

IS 13953 : 1994

(Reaffirmed 2014)

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भारतीय मानक

खाँडसारी — विशिष्टि

Indian Standard

KHANDSARI — SPECIFICATION

UDC 664.14 KHA

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1994

Sugar Industry Sectional Committee, FAD 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalised by the Sugar Industry Sectional Committee had been approved by the Food and Agriculture Division Council.

Khandsari is obtained from sugarcane juice using open pans for concentration and clarified either using natural clarificants (*Desi Khandsari*) or sulphur (*sulphur Khandsari*).

Khandsari is used for human consumption and for other purposes. It is estimated that more than 85 percent of *Khandsari* is used for direct human consumption.

The quality and chemical composition of *Khandsari* produced in different regions of the country varies widely due to manufacturing techniques.

In absence of any prescribed standards, the manufacturers may produce *Khandsari* of varying quality. Precise grade specification are also needed for export purposes, as and when required/needed. It is, therefore, felt that this standard will go a long way in helping the industry in manufacturing *Khandsari* of a good quality.

In the preparation of this standard, due consideration has been given to the relevant Rules prescribed by the Government of India, under the *Prevention of Food Adulteration Act, 1954* and *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*. The standard is, however, subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

KHANDSARI — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for *Khandsari*.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard.

IS No.	Title
1943 : 1964	Specification for A-twill jute bags (revised)
5982 : 1970	Specification for plantation white sugar for identification from other sugars

3 TYPES AND GRADES

3.1 Types

Khandsari shall be of the following types:

Khandsari (Desi) — *Khandsari* obtained from sugarcane juice using open pans for concentration and clarified using natural clarificants.

Khandsari (sulphur) — *Khandsari* obtained from sugarcane juice using open pans for concentration and clarified using sulphur.

3.2 Grades

Khandsari (sulphur) shall be of two grades, namely Grade 1 and Grade 2.

4 REQUIREMENTS

4.1 Description

4.1.1 *Khandsari* shall be manufactured in crystalline or in powdered form.

4.2 *Khandsari* shall be white or yellowish white in colour.

4.3 *Khandsari* shall be sweet to taste.

4.4 *Khandsari* shall be free from any added colouring matter, extraneous matter and substances deleterious to health. It shall also be free from iron filings.

4.5 *Khandsari* shall also comply with the requirements given in Table 1.

Table 1 Requirements for *Khandsari*
(Clause 4.5)

Sl No.	Characteristics	Requirements			Method of Test, Ref to	
		<i>Khandsari Desi</i>	<i>Khandsari Sulphur</i>		Annex of this Standard	Appendix of IS 5982 : 1970
(1)	(2)	(3)	Grade 1	Grade 2	(6)	(7)
i)	Moisture, percent by mass, <i>Max</i>	0.5	0.3	0.5	—	A
ii)	Pol percent, <i>Min</i>	96.0	97.5	96.5	—	B
iii)	Sulphur dioxide, (on dry basis), mg/kg, <i>Max</i>	Nil	70	70	—	E
iv)	Acid insoluble ash (on dry basis), percent by mass, <i>Max</i>	0.7	0.3	0.5	A	—
v)	Calcium oxide (CaO), mg/100 g, <i>Max</i>	100	100	100	—	F
vi)	Specific conductivity (mhos/cm ² × 10 ⁶), in 5 percent solution at 30°C, <i>Max</i>	100	—	300	—	D

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5 PACKING AND MARKING

5.1 Packing

Khandsari shall be packed in clean, sound and new A-twill jute bags conforming to IS 1943 : 1964 or polythene lined jute bags or polythene lined woven HDPE bags of food grade quality.

5.2 Marking

Each bag shall be suitably marked so as to give the following information:

- Name of the material;
- Type of *Khandsari*, *Desi* or sulphur;
- Grade of sulphur *Khandsari*;
- Name and address of manufacturer;
- Net mass of *Khandsari*; and
- Season of manufacture.

6 SAMPLING

6.1 Sampling shall be done as agreed to between the purchaser and the supplier.

ANNEX A

[Table 1, Sl No. (iv)]

DETERMINATION OF ACID INSOLUBLE ASH

A-1 REAGENT

A-1.1 Dilute Hydrochloric Acid

Approximately 5 N (prepared from concentrated hydrochloric acid).

