Lamination ... with integrated edge sealing / wrapping

For a long time the demand of the furniture and interior fittings industry has been for products for the effective sealing of chipboard edges. Through filling of the porous middle layer, profiled chipboards can also be wrapped with very thin paper foils, without the danger of telegraphing. The use of more homogenous but significantly more expensive materials, such as MDF, can therefore be avoided.

Edge sealing / Edge banding
FRIZ Kaschiertechnik, Weinsberg Germany, has developed a process together with KLEBCHEMIE in which the sealing of chipboard edges is integrated with the surface banding and wrapping with thin paper. A PO or EVA based hotmelt adhesive is applied with a slot nozzle to the edge of the chipboard cross section for:

1. a very smooth surface
2. the use of paper foils for edge wrapping (edge banding)

Surface Lamination/ Edge Wrapping (Edge Banding)
Edge sealing is combined inline with surface lamination and edge wrapping (edge banding) for industrial use.
EVA or PO hotmelt adhesive is generally applied to the paper foil with a slot nozzle or doctor blade. The surface and edge are then wrapped.

Complete Line adhesive system for normal temperature resistance
Edge Sealing with KLEIBERIT 762.3 EVA if required

Surface Lamination / Edge Wrapping with KLEIBERIT 742.3/743.5 EVA
- exceptional application properties
- line speeds up to 60 m/min
- high initial strength
- excellent temperature resistance

Complete Line adhesive system for high temperature resistance
Edge Sealing with KLEIBERIT 755.0 PO
Surface Lamination / Edge Wrapping with KLEIBERIT 750.0 PO
- perfect compatibility
- line speeds 60 m/min and more
- very high initial strength
- outstanding high temperature resistance (especially for export markets)

Overview of adhesive for surface lamination with integrated edge sealing and edge banding

<table>
<thead>
<tr>
<th>Product</th>
<th>Base Viscosity at 180 °C (mPa·s)</th>
<th>Application temperature</th>
<th>Properties / Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>742.3</td>
<td>EVA 10,000</td>
<td>180°C - 200°C</td>
<td>Lamination of paper foils on wood and wood based materials such as chipboard and MDF panels.</td>
</tr>
<tr>
<td>743.5</td>
<td>EVA 8,000</td>
<td>180°C - 200°C</td>
<td>Hotmelt for the surface lamination of wood based materials with thin paper foils.</td>
</tr>
<tr>
<td>750</td>
<td>FO 22,000</td>
<td>180°C - 200°C</td>
<td>Sealing compound for the sealing of chipboard in preparation for the direct wrapping with décor paper foils. Excellent filling of the middle layer, minimal shrinkage, smooth surface, very high temperature resistance, excellent melting properties.</td>
</tr>
<tr>
<td>755</td>
<td>FO 29,000</td>
<td>180°C - 200°C</td>
<td></td>
</tr>
<tr>
<td>762.3</td>
<td>EVA 15,000</td>
<td>180°C - 200°C</td>
<td></td>
</tr>
</tbody>
</table>
The lamination of flat surfaces with foils, veneers, or papers using thermo laminating or cold lamination equipment is a proven process in the wood working industry. These processes predominantly use EVA hotmelts and PVAC adhesives. Hence the final bond strength is achieved purely by physical setting, either through the cooling of the thermo plastic hotmelt adhesive or by the absorption of the water contained in PVAC adhesives.

The use of PUR hotmelts with rollers or slot nozzles is relatively novel. These processes require a new generation PUR hotmelts which provide long open time, high green strength and a high final bond strength. What all PUR hotmelts have in common is that in addition to the physical setting of the adhesive, they also cure chemically. This crosslinking creates significantly higher temperature and moisture resistance in comparison to EVA and PVAC adhesives.

Advantages

• Especially suitable for high bond strength requirements
• Very high temperature resistance
• Very high moisture and water resistance
• Simple application using roller and slot nozzle
• Flexible glue joint
• Adhesion to many different materials

These higher strength values have made it possible to explore new end user applications. This has enabled the technology of roller and slot nozzle application to develop rapidly. Roller applicators are predominantly in use in bonding large areas and less flexible materials. A typical example is all types of multi layer sandwich elements. Laminating large areas such as chipboard with more flexible materials such as foils and papers can be done using wide slot nozzles. For special applications, either roller or slot nozzle applicators can be used. For example, double roller applicators in the textile industry or for fibre backwoods varnishing.

Application

The application temperature of reactive PUR hotmelts is usually between +120 °C and +140 °C. The PUR RHM is melted in its original delivery container using special equipment and is then pumped through heated pipes to the application roller. The adhesive is applied to the substrate via direct contact with the application roller.

