

**Paints and varnishes - Determination of the percentage volume of non-volatile matter - Part 1: Method using a coated test panel to determine non-volatile matter and to determine dry film density by the Archimedes principle (ISO 3233-1:2013)**

## EESTI STANDARDI EESSÕNA

See Eesti standard EVS-EN ISO 3233-1:2013 sisaldab Euroopa standardi EN ISO 3233-1:2013 ingliskeelset teksti.

Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.

Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 16.01.2013.

Standard on kättesaadav Eesti Standardikeskusest.

## NATIONAL FOREWORD

This Estonian standard EVS-EN ISO 3233-1:2013 consists of the English text of the European standard EN ISO 3233-1:2013.

This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.

Date of Availability of the European standard is 16.01.2013.

The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 87.040

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English Version

Paints and varnishes - Determination of the percentage volume of non-volatile matter - Part 1: Method using a coated test panel to determine non-volatile matter and to determine dry film density by the Archimedes principle (ISO 3233-1:2013)

Peintures et vernis - Détermination du pourcentage en volume de matière non volatile - Partie 1: Méthode utilisant un panneau d'essai revêtu pour déterminer la matière non volatile et pour déterminer la masse volumique du feuil sec par le principe d'Archimède (ISO 3233-1:2013)

Beschichtungsstoffe - Bestimmung des Volumens nichtflüchtiger Anteile durch Bestimmung der Trockenfilmdichte (ISO 3233-1:2013)

This European Standard was approved by CEN on 28 December 2012.

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## Foreword

This document (EN ISO 3233-1:2013) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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### Endorsement notice

The text of ISO 3233-1:2013 has been approved by CEN as a EN ISO 3233-1:2013 without any modification.

# Contents

Page

Foreword .....	iv
Introduction .....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Principle .....	2
5 Apparatus and reagents .....	2
6 Sampling .....	5
7 Procedure .....	5
7.1 Number of determinations and preparation .....	5
7.2 Choice of receptacle .....	5
7.3 Determination of volume of uncoated receptacle .....	5
7.4 Application .....	6
7.5 Determination of volume of dry coating .....	7
7.6 Determination of density of the liquid coating material .....	7
8 Calculation .....	7
8.1 Calculation of the practical dry-film density, non-volatile-matter content and non-volatile matter by volume .....	7
8.2 Calculation of the spreading rate .....	8
9 Precision .....	8
9.1 Repeatability limit .....	8
9.2 Reproducibility limit .....	9
10 Test report .....	9
Annex A (informative) Examples of test conditions .....	10
Annex B (informative) Overview of the existing methods for determination of non-volatile-matter content and volume of non-volatile matter .....	11
Bibliography .....	12

## Introduction

This method is used to measure the density and to determine the volume of a dry coating obtainable from a given volume of liquid paint. This volume is considered to be the most meaningful measure of the coverage (area of surface covered at a specified dry-film thickness per unit volume) of a paint, varnish or related product. The value obtained by this method might not be the same as that calculated on the basis of the addition of masses and volumes of the raw materials in a formulation. The volume occupied by a combination of resin and solvent can be the same as, greater than or less than the combined volume of the separate components, due to contraction or expansion of the resin and solvent. A second factor affecting the volume of a dry coating formulation is the degree to which the spaces between pigment particles are filled with binder. A third factor is the use of volatile components in reactive systems that, by their reaction, change into non-volatile film-building materials, i.e. amines and reactive solvents in high-build two-component coating materials.

Above and close to the critical pigment volume concentration, the volume of a dry paint film is greater than the theoretical volume, due to an increase in unfilled voids between pigment particles. The porosity of the film means that this method is unsuitable.

The values obtained for the non-volatile matter by volume are dependent on the temperature and time of heating, and these conditions should be carefully considered for the material being tested.

# Paints and varnishes — Determination of the percentage volume of non-volatile matter —

## Part 1:

## Method using a coated test panel to determine non-volatile matter and to determine dry film density by the Archimedes principle

### 1 Scope

This part of ISO 3233 describes a procedure for determining the non-volatile matter by volume,  $NV_V$ , of coating materials and related products by measuring the density of a dried coating for any specified temperature range and period of drying or curing. This method determines the non-volatile matter immediately after application.

Using the non-volatile matter by volume results obtained in accordance with this part of ISO 3233, it is possible to calculate the spreading rate of coating materials.

The method specified in this part of ISO 3233 is the preferred method for air-drying materials. Its use for other materials still has to be tested.

This part of ISO 3233 is not applicable to coating materials in which the critical pigment volume concentration is exceeded.

### 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 referenced document (including any amendments) applies.

ISO 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method*

ISO 2811-2, *Paints and varnishes — Determination of density — Part 2: Immersed body (plummet) method*

ISO 2811-3, *Paints and varnishes — Determination of density — Part 3: Oscillation method*

ISO 2811-4, *Paints and varnishes — Determination of density — Part 4: Pressure cup method*

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

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