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**Binders for paints and varnishes —  
Determination of softening point —**

Part 1:  
**Ring-and-ball method**

*Liants pour peintures et vernis — Détermination du point de ramollissement —*

*Partie 1: Méthode de l'anneau et de la bille*



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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 of 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 35, *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).

This second edition cancels and replaces the first edition (ISO 4625-1:2004), which has been technically revised. The main changes compared to the previous edition are as follows:

- the automated method has been classified to be the reference method;
- an introduction with information on all three methods described in the three parts of ISO 4625 series has been added;
- CAS-numbers have been added to the chemicals used;
- the text has been editorially revised;
- the normative references have been updated.

A list of all parts in the ISO 4625 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](http://www.iso.org/members.html).

## Introduction

The ISO 4625 series specifies three widely used procedures for the measurement of the softening point of rosin-based resins. This document presents the ring-and-ball method, which has been the accepted standard for many years. ISO 4625-2 presents the Mettler cup-and-ball method. A new method, called the Mettler method without the ball, is to be presented in a future document.

This document is still the only standard test method accepted in regulatory documents such as Title 21 of the Code of Federal Regulations (CFR) – Food and Drugs.

Other parts of the ISO 4625 series concern Mettler cup-and-ball methods. Although the recommended testing conditions differ, the only difference between the equipment required in such methods is that Mettler method without the ball does not use a ball. Surveys have shown that the Mettler cup-and-ball method specified in ISO 4625-2 is the most widely used in the USA, while the Mettler method without the ball is the most widely used in Europe. These methods are less time consuming than the ring-and-ball manual method and the equipment is less expensive than the ring-and-ball automated method.

As a consequence of the thermoplastic nature of the test resins, the softening points obtained using the recommended test conditions for all three methods are not generally the same. Consequently, the test method and the testing conditions used should be noted in the final report.



# Binders for paints and varnishes — Determination of softening point —

## Part 1: Ring-and-ball method

### 1 Scope

This document specifies the test methods for determining the softening point of resins (including rosin) and similar materials by means of ring-and-ball apparatus.

Both manual and automated methods are specified, the automated method being the reference method.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

IEC 60751, *Industrial platinum resistance thermometer and platinum temperature sensors*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **softening point**

temperature at which a disc of sample held within a horizontal ring is forced downward a distance of 25 mm under the weight of a steel ball as the disc is heated at a prescribed rate in a water, glycerol, silicone oil, ethylene glycol/water or glycerol/water bath

### 4 Principle

In general, with materials of the types mentioned in [Clause 1](#), softening does not take place at a definite temperature. As the temperature rises, these materials gradually change from brittle or exceedingly thick and slow-flowing materials to softer and less viscous liquids. For this reason, the determination of the softening point shall be made by a fixed, closely defined method if the results obtained are to be comparable.

For the purpose of these test methods, the definition of softening point given in [Clause 3](#) applies.