visual consistency and conceal structural elements.
- Drop edges created by stacking HIMACS layers are recommended for Solid and Granite colour families.

6. **Installation Environment**

- Consider humidity, temperature fluctuations, and exposure to water or chemicals when selecting materials and methods.

7. **Compliance and Manufacturer Recommendations**

- Follow HIMACS installation guidelines and consult LX Hausys technical support for project-specific advice.
- Ensure all methods meet local building codes and safety standards.

3. Overhang Solutions Suitable for 20 mm Sheet

When designing countertops with overhangs extending beyond the base cabinetry, the following recommendations apply specifically to installations using 20 mm HIMACS sheets:

Overhangs up to 150 mm
No additional structural support is required.

Overhangs between 150 mm and 300 mm
If the overhang is subject to no load, additional support is not necessary.
If the overhang is expected to bear any load, corbels must be installed at intervals of no more than 600 mm for widths exceeding 150 mm, or where unusual loading conditions are anticipated.

For overhangs extending up to600 mm, the following support measures must be applied based on anticipated usage:

- **Zero Load Conditions:** A corbel must be installed to provide adequate support.
- **Normal Daily Use**: A ladder-type substructure must be positioned beneath the overhanging section, with supporting legs spaced at intervals not exceeding 600 mm.
- **Extended Spans:** If the distance between substructure supports exceeds 600 mm on either side, additional solid substructures must be incorporated to maintain structural integrity.
- **Edge Treatment Considerations**
  A properly fabricated edge detail enhances the strength of the overhang and conceals the supporting components.
  However, the stacking method is not recommended for 20 mm HIMACS sheets due to potential thickness variation, which may result in visible gaps when layers are stacked.

Overhang Dimensions	Additional Structure	Limitation
0 mm to 150 mm	Not required	X
150 mm to 300 mm	Not required	Without Additional weights
150 mm to 300 mm	Corbels every 600 mm	With Additional weights
300 mm to 600 mm	Corbels every 600 mm	Without Additional weights
300 mm to 600 mm	Supporting leg or column every 600 mm	With Additional weights

Overhang Support Ratio Guideline

To prevent structural failure in overhang applications, it is essential to adhere to the following support ratio:

- A maximum of one-third of the total width may extend unsupported beyond the base structure.
- The remaining two-thirds of the width must be fully supported.
- In instances where this ratio cannot be maintained, corbel brackets must be installed beneath the overhang to provide adequate structural support.

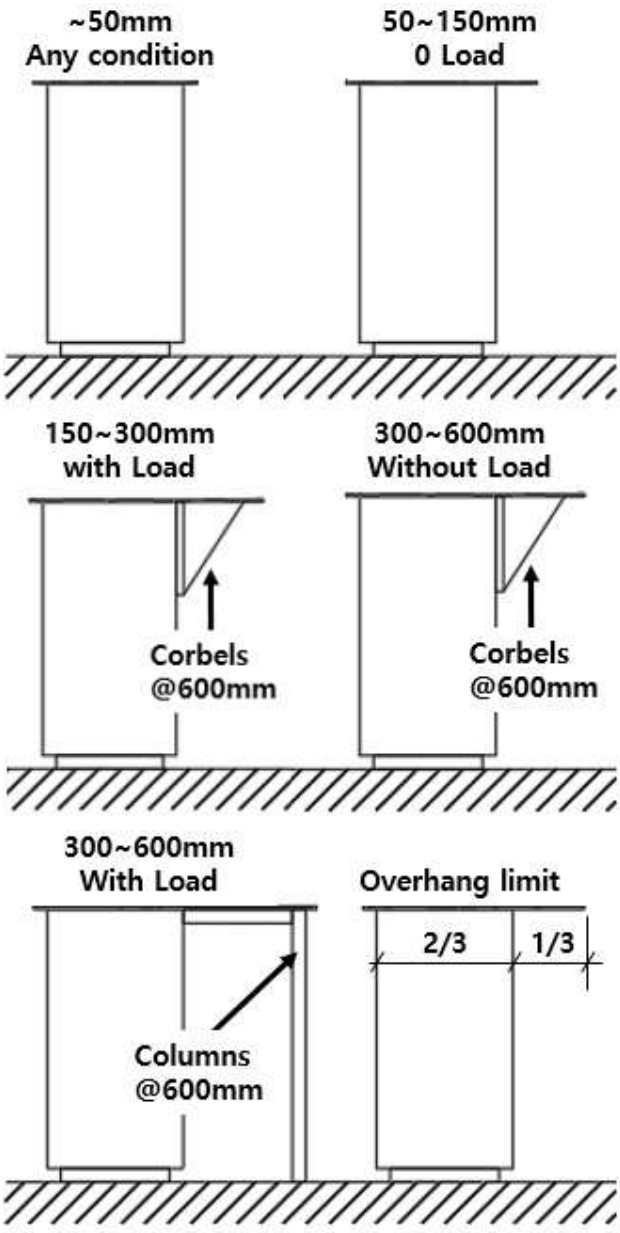
Bracket Installation and Overhang Support Instructions