A-2 PROCEDURE

A-2.1 Weigh accurately about 5 g of the sample in a tared, clean and dry platinum dish of 100 ml capacity. Carbonize the material in the dish with the flame of a burner. Complete the ignition by keeping in a muffle furnace at $550 \pm 25^\circ\text{C}$ until grey ash results. Cool in a desiccator. To the ash, add 25 ml of the dilute hydrochloric acid, cover with a watch glass and heat on a small flame of a burner to near boiling. Allow to cool and filter the contents of dish through Whatman filter paper No. 42 or its equivalent. Wash the filter paper with hot water

until the washings are free from chlorides. Return the filter paper and the residue to the dish. Keep it in an air-oven maintained at $105 \pm 2^\circ\text{C}$ for about 3 hours. Ignite in the muffle furnace at $550 \pm 25^\circ\text{C}$ for one hour. Cool the dish in a desiccator and weigh. Heat again for 30 minutes in a muffle furnace, cool and weigh. Repeat this process of heating for 30 minutes, cooling and weighing is less than one milligram. Note the lowest mass.

A-3 CALCULATION

A-3.1 Acid insoluble ash,

$$\text{percent by mass} = \frac{100 M_1}{M_2}$$

where

M_1 = Mass, in g, of the acid insoluble ash; and

M_2 = Mass, in g, of the sample taken for the test.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Reprography Unit, BIS, New Delhi, India

**AMENDMENT NO. 1 JULY 2002
TO
IS 13953 : 1994 KHANDSARI — SPECIFICATION**

(*Page 2, clause 5.2*) — Insert the following clause after 5.2:

‘ 5.2.1 *BIS Certification Marking*

The product may also be marked with the Standard Mark.

5.2.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.’

(FAD 2)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 FEBRUARY 2013
TO
IS 13953 : 1994 *KHANDSARI* — SPECIFICATION

(Page 1, Table 1) — Substitute the following for the existing table:

Table 1 Requirements for *Khandsari*
(Clause 4.5)

Sl No.	Characteristic	Requirement			Method of Test, Ref to	
		<i>Khandsari Desi</i>	<i>Khandsari Sulphur</i>		Annex of this Standard	Clause of IS15279 : 2003
			Grade 1	Grade 2		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Loss on drying, percent by mass, <i>Max</i>	0.5	0.3	0.5	—	4
ii)	Pol percent, <i>Min</i>	96.0	97.5	96.5	—	5
iii)	Sulphur dioxide (on, dry basis) ppm, <i>Max</i>	Nil	70	70	—	13
iv)	Acid insoluble ash, (on dry basis), percent by mass, <i>Max</i>	0.7	0.3	0.5	A	—
v)	Calcium oxide (CaO), mg/100 g, <i>Max</i>	100	100	100	B	—
vi)	Specific conductivity (mhos/cm ² × 10 ⁶), in 5 percent solution at 30° C, <i>Max</i>	100	—	300	C	—

[Page 2, clause 5.2 (e)] — Substitute ‘Net quantity’ for ‘Net mass’.

[Page 2, clause 5.2 (f)] — Insert the following after Sl No. (f):

‘(g) Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules, 2011* and *Food Safety & Standards (Packaging and Labelling) regulation, 2011*.’

(Page 2, clause A-3.1) — Insert the following ‘Annex B and Annex C’ at the end:

Amendment No. 2 to IS 13953 : 1994

ANNEX B
[Table 1, Sl No. (v)]
DETERMINATION OF CALCIUM OXIDE (CaO) CONTENT

B-1 APPARATUS

B-1.1 Calibrated Brix Spindle

B-1.2 Brix Cylinder

B-1.3 Conical Flasks, of 250 ml capacity.

B-1.4 Beakers, of 100 or 250 ml capacity.

B-1.5 Funnels

B-1.6 Pipette, calibrated at 10 ml.

