IS 2323 (1983, Reaffirmed 2009): Specification for Mustard, Whole and Ground (First Revision). UDC 664.511

IS : 2323 - 1983

Indian Standard

SPECIFICATION FOR MUSTARD, WHOLE AND GROUND

(First Revision)

UDC 664·511

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

May 1983

AMENDMENT NO. 2 JANUARY 1996
TO
IS 2323 : 1983 SPECIFICATION FOR MUSTARD, WHOLE AND GROUND

(First Revision)

(*Page* 5, *clause* 2.2.1, *lines* 5 *and* 6) — Substitute '9 of IS 1797 : 1985*' *for* '10 of IS : 1797 - 1973*'.

(*Page* 5, *foot-note with* '*' *mark*) — Substitute '*Methods of test for spices and condiments (*second revision*)' for the existing matter.

(*Page* 6, *clauses* 2.2.5 *to* 2.2.9) — Substitute '4 of IS 1797 : 1985*' *for* '5 of IS : 1797 - 1973*'.

(*Page* 6, *clause* 3.3, *line* 2) — Substitute '1985†' *for* '1978†'.

(*Page* 6, *foot-notes*):

a) *mark — Substitute '*Methods of test for spices and condiments (*second revision*)' for the existing matter.

b) † mark — Substitute '(*third revision*)' *for* '(*second revision*)'.

(*Page* 7, *Table* 2) — Substitute the following for the existing table:

TABLE 2 REQUIREMENTS FOR MUSTARD POWDER
(*Clauses* 0.3 *and* 3.5)

Sl No.	Characteristic	Requirement for Mustard Powder	Method of Test, Ref to		
			Annex	Cl No. of IS 1797 : 1985*	Other IS
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture, percent by mass, *Max*	7.0	—	9	—
ii)	Allyl isothiocyanate, percent by mass, *Min*	0.25	B	—	—
iii)	Non-volatile ether extract, percent by mass, *Min*	27.0	—	14	—
iv)	Total ash, percent by mass, *Max*	6.0	—	6	—
v)	Acid insoluble ash, percent by mass, *Max*	1.5	—	8	—
vi)	Starch, percent by mass, *Max*	2.5	—	—	8 of IS 7807 : 1975
vii)	Crude fibre, percent by mass, *Max*	6.0	—	13	—

* Methods of test for spices and condiments (*second revision*).

Amend No. 2 to IS 2323 : 1983

(*Pages* 7 *and* 8, *clauses* 4.1, 4.1.1 *and* 4.1.2) — Substitute the following for the existing matter:

'4.1 Packing

The material shall be packed in clean, sound and dry container made of metal, glass, food grade plastics, wood or jute bags. The wooden boxes or jute bags shall be suitably lined with moisture proof lining which shall not impart any foreign smell to the product. The packing material shall be free from any fungal or insect infestation and should not impart any foreign smell. Each container shall be securely closed and sealed.'

(*Page* 8, *clause* 4.2) — Substitute the following for the existing matter:

'4.2 Marking — The following particulars shall be marked directly on the container/package or a label affixed on it:

a) Name and address of the manufacturer or packer;

b) Name of the material (whole or ground);

c) Trade name or brand name, if any;

d) Name of grade (in case of mustard, whole);

e) Batch or code number;

f) Net mass when packed;

g) Best before (month and year); and

h) Any other markings required under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 and the *Prevention of Food Adulteration Act*, 1954 and the *Rules* framed thereunder.'

(*Page* 8, *clause* 5.1) — Substitute 'IS 13145 : 1993*' *for* '3 of IS : 1797 - 1973*'.

(*Page* 8, *foot-note marked* '*') — Substitute '*Spices and condiments — Methods of sampling (*first revision*)' for the existing title.

(FAD 9)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR MUSTARD, WHOLE AND GROUND

(First Revision)

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Indian Standard

SPECIFICATION FOR MUSTARD, WHOLE AND GROUND

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 February 1983, after the draft finalized by the Spices and Condiments Sectional Committee, had been approved by the Agricultural and Food Products Division Council.

0.2 Mustard is one of the important and commonly used material for spices in the Indian dietary as well as for the production of edible oil. It is marketed as whole dry seeds. It is also used in the production of mustard powder which is obtained by grinding mustard seeds.

