
प्रबलित चावल दानों के उत्पादन हेतु विटामिन
एवं मिनरल का पूर्वमिश्रण — विशिष्टि

**Vitamin and Mineral Premix for
Manufacturing Fortified Rice
Kernels — Specification**

ICS 67.220.20

© BIS 2021



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

November 2021

Price Group 3

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Allied products and Other Agricultural Produce Sectional Committee had been approved by the Food and Agriculture Division Council.

Vitamin and mineral premixes are dry or liquid custom blends of a wide range of vitamins, minerals, or combinations of vitamins and minerals, which are used in food and beverages for enrichment or fortification purposes with an objective of enhancing the nutritional value of the products. This standard lays down the specification for vitamin and mineral premixes used for manufacturing fortified rice kernels.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act, 2006* and the Rules framed thereunder and the *Legal Metrology (Packaged Commodities) Rules, 2011*. However, this standard is subject to the restrictions imposed under these, wherever applicable.

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

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.

Indian Standard

VITAMIN AND MINERAL PREMIX FOR MANUFACTURING FORTIFIED RICE KERNELS — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for vitamin and mineral premix for manufacturing fortified rice kernels.

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.

<i>IS No./Other Publication</i>	<i>Title</i>
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)
2491: 2013	Food hygiene — General principles — Code of practice (<i>third revision</i>)
5282 : 1969	Liquid sedimentation methods for determination of particle size of powders
16072 : 2012	Determination of moisture content in milk powder and similar products (Routine method)
16639 : 2018/ ISO 20633 : 2015	Infant formula and adult nutritionals — Determination of vitamin E and vitamin A by normal phase high performance liquid chromatography
16640 : 2018/ ISO 20634 : 2015	Infant formula and adult nutritionals — Determination of vitamin B ₁₂ by reversed phase high performance liquid chromatography (RP-HPLC)
EN 14164 : 2014	Foodstuffs — Determination of vitamin B ₆ by high performance chromatography

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Fortified Rice Kernels (FRK) — Rice shaped kernels containing vitamins and minerals produced through extrusion or whole rice kernels coated with vitamins and minerals.

3.2 Fortified Rice — Blend of fortified rice kernels and polished raw or parboiled rice in the ratio of 1 : 100 or 2 : 100.

3.3 Vitamin and Mineral Premix (VMP) — Combination of micronutrients (vitamins and minerals) in desired proportion ready for use as fortificant in the manufacturing of fortified rice kernels.

4 REQUIREMENTS

4.1 Description

Vitamin and mineral premix shall be free flowing powder without any lumps, made from food grade forms of vitamins and minerals and shall contain vitamins and minerals in specified proportions.

4.2 Vitamin and mineral premix shall be white to off white in colour with faint odour. It shall be easy to use and free from any objectionable or undesirable colour, odour and foreign matter.

4.3 Vitamin and mineral premix shall be manufactured in premises built and maintained under hygienic conditions (*see* IS 2491).

4.4 Chemical composition of vitamin and mineral premix shall be as under:

- a) Micronized ferric pyrophosphate or sodium iron (III) ethylene diaminetetraacetate trihydrate (sodium feredetate -NaFeEDTA);
- b) Folic acid; and
- c) Cyanocobalamine or hydroxycobalamine.

4.5 Vitamin and mineral premix may also contain following chemicals:

- a) Zinc oxide (ZnO);
- b) Retinyl palmitate;

- c) Thiamine hydrochloride, or thiamine mononitrate;
- d) Riboflavin, or riboflavin 5'-phosphate sodium;
- e) Nicotinamide, or nicotinic acid; and
- f) Pyridoxine hydrochloride.

4.6 Chemical forms of micronutrients shall be micronized and uniformly distributed within vitamin and mineral premix.

4.7 The composition of vitamin and mineral premix shall be according to the stated micronutrient composition when tested as per methods prescribed in Table 1.

4.8 Ingredients

Vitamin and mineral premix shall be prepared by using following ingredients:

- a) Base or carrier material used in vitamin and mineral premix shall be white in colour; and
- b) Permitted food grade emulsifiers/ hydrocolloids/ binding agents)/acid regulators/ antioxidants shall be used as per the allowances prescribed under regulations.

4.9 In addition to the above, Vitamin and Mineral Premix shall conform to the requirements specified in Table 2.

5 PACKING AND STORAGE

5.1 Vitamin and mineral premix shall be packed in food grade packaging material which is non-transparent, non-reactive, water-resistant and impermeable to light, water vapour, oxygen, carbon dioxide and other gases.

5.2 The product shall be packed in quantities as stipulated under the *Legal Metrology (Packaged Commodities) Rules, 2011* as well as in accordance with requirements under the *Food Safety and Standards Act, 2006* and the Rules framed thereunder.