B-2 REAGENTS

B-2.1 EDTA solution (Disodium salt of ethylene diamine tetraacetic acid solution) — Weigh accurately 6.647 3 g of EDTA into a beaker; dissolve the same in distilled water and make up the solution to 1 000 ml to obtain exactly M/56 solution.

B-2.2 Ammonia Liquor

B-2.3 Lead Sub Acetate (Horne' Dry Lead)

B-2.4 Potassium Ferrocyanide Powder

B-2.5 Potassium Iodide

B-2.6 Eriochrome Black T — Weigh 0.1 g of Eriochrome Black T into a 100 ml volumetric flask and dissolve the same in rectified spirit or absolute alcohol. Make up the volume with the same solvent and use it as the indicator.

B-3 PROCEDURE

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B-3.1 Take the sugar sample as obtained from the factory and dilute to 15° Bx. Transfer about 150 ml of diluted solution into a conical flask. Clarify the solution by lead subacetate (Adding, if necessary some amount of active carbon). Transfer about 60 ml of the clarified solution into a dry conical flask or flask previously rinsed with the clarified solution. Add powdered potassium ferrocyanide little by little till no further precipitate forms. Shake thoroughly and filter. Test the filtrate with potassium iodide. Collect the lead free filtrate in a conical flask. Pipette out 10 ml of this filtrate into a clean conical flask previously rinsed with distilled water and dried. Add 5 to 6 drops of liquor ammonia and 4 to 5 drops of the indicator solution when a pink red colour appears. Titrate against EDTA solution shaking the contents of the flasks after every addition of EDTA solution. The end point is indicated by the sharp change of colour from red to blue. Note the volume of the titrant.

B-4 CALCULATION

Calcium oxide content, mg/100 g = $V \times 100$ mg/litre of juice or diluted solution.

ANNEX C

[Table 1, Sl No. (vi)]

DETERMINATION OF SPECIFIC CONDUCTIVITY

C-1 FIELD OF APPLICATION

The specific conductivity in solutions gives measure of the concentration of ions at a given temperature, present in solutions. This method is applicable to *khandsari*.

C-2 DEFINITION

C-2.1 Specific Conductivity — *Specific conduction is defined as the conducting power of all the ions present in 1 cm cube of homogeneous solution at a given temperature. As such it gives the conducting power of all the ions present in 1 cm³ of solution.*

C-3 PRINCIPLE

The Specific conductivity of *khandsari* solution at a concentration of 5g/100g is determined at 30°C.

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C-4 REAGENTS

C-4.1 Purified Water — For preparation of all solutions (*Khandsari* and potassium chloride) use twice-distilled or deionized water with a conductivity of less than 1 $\mu\text{S}/\text{cm}$.

C-4.2 Potassium Chloride (0.01 mol/L) — Weigh out 745.5 mg after first dehydrating by heating to 500°C (dull red heat). Dissolve in water in a 1 litre volumetric flask and make up to the mark.

C-4.3 Potassium Chloride (0.002 mol/L) — Dilute 10 ml of potassium chloride solution, 0.01 mol/L (*see C-4.2*) and make it up to the mark in a 500 ml volumetric flask. This solution has a conductivity of $26.6 \pm 0.3 \text{ S}/\text{cm}$ at 30°C (after deduction of the specific conductivity of the water used).

C-5 APPARTUS

C-5.1 Calibrated the Conductivity Meter, with help of solution of potassium chloride (*see C-4.2* and *C-4.3*) at 30°C.

C-5.2 Volumetric Flasks, 100,500 and 1000 ml

C-5.3 Pipettes, 10 ml, conforming to class A of IS 1117.

C-5.4 Analytical Balance, capable of weighing to the nearest 1.0 mg.

C-6 PROCEDURE

C-6.1 Dissolve 5.0 g of sugar in water (*see C-4.1*) in a 100 ml volumetric flask and make up to volume at 30°C.

C-6.2 After thorough mixing, transfer the solution into the measuring cell and measure the specific conductivity at 30°C. Check the measurement using the reference solution (*see C-4.3*).

C-7 EXPRESSION OF RESULT

Report the value of specific conductivity of *khandsari* at 30°C in the units of $\mu\text{S}/\text{cm}$

(FAD 2)

Reprography Unit, BIS, New Delhi, India