INTERNATIONAL STANDARD

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Graphic technology — Determination of rheological properties of paste inks and vehicles by the falling rod viscometer

Technologie graphique — Détermination des caractéristiques rhéologiques des encres et excipients projetés, à l'aide d'un viscosimètre à tige tombante

Reference number
ISO 12644:1996(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 12644 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

Annex A forms an integral part of this International Standard.

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Graphic technology — Determination of rheological properties of paste inks and vehicles by the falling rod viscometer

1 Scope

This International Standard specifies the procedure for determining the viscosity and yield value of paste inks and vehicles which are unreactive under normal room conditions.

It is applicable to inks in the apparent viscosity range of 2 Pa · s to 200 Pa · s.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 viscosity: Measure of the internal friction of a liquid in motion. The viscosity is generally defined as the ratio of the shear stress (2.2) to the shear rate (2.3):

$$\eta = \frac{\sigma}{\gamma} \quad \ldots (1)$$

2.2 shear stress, σ: Force per area in a direction parallel to the applied force. Unit: Pa.

NOTES

1 For the falling rod viscometer, the shear stress is proportional to the total weight of the rod and the weight loads in accordance with the equation

$$\sigma = \frac{W}{A} = \frac{mg}{2\pi rl} \quad \ldots (2)$$

where (see figures 1 and 2)

- σ is the shear stress;
- W is the total weight of the rod and the weight loads;
- A is the apparent shearing area;
- g is the gravitational acceleration;
- m is the total mass;
- r is the radius of the rod;
- l is the length of the aperture.

2 The shearing length of the aperture of a falling rod viscometer usually contains both a tapered and a parallel section; therefore, it is understood that A is not the true shearing area but an apparent shearing area.