Continuum Mechanics, physical science par excellence inasmuch it studies the world commonly perceived by human senses, lacks its most important result consisting of a thermomechanical model of general applicability, free of approximations of laws valid for all matter and mathematically solvable. In previous works we expounded a theory that, by introducing completely new principles including the new law in question (that links density, velocity and thermodynamic pressure), arrived to a system of partial differential equations (PDEs) conceivable to constitute said result. This paper, in front of need for further theoretical, numerical and experimental checks of this new general model, has preparatory purpose of theoretically validating said law in coherence with Continuum Mechanics normally consolidated and shared. To this aim, necessary tools of logic, tensor calculus and mathematical analysis are premised, also circumstantiating laws and principles of state of art. It is lastly considered the compatibility of new law with current general model and with its best known specifications, and a significant advantage of new model over current one is identified in being absent the stress constitutive equation.

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