Technical spunbond production
Sustainable solutions
Your benefits

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From Melt to Nonwovens
Solutions along the textile value chain

Place your business ideas in professional hands! Consulting, engineering, plant construction and high-tech machinery – the whole package from a single source. Many years of experience in textile machine construction and our strong global network form a solid basis and the perfect prerequisites for us as your solutions provider.

Define your nonwoven properties from the very outset
From melt to material – we have your value-added chain under control. You increase your profit, because an optimized manufacturing process encompassing all production steps, provides you with the greatest possible influence on the quality of your end product and your production costs. Add to this the fact that our brand strength will make financing your project a profitable investment. Extensive experience and engineering and management competencies help us to even deliver complex projects and processes on time. You can rely on that!

**Bitumen Roofing Substrate** (for top layer, often flat roofs)

| Polymer | PET, PE, PET
| Basis weight | 100 – 300 g/m²
| Filament size | 2 – 6 dtex
| Standard product width | 1.510 mm
| Machine standard width (trimmed) | 0.500 mm (other widths on request)
| The capacity | 400 to 600 tons per year

**Geotextile** (e.g. for surface drainage, erosion control, soil separation)

| Polymer | PP, PET, rPET
| Basis weight | 50 – 120 g/m²
| Filament size | 4 – 7 dtex
| Standard product width | 600 – 5,000 mm
| Machine standard width (trimmed) | 0.500 mm (other sizes on request)
| The capacity | 400 to 600 tons per year

**Roofing Underlayment** (for use between roofing tiles, wooden roof)

| Polymer | PP, PET, rPET
| Basis weight | 50 – 120 g/m²
| Filament size | 4 – 10 dtex
| Standard product width | 1,500 mm
| Machine standard width (trimmed) | 3.200 mm (other sizes on request)
| The capacity | 400 to 600 tons per year

Spunbonding  →  Needle Loom  →  Needle Loom  →  Stretching  →  Heating  →  Cooling  →  Binder  →  Accumulator  →  Winder
Spunbond production with Oerlikon Neumag technology

The Oerlikon Neumag spunbond process is specially designed and developed for the production of technical nonwovens. Polymer, filament and web weight flexibility meeting high industrial quality standards and efficient productivity, are essential for nonwoven producers in this field.

The idea
We offer a one-step nonwoven production process from one single source – from the raw material to the finished nonwoven roll good.

The Oerlikon Neumag Spunbond process is characterized by:
- High throughput spinning to enable cost effective production
- High speed spinning capability for high tenacity and low shrinkage filaments
- Optimized melt distribution for eliminating web performance variation across the width
- Robust spinning suitable for a wide variety of melt spinnable polymers
- Decoupled draw slot system to allow optimized filament characteristics
- Mono and bicomponent technology to meet your requirements

The benefits
We have developed the processes and engineered dedicated production lines from melt to nonwoven for technical nonwovens:
- Low production costs through high capacity production, less space, machines and operators, low waste rate, low energy consumption and higher yield
- High product performance with low basis weight to meet the leading market requirements

e-save provides you with a competitive edge
With e-save, Oerlikon Mannmade Fibers introduced a label for particularly energy-efficient systems, machines and components back in 2004. Over the past years, e-save has established itself as the trademark of a comprehensive efficiency program. This underlines the preeminent role of Oerlikon Mannmade Fibers when it comes to commercial success and sustainability.

The Oerlikon Neumag spunbond technology sets standards. Compared to conventional concepts, this solution convinces in terms of:
- Energy: the consumption for compressed air has been reduced by 18%
- Economics: reduction of conversion costs by up to 40%
- Environment: less than 1% non-recyclable trim waste
- Ergonomics: the plant can be operated by only 3 – 5 operators.
More than 5 million tons of technical nonwovens will be consumed in 2015, representing about 60% of the total nonwoven market. The market is growing rapidly with over 6% per year.

