



- 1 Core sample of steel fiber reinforced concrete
- 2 Thermal image of a steel fiber reinforced concrete test block being stimulated by a magnetic coil

NONDESTRUCTIVE DETECTION OF STEEL FIBERS IN CONCRETE

Background

Incorporating conventional steel rebar is a costly process due to the high material price and time-consuming reinforcement work. Under certain conditions, this process can be partially or completely replaced by incorporating steel fibers into concrete components.

However, there is a risk of component failure, because fibers can produce a reinforcement effect only when they are properly aligned and concentrated. Even increasing the fiber content cannot ensure sufficient security, since more fibers cannot compensate for, say, inadequate fiber orientation.

Thermography

Thermography is a promising nondestructive testing method for determining the actual distribution and orientation of steel fibers in concrete, and can be integrated into production processes. Using this imaging technique, an object's spatially resolved temperature distribution is made visible near the surface by means of infrared detectors. If an object is actively exposed to heat, the cooling process on its surface can be measured using thermographic methods.

Applications

This test method offers the precast elements industry a way to enjoy the benefits of fiber concrete in all kinds of component geometries. The material can then be designed and adapted to provide commercial and technological advantages in applications.

Fraunhofer Institute for Building Physics IBP

Department
Inorganic Minerals and Recycling
Fraunhoferstrasse 10
83626 Valley
Germany

Contact

Dr. Volker Thome
Phone +49 8024 643-623
volker.thome@ibp.fraunhofer.de

Norbert Leiss
Phone +49 8024 643-296
norbert.leiss@ibp.fraunhofer.de

www.ibp.fraunhofer.de