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Rubber, vulcanized or thermoplastic — Determination of dynamic properties —

Part 3: Glass transition temperature (T_g)

Caoutchouc vulcanisé ou thermoplastique — Détermination des propriétés dynamiques —

Partie 3: Température de transition vitreuse (T_g)

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Foreword

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This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

A list of all parts in the ISO 4664 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Elastomers are viscoelastic in nature hence their response to dynamic stress is a combination of elastic and viscous response. Glass transition temperature, T_g, is the temperature at which an amorphous or semi crystalline polymer transforms from a rubbery viscous state to a brittle glass-like state. It is always lower than the melting temperature.

This document is based on a force induced vibration test from which the stiffness can be determined, (see Annex A) and modulus and tan δ can be calculated. Tan δ is the ratio of viscous modulus to the elastic modulus. Tan δ is plotted against temperature and the glass transition temperature is taken as the peak in the curve.

The measured value of T_g depends on the experimental conditions and the mode of deformation. Measurement of T_g in dynamic mode is more sensitive to the temperature dependent physical properties of the material and is relevant to understanding its service temperature.