Oerlikon Barmag & Neumag - Solutions for Textile PA Industry

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Oerlikon barmag & Neumag - Solutions for Textile PA Industry

October 2010

Agenda

1. Some market figures on PA6 and PA66 textile and industrial filament yarns (source: “The Fiber Year 2009/10” by A. Engelhardt)

2. Today’s technologies for PA6 and PA66 spinning and texturing
World Fibers Supply

avg. annual fiber consumption 2000-2009
- all fibers: 3.3%
- polyester: 6.0%
- cotton: 2.6%
- polyamide: -1.4%

World polyamide production by fiber type
Production in 2009: 3.49 mill tons

Polyamide production 2008:
3.56 million tonnes
-9.8% vs 2007;
loss of nearly 400,000 tonnes!

Polyamide production 2009:
3.49 million tonnes
-1.4% vs 2008;
loss of 50,000 tonnes!
Polyamide textile and industrial filament 2009/10

### Textile Filament
- **2009:**
  - Production: 1.6 mill. tons (+8.3% vs 2008)
  - Production increase only in China;
  - (larger) investments mainly in China
- **2010:**
  - Production increases in China, Taiwan, India, Japan and US
  - Chinese PA textiles (hosiery, nylon fabrics for outdoor clothing) are in high demand in China
  - Mill consumption in US is running high (for sports apparel mainly); tightened yarn supply in Europe (especially in the high-end markets)
  - Ongoing substitution of nylon by polyester filament where price is the crucial factor

### Industrial Yarn
- **2009:**
  - Production: 0.89 mill. tons (-7.4% vs 2008)
  - Production increase only in China; double-digit decreases in the Americas and Europe.
- **2010:**
  - Strong demand in Asia, US, Europe with the automotive industry picking up world-wide (world car sales are estimated to increase by 10% to 56.01 mill vehicles in 2010)
  - The demand for lower cost polyester airbag yarns is still constrained, so airbag PA yarns are not under pressure now

The polyamide textile filament market

**Markets for textile PA filament:**
- Hosiery, underwear
- Swimwear, functional & outdoor wear
- Women’s apparel

**Situation:**
- Steadily increasing capacities in China
- Capacity reductions in rest of world - only small investments for differential products

**Main challenges in the next years:**
- Competition with lower-cost polyester fibers
- Margin and differentiation pressure
- Sustainable production
Agenda

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How to cope with market challenges

reasons for the success of polyester

- higher margins due to increased rate of differential fibers
- reduction in fiber production costs due to high-performance equipment and high output per square meter
- reduction in raw material (PTA, MEG) cost due to economies of scale (e.g. 600 tpd polycondensation plant)

solutions for textile PA spinners

- a challenge for CP supplier
WINGS POY for PA and PETP

Top yarn quality, low resource consumption, easy handling

Average yarn brakes:
<0.7 per ton/day

Reduction string-up time:
approx. 2min

Reduction in string-up waste:
30%

The WINGS concept:
- fast and easy string-up
- higher production - less waste
- lower energy consumption
- higher profit

2010-11-11 Oerlikon Barmag - PA Spinning & Texturing
WINGS POY for polyamide

The WINGS principle
--- Winder INtegrated Godet Solution ---
* floor-operated machine
* compact design
* space-saving zigzag arrangement available
* proven components
* a pre-tested plug-and-play unit
* new E-concept

The WINGS success story
* more than 8,000 WINGS POY machines sold
* in more than 50 projects
* to more than 25 customers
* in 3 continents

First PA versions sold in mid 2010

DIO spin package (Double In One) with SP82Plus quenching
Enabling multiple ends per spinning position

Two spin packs in one body
* no hydraulic split
* Denier CV as known from single end spinning

SP82 Plus quenching
* each 12-ends per winder are completely separated from spinning to take-up thus offering full bobbin rates and waste rates as 12-end concepts

Operation window for PA 6 POY
* from 20 to 75 den (final)
* filament counts from 20D/7F to den 75D/56F
* semi dull, full dull, bright
* various cross sections

lower space requirements compared to single end packs
POY and HOY spinning solutions for PA6 and PA66

Overview

PA6 POY
- from 10 to 150 den
- filament counts from 10D/7F to 150D/96F

PA6 HOY
- from 15 to 100 den
- filament counts from 15D/8F to 100D/96F

PA66 POY
- from 10 to 100 den (final)
- filament counts from 10D/7F to 100D/96F

PA6 POY (multi end)
- from 20 to 75 den (POY)
- filament counts from 20D/7F to 75D/56F

Proven components

- E10 / E11 / E8 extruder series
- SPx spin beam
- standard spin packs
- standard X flow quench
- WINGS POY (12 ends)
- WINGS POY (6 ends)
- WINGS POY (2 x 12 ends)
- DIO
- SP82Plus

Preferred operational range: 30 - 200 den

Oerlikon Barmag solutions - eFK-PA DTY machine for PA

The choice is yours - in polyamide texturing too!

