

Measurement of the dynamic rheology of a wet fiber network during short loads cycles

The fibre network is compressed during the dewatering in the wire section. The pressure drop in the fibre network due to the fluid flow causes this compression. The compression of the network leads to a reduction of the permeability. This implies that the flow of water out of the fiber network is rendered more difficult. As a consequence, the flow takes more time or a higher vacuum has to be applied. This leads to larger paper machines and higher higher energy consumption. After the dewatering pulse, the web will expand which gives room for rewetting, the backflow of water from the forming fabric to the web. This is a highly unwanted phenomenon.

So far, very little is known on the quantitative deformation of the fiber network during the pressure pulses in the initial phase of dewatering in a paper machine. The goal of this final thesis is to measure the deformation of a fiber network during short pressure pulses. An existing laboratory suction box will be used. Here, a fibre network can be exposed to short pressure pulses. During the pulses, the thickness of the network will be measured. Ideas and some equipment for the measurement of the thickness exist but the method itself has to be refined.

The thesis work will performed in co-operation with the Division of Paper Technology at KTH.

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