5.3 Storage

Vitamin and mineral premix shall be stored in a clean, dry and cool place and the storage temperature shall not exceed 25 °C.

Table 1 Methods of Test for Vitamins and Minerals

(Clause 4.7 and 8)

Sl No. (1)	Chemical Form of Micronutrient (2)	Method of Test (3)
i)	Micronized ferric pyrophosphate Sodium iron (III) ethylenediamine tetraacetate trihydrate (sodium feredetate- NaFeEDTA)	AOAC 944.02 or AACC 40-70.01 (total iron present in ferric form) by Atomic Absorption Spectroscopy or Spectrophotometry or AOAC 984.27 using ICP Emission
ii)	Folic acid	AOAC 992.05
iii)	Cyanocobalamine or hydroxycobalamine	IS 16640
i)	Zinc oxide (ZnO)	AOAC 984.27 (using ICP emission spectroscopy) or AACC 40-70.01 (using atomic absorption)
ii)	Retinyl palmitate	IS 16639
iv)	Thiamine hydrochloride or Thiamine mononitrate	AOAC 2015.002 or AACC 86-80.01 (Total thiamin, thiamin phosphate, thiamin diphosphate, and thiamin triphosphate)
v)	Riboflavin or riboflavin 5'-phosphate sodium	J.AOAC Int. 2009;680-687
vi)	Nicotinamide or nicotinic acid	AOAC 2015.003 or AACC 86-90.01
vii)	Pyridoxine hydrochloride	EN 14164

Table 2 Physical characteristics of Vitamin and Mineral Premix

(Clause 4.9, 6.2 and 8)

Sl No. (1)	Parameters (2)	Specification (3)	Method of Test, Ref to (4)
i)	Moisture content, percent by mass, <i>Max</i>	11	IS 16072
ii)	Particle size of micronized ferric pyrophosphate (D ₉₀ particles), µm	1-3	IS 5282

6 MARKING

6.1 The ink used for marking shall be of such quality which may not contaminate the product. Each package shall be suitably marked legibly and indelibly as to give the following information:

- a) Name of the product;
- b) Name and address of the manufacturer;
- c) Date of packing;
- d) Lot/batch number;
- e) Net quantity;
- f) Best before.....month.....year;
- g) List and levels of the micronutrients along with their chemical form;
- h) Food grade compliance declaration;
- j) Storage advisory note; and
- k) Any other information required under the *Legal Metrology (Packaged Commodities) Rules, 2011, the Food Safety and Standards (Labelling and Display) Regulations, 2020*.

6.2 Vitamin and mineral premix manufacturer should provide the certificate of analysis (COA) and chemical composition along with food grade certificate including all the requirements specified in Table 2.

6.3 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 material for ascertaining conformity to the requirements of this standard shall be drawn as per requirements of testing protocols.

8 TESTS

8.1 All the tests shall be carried out as specified in *col 3* of Table 1 and *col 4* of Table 2.

8.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see IS 1070*) shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee, FAD 16

<i>Organization(s)</i>	<i>Representative(s)</i>
Directorate of Marketing and Inspection, Ministry of Agriculture, New Delhi	DR VIJAYA LAKSHMI NADENDLA (Chairperson) SHRI P. K. SWAIN (Former Chairperson)
All India Food Processors' Association, New Delhi	SHRI KRISHNA KUMAR JOSHI SMT KAMIA JUNEJA (<i>Alternate</i>)
Central Food Technological Research Institute (CFTRI), Mysore	DR M. S. MEERA DR V. B. SASHIKALA (<i>Alternate</i>)
Centre of Excellence for Soybean Processing, CIAE, Bhopal	DR PUNIT CHANDRA DR S. K. GIRI (<i>Alternate</i>)
Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana	DR D. N. YADAV DR MRIDULA D. (<i>Alternate</i>)
Central Tuber Crop Research Institute (CTCRI), Thiruvananthapuram	DIRECTOR DR M. S. SANJEEV (<i>Alternate</i>)
Central Warehousing Corporation (CWC), New Delhi	SHRI A. K. MALHOTRA SHRI SIDHARTH RATH (<i>Alternate</i>)
CONCERT, Chennai	SHRI R. SANTHANAM, IAS (RETD) SHRI G. SANTHANARAJAN (<i>Alternate</i>)
Confederation of Indian Food Trade & Industry (CIFTI)-FICCI, New Delhi	MS PARNA DASGUPTA MS PRIYANKA SHARMA (<i>Alternate</i>)
Confederation of Indian Industries (CII), New Delhi	SHRI MANISH WHORRA SHRI AROMAL JKOSHI (<i>Alternate</i>)
Consumer Education and Research Centre, Ahmedabad	SMT DOLLY A. JANI DR ANINDITA MEHTA (<i>Alternate</i>)
Consumer Guidance Society of India, Mumbai	DR SITARAM DIXIT DR M. S. KAMATH (<i>Alternate</i>)
Consumer Research, Education, Action, Training and Empowerment (CREATE)	SHRI K. SURESH KANNA SHRI R. PONNAMALAM (<i>Alternate</i>)
Defence Food Research Laboratory (DFRL), Mysore	DR PAL MURUGAN.M MS SAKSHI SHARMA (<i>Alternate</i>)
Directorate General of Supplies and Transport, Delhi	COL S. C. JOSHI MAJ SONALI DUDHANE (<i>Alternate</i>)
Directorate of Marketing and Inspection, Faridabad	SHRI M. THANGARAJ SMO (STD) (<i>Alternate</i>)
Directorate of Plant Protection Quarantine and Storage, Faridabad	PLANT PROTECTION ADVISER SHRI R.V. SINGH (<i>Alternate</i>)
Food Corporation of India (FCI), New Delhi	SHRI A. S. ARUNACHALAM SHRI SACHIN (<i>Alternate</i>)
Food Safety and Standards Authority of India, New Delhi	MS APRAJITA VERMA
G.B. Pant University, Food Science Division, Pant Nagar	DR SATISH K. SHARMA DR SWETA RAI (<i>Alternate</i>)

