BRITISH STANDARD

BS EN ISO
8130-2:2010
Incorporating corrigendum April 2011

Coating powders — Part 2: Determination of density by gas comparison pyknometer (referee method) (ISO 8130-2:1992)

ICS 87.040

National foreword

This British Standard is the UK implementation of EN ISO 8130-2:2010. It is identical to ISO 8130-2:1992. It supersedes BS 3900-J6:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee STI/10, Test methods for paints.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Pigments, Paints and Varnishes Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 April 1993

The following BSI references relate to the work on this standard:
Committee reference PVC/10
Draft for comment 88/54511 DC

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Amendments/corrigenda issued since publication

Date	Comments
30 April 2011	This corrigendum renumbers BS 3900-J6:1993 as BS EN ISO 8130-2:2010

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 8130-2

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ICS 87.040

English Version

Coating powders - Part 2: Determination of density by gas comparison pyknometer (referee method) (ISO 8130-2:1992)

Poudres pour revêtement - Partie 2: Détermination de la masse volumique à l'aide d'un pycnomètre à gaz (méthode de référence) (ISO 8130-2:1992)

Pulverlacke - Teil 2: Bestimmung der Dichte mit einem Gasvergleichspyknometer (Schiedsverfarhen) (ISO 8130-2:1992)

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Ref. No. EN ISO 8130-2:2010: E

Foreword

The text of ISO 8130-2:1992 has been prepared by Technical Committee ISO/TC 35 “Paints and varnishes” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 8130-2:2010 by 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 May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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Endorsement notice

The text of ISO 8130-2:1992 has been approved by CEN as a EN ISO 8130-2:2010 without any modification.

1 Scope

This part of ISO 8130 specifies a method for the determination of the density of coating powders using a gas comparison pyknometer. It can be used for all types of coating powder, is simple to carry out, but requires more expensive instrumentation than is often used for density determinations.

The density of coating powders can also be determined using the liquid displacement pyknometer method described in ISO 8130-3. The apparatus is relatively inexpensive, but the liquid displacement pyknometer method is liable to give erroneous results, particularly if the powder swells in contact with the displacement liquid used or the displacement liquid does not totally displace the air between the powder particles. The liquid displacement method is much slower in execution, less accurate and is only to be used if it can be shown that the same results will be obtained as for the gas comparison pyknometer method.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 8130. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8130 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 842:1984, *Raw materials for paints and varnishes — Sampling.*

3 Principle

The volume of a weighed test portion is determined by measuring the volume of gas displaced within a receptacle when the test portion is introduced. This is achieved by equalizing the pressure difference which arises due to the displacement of the gas. The density is then calculated from the mass and the volume of the test portion.

4 Material

4.1 Air or, if desired, **helium**, commercial grade, in a steel cylinder.

Other gases may be used provided that the product under test is not affected and this deviation from the method is noted in the test report.

5 Apparatus

5.1 *Gas comparison pyknometer*, for the manual or automatic determination of the density, complying with the requirements given below.

The essential design of a typical gas comparison pyknometer using air as the medium is outlined in Figure 1. It consists of two cylinders (A and B) with pistons of exactly equal dimensions. The cylinders are connected by a valve and a pressure difference meter. The test portion, contained in a 50 ml beaker, is placed in cylinder B. Both pistons are moved by an equal amount which results in a pressure difference between cylinders A and B. The measuring piston in cylinder B is then moved again to re-establish equal pressure. The resulting volume change, which is equivalent to the volume of the test portion, is read from the scale.

The swept volumes of the cylinders shall be measured and shown to be equal to within 0,5 % (relative). The intervals in the scale showing the measured volume shall not be greater than 1 % of the measured volume. The scale calibration shall be checked by placing reference standards, of known volume and traceability, in the apparatus. The use of two different volumes is sufficient for routine checks, but at least five different volumes shall be used for the initial calibrations to show that the scale is linear over the whole of its range.

NOTE 1 Suitable gas comparison pyknometers are available from several manufacturers.

6 Sampling

Take a representative sample of the product to be tested, as described in ISO 842.

7 Procedure

Carry out the determination in duplicate at (23 ± 1) °C and, where applicable, at a relative humidity of (50 ± 5) %.

Adjust the apparatus in accordance with the manufacturer's instructions, in particular to allow for the volume of the beaker material. Check the apparatus to ensure that there are no leaks.

Weigh the sample beaker to the nearest 1 mg and fill it almost to the brim with the product under test, making sure that no powder is on the outside walls of the beaker. Weigh the beaker plus contents to the nearest 1 mg to determine the mass (m) of the test portion.

Place the beaker and contents in the apparatus and determine the volume of the test portion by following the instructions given by the manufacturer of the apparatus. Repeat the volume measurement in order to ensure that the reading is consistent and calculate the mean (V) of the two volumes.

NOTE 2 If the gas is dry, a slight change in density may be observed due to the drying of the test portion.

If the two readings differ by more than 2 %, disregard the results.

8 Expression of results

8.1 Calculation

Calculate the density ϱ_p, in grams per millilitre, of the coating powder at 23 °C, using the equation:

$$\varrho_P = \frac{m}{V}$$

where

m is the mass, in grams, of the test portion;

V is the volume, in millilitres, of the test portion.

If the two determinations differ by more than 0,04 g/ml, repeat the procedure described in clause **7**.

Calculate the mean of two valid determinations and report the result to the nearest 0,01 g/ml.

8.2 Precision

No precision data are currently available.

9 Test report

The test report shall contain at least the following information;

a) all details necessary to identify the product tested;

b) a reference to this part of ISO 8130 (ISO 8130-2);

c) the type of gas comparison pyknometer and the gas used;

d) the result of the test (individual values and mean value);

e) any deviation from the test method specified;

f) the date of the test.

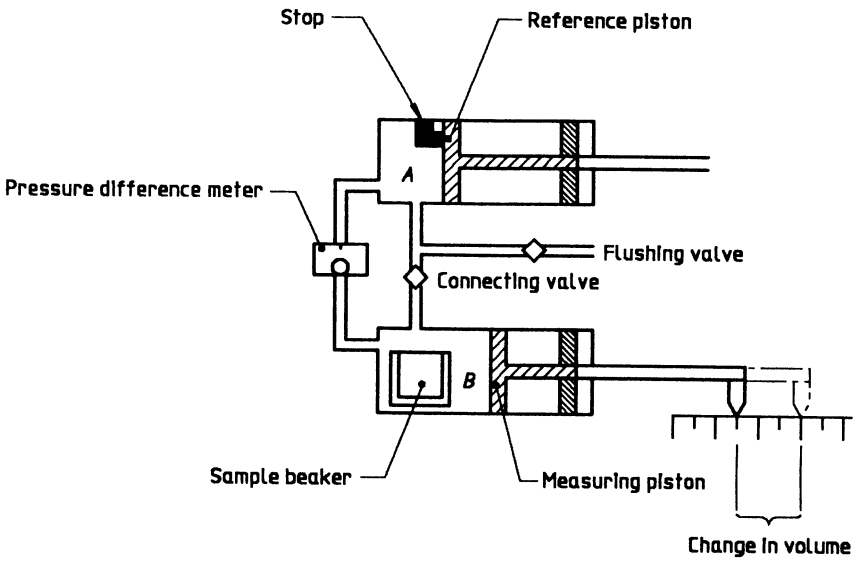

Figure 1 — Example of a gas comparison pyknometer

List of references

See national foreword.

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