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**Butadiene rubber — Determination of  
microstructure by infra-red spectrometry**

*Caoutchouc butadiène — Détermination de la microstructure par  
spectrométrie à infrarouge*



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## Contents

Page

Foreword.....	iv
1 Scope .....	1
2 Normative references .....	1
3 Principle .....	1
4 Reagent.....	1
5 Apparatus .....	1
6 Sampling .....	2
7 Procedure .....	2
8 Precision .....	5
9 Test report .....	7

## Foreword

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Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12965 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analyses*.

# Butadiene rubber — Determination of microstructure by infra-red spectrometry

**WARNING** — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

## 1 Scope

This International Standard specifies a method for the determination of the microstructure of butadiene rubber (BR) by infra-red spectrometry using a cast film.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1407:1992, *Rubber — Determination of solvent extract*.

ISO 1795:2000, *Rubber, raw natural and raw synthetic — Sampling and further preparative procedures*.

ISO/TR 9272:1986, *Rubber and rubber products — Determination of precision for test method standards*.

## 3 Principle

**3.1** A small quantity of extracted rubber is dissolved in methylene chloride and cast on a salt plate.

**3.2** A spectrum is obtained over the range  $2\,000\text{ cm}^{-1}$  to  $600\text{ cm}^{-1}$ . From the absorbances at fixed wavelengths, the *cis*, *trans* and vinyl contents are calculated.

## 4 Reagent

**4.1** Methylene chloride.

## 5 Apparatus

**5.1** Double-beam infrared spectrophotometer or Fourier-transform infra-red (FTIR) spectrophotometer, with  $2\text{ cm}^{-1}$  resolution. The instrument shall be capable of scale expansion along the absorbance or transmittance axis over the spectral region of  $2\,000\text{ cm}^{-1}$  to  $600\text{ cm}^{-1}$ .