Textile Innovations

Business Development with New Textile Solutions and Innovative Partners

Chemtax Seminar
at
Taiwan International Textile & Garment Machinery Exhibition
March 13, 2014

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Contents

• Textile Innovation for New Applications
• Innovation Partner Zimmermann
Textile Innovations for New Applications

- Filter fabrics
- Driving belts
- Conveyer belts
- Anti-static textiles
- High-pressure hoses
- Sealing knits
- ...
- ...
- ...
- ...

Indutech

Zimmermann
Textile Innovations for New Applications

- Detection of corrosion in piping systems
- Thin fabric with embedded copper wires → Wire break → Alarm

POWERSENS Technology
Textile Innovations for New Applications

- Automobile
- Railway
- Space flight
- Aircraft construction
- Shipbuilding

- Seat covers
- Seat belts
- Carpeting
- Filters
- Airbags
- ...
- ...
- ...
- ...
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- Packaging
- Transport
- ...
- ...
- ...
- Wash bags
- Big Bags
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Burglary / break-in detection at containers

- Wire is endlessly inserted in woven fabric
- Meander-like course of wire, wire distance 2.5 mm
- Wire break → alarm
- Online supervision

Isolated copper wires

PET multifil

POWERSENS Technology
Textile Innovations for New Applications

Container

Alarm transmitted via satellite

POWERSENS Technology
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- Environment protection
- Waste removal
- ...
- ...
- ...

- Filter systems for the purification of water and air
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- Road construction
- Civil engineering underground
- Dump construction
- ... 
- ...

- Fabrics for the road construction
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- Agriculture
- Forestry
- Gardening and landscaping

- Shading fabrics
- Canvas for greenhouses
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- Isolation fabrics
- Sun blind (inside / outside)
- Fabrics for light weight constructions
- Pavilions
- Sealing profiles for doors and windows
- Noise protection
- Fire protection
- ...
- ...
- ...

Buildtech
Textile Innovations for New Applications

- Wound dressings
- Bandages
- Orthoses
- Compression stockings
- ...
- ...
- ...
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Compression Hosiery for Phlebological Diseases
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Compression Hosiery for Lymphodema
Textile Innovations for New Applications

Norms for Medical Compression Stockings
# Textile Innovations for New Applications

## Table of Compression Values

<table>
<thead>
<tr>
<th>Compression class (US Standard)</th>
<th>Compression class (RAL - GZG)</th>
<th>Compression at the ankle 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ccl</td>
<td>Ccl</td>
<td>HPa</td>
</tr>
<tr>
<td>15/20</td>
<td>not applicable</td>
<td>20 to 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 to 17</td>
</tr>
<tr>
<td>20/30</td>
<td>I     mild high</td>
<td>24 to 28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 to 21</td>
</tr>
<tr>
<td>30/40</td>
<td>II    moderate</td>
<td>31 to 43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 to 32</td>
</tr>
<tr>
<td>40/50</td>
<td>III   strong</td>
<td>45 to 61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34 to 46</td>
</tr>
<tr>
<td>50 high</td>
<td>IV    very strong</td>
<td>65 and higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>49 and higher</td>
</tr>
</tbody>
</table>

1) The values indicate the compression exerted by the hosiery at a hypothetical cylindrical ankle.

2) 1 mmHg = 1,333 hPa.
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Advantages RAL-GZG

- RAL-GZG is the most modern standard: all the *latest developments* during the European Standardization process are taken over

- Controlled compression based on *inlaid compression-thread*

- *No thermic deformation* of the compression thread (boarding etc.) allowed

- *Reproducible results of compression value* determination because of the standardized marking board (only required in RAL-GZG)

- *Pressure profile* based on size tables

- *Determination of compression value and pressure profile without destroying* the tested stocking

- *Material requirements* in order to guarantee durability and secure reimbursement
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- Sports hosiery
- Sports and compression
- Performance increase and recovery
- ...
- ...
- ...
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Skin irritation due to friction is a big issue in compression textiles. ZIMMERMANN has the solution.

