

The Influence of the Diameter of the Flow Conducts on the Rheological Behavior of a Non-Newtonian Fluid

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Abstract : The knowledge of the rheological behavior of the used products in different fields is essential, both in digital simulation and the understanding of phenomenon involved during the flow of these products. The fluids presenting a nonlinear behavior represent an important category of materials used in the process of food-processing, chemical, pharmaceutical and oil industries. The issue is that the rheological characterization by classical rheometer cannot simulate, or take into consideration, the different parameters affecting the characterization of a complex fluid flow during real-time. The main objective of this study is to investigate the influence of the diameter of the flow conducts or pipe on the rheological behavior of a non-Newtonian fluid and Propose a mathematical model linking the rheologic parameters and the diameter of the conduits of flow. For this purpose, we have developed an experimental system based on the principal of a capillary rheometer.

Keywords : rhéologie, non-Newtonian fluids, experimental study, mathematical model, cylindrical conducts

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