

Material Handling Instructions





Features & Benefits	5
General Description	6
Product Quality Characteristics	7
Packing, Handling & Storing	8
Decoiling of Coils	10
Cutting of Coils	11
Handling Sheets	12
Handling Panels	13
Lamination Systems	14
Processing of Sheets	16
Equipment & Instructions	17
Cutting of Panels	18
Finishing of Panels	19
Cutout Instructions	20
Panel Installation	20
Repair	21
General Advice	21



CeramicSteel Surfaces

Durability, Functionality,
and Safety for all surfaces.

**For more than 70 years,
Polyvision has been
manufacturing CeramicSteel
surfaces that endure even
the harshest environments**

Formerly known as Alliance,
Polyvision's roots trace back to
1954, when it began manufacturing
enameled steel for whiteboards,
chalkboards, and architecture.

Throughout history, Polyvision
has prioritized innovation and
utilized advanced manufacturing
technologies and material science
to create the longest-lasting and
most eco-friendly CeramicSteel
surface available anywhere.

At Polyvision, we believe in the
power of collaboration. We partner
with renowned visionaries,
researchers, and designers
worldwide. This global network
fosters our tradition of producing
innovative products, ensuring
that architects and building
professionals everywhere
have access to the best solutions.



Features and Benefits

Features that last.

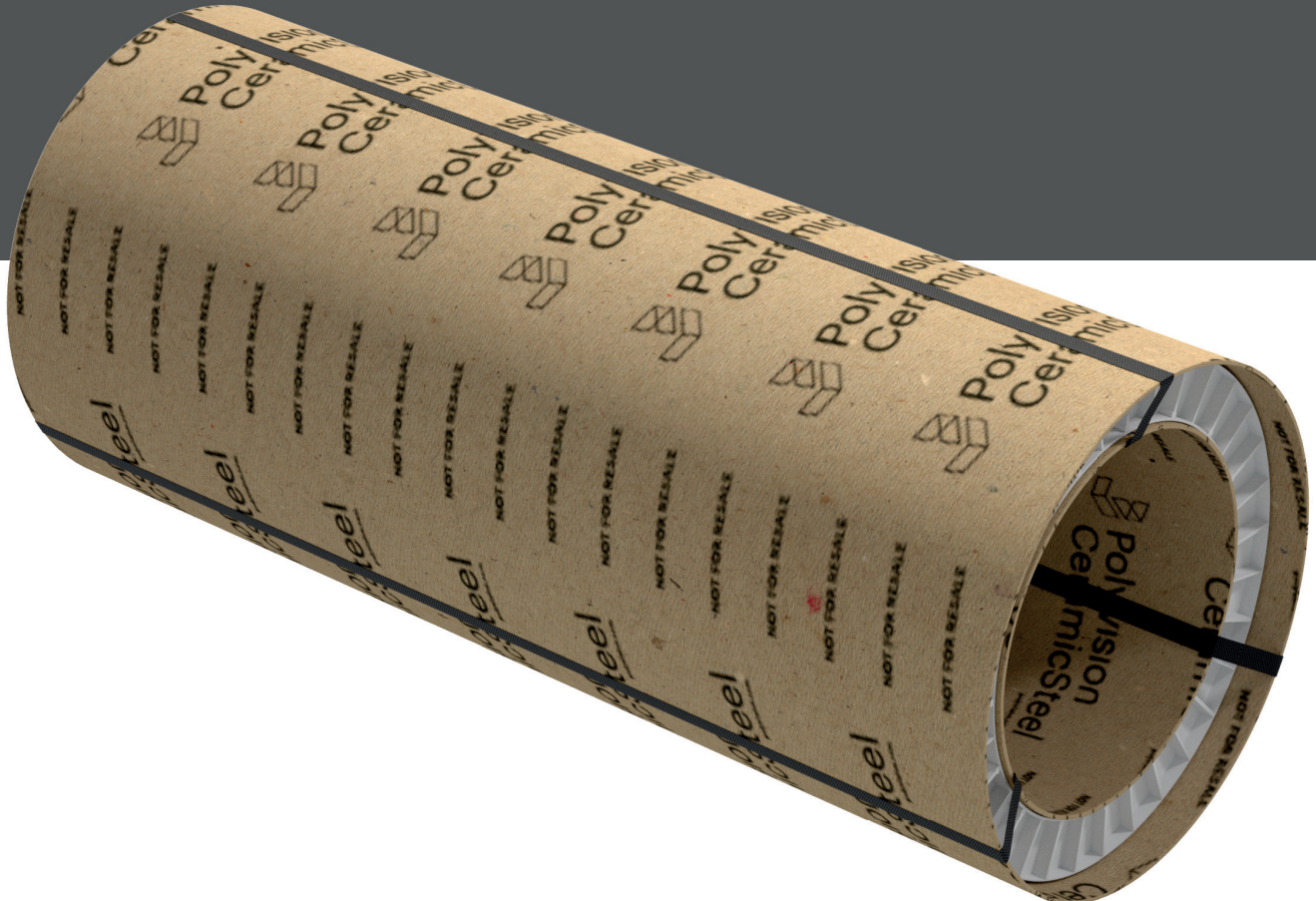
- Smooth, inert surface
- Made from inorganic materials
- Magnetic
- Colorfast, will never fade
- Resistant to bacteria, scratching, staining, chemicals and fire
- Easy to clean
- Releases zero VOCs



General Description

Polyvision CeramicSteel for visual communication, infrastructure and industrial applications is a thin stripsteel coated in a continuous enamelling process. Ground and topcoat vitreous enamel layers are fired in the range of 700° - 900° C (1292° - 1652° F). CeramicSteel is protected with polyethylene foil or paper, produced in different widths and coiled up in lengths of 80 l'm up to 150 l'm depending on thickness of ceramicsteel.

CeramicSteel can be cut in different sizes and adhered using various bonding systems onto a wide range of substrate panels used for school, office, infrastructure or industrial applications.



