PD CEN/TS 17307:2019

BSI Standards Publication

Material derived from End-of-Life tyres - Granulates and powders - Elastomers identification: Gas-chromatography and mass-spectrometric detection of pyrolysis products in solution

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National foreword

This Published Document is the UK implementation of CEN/TS 17307:2019.

The UK participation in its preparation was entrusted to Technical Committee PRI/73, Industrial rubber products.

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

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

Published by BSI Standards Limited 2019

ISBN 978 0 539 01394 8

ICS 83.160.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2019.

Amendments/corrigenda issued since publication

Date	Text affected

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 17307

March 2019

ICS 83.160.01

English Version

Material derived from End-of-Life tyres - Granulates and powders - Elastomers identification: Gas-chromatography and mass-spectrometric detection of pyrolysis products in solution

Matériaux obtenus à partir de pneumatiques en fin de vie - Granulats et poudrette - Identification des élastomères: Détection par chromatographie en phase gazeuse et spectrométrie de masse des produits de pyrolyse en solution

Material aus Altreifen - Granulat und Mehle - Identifizierung von Elastomeren: Gaschromatographie und massenspektrometrische Detektion von Pyrolyseprodukten in Lösung

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Ref. No. CEN/TS 17307:2019: E

Contents

Page

European foreword

This document (CEN/TS 17307:2019) has been prepared by Technical Committee CEN/TC 366 “Materials obtained from End-of-Life Tyres (ELT)”, the secretariat of which is held by UNI.

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Introduction

WARNING — Persons using this Euopean 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 document specifies a method for the identification of the elastomers in granulates or powder derived from End-of-Life Tyres.

The method specified is a qualitative method only.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1407, *Rubber — Determination of solvent extract*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Principle

A sufficient amount of granules or powder is compacted and homogenized in a laboratory mill and a small aliquot of the homogenized sample is then solvent extracted and subjected to pyrolysis at elevated temperature. Few drops of the liquid pyrolysis products are then diluted in dichloromethane for the GC/MS analysis. The use of the mass-spectrometric detector is a mean for improving the sensitivity and reliability of the identification of the elastomers present in low or trace amount, with threshold limit estimated to about 5 %.

The use of this standard pre-supposes sufficient working knowledge of the principles and techniques of gas chromatography/mass-spectrometry (GC/MS) for the analyst to perform the operations described and interpret the results correctly.

5 Reagents

5.1 Dichloromethane

5.2 Acetone

5.3 Nitrogen, for flushing the pyrolysis product.

6 Apparatus

All reagents shall be of analytical grade

6.1 Extraction apparatus. The apparatus specified in ISO 1407 is satisfactory.

6.2 Pyrolysis apparatus (see Figure 1), comprising a glass tube A having inward projections to prevent the sample from falling to the bottom of the tube, and a lateral condenser tube. The tube A has a standard ground-glass joint B that carries a small glass adductor tube for the connection to flowing