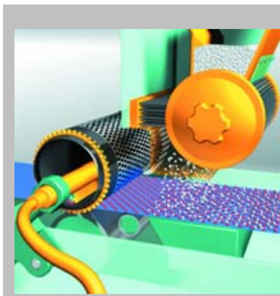
VESTAMELT®

Thermoplastic copolyamide hotmelt adhesives

- Double dot



Double dot coating

A double dot consists of a highly viscous or cross-linked base dot and a low-viscous top dot. This allows light and open face materials to be bonded to equally open linings without strike back, without the adhesive penetrating the fabric, and without the back of the material sticking to the machine. Other advantages include a low application weight, better adhesion to surfaces that are difficult to fuse, and a soft textile feel.

Application method

In recent years, new base materials such as polyester charmeuses (about 35 g/m²) have come into use to close the gap between nonwoven fabric and woven lining. Because these materials have open surfaces and are also very temperature-sensitive, it is not advisable to use paste dot or powder dot coatings. In both methods, the coating dot is pressed too deeply into the lining, causing hardening. Powder dot coating has the additional disadvantage that the lining is subjected to too much thermal stress, impairing the product's elasticity.

A newly developed coating technology, the double dot process, is ideal for coating and bonding these materials, however. As seen in the figure, the double dot sinks into the lining very little compared to the other two processes because the base dot has a high viscosity.

1. Rotary-screen printing is used to apply the base dot.
2. A powder adhesive that will adhere only to moist paste dots, is next scattered on the base dot while it is still moist.
3. Any top-dot powder that falls between the base dots is removed by aspiration in a later step.
4. The water is removed from the base dot within a dry channel. The base dot is sintered to the lining substrate, and both dots are bonded together.

A double dot produced in this manner consists of approximately 3-5 g/m² base dot and 4-5 g/m² top-dot material.

Fusing

Fashionable face fabrics, such as polyester and viscose georgette and microfibers, are provided with a special finish (siliconizing or fluorocarbonizing). Conventional systems fail to bring about adhesion in these materials because suitable low-viscous hotmelt adhesives will seek the path of least resistance and strike back deep into the liner (see figure).

In the double dot process, the base dot forms a highly viscous barrier layer that prevents strike back into the liner. The top dot's hotmelt adhesive is forced to run in the direction of the face fabric, resulting in good adhesion due to its good bonding to the base dot and its excellent wetting of the surface (see figure).

Behavior of the coating dots during fusing as a function of the coating process

Design of the double dot system

The double dot system is by far the most elaborate application system. It consists of:

- paste head
- scattering device
- powder aspiration
- air nozzle
- powder recycling
- drying oven
- IR melting

The quality of the individual components and proper match between the materials, the base adhesive, and the top-dot adhesive is crucial to the success of the double dot process. When everything has been properly matched, running speeds of 50 m/min are possible. The two most critical factors affecting the rate are the aspiration of the excess powder and the design of the drying oven.

Just a few years ago, beater rolls were used to fling up the excess powder and aspirate it. Experience has shown that the powder was not only flung upward, but was also shaken down into the lining, where it caused hardening and higher material consumption. Today the powder is removed by air nozzles located in the front and rear of the aspiration device. The more laminar the air stream, the more effectively the excess powder is cleaned from the lining. This means that eddying must be prevented, requiring an aerodynamically optimized suction system.

The aspirated powder is freed of fibers and agglomerates. About 40 percent of this recycled powder is mixed with the original powder and recycled to the process.

Another factor is the drying oven. The paste dot process uses only circulating air ovens, but they are not adequate in this case. Instead, it is recommended that IR fields be installed at the oven inlet and outlet. The IR field at the inlet is intended to agglomerate the scattered top dot material as quickly as possible and fasten it to the base dot. The top dot is fused to the bottom dot at the oven outlet.

VESTAMELT® copolyamides for the powder filled base dot

VESTAMELT®	Properties, suitability
250-P1	High melting point and high melt viscosity, very good resistance to strike back, very good resistance to temperature, washing and steam
X1310-P1	Thermal cross-linkable hotmelt adhesive; before cross-linking: low melting point and low melt viscosity, good adherence to copolyamide top dot
X1316-P1	Thermal cross-linkable hotmelt adhesive; before cross-linking: higher melting point and higher melt viscosity, for high resistance requirements

Particle sizes:
P1 = 0 to 80 µm

Grades can be blended to produce different properties.

VESTAMELT® copolyamides for the scattered top dot

VESTAMELT®	Properties, suitability
430-P2	Low melt viscosity with good face fabrics, ladies wear
730-P2	Low melting point, low melt viscosity, very good adhesion to surfaces that are difficult to fuse, such as siliconized fabrics
840-P2	Wide fusing range, high resistance to steam, good adhesion strength, multi-purpose grade for different interlinings
X1027-P2	Low melt viscosity, low fusing temperature, very good adhesion to surfaces that are difficult to fuse, high resistance to steam, good for colored linings
X1301-P2	Wide fusing range, very good adhesion and soft feel, very good resistance to washing and hydrolysis

Particle sizes:
P2 = 80 to 200 µm

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