When installing support brackets for overhangs, the following procedures must be observed to ensure structural integrity and material protection:

- **Do not affix brackets directly to the HIMACS material.**
- Instead, incorporate a piece of hardwood within the perimeter or lattice support structure. Fasteners or screws should be used only if they do not exceed the thickness of the hardwood component.

- **For metal supports,** apply silicone at all junction points to prevent direct contact and allow for flexible bonding.
- **Alternative Support Method:** A full substrate beneath the overhang, combined with a web support structure positioned above the base cabinets, is also considered an acceptable method of reinforcement.

Choose the installation method and fittings that are most appropriate for the specific requirements of your project. The selected approach must ensure compliance with all relevant performance and structural criteria.



Overhang solutions
for 20 mm sheet

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17. Interior Wall Cladding Installation

HIMACS sheet material, regardless of thickness, is suitable for use in interior settings for both full-height and partial-height wall cladding (such as wainscoting) in dry environments. It may also be applied to wet areas, including shower walls and bath surrounds.
However, HIMACS should not be installed on any wall substrate that has been compromised by moisture—whether through damage or discolouration.
This section outlines the standard procedure for fabricating interior wall installations to ensure consistent and reliable quality.

1. Wall Cladding Installation – Dry Rooms

Definition

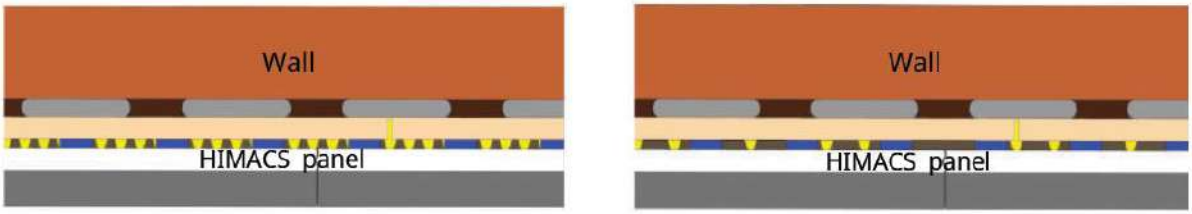
Dry room refers to an interior space within a building—such as a house, flat, or commercial property—where the relative humidity is maintained at low levels, typically below 20% RH (relative humidity), to prevent moisture-related issues. These rooms are designed to remain free from dampness, condensation, and water ingress, making them suitable for applications where moisture-sensitive materials or finishes are used.

