Sächsisches Textilforschungsinstitut e.V. (STFI) An-Institut der Technischen Universität Chemnitz
Annaberger Straße 240 · 09125 Chemnitz · Germany
Managing Director: Dr. Heike Illing-Günther
Phone: +49 371 5274-0 · Fax: +49 371 5274-153 · E-Mail: stfi@stfi.de

ConTex – Textile reinforced concrete for complex shaped surface composite structures

Aim of the Project

A research project was carried out with main focus at the design, experimental production and construction of a textile-reinforced shell structure with a diameter of 5 m, a height of 2.5 m and wall thicknesses of only 25 to 50 mm. As a result a concrete pavilion with special design ("Smartie") was built.

Fig. 1: Separate part of shell structure

Fig. 2: Filigree reinforcement made of carbon fibers

Experimental and Results

An FEM-based method was used for the load-bearing construction planning of the pavilion made of four curved components. The Method was adapted to the material textile concrete. With the help of the FEM simulation the material-saving design, the arrangement and dimensioning of the textile reinforcement, the formation of openings and component connections as well as the position and size of the base could be calculated. The manufacturing of the pavilion made it possible to examine technical aspects such as formwork construction, reinforcement production, concreting, transport and assembling of the individual parts. Load tests on the structure ensured the validation of the software and the preparation of a procedure for building inspectorate approval.

Fig. 3: "Smartie" made of textile reinforced concrete

Acknowledgement

Financial support by the German Ministry of Education and Research (BMBF) within the framework Entrepreneurial Regions, project futureTEX, no. 03ZZ0610D is gratefully acknowledged.

Contact: Dipl.-Ing. Heike Metschies Phone.:+49 371 5274-213 E-Mail: heike.metschies@stfi.de