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# **Plastics — Resins in the liquid state or as emulsions or dispersions — Determination of apparent viscosity using a single cylinder type rotational viscometer method**

*Plastiques — Résines à l'état liquide ou en émulsions ou dispersions  
— Détermination de la viscosité apparente par la méthode du  
viscosimètre rotatif de type à un cylindre*



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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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This third edition cancels and replaces the second edition (ISO 2555:1989), which has been technically revised. The main changes compared to the previous edition are as follows:

- a) the name of the equipment has been changed to "single cylinder type rotational viscometer" and the method of determination of viscosity is described with more general terms to avoid reference to specific brand names;
- b) the commercially available main models and spindles have been summarized;
- c) digital type viscometer has been added;
- d) the accuracy of test method has been added;
- e) the calibration method has been added.

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## Introduction

A rotational viscometer is composed of a spindle, a torque measuring device and a spring. There are three types of rotational viscometers with regard to difference of the spindle:

- a) single cylinder type (used in this document, i.e. ISO 2555);
- b) coaxial cylinder type (used in ISO 3219<sup>[2]</sup>);
- c) cone-plate type (used in ISO 3219<sup>[2]</sup>).

Single cylinder type rotational viscometers measure viscosity under non-constant shear rate. Coaxial cylinder type and cone-plate type instruments measure viscosity under constant shear rate.

When using a single cylinder type instrument, the measured viscosity is relative to measuring conditions. Conditions are therefore intended to be specified for viscosity measurements.

For Newtonian fluids, the viscosity value remains the same even if different viscosity measuring methods from this document and ISO 3219 are used.

With non-Newtonian fluids the measured viscosity changes depending on shear rate. The viscosity determined using different measuring methods such as methods from this document and ISO 3219 therefore may differ from each other, depending on shear rates used during measurements.

The Brookfield method has contributed a lot to determination of liquid viscosity. With its simple measuring low-cost equipment, the principles underlying the Brookfield technique still remain an important element in determination of viscosity of liquids.

This document is largely based on the Brookfield method established in 1989. However, some of the instruments mentioned in the previous edition of this document have long been discontinued. Moreover, although analogue (or the so-called “dial”) type was the predominant viscometer type at that time, the use has now shifted to digital viscometers in the recent years, increasing the need for this document to be revised.

The terms and standards introduced in this new edition are based on ISO 1652<sup>[1]</sup>.

Currently, digital viscometer has become the mainstream. However, analogue (or dial) viscometer is still used and cannot be removed from the method. This document allows the use of both analogue (or dial) viscometer and digital viscometer.