

# Verification of the Moving Particle Semi-implicit Method for Multi-physics Simulation in Thermoplastic Injection Process

N. Benkemoun\*, S. Koshizuka<sup>†</sup> and K. Shibata<sup>†</sup>

\*<sup>†</sup> The University of Tokyo  
7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan  
\* n.benkemoun@mps.q.t.u-tokyo.ac.jp

## ABSTRACT

In this paper, we present a method to calculate the injection process of a hot amorphous thermoplastic using the MPS method [1]. The MPS method was initially developed for purely Newtonian fluids, but has previously been adapted for other types of fluids, such as snow [2] or Cross fluids [3]. Due to their viscosity depending on shear rate and temperature, thermoplastics require more complex models such as the Cross-WLF viscosity model, used here. Firstly, validation for an isothermal Poiseuille flow will be made. Afterwards, the filling simulation of a cold mold is done. Heat transfer is solved explicitly using the Laplacian discretization of the MPS method [4]. Non-slip boundary is also considered. The focus of this study is flow behavior and thermal analysis. The validation will be compared to FEM software calculated results. The thermoplastic's properties come from an experimental study [5].

## REFERENCES

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