

# Development of Tape-casting technique for 3D printing of high-viscosity pastes

## ✓ Bachelor- / Studien- / Masterarbeit

To 3D print piezoelectric sensors, extremely thin layer of the material must be formed. The suspensions itself, before printing, is a tooth-paste like material with high viscosity and good flow abilities. A technique to produce a thin paste layer (<20  $\mu\text{m}$ ) without air bubbles and other irregularities must be developed.

As a first step, investigation and comparison of various existing tape-casting systems is envisioned.

The main physical principles of material tape-casting will be investigated and used to develop tape-casting technique. The system to be developed must have controllable layer height, exchangeable metal blades and heating mechanism. Furthermore, the system to feed and clean material must be developed.

### Tasks:

- Investigation and comparison of tape-casting techniques and their physical principles
- Construction and development of tape-casting mechanism
- 3D printing of piezoelectric sensors with developed tape-casting mechanism

### Additional information:

- Part of experimental work might take place at DLR Braunschweig
- Multiple works on same topic possible (e.g. Studienarbeit + Masterarbeit)

