



## DESIGN OF EQUIPMENT FOR CHARACTERIZATION OF ELASTOMERS USING IMPACT TESTING

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### Presentation

Spring 2010

### Report

will be published as report TVSM-5172

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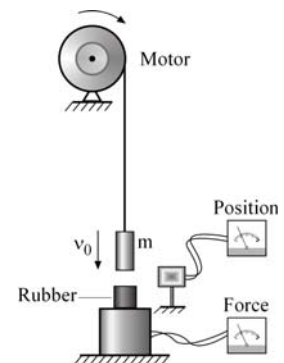
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### Background:

Tetra Pak uses rubber coated rollers in the converting process. The rubber coated roller is one of two rollers in a nip where adhesion between molten polymer and paperboard is created. Simulations are done in the development process as a tool to predict the behavior of these rollers. One important component in the simulation model of the roller is material models covering the dynamic behavior of the rubber. Dynamic testing of rubber materials is however a time and cost consuming process. Today Tetra Pak uses suppliers to do this kind of testing of material properties. To speed up the lead time from testing of rubber materials to a completed simulation, this could be done in house at Tetra Pak.

### Objective:

The purpose of this master thesis is to design equipment for dynamic impact testing of rubber material according to the method proposed by Austrell in the paper *Dynamic characterization of elastomers using impact testing, 2009*. The basic principal is a drop test where the loading rate is controlled by the drop height and the load amplitude is controlled by the weight of the dropped body. The force acting on the rubber specimen and the compression of the



specimen needs to be measured simultaneously. Special care must be taken when designing these measuring methods since the contact time in the impact cycle is very short.

### Deliverables:

The deliverable is a design proposal for mechanical drop test device including measuring equipment. The measuring equipment shall contain devices to measure force and deformation simultaneously during the impact of the weight on the rubber specimen. A final report should be written in english in template according to Division of structural mechanics, LTH.



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