Your advantages in compression textiles:
- best skin protection
- less heat build-up on the skin
- long lasting product - low abrasion
- dry feet
- less dirt and smell
- long term comfort - very soft

Our PVDF multifilament fibers are available:
- in titers from 78 dtex up to 2380 dtex
- in different colours
- with high crimp (KDK)

Our performances:

ZIMMERMANN PVDF fibres are: multifilament fibres (24f,48f,96f)
- offer very low friction coefficient in dry and wet conditions (see graph last page)
- are resistant against chemicals and temperatures up to 150° C/302° F
- are hydrophobic
- stay soft - even after multiple usage
- high elongation properties
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- Subject and object protection
- Occupational health and safety
- ...
- ...
- ...
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Material Combinations for Different Applications

- **Silver (Shildex 33/12/1 or 78/18/1 or 235/32/1*)**: Heating, Antibacterial Finishing, Shielding, Conducting

- **Premium steel (1f. wire of premium steel, 0,04mm or 0,05mm*)**: Heating, Conducting, Data Transmitting

- **Textile Wire (MS 70 1+6x0,04mm or Cu/Ag 1+6x0,04mm SL 3-5 or Cu 1+6x0,05mm or Cu/Ag 0,071mm*)**: Heating, Conducting, Data Transmitting

- **Bekinox (VN 12/2x275/175S316 L/HT or VN 12/3x275/175S316 L/HT or VN 12/4x275/175S316 L/HT )**: Heating, Conducting

Actually samples yarn constructions with different e.g. elongation, running time
Textile Innovations for New Applications

- Furniture
- Cushions
- Carpets
- Floor coverings
- ...
- ...
- ...

Hometech

S E F A R

Zimmermann
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- Shoes
- Clothing
- ...
- ...
- ...

➢ Trend for functional clothing
Textile Innovations with Innovative Partner – Zimmermann –

- Medical Compression Stocking as evolution of socks
- More sophisticated machines and also higher sophisticated yarn required
- Elastic yarn is providing compression
- Long experience of Zimmermann in the yarn influence for compression and in know how transfer with medical compression hosiery manufacturers
- High medical awareness in developing functional yarns
- Applying high sustainability and comprehensive quality
- Proven partnerships with Medical Compression Stocking Manufacturers in development and producing
We thread quality with cost-effectiveness
Overview

- About us
- History | development
- Areas of our business
- Innovations
- Market orientation
- Regions
- References
We thread cost-effectiveness with customer satisfaction

If you ask us what’s so special about Zimmermann, we’ve got plenty of answers. The crucial point, however, is that we are constantly improving ourselves both for and with our customers.

This goes for the users of our elastic covered yarns as well as for the partners that use our innovative threads to develop futuristic ideas with textiles.

For us, collaboration means really working with our customers. We listen, we check our products, we adapt them to match your requirements, or we can develop completely new solutions if need be.

This is how we impress our customers – with yarns from the finest raw materials, precision-covered.
We thread durability with flexibility

The striking feature of our threads also applies to Zimmermann and all our partners: elasticity is the key. And we work on this goal every single day to ensure that we stay as flexible and as responsive as possible.

We respond to enquiries from our customers directly, offering customised quotes, more flexible production and extensive one-to-one advice from our sales and customer advisers, our product developers or our production managers. You can always get in touch with us, because we know that our customers can only survive in the global competition through quality and ideas.
History | Development

- The company was founded by Werner Zimmermann in Simmerberg in 1953. The company has its roots in his father’s firm in Wuppertal, which was established in 1888.

- In 1961, the company's own premises were built on the Riederstrasse.

- In 1968, the company's premises were expanded.

- In 1980, a new production facility was built.

- In 1991, Zimmermann was taken over by the Geiger Group.