Product Quality Characteristics

Enamel Coating Layers for Visual Communication

Backside $\pm 40 \mu\text{m}$ (typical)
Topside $\pm 35 \mu\text{m}$ (typical)
Color coat: only at topside 60-85 μ

Widths

Europe, Middle East, Africa and Asia

1200 mm
1175 mm
1000 mm
975 mm
875 mm

Americas

60 in
48 in
36 in

Enamel Coating Layers for Infrastructure & Industrial

Backside $\pm 70 \mu\text{m}$ (typical)
Topside $\pm 75 \mu\text{m}$ (typical)
Color coat: only at topside 75 - 110 μ

Special additional backside coating for better adhesion or double-sided backside finish

Steel Thickness for Visual Communication

Europe, Middle East, Africa and Asia

0,32 mm / 0,35 mm

Americas

0.013 / 0.019 in

Steel Thickness for Infrastructure & Industrial

0,70 mm (double-sided)
0,56 mm
0,35 mm

Gloss

Whiteboard

Different gloss levels U/H/S/L/P

Chalk (C)

Ultra matte range
ca. 5,5 GU with 60° head

Infrastructure

M Matte 60+/-10 (60°),
G Gloss 65+/-10 (20°)

For more specific characteristics see spec sheets



Packing, Handling & Storing

Packing

e³ CeramicSteel coils are packed one, two or three coils per pallet for transportation. The weight of a coil is 400 to 500 kg (800 to 1100 pounds). e³ CeramicSteel is available protected by a selfadhesive transparent polyethylene film of $\pm 50 \mu$ or protected by craftpaper.

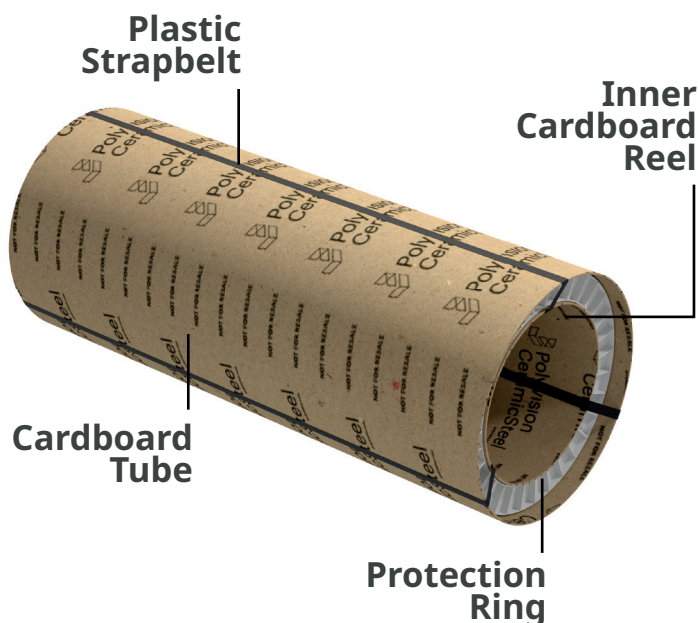
Then the e³ CeramicSteel is wound on strong cardboard tubes with the color side facing inward. The inside diameter of the tubes is 302 mm (12 in) and adapted widths.

Handling

Lift using a forklift. Don't let the coils balance on the tip of the fork or transport a coil rolling over the floor.

Storing

- Store the coil on a clean flat floor
- Contact your racking supplier to determine what capacities are needed in your facility.
- The weight-bearing capacity of a rack must be 1.5 times the weight intended to be stored.
- Each rack level should be equipped with a flat wooden floor to provide full support of the coils.
- Never put a coil (without cardboard protection) on the floor or on an unprotected area. Any unflatness or dirt on the floor might damage the CeramicSteel.



The weight of the coil is 400-max 500 kg.

The cardboard coil packing weight is +/- 20 kg (44lbs) and can be recycled.

The edges are protected by plastic rings. The outside of the coil is protected by a strong cardboard tube, or with shrink-wrap.

The tubes and rings are strapped together with three plastic strapbelts going through the inner tube of the coil.

For land transportation

The coils are strapped on wooden pallets, per one, two or three coils.

For sea freight

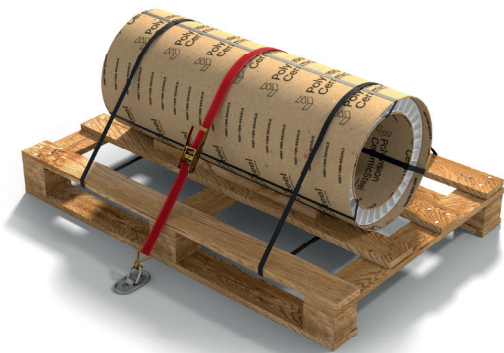
The coils are packed in custom-made wooden crates for every two or three coils.



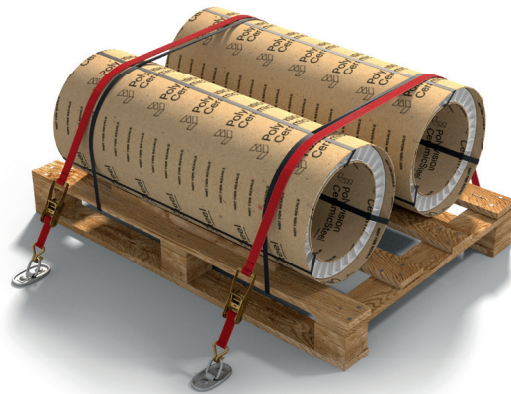
Small pallet of sheets



Large pallet of sheets



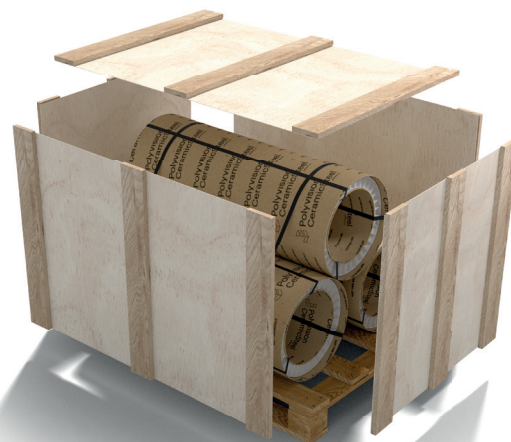
One coil strapped to a wooden pallet



Two coils strapped to a wooden pallet



Three coils strapped to a wooden pallet



Three coils in a wooden crate



Decoiling of Coils

Preparation

Lift or place the coil in position to:

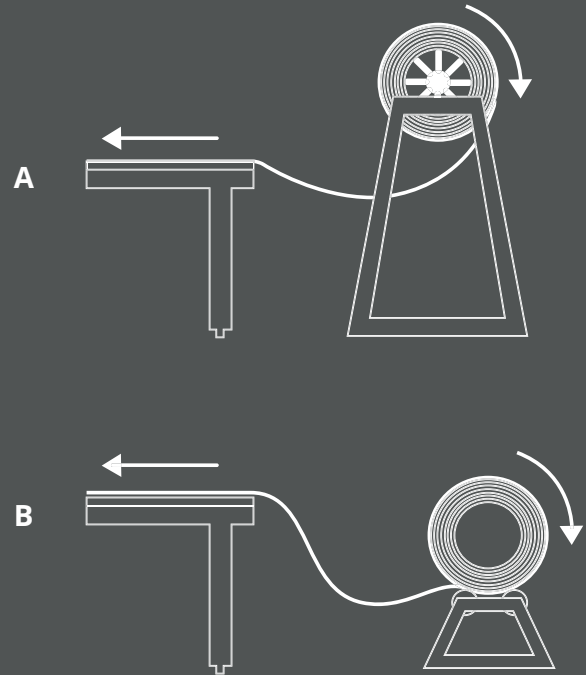
- Cut and remove the plastic straps
- Remove the two PVC rings
- Remove the cardboard protection tube
- Fit the inner tube on the unwinding mechanism

Version A

Manual or automatic decoiler with mandrel: Position the coil by use of a forklift truck, pulley, etc.

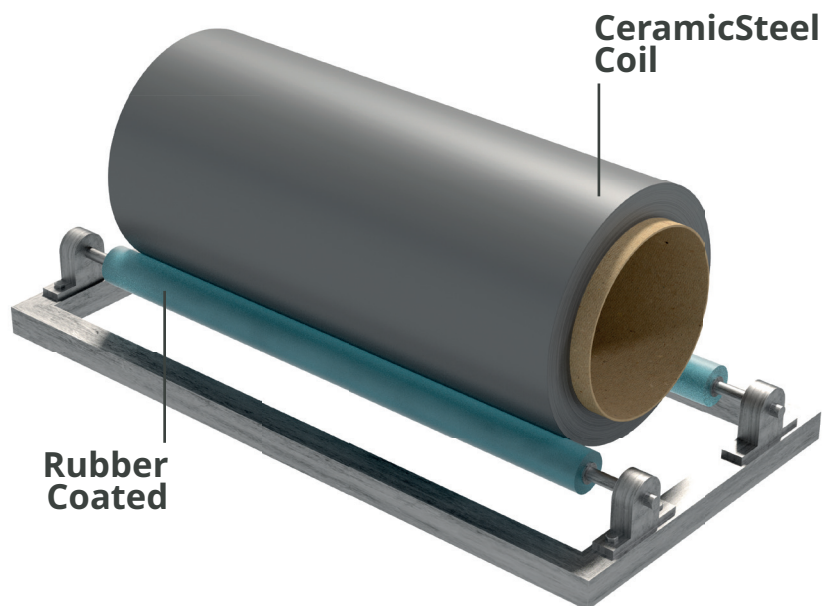
Version B

Support rollers: Lay the coil on the support rollers by means of a forklift truck, pulley, etc. The rolls have to be protected by a thick rubber tube.



Caution!

Use safety gloves. The protection film covering the CeramicSteel must be kept intact during application.



Unwinding the coil

Remove the adhesive tape from the CeramicSteel. Insert the CeramicSteel by hand into the drive rolls. If there are no drive rolls, put the sheet of CeramicSteel across the shears to the measurement stop.

Cutting of Coils

Mechanical or hydraulic guillotine shears

The equipment must have a firm upperhead beam and a reliable mechanism for adjusting parallelism

Blades

Preferably double-edged (reversible). SD 13 tempered. The hardness must be 60 on scale of Rockwell C.

Cutting angle

About 2 to 2.5° when using adjustable shears

Tolerance (spacing)

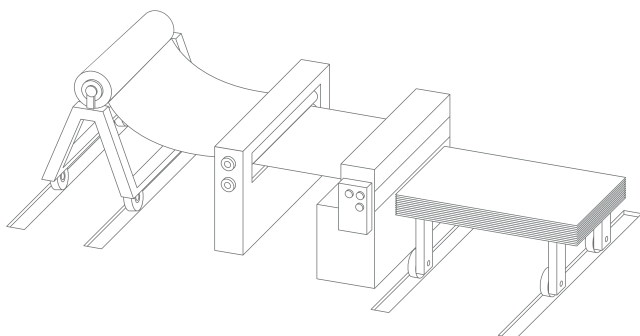
0,02 to 0,04 mm

Table and pressure bar

The table and pressure bar must be kept impeccably clean to avoid accidental damage or marks on the enamel surface. If necessary, insert a protection plate between the pressure bar and the CeramicSteel sheet.

Recommended accessories

A perfectly flat, movable table to support the CeramicSteel sheet as it enters the shears. A movable table with end buffer at the exit of the shears.



Cutting to Length

Standard sheets

Width

Europe, Middle East, Africa and Asia

1200 mm
1175 mm
1000 mm
975 mm
875 mm

Americas

59 - 7/8 in
47 - 7/8 in
35 - 7/8 in

Length

Leave the protection film on the surface. If needed, put a new paper in between the sheets.

