



BSI Standards Publication

Plastics — Determination of dynamic mechanical properties

Part 11: Glass transition temperature

National foreword

This British Standard is the UK implementation of [ISO 6721-11:2019](#). It supersedes [BS ISO 6721-11:2012](#), which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/21, Testing of plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

Attention is drawn to the fact that during the development of this International Standard, the UK committee voted against its approval.

The UK committee submitted a negative vote due to concerns regarding the introduction in this revision of two alternative definitions for measuring glass transition temperature (T_g) (i.e. [Subclause 3.1](#) ($T_{M''}$) and [Subclause 3.3](#) ($T_{\tan\delta}$) in addition to the original definition given in [Subclause 3.2](#) ($T_{M'}$)).

[Subclause 3.3](#) defines temperature at peak of loss factor curve and notes that 'loss factor' is also called ' $\tan \delta$ '. The UK committee recommends use of ' $\tan \delta$ ' to describe the ratio of loss modulus divided by storage modulus (see below) because it is a more widely adopted terminology by users of this technique and other known standards than 'loss factor'. It also avoids potential confusion between 'loss modulus' and 'loss factor'.

[Clause 4](#) states that T_g is determined using one of the characteristic data points in the measured data as defined in Subclauses 3.1 to 3.3. These options could cause confusion through multiple T_g values being quoted, with the possibility of several degrees (°C) difference in the reported values.

In addition, no guidance is given on a default definition in cases of dispute or qualification.

The UK committee recommends that users should determine T_g using the definition provided in Subclause 3.2, which was the only definition of glass transition (T_g) given in the withdrawn standard BS ISO 6721-11:2012. This definition is the same as that used in BS ISO 20144:2019, *Fibre-reinforced plastic composites — Standard qualification plan (SQP) for composite materials, including reduced qualification plan (RQP) and extended qualification plan (EQP) schemes*, where BS ISO 6721-11:2019 is referenced for T_g measurements.

The UK committee also notes that:

- commercial instrument software will often not include loss factor as an option for data plotting, so $\tan \delta$ should be used in these cases; and
- no evidence of validation is given for the calibration specimens in the tensile mode described in Annex B, [Subclause B.1.3](#).

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 52278 9

ICS 83.080.01