

# Maktherm Hotmelt Adhesives Application Guideline

When adhesion problems occur, it is a common reaction among edgebander operators to immediately look for fault with either the materials or adhesive being used in the process. In most cases however, adhesion problems are created by other factors.

To assist you in eliminating most problems we are pleased to offer the following guidelines, which are covered under the following headings:

1. Bonding with hotmelt adhesives.
2. Working Conditions
3. Materials
4. Troubleshooting
5. Introduction of Maktherm 26 Transparent Adhesive.

## 1. BONDING WITH HOTMELT ADHESIVES

To understand the bonding process it is necessary to know the main properties of Hotmelt adhesives.

- **Viscosity**

It's a measure of the resistance to flow of the adhesive. Higher viscosity means more thick and less fluid glue. Viscosity can influence the glue spreading and penetration on the substrate. The adhesive viscosity decreases with temperature.

- **Softening Point**

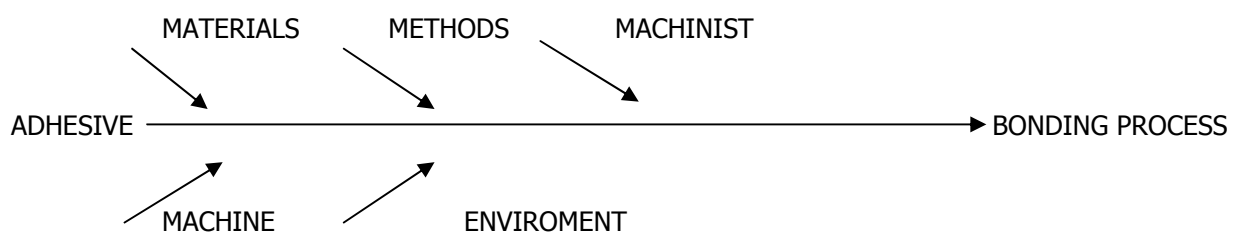
This property is a measure of the temperature that the adhesive becomes fluid. The softening point influences the heat resistance and the *open time*.

- **Open Time**

Open time or open assembly time is the maximum time between spreading the adhesive and the application of pressure to the assembly. If the open time passes, the adhesive is no longer fluid enough to wet the bonding surface.

**Note:** Open time is not a specification, and strongly depends on materials, applying temperature, adhesive spread and environment.

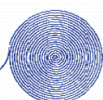
Beside the adhesive there are other factors that influence a bonding process:



While the adhesive can be chosen in accordance with materials and methods, the operator must adjust the machine according to the environmental conditions and also the materials.

The universal glue, in terms of solving all the working problems under all conditions of use, has not yet been developed. Although it is difficult to take into account the vast range of variables in the bonding process, it is quite possible to arrive at a compromise that can be completely satisfactory.

The working conditions for bonding with hot-melt adhesives must be properly adjusted, because they play a major role in the bonding process.



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## 2. WORKING CONDITIONS

- **Temperature**

Excessive high temperatures for long periods will oxidise the glue, changing its adhesive properties. Formation of crusts on the wall of the melting tank will reduce heat transfer and subsequent cooling of the glue. If the application temperature is too high the glue can start stringing, also if it is too fluid after the pressing stage the material may come unglued.

Low application temperatures will increase viscosity that affects the spreading, causing sparse application. Low temperature will also lead to poor wetting of the bonding surface.

- **Speed**

Low working speed can cause the adhesive to be cool before the pressing plate, resulting in defective bonding. With low speed machines (8-15 m/min) special types of adhesives must be used.

With high feed speeds, the fusion pot may not be able to feed enough adhesive, causing a bad spread.

- **Spreading**

The quantity of glue applied depends on the type of materials being used, and on other working conditions. With larger quantities of adhesive the glue line will take longer for cooling, allowing lower speed. Excessive glue will dirty the materials and the machine.

Low spreading will cause defective bonding due to defective spreading and low temperature on the glue line.

