ADHESIVES: REDUCTION TO ESSENTIALS – WITH INCREASING DEMANDS IN QUALITY

The Future of Edgebanding: PUR Hot Melt Adhesives.

Source: Jowat SE

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The selection of an adhesive and the application amount used are both crucial for a perfect end product. This is why various criteria have to be considered when planning for production: What are the defined quality criteria for the end product? Which adhesive system is the most appropriate one for production? What are the technical conditions that warrant a smooth and efficient production process during manufacture? Is the processing of the adhesive subject to legal regulations?

One of the major factors to determine a defined quality of the end product is the adhesive application amount. If it is insufficient, it will be at the expense of quality, and an excessive amount applied in the wrong area leads to the same result. The factor searched for in this complex interplay is always the optimum application amount under economic and quality considerations.

DEPENDENT ON EXTERNAL FACTORS: ADHESIVES FOR SURFACE FINISHING

In all bonding processes, the optimum application amount often depends on the surface structure. To achieve a perfect bond, the surface conditions of the substrates must be taken into account. Modern adhesive systems are in this context often very specific: When the interplay is perfect, they are very forgiving of surfaces which are not ideal, maintain a solid connection of substrates in cases where the bondable surface seems inadequate, and act as efficient fillers when things get uneven. Each application has its individual requirements.

For instance, the visual and tactile quality of décor surfaces depends on many factors: the quality of the bonding partners, which are the panels and décor materials; the kind of adhesive; the application amount; and the production technology. If any one

of these factors is modified, the parameters of all other settings throughout the system may also have to be reset.

While one focus in the past was on a reduction of adhesive grammage in order to lower manufacturing costs and increase product quality, the panels used in those times became rougher and the décor materials, thinner, to maintain a competitive edge in the market.

Hence, the expectations for the performance of adhesives grew more demanding. Adhesives were expected to level uneven panel surfaces in spite of low application amounts. Adhesives were expected to not penetrate the décor material and to lend a superior hardness to products. Additionally, the use of adhesives must never represent a bottleneck in the production cycle.

The high initial strength achieved with adhesives specialised for surface coatings ensures an immediate downline processing stream. This means that frequently in the surface coating sector, the quality of the end product indirectly defines the application amount of the adhesive.

ONLY THE CORRECT AMOUNT OF ADHESIVE ENSURES FIRE PROTECTION

The application amount utilised in products for interior building purposes are often controlled by legal standards. This applies to components which must meet high fire protection levels. The completion of industrial, administrative or public buildings (for example train stations, airports and shopping centres), interior finishing of ships, vehicles for road and rail transport requires a compliance with fire protection guidelines – and the adequate adhesive

The furniture industry uses a vast variety of edgebanding materials.

Source: Jowat SE

application amount is one of the essential factors in keeping those guidelines. After all, if the application amount used does not match the permitted or specified amount, the liability terms in case of fire damage may be voided.

When using adhesive systems and sealing compounds, all those involved in the entire construction chain should ensure that all bonding materials are certified. Suppliers need to be checked for compliance. Data sheets that are forwarded with the product by certified suppliers need to indicate the exact guidelines and the correct processing and dosage of the adhesives for each specific utilisation.

Very stringent standards are set by organisations for seagoing vessels. The International Maritime Organization (IMO) defines the standards, which the professional organisations for ship owners have to comply with by furnishing proof. Adhesive manufacturers undergo certification audits, which guide adhesive processors in ensuring that application amounts comply with set standards and state the processing instructions of the technical data sheets. These standards set the fire load characteristics for the adhesive and the specified levels and are especially essential when used for marine applications.

A "zero-bondline" is extremely demanding on the bonding process.

Source: Jowat SE

DETERMINED BY THE PURPOSE: THE BONDLINE EXECUTING A FUNCTION

A bondline makes sense when it offers additional functions – not only as an expansion joint, but as a joint for the planks of a ship deck, or as décor in an innovative mix of laminate panels – basically, a bondline is needed in all cases where sealing and insulation are required.

There are some questions with regard to the thickness of the bondline that resurface time and again: Which adhesive technology and which application amount will most efficiently match the scheduled end product quality? A "zero bondline" may be visually appealing, but does it ensure adequate prevention of moisture damage for components used in the kitchen, bathroom or laboratory?

The issue of zero bondlines is becoming increasingly important in furniture manufacturing. Bondline thickness will affect the type of bonding technology used for applications in the manufacture of furniture. Over the past few years, the quality of furniture has been improving. In superior furniture manufacturing, especially where a perfect bondline is required, moisture-curing PUR hot melt adhesives are being used more frequently.

EDGEBANDING: DRIVING THE DEVELOPMENT OF ADHESIVES

The standard edgebanding process – where different types of edgebands are bonded directly to various panels – is still the most common method of edgebanding. While other adhesive systems are gaining ground in the industry, EVA-based adhesives are still the most established and widely used technology.

•PO Hot Melt Adhesive

An alternative to EVA hot melt adhesives are those based on polyolefin (PO), which have been in use since the mid-1990s. PO hot melt adhesives is an effective solution in the industry as it can be processed like the classic EVA hot melt adhesives without any technical modifications to the equipment. PO hot melt adhesives are widely used in the kitchen and the furniture industry – both for the commercial and high-quality furniture sectors.

• PUR Hot Melt Adhesive

Another type of adhesive used in the industry is the moisture-curing hot melt adhesives based on polyurethane (PUR). PUR hot melt adhesives are the preferred choice to attain high quality edgebanding results and perfect bondlines. Top quality edgebanded furniture components that use the adhesive demonstrate heat resistance values that are higher than 120°C and a high resistance to water and chemicals.

PUR hot melt adhesives require more attention during the manufacturing process and are supplied in moisture-proof packaging and processed in special melting units to avoid contact with moisture in the air. In spite of this, the rising trend of edgebanders adapted to the PUR processing technology is an indication of the adhesive's growing popularity on the market. There is also a growing demand for the upgrade of standard edgebanding machines to be able to process PUR hot melt adhesive technology.

PUR is also currently available in granulate form, enabling an easy introduction to the adhesive. The granulate form is suitable for processors who are new to the technology, as well as small industrial companies that require PUR edgebanding for specific products. Companies like Jowat SE provide PUR granulate in special cans which are easy to handle and process.

In the past, processors who only have melt units for non-reactive hot melt adhesives (like EVA), had to make expensive modifications to the applicator equipment to process high quality, moisture-curing PUR adhesive. These companies are now able to utilise the existing application technology without any additional investments for processing reactive PUR hot melt adhesives with the introduction of its granulate form – taking into account several precautionary measures.

Jowat offers a wide range of packaging units for PUR hot melt adhesives for edgebanding: starting with small cartridges for manual edgebanders, 2kg-cans for standard slug-melters, and up to 20kg-hobbocks for pail-melters and even 200kg-drums filled with PUR adhesive. The range is enhanced with special packaging units for Holz-Her machines, such as the classic well known cartridge or the new Glu Jet PURXL cartridges in XL size.

CONCLUSION

The bonding system is an integral component that affects the decision-making process in the industry – from market requirements, to production technology, to legal aspects, and the level of investment required by the processing company. If adhesives and their processing parameters are able to meet production targets, this may lead to competitive advantages that contribute to the long term success of a company. **PFMENA**