State-of-the-art technology with inherent flexibility and future opportunities are needed. Advanced spunbonds meet the requirements for thinner, lighter and more efficient materials in technical applications, such as geotextiles and roofing substrates.

Our technology is characterized by a one-step production process, suitable for nearly all melt-spinnable polymers, with bicomponent capability, a wide processing window and a wide range of filaments. Our technology allows you to significantly reduce your operational expenses.

We offer the complete nonwoven production process – from the raw material to the finished nonwoven roll goods – including all downstream and auxiliary equipment optimized for the efficient production of substrates for bitumen roofing membranes and roofing underlayment, geotextiles as well as further technical applications.

Grow with a growing market

Source: SmithersApex (2012/2015)
Excellent product quality

Key benefits

Leading technology

One basis, many possibilities

The basis for an excellent end product is an optimum spinning result. It makes no difference whether you want to produce bitumen roofing substrates, roofing underlayments, geotextiles or other technical nonwovens, our spinning technology is the ideal starting basis.

For optimal spinning, the polymer must be distributed in the spinning beam under very uniform conditions. With our segmented distribution system, a uniform residence time and heat transfer is achieved for the polymer across the beam and spinneret. As a result of the excellent polymer distribution, our spunbond technology achieves homogeneous web characteristics. To this end, consistent tenacity and elongation values in both cross and machine direction, are achievable.

The results are:
- Bitumen roofing substrate nonwovens from 100% PET spunbond with our technology are comparable to glass fiber reinforced products.
- High grade roofing underlayment nonwovens, a high standard with future opportunities.
- Geotextile nonwovens with excellent properties and best cost/performance ratio.

Improved strength at lower basis weight (Benchmark example)

<table>
<thead>
<tr>
<th>Bitumen roofing substrate</th>
<th>Geotextile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oerlikon Neumag product 170 g/m²</td>
<td>EU benchmark product 180 g/m²</td>
</tr>
<tr>
<td>Oerlikon Neumag product 120 g/m²</td>
<td>EU benchmark product 130 g/m²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tensile strength [kN/m] (MD)</th>
<th>Tensile strength [kN/m] (CD)</th>
</tr>
</thead>
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</table>
High production capacities at low costs

Low consumption values for energy, gas, air and water, low personnel requirement as well as a low waste rate with raw material consumption, ensure that the investment of your plant is amortized within 2-4 years.¹

High throughputs
Our spunbond technology enables significantly higher throughputs than achievable with other standard systems available on the market: up to 300 kg/(h·m) for virgin polyester and up to 240 kg/(h·m) for polypropylene.

Low energy consumption
As a result of the optimization of the draw slot and a process optimization, the energy consumption for compressed air has been reduced, compared to our previous solutions, by 18%.

Low waste rate
Due to the high system up-time with planned maintenance intervals and the possibility of recycling the majority of the waste, the non-recyclable trim waste is less than 1%.

Economical plant
Our one-step spunbond process from chips to roll goods eliminates the need of semi-product stores and saves space in particular vs. two-step processes like carding (fiber and nonwoven production). Our compact spinning units need a maximum height of 12 meters. An additional building level for the processing is not necessary.

Due to easy-to-operate components and our single process control system, the plant can be operated by only 3-5 operators.

¹ At full production and 25% sales margin of the nonwoven roll good on average.

Example conversion costs (excl. raw material)

<table>
<thead>
<tr>
<th>Bitumen roofing substrate production</th>
<th>Geotextile production</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>50%</td>
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<td>%</td>
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Oerlikon Neumag process
Competitive spunbond process
Innovative, powerful and flexible – nonwoven production with Oerlikon Neumag technology

With more than 100 systems for PET, PP and bicomponent staple fibers installed worldwide – with production capacities in excess of 4.3 million tons/year – we are able to draw on comprehensive and proven know-how in the processing of polyester and polypropylene. This expertise is deployed for your benefit in the production of technical nonwovens.

