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*भारतीय मानक मसौदा*

**ट्रैगाकैथ गम, खाद्य ग्रेड — विशिष्टि**

*(आइ एस 7238 का दूसरा पुनरीक्षण)*

*Draft Indian Standard*

**TRAGACANTH GUM, FOOD GRADE — SPECIFICATION**

*(Second Revision of IS 7238)*

**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 published in 1974. In the preparation of this standard, considerable 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 (FCC), Third Edition, National Academy of Sciences, National Research Council, Washington D.C., USA.

It was first revised in 1997 to incorporate the requirement of solubility to keep it in line with FCC; to provide requirements for heavy metals, viscosity and their test methods; and to provide for 'directions for storage' and 'expiry/best before date' under marking clause.

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

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- a) The requirement for heavy metals has been removed as the limit of lead (contaminant in food colours) is already covered through the standard; and
- b) The marking requirements have been updated.

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 tragacanth 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 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** Tragacanth gum is dried gummy exudation obtained from *Astragalus strobiliferus* or other species of *Astragalus* (Family - *Leguminosae*).

**3.2** Tragacanth gum is a white to yellowish-white, nearly odourless powder.

### 3.2.1 *Unground Tragacanth*

Occurs as flattened, lamellated, frequently curved fragments or straight or spirally tested linear pieces from 0.5 to 2.5 mm in thickness. It is white to pale yellow in colour, translucent, horny in texture and having a short fracture. It is odourless and has an insipid mucilaginous taste. It is rendered more easily pulverizable if heated to a temperature of 50 °C.

### 3.2.2 *Powdered Tragacanth*

It is white to yellowish-white in colour.

### 3.3 Solubility

**3.3.1** One gram of powder of tragacanth in 50 ml of water swells to form a smooth, stiff, opalescent mucilage free from cellular fragments.

**3.3.2** Insoluble in ethanol.

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

**4 REQUIREMENTS**

**4.1 Identification Tests**

**4.1.1** When examined microscopically in water mounts, it shows numerous angular fragments with circular or irregular lamellae and starch grains up to 25 µm in diameter. It should show very few or no fragments of lignified vegetable tissues.

**4.1.2** Identify arabinose, xylose, fructose, galactose and galacturonic acid in the product on a chromatogram by the method given in Annex A.

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

**Table 1 Requirements of Tragacanth Gum, Food Grade**  
(Clause 4.2)

<b>Sl. No.</b>	<b>Characteristic</b>	<b>Requirements</b>	<b>Method of Test, Ref to</b>
(1)	(2)	(3)	(4)
i)	Loss on drying, percent by mass, <i>Max</i>	10	IS 6795
ii)	Total ash, percent by mass, <i>Max</i>	4	IS 6795
iii)	Acid insoluble ash, percent by mass, <i>Max</i>	0.5	IS 6795
iv)	Starch and Dextrins	To pass the test	IS 6795
v)	Tannin-bearing gum	To pass the test	IS 6795
vi)	Arsenic (as As), mg/kg, <i>Max</i>	3	IS 1699
vii)	Lead (as Pb), mg/kg, <i>Max</i>	2	IS 1699
viii)	Viscosity of a 1 percent solution, <i>Min</i>	250	Annex B
ix)	Karaya Gum Test, percent by mass, <i>Min</i>	To pass the test	Annex C
x)	Acid insoluble matter, percent by mass, <i>Max</i>	2	Annex D

**4.3 Microbiological Specifications**

**4.3.1 *Escherichia coli***

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

**4.3.2 *Salmonella***

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

**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**

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

## **10 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**

[*Clause 4.1.2*]

**CHROMATOGRAPHIC IDENTIFICATION OF SUGARS IN THE HYDROLYSATE FROM GUMS**

**A-1 PROCEDURE**

**A-1.1** Boil a mixture of 100 mg of the sample and 20 ml of 10 percent sulphuric acid for 3 h. Allow to cool and add excess barium carbonate (about 10 mg). Mix with a magnetic stirrer until the solution is of pH 7, and filter. Evaporate the filtrate in a rotary evaporator at 30°C to 50 °C in vacuum until a crystalline (or syrupy) or residue is obtained. Dissolve it in 10 ml of 40 percent methanol. This is the hydrolysate used below.

**A-1.2** Prepare thin layer chromatoplates with a mixture of 15 g cellulose powder (for example, Camag Cellulose D) and 90 ml water and dry them for 10 min at 100 °C.

**A-1.3** Place 1 to 10 microlitre spots of hydrolysate on the starting line of two chromatoplates and spots containing 1 to 10 micrograms of the sugars which could be present in the hydrolysate. Use two solvents, namely, (a) a mixture of formic acid, methyl ethyl ketone, tertiary butanol and water (15:30:40:15 by volume); and (b) a mixture of isopropanol, pyridine, acetic acid and water (40:40:5:20 by volume) to develop the plates.

**A-1.4** After development, spray with a solution of 1.23 g anisidine and 1.65 g phthalic acid in 100 ml ethanol and heat the plates at 100 °C for 10 min. A greenish-yellow colour is produced with hexoses, a red colour with pentoses and a brown colour with uronic acids.

**ANNEX B**

[*Table 1, Sl. No. (viii)*]

**TEST FOR VISCOSITY**

**B-1** Transfer a 4.0 g sample, finely powdered, into the container of a stirring apparatus equipped with blades capable of revolving at 1 000 rpm. Add 10 ml of alcohol to the sample so as to wet the gum uniformly, and then add 390 ml of water avoiding the promotion of lumps. Immediately stir the mixture for 7 min, pour the resulting dispersion into a 500 ml bottle, insert a stopper, and allow to stand for about 24 h in a water-bath at 25 °C. Determine the apparent viscosity at a temperature with a brookefield or equivalent type viscometer using spindle No. 2 at 30 rpm and a factor 10.

**ANNEX C**

[*Table 1, Sl. No. (ix)*]

**TEST FOR KARAYA GUM**

**C-1** Boil 1 g of the material with 20 ml of water until a mucilage is formed, add 5 ml of hydrochloric acid and again boil the mixture for 5 min. No permanent pink or red colour shall develop.

**ANNEX D**

[*Table 1, Sl. No. (x)*]

**DETERMINATION OF ACID INSOLUBLE MATTER**

**D-1** In a 250 ml round-bottomed flask, place 2.0 g of tragacanth and add 95 ml of methanol. Moisten the powder by swirling and add 80 ml of hydrochloric acid. Add a few glass beads of about 4 mm in diameter and heat under reflux in a water-bath for 3 h shaking occasionally.

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Eliminate the glass beads and filter by suction the suspension while hot through a previously tared sintered-glass filter. Rinse the flask with a small quantity of water and pass the rinsings through the filter. Wash the residue on the filter with about 40 ml of methanol and dry at 110 °C to constant weight. Allow to cool in a desiccator and weigh. Calculate as follows:

$$\text{Acid insoluble matter, percent by mass} = \frac{M_1 - M}{M} \times 100$$

where

- $M_1$  = mass, in g, of tared sintered glass filter; and
- $M$  = mass, in g, of sintered glass filter and dried filtrate.