

Mattress assembly

- High efficiency in manufacturing
- High-performance adhesives for automated processes
- Easy handling due to hot melt adhesives



Jowat-Toptherm® 232.30

Jowatherm-Reaktant® 639.10

Adhesives for mattress assembly



The quality of a mattress is determined by its structure, the processed materials, the used adhesive and the related assembly process.

Apart from quality, efficiency plays an essential role for mattress manufacturers. In this context, efficiency means especially an excellent cost-benefit ratio, high productivity in the assembly of the mattresses and in the following processes, such as filling, packing and shipping.

Minimal production costs, short process cycles, easy handling with a low potential for errors in the assembly and downline processing are decisive factors in the global competition. Effectiveness can be increased by reducing and preventing inefficient waiting times and transport routes.

The adhesive for mattress assembly has to support the virtually unlimited structure diversity and be characterised by good adhesion also to substrates which are difficult to bond, such as latex, viscose or gel foams. Therefore, different adhesive systems with different application methods may be used for different mattress types depending on the mattress structure. Automated adhesive application by roller or bead (multi bead) has become established in industrial operations.

Automated mattress assembly processes can generally be divided into the two main mattress types Bonnell or pocket innerspring mattresses, and foam mattresses.

Polyolefin hot melts (applied in beads) are the standard adhesives for innerspring mattresses, and reactive polyurethane hot melt adhesives (applied by roller) are used especially in the manufacture of foam mattresses where they provide excellent advantages compared to the established polychloroprene dispersion adhesives.

The fast build-up of strength of hot melt adhesives facilitates faster processing speeds and consequently increased efficiency.

Requirements | Efficient manufacturing processes

- High productivity
- High plant availability
- Easy handling
- Short process cycles
- Fast downtime processing
- Low potential for errors
- Minimum safety requirements
- Good environmental compatibility
- Avoidance of unnecessary transport





Innerspring mattress assembly with polyolefin hot melt adhesives

Due to a relatively small bonding surface which has to resist the height and width differences between the innerspring and the foam frame, the tensions in the bondline can be very high in the assembly of innerspring mattresses. Very high initial strength and a fast build-up of cohesion are therefore essential requirements for the adhesive.

In industrial manufacturing, the application of multiple beads by automated bonding units has become established. The challenge is a relatively long assembly time of up to 2 minutes. The adhesive has to provide a very good initial strength and a fast build-up of cohesion during the open time to resist the tensions in the bondline. After the substrates have been pressed shortly by hand, the adhesive has to ensure that the bondline will stay closed while the mattress is transported to the pressing unit as well as in downline processing. An immediate rolling and packing of the mattress after pressing and filling is also demanded more frequently.

Jowat-Toptherm® 232.30 is characterised by superior processing performance on automated bonding units and can also be applied by manual spraying. The fast build-up of strength facilitates shorter process cycles. Assembly and pressing times can be reduced, the output grows and consequently efficiency can be improved.

Jowat-Toptherm® 232.30

“All-rounder” for the assembly of innerspring mattresses; bead application or by spraying.

At the same time, plant availability increases and the potential for errors in the assembly process is reduced.

Jowat-Toptherm® 232.30 provides a permanent bond and a soft bondline for high quality and comfort demands.

Compared to the solvent-based adhesives which are still used in mattress manufacturing, PO hot melt adhesives are free of solvents, reduce the exposure to hazardous substances at the workplace and provide a major input into the protection of the environment. The requirements according to ÖkoTex 100 standards, LGA, Blue Angel and IKEA are fulfilled.

Characteristics of Jowat-Toptherm® hot melt adhesives

- Superior processing characteristics
- Good adhesion also to latex, viscose and gel foams
- High initial strength in spite of low viscosity
- Fast build-up of cohesion
- Short pressing times – depending on the complexity of the mattress, the pressing process may be the bottleneck of the application
- Roll packing immediately after pressing possible
- Minimal impact on employees and the environment

Polymer basis		PO
Processing temperature	[°C]	150 – 180
Viscosity – Brookfield at 160 °C	[mPas]	approx. 2,800
Open time – 4 mm bead	[s]	90 - 120
Density	[g/cm ³]	approx. 0.90
Appearance		yellow



INFO: PUR hot melt adhesives

One-component, reactive polyurethane hot melts (PUR HM) are characterised by a chemical crosslinking reaction with moisture after the physical setting process through cooling and solidification. During crosslinking small amounts of CO₂ gas are formed, most of which is released through the adhesive film. At room temperature, this minimal amount of CO₂ gas is generally not visible to the human eye. The chemical reaction is initiated by humidity and/or moisture in the substrates. Therefore, PUR hot melts have to be protected from humidity during production, storage and processing to prevent a premature reaction. After complete chemical crosslinking, PUR hot melts cannot be molten again and provide superior resistance to water, solvents and cleaners.

Foam mattress assembly with reactive polyurethane hot melt adhesives

Due to new mattress structures and materials, foam mattresses have to meet increasing requirements regarding the bonding and the durability of the mattress. Reactive polyurethane hot melt adhesives (PUR) provide major advantages over standard dispersion adhesives, especially in light of the demand for reduced drying times and shorter distances prior to roll packing. The water input from dispersions into the mattress and the resulting waiting time until all the water has evaporated and the mattress has dried, as well as the difficulty to measure the moisture content have led to new requirements in the mattress industry.

Applied by roller, PUR hot melt adhesives ensure a full-surface and superior bonding results in the assembly of the different foam layers of foam mattresses as well as permanent durability. Adhesives from this group provide bondlines which are permanently soft and meet high quality and comfort expectations.

The superior initial strength facilitates easy handling as well as inline assembly and packing processes. Immediate packing after assembly reduces the waiting time and consequently the necessary storage space, leads to lower process costs and increases efficiency.

These properties coupled with more reliable pro-

cesses are major benefits for the use of PUR hot melt adhesives in mattress assembly. In addition, the customer purchases a mattress which is free of solvents, chlorine compounds and preservatives, with no risk of mould formation due to trapped moisture.

Jowatherm-Reaktant 639.10[®] facilitates a bond of all standard materials, especially materials which are difficult to bond such as latex, viscose or gel foam. The requirements according to IKEA, Oeko-Tex100; LGA and Blue Angel are fulfilled.

Characteristics of Jowatherm-Reaktant[®] hot melt adhesives

- 100 % solids content, no water used during bonding, immediate packaging possible
- Inline roll-packing of the mattress without long drying times, depending on mattress structure
- Less storage and production area necessary
- Reduced costs due to higher yield possible
- Storage and transport stable adhesive
- Foam layers may be repositioned
- Short pressing time
- High initial strength – easy handling of the mattress
- Very high heat resistance and compound strength due to chemical crosslinking

Jowatherm-Reaktant[®] 639.10

For the assembly of foam mattresses and foam lamination; application by roller or spraying.

Polymer basis		PUR
Processing temperature	[°C]	110 – 130
Viscosity – Brookfield at 120 °C	[mPas]	approx. 14,000
Open time – Jowat test method	[min]	up to 3
Reaction time	[days]	1 to 3
Density	[g/cm ³]	approx. 1.1
Appearance		opaque

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