<i>Organization(s)</i>	<i>Representative(s)</i>
In Personal Capacity	DR S. C. KHURANA
In Personal Capacity	SHRI I. C. CHADDHA
Indian Grain Storage Management and Research Institute, Hapur	DIRECTOR
Indian Institute of Food Processing Technology (IIFPT), Thanjavur	DR C. ANANDHARAMAKRISHNAN
Indian Institute of Maize Research (IIMR), Ludhiana	DR R. SAI KUMAR DR DHARAM PAUL CHAUDHARY (<i>Alternate</i>)
Indian Institute of Packaging (IIP), Delhi	SHRI MADHAB CHAKRABORTY DR NILAY PRAMANIK (<i>Alternate</i>)
Ministry of Consumer Affairs, Food and Public Distribution, New Delhi	DR SUBHASH GUPTA DR S. C BANSAL (<i>Alternate</i>)
National Institute of Food Technology Entrepreneurship & Management (NIFTEM), Sonapat	DR ANKUR OJHA
National Institute of Nutrition (NIN), Hyderabad	DR NAVEEN KUMAR R.
National Rice Research Institute, Cuttack	DR AWADHESH KUMAR DR (SMT) PADMINI SWAIN (<i>Alternate</i>)
National Sugar Institute (NSI), Kanpur	DR V. P. SRIVASTAVA
Protein Foods and Nutrition Development Association of India (PFNDAI)	DR SHATADRU SENGUPTA DR JASVIR SINGH (<i>Alternate</i>)
Roller Flour Millers Federation of India (RFMFI), New Delhi	SHRI D. V. MALHAN
Vasantdada Sugar Institute (VSI), Pune	DR RAJEEV V. DANI DR SANJEEV V. PATIL (<i>Alternate</i>)
Warehousing Development and Regulatory Authority (WDRA), New Delhi	DR RADHEY KRISHNA TRIPATHI
BIS Directorate General	SMT SUNEETI TOTEJA, SCIENTIST 'E' AND HEAD (FAD) [REPRESENTING DIRECTOR GENERAL (<i>Ex-Officio</i>)]

Member Secretary

MS LAVIKA SINGH
SCIENTIST 'B' (FAD), BIS

Panel on Specifications for Fortified Rice Kernels, FAD 16/Panel 7

<i>Organization(s)</i>	<i>Representative(s)</i>
Indian Institute of Technology Kharagpur, Kharagpur	DR H. N. MISHRA, (Convenor)
CSIR - Central Food Technological Research Institute, Mysore	DR A. JAYADEEP
Directorate of Marketing and Inspection, Faridabad	SHRI M. THANGARAJ
Food Corporation of India (FCI), New Delhi	SHRI A. S. ARUNACHALAM
Food Fortification Resource Centre, New Delhi	SHRI TUSHAR BHARDWAJ
Indian Institute of Food Processing Technology, Thanjavur	DR C. ANANDHARAMAKRISHNAN
Indian Institute of Technology Kharagpur, Kharagpur	DR CHANDRAKANT GENU DALBHAGAT
National Rice Research Institute (NRRI), Cuttack	DR PADMINI SWAIN
UN – World Food Programme, New Delhi	DR SHARIQUA YUNUS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 2016* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 16 (18094).

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 : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern : Plot No. 4-A, Sector 27-B, Madhya Marg CHANDIGARH 160019	{ 265 0206 265 0290
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE.
DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI.
HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW.
NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi