भारतीय मानक मसौदा
लुगदी के लिए परिक्षण पद्धतियां
भाग 6 लुगदी का तांबा संख्या

(*IS 6213 (part 6) का पहला पुनरीक्षण*)

Draft Indian Standard
METHODS OF TEST FOR PULP
PART 6 COPPER NUMBER OF PULP

(*First revision of IS 6213 (part 6)*)

ICS 85.040

Paper and Paper Products Sectional Committee, CHD 15	Last date of comments: 24 August 2025

FOREWORD

(Formal clauses shall be added later)

For obtaining good quality of paper, it is essential that the pulp which goes into the manufacture of paper is properly cooked and bleached. Copper number may be regarded as the index of the reducing groups of cellulose, sugars and impurities possessing reducing properties present in the pulp. As the hydrolyzed or oxidized cellulose is capable of reducing certain metallic ions like copper to lower valence states, the reaction of this type has served to detect damage to cellulose and to estimate the quantity of reducing groups.

This standard was originally published in 1971, in order to provide guidance to the people working in pulp and paper mills regarding the methods to be adopted for analysis of pulp. In this revision, the following modifications have been incorporated –

a) References clause have been updated.

b) ICS code has been updated.

c) Certain editorial modifications have been incorporated.

Further, the standard has been updated to reflect the latest format and style of Indian Standards.

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*)’.

Draft Indian Standard

METHODS OF TEST FOR PULP
PART 6 COPPER NUMBER OF PULP

1 SCOPE

This standard (Part 6) describes the procedure for determination of copper number of bleached and purified pulps.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TERMINOLOGY

For the purpose of this standard, the definition of terms given in IS 4661 (Part 2) and the following shall apply.

3.1 Copper Number - The number of grams of metallic copper in cuprous oxide resulting from the reduction of copper sulphate by 100 g of cellulose pulp fibres.

4 REAGENTS

Unless otherwise specified, pure chemicals and distilled water (*see* IS 1070), freshly boiled and cooled, shall be employed in the tests.

NOTE – 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

4.1 Solution A-Dissolve 60 g of copper sulphate ($CuSO_4.5H_2O$) in one litre of distilled water.

4.2 Solution B – Dissolve 200 g of sodium potassium tartrate and 100 g of sodium hydroxide in one litre of distilled water.

4.3 Solution C – Take 50 g of anhydrous ferric sulphate add to it 200 ml of distilled water and 100 ml of concentrated sulphuric acid of specific gravity 1.64. Warm the mixture till it clears and then make the volume to one litre with distilled water. Before using the solution add a little potassium permanganate solution drop by drop till a faint pink colour appears.

4.4 Potassium Permanganate Solution – 0.1 N.

5 PROCEDURE

In a 250 ml beaker, take 20 ml of solution A and 20 ml of solution B. Suitably disintegrate a representative sample of the pulp. Determine the moisture content of a portion. Weigh a sample of the pulp equivalent to 1 g ± 0.02 g of oven dry pulp. Warm the solution in the beaker and add the pulp when it just starts boiling. Allow the contents of the beaker to boil exactly for 3 minutes. Remove the beaker from the heater and dilute the contents with hot distilled water. Filter the contents of the beaker through a quartz glass crucible and wash with hot distilled water (about one litre). Finally wash with cold distilled water and throw away the washings. Dissolve the copper deposited on the sample in freshly prepared ferric sulphate solution C

(about 25 ml). Finally wash with 500 ml of distilled water. Titrate the filtrate with 0.1 N potassium permanganate solution to a faint pink colour.

6 CALCULATION

Copper number = $\frac{6.36 \times V \times N}{W}$

where

V = volume of potassium permanganate solution required for titration, in ml.

N = normality of potassium permanganate solution, and

W = weight of oven dry sample of pulp, in g.

ANNEX A
(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 1070 : 2023	Reagent grade water – Specification (*fourth revision*)
IS 4661 (Part 2) : 2022/ ISO 4046-2 : 2016	Paper board pulps and related terms — Vocabulary: Part 2 Pulping terminology (*third revision*)