LABORATORY

Setting standards for equipment and know-how
Due to its quality tests with regard to the biobased fibers cotton, wool and bast fibers, FIBRE enjoys a good reputation among its customers at home and abroad. This high appreciation is not only based on reliability but also on the neutrality and independence of FIBRE's inspection services.

Apart from physical-technical tests for determining process relevant fiber parameters, FIBRE also offers chemical and optical testing methods. Furthermore, composite material analysis offers additional possibilities of testing by which, for example, mechanical tests of fiber composite structures from carbon-fiber reinforced polymer materials are realized.

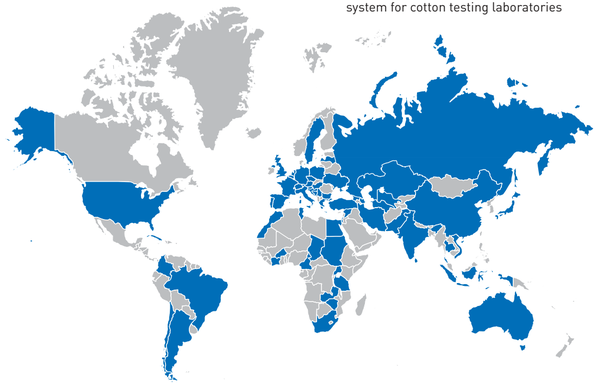
And last but not least, FIBRE can also pit its performance against international standards. This is proved by the Testing Center that has been accredited with all relevant test procedures in accordance with DIN ENISO/IEC 17025:2005.

Testing devices (a selection):

- cotton fiber test lines (Uster and Premier)
- special testing devices for detailed analysis of individual fiber features
- photo and scanning electron microscopy, image analysis
- tensile and fatigue testing machines up to 250 kN
- special testing devices for fiber products, e. g. for fogging detection, thermal conductivity measuring

The international activities within the framework for the harmonization of test methods focus on:

- comparison of test methods
- harmonization of cotton testing based on the Bremen Cotton Round Trial
- harmonization of wool testing in cooperation with INTERWOOLLABS
  Committee work in the ITMF Committee on Cotton Testing Methods, for example
- participation in the ICAC Expert Panel (CSITC) for introducing a certification system for cotton testing laboratories



Countries participating in the Bremen Cotton Round Trial

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FASERINSTITUT FIBRE BREMEN

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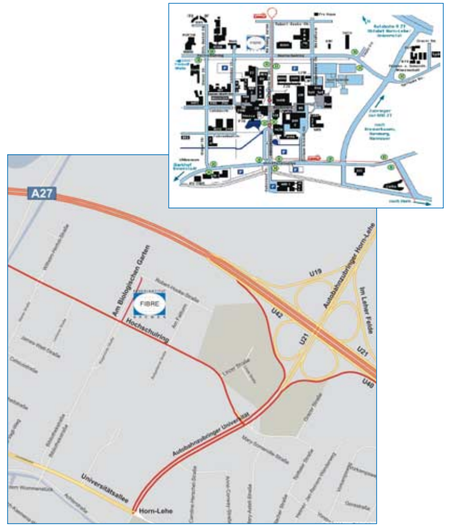
DAP-PL-3537.00

EMAS

Universität Bremen
FB Produktionstechnik

HOW TO GET IN TOUCH WITH US



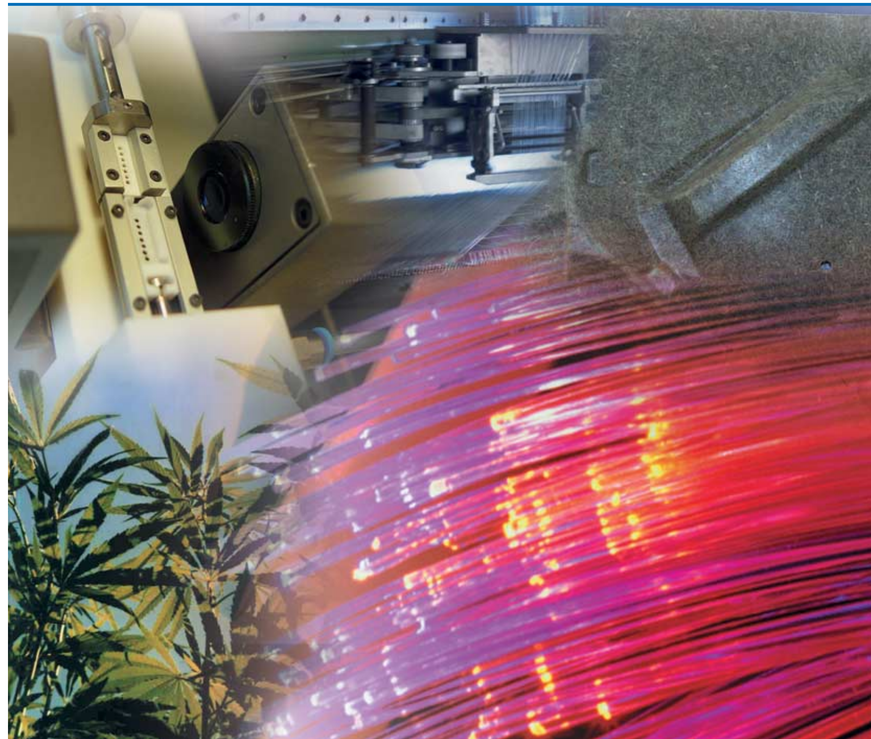
Public Transportation
Tram: 6
Bus: 21, 28, 32
Station: Klagenfurther Straße

