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BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

भारतीय मानक ***मसौदा***

एस्कॉर्बिल पाल्मिटेट, खाद्य ग्रेड — विशिष्टि

(*आइ एस 13462 का पहला पुनरीक्षण*)

Draft *Indian Standard*

ASCORBYL PALMITATE, FOOD GRADE — SPECIFICATION

(*First Revision of IS 13462*)

ICS 67.220.20

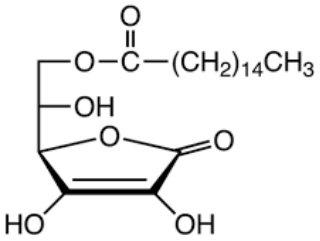
Food Additives Sectional Committee, FAD 08 **Last date of comments:** 22 February 2025

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. It is permitted under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations*, 2011.

Ascorbyl palmitate is also known as vitamin C palmitate; L-ascorbyl palmitate; 8-palmitoyl-3-keto-L-gulofuranolactone; 2, 3-dehydro-L three-hexono-I, 4-lactone-6-palmitate. The empirical and structural formulae and molecular mass of the product are given below:

Empirical Formula	*Structural Formulae*	*Molecular Mass*
$C_{22}H_{38}O_7$		414.55

Ascorbyl palmitate is used as an antioxidant in edible oils and fats, excluding ghee and butter, in the country.

The standard was first published in 1992. In the formulation of this standard, considerable assistance was derived from FAO Food and Nutrition papers No. 4 — Specification for identity and purity of thickening agents, anticaking agents, antimicrobials', antioxidants, emulsifiers, issued by FAO/WHO, Rome 1978; and Food Chemical Codex, published by National Academy of Sciences and National Research Council, Washington DC, USA.

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 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*)’. The 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 the methods of sampling and test for ascorbyl palmitate, food grade.

2 REFERENCES

The following standards 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 editions of the standards indicated below:

IS No.	*Title*
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 1699 : 2024	Food colours — Methods of sampling and test (*third revision*)

3 REQUIREMENTS

3.1 Description

Ascorbyl palmitate shall be a white or yellowish white solid, with a citrus like odour.

3.2 Identification Test

3.2.1 *Solubility*

It shall be very slightly soluble in water and in vegetable oils. One gram dissolves in about 4.5 ml of alcohol.

3.2.2 *Melting Range*

The melting range of the product shall be between 107 °C to 117 °C.

3.2.3 A ten percent solution of the sample in ethanol decolourizes a 0.1 percent solution of 2,6-dichlorophenol-indophenol.

3.3 Specific Rotation

The specific rotation at 25 °C of a 10 percent (*m*/*v*) solution of the sample in methanol shall be between +21 °C to +24 °C, calculated on the dried basis.

3.4 The material shall also conform to the requirement given in Table 1.

4 PACKING

The material shall be filled in well-closed containers so as to preclude air contamination of the contents with metal or other impurities.

5 STORAGE

The material shall be stored in a cool and dry place.

Table 1 Requirement for Ascorbyl Palmitate, Food Grade
(*Clause* 3.4)

SI. No.	Characteristic	Requirement	Method of test, Ref to
(1)	**(2)**	**(3)**	**(4)**
i)	Purity as $C_{22}H_{38}O_7$, percent by mass (on dry basis), *Min*	95	Annex A (A-1)
ii)	Sulphated ash, percent by mass (on dry basis), *Max*	0.1	Annex A (A-2)
iii)	Loss on drying, percent by mass, after drying in a vacuum oven at 56 °C to 60 °C for one hour, *Max*	2	IS 1699
iv)	Arsenic, mg/kg, *Max*	3	IS 1699
v)	Lead mg/kg, *Max*	2	IS 1699

6 MARKING

Each container shall be legibly and indelibly marked with 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.

6.1 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.

7 SAMPLING

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

8 TESTS

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

8.2 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, *SI No*. (i)]

METHOD OF TEST FOR ASCORBYL PALMITATE, FOOD GRADE

A-1 PURITY

A-1.1 Reagents

A-1.1.1 *Absolute Alcohol*

A-1.1.2 *Iodine Solution* — 0.1 N

A-1.2 Procedure

Dissolve about 300 mg, accurately weighed material, in 50 ml of alcohol in a 250 ml Erlenmeyer flask. Add 30 ml of water and immediately titrate with 0.1 N iodine solution to a yellow colour which persists for minimum 30 seconds. Each ml of 0.1 N iodine solution consumed will be equivalent to 20.73 mg of ascorbyl palmitate.

A-2 SULPHATED ASH

A-2.1 Reagent

A-2.1.1 *Sulphuric Acid* — Concentrated

A-2.2 Procedure

Weigh accurately 5 g of the material in a tared crucible. Ignite, gently at first, until the material is thoroughly charred. Cool, moisten the residue with 1 ml of sulphuric acid and ignite gently till the carbon is completely oxidized. Cool the crucible in a desiccator and weigh.

NOTE — Carry out the ignition in a place protected from air currents and use as low temperature as possible to effect complete combustion of carbon.

A-2.3 Calculation

$$\text{Sulphated ash, percent by mass} = \frac{M_1}{M_2} \times 100$$

where

M_1 = mass, in g, of the residue; and

M_2 = mass, in g, of the material taken for the test