

In the first chapter of the thesis we present an introduction to the viscoplasticity and overview of the presented problems. The constitutive relation for Bingham fluid is derived and in the second chapter. Further there is demonstrated a procedure of proving existence and uniqueness with classical variational method. This method is compared with the same process using modern implicit theory. The last chapter starts with summary of used problem formulations and used software. It is then followed by the main part with results of numerical simulations, both for the purpose of used formulations comparison and then verification of the preferred one in more complicated simulations. We expect a possible application of tested approaches on different materials.