भारतीय मानक

Indian Standard

IS 18479 : 2023

ताड़ की गिरी के फैटी एसिड — विशिष्टि

Palm Kernel Fatty Acids — Specification

ICS 71.080.40

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

November 2023 **Price Group 5**

Oils and Oilseeds Sectional Committee, FAD 13

FOREWORD

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

The palm kernel fatty acids are obtained by the hydrolysis of palm kernel oil. Palm kernel oil is obtained from the kernels of the palm fruit (*Elaeis Guineensis*). Palm kernel fatty acids mainly consist of medium chain saturated fatty acids; lauric acid and myristic acid being the main fatty acids.

Palm kernel fatty acids are an important ingredient of fat charge for toilet soaps, since they impart good lathering and hardness properties to soaps. They are also used as a raw material for oleo chemicals, surfactants and allied industries.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

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.

Indian Standard

PALM KERNEL FATTY ACIDS — SPECIFICATION

1 SCOPE

1.1 This standard prescribes the requirements sampling and test for palm kernel fatty acids.

1.2 This standard does not cover the derivatives of palm kernel fatty acids such as hydrogenated palm kernel fatty acids, stripped palm kernel fatty acids and other fractionally distilled palm kernel fatty acids derived from palm kernel oil.

2 REFERENCES

The standards given below 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 these standards:

IS No.	*Title*
IS 548	Methods of sampling and test for oils and fats:
(Part 1/Sec 2) : 2021	Sampling, physical and chemical tests, Section 2 Physical and chemical tests
(Part 3/Sec 1) : 2021	Advanced instrumental methods, Section 1 Determination of fatty acid profile
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 1448 (Part 21) : 2019/ISO 2719 : 2016	Methods of test for petroleum and its products: Part 21 Determination of flash point — Pensky-martens closed cup method (*fourth revision*)

3 GRADES

The material shall be of three grades, namely:

Grade 1 — Distilled grade obtained from palm kernel oil.

Grade 2 — Undistilled grade obtained from palm kernel oil.

Grade 3 — Distilled grade obtained from palm kernel fatty acid distillate (PKFAD).

NOTE — Palm kernel fatty acid distillate (PKFAD) is a by-product obtained during the physical refining of palm kernel oil to produce refined, bleached and deodourised (RBD) palm kernel oil. The requirements of palm kernel fatty acid distillate are not covered in this standard.

4 REQUIREMENTS

4.1 Description

Grade 1 and Grade 2 palm kernel fatty acids shall be produced by splitting the oil obtained from the kernel of the fruit of the oil palm (*Elaeis Guineensis*) tree. Grade 1 material shall have been further subjected to vacuum distillation. Grade 3 shall be obtained by distillation of palm kernel fatty acid distillate (PKFAD).

4.1.1 If solvent is used in the manufacture of oil or fatty acid, a minimum flash point requirement specified in Table 1 will be operative.

4.2 The material shall be free from sediments, suspended and other foreign matter and separated water. Grade 1 and Grade 3 shall be clear and transparent on melting above 30 °C.

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

4.4 The material shall comply with the fatty acid composition specified in Table 2, when tested as per IS 548 (Part 3/Sec 1) or any other validated international method.

5 PACKING AND MARKING

5.1 Packing

The material shall be supplied in suitable containers as agreed to between the purchaser and the supplier. The packaging material shall not affect the quality of the product/material being packed.

5.2 Marking

5.2.1 The containers shall be securely closed and legibly and indelibly marked with the following

information:

a) Name and address of manufacturer and trade-mark, if any;
b) Name and grade of the material;
c) Net quantity of the material;
d) Batch or lot number in code or otherwise;
e) Month and year of manufacture;
f) Expiry date (month and year); and
g) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011.

5.2.2 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.

Table 1 Requirements for Palm Kernel Fatty Acids

(*Clause* 4.3)

Sl No.	**Characteristic**	**Requirement for**			**Method of Test, Ref to**
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture, percent by mass, *Max*	0.5	1.0	0.5	**6** of IS 548 (Part 1/Sec 2)
ii)	Saponification value	254 to 260	254 to 260	245 to 280	**16** of IS 548 (Part 1/Sec 2)
iii)	Acid value shall not differ from saponification value by more than	4	6	12	**8** of IS 548 (Part 1/Sec 2)
iv)	Iodine value	15 to 21	15 to 21	25 (*Max*)	**15** of IS 548 (Part 1/Sec 2)
v)	Mineral acidity	Nil	Nil	Nil	**A-1**
vi)	Ash, percent by mass, *Max*	0.1	0.3	0.3	**A-2**
vii)	Unsaponifiable matter, percent by mass, *Max*	0.5	0.5	1.0	**9** of IS 548 (Part 1/Sec 2)
viii)	Titre, ºC	20 to 26	20 to 28	20 to 28	**13** of IS 548 (Part 1/Sec 2)
xi)	Colour, 1-in cell, *Y* + 5*R*, *Max*	5	—	20	**14** of IS 548 (Part 1/Sec 2)
x)	Flash point, ºC, *Min*	100	100	100	IS 1448(Part 21)[1)]

[1)]Procedure C given in IS 1448 (Part 21) is applicable for determination of flash point of fatty acids.