Sheets cut to size

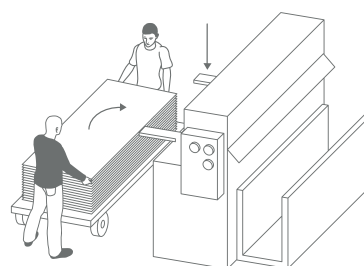
Dimensions are according to customer requirements.

Tolerance

± 1 mm until 1200 mm length with a diagonal difference of maximum 1 mm

± 1 mm between 1200 to 2000 mm length with a diagonal difference of maximum 2 mm

+ 1/-2 mm for larger lengths with a diagonal difference of maximum 3 mm



Cutting to Width



Handling Sheets

Handling

To avoid creases and scuffing, large sheets must be handled by two people. No short plying allowed. Leave the protection film on the surface.

Storage

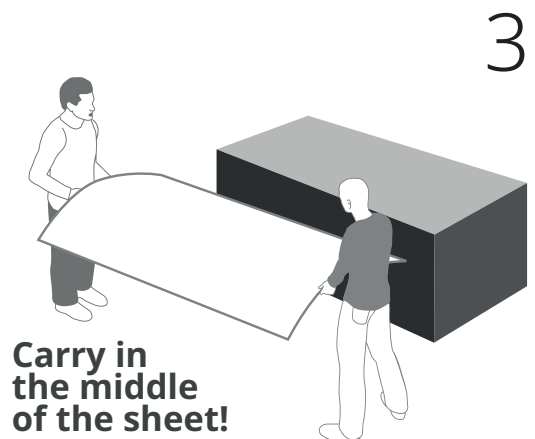
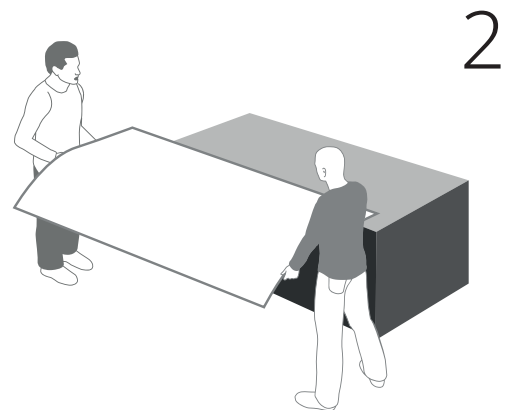
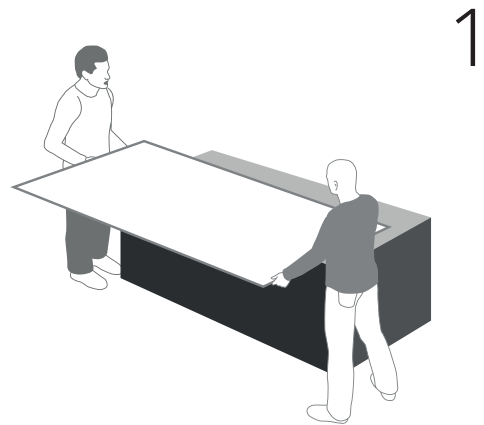
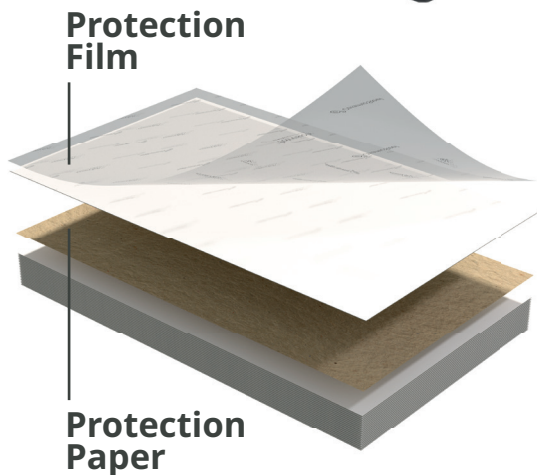
At all times, store on a flat, clean and rigid surface (pallet, car, etc) without elevated nails. The cut edges must always be perfectly aligned. Fit stops to ensure that the sheets do not slip.

Safety

Safety gloves are recommended for handling sheets.

Attention!

If improperly handled, enamel will crack and show hairlines in the surface!



Handling Panels

Unpacking

Delivery vehicles should be offloaded with a forklift. Prior to offloading, inspect pallets for signs of visible damage. Immediately report any visible damages, including broken pallets, broken straps or any other potential issues. Take digital photographs if possible.

If there is damage

A In case of FCA (Free Carrier) delivery, contact the freight company immediately to have an agent conduct a visual inspection.

B In case of DAP (Delivery At Place) delivery, immediately contact your Polyvision facility

Storage

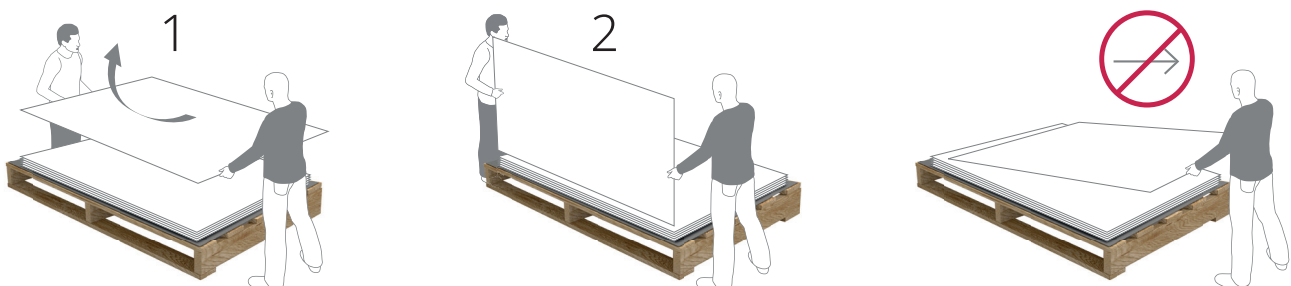
- Keep pallets dry and free of debris
- Any pallets stored outside should be protected from inclement weather conditions.
- Place pallets on hard, flat surfaces that are not subject to standing water.
- Pallets containing CeramicSteel panels should be stacked no more than three high.
- Pallets should never be stacked vertically or in such a way that the corners are vulnerable to damage.