All key components of the Oerlikon Neumag spunbond technology are manufactured in our factory in Neumünster. We also work with renowned partners.

Outstanding flexibility in polymer use
Our spunbond technology is designed for a wide variety of melt spinning polymers such as PET, R-PET, PP, PE, PA, PLA and PPS.

Additionally, our lines can be optionally equipped with bicomponent technology which has been installed in a number of commercial lines. Our unique bicomponent system allows:
- Core/sheath with a sheath content as low as 5%
- Decreased costs per unit with cost-efficient polymer, e.g. recycled polymer in the core
- A wide range of polymer combinations, polymer ratios and viscosities
- Adding value by utilizing different core and sheath properties, e.g. strength, softness and elongation

Draw slot technology
In the draw slot, the filaments are accelerated by induced compressed air, thus controlling the filament draw ratio. The drawing is independent of the spinning and quenching for obtaining the desired filament characteristics.

Our draw slot is designed to enable an improved air velocity distribution over the draw slot width. This design offers a more homogeneous distribution and thus a more homogeneous web-formation. The achieved, significantly lower basis weight spread results in the reduction of the mean basis weight by maintaining required technical characteristics like tensile, puncture and tear strength, thus leading to savings in polymer costs.

Improved forming zone
Better formation for less edge trim and therefore savings in raw material costs.

In the forming zone, which directly adjoins the draw slot, the filament speed is reduced in order to open and oscillate the filaments for a homogeneous distribution and fiber orientation. Our forming zone design allows a controlled air and filament guidance for achieving clear and homogeneous web edges. Therefore the edge trim can be significantly reduced or even eliminated – depending on the product requirements.

The suction box offers a more robust formation and a wider process window which is essential for a broad and flexible product portfolio. Our design leads to controllable settings for individual products, improved formation freezing and improved web transfer.

This results in an extended process flexibility which enables the production of nonwovens with varying characteristics in terms of:
- Polymers used,
- Filament fineness and cross sections,
- Fiber orientation and
- Basis weights.
Progress is steaming ahead within the textile machine and systems construction sector, with production processes continually improving. However, production processes are also becoming increasingly complex and require reliable steering and monitoring to prevent expensive machine downtimes.

Those dispensing with optimally-tuned service are taking a huge risk: investments can quickly become absolutely worthless if the technology or the service fails to be future-proof or performance-compliant.

Collaborating with you, Oerlikon Manmade Fibers’ mission statement is to ensure that your production processes run smoothly. For this reason, our motto and ambition is: Partnering for Performance. This stands for a service initiative benefitting all customers who expect more than just service alone. The Partnering for Performance offers ensure that your systems remain state-of-the-art: profitable and ready for operation, hence ensuring you make a sound decision – for future-proof investment, for technological leadership and for production reliability in your day-to-day operations.

**Think globally, act locally**
Under the Partnering for Performance umbrella, our Oerlikon Manmade Fibers Service offers a plethora of the most diverse products and services to ensure that you reliably achieve your goals: faster return-on-investment (ROI), shorter downtimes and optimized production processes. We will swiftly and efficiently implement your requirements – at any time and anywhere, a pledge that is backed up by highly-qualified employees at our headquarters in Germany along with our network of over 20 worldwide service stations.

Find out more on Oerlikon Neumag Customer Services

Or contact us: customer-services.neumag@oerlikon.com
Our arguments

With our Oerlikon Barmag and Oerlikon Neumag competence brands, we are the world market leader for manmade fiber filament spinning systems, texturing machines, BCF systems, staple fiber systems and artificial turf systems. As a service provider for engineering and after-sales services, we offer total solutions for the entire textile value added chain. We attach great importance to energy efficiency and sustainable technologies in all our developments.

To what extent do you profit from this? Our market position guarantees you the benefits and quality of leading technologies, our sustainable products save you money and our comprehensive services save you time and hence increase your profit.

More on Oerlikon Neumag
Spunbond solutions

Or contact us:
sales.neumag@oerlikon.com