

Review of doctoral thesis of Roman Kolařík:
“Modelling of Film Blowing Process for non-Newtonian Fluids by Using Variational Principles”

The doctoral thesis written by Roman Kolařík is devoted to modeling film blowing process for tubular film production. Introductory part of thesis deals with description of film blowing process and its instabilities. In the second part up to date overview of process mathematical modeling is presented. On the basis above mentioned chapters the aim of doctoral thesis is formulated. The thesis consists of four articles (two published, one accepted and one submitted for publication in high impact factor journals).

The first paper deals with analysis of process by using minimum energy approach. Obtained results were compared with theoretical and experimental data taken from literature. Model predictions have been found in relatively good agreement with experimental data. During oral defense I would like to hear author's comment to the difference between model and experimental temperature profile especially at high x values.

The second paper deals with analysis of process stability by using variational principle model. Practical aspects of stability analysis results are very interesting.

The third paper the variational principle model is applied to investigation of polyolefin extensional rheology effect on film blowing stability. In this paper the theoretical variational principle model was verified experimentally and relatively good agreement between theoretical and experimental results was attained.

The fourth paper is also devoted to experimental verification of variational principle model application to multilayer film blowing process.

The thesis represents new original results and information that were published in high impact factor journals. The thesis is written to a high standard of academic rigour, the presentation of data and text structuring is well done. Presented conclusions are well formulated and are acceptable. The author has shown the ability of individual scientific work and I recommend his thesis to be accepted for defending in front of the state committee panel and after successful defence to promote Ing. Roman Kolařík as a “Ph.D”.

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