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Plastics — Thermoplastic polyurethanes for moulding and extrusion —

Part 3: Distinction between ether and ester polyurethanes by determination of the ester group content

Plastiques — Polyuréthannes thermoplastiques pour moulage et extrusion —

Partie 3: Distinction entre polyuréthannes éther et ester par dosage des groupements esters

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

ISO 16365 consists of the following parts, under the general title *Plastics — Thermoplastic polyurethanes for moulding and extrusion*:

— *Part 1: Designation system and basis for specifications*

— *Part 2: Preparation of test specimens and determination of properties*

— *Part 3: Distinction between ether and ester polyurethanes by determination of the ester group content*

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Introduction

The saponification value is a fast and easy determination method to distinguish between polyesterol and polyetherol-based thermoplastic polyurethanes. However, the saponification value strongly depends on the reaction conditions. Higher saponification values result in longer hydroxylation times and/or higher temperatures. With this procedure, the theoretically expected values have been found.

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Plastics — Thermoplastic polyurethanes for moulding and extrusion —

Part 3: Distinction between ether and ester polyurethanes by determination of the ester group content

1 Scope

This part of ISO 16365 specifies a method for the determination of esters including ester thermoplastic polyurethanes (TPU) and ether TPU for quality control without the necessity of sophisticated instrumentation and avoids or minimizes long-term microbial testing for TPU materials. The method described is used to distinguish major TPU types and characterize TPU mixtures.

The method is applicable to all linear polyurethanes based on 4,4'-diphenylmethane diisocyanate (MDI) and is intended for instance to minimize long-term tests related to microbe resistance and hydrolysis.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
acid value of total hydrolysable groups
S_{Z1}
number of milligrams of potassium hydroxide required to neutralize the free acids of ester and urethane groups present in 1 g of thermoplastic polyurethanes, when determined in accordance with the procedure specified in this part of ISO 16365

Note 1 to entry: The acid value is expressed in milligrams per gram.

3.2
acid value of hydrolysable urethanes
S_{Z2}
number of milligrams of potassium hydroxide required to neutralize the free acids of only urethane groups present in 1 g of thermoplastic polyurethanes, when determined in accordance with the procedure specified in this part of ISO 16365

Note 1 to entry: The acid value is expressed in milligrams per gram.

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