- In 1996, production capacity was increased and the production facility was enlarged from 3,200 m² to 4,800 m².
History | Development

- In 2001, construction began on what is for now the final expansion project.
- From 2001 came the development of the electromagnetic protection fabric E-Blocker, along with electrically conductive yarns.
- In 2003, Zimmermann looked back on 50 successful years.
- In 2005, the umbrella brand novonic® was introduced, with its subclasses of novonic® Heat, novonic® E-Blocker, novonic® Data and novonic® Sensor.
- In 2006, Zimmermann received a distinction at the awards ceremony of the Bavarian Innovation Prize for its new novonic® range.
- In 2007, work began on a production collaboration project in Brazil to expand the company’s portfolio of products and delivery capacity.
Areas of our business

Our four main areas of activity:

- Medical stockings | bandages
- Socks
- Flat knit | pullover sector
- Technical threads
Medical stockings | bandages

- “Classically” covered-thread technology for support stockings and fine stockings (circulation-supporting, flight socks).

- Tried-and-tested, long-life and even thread construction, even compression, constant innovations.

- We cover the growing requirements for different compression strengths through new medical findings with custom thread developments.

- Product development with considerable experience and rapid implementation. Customised, expert support.
Socks

- Extremely evenly covered Elastane threads are used for the seams or plating threads of socks, knee socks and knitted tights.

- Thanks to soft elasticity, the sock top does not dig in.
Flat knit | pullover sector

- We can provide high-quality Elastane threads with even elasticity in a wide range of colours to choose from.
- High, durable and even elasticity
- Excellent fit
Sports and underwear

- We offer customer-specific thread combinations for high wearer comfort.
- We can create the right type of thread for any product.
- Specialist threads for seamless garments.
Technical threads

Special developments and production of covered elastic and technical threads (aramids, glass, steel, carbon, etc.) for the following areas of application:

- Cut, stab and tear-proof
- Protective
- Anti-static
- Insulating
- Anti-bacterial
- Transport technology
- Protects against UV radiation
- Electrically conductive
Market orientation

- As well as outstanding product quality, colour and pattern-true developments are our first priority, together with ensuring continuous reproducibility over long delivery periods.

- The development and production of special colours is one of our services that is valued by many customers. We have earned an excellent reputation on the market for being able to deliver sample-true threads for years.
To date, we have developed over 6,000 different variations of thread. In the more recent past, for example, these have included anti-bacterial threads, climate threads or even safety threads.

We can deliver special products in large and small quantities thanks to our flexible production units, as well as handling major orders for standard products.
Regions

- Our closeness to Lake Constance, and thus to the geographically and provincially appealing tri-national area between Germany, Austria and Switzerland, makes our headquarters in Simmerberg / Westallgäu a major advantage, primarily for our staff, but also for our international customers.

- The constant expansion of the local airport in Friedrichshafen (approx. 40 km away) promises further opportunities for our company and our customers in future.

- We can ship worldwide from our site in the Westallgäu region. Our partner in Brazil also means that we can serve the South American market with products of Zimmermann quality.
We belong to the selected quality circle of “Lycra-Assured Producers”.

All of our products are tested and certified to Öko-Tex standard 100, product class I (baby products).

We count almost all of the leading manufacturers of compression stockings in Europe as our clients, alongside well-known sock manufacturers.

As we are certified according to ISO Standarts, the customers of our elastic and technical yarns can rely on constant high quality products.
novonic®. Makes your life more agreeable.

- novonic® is the first textile cable that can be integrated easily into any type of textile structure and carry out one or more functions.

- The development of this patented thread was advanced by Zimmermann in intensive collaboration with a team of scientists (Rent-a-Scientist GmbH, Regensburg).

- The novonic® thread cable allows textile surfaces such as fabric, knitted goods, ribbons or netting to be created using conventional modern textile technology methods. These novonic®-equipped textiles can be heated, can transfer data, monitor functions and protect from radiation.
The structure of novonic® is incredibly simple. An elastic or non-elastic core thread is covered in a spiral manner with wire and the two are bound protectively together with an outer covering thread.

The combination of various high-tech materials gives rise to a thread cable that combines sufficient mechanical flexibility and high elasticity with kink-resistant and stretchable electrical conductivity and a textile feel.

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Thank you!!