इंटरनेट मानक

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Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 3077 (1992): Roasted and Ground Coffee [FAD 6: Stimulant Foods]

"ज्ञान से एक नये भारत का निर्माण"
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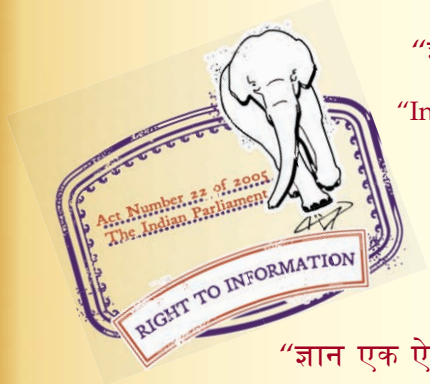

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

(Reaffirmed 1998)

भुनी हुई तथा पिसी हुई काफी — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

ROASTED AND GROUND COFFEE — SPECIFICATION

(Second Revision)

UDC 663·93

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

August 1992

Price Group 6

FOREWORD

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

The roasted and ground coffee is obtained by roasting, under suitable conditions, pure coffee seeds so as to develop full coffee aroma. The seeds after roasting are ground to desired particle size.

This standard was issued earlier in 1965 and subsequently revised in 1971. In view of further technological advances, the standard is being revised again. The revised version incorporates changes in the values of acid insoluble ash, the labelling requirements, degree of correlation between colour readings and grading, etc.

While formulating this standard, due consideration has been given to the relevant Rules issued by the Government of India under the Prevention of Food Adulteration Act, 1954 and the Standards of Weights and Measures (Packaged Commodities) Rules, 1977. This standard is, however, subject to the restrictions imposed under these rules, 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

ROASTED AND GROUND COFFEE— SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for roasted and ground coffee.

2 REFERENCES

The following standards are necessary adjuncts to this standard:

IS *No.*	*Title*
265 : 1987	Hydrochloric acid (*third revision*)
1070 : 1992	Reagent grade water (*third revision*)
2491 : 1972	Code for hygienic conditions for food processing units (*first revision*)

3; REQUIREMENTS

3.1 Description

The material shall be prepared only from cured coffee beans which are properly cleaned, and are free from extraneous matter, husk pieces and insect infestation. Coffee seeds may however contain silver skin. Coffee seeds of either a single type or grade or a blend of different types and grades may be used for roasting and grinding. The roasting may be carried out to the desired colour, designated as light roast, medium roast and dark roast, the degree of roast being determined by the method prescribed in Annex A.

3.2 Freedom from Extraneous Matter and Impurities

The material shall be free from any artificial colouring, flavouring or extraneous matter and shall be free from rancid or off flavour. It shall not contain any substances other than those derived from its extractions.

3.3 Cup Test

The material shall be evaluated for cup test in accordance with the procedure prescribed in Annex B.

3.4 Microscopic Appearance

When the material is subjected to microscopic examination as prescribed in Annex C, the characteristic appearance similar to the photomicrographs as shown in Fig. 1 to 3 shall be seen,

3.5 Determination of Grind (Particle Size)

The material shall be graded as extra fine, fine, medium and coarse in accordance with Table 1. The particle size shall be determined by the method prescribed in Annex D.

Table 1 Particle Size of Roasted and Groand Coffee

Type	Percentage by Mass Retained on 710-Micron IS Sieve, Max	Percentage by Mass Retained on 500-Micron IS Sieve, *Max*	Percentage by Moss Passing Through 355-Micron IS Sieve, Max
(1)	(2)	(3)	(4)
Extra fine	5	10	Above 50
Fine	10	15	50
Medium	20	20	30
Coarse	30	25	15

3.6 Hygienic Conditions

The material shall be manufactured in premises built and maintained under hygienic conditions (see IS 2491 : 1972). The handling equipment like roasters, grinders and packing equipment shall be clean and free from any objectionable odour.