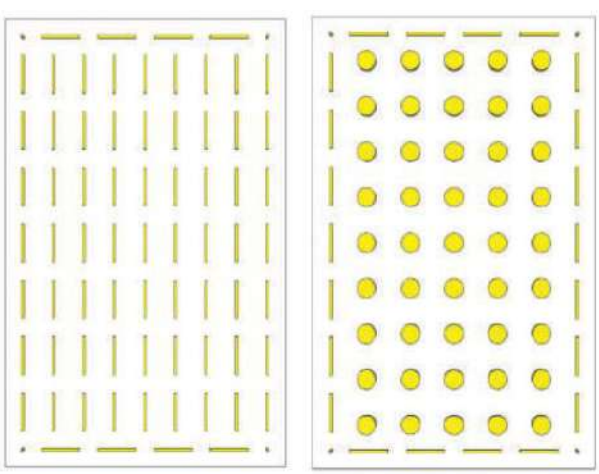
Wall Requirements for HIMACS Installation

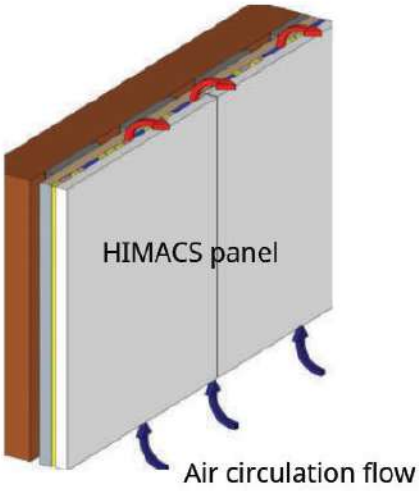
- Walls intended to support HIMACS must be in excellent condition, with a maximum unevenness of 1 mm per metre and free from any imperfections.
- Any source of moisture within or behind the existing wall structure must be completely removed.
- **Note:** HIMACS is a decorative surfacing material and does not serve as a structural or waterproofing solution.

Recommendations

- **Wall Penetrations:**
    - Create openings for wall penetrations (e.g., electrical outlets and switches) using a router.
    - Openings should be at least 12 mm larger in both height and width than the actual device.
    - All corners must be rounded with a minimum radius of 3 mm, and cut edges should be smoothed using 150-grit sanding material.
    - For larger openings, corners should have a radius of 6 mm.
- **Fixing HIMACS Panels:**
    - Affix the HIMACS material to the existing wall using only 100% silicone sealant.
    - Apply the silicone sealant in 25 mm diameter spots, spaced 100 mm to 150 mm apart.
    - Apply a continuous bead of silicone sealant around the entire perimeter of the HIMACS panel, including any cut-outs.
    - Avoid using dark-coloured silicone sealant, as it may be visible through the HIMACS material.
- **Panel Joints:**
    - For applications exceeding standard sheet dimensions, HIMACS panels may be joined using either joint adhesive or colour-matched silicone sealant:
        - Adhesive joints must be completed prior to placing the material.
        - Silicone sealant joints can be applied with the material already in place.
    - In dry environments, seams may be positioned vertically or horizontally. In wet areas, vertical seams are recommended to facilitate water runoff.
- **Expansion Joints:**
    - For all thicknesses, allow for expansion joints of no less than 6 mm every 300 mm both vertically and horizontally.
    - The same spacing should be maintained at internal corners and at floor or ceiling junctions.
    - If expansion/control joints exist in the backing material, the HIMACS joints must align accordingly.
    - These joints and gaps should be sealed with colour-matched 100% silicone sealant.







Glue application systems*) for HIMACS panel

*) = not recommended for thin sheet material of HIMACS

For HIMACS sheets with a thickness of 4.5 mm or 6 mm, the use of asub-construction boardis essential to prevent potential moisture-related issues. This board acts as a stabilising layer and must be dry, flat, and suitable for interior use.

To ensure the long-term stability of the HIMACS surface, afull-surface permanent adhesive applicationis recommended when bonding the sheet to the sub-construction board. This method provides uniform adhesion and minimises the risk of Warping or detachment over time.