THE MEASURE
FOR FIBER TECHNOLOGY

Faserinstitut Bremen e.V.

FASERINSTITUT FIBRE BREMEN

Universität Bremen
FB Produktionstechnik



FASERINSTITUT BREMEN e.V.

Know-how and competence in fiber technology
The "Faserinstitut Bremen e.V." (FIBRE) offers integrated research and development services on the subject of fibers, semi-finished textile products and fiber composites. Special emphasis is placed on the testing, further development and processing of materials, processes and products by using the state-of-the-art methods and knowledge from research. At the same time, FIBRE's performance profile is consistently tailored to the customers' needs. The cooperation with the University of
Bremen provides an ideal bridge for customers from trade and industry to have quick access to the latest knowledge from research. In addition to this, FIBRE is able to offer tested competence in a systematic way thanks to the Testing Center accredited in accordance with DIN EN ISO/IEC 17025:2005 and to the environmental management system certified in accordance with EMAS II. With 33 staff members who are specialists in their field, FIBRE is an acknowledged partner of industry, trade and research. The FIBRE know-how is used and appreciated as factor of success both with regard to completing commissions of work as well as to cooperation within research projects.
Well-known automobile sub-suppliers as well as a number of companies from the textile and aviation industry confirm this with their intensive and long-standing partnership in the four fields of competence

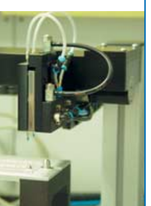
- fiber- and fibrous product-oriented test methods
- fiber composite structure and procedure development
- biobased materials/sustainability
- fiber development/bionics

FASERINSTITUT BREMEN e.V.
UNIVERSITY OF BREMEN

Head of the Institute: Prof. Herrmann
Deputy: Dr. Schneider
Quality Management: Mr. Rödig **Assistance:** Ms. Gleitze

Strategy coordination Mr. Hoffmeister	**Test method development** Mr. Drieling	**Composites: structure and process-development** Mr. Purol	**Biobased materials/ sustainability** Dr. Müssig	**Fiber development and fiber bionics** Dr. Wego	**Administration** Dr. Schneider Ms. Gerdts
Fibers/Raw-Materials					
Textiles and Products	Mr. Bäumer Dr. Miene Ms. Phan Mr. Rettig	Ms. Book Mr. Calomfirescu Mr. Rötjer Mr. Schiebel Mr. Steinbrink Mr. Zuardy	Ms. Abdulajewa Mr. Babaian Mr. Cescutti Dr. Fischer Ms. Gerardi Ms. Gu. Meyer		
Composites and Lightweight Structures					
Services	**Laboratory** Mr. Freimuth Ms. Arndt, Ms. Bormann, Ms. Ga. Meyer, Mr. Mirzaghavam, Ms. Slootmaker				
Safety by Fibers					

The Faserinstitut has been established in a matrix organisation with areas of operation and fields of competence in order to render its performances in line with market conditions and on a high-quality basis.



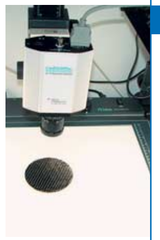
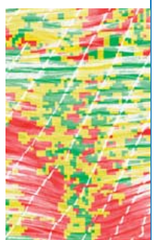


Image analysis facility



Automated testing of angularities on multi-axial layings with digital image analysis

TEST METHOD DEVELOPMENT

Quality requires experience
The field of competence "fiber- and fibrous products-oriented test methods" has laid the foundations for a consistent and purposeful further development of the experience FIBRE has gained over the years in the area of fiber characterization and harmonization of test methods. Based on the knowledge of test methods and procedures with regard to traditional fibrous materials such as cotton and wool, FIBRE's range of services was successfully extended to further biobased and synthetic fibers. It was also able to succesfully apply the possibilities of laboratory tests also to the requirements of the production on site. The testing competence of FIBRE now ranges from pure laboratory characterization to production-related measurements of fibers and semi-finished products – from the spinning process to the production of high-performance fiber composites.

