
**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*.

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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 $\tan \delta$ can be calculated. $\tan \delta$ is the ratio of viscous modulus to the elastic modulus. $\tan \delta$ 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.

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