3.7 The material shall also comply with requirements given in Table 2.

4 PACKING AND MARKING

4.1 Packing

The material shall be packed in 25 g, 50 g, 100 g, 200 g, 500 g, 1 kg and multiples thereof in air-tight tin-plate or glass containers or in suitable metal foil or other laminate containers with food grade plastic lining. Where metal foil or other laminate containers with plastic linings are used,

a cautionary notice to the following effects shall be printed:

'Once opened, transfer contents immediately into air-tight container'.

NOTE — Other food grade packing materials may be used subject to their suitability being established.

Table 2 Requirements for Roasted and Ground Coffee

(*Clause* 3.7)

Sl No.	Characteristic	Requirement	Method of Test, Ref to Annex
(1)	(2)	(3)	(4)
i)	Moisture (at the time of packing), percent by mass, *Max*	4'0	E
ii)	Total ash (on dry basis), percent by mass	3·0 to 6·0	F
iii)	Acid insoluble ash (on dry basir), percent by mass, Max	0'1	G
iv)	Water soluble ash (on dry basis), percent by mass, *Min*	65·0	H
v)	Alkalinity of soluble ash in millilitres of 0·1 N hydrochloric acid per gram of material (on dry basis)	3'5 to 5·0*	J
vi)	Water soluble matter (on dry basis), percent by mass	26·0 to 35·0	K
viij	Caffeine (on dry basis), percent by mass, *Min*	1'0	L
viii)	Petroleum ether extract (on dry basis), percent by mass, *Min*	8'5	M

*These values are being considered for adoption under the Prevention of Food Adulteration Rules. Till such time these values are adopted. granting ISI Certification Mark will be based on the existing requirements given under the PFA Rules for these characteristics (see Foreword).

4.2 Marking

The following particulars shall be marked legibly and indelibly on the label of the container:

a) Name of the material;

b) Grind and roast (optional);

c) Name and address of the manufacturer;

d) Batch or code number;

e) Net mass;

f) Month of manufacture;

g) 'Best before---' (date to be given by the manufacturer) (optional);

h) The following cautionary note shall be printed on the flexible containers;

'Once opened, transfer contents immediately into air-tight container'; and

j) Any other requirements laid down under the *Standards of Weights and Measures (Packaged Commodities) Rules,* 1977/*Prevention of Food Adulteration Rules, 1955.*

4.2.1 *Standard Mark*

Details available with the Bureau of Indian Standards.

5 SAMPLING

5.1 Representative samples of the material shall be drawn and criteria for ascertaining conformity of the material to the requirements of this specification shall be as prescribed in Annex N, except moisture for which from each batch, before packing, a sample shall be taken and sealed suitably.

6 TESTS

6.1 Tests shall be carried out by the appropriate methods referred to in 3.1, 3.3, 3.4, *3.5* and those referred to in col 4 of Table 2.

6.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (see IS 1070 : 1992) shall be used where the use of water as a reagent is intended.

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

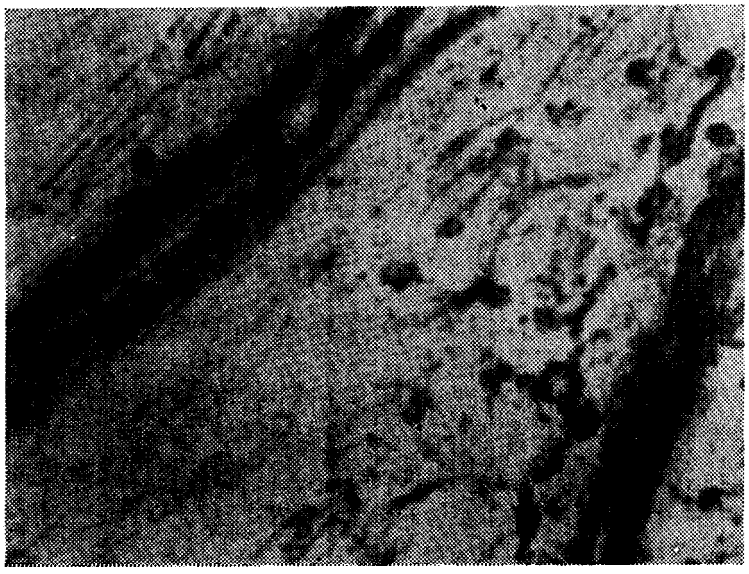

FIG. 1 ROASTED COFFEE POWDER x 100 (PHOTOMICROGRAPH)
COFFEE SHOWING SCLERENCHYMATOUS FIBRHS OF ENDOCARP (SEED COAT)

