

## Press Release

Oerlikon Barmag presents innovative solutions for HMLS polyester yarn

### “Green” tire cord thanks to EvoQuench

**Remscheid/Frankfurt, May 4, 2015 – At this year’s Techtexil, the leading international trade fair for technical textiles, the Manmade Fibers Segment of the Swiss Oerlikon Group presents in Hall 3, B06 its solutions for safety and quality for HMLS polyester yarn (high-modulus low-shrinkage), to be used in tire cord.**

Oerlikon Barmag is one of two companies worldwide that deliver machine solutions for the production of HMLS yarn. The material is extremely tear-resistant, but elastic and temperature as well as dimensionally stable. It is predominantly used in high-speed tires, which – as a result of the high speeds achieved – are subjected to particularly high loads. Here, strong polyester tire cord has almost completely replaced viscose fiber rayon for ecological reasons. The decisive benefit of HMLS yarns compared to alternative polyester yarns is the extreme dimensional stability of the high-performance yarn.

As a result of contact with the road, tires are subjected to a constant friction, which heats up the tires and consequently increases the internal air pressure. Therefore, the higher the speed, the higher the tire temperature and the pressure within the tire. And this is precisely where high-modulus polyester comes into its own: reinforcing tires with dimensionally-stable HMLS also permits high speeds with a high degree of safety. In other words, tires made from HMLS yarn remain dimensionally stable even under loads and at high temperatures.

#### Process-technology challenge

The HMLS yarn acquires its unique properties in the spinning process. High speeds in the production process guarantee a stable arrangement of the molecules within the polymer, which forms the actual filament. The internal structure of the molecule chain is in turn decisive for the dimensional stability of the subsequent yarn.

Manufacturing this challenging material in an economical manner therefore requires stable process technology and high-quality components. These determine the requirements for the spinning plant, the godets and the winders. The higher the spinning and winding speeds, the more sensitively the filaments react to even the smallest irregularities in the polymer melt, which can then quickly result in breaks in the filament. As in the case of all filament yarns, each yarn break impacts on the quality and the sale price of the yarn packages. Here, the solution lies in designing the spinning plant components in a way that balances out the unavoidable contamination in the melt. Oerlikon Barmag HMLS systems therefore now work with the EvoQuench quenching system, which has already proven itself in the textile processes. Filament bundles with up to 600 individual filaments are evenly spun, cooled and spin-finished and in this way allow homogenous threads of between 1000 and 2000 denier to be manufactured.

The thick titers are gently and evenly drawn on up to six godet duos. The – compared to conventional industrial yarns – more intensive and longer yarn heat-treatment time guarantees the required low

shrinkage values. Subsequently, the yarn is wound using latest-generation ACW high-speed winders at speeds of up to 7,000 meters per minute.

## **Green technology**

Using the EvoQuench system for manufacturing industrial yarn is also setting new standards in terms of energy savings. As in the case of textile processes, the e-save certified EvoQuench system dramatically lowers the energy consumption. Depending on the titer and the dpf, the consumption of the compressed air so decisive for the energy consumption in quenching is reduced by around 80 percent compared to a cross-flow quenching system. For a standard system size with four positions and an assumed electricity price of US\$ 0.15 per kilowatt hour, the system operator saves around US\$ 40,000 per years in terms of energy costs by just using the EvoQuench alone. Correspondingly, carbon footprint calculations for a four-position polyester HMLS system with EvoQuench quenching have revealed annual savings of just under 152 tons of CO<sub>2</sub>e compared to the alternative with cross-flow quenching.

And a pleasant side effect: due to the considerably lower air consumption, the air-conditioning systems can be correspondingly smaller in scale, which in turn reduces investment costs for air-conditioning by 80 percent. Compared to alternative system concepts available on the market, the Oerlikon Barmag HMLS concept scores highly above all as a result of its proven high-frequency godets. As a result of the resonance frequency-operated induction heater, the godets alone provide hourly savings of up 8 kW per hour.

## **Caption:**

### **Fig 1\_ Innovation\_Technology\_HMLS yarn**

The decisive benefit of HMLS yarns compared to alternative polyester yarns is the extreme dimensional stability of the high-performance yarn. The material is predominantly used in high-speed tires.

### **Fig 2\_ Innovation\_Technology\_HMLS yarn**

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**About Oerlikon**

Oerlikon (SIX: OERL) is a leading global technology Group, focusing on providing market-leading technologies and services for surface solutions, manmade fibers manufacturing, drive systems and vacuum pumps and components in growth markets. These cutting-edge technologies benefit customers by improving their product performance, productivity, efficient use of energy and resources, and also by contributing to a more sustainable environment. A Swiss company with over 100 years of tradition, Oerlikon has a global footprint of over 15 500 employees at more than 200 locations in 36 countries and sales of CHF 3.2 billion in 2014. The company invested CHF 121 million in R&D in 2014 and has over 1,300 specialists developing innovative and customer-oriented products and services.

For further information: [www.oerlikon.com](http://www.oerlikon.com)

**About Oerlikon Manmade Fibers Segment**

Oerlikon Manmade Fibers Segment with the product brands Oerlikon Barmag and Oerlikon Neumag is the world market leader for filament spinning systems used for manufacturing manmade fibers, texturing machines, BCF systems, staple fiber spinning systems and artificial turf systems and – as an engineering services provider – offers solutions along the entire textile value added chain. As a future oriented company, the Oerlikon Group segment's research and development is driven by energy-efficiency and sustainable technologies. With the expansion of the product range to include polycondensation systems and their key components, the company now caters to the entire process – from the monomer all the way through to the textured yarn. The primary Oerlikon Barmag markets are in Asia, with Oerlikon Neumag's main markets in the US, Turkey and China. Correspondingly, the companies—with almost 2,500 employees – have a worldwide presence in 120 countries as part of the Oerlikon Manmade Fibers network of production, sales and distribution and service organizations. At the R&D centers in Remscheid, Neumünster and Chemnitz, highly-qualified engineers and technicians develop innovative and technologically-leading products for tomorrow's world.

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