0.3 Originally two separate Indian Standards (IS : 2323 and IS : 2799) were issued on Specification for mustard whole and mustard powder. In view of the increasing use of material in spice trade, the Committee felt that the two standards should be amulgamated in one Indian standard to facilitate its maximum utility. Hence IS : 2323 has been revised and IS : 2799 is being withdrawn. The limits specified in Table 2 are intended to be reviewed with the experience gained.

0.4 There are numerous varieties of mustard in the market. Some of the important and well-known types are:

a) *Brassica alba* (Linn.) boiss. (*Sinanis alba* Linn.)	White mustard (*SAFED RAI*)
b) *Brassica campestris* Linn. var. *dichotoma* (Roxb.) Watt	Brown *SARSON*, *KALI SARSON*
c) *Brassica campestris* Linn. var. *Sarson* Prain	Yellow *SARSON*
d) *Brassica campestris* Linn. var. *Toria* Duthie & Fuller	Indian rape, *TORIA*

e) *Brassica juncea* (Linn.) Coss, et Czern. — Indian mustard, *RAI*

f) *Brassica nigra* (Linn.) W. D. J. Koch — Black mustard, *BANARASI RAI*

0.4.1 Of the above, the last two types namely, *Brassica juncea* (Linn.) and *Brassica nigra* (Linn.) are mainly used as a condiment. The other types of mustard are used for the production of mustard oil. There is no definite demarcation between the uses of the different varieties of mustard as a spice and for the production of oil. All the varieties marketed as mustard have, therefore, been covered under this specification.

0.4.1.1 In mustard to be used as a spice, the important constituent is the volatile oil, while in the case of mustard seeds to be used for the production of oil, the fixed oil content is the determining factor for the quality of the seeds. As the percentages of the volatile oil and the fixed oil content vary considerably depending on the variety and many other agricultural practices, location of the area of cultivation, climatic conditions, etc, the values for these characteristics have not been specified.

0.5 This standard takes into consideration the prevailing methods of trade and has adopted the different grades formulated by the Agricultural Marketing Adviser to the Government of India for incorporating in the Agmark (Grading and Marking) Rules framed under the Agricultural (Grading and Marking) Act, 1937. This standard is subject to the provisions imposed under the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder, wherever applicable.

0.6 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*. 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

1.1 This standard prescribes the requirements for mustard, whole and ground for use as spices and condiments.

*Rules for rounding off numerical values (*revised*).

2. MUSTARD WHOLE

2.1 Grades

2.1.1 The mustard, whole, shall be graded before packing. The grading shall be done on the basis of the extent of extraneous matter; damaged, discoloured and dead seeds; shrivelled, immature, and slightly damaged seeds, the admixture of other varieties of mustard; the presence of small atrophied seeds; and the presence of whole sound seeds.

2.1.2 The designations of the grades and their requirements shall be as given in Table 1.

TABLE 1 GRADE DESIGNATIONS OF MUSTARD, WHOLE AND THEIR REQUIREMENTS

Grade Designation	Extraneous Matter, Percent by Mass, *Max*	Damaged, Discoloured, and Dead Seeds, Percent by Mass, *Max*	Shrivelled, Immature and Slightly Damaged Seeds, Percent by Mass, *Max*	Admixture of Varieties Other Than the Variety Named, Percent by Mass, *Max*	Small Atrophied Seeds, Percent by Mass, *Max*	Whole Sounds Seeds of the Variety of Mustard Named, Percent by Mass, *Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Category I	1·0	1·0	1·5	3·0	5·0	92
Category II	3·0	2·0	4·0	10·0	10·0	80
Category III	5·0	3·0	8·0	15·0	20·0	60

2.2 Requirements

2.2.1 *Appearance* — The mustard, whole, shall have the shape, size and colour characteristics of the variety of mustard supplied. The seeds shall be mature, hard, sound and reasonably dried. Reasonable dryness shall mean that the moisture content is not more than 10·0 percent by mass when determined in accordance with the method given in **10** of IS : 1797-1973*.

2.2.2 *Taste and Flavour* — The mustard, whole, shall have the pungency characteristic of the variety of the mustard supplied. The seeds shall be free from musty odour.

*Methods of sampling and test for spices and condiments (*first revision*).

2.2.3 *Freedom from Moulds, Insects, etc* — The mustard, whole, shall be free from visible moulds and insects, living or dead, and other deleterious substances.

