



Niemann Möbelfabrik

Adhesives:

# Outgluing



Polyurethane hot melt benefits to boot. By Michael Blasius (right),

Today, reactive polyurethane hot melt adhesives (PUR-HM) can be used to serve almost any bonding task in the furniture industry. They are used in profile wrapping, for the diverse methods in edgebanding, for postforming, for soffforming, and for flat surface lamination.

They are also used for sealing of the underside of HPL-coated and conventional edgebanded worktops, and for numerous different assembly applications with the most varied substrates – like plastics, metals, or glass. The requirements which the adhesive bond has to meet are frequently high and diverse.

New developments include an adhesive for laminating enamelled glass with EPS (expanded polystyrene) foam and aluminium sheets used for the prefabrication of exterior glass panels for buildings. This adhesive contains a special additive which provides improved adhesion to glass, ceramics, and also some metals. These panels are already decorating the outsides of many buildings.

There are as well adhesives in the market for laminating (roller coater application), processed at low temperatures (approximately 100 – 110 deg C) with no stringing, minor vapours,



Meister-Panel Industrie

Adhesives for laminating enamelled glass with EPS (expanded polystyrene) foam and aluminium sheets are used for the prefabrication of exterior glass panels for buildings.

and low emissions of isocyanate. These adhesives are used for manufacturing lightweight elements with paper, aluminium, or plastic honeycomb inlay. High-gloss surface finishing can also be bonded with a smooth surface featuring a 'mirror' effect.

These laminating adhesives, due to their low application temperature and intrinsic viscosity, are used for laminating micro-perforated materials without clogging up the micro-pores.

They therefore maintain the optimal sound reduction properties of the finished components.

## HPL Onto Substrate

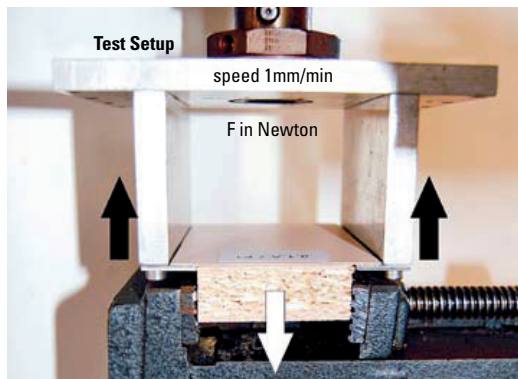
One application which seems at first glance to be a simple one also required the development of a new adhesive – laminating of HPL onto wood-based substrates. The quality of this bond depends largely on the amount of adhesive applied, on the open time, and on the pressure exerted afterwards.

Depending on the quality of the base panel, a quantity of 120 g/m<sup>2</sup> and more is required. Due to diverse machine layouts, feed speeds or intervals, types of HPL, etc, the demand was for an adhesive with an even wider processing window, offering more reliability, and preferably lower application weights. Jowatherm-Reaktant 609.38 from Jowat has improved wetting properties, which are responsible for the improved bonding results compared to other conventional PUR hot melts.

Comparisons under microscope show that the effective bondable surface (contact surface HPL/adhesive) of the adhesive is at about 50 – 70 percent, while other hot melts under comparable conditions only reach 25 percent or less.

# The Competition

adhesives are seeing more applications, with **Theodor Hippold (left)**, R&D, PUR-HM Adhesives and manager, industrial division woodworking, Jowat



Pic A: The test specimen (HPL-laminated PB) has a dimension of 70 x 100 mm. The HPL is now pulled directly upwards with a speed of 1 mm/min. The force to separate the HPL from the particleboard is measured in set intervals after the lamination.



Adhesives are now available for laminating micro-perforated materials without clogging up the micro-pores, maintaining the optimal sound reduction properties of the finished components.

A bondable surface with less than 20 percent will in most cases lead to delamination of the HPL (noticeable usually a few days after lamination). The assembly of specimen, dimensions and testing procedure can be seen in Pic A. With a wide selection of HPL materials tested, successful results were achieved with this new hot melt even with a grammage of approximately 80 – 100 g/m<sup>2</sup> and an open time of up to 30 seconds.

## Low Free Monomer Content

The chemical responsible for crosslinking PUR-HM is the diphenyl-methane-diisocyanate (MDI). The labelling requirement for any adhesive formulated with the isocyanate is based on the content of free monomer MDI (applies

also to other products like sealing compounds, etc if based on MDI).

For quite some time, the company has been producing reactive PUR hot melts with a free monomer content of less than 0.1 percent, with a performance equal to the 'classic' PUR HM adhesives. A respective patent was granted for this special manufacturing technology. However, the market acceptance for these products was limited to some edgebanding, and a few profile wrapping cases.

Lately the company has faced requests for an adhesive low in free

monomer for flat surface lamination. The exposed surface area in flat lamination is several times larger in comparison to edgebanding. On such lines, the potential exposure risk of workers to some isocyanate emissions is therefore much higher. A general-purpose laminating adhesive featuring low free monomer content is then required for this need.

Recent developments offer even more benefits on both the economical and ecological aspects of adhesives. Hence, the adhesive has, by far, not reached its limits. **FDM**

ENQUIRY NO. 2303

## JOWAT: LAMINATING ADHESIVE

The Jowatherm-Reaktant EP 33 601.70 from Jowat contains a free monomer content of less than 0.1 percent. This general-purpose laminate adhesive has an open time of about seven minutes. It is suitable for sandwich constructions, interior wall panelling, sidings, separating walls, wall and roof insulating panels.

The product's strength is adhesive needs about seven to eight days for complete crosslinking. Due to the low content in free monomer isocyanate, this

ENQUIRY NO. 2304