The coating substrate is then either applied by hand or machine and the required pressure is applied via the press rollers. This process is mainly used for very large and rigid materials. With slot nozzle system the adhesive is usually applied to the flexible roll material and the online pressing is done immediately afterwards via large area calenders. The line speed is max. 80 m/min.

Competence PUR - The New Age of Flat Lamination

Functional Panels

Sandwich panels / Lightweight Applications

Sandwich panels and lightweight panels are made up of multilayer construction. Depending on the application, different core materials are bonded with different surface layers. The sandwich panel first gets its high load capacity and rigidity as a result of bonding the shear connected core with the surface layers. Modern lightweight panels feature high strength, lightweight components, versatile design and are cost-effective. Their excellent form stability, torsional stiffness and high load capacity make it possible to use for transport and construction as well as in machine and plant construction. Together with the unique characteristics of the individual constructive elements, KLEIBERIT’s innovative adhesive systems provide for highly flexible bond and guarantees lasting functionality.

Decorative Panels

High Glass (Premium Surfaces) with ABS or PET Foils

In modern interior design, furniture and flooring, high gloss surfaces are increasingly gaining in importance. This trend gives many manufacturers the chance to enter a new market. However, the production of high-gloss surfaces is also a challenge, as the visual requirements are very sensitive. The specially developed PUR hotmelts adhesives from KLEIBERIT are perfectly formulated for bonding high glass foils.

- Excellent application characteristics
- Optimised smoothing characteristics in calendaring
- Perfect adhesion to various materials
- High green strength
- Brilliant optic also with thin foils
- Application with roller coater or slot nozzle with roller bar

KLEIBERIT 706 PUR RHM

KLEIBERIT 709 PUR RHM 710.1/711.1 PUR RHM

KLEIBERIT 709.1 for glass, ceramic and metal lamination to wood-based materials. The long open time allows large surface areas to be bonded.

KLEIBERIT 709.3 for high gloss foil (e.g. ABS < 0.7 mm) lamination. Due to the low processing temperature and the long open time, a homogeneous application property is achieved.

KLEIBERIT 709.4 for thick high gloss foil (e.g. ABS > 0.7 mm) lamination. The low processing temperature, the long open time and a very high green strength allows homogeneous application properties.

KLEIBERIT 710.1 for bonding transparent foils (e.g. PET) by roller coater application. High stability on the roller. Following cross linking, a highly heat resistant, cold and moisture resistant and durable bond is attained.

KLEIBERIT 711.1 for bonding transparent foils (e.g. PET) by slot nozzle application. Short open time, very high green strength. Excellent temperature and moisture resistance.

Flattening in a stable lamination and hotcoating lines to another

Disposal information

Cross linked PUR hotmelts can be disposed of with the normal waste disposal. In addition to this, our packaging materials are suitable for recycling and can, once emptied sufficiently, be put through the appropriate recycling channels.

Cleaning properties Advantages:

• avoiding of blockages and reactive contamination
• good mixing properties with PUR hotmelts
• neutralising the isocyanate reaction

Storage: PUR RHM can be stored in factory sealed containers for approx. 12 months. For detailed information, see technical data sheet.

Flat Lamination

| Product | Viscosity at 120°C [mPa·s] | Viscosity at 20°C [mPa·s] | Viscosity at 140°C [mPa·s] | Open time at 20°C [min] | Share of hardener | Characteristics / Applications
|---------|--------------------------|--------------------------|--------------------------|----------------------|------------------|--------------------------|
| 706.1  | 12,000                   | 6,000                    | 2                      | 2                    | 1,000            | low short open time, for laminating process
| 706.2  | 12,000                   | 6,000                    | 2                      | 2                    | 1,000            | low short open time, for laminating process

Cleaning

| Product | Viscosity at 120°C [mPa·s] | Viscosity at 20°C [mPa·s] | Specific weight [g/cm³] | Cleaning properties | Applications
|---------|--------------------------|--------------------------|------------------------|---------------------|--------------------------|
| 761.1  | 11,000                   | 6,000                    | 0.98                   | cleaning of mixing and application equipment when changing from one PUR to another
| 761.2  | 11,000                   | 6,000                    | 0.98                   | special cleaner for application rollers for flat laminating and hotcoating lines

Table: Adhesives / Coatings

<table>
<thead>
<tr>
<th>Machine Manufacturer</th>
<th>KLEIBERIT 706 PUR RHM</th>
<th>KLEIBERIT 709 PUR RHM 710.1/711.1 PUR RHM</th>
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<tr>
<td>RAABER MFG. Co.</td>
<td><a href="http://www.raaber.com">www.raaber.com</a></td>
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