Important Installation Guidance for HIMACS Surfaces in Wet rooms

Prohibited Environments:

- HIMACS must not be used on any surface within steam rooms, steam showers, saunas, or any comparable high-humidity environments.

Substrate Requirements:

- The wall substrate intended for HIMACS application must be a moisture-resistant material, such as a cement-based backer board.
- The surface must be structurally sound, level to within 1 mm over a 1 m span both vertically and horizontally, and free from any irregularities or defects.

2. Wall Cladding Installation – Wet Rooms

Definition

Wet room is space designed to accommodate direct water exposure from bathing or showering activities. It could integrate drainage, ventilation, and surface finishes to ensure hygiene, safety, and durability in high-use environments.

Recommendations

Moisture Control:

- Any source of moisture present within or behind the existing wall substrate must be completely eliminated prior to installation.
- HIMACS is not designed to function as a structural or waterproofing solution for external moisture ingress; it is strictly a decorative surfacing product.

Substrate Termination:

- The backer board must terminate a minimum of 12 mm above the floor or shower tray to prevent moisture—including condensation—from wicking upwards into the substrate.

Adhesive Application Recommendations:

- Use 100% silicone sealant exclusively to bond HIMACS to the wall substrate.
- Avoid using dark-coloured silicone sealants, as these may be visible through the HIMACS material.
- Apply the silicone sealant in 25 mm diameter spots, spaced 100 mm to 150 mm apart across the surface.

- A continuous bead of silicone sealant must be applied around the entire perimeter of the HIMACS panel and any cut-outs to ensure a secure and sealed installation.

Seaming and Panel Installation:

- For applications exceeding standard sheet dimensions, HIMACS panels may be joined using either a colour-matched silicone sealant or a dedicated joint adhesive.
- Adhesive joints must be completed prior to positioning the panels.
- Silicone sealant joints may be applied with the panels already in place.
- In wet wall environments, seams should be oriented vertically to promote effective drainage and minimise water retention.

Expansion and Movement Control:

- Allow for expansion joints of no less than 6 mm every 300 mm, both vertically and horizontally, regardless of panel thickness.
- Where expansion or control joints exist in the substrate (e.g., cementitious backer board), HIMACS joints must be aligned precisely with those locations.

Fixture Penetrations:

- Use a router to create openings for shower controls, heads, and taps.
- Each opening must be at least 12 mm larger in diameter than the fixture penetration.
- Smooth all cut edges using 150-grit abrasive material.
- Seal all penetrations with 100% silicone sealant to prevent water ingress behind trim or escutcheon plates.

Perimeter and Corner Spacing:

- Maintain a 3 mm gap where wall panels meet the shower base or tray.
- Apply the same spacing at internal corners, floor junctions, and ceiling interfaces.
- All gaps and expansion joints must be sealed using colour-matched 100% silicone sealant.

Trim and Accessory Attachment:

