

Development of innovative nonwovens and their applications



Research topics

- development, technical support and testing of nonwovens
- further development of nonwoven technologies
- finest fiber nonwoven technologies (fiber $\varnothing < 1\mu\text{m}$)
- assisting industrial partners with regard to technological, material and application issues
- development and production of medical nonwovens and implants

Range of services

- processing behavior of polymers and fibers (synthetic fibers, high-performance polymers and fibers, biodegradable and medical polymers and fibers, bicomponent fibers)
- technology development (nonwoven technologies and engineering)
- nonwoven testing
- product development (products for medical and hygiene, implants, filters, automotive materials)
- certified production of nonwovens for medical applications in the cleanroom



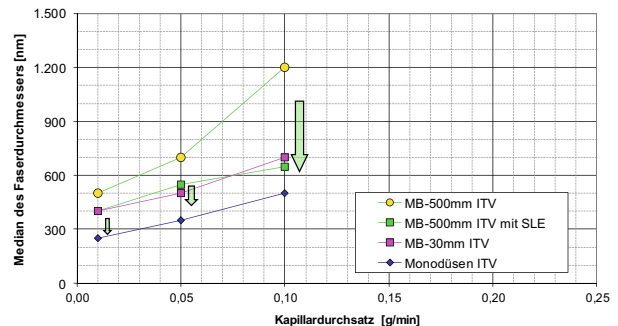
Carbon and natural
fiber enabled
1,000 mm needle
felt line

Nonwoven pilot plant for finest fibers

The DITF are a worldwide leader in the development of finest fiber nonwoven technologies (fiber diameter < 1 micron) with the centrifuge spinning and meltblow technique. There are two self-developed meltblow plants (laboratory scale and 500 mm working width) and one co-developed 1 m wide REITER centrifuge spinning system ready for practical development. With the 500 mm wide Trützschler Nonwovens Aqua Jet system the entangling of finest fiber webs is currently developed. A calender combining thermobond and ultrasonic bonding was built up by Wumag Texroll and Herrmann Ultraschall-technik for bonding of low weight webs (<10 g/m²) and their lamination on a carrier textile respectively.

The nonwoven pilot plant

In-house developments and cooperation with leading machine manufacturers enable research and development on production-related nonwovens machines as well as technological predevelopments for industry. A needle felt line with fiber opening, carding, cross-lapper and DILO OUG II is equipped with exhaust systems to enable processing of carbon and natural fibers.

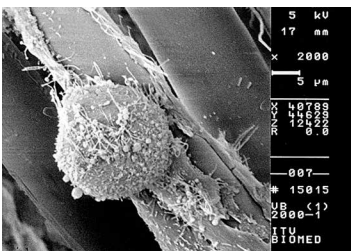


Nabla technology: productive finest fiber production in the melt blow process (BMBF Projekt 13N9861; ITV/ITWM/FFD/Neumag)

Close collaboration with textile machinery industry

The nonwoven machinery industry is highly developed. The nonwoven lines have reached dimensions which exceed the development level of institutes. Yet as the machinery industry lacks in experience in specialized

application related knowledge joint developments of the DITF and the machinery companies is being performed. The results of R & D pilot plants are being validated by transfer to production scale machines.



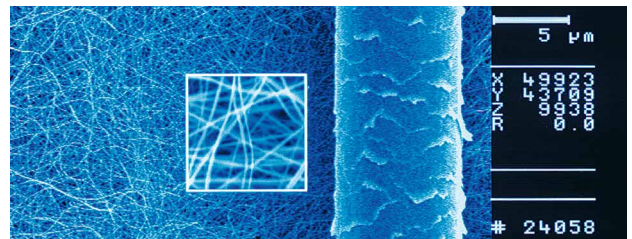
Tissue-Engineering

The cleanroom laboratory

At DITF a cleanroom is available for nonwoven development and production of medical products including the technologies of carding & needling; calendering; dry spinning and centrifuge spinning for finest fibers nonwovens. The DITF are certified according to DIN EN ISO 13485 for development and production of medical devices.

Materials and Applications

Technical developments are focussing on standard fibers, high-end and high melting materials. New fibers for nonwoven technologies are under development in collaboration with the research area Filament Yarn Processing Technologies. The focus is on the processing of absorbable and non-absorbable polymers for medical, hygiene environmental applications.



Finest fiber nonwoven compared to human hair

The German Institutes of Textile and Fiber Research (DITF) form the largest textile research center in Europe. From the molecule to the finished product, the DITF conduct research and develop products along the entire textile value chain, always taking into consideration the corporate processes and business models. A wide range of textile testing services, prototype construction and a pilot factory complete the offer.

The Competence Center Chemical Fibers & Nonwovens is based on the four pillars of polymer chemistry, polymer physics, mechanical engineering and medical technology. Fiber developments are aimed at a sustainable textile industry. For this purpose, polymers from biobased raw materials are processed, the fibers can be recycled and/or are biodegradable.

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