

भारतीय मानक मसौदा  
कागज़ और संबद्ध उत्पादों के लिए नमूना चयन और परीक्षण  
की पद्धतियाँ

भाग 8 — कागज़, बोर्ड, लुगदी और सेलूलोज़ नैनोमटेरियल्स के लिए परीक्षण  
पद्धतियाँ

अनुभाग 2 — 900 °सेल्सियस पर भष्म अवशेष (राख की मात्रा) का निर्धारण

*Draft Indian Standard*

**Methods of Sampling and Test for Paper and Allied  
Products**

Part 8 — Methods of Test for Paper, Board, Pulps and cellulose  
nanomaterials

Section 2 — Determination of residue (ash content) on ignition at 900 °C

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ICS 85.060

Paper and its Products Sectional  
Committee, CHD 15

Last date of comments: 13<sup>th</sup> September  
2024

NATIONAL FOREWORD

(formal clauses to be added later)

The magnitude of the residue (ash content) on ignition at a given temperature is related to, but not equal to, the content of mineral constituents in the sample of paper, board, pulp and cellulose nano-materials.

In samples containing calcium carbonate, there is practically no decomposition of carbonate by ashing at 525 °C. Other fillers and pigments such as clay and titanium dioxide are also unaffected by ashing at 525 °C. Therefore, the residue on ignition at 525 °C provides a good estimate of the total inorganic matter in the sample, provided that the sample does not contain other minerals (such as magnesium carbonate and calcium sulfate) which decompose at or below this temperature.

Generally, as a preliminary step, determination of residue (ash content) on ignition at 525 °C of sample is carried out. Subsequently, for inorganic materials such as China Clay and calcium carbonate, the residue on ignition at 900 °C is determined. These determinations are used as screening test for checking the overall quality of products and determining particular mineral constituents.

This standard covers determination of residue (ash content) in samples of paper, board, pulp and cellulose nano-materials on ignition at 900 °C. A separate standard is being published for determination of residue (ash content) in these samples on ignition at 525 °C.

ISO has published test method standards related to paper, pulp and board under three broad categories namely 'Paper, board and pulps', 'Paper and board' and 'Pulps'. Related Indian Standards published in IS 1060 (Parts 1, 2 and 3) 'Methods of sampling and test for paper and allied products' and IS 6213 series of standards published for 'Methods of test for pulps' are widely recognized and used in India. To maintain consistency with the prevailing international practices and to retain the existing test methods series, the committee responsible for formulating this standard decided to harmonize the methods of tests prescribed in IS 1060 series and IS 6213 series with those published by ISO and publish these adopted test methods standards in subsequent parts/ sections of IS 1060 series or IS 6213 series.

Related Indian Standards on methods of test have been published in the following other parts of IS 1060 series on 'Methods of sampling and test for paper and allied products':

Part 4 Methods of test for paper, board and pulp

Part 5 Methods of test for paper and board

Part 6 Methods of test for paper

Part 7 Methods of test for board

This standard is being published as Part 8 'Methods of test for paper, board, pulps and cellulose nanomaterial' of IS 1060 series. This Section of IS 1060 (Part 8) describes the

determination of the residue (ash content) on ignition of paper, board, pulps and cellulose nanomaterials at 900 °C in all types of paper, board, pulp and cellulose nanomaterial samples. Other sections of IS 1060 (Part 8) that are being formulated are:

- |       |   |
|-------|---|
| Sec 1 | Determination of residue (ash content) on ignition at 525 °C<br>CHD 15 (25952) WC   |
| Sec 3 | Determination of acid-soluble magnesium, calcium, manganese, iron, copper, sodium and potassium<br>CHD 15 (25971) WC          |
| Sec 4 | Determination of dry matter content by oven-drying method —<br>Materials in solid form<br>(Under development)                 |
| Sec 5 | Determination of dry matter content by oven-drying method —<br>Suspensions of cellulosic nanomaterials<br>(Under development) |

This test method was originally included in IS 1060 (Part 1) which was published in 1956 and subsequently revised in 1966, prescribing the incineration temperature as  $(800 \pm 25)$  °C. During the formulation and revision of this test method due weightage was given to the then existing International Standards. In 2018, the committee decided to align this test method with ISO 2144:2015 wherein the ignition temperature was prescribed as  $(900 \pm 25)$  °C. As standards related to methods of test for paper, board and pulp were published in IS 1060 (Part 4) series, this test method was published as a separate standard i.e. IS 1060 (Part 4/Sec 3) : 2018 'Methods of sampling and test for paper and allied products Part 4 Methods of test for paper, board and pulps Section 3 Determination of residue (ash) on ignition at 900 °C'.

ISO has further revised the standard in 2019 expanding the title and scope to cover cellulose nanomaterial as well. Recognizing the benefits of following uniform practices globally, the committee has decided to adopt latest version of ISO 2144 and publish it as part of IS 1060 (Part 8) series, which provides methods of test for paper, board, pulp and cellulose nanomaterial, superseding ISO 1060 (Part 4/Sec 3) : 2018.

The current ISO Standard has the following modifications from its previous version:

- a) The scope has been changed to cover also cellulose nanomaterials instead of only paper, board and pulps;
- b) A definition of cellulose nanomaterial, along with additional instructions for sampling, sample preparation, and incineration for cellulose nanomaterials have been incorporated; and

- c) Additional instructions are given on how to express results when a sample has low ash content.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 186 Paper and board — Sampling to determine average quality	IS 1060 (Part 5/Sec 1) : 2014/ISO 186 : 2002 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 1 Sampling to determine average quality.	Identical
ISO 287 Paper and board — Determination of moisture content of a lot — Oven-drying method	IS 1060 (Part 5/Sec 2) : 2021/ISO 287 : 2017 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 2 Determination of moisture content of a lot — Oven-drying method ( <i>first revision</i> ).	Identical
ISO 638 Paper, board and pulps — Determination of dry matter content — Oven-drying method	IS 6213 (Part 21) : 2019/ISO 638 : 2008 Methods of test for pulp: Part 21 Paper, board and pulps — Determination of dry matter content — Oven-drying method ( <i>first revision</i> ).	Identical

The Committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
ISO 7213	Pulps — Sampling for testing

In this adopted standard, reference appears to certain International Standards where the standard atmospheric conditions to be observed are stipulated which are not applicable to tropical/subtropical countries. The applicable standard atmospheric conditions for Indian conditions are  $(27 \pm 2)$  °C and  $(65 \pm 5)$  percent relative humidity and shall be observed while using this standard.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.

**'FOR COMPLETE TEXT OF THE DOCUMENT, KINDLY REFER ISO 2144 : 2019**

**Note:** The technical content of the document has not been enclosed as these are identical with the corresponding ISO Standard. For obtaining the copy of the complete ISO Standard, please contact:

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