filter technology innovation for rail infrastructure

United Nations Economic Commission for Europe
Trans-European Railway (TER) Project
Trans-European North-South Motorway (TEM) Project

TEM and TER Joint Expert Meeting
Bad Gastein/Austria 10 October 2013
Dexwet® history

- **2002:** Dexwet® USA LLC founded in Georgia, USA as patent holding
- **2005:** Dexwet® Technology Distribution Ltd. founded as marketing company
- **2008:** Dexwet® awarded “Company of the Year 2008“ in segment environmental technologies by Austrian Ministry of Economy
- Dexwet® International AG consolidated in 2011 as milestone for international growth
- First patent application in 1999, first patent granted 2002, meanwhile 28 international patents in place => 4th patent generation in filing process
Dexwet® technology

- Invented to filter **harmful toxic fine dust** emitted from laser printers, copy machines, faxes
- Effective filtering of
  - **Macro-dusts** (5 - 0,1 mm particles)
  - **Micro-dusts** (0,1 – 0,001 mm particles) and
  - **Nano-dusts** (0,001 – 0,000001 mm particles)
- **Air-permeable** staggered filter staves with multi-rows moistened with special fluid medium (working principle similar to human nose and lung)
- Particles are **bound long term** by liquid
- Bases on **knowledge and science framework** of
  - Applied advances **biomimetics, nano-technology** and fundamental physical & chemical principles
Dexwet® technology lead

• While competitive in filtering macro-dust, Dexwet® technology is the most effective and economic solution to filter more than 95% of micro- and nano-dusts

• High air-throughput sustained even when filter is ending its lifetime (ideal for combination with electronic devices that need high air throughput in order not to overheat)

• No Billard Effect (bigger dust particles pushing out smaller particles); what Dexwet® filters permanently stays in the filter

• Longer filter lifetime (2-6 times longer compared to conventional fiber and textile fabrics) => significant cost saving potential through reduction of service & maintenance works & costs
Dexwet® USP

Comparison of air throughput over the

The Dexwet “Delta” comparison of air throughput capacity over the filter lifecycle

Week: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

In %: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

Dexwet Filter

Textile Filter

end of useful life

textile filter

end of useful life

Dexwet filter
Dexwet® USP

Dexwet dominant USP - Air Throughput Capacity

Air throughput volume in m³

Week

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Dexwet Filter

Fabric filter

Dexwet "Delta"
Cooperation OEBB-Dexwet

- first joint applied R&D project initiated beginning of 2013 for info-panels
- service cost reduction by doubling filter exchange term (2->4 months)
- protection of electronics, longer investment lifecycle, less spareparts

Dexwet Filter

Traditional Fabric Filter

after 6 weeks of operation
Cooperation OEBB-Dexwet

- **Dexwet® multifunctional filter system MF-1** is designed
  - highly flexible
  - adaptable to any size, length and environment (heat, cold, humidity)
  - highly sterile and sterilizing (virus, bacteria, biologically hazardous particles,...)
  - fully recyclable
Cooperation OEBB-Dexwet

- **Joint product development:**
  - air ventilation and air condition in railway locomotives & wagons
  - air ventilation and air condition in other railway facilities & infrastructure
  - automation equipment, etc.

- **focus on**
  - business process optimization
  - rationalization potentials
  - sustainable development and
  - energy efficiency

- **joint marketing** to European railway markets
Dexwet International AG

Thank you for your attention!

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