

Curing Mechanism of Hot Melt Adhesives and Reactive Adhesives

Detail Introduction :

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There are various types of adhesives. Different types of bonds have other curing methods. Different curing methods also involve different hot-pressing processes. Different hot-pressing approaches will use different heat press equipment.

Adhesives are either liquid or solid. When bonding, the adhesive needs to be in a liquid state. Only liquid can infiltrate the surface of the adherend. After infiltration, it will become solid again, and then it will increase bonding strength. The process of being in a solid-state is called curing.

The curing of hot melt adhesives is a relatively simple form and is a physical change. Hot melt adhesives are solvent-free pure solid adhesive products, which need to be heated and melted to make them into a liquid. After the liquid glue is fully spread and wetted on the surface of the adherend, the whole is cooled, and the hot melt adhesive becomes solid again so that the adherend forms a certain strength.

The curing of reactive adhesives is more complicated because of the chemical reactions involved in curing them. Different types of reactive adhesives have different reaction mechanisms, but the basic direction is the same. In the beginning, the liquid uncured adhesive fully wets the adherend, and then under certain conditions, the active groups in the adhesive undergo chemical reactions such as polymerization and cross-linking to form a thermosetting resin, thereby forming bond strength between adherents, like urea-formaldehyde resin. Phenolic resins and epoxy resins belong to this category of adhesives.

Due to the different curing methods, the sizing process of different adhesives is also very different, so the designed process equipment will also be different. This is an influencing factor that we must consider in the design of adhesive formulations.

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