- **Pressure**

Without pressure the bonding will not take place. Bonding materials like solid wood lippings or thick PVC will need more pressure at the rollers, because of the flexure force that opposes the edge to the roll.

## 3. MATERIALS

There are different properties in edging and wrapping materials, and they must be taken into account to adjust the machines.

- **PVC +0.4mm**

PVC is easy to bond if the primer is applied properly by the manufacture. This is the more stable material to produce plastic edges.

- **Thick PVC and Tekton**

Like thin PVC, thick PVC edges are easy to bond, but require in the pressing rolls.

- **Melamine**

The quality of melamine edges vary considerably. Normally they need more temperature to bond. Melamine edges have less heat resistance than PVC because of internal strength developed by heat.

- **HPL**

HPL edges and profiles have very different backing qualities. Usually HPL needs more temperature and suitable edges to bond. When using primer the heat resistance is approximately 60°C. Like melamine edges, HPL also develops internal strength when heated, causing low heat resistance.

- **Veneer**

Usually hot-melt adhesives have good adhesion to veneers, but some exotic veneers are difficult to bond in the profile wrapping process. Special care must be taken with humidity to obtain good bonding results.

- **Solid wood**

Solid wood lippings are difficult to bond due to flexural strength. Usually they need a primer and a good bonding is only obtained with special edgebanding machines that apply glue to the panel and to the edge.

- **Paper**

Decorative paper used in profile wrapping needs a correct choice of the adhesive. Some types of decorative paper detach with time if the adhesive choice isn't correct. This problem is caused by incompatibility of the adhesives with the resins that impregnate the paper.

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## 4. TROUBLESHOOTING

There are many possible causes that can lead to defective bonding. The most common defect and possible causes are:

DEFECT	POSSIBLE REASONS	CORRECTIONS
Unglued edge at end of edging machine	Open time exceeded. Lack of adhesive Dirt or grease on edge Edge without primer Wrong choice of glue	Increase feed speed and / or temperature Check applicator roll Clean edging material Check edge Read adhesive instructions
Edge detaches some time after bonding	Low heat resistance  Materials with humidity	Avoid storing material in hot places, use a high heat resistance glue Check humidity of panels, melamine, veneers, and solid wood lippings
Some parts of edge not glued	Bad glue spread Dirt or grease on panel Panel not properly cut Defective pressing roll	Increase glue spreading and/or temperature Clean panel and / or edge Check panel and saws Check pressing roll

## 5. MACKTHERM 26 TRANSPARENT ADHESIVE

### Introduction

New developments in hot-melt adhesives for the furniture industry have resulted in the production of a filler free transparent adhesive for edgebanding.

### Main Advantages

1. Almost invisible adhesive glue joints
2. It is possible to Bond edging material with different colours, without changing the adhesive
3. More effective with light colours than with dark.
4. Lower glue consumption per M<sup>2</sup> due to lower density and higher resistance.
5. Very thin adhesive joints
6. Adhesive spread reduction between 2/3 and 1/2 compared with filled hot-melts: about 200gm per M<sup>2</sup>, instead of 350-400 gm per M<sup>2</sup>
7. High initial and final strength
8. Important for bonding difficult veneers and thick PVC edges.
9. Higher heat resistance
10. Better bonding quality

### Typical working conditions

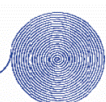
Temperature at application roll	190°C
Temperature at melting pot	160°C
Feed Speed	20m/min
Adhesive speed	200 gr/m <sup>2</sup>

### Recommendations

1. The Melting pot should be cleaned, in order to obtain transparent joints.
2. The melting pot temperature should not exceed 160°C for long periods, to avoid changing the adhesive colour.
3. When bonding dark colour edges the adhesive joint is more visible than with light colours, due to the light refraction.
4. To obtain a perfect glue joint it is necessary that the edge banding machine is well adjusted.

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