Preface

Through the years materials have been characteristically evaluated by means of crude drop-type high speed tests in order to supplement the more conventional studies of stress–strain behavior obtained by pulling specimens apart at rates of loading commonly referred to as "static" rates.

These drop-type tests have provided a roughly qualitative measure of material performance, largely categorized as "acceptable" or "not acceptable" for a particular application. However, they left much to be desired in the way of precise data that might be used to study the effects of molecular structure and of interactions between addends or alloys upon the time-dependent mechanical properties of materials in general and polymeric materials in particular.

Within the last few years universal test equipment capable of obtaining high deformation rates has become commercially available, enabling more and more laboratories to use high speed testing in both basic and applied research programs as a means of clarifying impact behavior, studying the mechanism of fracture and investigating the fundamental viscoelastic nature of polymeric systems. As a result, the effects of polymer structure on the rate-sensitive mechanical properties of these systems can be defined over a range encompassing both dynamic (i.e., fractional millisecond) and static response time.

It will be noted that most of the papers presented in the Symposium which follows deal with high speed techniques as used in studies of polymeric materials. (This Symposium on High Speed Testing is the Second in a continuing series. Proceedings of the First Symposium are available as *High Speed Testing:* Volume I, Interscience Publishers, New York, 1960.) However, those papers which are not concerned specifically with polymers are felt to be no less valuable to readers of the *Journal of Applied Polymer Science* in view of the techniques and instrumentation which they bring to bear upon possible future studies of polymer performance.

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