Preferred operational range: 30 - 200 den
V cross section
S cross section (for very fine yarns)

Heating / Cooling
- 2.0 m Dowtherm heater / 1.1 m cooling plate
- 2.0 m Dowtherm heater / 0.7 m Cooling plate
- 1.5 m Dowtherm heater / 0.85 m cooling plate (CoolFlex configuration)

Take-Up
- CAMshaft
- ATT (optimal tension control)
- Special configurations available on demand

eFK for polyamide - first machines have been sold in summer 2010
- will be available in OCN’s showroom in March 2011
Spinning PA textile filaments
Solutions for success in a difficult market

High-performance equipment for PA
* e.g. 24 ends/spinning position
* e.g. high output/square meter with WINGS POY

High-efficiency equipment for PA
* e.g. reduced waste rates / increased rate of full bobbins
* e.g. reduced energy consumption / reduced number of operator
* e.g. tailor-made texturing technology

High-quality PA products
* high and even yarn quality / excellent dyeability
* good unwinding performance in the downstream
* differential fibers

CCFEI
Oerlikon Neumag – BCF PA6 & PA66

Shanghai, 2nd of December
PA6 BCF – a mission impossible?
Find the right partner to get to the top!

Agenda

1. What is BCF?
2. Where is the BCF market going?
3. Who is Oerlikon Neumag?
4. What is the technology of Oerlikon Neumag?
5. Why is Neumag the perfect partner?.
What is BCF?
A short introduction into the world of carpet fibers

BCF
BCF is short for bulked continuous filament or simply carpet yarn.

BCF PA 6
PA6 is short for Polyamide and a nylon yarn.

Fields of application
High demand for BCF PA6 yarn is given from the contract sector e.g. in hotels, automotive application and for exhibitions (e.g. Shanghai Expo and Asian Games)

Where is the BCF market going?
1/3 of total carpet yarn production is made from PA (6+ 66)

Source: Neumag, Chemical Fibers International, Intercontuft 2009
Where is the BCF market going?

Forecast: Nylon 6 Carpet Filament installed capacity – Split by region

<table>
<thead>
<tr>
<th>Region</th>
<th>[000 tons/year]</th>
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<tr>
<td>USA</td>
<td>556</td>
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<td>W-Europe</td>
<td>526</td>
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<td>E-Europe</td>
<td>506</td>
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<td>Africa/ ME</td>
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Growth Rate

1. What is BCF?  3. Who is Oerlikon Neumag?
2. Where is the BCF market going?  4. What is the technology of Oerlikon Neumag?
5. Why is Neumag the perfect partner?
Who is Oerlikon Neumag?
Offers a Comprehensive and High-Quality Product Portfolio

- **BCF**
  - BCF plants for the production of carpet yarn.
- **Staple Fibers**
  - Staple Fiber lines produce material used in textile yarns for apparel as well as fibers used in woodytype, nonwovens and filtration.
- **Spunbond/Meltblown**
  - Spunbond lines up to 7m width from hygiene to technical applications. Meltblown lines for filtration and barrier applications.
- **Airlaid**
  - Airlaid lines for the production of absorbent core materials, wipes, napkins and table tops.
- **Carding**
  - Complete carding lines, which process fibers for geotextiles, automotive, artificial leather, wipes and carpets.

Neumag BCF Technology Development
Launch of new Products

1. Who is BCF?
2. Where is the BCF market going?
3. Who is Oerlikon Neumag?
4. What is the technology of Oerlikon Neumag?
5. Why is Neumag the perfect partner?
North America: 247,000 t/y  
Europe: 85,000 t/y  
Turkey: 230,000 t/y  
Middle East: 81,000 t/y  
Africa: 74,000 t/y  
Rest of Asia: 21,000 t/y  
China: 40,000 t/y  
Middle East: 81,000 t/y  
Total: ~ 785,000 t/y

~ 2860 ends  
~ 1020 positions

Selected customers: 
- Shaw  
- Oriental Weavers  
- Mohawk  
- Gülsan  
- Beaulieu Group  
- Haima  
- Shanhua  
- Sitong

Market Share Split in BCF carpet yarn equipment

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<tr>
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<th>Oerlikon Neumag</th>
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<th>Other</th>
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<tr>
<td></td>
<td>65%</td>
<td>30%</td>
<td>5%</td>
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Neumag Order Income BCF – Split by Year [MCHF]

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<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<td></td>
<td>116</td>
<td>113</td>
<td>28</td>
<td>150</td>
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What is BCF?  
Where is the BCF market going?  
Who is Oerlikon Neumag?  
Why is Neumag the perfect partner?  
What is the technology of Oerlikon Neumag in BCF? 
Spinning with dosing and extrusion
What is the technology of Oerlikon Neumag in BCF?

Take Up
## Why is Neumag the perfect partner for PA6 BCF equipment?

### Experience and development

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<td>Carpet Competence Center</td>
<td>Our R&amp;D facilities are equipped with a twister/cabler, a heatset line and two tufting machines to optimise all yarn relevant parameters. You can feel the touch, see the appearance and see the coverage of the yarn.</td>
</tr>
<tr>
<td>Manufacturing in Germany</td>
<td>We are manufacturing all BCF core components in our workshop in Germany by a very experienced team with high precision tooling.</td>
</tr>
</tbody>
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11.11.2010

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## PA6 BCF – a mission impossible?

Climbing the top is not as difficult as it seems!
Thank you for your attention!