In addition to its close relations to the industry and the science sector, the DITF are fully involved in the activities of a large number of associations, organisations and specific networks that serve as research platforms across different systems and disciplines.

The DITF cooperate with numerous companies in Germany and abroad that participate in publicly-funded research projects. The DITF also receive research projects directly from these companies.

The following partners currently support HPFC projects:

The HPFC is sponsored by the Ministry of Economic Affairs, Labour and Housing and the Ministry of Science, Research and the Arts of the state of Baden-Württemberg, among others, with funding from the European Fund for Regional Development (EFRE).
Facilities of the High Performance Fiber Center (HPFC) reaching an approximate 1000 m$^2$ apply the latest equipment currently available worldwide for the development of high-performance fibers. With this new development center, the DITF strengthens their expertise and leading position in application-oriented research, the development of fibers with extraordinary properties and in sustainable production methods.

High Performance Polymer Fibers
Polymer fibers are a key element in the area of high performance fibers, featuring extraordinary strength, stability and resistance. The research conducted at the DITF Denkendorf involves among other things the development of cost-efficient and sustainable production processes and innovative types of fibers.

Carbon Fibers from Alternative Precursors
Carbon fibers offer the best material properties when used in high-strength fiber composite materials. Using alternative precursors from biogenic resources, they can be produced to improve cost and resource efficiency. Current research projects at the DITF intend to optimize these new precursors and develop carbon fibers that are ready for the market.

Ceramic Fibers
Ceramic fibers reinforce ceramic composite materials and significantly improve their behaviour at rupture. The new production facilities at the HPFC allow specific in-process controls for all steps in the production of ceramic fibers. This helps to optimize the properties of this fiber type that is so important for many industrial applications.

High Performance Fibers for the Future

Research and development at the HPFC is supported by modern analytics. This allows the detection of physical and structural changes in the fiber material and to correlate these with process conditions. The DITF have the latest measurement technology available for this purpose:

- X-ray scattering (WAXS, SAXS)
- High-resolution Raman microscopy
- Zeiss scanning electron microscope with FIB (Focused Ion Beam)
- HT thermogravimetric analysis combined with FT-IR and MS
- Thermoanalysis (DSC, TGA)
- Density measurement
- MALDI-TOF
- Modelling and simulation of processes

Fields of Application
With their extraordinary properties, high-performance fibers offer new design and function-related solutions. They are the key components for forward-looking product innovations in many different areas:

Mobility
Fiber reinforced structures and products e.g. for the automotive industry, aerospace technology, architecture

Energy, environment and resource efficiency
Energy and environmental technology e.g. water treatment, aquatic and landscape conservation, recycling of high-performance fibers, smart energy management

Construction and architecture
Building materials with textile components, fiber-based materials

Health and Care
Textile implants and regenerative medicine, wound treatment products, diagnostic and monitoring systems, smart textiles, drug delivery and therapeutic systems

Analytics

Technical facilities at the HPFC
HPFC’s machinery includes five independent state-of-the-art production lines:
- Melt-spinning plants applicable for biopolymers, reactive extrusion and special carbon fiber precursors
- Furnace, fed with inert gas for ceramic fibers (up to 1600 °C)
- Facility for electron beam hardening of melt spun fibers within the spinning process
- Oxidation line for precursors up to 12K
- Carbonization line up to 12K