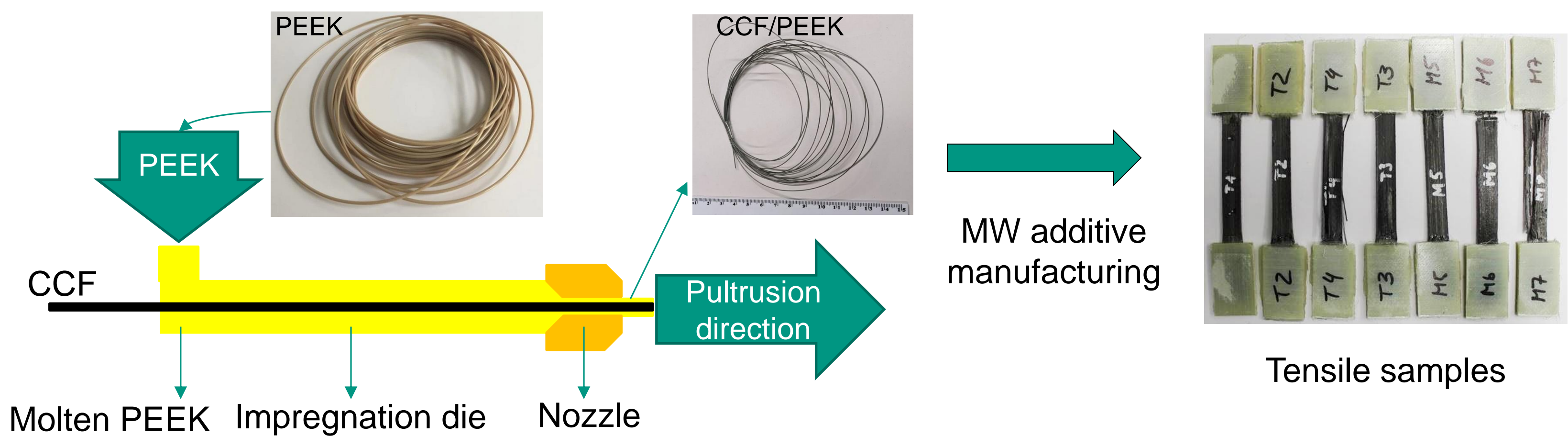


Masterarbeit

Microwave Additive Manufacturing of Continuous Carbon Fiber Reinforced PEEK Composites



Motivation:

Continuous carbon fiber reinforced polyether-ether-ketone (CCF/PEEK) composites are biocompatible materials and have been widely used in spinal cages, bone fixation screws and orthopedic implants, such as knee replacement products. However, the lightweight, customized CCF/PEEK structures are difficult to manufacture. As a promising technology, microwave additive manufacturing can produce those CCF/PEEK structures easily without additional efforts.

Contents:

- Understand the 3D printing process of PEEK plastics and CCF/PEEK composites
- Produce the CCF/PEEK filaments using the developed filament impregnation system in the lab
- Research the difference between microwave and conventional heating of CCF/PEEK filaments by simulation modelling
- Identification of suitable printing parameters by experiments as well as simulation modelling
- Operate microwave additive manufacturing system to print CCF/PEEK tensile samples

Requirements: Materials science and engineering, mechanical engineering, electrical engineering or comparable

Type of work: Analytics, Practices, Simulation

Prerequisites:

- Motivation and interest in the area of 3D printing
- Independent and structured way of working
- Previous knowledge and experience on PEEK printing is an advantage

Start time: now

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