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भारतीय मानक मसौदा

काराँब बीन गम, खाद्य ग्रेड — विशिष्टि

(आइ एस 7237 का दूसरा पुनरीक्षण)

Draft Indian Standard

CAROB BEAN GUM, FOOD GRADE — SPECIFICATION

(Second Revision of IS 7237)

ICS No. 67.220.20

Food Additives Sectional Committee, FAD 08 **Last Date of Comments:** 15 February 2025

FOREWORD

(Formal clauses would be added later)

Food additives are added to improve the appearance, flavour, texture or storage properties, etc of the processed foods. As certain impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. A series of standards have, therefore, been prepared to cover purity and identification of these substances. These standards would help in checking purity, which is required to be checked at the stage of manufacture, for it is extremely difficult to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and national/ international bodies.

Use of gum as thickening agent and stabilizer has been permitted under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011*.

The standard was first published in 1974. In preparation of this standard, considerable amount of assistance was derived from the specifications for the identity and purity of some food colours, emulsifiers, stabilizers, anti-caking agents and certain other substances, FAO Nutrition Meetings Report Series No. 46B, WHO (Food Add/70.37, FAO), Rome; and Food Chemical Codex, Third Edition, National Academy of Sciences, National Research Council, Washington D.C., USA.

The standard was first revised in 1997 to incorporate the requirement of solubility to keep it in line with food chemical codex NRC; to provide the requirements for heavy metals, galactomannans and their test methods; and to provide 'directions for storage' and 'expiry/best before date' under marking clause.

January 2025

In this revision, one amendment issued to the previous version of the standard has been incorporated and the following major changes have been made:

- a) The nitrogen to protein conversion factor has been updated to keep it in line with JECFA Monograph (2016);
- b) The requirement for heavy metals has been removed as the limit of lead (contaminant in food colours) is already covered through the standard; and
- c) The marking requirements have been updated.

Synonym – Carob, Locust bean gum, St. John's bread, Algasoba

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 : 2022. 'Rules for rounding off numerical values (*second revision*)' This number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for carob bean gum, food grade.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provision 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 editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 1070 : 2023	Reagent grade water — Specification (<i>fourth revision</i>)
IS 1699 : 2024	Food colours - Methods of sampling and test (<i>third revision</i>)
IS 5194 : 1969	Method for determination of nitrogen — Kjeldahl method
IS 5402 (Part 1) : 2021	Microbiology of the food chain - Horizontal method for the enumeration of microorganisms - Part 1: Colony count at 30 C by the pour plate technique (<i>third revision</i>)
IS 16069 (Part 2) : 2013/ ISO 21527-2	Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of yeasts and moulds: Part 2 colony count technique in products with water activity less than or equal to 0.95
IS 16067 (Part 3) : 2023/ ISO 16649-3 : 2015	Microbiology of the food chain Horizontal method for the enumeration of beta glucuronidase positive <i>Escherichia coli</i> : Part 3 Detection and most probable number technique using 5-bromo-4-chloro-3- indolyl-D-glucuronide
IS 5887 (Part 3/Sec 1) : 2020/ ISO 6579-1 : 2017	Methods for detection of bacteria responsible for food poisoning: Part 3 Horizontal method for the detection, enumeration and serotyping of <i>Salmonella</i> : Section 1 Detection of <i>Salmonella</i> spp. (<i>third revision</i>)
IS 6795 : 2007	Acacia (Arabic) gum, food grade — Specification (<i>first revision</i>)

3 DESCRIPTION

3.1 Carob bean gum is obtained from the ground endosperms of *Ceratonia silioua* (L), *Tauh*, (Fam. Leguminosae). It consists chiefly of high molecular weight polysaccharides composed mainly of galactomannans.

3.2 Description

Carob bean gum is a white to yellowish white, nearly odourless powder.

3.3 Solubility

3.3.1 *Water* – Forms a solution in hot water.

3.3.2 *Ethanol* – Insoluble.

NOTE – The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity.

4 REQUIREMENTS

4.1 Identification Tests

4.1.1 A water solution of carob bean gum may be converted to a gel by the addition of small amounts of sodium borate.

4.1.2 Transfer 2 g sample into a 400 ml beaker, moisten it thoroughly with about 4 ml of isopropanol. add with vigorous stirring 200 ml of water and continue the stirring until the gum is completely and uniformly dispersed. An opalescent, slightly viscous solution is formed. Transfer 100 ml of the solution prepared as above into another 400 ml beaker. heat the mixture in a boiling water bath for about 10 minutes and then cool to room temperature. There is an appreciable increase in viscosity (differentiating from guar gum).

