

# **Current Scientific Knowledge about new Composite Materials on the Basis of Polymer Concrete**

by

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## **Introduction**

Continuous development of science and technology is characteristic of every single technical area nowadays, the engineering industry not being an exception. It is this constant development of different areas of the sector that leads to the need to develop the sector as a whole, necessitating improvement, rationalization, innovation, and creation of all of the sector's elements. Currently, high-speed technologies, hybrid technologies, technologies that are fully automated are at the center of attention, in addition to the use of new materials, whose properties are better than the properties of commonly available materials, the use of biomaterials, nanotechnologies, the production trying to be continuous and waste-free, centered on economy and ecology, etc. Each production element or a complex of them aiming at approaching this so-called new production trend has to meet a number of criteria. It is never enough to choose one innovative manufacturing element in the form of a modern machine, technology, tool, or material. Rather, at least the entire production subsystem needs to be innovated most of the time.

The concept of innovation is defined as introducing something new, introducing a new process, product, or a method of production. The need to innovate is largely based on deficiencies of the old process, or it is an attempt to be different, better, and ultimately faster, of greater quality, more profitable.

The present monograph is based on the fact that the CNC machine tools produced up till now have been built on long-standing design solutions, where the main production material is steel. Drawing on the premise that the discovery of composite materials opens up insofar unexplored application

possibilities of this new technical material in science and technology, a scientific question arises as to whether these materials can be used as a structural element of production machines and at the same time, what advantages or disadvantages such a solution presents. The monograph chronologically maps the main theoretical starting points of the studied subject and then provides a description of practically conducted experiments.