2.2.4 *Freedom from Argemone Seeds* — The mustard, whole, shall be free from argemone seeds when tested in accordance with the method prescribed in Appendix A.

2.2.5 *Extraneous Matter* — When determined in accordance with the method given in **5** of IS : 1797-1973*, the proportion of extraneous matter, which includes dust, dirt, stones, lumps of earth, chaff, stem or straw, food grains including oilseeds of any other kind or any other impurity, shall be not more than 5·0 percent by mass.

2.2.6 *Damaged, Discoloured and Dead Seeds* — These include seeds that are appreciably damaged or discoloured so as to affect the quality of the material and also include dead seeds which are duds and can easily be crushed between fingers. The proportion of damaged, discoloured and dead seeds shall be not more than 3·0 percent by mass when determined by the method given in **5** of IS : 1797-1973*.

2.2.7 *Shrivelled, Immature and Slightly Damaged Seeds* — These include, besides slightly damaged seeds, seeds which are not properly mature and have become shrivelled. The proportion of shrivelled, immature and slightly damaged seeds shall be not more than 8·0 percent by mass when determined by the method given in **5** of IS : 1797-1973*.

2.2.8 *Admixture of Varieties Other than the Variety Named* — The proportion of admixture of varieties of mustard other than the variety named shall be not more than 15·0 percent by mass when determined by the method given in **5** of IS : 1797-1973*.

2.2.9 *Small Atrophied Seeds* — These include seeds shrunken or shrivelled resulting in the diminution of size of the same. The proportion of small atrophied seeds shall be not more than 20·0 percent by mass when determined by the method given in **5** of IS : 1797-1973*.

3. MUSTARD POWDER

3.1 Description — The mustard powder shall be prepared by grinding clean mustard seeds.

3.2 Taste and Smell — The mustard powder shall have its characteristic pungent taste. It shall not give rancid taste or musty smell.

3.3 Fineness — The mustard powder shall be ground to such a fineness that all of it passes through 600-micron IS Sieve IS : 460 (Part I)-1978† and nothing remains on the sieve.

*Methods of sampling and test for spices and condiments (*first revision*).
†Specification for test sieves: Part I Wire cloth test sieves (*second revision*).

3.4 Freedom from Moulds, Insects, etc — The mustard powder shall be free from dirt, mould growth and insect infestation.

3.5 The mustard powder shall also comply with the requirements given in Table 2.

TABLE 2 REQUIREMENTS FOR MUSTARD POWDER

(*Clauses* 0.3 *and* 3.5)

Sl No.	Characteristic	Requirement for Mustard Powder	Method of Test, Ref to	
			Appendix	Cl No. of IS : 1797-1973*
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, *Max*	7·0	—	10
ii)	Allyl isothiocyanate, percent by mass, *Min*	0·25	B	—
iii)	Non-volatile ether extract, percent by mass, *Min*	27·0	—	15
iv)	Total ash, percent by mass, *Max*	6·0	—	7
v)	Acid insoluble ash, percent by mass, *Max*	1·5	—	9
vi)	Starch, percent by mass, *Max*	2·5	—	18†
vii)	Crude fibre, percent by mass, *Max*	6·0	—	14

*Methods of sampling and test for spices and condiments (*first revision*).
†By diastat hydrolysis.

3.6 The mustard powder shall be manufactured and packed under hygienic conditions.

4. PACKING AND MARKING

4.1 Packing — The mustard, whole, shall be packed in clean and sound jute, cloth, paper or polyethylene bags. The bags shall be free from any fungal or insect infestation and shall be free from any undesirable smell.

4.1.1 The mustard powder shall be packed in sealed, clean and sound tin-plate or glass containers or paper cartons properly lined with

moisture-proof paper or in moisture-proof bags made of a material which does not impart any smell to the mustard powder. The quantities packed in each container/carton may be 0·25, 0·5 and 1·0 kg or more or less as required.

4.1.2 A suitable number of such containers/cartons may be packed in wooden or cardboard cases.

4.2 Marking — The following particulars shall be marked or labelled on each primary container or bulk containers used for transport:

a) Variety of mustard;
b) Name of the grade of mustard (in case of mustard, whole);
c) Name and address of the packer;
d) Batch or code number;
e) Net weight ; and
f) Date of packing.

