Spunlace meets Spunbonding

Spunbond applications on new paths

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Introduction

After having worked with proven bonding and finishing methods for a long time, there has been considerable movement lately in the spunbond market.

The market in today's spunbond sector is dominated mainly by calendered spunbonds for the hygiene sector and mechanically needled spunbonds for geotextiles and roofing applications.

In the future, however, new bonding methods such as the AquaJet-Spunlace technology by Fleissner will be more and more used for the production of new generations of spunbonds. Being the leading supplier of spunlace and finishing equipment for spunbond webs, Fleissner cooperates with all spunbond machinery producers such as Reifenhäuser.

Both the spunlace technology and the spunbond process already have maximum growth rates today. During the past years, spunlace nonwovens - being mainly carded staple fiber webs - have already replaced and superseded many other nonwovens products that were produced by other bonding methods. This explains the spunlace technology's strongly dominating position in the market today (Fig. 1).

Also the market trend of the last few years for the spunbond sector worldwide and in Europe (Fig. 2) shows a considerable growth that will increase even further due to new bonding methods such a spunlacing.

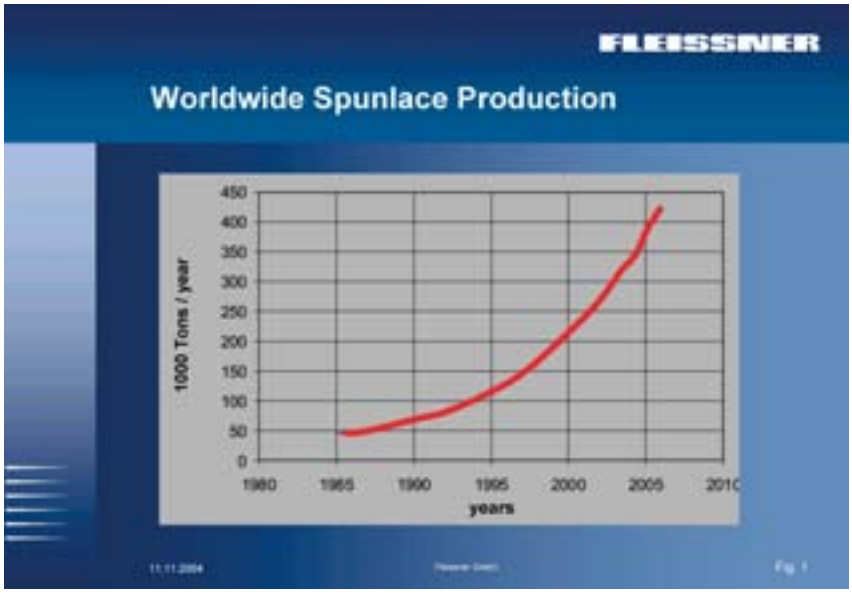

Fig. 1: Spunlace market

The requirements made on spunbond products influence the choice of bonding and finishing processes. It is not important whether PP, PET, other homopolymers or bicomponent fibers are used.

Based on its experience from more than 1000 continuous finishing lines for spunbonds, carded webs, wet-laid webs and air-laid webs,

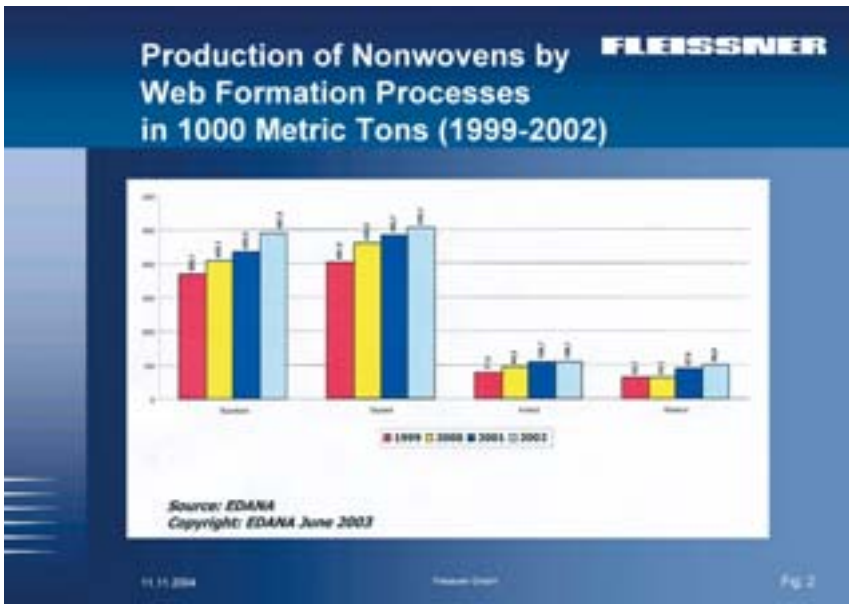

Fig. 2: Spunbond market

Fleissner can plan and deliver finishing lines that meet the requirements made on the final products:

Proven spunbond products and technologies

• Light-weight webs from 10-30 g/m^2 for the hygiene and agricultural sectors
Fibers: PP
Bonding: Calendering
Finishing: Application of hydrophobic / hydrophilic / flame-retardant / bonding chemicals and drying on Fleissner high-performance through-air dryers at speeds of up to 800 m/min.

• Light-weight to medium webs up to 80 g/m^2 as sarking membranes for the building sector.
Fibers: PET
Bonding by calendering/mechanical needling and subsequent finishing: Heatsetting on perforated drum lines operating on the through-air principle for increasing dimensional stability and strength

• Heavy-weight webs up to 600 g/m^2 for geotextiles
Fibers: PET or PP
Bonding by mechanical needling with subsequent heatsetting on perforated drum through-air lines for increased strength or with special open-width stretching stenters by Fleissner.