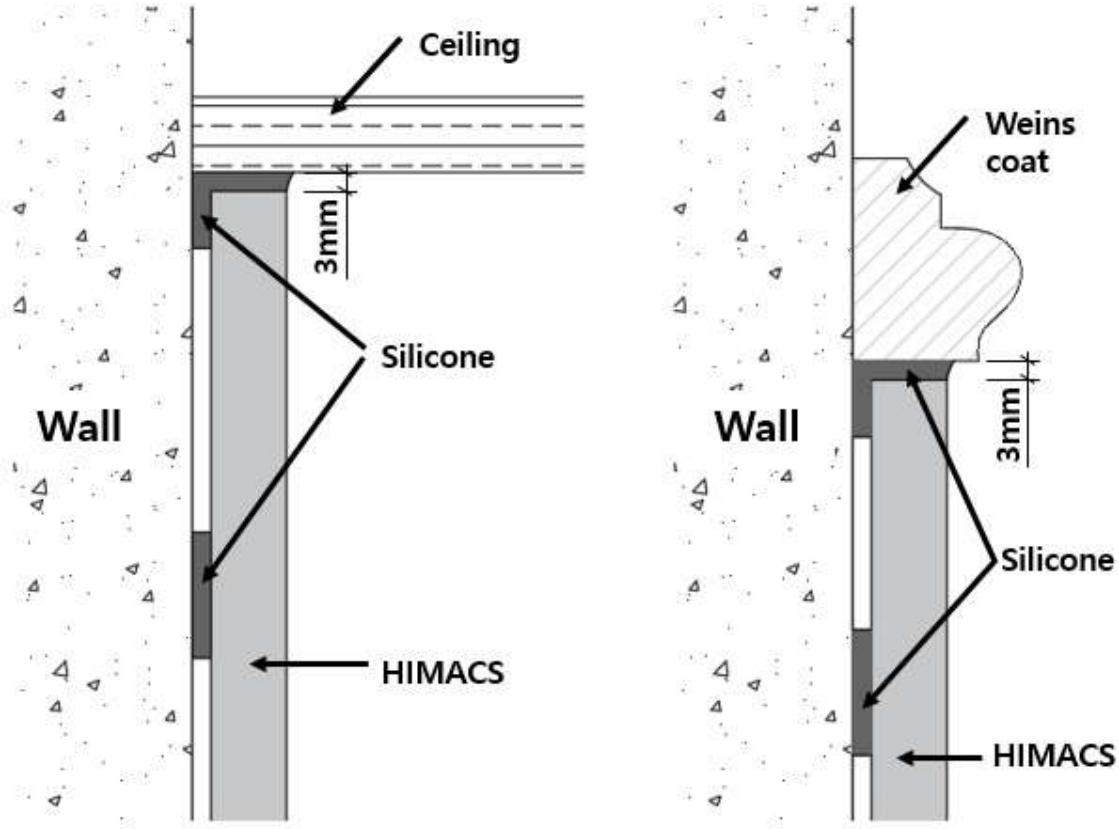
- Affix batten strips, crown mouldings, skirting trims, and corner profiles using 100% silicone sealant, ensuring a secure and watertight finish.

Hygiene Compliance:

- HIMACS is suitable for hygienic environments such as spas, wellness centres, and healthcare facilities.
- Ensure installation meets Health and Safety Executive (HSE) guidelines for wet areas and infection control.

Ventilation Requirements:

- Wet rooms must be equipped with adequate mechanical ventilation systems to comply with local regulations, ensuring proper moisture management and air quality.



Wall cladding with ceiling contact or Wains coats

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18. Repairs

HIMACS is a homogeneous material where its molecular structure is through and through the whole sheet panel thickness, length and width. Therefor it can become repaired efficient and easily. The proper method to get the repair with stable quality will be addressed in this section.

1. Information

One of the main advantages of HIMACS is that the surfaces can be repaired in the event of an accident. Depending on the type of damage, a number of solutions can be used.

However, as due to small production variations or other circumstances it may happen that there will be some color differentiations' by time. To avoid any risk of difference it is to recommend keeping an original piece, like cut-out or similar lefts of the origin at a place to find it back later.

To avoid any color match issue between the installation and its repair plug it is best to use a piece of the original material.

Therefore, a piece of a cutout supposed to be stored beside the kitchen or vanity or furniture.

If no spare piece is available, check color match before starting repair.

2. Repair Recommendations

Shallow and slight scratches

- For scratches, it may well be possible to sand them out with scotch brite pads, abrasive creams or even abrasive sandpapers.
- Ensure to protect and cover other areas which should be not affected by your work. Always use dust collection systems as well as vacuum cleaner.

Deep scratches and cut marks

- With deep scratches and cut marks it can be repaired by using standard sanding and polishing method.

