भारतीय मानक
Indian Standard

IS 16518 : 2018

मकई — विशिष्टि

Maize — Specification

ICS 67.060

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.org.in www.standardsbis.in

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

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.

This standard is based on the Cereals Grading and Marking Rules, 2001 applying to maize (*Zea mays* L.).

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 and Regulations framed thereunder and the *Legal Metrology (Packaged Commodities) Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

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

MAIZE — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for maize (*Zea mays* L.).

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*
460 (Part 1) : 1985	Test sieves : Part 1 Wire cloth test sieves (*third revision*)
1070 : 1992	Reagent grade water — Specification (*third revision*)
4333	Methods of analysis for foodgrains
(Part 1) : 2018	Refractions (*second revision*)
(Part 2) : 2017	Determination of moisture content (*second revision*)
(Part 5) : 1970	Determination of uric acid
IS 14818 : 2017/ ISO 24333 : 2009	Cereal and cereal products — Sampling
IS 16287 : 2015 ISO 16050 : 2003	Foodstuffs — Determination of aflatoxin B_1, and the total content of aflatoxins B_1, B_2, G_1 and G_2 in cereals, nuts and derived products — High-performance liquid chromatographic method

3 TERMINOLOGY

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

3.1 Foreign Matter — Any extraneous matter other than foodgrains comprising of,

a) inorganic matter includes glass and metallic pieces, dust, sand, gravel, stones, dirt, pebbles, lumps or earth, clay, mud and animal filth etc;

b) organic matter consisting of husk, chaff, straw, weed seeds and other inedible grains etc.

3.2 Other Edible Grains — Any edible grains (including oil seeds) other than the one which is under consideration.

3.3 Varietal Admixture — The presence of a variety of the same grain other than the variety in consideration.

3.4 Damaged Grains — Grains that are sprouted or internally damaged as a result of heat, microbes, moisture or weather.

3.5 Immature and Shrivelled Grains — Grains that are not properly developed.

3.6 Weevilled Grains — Grains that are partially or wholly bored by insects injurious to grains but do not include germ eaten grains and egg spotted grains.

4 REQUIREMENTS

4.1 Description

Maize shall,

a) be the dried mature grains of *Zea mays* L.;

b) be sweet, hard, clean, wholesome, uniform in size, shape, colour and in sound merchantable condition;

c) be free from added colouring matter, moulds, weevils, obnoxious substances, discolouration, poisonous seeds and all other impurities except the limits specified in Table 1; and

d) be free from rodent hair and excreta.

4.2 Pesticides/insecticides residues, toxic metals, naturally occuring toxic substances and other contaminants (if any) in the product shall not exceed the limit as prescribed in the *Food Safety and Standards (Contaminants, Toxins and Residues) Regulations*, 2011.

4.3 In addition to the above, maize shall also conform to the requirements specified in Table 1.

5 PACKING

5.1 The product shall be packed in gunny bags, jute bags, poly woven bags, poly pouches, cloth bags or other suitable packages which shall be clean, sound, and free from insect/ fungal infestation and the packing material shall be as permitted under the *Food Safety and Standards (Packaging and Labelling) Regulations*, 2011. Each package shall contain maize of the same grade designation. Each package shall be securely closed and sealed.

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.

6 MARKING

6.1 The ink used for marking shall be of such quality which may not contaminate the product. Each container

Table 1 Requirements for Maize
(*Clause* 4.3)

Sl No.	Characteristic	Requirement				Method of Test, Ref to
		Grade I	Grade II	Grade III	Grade IV	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Moisture, percent by weight, *Max*	12.00	12.00	14.00	14.00	IS 4333 (Part 2)
ii)	Foreign matter[1)]					Annex A
	Inorganic, percent by weight, *Max*	0.1	0.25	0.50	0.75	
	Organic, percent by weight, *Max*	Nil	0.10	0.25	0.25	
iii)	Other edible grains, percent by weight, *Max*	0.50	1.00	2.00	3.00	IS 4333 (Part 1)
iv)	Varietal admixture, percent by weight, *Max*	5.00	10.00	15.00	15.00	IS 4333 (Part 1)
v)	Damaged grains, percent by weight, *Max*	1.00	2.00	3.00	4.00	IS 4333 (Part 1)
vi)	Immature and shrivelled grains, percent by weight, *Max*	2.0	4.0	6.0	6.0	IS 4333 (Part 1)
vii)	Weevilled grains (percent by count), *Max*	2.0	4.0	6.0	8.0	IS 4333 (Part 1)
viii)	Uric acid, mg/kg, *Max*	100	100	100	100	IS 4333 (Part 5)
ix)	Aflatoxin, mg/kg, *Max*	30	30	30	30	IS 16287

[1)] In foreign matter, the impurities of animal origin shall not be more than 0.10 percent by weight.

shall be suitably marked as to give the following information:

a) Grade designation;
b) Name and address of the packer;
c) Place of packing;
d) Date of packing;
e) Lot/batch number;
f) Net quantity;
g) Maximum retail price inclusive of all taxes;
h) Best before……..month…….year; and
j) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011 and the *Food Safety and Standards (Packaging and Labelling) Regulations*, 2011 and the *Food Safety and Standards Act*, 2006.

6.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

6.2.1 The use of standard mark is governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and regulations made thereunder. The details of conditions under which a license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING

Representative samples of the material for ascertaining conformity to the requirements of this standard shall be drawn according to the method given in IS 14818.

8 TESTS

8.1 All the tests shall be carried out as specified in col 7 of Table 1.

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

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

DETERMINATION OF FOREIGN MATTER (ORGANIC AND INORGANIC

A-1 APPARATUS

A-1.1 Physical Balance, 5 mg readability.

A-1.2 Sieves ¾The following four IS Sieves of round holes shall be used [*see* IS 460 (Part 1)]:

	IS Sieve
Top	4.00 mm
Second from top	3.35 mm
Third from top	1.70 mm
Fourth from top	1.00 mm

A-1.2.1 A solid bottom pan shall be used at the bottom.

A-2 PROCEDURE

For the purpose of reducing the quantity of the test sample, spread the entire sample in a tray, divide it into four equal portions, collect the two opposite portions and repeat this process till the required quantity of sample is obtained.

Weigh about 500 g of the test sample and record the prescribed mass. Pour the quantity over the set of sieves previously arranged in a way so that the sieve with the largest perforations comes at the top and those with smaller perforations are placed in order of their sizes. Then, agitate the sample thoroughly to strain out the foreign matter at various levels. As a result of this straining, other foodgrains and foreign matter like bolder pieces of clay, chaff etc., would remain on the first three sieves according to their sizes. The topmost sieve would contain bold grains, big pieces of clay and other big sized foreign matter, while the lower sieves would contain smaller foreign matter. Separate the sieves after straining and pick up all foreign matter by hand or forceps from each of them and add it to the foreign matter collected on the bottom pan.

Put the entire foreign matter collected as above into a beaker containing carbon tetrachoride. The inorganic extraneous matter will settle down which can be separated from the organic foreign matter. Remove the organic foreign matter, dry and weigh. Calculate the percentage. Remaining amount shall be the inorganic foreign matter.

Bureau of Indian Standards

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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.org.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 — 26 50206, 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

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