Services offered:

- fiber quality test and fiber characterization
- development of fiber-specific test methods
- reliability and harmonization of test methods
- test methods for textile semi-finished materials & products

Current reference projects

- optimization of existing and development of new laboratory measurement
  - development of new test methods by using innovative sensorics
  - reference test methods, distribution of fiber characteristics
  - extension of the field of application of existing testing apparatuses
- measurements in the processing procedure
  - online quality recording as input figure for process regulation
  - online quality assurance during production
  - application of non-contact, quick online sensorics
- selection of instruments and methods used
  - digital image analysis
  - "electronic sniffer"
  - sound emission analysis
  - international harmonization of the operative cotton classification within the framework of ICAC Task Force on Commercial Standardization of Instrument Testing of Cotton (CSITC)

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Deformation pressing for processing fiber-reinforced thermoplastics

STRUCTURE AND PROCESS DEVELOPMENT

Efficient procedures – the key to competitiveness
Based on innovative improvements of products and procedures, FIBRE creates interesting approaches for increasing the competitiveness of its customers. In the field of competence "fiber composite structure and procedure development", efficiency-increasing services are offered for this purpose such as the development of continuous, automated production methods as well as simulation and structure development can be expected that the gained knowledge will result in further interesting applications such as carbon-fiber reinforced plastics in the automobile and tracked vehicle industry as well as in engineering.

Services offered:

- development of automated pressing procedures for processing fiber-reinforced thermoplastics
- process development of continuous production methods for profiles with variable geometry
- layout and design of load-optimized fiber composites
- simulation of the drapeability of textile semi-finished products and of distortion effects of cured CFRP components
- development of textile production methods (continuous pre-forming, TFP technology)
- development of innovative CFRP components (from definition to prototypes)
- investigations on the substitution of metallic components by fiber-reinforced plastics

FIBRE offers its customers special synergies by means of its active participation in the competence network CFK Valley Stade, resulting from the intensive cooperation with the Composite Technology Center GmbH, an Airbus subsidiary, as well as from further specialized partners from industry and research at home and abroad.

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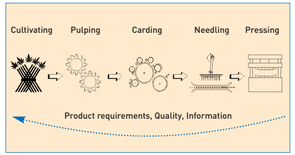
BIOBASED MATERIALS/SUSTAINABILITY

Integrated thinking – systematic development
In the field of competence "biobased materials/ sustainability", FIBRE deals with the production, modification, upgrading and processing of biobased fibers, based on the customers' duties record book on product features. The integrated way of looking at the process chain for optimizing the product and process development is to the fore in this context. It offers the customers a decisive advantage because technical, economical and ecological requirements are already taken into account at the development stage, covering all steps of the value-added chain from the technical application to cultivation.



In order to offer its customers a maximum of know-how, FIBRE furthermore pursues the goal of combining the individual links of the international, industrial production chain with regard to biobased materials and products with each other in an optimal way. In this connection, special emphasis is put on the investigations on the influence of fiber and raw material features on product features.

Services offered:

- quality assurance along the value-added chain – from the product to cultivation
- production of biobased fibers/digestion/ separation
- modification/upgrading of biobased fibers
- processing of biobased fibers/production of nonwovens and felt
- processing of biobased fibers to fiber-reinforced plastics
- development of biobased materials
- technical use of renewable raw materials
- influence of fiber characteristics on product features
- resource-sparing process technology
- trade cycle/life-cycle assessment/ environmental management

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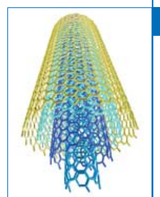

Multi-wall carbon nanotube (Source:http://students.chem.tue.nl/ifp03/default.htm)

Member of CFK Valley Stade™

FIBER DEVELOPMENT AND FIBER BIONICS

Taking nature's perfection as an example
In the field of competence "fiber development/ bionics", the production, modification and new applications with regard to fibers are investigated. Special emphasis is often put on bionic principles, which have been developed by nature in the form of fibers, such as muscles, spiders' webs or nerves.

This field of competence does research on both biobased and synthetic fibers. The Institute is equipped with state-of-the-art laboratory and pilot facilities for melt-spinning processes. Special emphasis is put on developments in the area of carbon fiber technology. A current goal is to produce adapted precursors with new raw materials.

The field of competence further works on the modification of fiber functions by using nano-particular components. Examples for this are the single- and multi-wall carbon nanotubes which are, among other things, used for mechanical reinforcement or improvement of electrical conductivity.

This field of competence is additionally actively involved in the development of the new, international network called Fiber International Bremen (FIB). This network covers the topics of fibers, fiber technology and fiber application. Among FIB's important goals are a close networking of business and research and the support of outstanding know-how carriers, sub-suppliers and manufacturers by means of cooperations. For the first time, fibers are being defined according to their functions such as actuator / sensor and signal transmission / communication properties by making use of the manifold combination possibilities of different (intelligent) fiber materials, geometries and interfaces.

FIB Fiber International Bremen

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