DEUTSCHE NORM

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DIN 53019-1

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Supersedes
DIN 53019-1:1980-05 and
DIN 53018-1:1976-03

Viscometry – Measurement of viscosities and flow curves by means of rotational viscometers – Part 1: Principles and geometry of measuring system English translation of DIN 53019-1:2008-09

Viskosimetrie –
Messung von Viskositäten und Fließkurven mit Rotationsviskosimetern –
Teil 1: Grundlagen und Messgeometrie
Englische Übersetzung von DIN 53019-1:2008-09

Viscosité –
Mesurage des viscosités et des courbes d'écoulement par des viscosimètres à rotation –
Partie 1: Concepts fondamentaux et géométrie du mesurage
Traduction anglaise de DIN 53019-1:2008-09

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A comma is used as the decimal marker.

Contents

Foreword

This standard has been prepared by Working Committee NA 062-08-31 AA *Viskosimetrie* of the *Normenausschuss Materialprüfung* (Materials Testing Standards Committee).

DIN 53019, *Viscometry — Measurement of viscosities and flow curves by means of rotational viscometers* comprises:

— *Part 1: Principles and geometry of measuring system*

— *Part 2: Viscometer calibration and determination of the uncertainty of measurement*

— *Part 3: Measurement errors and corrections*

Amendments

This standard differs from DIN 53018-1:1976-03 and DIN 53019-1:1980-05 as follows:

a) DIN 53018-1:1976-03 and DIN 53019-1:1980-05 have been combined.

b) The contents have been rearranged and updated.

Previous editions

DIN 53788: 1974-04
DIN 53018-1: 1976-03
DIN 53019-1: 1980-05

1 Scope

This standard specifies flow zones for measuring the flow behaviour of Newtonian and non-Newtonian fluids in rotational viscometers by describing a number of instrument geometries, the flow behaviour being described by the shear viscosity[1)], the shear viscosity function[1)], the viscosity curve[1)] or the flow curve[1)] (i.e. the graph of the relationship between shear rate and shear stress).

This standard can only be applied if the following conditions are met.

a) There is no slippage between the fluid and the boundary surfaces, i.e. the fluid adheres to the walls.

NOTE Wall adhesion is not the same as wall wetting.

b) The accelerating forces in the fluid remain so low that the flow pattern is determined solely by laminar, stationary layer flow.

c) Any variations in the temperature of the fluid with location and time are negligible.

d) The flow zones are described by boundary surfaces, each of which comprises a lateral cylinder surface, a lateral cone surface or a circular surface (simple boundary surfaces). In practice, composite boundary surfaces are also used.

e) Any boundary surfaces other than these simple ones have no effect on the flow zone.

f) Any circularity defects in the boundary surfaces or errors in their axial alignment shall be negligible.

Any deviations from the above conditions will increase the uncertainty of measurement (see DIN 53019-2) unless they can be compensated for by appropriate corrections (see DIN 53019-3).

2 Normative references

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

DIN 1342-1, *Viscosity — Rheological concepts*

DIN 1342-2, *Viscosity of Newtonian liquids*

DIN 1342-3, *Viscosity of non-Newtonian liquids*

DIN 53019-2, *Viscometry — Determination of flow curves with rotational viscometers — Part 2: Viscometer calibration and determination of uncertainty of measurement*

DIN 53019-3, *Viscometry — Measurement of viscosities and flow curves by means of rotational viscometers — Part 3: Measurement errors and corrections*

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1) See DIN 1342-1.