



ANDRITZ AG --- Master Thesis

TITLE: EFFICIENCY OPTIMIZATION OF SCREW COMPRESSION DEVICE FOR WOOD CHIP DEWATERING

Screw compression devices are used in the Pulp & Paper and MDF industry for dewatering wood chips. Dewatering is required, depending on the application, either to minimize the thermal drying energy or to maximize the impregnation on following process steps. From the economical point of view, this dewatering step is characterized by the achieved moisture drop at a certain throughput versus the required specific energy and the yield loss.

The design of the screw compression devices was mainly empirically optimized over the last decades based on field experiences. The large variation of the raw material characteristics in the field, the impact of equipment wear on the compression screw performance indicators as well as the lead time for the manufacturing of new screw designs drastically limit the empirical optimization and do not allow a systematical approach.

A laboratory apparatus for compression dewatering tests under representative conditions is currently being engineered and manufactured. This apparatus will be installed in our laboratory in **Graz** and will be operated by the lab team.

The equipment trials will take place from October to December 2019 although a literature study and the trial preparation work have to be done in advance, starting August 2019.

Subject for the master thesis is the scientific supervision of the first test series conducted with the new apparatus with the following targets:

- 1) Define efficient testing and data analyze procedures, verify the repeatability of the test results and quantify the statistical deviations
- 2) Definition and supervision of the first test series to quantify the impact of the main screw design characteristics (approx. 13 parameters)
- 3) Evaluate the test results in regards to the economical equipment optimization
- 4) Evaluate the correlation of the test results to literature information, existing field measurements and former lab results. Identify, explain and if possible quantify systematic deviations.

This master thesis is remunerated as service contract (Werkvertrag) 3.000 EUR.

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