FIG. 2 ROASTED COFFEE POWDER x 100 (PHOTOMICROGRAPH)
COFFEE SHOWING SCLBRENCHYMATOUS FIBRES OF ENDOCARP (SEED COAT)

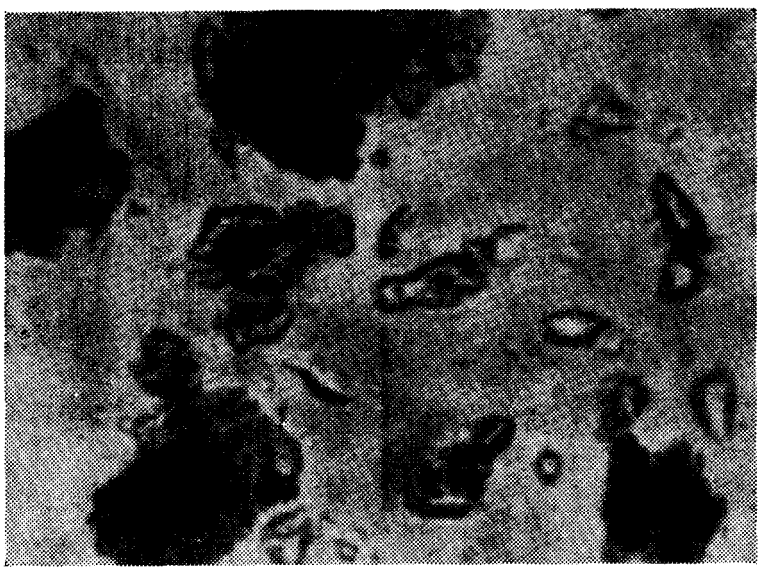

FIG. 3 ROASTED COFFEE POWDER x 100 (PHOTOMICROGRAPH)
COFFEE SHOWING MASSES OF SCLEREIDS

ANNEX A
(*Clause* 3.1)

DETERMINATION OF COLOUR AND ROAST

A-l APPARATUS

A-l.1 Photo-Electric Reflection Meter

Of suitable type with search unit 610 Y and tristimulus green filter.

A-2 PROCEDURE

A-2.1 Measure the colour (Y-value) of the roasted and ground coffee by taking the reading in the photo-electric reflection meter using tristimulus green filter. The percent reflectance is recorded as Y-value.

A-2.2 **Grading**

The material shall be graded in the following manner:

Y-value Reading	*Grading*
5·6 to 6·5	Light roast
4·1 to 5.5	Medium roast
3·0 to 4·0	Dark roast

ANNEX B
(*Clause* 3.3)

CUP-TEST

El PROCEDURE

B-1.1 Note the colour, appearance and aroma of the material.

B-l .2 **Cup-Test**

Take 10 g of sample in a 250-ml cup and add 200 ml of chlorine-free soft water just brought to the boil. Mix well and allow it to brew for six minutes. Study the acidity, body, and flavour of the liquor.

Serve the coffee in porcelain or glass containers in at least 50 ml portions at a temperature of 60 ± 2°C.

B-2 EVALUATION OF THE LIQUOR

B-2.1 Evaluate the cup as per the details given below in the Score Card. If more than one sample is required to be evaluated at one time, the score card may be modified.

SCORE CARD

Name..... ..Date.....

