

# Modeling of non-Newtonian fluids without material frame indifference

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In the fifties the modeling of *non-Newtonian fluids* initiated the search for invariant time derivatives with respect to certain space time transformations. Then *Euclidean Transformations* were selected to establish the *Principle of Material Frame Indifference* and *N<sup>th</sup> Grade Fluids*. However, the two concepts lead to serious inconsistencies between thermodynamic consistent models and experimental observations. In 1986 the subject has been resolved in a remarkable paper by I. Müller and K. Wilmanski. We discuss alternative *non-Newtonian fluids* models of *Maxwell-type* and of *Balance-type* within *Continuum Thermodynamics* as it was laid down by D. Bothe and W. Dreyer.