Deep indentations and chip break out

- With deep indentations and chip break out it is possible to drill out the affected area and fill the hole with HIMACS color matched adhesive. This may best method by pattern color.
- Drill out the affected area, and, clean the part with white cloth and denatured alcohol. Fill the hole with HIMACS color matched adhesive. Be sure to over fill the hole and try to eliminate any air pockets prior to curing.
- Once cured the adhesive it can be sanded down in the normal standard way, however, the repaired area will need to be blended in with the existing work surface.

Small areas of damage (crack and hole)

For small areas of damage like crack and hole, particularly with the Granites and Sands, a plug repair is a possible solution .

Repair Procedure:

1. Using trimmer, cut the cracked part or hole. And, clean the part with white cloth and denatured alcohol.
2. Prepare proper plug using same color piece of HIMACS sheet.Plug the prepared piece, and apply HIMACS color matched adhesive.
3. Be sure to overfill the part and try to eliminate any air pockets prior to curing.
4. Once cured the adhesive it can be sanded down in the normal standard way, however, the repaired area will need to be blended in with the existing work surface.Adhesive joints must be completed prior to placing the material.
5. Silicone sealant joints can be applied with the material already in place.
6. In dry environments, seams may be positioned vertically or horizontally. In wet areas, vertical seams are recommended to facilitate water runoff.

Major damage

For major damage, regarding cracks or burn marks, a 12 mm triangular or round piece of HIMACS (same thickness as installed) will need to be fitted.

Process:

1. Make a template and clamp it to the surface around the damaged area.
2. Machine out the section using a portable hand router.
3. Using the same template, cut another section from an offcut of color-matched HIMACS piece, or preferably from the same sheet to minimize any color difference.
4. Bond the triangular spare piece with HIMACS adhesive and reinforce the underside.
5. Depending on the intensity of damage, it may be recommended to replace the section partly if necessary.
6. Repairs through a heating section, like a hob cutout or another similar heating device, will not be successful for a positive long-term result and is not recommended.

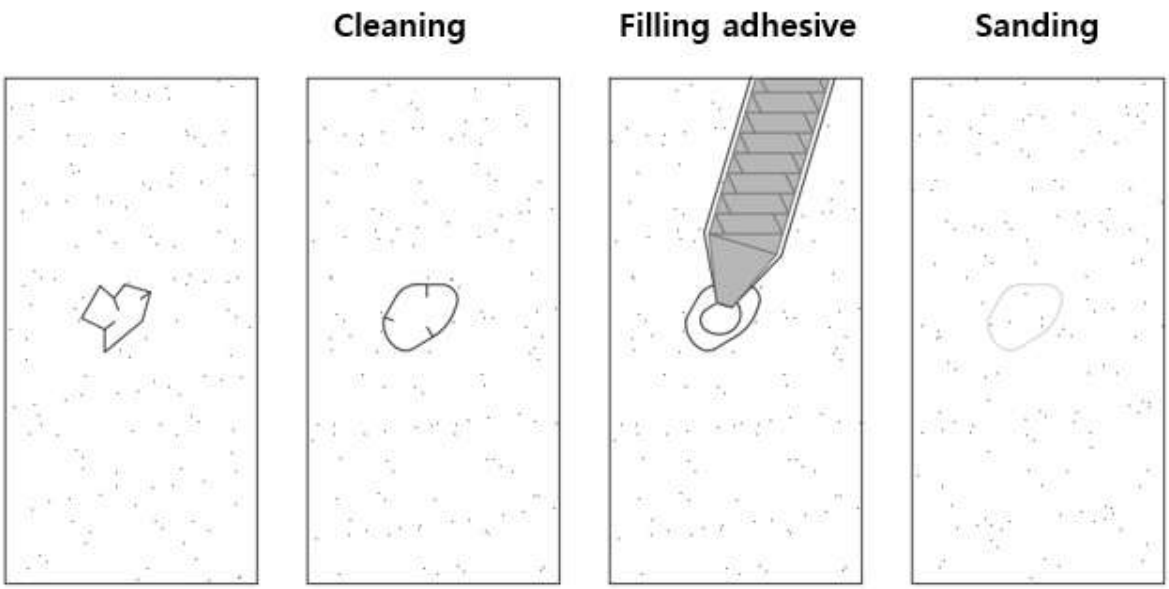
Broken seams

To repair a broken seam, first machine a ‘V’ groove down the entire length of the crack.

