Thermoforming Instructions for Polygood® Panels

The thermoforming process includes three main stages:

1. Heating

The panel is heated to its forming temperature, which for Polygood® ranges between 100°C and 140°C (212°F to 284°F), depending on the panel thickness, pattern type, forming method, and complexity of shape (the more complex the shape of the product, the more it needs to be heated).

Heating is typically done using:

1. Contact heat transfer – via thermal plates or thermo presses (recommended).
This method is best suited for Polygood® panels, providing even and reliable heating. However, some patterns may be more porous and sensitive to heat, which can result in surface damage such as bubbling or discoloration.

2. Infrared heating – via ovens (not recommended).
Infrared ovens may cause localized overheating, leading to yellowing or damage. While not generally recommended, this method can be used in specific cases. Use with extreme caution, follow safety precautions, and always test on samples or spare parts beforehand.

3. Hot air – using heat guns for localized heating at bend points.
This method is suitable for small-area forming. Only use heat guns with digital temperature control, and set the temperature low to avoid damaging the surface. High temperatures and rushing may cause permanent deformation or burning. Always test on offcuts or spare parts before actual application.

Recommendation:

For sensitive patterns*, we recommend two-stage heating:

- First stage – 90–100°C (194–212°F)
- Second stage – 120–130°C (248–266°F)

This gradual approach helps reduce the risk of surface damage.

*Sensitive patterns:

Aqua drift	Midnight	Translucent Burgundy
Black Lollipop	Pattern №5	Translucent Clear
Coral Reef	Pebble	Translucent Glitter Gold
Dark Knight	Reverse Timeless Duo	Translucent Glitter Green
Emerald Ghost	Sapphire Terrazzo	Translucent Green
Fluer de Nuit	Sea Foam Dark	Translucent Neon Green
Ice Lollipop	Terrazzo Nuovo**	Translucent Orange
Maldives	Translucent Black	Translucent Pink
Marbellous**	Translucent Bronze	Translucent Red

** Note on Marbellous and Terrazzo Nuovo patterns:
These patterns contain surface filler. During thermoforming, pores may open and filler material can become visible on large bending radii.

Important:

Infrared ovens may still be used in some specific cases. If so, extra caution must be taken. Always follow safety protocols and test on samples or spare parts first to avoid overheating and material degradation.

2. Forming

Once the panel is heated and pliable, it is formed using one of the following techniques:

Forming technologies:

1. Vacuum membrane press — uses a silicone membrane and a mold.
Example

2. Linear press mold — includes a matrix and punch, or matrix only, with a fixing system.
Example

3. Press mold with punch and die on a hydraulic press – suitable for both simple and complex volumetric shapes with draft.
Polygood® panels offer excellent formability for this type of thermoforming and outperform mineral-based materials such as Corian® and Krion® when it comes to shaping three-dimensional elements.
Example

4. Manual forming — performed using heat-resistant protective gloves and a simple matrix (suitable only for small parts).
Manual thermoforming without a mold can also be used to create unusual and experimental shapes for artistic objects and prototypes.
Caution: the material is heated to a high temperature and requires time to cool and harden — take care to avoid burns.

5. Bending lines — using a machine with infrared wire heating for straight bends.
It is important to control both the wire temperature and the distance between the hot wire and the panel surface — incorrect settings can lead to surface damage or even fire.
Due to the nature of infrared heating, this method is only suitable for thin panels and less heat-sensitive patterns.
This is not the most recommended technology for use with Polygood® panels. However, in certain cases it can be applied successfully. Always follow strict safety precautions and test on samples or spare parts before full application.
Example

⚠️ All external links are for reference only and do not constitute product recommendations.

Note on molds:

- The mold must allow minimal air permeability to avoid bubbles and ensure full contact:
- This can be achieved via porous materials
- Or by adding small vent holes in the corners or across the surface

3. Cooling and Shape Fixation

Cooling usually happens while the part is still in the mold. The softened material stays pressed against the mold until it retains its final shape.

- Heat dissipates through the mold material and pressing elements
- Slow, even cooling is essential for good results

Recommended mold materials:

- MDF or plywood — low thermal conductivity, affordable, and easy to work with
- Polygood® molds are also possible, but MDF/plywood are generally more efficient

Important Notes on Accuracy and Shape Deformation

After cooling and removing the part, slight deformation may occur due to:

1. Incorrect heating
   - Uneven temperature
   - Heating too fast or insufficiently
2. Poor contact during forming
   - The panel wasn't pressed firmly enough
   - The mold was too sharp or lacked ventilation
3. Too rapid cooling

🛠️ Always perform test runs on non-commercial blanks before final production to optimise heating, forming, and cooling parameters.

Finishing and Cutting

Once cooled and shaped, the final part usually needs cutting and edge finishing. This is done using:

- CNC machinery for precise, repeatable results
- Manual trimming with a handheld router or milling machine.

Thermoforming matrix for Polygood®

General Data (bending up to 90 degrees and large radiuses, 500mm and above):

Item	Heat Fan	Heat Oven	IR Oven**
Temperature, °C	120 (248°F)	120 (248°F)	120 (248°F)
Heating duration, min	~30*	~30*	~30*
12mm 19mm	~40*	~40*	~40*
Heating side	Both	Both	Both
Bending	Manual or machine	Manual or machine	Manual or machine
Shape Matrix	Yes	Yes	Yes

* - may require a longer time for heatingdue toheatingirregularity ** - may cause an irregular heating in case of short distance between lamps and plastic plate

General Data (bending up < 90 degrees and small radiuses, less than 500mm):

Item	Heat Fan	Heat Oven	IR Oven**
Temperature, °C	120-140 (248°F-284°F)***	120 (248°F)	120 (248°F)
Heating duration, min	~30-40*	~30*	~30*
12mm 19mm	~40-60* Both	~40*	~40*
Heating side	Both	Both	Both
Bending	Manual or machine	Manual or machine	Manual or machine
Shape Matrix	Yes	Yes	Yes

*** - may require a short time heat up to 140°C (284°F), before – proceed a test with a small piece of plastic plate, especially in case of complex shape

Heating / Timing:
Timing starts after achievement of required temperature
Heat up slowly with the speed roughly 100°C (212°F) in 3-5 min
Bending:
Use a protective gloves Bend accurately without extra force If needed, heat up once more or/and increase temperature up 50°C (122°F) Use a matrix for bending In case of complex shapes – use a manual heat fan to heat up locally area for bending

PRECAUSIONS:
Due to different design of ovens – do the test at small piece before Extra force in case of improper heating may cause damage, pattern distortion and porosity