

INTERNATIONAL
STANDARD

ISO
12634

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**Graphic technology — Determination of
tack of paste inks and vehicles by a rotary
tackmeter**

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*Technologie graphique — Détermination de la consistance des encres et
excipients projetés à l'aide d'un consistomètre rotatif*

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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.

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.

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Introduction

The tack value is a well-established criterion for assessing a paste ink or vehicle, although the parameter tack is poorly defined. The tack cannot be regarded as a material property that can be derived from basic physical phenomena. However, the tack may predict in some cases the behaviour of ink in a printing press.

Parameters that affect tack are:

- dimensions, hardness and elasticity parameters of elastomeric rollers;
- surface properties of rollers;
- nip pressure;
- roller speed;
- the temperature of rollers and environment;
- the temperature of the sample;
- the ink film thickness;
- influence of the ink or vehicle on the properties of the elastomeric rollers (e.g. absorption of solvents);
- the condition of the elastomeric rollers due to the cleaning process;
- the condition of the elastomeric rollers due to long-term use;
- the properties of the test sample.

Respecting all differences, this International Standard is a guideline so that users of comparable equipment obtain comparable results when working under the same conditions. This International Standard cannot replace the technical manuals.

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Graphic technology — Determination of tack of paste inks and vehicles by a rotary tackmeter

1 Scope

This International Standard specifies the procedure for determining the tack value of paste inks and vehicles which have low volatility and are unreactive under normal room conditions during the time span required for testing.

This International Standard contains a basic description of the rotary tackmeters most commonly used.

2 Definition

For the purposes of this International Standard, the following definition applies.

2.1 tack: Restoring force between two rotating rollers of a given width caused by the splitting of an ink or vehicle film on the roller surfaces.

NOTES

- 1 Tack is a rheological parameter indicative of internal cohesion and other physical/chemical properties of the fluid.
- 2 The term "apparent tack" is deprecated because all tack values are instrument specific by nature.

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3 Test method

3.1 Principle

A rotary tackmeter consists of a roller system of at least 3 rollers. One roller is driven by a motor while another is connected to a sensor measuring the force at which the roller is displaced from its equilibrium position. The third is an oscillating roller used for sample distribution. Measurement of the restoring force induced by the splitting of the ink or vehicle film provides an instrument-specific value of tack.

3.2 Apparatus

The apparatus used for the test shall include:

- rotary tackmeter; ¹⁾

- 1) The following are examples of suitable tackmeters available commercially (in alphabetical order):
- Betta Tech 2000;
 - Prüfbau Inkomat;
 - Prüfbau Tackomat;
 - Tack-o-scope;
 - Thwing-Albert Inkometer;
 - Toyoseiki Inkograph.

This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this (these) product(s).

- ink pipette suitable for measuring the sample volume with an accuracy of $\pm 1\%$;
- thermostat to control the roller temperature to $\pm 0,2\text{ }^{\circ}\text{C}$;
- stopwatch or timer;
- washing agent; the washing agent shall not change the conditioning of the elastomeric rollers;
- calibratory equipment;
- x/t recorder, optional.

3.3 Temperature

The test shall be carried out under a room temperature of $(23 \pm 2)\text{ }^{\circ}\text{C}$.

The test shall be performed at constant instrument temperature. Widely used thermostat settings are $30\text{ }^{\circ}\text{C}$ or $32\text{ }^{\circ}\text{C}$.

3.4 Conditioning of the tackmeter

After installation or when new rollers are installed, the elastomeric rollers need to be stabilized before use by repeated runs with material of the type to be tested. These runs shall be repeated until tests of a reference ink or vehicle show consistent results.

In normal use with properly stabilized rollers the tackmeter shall be conditioned by a preliminary run using ink or vehicle of the same type to be tested.

If the ink or vehicle to be tested affects the roller material (e.g. radiation curable inks) separate sets of dedicated rollers shall be used.

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3.5 Calibration

Before regular use, the tackmeter shall be calibrated according to the manufacturer's instructions. Additionally, a routine test is recommended using an internal standard ink or vehicle with known performance.

3.6 Preparation for testing

The sample shall be homogenous and it shall not contain any coarse particles.

3.7 Test procedure

A measured amount of ink or vehicle shall be evenly distributed on the tackmeter rollers using an ink pipette. The amount of ink or vehicle to be applied should be in accordance with the manufacturer's recommendations.

NOTE — These amounts result in an optimum ink film thickness for the respective instruments. The following amounts are recommended by the manufacturers, they yield an ink film thickness from $4\text{ }\mu\text{m}$ to $13\text{ }\mu\text{m}$.

Tackmeter	ml
Betta Tech 2000	1,00
Prüfbau Inkomat	1,00
Prüfbau Tackomat	0,55
Tack-o-scope	0,30
Thwing-Albert Inkometer	1,32
Toyoseiki Inkograph	1,31

The test sample shall be distributed at low speed for 30 s.

After having switched to measuring speed, a first tack reading shall be taken as soon as the roller speed is stable. A second reading shall be taken after one minute of running.

3.8 Cleaning

After testing, the roller system and the pipette shall be cleaned immediately with appropriate cleaning agents.

NOTE — The ink or vehicle is removed from the roller surface by a solvent-dampened wiper folded tightly and held tightly against the driven roller or roller nip while running the tackmeter at low speed. When cleaning high tack inks or vehicles from the rollers it is recommended to dispense a small amount of solvent onto the rollers beforehand. This procedure may be repeated if necessary to remove most of the material. The machine is stopped and then wiped gently to remove ink or vehicle and excess solvent from all rollers.

The instrument shall be run at low speed for at least three minutes before another sample is tested.

4 Report

The test report shall include the following information:

- Sample designation;
- Tack data;
- Room temperature;
- Thermostat temperature;
- Type of tackmeter;
- Amount of ink or vehicle used and/or film thickness;
- Roller surface speed in metres per minute or revolutions per minute;
- Period for sample distribution (if not 30 s);
- Periods at which readings are taken;
- Report of non-standard test conditions;
- Date of testing;
- Operator.

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