Attention!

Panels should always be lifted into a vertical position before moving.

Handling

- When CeramicSteel panels are shipped, they are protected by craftpaper or a self-adhesive transparent polyethylene film. Keep panels in the original package until installation.
- Prevent dirt from settling on and between panels to avoid aesthetic surface damage.
- Make sure panels are well supported and clamped on a table or on trestles.
- Follow all safety instructions regarding personal protection when processing the panels.
- Wear required safety equipment such as gloves, goggles, ear protection, dust-mask, etc.
- Protect panel surface against saw-dust and saw-sparks (metal particles).
- CeramicSteel will chip when cut or drilled with power tools. Hand cutting can cause chipping up to approx. 2 mm from edge. When chipping is in excess of 2 mm please check state of cutting tools and check that the panel is adequately supported and clamped to prevent it from vibrating.
- All cut or drilled sections should be protected against humidity with PVC tape and/or covering/sealing profiles or sealing washers.



Lamination Systems

Important process considerations

1. The surface of the substrate must be smooth and clean, because the ceramic surface reflects the shape and relief of the substrate surface.
2. All kinds of substrates can be used, but very light weight substrates need special processing. Please contact Polyvision with any questions. One balance sheet at the back is needed.
3. The backside of the CeramicSteel sheet must be smooth and clean.
4. Pinch roll or flat press must be smooth and clean.
5. Settings on both sides of the pinch rolls must be accurate and parallel.
6. Bonding strength must be sufficient especially on lighter substrates.

I. Hot melt polyurethane (PUR)

1. Application method: Glue is only applied to one surface (usually the substrate) by a double-sided roll coater.
2. Application weight per glue layer: 80-100 g/m²
3. Press method: Pinch rolls (minimum pressure on panel of 4 kg/cm²)

II. Contact adhesive: solvent or water-based

1. Application method: Glue must be applied on both CeramicSteel and substrate by spray guns or curtain coater. Before joining, the water or solvents need to be evaporated (the adhesive must give a tack to the fingers, but no threadforming is allowed)
2. Application weight per glue layer: 36-44 g/m²
3. Press method: Pinch rolls (minimum pressure on panel of 4 kg/cm²)

III. Polyvinylacetate (PVAC)

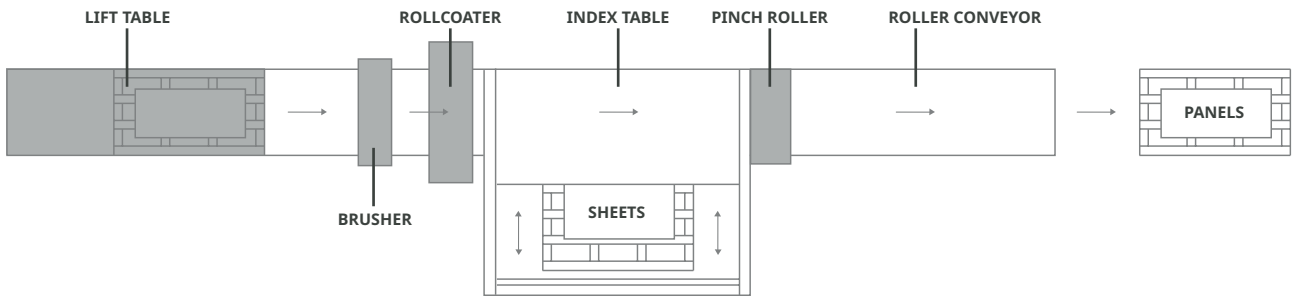
1. Application method: Glue is only applied to one surface (usually the substrate) by a roll coater.
2. Application weight per glue layer: 110-130 g/m²
3. Press method: per pallet under a flat stack press.

