INTERNATIONAL STANDARD

ISO 3219-1

First edition
2021-05

Rheology —

Part 1: Vocabulary and symbols for rotational and oscillatory rheometry

Rhéologie —

Partie 1: Vocabulaire et symboles pour la rhéométrie rotative et oscillatoire

Reference number
ISO 3219-1:2021(E)

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Published in Switzerland

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Foreword

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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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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement), and in cooperation with ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This first edition cancels and replaces the second edition (ISO 3219:1993), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the terms and definitions have been moved to ISO 3219-1, the general principles have been moved to ISO 3219-2;

— new terms and definitions have been added;

— Table 1 on symbols has been added.

A list of all parts in the ISO 3219 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Rheology —

Part 1: Vocabulary and symbols for rotational and oscillatory rheometry

1 Scope

This document specifies general terms and definitions that are used in the context of rotational and oscillatory rheometry.

Further terms and definitions can be found in the other parts of the ISO 3219 series where they are used.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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 https://www.iso.org/obp

3.1
absolute value of the complex shear modulus
$|G^*|$
ratio of the amplitude of the *shear stress* τ_0 (3.41) and the amplitude of the *shear strain* γ_0 (3.40)

Note 1 to entry: The absolute value of the complex shear modulus $|G^*|$ has the unit pascal (Pa).

3.2
absolute value of the complex shear viscosity
$|\eta^*|$
ratio of the amount of the complex shear modulus $|G^*|$ (3.1) and the *angular frequency* ω (3.5)

Note 1 to entry: The absolute value of the complex shear viscosity $|\eta^*|$ has the unit pascal multiplied by seconds (Pa·s).

3.3
amplitude sweep
oscillatory test with variable amplitude at a constant *angular frequency* ω (3.5)

3.4
angular displacement
angular deflection
φ
angular measure where the angle is indicated by the length of the arc

Note 1 to entry: The angular displacement has the unit radians (rad).

3.5
angular frequency
ω
temporal change of the *angular displacement* φ (3.4) in oscillation

Note 1 to entry: The angular frequency ω has the unit radians per second ($rad \cdot s^{-1}$) or, since rad is dimensionless (i.e. metre divided by metre), the unit reciprocal seconds (s^{-1}).

Note 2 to entry: The angular frequency ω, in reciprocal seconds (s^{-1}), is linked to the frequency f, in hertz (Hz) or in reciprocal seconds (s^{-1}), via the following relation:

$$\omega = 2\pi \cdot f$$

3.6
angular velocity
Ω
temporal change of the *angular displacement* φ (3.4) in rotation

Note 1 to entry: The angular velocity Ω has the unit radians per second ($rad \cdot s^{-1}$).

Note 2 to entry: The angular velocity Ω, in radians per second ($rad \cdot s^{-1}$), is linked to rotational speed n, in reciprocal seconds (s^{-1}), via the following relation:

$$\Omega = 2\pi \cdot n$$

3.7
continuous ramp
type of test where the specified variable from the initial value to the final value varies monotonously and constantly during the test

Note 1 to entry: The continuous ramp is performed by linear or logarithmic presetting.

Note 2 to entry: An alternative to the continuous ramp is the *step ramp* (3.46).

3.8
elastic behaviour
elasticity
property of a material to show reversible deformation and storage of mechanical energy

3.9
flow curve
graphical representation of the relation between *shear stress* τ (3.41) and *shear rate* $\dot{\gamma}$ (3.38)

3.10
frequency
f
oscillation per unit of time

Note 1 to entry: The frequency f has the unit hertz (Hz), where 1 Hz is 1 oscillation per second.

Note 2 to entry: The frequency f, in hertz (Hz) or in reciprocal seconds (s^{-1}), is linked to the *angular frequency* ω (3.5) in reciprocal seconds (s^{-1}) via the following formula:

$$f = \frac{\omega}{2\pi}$$

3.11
frequency sweep
oscillatory test (3.24) with variable *angular frequency* ω (3.5) at a constant amplitude