Batch/Code No..... Time.....

a) Assign scores for each quality attribute:

Quality Attribute	*Max Score*	*Score*
1) Acidity	4	
2) Body	8	
3) Flavour	8	

b) Indicate, if any, the degree of the defects, such as the following, by denoting Suspicion (S), Slight (Sl) or Pronounced (P):

Bricky	
Chemical	
Earthy	
Fruity	
Fermented	
Grassy	
Harsh	
Musty	
Oily	
Sour	
Spicy	
Stale	
Unclean	
Woody	

Signature

B-2.2 For defects, deduct 1, 2 or 3 marks depending upon the classification of the defect under suspicion, slight or pronounced.

B-2.3 On the basis of the net score the final evaluation shall be under the following categories:

Fine	*Good*	*Fair*	*Failing Off*	*Poor*
16-20	12-15	9-11	7-a	O-6

B-2.4 The roasted and ground coffee shall be deemed to have passed the test, if the net score is 11 and above.

ANNEX C
(*Clause* 3.4)

MICROSCOPIC APPEARANCE OF ROASTED AND GROUND COFFEE

C-1 APPARATUS

C-1.1 Microscope

With an eye-piece micrometer calibrated with a side micrometer and having a magnification of 300 to 500.

C-1.2 **Microscope Slides**

C-1.3 Cover Glasses

Either circular or square.

C-2 **REAGENTS**

C-2.1 Sodium Hydroxide Solution

Two percent (*m/v*).

C-2.2 Glycerine

C-3 **PROCEDURE**

C-3.1 Microscopic Examination

Take about one gram of the material and transfer it to a beaker containing 50 ml of 2 percent sodium hydroxide solution. Stir the contents by means of a glass rod and boil for 3 to **4** minutes. Decant the supernatant liquid and add 50 ml of water to the remainder, boil again and decant. Repeat this process till the residual powder gives no **colour** with water (treatment with calcium chloride solution and then washing with water may be done in case the decant still shows some **colouring** matter). With the help of a glass rod drawn out at one end to have a small orifice, place a drop of the residue material in glycerine on a clear microscope slide. Place the cover glass on the drop of the suspension and see under microscope.

ANNEX D
(*Clause* 3.5)

DETERMINATION OF PARTICLE SIZE

D-1 APPARATUS

D-1.1 Sieves

a) 710-micron IS Sieve

b) 500-micron IS Sieve

c) 355-micron IS Sieve

D-1.2 Fan

Fitted to the sieves.

D-1.3 **Shaking Machine**

Of suitable type, adjusted for 28 to 30 shakes per minute.

D-2 PROCEDURE

D-2.1 Make a representative sample by mixing thoroughly 100 g of the sample. Weigh the pan and the 710-micron. 500-micron and 355-micron IS Sieves individually and record the weight. Stack them *in* the proper order and pour the sample into the top screen and then close. Fix the unit to a shaking machine and shake the sample for 5 min. After 5 min of shaking, reweigh the sieves and the pan. Repeat the experiment once again in the same manner. Report the data as follows:

	Trial 1	*Trial* 2
Mass, in g, of the sample taken	100	100
Mass, in g, of 710-micron *IS* Sieve and coffee	*a*	*m*
Mass, in g, of sieve alone	*b*	*n*
Mass, in g, of coffee	*a - b*	*m - n*
Mass, in g, of 500-micron *IS* Sieve and coffee	c	*p*
Mass, in g, of sieve alone	*d*	*q*
Mass, in g, of coffee	*c - d*	*p — q*
Mass, in g, of 355-micron IS Sieve and coffee	e	*r*
Mass, in g, of sieve alone	*f*	*s*
	e —f	*r — s*

D-2.2 Calculate the average of the two experiments as grams of coffee retained on 710-micron, 500-micron and 355-micron IS Sieve and grade as indicated in Table 1.

ANNEX E

[*Table* 2, Item (i), F-2.1 G-2.1, K-2.1 *and M-4.1*]

DETERMINATION OF MOISTURE

E-1 PROCEDURE

E-1.1 Weigh accurately about 5 g of the material in a tared dish (about 8·5 cm in diameter). Place the dish in an oven and dry at 100 ± 2°C for 6 hours. Cool the dish in a desiccator and weigh. Repeat the process of heating for 30 minutes, cooling in a desiccator and weighing, until the difference between two successive weighings is less than one milligram. Record the lowest mass,

E-2 CALCULATION

E-2.1 Moisture, percent by mass $= \frac{100\ (M_1 - M_2)}{M_1 - M}$

where

M_1 = mass, in g, of dish with the material before drying;

M_2 = mass, in g, of dish with the material after drying, and

M = mass, in g, of empty dish.