4.1.3 Identify sugars as indicated in Annex A. Only mannose and galactose are present.

4.1.4 Place some ground carob bean gum in an aqueous solution containing 0.5 percent iodine and 1 percent potassium iodide on a glass slide for microscopic examination. Carob bean meal contains long stretched tubiform cells. separate or slightly interspaced; their brown contents are much less regularly formed than in guar gum. (Guar gum shows close groups of round to pear formed cells; their contents are yellow to brown.)

4.2 The material shall also comply with the requirements given in Table 1.

Table 1 Requirements of Carob Bean Gum, Food Grade
(Clause 4.2)

Sl. No.	Characteristic	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Loss on drying, percent by mass, <i>Max</i>	14	IS 6795
ii)	Total ash, percent by mass, <i>Max</i>	1.2	IS 6795
iii)	Acid insoluble matter, percent by mass, <i>Max</i>	4	Annex A (A1)
iv)	Protein (N × 6.25), percent by mass, <i>Max</i>	7	Annex A (A2)
v)	Starch and dextrins	To pass the test	IS 6795
vi)	Tannin-bearing gum	To pass the test	IS 6795
vii)	Arsenic (as As), mg/kg, <i>Max</i>	3	IS 1699
viii)	Lead (as Pb), mg/kg, <i>Max</i>	2	IS 1699
ix)	Galactomanns, percent by mass, <i>Min</i> (<i>see</i> Note)	75	-

Note - The remainder, after subtracting from 100% the sum of the percentages of acid-insoluble matter, total ash, loss on drying and protein, represents the percentage of galactomanns in the sample.

4.3 Microbiological Specifications

4.3.1 Total Plate Count

The total plate count per gram of the product shall be not more than 5 000 when determined according to the method prescribed in IS 5402 (Part 1).

4.3.2 *Escherichia coli*

Escherichia coli per gram of the product shall be negative when determined according to the method prescribed in IS 16067 (Part 3).

4.3.3 *Salmonella*

Salmonella per gram of the product shall be negative when determined according to the method prescribed in IS 5887 (Part 3/Sec 1).

4.3.4 *Yeasts and Moulds*

Yeasts and moulds per gram of the product shall be not more than 500 when determined according to the method prescribed in IS 16069 (Part 2).

5 PACKING

The material shall be securely packed in well-filled containers with minimum access to light and moisture. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

6 STORAGE

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

7 MARKING

7.1 The containers shall be securely closed and shall bear legibly and indelibly the following information:

- a) Name of the material including the words 'Food Grade';
- b) Source of manufacture;
- c) Net content when packed;
- d) Batch or code number;
- e) Date of manufacture; and
- f) Expiry/ Best before date;
- g) Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules, 2011* and *Food Safety and Standards (Labelling and Display) Regulations, 2020*.

7.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SAMPLING

Representative samples of the materials shall be drawn according to the method prescribed in IS 1699.

9 TESTS

9.1 Tests shall be carried out by the methods specified in col (4) of Table 1.

9.2 Quality of Reagents

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

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

ANNEX A

[Table 1]

METHOD OF TEST FOR CAROB BEAN GUM

A-1 METHOD FOR ACID INSOLUBLE MATTER

Transfer a 1.5 g sample, accurately weighed, into a 250 ml beaker containing 150 ml of water and 15 ml of 1 percent sulphuric acid. Cover the beaker with a watch-glass and heat the mixture on a steam bath for 6 h rubbing down the wall of the beaker frequently with a rubber tipped stirring rod and replacing any water lost by evaporation. Then add about 500 mg of a suitable filter aid, accurately weighed, and filter through a tared Gooch crucible provided with an asbestos pad. Wash the residue several times with hot water, dry the crucible and its contents at 105 °C for 3 h, cool in a desiccator and weigh. The difference between the mass of the filter aid plus crucible and pad and the total mass is the weight of the acid insoluble matter. Calculate as percentage.

A-2 PROTEIN

Determine nitrogen by Kjeldahl method given in IS 5194. Multiply the percent nitrogen by 6.25 to get protein percent.