# The Airlaid Manufacturing Process

The process for making airlaid nonwovens involves three primary steps: fiber defibration, web formation and web bonding.

1. Fiber defibration. Fluff pulp is delivered in a highly compressed roll that has a cardboard-like feel. Rolls are fed into hammermills which have a series of small hammers that rotate at high speed separating the pulp into individual loose fibers. The fibers are then transported to the web forming system.

Synthetic fibers can also be added at this stage. These arrive in compact bale form and are fed into bale opening systems which loosen and separate the bales into individual fibers.

2. Web Formation. There are two main forming technologies used to produce airlaid webs. With one system, the fluff pulp fibers are sifted through a coarse screen and deposited with vacuum assistance onto the forming wire, below. The second system uses drum formers. In this instance the fibers pass through a series of holes or slots in a large cylinder that spans the width of the forming wire. With both technologies, the pulp sheet is kept in place by a vacuum system located below the forming wire, and additives, such as superabsorbent polymers or odor control powders, can be incorporated into the web at this stage.

Production lines generally have more than one web former to allow for flexibility in the web formation and increase line throughput. The technology often allows for the web composition and structure to be controlled to achieve various required functions.

Prior to bonding, the web is compacted by large rollers to provide some integrity and cohesiveness. It can also be embossed with a design or logo as required by the customer.

3. Web Consolidation.
There are three primary bonding technologies: latex, thermal and hydrogen bonding. The term *multi-bonding* is used when more then one of the above technologies are used in combination, generally latex and thermal bonding.

*Latex bonding.* Two different methods can be used to apply latex binder to the web depending on the design of the production line. With one method, the top of the compacted web is sprayed with latex, dried in an oven and flipped over so that it can be sprayed on the other side. It then goes through a second oven that dries and cures the binder before the web is cooled, slit and wound into rolls.

Some manufacturers are able to apply latex foams instead of using sprays, which is a cleaner, lower maintenance application technology. However it is relatively new and limited in use and generally only a consideration for materials exceeding 100 gsm.

*Thermal Bonding.* With thermal bonding the web must contain synthetic bonding fibers (generally bi-components with polyethylene and polypropylene). After compaction the web is transported into an oven which softens and melts the sheaths of the fibers to the point where they fuse together,

bonding the various components of the web. The web is then calendered to the correct thickness, cooled and transported to the slitting/rewinding system.

*Hydrogen-bonding.* Hydrogen bonding utilizes the ability of cellulose fibers to bond together when naturally occurring moisture contained in the fibers is removed while the fibers are in close contact. Generally, the bonding is accomplished under conditions of high temperature and pressure. This process eliminates the need for synthetic binders to be added to the airlaid web. *NovaThin® is produced using hydrogen-bonding technology.*

*Multi-bonding.* Multi-bonding is a combination of latex and thermal bonding. The web is thermally bonded and a light application of latex is sprayed on both sides of the web to reduce the lint that is often released in high-speed converting operations.

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