PCCL
Polymer Competence Center Leoben

Join our team

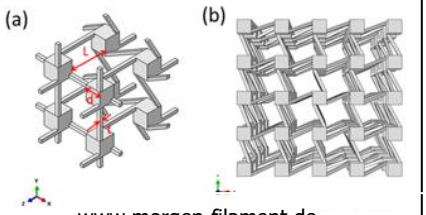
The Polymer Competence Center Leoben GmbH (PCCL) is the leading Austrian center for cooperative research in the field of polymer technology and polymer science. In collaboration with companies in the polymer industry and numerous academic institutions, our around 100 highly-qualified employees jointly work in R&D projects on innovative polymer solutions for a wide range of applications. We currently aim to strengthen our team and offer a

MASTERTHESIS in the field of „Mechanical Testing and Characterization of 3D-printed Metamaterials" Job-ID: 20201230

Background:

Metamaterials offer unique mechanical properties, e.g. negative Poisson's Ratio, variable stiffness, foldability, etc. The properties are usually defined by geometric parameters of the structure. Conventional processing techniques limit the possible geometries that can be manufactured. With additive manufacturing, or 3D-printing, new metamaterials can be designed and fabricated. The goal of the thesis is to examine the influence of mechanical properties on a newly designed functional metamaterial, manufactured with selective laser sintering (SLS). For this, numerical simulations in combination with mechanical testing of this metamaterial will be conducted. To generate material models for the simulation, different material tests on specimen level (bending-, tensile and impact-tests) will be made at different temperatures (-30 °C to 23 °C). The metamaterial itself is characterized with compression tests, aided with optical measurements. The results are then compared to those from numerical simulations. Depending on the candidate's preferences the mechanical aspect (numerical simulation and testing) or the processing aspect (FFF or DLP printing of additional metamaterial geometries) are focused in the thesis.

Tasks:



www.morgen-filament.de

Test material

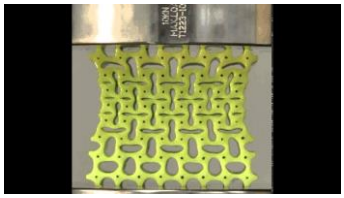
- Three (optional four) different SLS-printed materials

Mechanical Testing

- Material characterization (bending, tensile, impact)
- Metamaterial (compression tests with optical measurement)

Optional: Focus on

- Either numerical simulation
- Or additional FFF / SLA print of metamaterial geometries


https://www.youtube.com/watch?v=IFIpsXHsGm0

Goals

- Comprehensive comparison of three (optional four) different materials at different temperatures
- Characterize influence of material properties on metamaterial
- Optional: Print, test and compare FFF or SLA printed metamaterial to SLS

We offer:

- A 4-month contract with a gross monthly salary of € 978,-
- Beginning on or after February 2021

Contact:

If you are interested, please contact jobs@pccl.at, indicating the **Job-ID 20201230**.

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