ANNEX F

[*Table 2, Item* (ii)]

DETERMINATION OF TOTAL ASH

F-l PROCEDURE

F-l.1 Weigh accurately about 5 g of the material in a porcelain dish at 100 ± 2°C until water is expelled and then heat slowly over a flame until swelling ceases. Ignite in a muffle furnace at 550 ± 10°C until grey ash results. Heat the dish again at 550 ± 10°C for 30 minutes. Cool the dish in a desiccator and weigh. Repeat this process of heating for 30 minutes, cooling in a desiccator and weighing, until the difference between two successive weighings is less than one milligram. Record the lowest mass.

NOTE — Preserve the dish: containing this ash for the determination of acid insoluble ash (*see* G-2.1).

F-2 CALCULATION

F-2.1 Total ash (on dry basis), percent by mass $= \frac{10\,000\ (M_2 - M)}{(M_1 - M)\ (100 - M_3)}$

where

M_2 = mass, in g, of dish with the ash;

M = mass, in g, of empty dish;

M_1 = mass, in g, of dish with the material; and

M_3 = percent of moisture as determined in Annex E.

ANNEX G

[*Table* 2, *Item* (iii)]

DETERMINATION OF ACID INSOLUBLE ASH

G-1 REAGENT

G-1.1 Dilate Hydrochloric Acid

Approximately 5 N prepared from concentrated hydrochloric acid (*see* IS 265 : 1987).

G-2 PROCEDURE

G-2.1 To the ash contained in the dish (see **F-1.1**), add 25 ml of dilute hydrochloric acid, cover the dish with a watch glass and heat it on a water-bath for 10 minutes. Allow to cool and filter the contents of the dish through Whatman filter paper No. 42 or its equivalent. Wash the filter paper till the washings are free from the acid. Return the filter paper and the residue to the dish. Keep it in an electric air-oven maintained at 135 ± 2°C for about 3 hours. Ignite in a muffle furnace at 550 ± 10°C for one hour. Cool the dish in a desiccator and weigh. Repeat the process of igniting in a muffle furnace, cooling and weighing at half-hour intervals until the difference in mass between two successive weighings is less than one milligram. Record the lowest mass.

G-3 CALCULATION

G-3.1 Total ash (ondrybasis), percent by mass $= \frac{10\,000\,(M_2 - M)}{(M_1 - M)\,(100 - M_3)}$

where

M_2 = mass, in g, of dish with the ash;

M = mass, in g, of empty dish;

M_1 = mass, in g, of dish with the material; and

M_3 = percent of moisture as determined in Annex E.

ANNEX H
[*Table* 2, *Item* (iv)]

DETERMINATION OF WATER SOLUBLE ASH

H-l PROCEDURE

H-1.1 Proceed as in Annex F to obtain the total ash. Add 25 ml of water to the ash, stir well, boil for a minute and then filter through Whatman filter paper No. 42 or its equivalent. Collect the filtrate in a 150-ml beaker, wash the filter paper 4 to 5 times with hot water and collect the washings in the same beaker. Preserve the combined filtrates for estimation of alkalinity of soluble ash (see J-2.1).

H-l.2 Dry the filter paper containing the residue in an oven and then ignite it carefully in a weighed platinum or other suitable dish. Complete the ashing in a muffle furnace at 550 ±10°C for one hour, cool in a desiccator and weigh. Repeat the ignition in the muffle furnace for 30 min, cool and reweigh. Repeat this process till the difference between two consecutive weighings is less than one milligram. Record the lowest mass.