• Medium web weights up to 250 g/m^2 for roofing membranes
Fibers: PET
Bonding by mechanical needling and subsequent heatsetting and binder bonding and drying/curing on perforated drum drying lines (Fig. 3)

• Medium web weights up to 130 g/m^2 for primary backings of tufted carpets

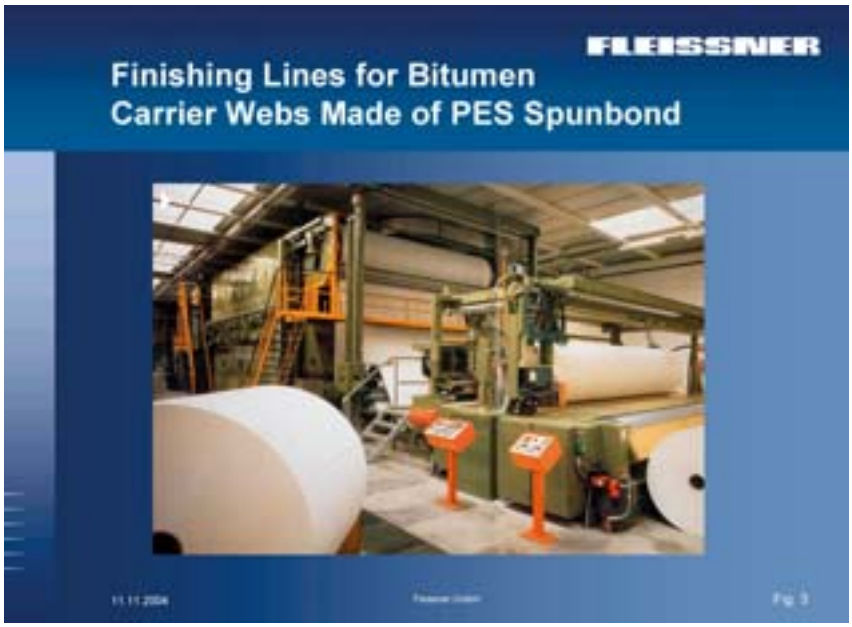

Fig. 3: Roofing line

Fibers: PET/ Co PET or PET/PA bicomponent fibers
Bonding by hot-air thermobonding with Fleissner HighTech through-air bonding lines

New technology concepts: Spunlace meets Spunbonding

• Often light-weight webs that have been calendered do not offer the desired softness for applications in the hygiene sector. Subsequent treatment on an AquaJet-Spunlace line increases the softness and improves the volume. This can be done at processing speeds of up to 600 m/min. The spunlace line can be installed both in-line with the spunbond machine and off-line.

• The speed and economic efficiency of the production process for heavy webs for geotextiles have so far been limited by the relatively low speed of the mechanical needling process, as higher speeds

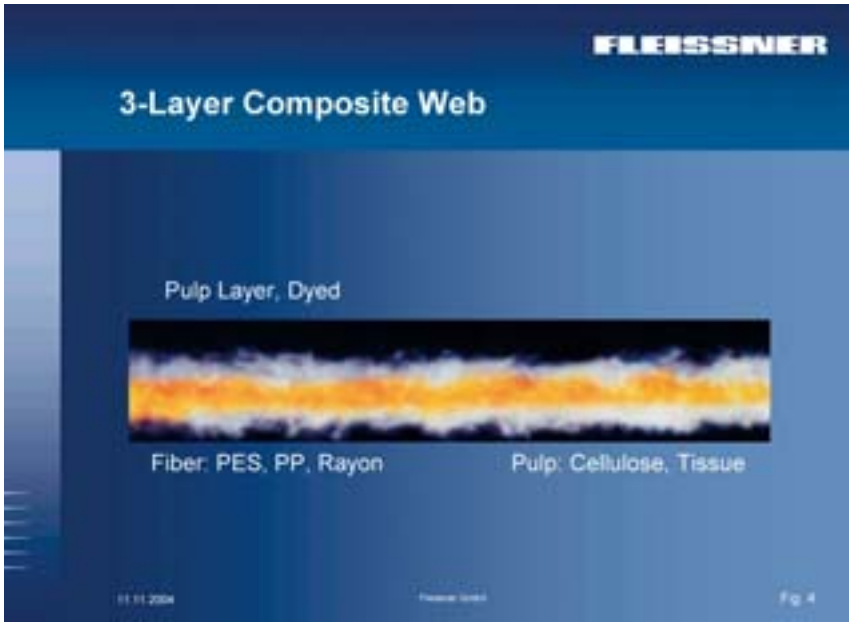

Fig. 4: 3-layer composite with inner airlaid-pulp layer

would destroy the endless filaments (reduction of strength).

Bonding by the spunlace technology makes it possible to operate at higher production speeds which increases line efficiency. At the same time the tensile strength of the goods is improved. Thus fiber costs can be reduced by the reduction of web weights. This considerably increases the economic efficiency of the process. A large-width line has already been delivered by Fleissner.

• Production of wet wipes as 3-layer composites by bonding PP spunbond layers on the outside and a pulp layer produced on an airlaid line on the inside (Fig. 4). This results in 2 advantages: Drastic improvement of water absorbency due to the cellulose fibers and high saving of costs because the use of more than 50% pulp allows to strongly reduce the raw material costs. Possible line speeds of up to 400-600 m/min.

• When producing spunbond filaments from splittable conjugate fiber cross-sections (e.g. orange type), the AquaJet-Spunlace technology causes fibrillation of the fibers so that very fine filaments of less than 0.01 den can be obtained. The nonwovens thus produced (e.g. Evolon by Freudenberg) are used for wipes with special properties – due to the large fiber surface – and increasingly also for garments and coating substrates (artificial leather).

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