Table 2 Fatty Acid Composition of Palm Kernel Fatty Acids

(*Clause* 4.4)

Sl No.	Fatty acid	Percentage
(1)	(2)	(3)
i)	C6 : 0	ND to 0.8
ii)	C8 : 0	2.4 to 6.2
iii)	C10 : 0	2.6 to 5.0
iv)	C12 : 0	45.0 to 55.0
v)	C14 : 0	14.0 to 18.0
vi)	C16 : 0	6.5 to 10.0
vii)	C16 : 1	ND to 0.2
viii)	C17 : 0	ND
ix)	C17 : 1	ND
x)	C18 : 0	1.0 to 3.0
xi)	C18 : 1	12.0 to 19.0
xii)	C18 : 2	1.0 to 3.5
xiii)	C18 : 3	ND to 0.2
xiv)	C20 : 0	ND to 0.2
xv)	C20 : 1	ND to 0.2
xvi)	C20 : 2	ND
xvii)	C22 : 0	ND to 0.2
xviii)	C22 : 1	ND
xix)	C22 : 2	ND
xx)	C24 : 0	ND
xxi)	C24 : 1	ND

NOTE — ND = non-detectable, defined as ≤ 0.05 percent.

ANNEX A

[*Table* 1, *Sl No.* (v) *and* (vi)]

TEST FOR MINERAL ACIDITY AND ASH

A-1 TEST FOR MINERAL ACIDITY

A-1.1 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.

A-1.2 Reagents

A-1.2.1 *Methyl Orange Indicator* — 0.05 percent (*m/v*) solution.

A-1.2.2 *Light Petroleum Ether* — (60 °C/80 °C)

A-1.3 Procedure

Measure 10 ml of the melted sample into a separating funnel and shake intimately with three successive 10 ml portions of hot water. The temperature of the hot water should be more than the melting point of palm fatty acids. Combine the aqueous extracts, transfer to another separating funnel and remove traces of fatty acids in the water by extraction with light petroleum ether. Test the aqueous extract so obtained with a few drops of methyl orange indicator.

A-1.4 The material shall be taken to have satisfied the requirements of the test if the indicator does not show acid reaction.

A-2 DETERMINATION OF ASH

A-2.1 Apparatus

A-2.1.1 *Platinum Crucible*

A-2.1.2 *Desiccator* — containing an efficient desiccant, such as fused calcium chloride.

A-2.2 Procedure

Weigh accurately about 10 g of the air-dried material into a platinum crucible which has been previously dried, cooled in the desiccator and weighed. Heat the crucible over a low flame and ignite the contents gently. Incinerate the residue in a muffle furnace at 550 °C ± 10 °C until free from carbon. Cool the crucible in a desiccator and weigh. Repeat the above procedure of heating, cooling and weighing until the difference between two successive weighings does not exceed 1 mg.

A-2.3 Calculation

$$\text{Ash, percent by mass} = \frac{100\,m}{M}$$

where

m = mass, in g, of the ash; and

M = mass, in g, of the material taken for the test.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Oils and Oilseeds Sectional Committee, FAD 13

Organization	*Representative(s)*
ICAR - Central Institute of Post-Harvest Engineering & Technology (CIPHET), Ludhiana	DR DEEP NARAYAN YADAV **(*Chairperson*)**
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Food Safety and Standards Authority of India, New Delhi	MS AIMAN ZAIDI
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Voluntary Organisation in Interest of Consumer Education (VOICE), New Delhi	SHRI M. A. U. KHAN MR K. C. CHAUDHARY (*Alternate*)
In Personal Capacity (*127/6, South Bakkalam, P.O. Kanul, Kalliasseri, Kannur - 670562*)	DR A. MADHAVAN
In Personal Capacity (*310, Kohat Enclave, Pitampura, New Delhi - 110034*)	DR Y. C. NIJHAWAN
In Personal Capacity (*3A/148, Azad Nagar, Kanpur - 208002*)	PROF R. K. TRIVEDI
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'E'/DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
DR BHAWANA
SCIENTIST 'D'/JOINT DIRECTOR
(FOOD AND AGRICULTURE), BIS

Panel for Revision of Indian Standards on Fatty Acids, FAD 13/Panel V

Organization	*Representative(s)*
Institute of Chemical Technology, Mumbai	PROF R. D. KULKARNI **(*Convenor*)**
CSIR-Indian Institute of Chemical Technology, Hyderabad	DR PRADOSH P. CHAKRABARTI
Himalaya Wellness Company, Bengaluru	DR SUNDARAM RAMACHANDRAN
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Institute of Chemical Technology, Mumbai	PROF AMIT P. PRATAP
Unitop Chemicals, Mumbai	DR A. T. MIRAJKAR
In Personal Capacity (*B/501, Chinar CHS, Kothrud, Pune - 411038*)	SHRI VILAS KAKADE
In Personal Capacity (*3A/148, Azad Nagar, Kanpur - 208002*)	PROF R. K. TRIVEDI

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This Indian Standard has been developed from Doc No.: FAD 13 (21754).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
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Published by BIS, New Delhi