

We consider steady flows of homogenous incompressible fluid described by generalized Stokes system. We study two models, first with shear-rate dependent viscosity and second with pressure and shear-rate dependent viscosity. We investigate internal flows in bounded domains subject to Navier's boundary condition. First, to show the difference, we present proofs of existence and uniqueness of solutions for both systems. Then we investigate, what are the assumptions allowing to take the fluid mechanics limit, as Navier's boundary conditions approximate first no-slip and then (perfect) slip boundary conditions. Finally, we consider for simplicity specially periodic problem and show regularity result (integrability of the second derivatives of the velocity and the first derivatives of the pressure).