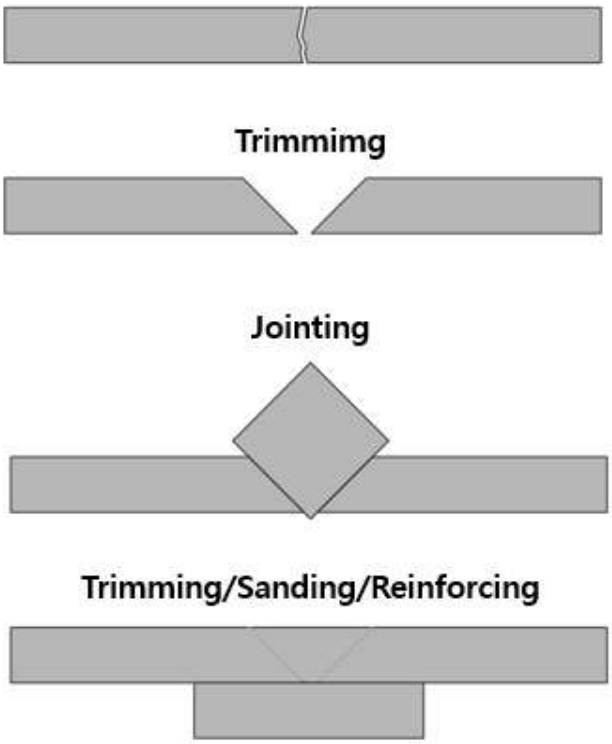
Recommendations:

- Make a square strip of matching LX Hausys HIMACS sheet so that when turned through 90°, it fits the groove.
- Ensure no production air bubbles may appear after finishing off.

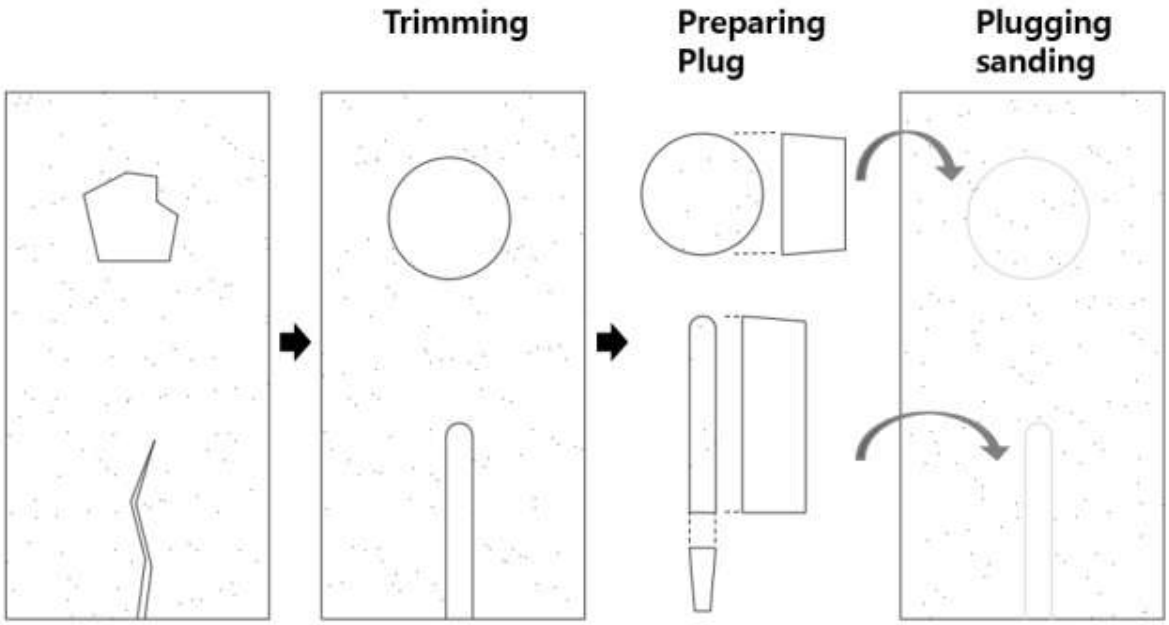
- Apply LX Hausys HIMACS adhesive into the groove and push the square section home until sufficient adhesive is forced upwards.
- Once fully cured, sand down the new section as normal.
- Ensure that the seam has reinforcement beneath prior to completion.