5. SAMPLING

5.1 Representative samples of the material shall be drawn and tested for conformity to this specification as prescribed in **3** of IS : 1797-1973*.

APPENDIX A

(*Clause* 2.2.4)

TEST FOR THE PRESENCE OF ARGEMONE SEEDS

A-1. REAGENTS

A-1.1 Concentrated Hydrochloric Acid — sp gr 1·19 (*see* IS : 265-1976†).

A-1.2 Concentrated Nitric Acid — *See* IS : 264-1976‡.

A-1.3 Dragen Dorff's Reagents — Shall be prepared as follows:

Solution A = Bismuth subnitrate — 800 mg,
glacial acetic acid — 10 ml, and
water — 40 ml.

*Methods of sampling and test for spices and condiments (*first revision*).
†Specification for hydrochloric acid (*second revision*).
‡Specification for nitric acid (*second revision*).

Solution B = Potassium iodine — 8 gm, and water — 20 ml

Stock solution = Solutions A + B (equal volume)

Dilute solution = Stock solution + acetic acid + water (1 + 2 + 10)

A-2. PROCEDURE

A-2.1 Place the sample in between the two halves of a half folded Whatman No. 1 filter paper and press the seed by means of a paper weight so that it bursts with a sound, leaving two stains of oil on the two sides of the filter paper. Soak one oil spot with concentrated hydrochloric acid and test with Dragendorff's reagent and test the second spot with concentrated nitric acid.

A-2.2 Test Result — If the spot, tested with Dragendorff's reagent shows an orange red colour and the spot tested with nitric acid shows an orange yellow to crimson colour argemone seeds are present. The positive results in both the tests performed simultaneously is conformity for the presence of argemone seeds.

A-2.2.1 If there is no positive reaction, the mustard seeds shall be deemed to be free from argemone seeds.

APPENDIX B

DETERMINATION OF VOLATILE OIL

(as allyl isothiocyanate)

B-1. METHOD

B-1.1 The mustard powder is macerated with water at 37°C and the volatile oil is then distilled in ammonium hydroxide solution. The allyl isothiocyanate is precipitated as silver sulphide by adding silver nitrate solution and the excess of silver nitrate added is determined by titration with ammonium thiocyanate solution.

B-2. REAGENTS

B-2.1 Rectified Spirit — *See* IS : 323-1959*, neutral to phenolphthalein.

B-2.2 Ammonium Hydroxide Solution — 1 : 2, prepared by mixing one volume of concentrated ammonium hydroxide (sp gr 0·92) with 2 volumes of water.

*Specification for rectified spirit (*revised*).

B-2.3 Standard Silver Nitrate Solution — 0·1 N.

B-2.4 Concentrated Nitric Acid — sp gr 1·14 (*see* IS : 264-1976*).

B-2.5 Standard Ammonium Thiocyanate Solution — 0·1 N.

B-2.6 Ferric Ammonium Sulphate Indicator Solution — 10 percent in water.

B-3. PROCEDURE

B-3.1 Place 5 g of the material accurately weighed in a 200 ml distillation flask and add 100 ml of water. Stopper tightly and macerate at about 37°C for 2 hours. Add 20 ml of rectified spirit and distil approximately 60 ml into a 100 ml of volumetric flask containing 10 ml of the ammonium hydroxide solution, taking care that the end of condenser dips below the surface of the solution. Add 20 ml of the standard silver nitrate solution and let stand for 18 hours. Heat to boiling on a water-bath in order to agglomerate the silver sulphide. Cool, dilute to the mark with water and filter. Acidify 50 ml of the filtrate with 5 ml of concentrated nitric acid and titrate with the standard ammonium thiocyanate solution, using 5 ml of the ferric ammonium sulphate indicator solution.

B-4. CALCULATION

B-4.1 Volatile oil (as allyl isothiocyanate), percent by mass

$$= \frac{\cdot 991\ 6\ (\ V_1N_1 - V_2N_2\ )}{M}$$

where

V_1 = half of the volume in ml of the standard silver nitrate solution added to distillate,

N_1 = the normality of the standard silver nitrate solution,

V_2 = volume in ml of the standard ammonium thiocyanate solution required for titration,

N_2 = normality of the standard ammonium thiocyanate solution, and

M = mass in g of the sample taken for the test.

*Specification for nitric acid (*second revision*).