IV. Other possible bonding systems

1. Acrylate
2. Double-sided tape
3. Pressure and temperature-sensitive adhesive film.

***For more information, see contacts on the last page.**

I. Hot melt polyurethane (PUR)



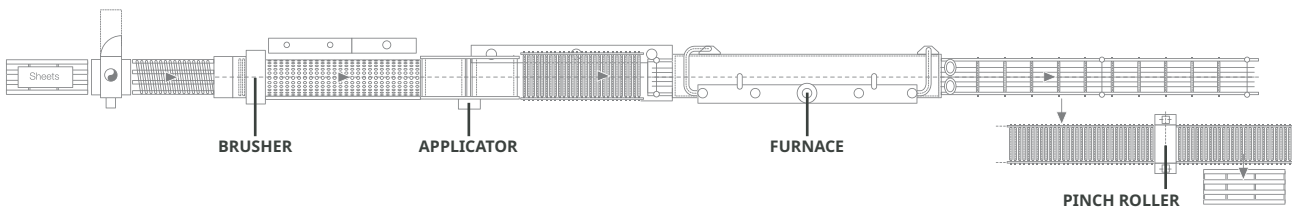
Advantage

- Continuous process
- Environmentally friendly

Disadvantage

- Relatively expensive adhesive

II. Contact adhesive: solvent or water-based



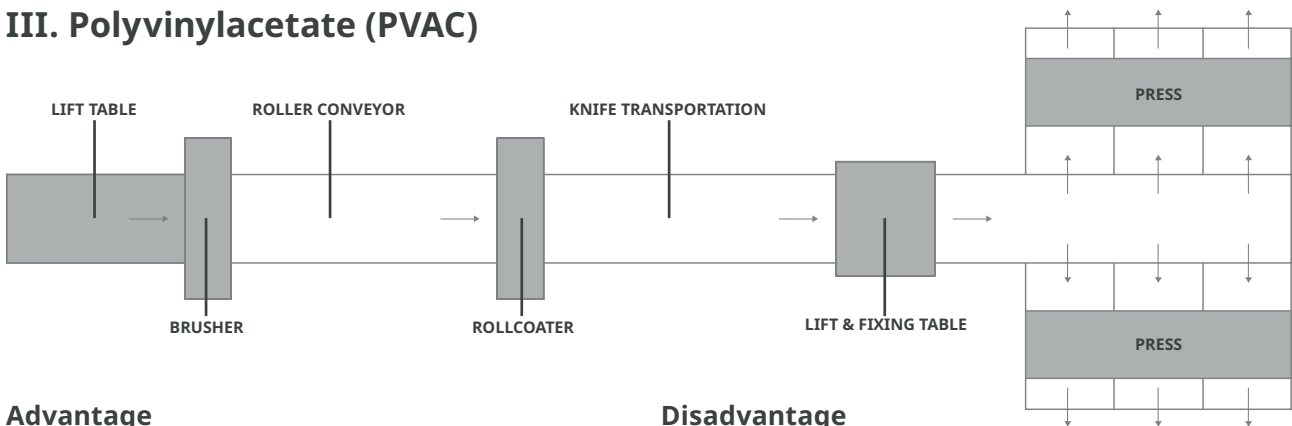
Advantage

- 99% reliable result
- Relatively inexpensive adhesive

Disadvantage

- No continuous process
- If the contact adhesive contains solvents, check the local safety environmental regulations

III. Polyvinylacetate (PVAC)



Advantage

- Very inexpensive adhesive

Disadvantage

- No continuous process

Important! Before starting, contact the adhesive supplier to discuss the following:

- The adhesive must be suitable for glass (CeramicSteel), substrate (customer choice) and backside (galvanized steel or customer choice).
- Application method, application weight, press method and pressure, drying/curing times.
- Periodic pull-off tests shall be done during and after production to see the % of bonded surface after \pm 24 hrs. curing to check the adhesion strength.

GOOD if it pulls off 80% of the surface of the substrate.



Processing of Sheets

Punching

Cut the material to the shape required by making a series of punched holes. It is normal for the enamel to chip off along the cutting edge to a width of ± 1 mm.

Laser

Cut the sheet to the shape required. It is normal for the enamel to chip off along the edge to a width of ± 2 mm. The lower side will show some "burr" (enamel drops).

Waterjet

Cut the sheet to the shape required. It is normal for the enamel to chip off along the edge to a width of $\pm 0 - 0,5$ mm. The lower side will show some burr.

Drilling

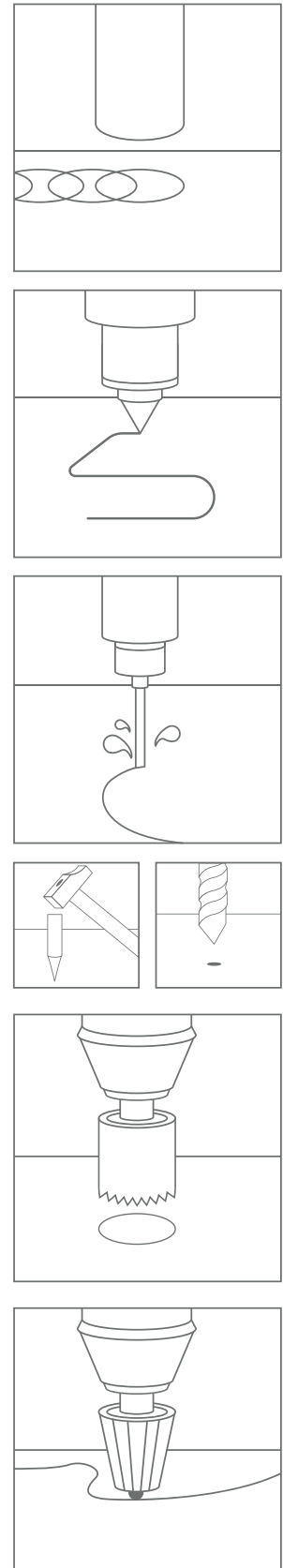
For small holes, hardened metal drill bits should be used. The enamel should be marked with a punch before drilling. It is normal for the enamel to chip off to a width of ± 2 mm along the edge.

Hole Saw Cutting

For large holes (electrical sockets), hardened metal hole saw drill should be used. The enamel should be marked with a punch before drilling. Start entering the hole saw in an angle of 10° . It is normal for the enamel to chip off to a width of ± 2 mm along the edge.

Milling

Rough milling is for grooves and shapes where the edge of the enamel must be straight. It is normal for the enamel to chip off along the edges to a width of ± 2 mm.

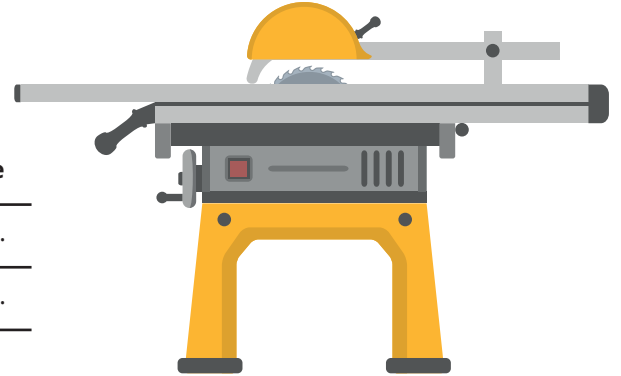


Equipment & Instructions

Sawing Specifications

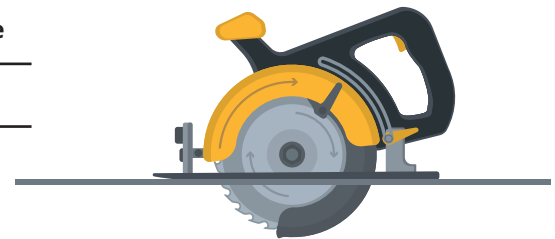
1. Panel Saw Machine

Substrate or Panels	Saw type	RPM	Feed rate
All wooden substrates	1	3.700	50 m/min.
Cement-fiber boards	2	2.200	10 m/min.
All laminated panels	1	1.020	3 m/min.



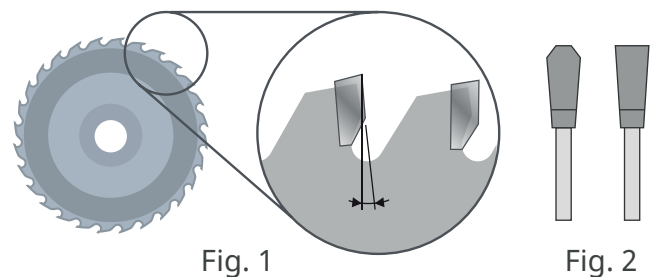
2. Circular Saw

Panels	Saw type	RPM	Feed rate
All laminated panels	3	1.200	Manual



Both Panel Saw Machine & Circular Saw Machines Require a Specific Blade Type:

- Multi Material Blade (eg Bosch)
- Widia blade
- Teeth: between 60-80
- Angle: neg. $-3^{\circ}/-5^{\circ}$ (Fig. 1)
- Teeth shape: teeth angle & shape every other tooth (Fig. 2)



3. Pendulum Jig Saw

- To cut out squares and holes for light switches and electrical outlets use a pendulum saw.
- Type of saw: cutting blade for stainless steel
- The cut edge of the enamel is not clean
- Burr must be removed; cut edge must be protected (PVC tape or sealer, covered)



Cutting of Panels

Saw Type

Substrate or Panels	Max RPM	Diameter	# of teeth
All wooden substrates	4300 R/min.	450 mm	72
Cement-fiber boards	2500 R/min.	450 mm	26
All laminated panels	1200 R/min.	170 mm	48

Before Sawing or Cutting

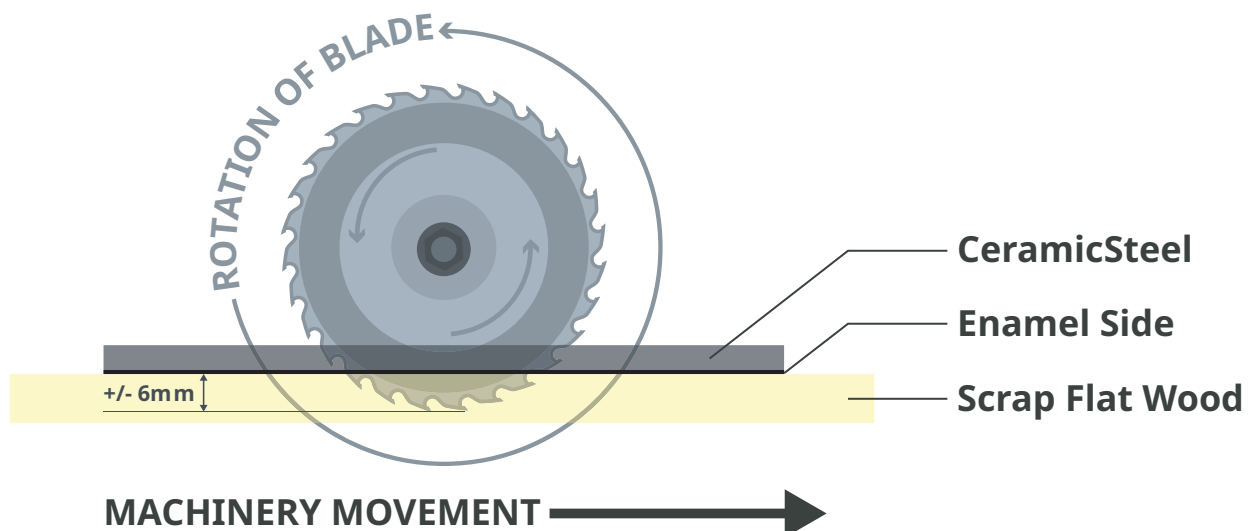
Make an accurate measurement of the area you want to cover with the panels, mark the height and width on the panel.

Protect the area where the cutting will be done by covering it with paper tape, cardboard or plastic. This is to prevent surface damage from chips coming off the board.



Saw Instructions

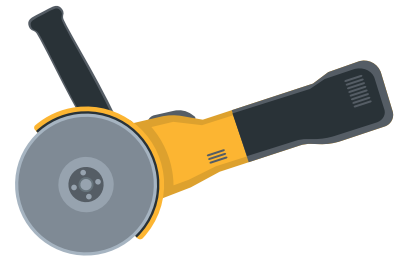
1. Put the panel on scrap flat board at least 12 mm thick.
2. Place the CeramicSteel surface facing down on top of the wooden panel.
3. Cut the panel with the help of guide rail, ± 6 mm through bottom wooden panel. This will prevent large pieces from chipping off the panel.
4. After cutting, it is recommended to grind the edges with a grinder grade P120 – P180.



Finishing of Panels

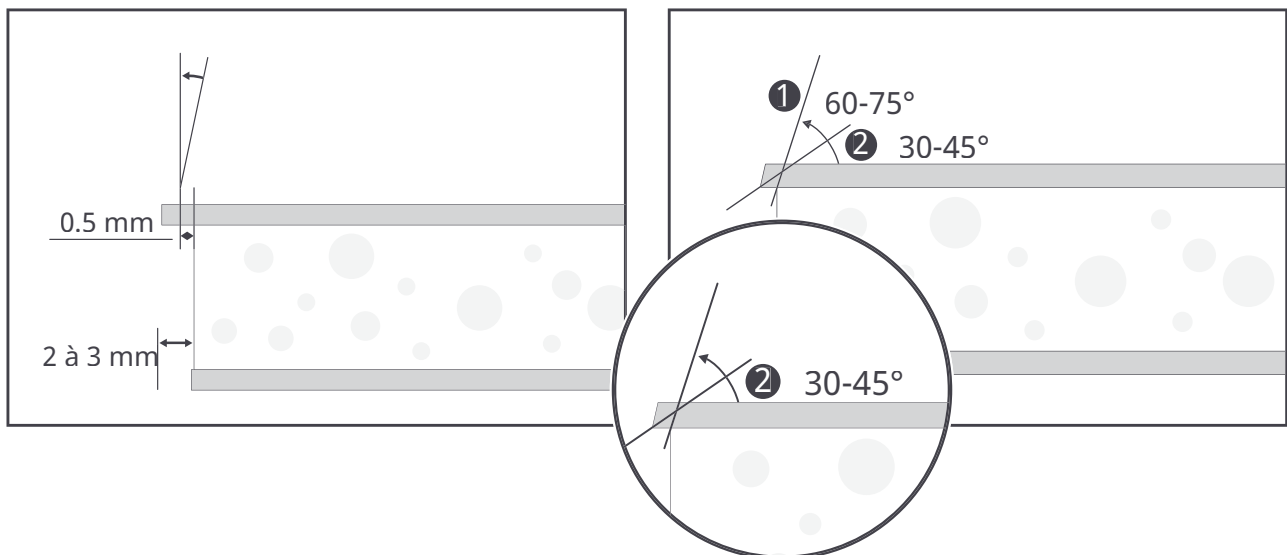
Finishing To Get a Smooth Enamel Edge

To remove the burrs after sawing and/or cutting.
Type of grind paper: medium to fine grains P120 - P180. Keep the grinding machine under an angle.



Grinding Disc Specifications	Grain Size	Diameter
Rough sanding	36	178 mm
Final sanding - Step 1	50	76 mm
Final sanding - Step 1	60	76 mm

Caution!
Protect the nearby panels against the metal sparks.



Drilling Equipment

To drill pilot holes for pendulum saw, cable holes, light switches, electrical sockets.



Required equipment

- Drilling machine & Drill
- Center Punch

Depending on the type of hole use a

- Metal Drill
- Conical Metal Drill
- Hole Saw Cutter



Center Punch



Metal Drill



Conical Metal Drill



Hole Saw Cutter



Cutout Instructions



1. Place the finished side up.
2. Apply masking tape to the entire area to cut.
Be sure to apply enough to protect the surface from the base plate of the saw.
3. Drilling a hole
 - A. Punch with center punch to break the surface
 - B. Drill the hole with the right equipment
 - Metal Drill (small hole)
 - Conical drill for holes up to diameter 32 mm
 - Metal hole saw cutter (bigger holes).
To start: insert in an angle to cut through the enamel steel surface.
4. Cutting squares (using a pendulum saw)
 - A. Draw the area to cut
 - B. Punch with center punch
 - C. Drill the hole with a metal drill diameter 10mm, 5mm from the edge to cut
 - D. Cut area with pendulum saw

Note CeramicSteel can chip off approximately 1 mm when cut or drilled with power tools. Always check the state of cutting tools and that the panel is adequately supported and clamped to prevent it from vibrating.
5. Burrs left after cutting can be removed with a grinder (sand paper grade P120-P180).

Panel Installation

Gluing CeramicSteel Panels to the Wall

Recommendation Using Hi-tack glue and 3M VHB tape (prevent the panels coming off the wall in the first few hours). This glue can take 4-5 mm tolerance wall imperfections.

- Use suction cups to install the panels.
- When mounting multiple panels, using tile clips or space tape can help with the alignment. This is especially recommended for 6mm thick panels, due to the flexibility.
- It is recommended to choose waterjet cuts (standard edges) for multiple seamless joints.
- To finish inner corners, a silicon gel can be used.



Minimum Required Wall Construction

For wall mounting/ gluing, a standard gypsum wall or cement board wall is sufficient. The wall has to be flat and strong enough to hold panels.

Repair

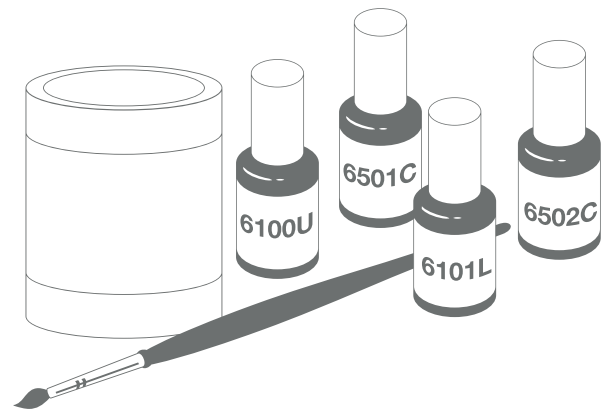
Cold Enamel

- For the repair of chipped off enamel maximum ± 5 mm diameter

Instructions for Use

- Stir well before use
- Clean the damaged spot
- Cover the damaged spot with cold-enamel using a nailpoint or a fine pencil

Tins of cold-enamel 100 CC are available in all standard colors



General Advice

When ordered material arrives at your facility, the first step while receiving the material should be a visual inspection.

Any visible damages, including broken pallets, broken straps, or any other cause of hidden damage must be written down on the freight bill before the material is accepted.

Take digital pictures if possible.

If there is damage

- A** In case of ex-works delivery, contact the freight company immediately to have an agent conduct a visual inspection.
- B** In case of free house delivery, contact your PolyVision facility at once.

It is very important that all packaging and damaged materials are available for this inspection.



Americas

4301 N Wood DR
Okmulgee, OK 74447 USA
info@polyvision.com | 1.678.542.3100

Europe, Middle East + Africa

Zuiderring 56
3600 Genk, Belgium
EMEAsupport@polyvision.com | +32.89.32.31.30

Asia Pacific

15th Floor, Kinwick Centre
32 Hollywood Road, Central District, Hong Kong
APACsupport@polyvision.com | +852.2520.0160

SURFACEMATTERS™

©2024 Polyvision Corporation. All rights reserved. Trademarks used herein are the property of Polyvision Corporation or of their respective owner. Polyvision Corporation reserves the right to make changes in product design, construction or detail, and to discontinue any product or material without notice.

polyvision.com



15-10-2024 EMEA APAC