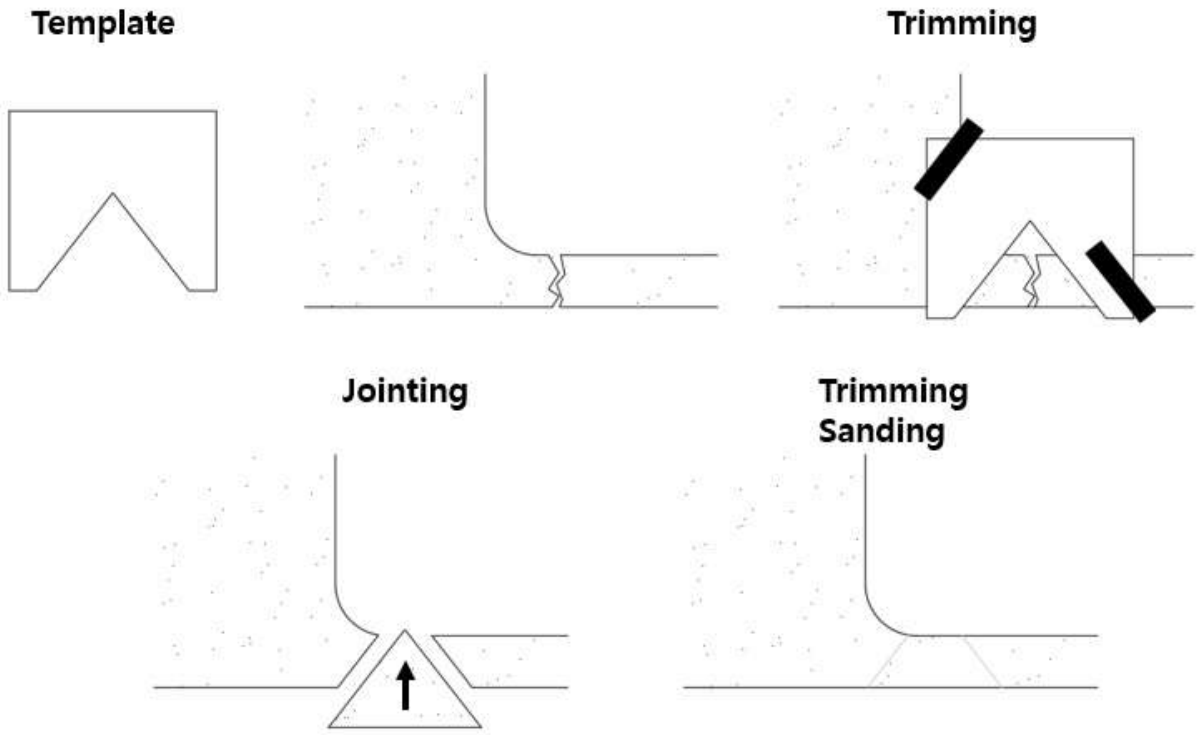
Deep indentation or chips irregularity repair



Seams break repair



Minor damages repair



M repair

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