

The importance of the element Air for the area of technical textiles

Fiber-based materials and innovations that are „made in Germany“ are closely related to each other. The textile industry is an excellent problem solver for a wide range of industries, especially if lightweight is demanded. High-tech textile materials can be found in cars just as in mattresses, in wind turbines, in our homes or in medical implants.



Braiding of carbon fibers (ITV Denkendorf)

Fibers are currently experiencing a renaissance. Textiles broaden the material portfolio with respect to design, functionality and sustainability. Thanks to these characteristics, fiber-based materials are perfectly suited for a wide range of applications and represent a profitable alternative. The textile industry with its fiber-based materials is one of the most traditional and creative branches of industry. Efficiency and innovation are the success factors that have guided the industry through the era of structural change and that will ensure its sustainability.

Lightweight construction in mobility

Fiber component technologies are a significant catalyst in lightweight construction. Modern lightweight construction is impossible without fibers, and fibers are indispensable in forward-looking mobility, to reduce weight and ultimately also fuel consumption and emissions. New methods such as the fiber blow molding technology, sandwich components or multi-axial fabrics are expected to be in great demand.

The A380 would not have taken off without fibers. And with its new A350 XWB,

Fiber-based materials fulfill requirements with respect to energy efficiency, multi-functionality and sustainability with „ease“. They are therefore an outstanding alternative to conventional materials in more and more applications. The textile industry offers lightweight solutions for key issues of the future, for example mobility, health, energy or nutrition, and therefore gains in importance.

Airbus has also set new standards, in terms of performance and economy. With a carbon-based composite share of more than 50% of its basic weight, the company has made huge progress. In the aircraft industry, every kind of weight reduction counts, whether this is seats or the on-board kitchen, and fibers make an outstanding contribution. Modern materials and intelligent design are the prerequisites for economical flying.

concerning electric mobility and the enormous change in the automotive industry, textile know-how is also in demand here. In addition to carbon and fiber-glass reinforced lightweight components, fiber materials play a decisive role, especially in thermal management. Energy-efficient interior temperature control or the conditioning of sensitive batteries extends the range of electric vehicles.

Another example of how critical textile materials are for future mobility is the high-performance polymer mats which are used in batteries and fuel cells. Innovative and smart textiles such as phosphorescent yarns or sensor fibers also have potential in sustainable mobility solutions. The mechanical engineering industry, medical engineering and the construction industry have also



Examples of fiber reinforced composites
(ITV Denkendorf)

discovered the potential of textiles and offer great future market opportunities.

Key factors for performance are the new fiber construction methods which offer additional benefits. The market asks for bionic approaches and the integration of additional functionalities. „Simply lightweight“ is not a sufficient argument in favor of using fibers. Fiber must provide more benefits for customers and users. By combining its diversified competencies in textile technology, the automotive industry, the aviation industry and production engineering, the state of Baden-Württemberg/Germany makes a major and indispensable contribution and acts as a global pioneer in fiber composite technology to achieve „lightweight“ mobility.

Lightweight environmental protection - filters

Our prosperity and the increase in economic activities have brought about increased environmental pollution, higher levels of particulate matter or particle-sensitive production technologies. People are becoming increasingly susceptible to allergies. Clean air is vital for us. High-performing textile filter media help to isolate foreign particles in the air and so protect our health and the environment.

Environmental technology with its areas of waste, air and water, includes a multi-stage value-added chain

that varies depending on the field of technology. Greater competitive intensity promotes an active cross-industry exchange between companies and research institutes to drive innovations and optimize products.

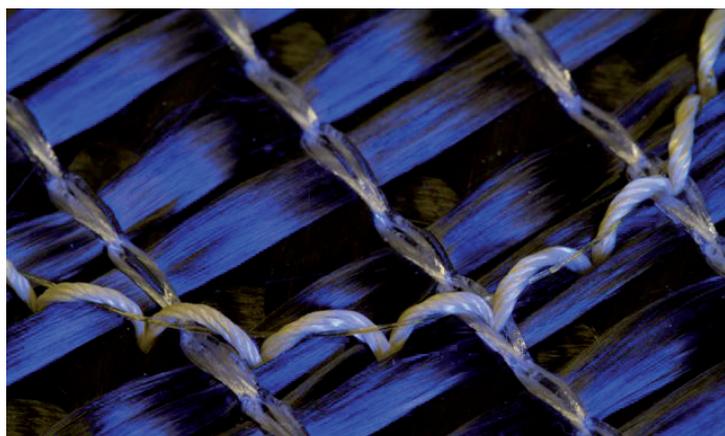
Smoke stacks and dark fumes near power and manufacturing plants are history. The quality of our air has improved steadily – despite increasing road, rail and air traffic. The continuous development of textile filter media and systems for aerosol absorption ensures adjustment to the new requirements. Innovations are mainly driven by new statutory limit values, restrictions and, last but not least, international competitive pressure.

Textile products such as nonwovens, membranes or felt form the cores of such filters. They are processed into hoses, mats, pipes or bags and integrated into complete systems. In this way, particles of various different sizes – from 0.01 to 20,000 micrometers – may be isolated, to improve our well-being but also to reduce maintenance and cleaning costs.

Filters are not only used for dust filtration, modern air filters are also employed to optimize the flow dynamics of automobiles or airplanes. In addition, they help to absorb odors or comply with hygiene requirements. Their efficiency strongly depends on their surface technology and the airflow within the filter system.

Filter technology today also demands lightweight, sustainable and flexible solutions. To boost resource efficiency, recyclates are used for fleece materials. New designs and optimized constructions result in weight reduction and provide better adaptability for their final location within the vehicle.

In the area of air filtration, Baden-Württemberg has set the standards at an international level by interdisciplinary cooperation between industries and biologists, textile experts, engineers and scientists. Together they make an important contribution to conserving nature.



Glass fiber sensor (ITV Denkendorf)



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AFBW – Allianz Faserbasierte Werkstoffe Baden-Württemberg – is an association of companies, universities, research institutes and industrial organizations in Baden-Württemberg.

As a cross-industry network, AFBW puts fibers and their applications at the center of its activities and brings together the stakeholders along the entire value-adding chain. It therefore provides a platform for dialogue and knowledge transfer between companies, scientists and politics. The alliance understands itself to be a driver of innovations that identifies new applications and initiates material and product innovations.

AFBW's fields of activity and research concern many different areas of life. The area of mobility and mechanical engineering is mainly about weight reduction, for example by using new materials in the automotive industry. Specific properties of the fiber enable new products in the health industry, for example by developing new types of implants (skull implants made of ceramic fiber composites) or fabrics for wound dressings or textile nerve conduits. The construction industry utilizes the strength and durability of fiber-based materials. Fibers can be constructed in such a way that allows for the development and marketing of protective materials. Fiber-based materials can be used in more and more applications. With their versatile functions, they replace established systems based on conventional materials in many areas of use.

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