

Preface

Our understanding of the physical or physicochemical processes underlying the mechanical behaviour of materials, which comes under the heading of rheophysics, is based on a wide range of scientific investigation that has progressed to different extents for different materials. Apart from gases, liquids, and simple solids, it is in the field of polymer science that progress has been most significant over the past fifty years or so, and there is no lack of specialised works on this topic. Much more recently, there have been several books detailing the rheology of foams, granular media, and colloids. The present book sets out from the idea that, before we can understand the rheophysics of any given material, it is particularly instructive, even essential, to master the basic tools for handling a broad range of materials. This approach has been built up gradually in the context of my own lectures on *Rheophysics and Soft Matter* which form part of an M.Sc. in the physics of building materials, a novel course set up by the late O. Coussy at the *Ecole des Ponts et Chaussées* and the *Ecole Polytechnique*, now run by Xavier Chateau. My aim here has thus been to bring together in a single textbook, not the work in progress at the frontier of each field of research, but the basic elements of our physical understanding of the main classes of material, and this in the most unified way possible.

The first version of this book appeared in French with a foreword by Etienne Guyon, reproduced here in English. The whole work has been translated by Stephen Lyle, who also helped to improve certain passages. The author acknowledges the financial support of Saint-Gobain for the book translation.

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Rheophysics

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