H-2 CALCULATION

H-2.1 Acid insoluble ash (on dry basis), Percent by mass $= \frac{10000\,(M_2 - M)}{(M_1 - M)\,(100 - M_3)}$

where

M_2 = mass, in g, of dish with acid insoluble ash;

M = mass, in g, of empty dish;

M_1 = mass, in g, of dish with the material; and

M_3 = the percentage of moisture.

H-2.2 Water soluble ash, percent by mass = $A - B$

where

A = total ash, percent by mass; and

B = water insoluble ash, percent by mass.

H-2.3 Water soluble ash of total ash, percent by mass = $\frac{\text{Water soluble ash}}{\text{Total ash}} \times 100$

ANNEX J
[*Table* 2, *Item* (v)]

DETERMINATION OF ALKALINITY OF SOLUBLE ASH

J-l REAGENTS

J-1.1 Standard Hydrochloric Acid

0·1 N.

J-l.2 **Methyl Orange Indicator**

Dissolve 0·5 g of methyl orange in 500 ml of distilled water. Filter, if necessary.

J-2 PROCEDURE

J-2.1 Titrate the filtrate obtained with standard hydrochloric acid, using the methyl orange indicator. Note the volume in millimetres of the acid used.

J-2.2 Calculate the quantity of 0·1 N **hydrochlo-**ric acid required to neutralize the water soluble ash from one gram of the dry material.

ANNEX K

[*Table* 2, *Item* (vi)]

DETERMINATION OF WATER SOLUBLE MATTER

K-1 PROCEDURE

K-1.1 Weigh accurately about 2g of the material in a 500-ml Erlenmeyer flask and add 200 ml of water and reflux over a low flame for one hour. Cool and filter through a Whatman filter paper No, 1 or its equivalent. Wash three times with 10 to 15 ml of water and finally make up to 250 ml in a graduated flask. Shake well and pipette a 50-ml aliquot in a tared dish and evaporate on a water-bath. After complete evaporation, dry for one hour in an oven at 100 ± 2°C, cool in a desiccator and weigh. Dry again at 100 ± 2°C for 30 min, cooling in a desiccator and weighing until the loss in mass between the successive weighings is less than one milligram. Record the lowest mass.

K-2 CALCULATION

K-2.1 Water soluble matter (on dry basis), percent by mass $= \frac{50000\,(M_2 - M_1)}{M\,(100 - X)}$

where

M_2 = mass, in g, of the dish with the dried water soluble matter;

M_1 = mass, in g, of the empty dish;

M = calculated mass, in g, of sample taken for the test; and

X = the percentage of moisture as determined in Annex E.

ANNEX L

[*Table* 2, *Item* (vii)]

DETERMINATION OF CAFFEINE CONTENT

L-1 REAGENTS

L-1.1 Magnesium Oxide

Powdered.

L-1.2 Dilute Sulphuric Acid

1 : 9 obtained by diluting concentrated sulphuric acid of sp gr 1-84.

L-1.3 Chloroform

Redistilled.

L-1.4 Potassium Hydroxide Solution

One percent (*w/v*).

L-1.5 Potassium Sulphate

Crystals, nitrogen-free.

L-1.6 Mercuric Oxide

Nitrogen-free.

L-1.7 Concentrated Sodium Hydroxide Solution

Dissolve about 225 g of sodium hydroxide in 500 ml of water.

L-1.8 Standard Sulphuric Acid

0.05 N.

L-1.9 Methyl Red Indicator

Dissolve one gram of methyl red in 200 ml of rectified spirit (95 percent by volume).

L-1.10 Standard Sodium Hydroxide Solution

0·1 N.

L-2 PROCEDURE

L-2.1 Weigh accurately about 5 g of the material, transfer to a 250-ml Erlenmeyer flask, add 3 g of magnesium oxide and 100 ml of distilled water. Weigh the flask with contents and boil under a reflux condenser for 45 min, shaking occasionally. Cool and weigh the flask again and add water till the original mass is obtained. Mix well and filter through a dry filter paper directly into a 50-ml graduated flask until exactly 50-ml of the solution (equivalent to half the quantity of the material taken for the test) is obtained Transfer the solution to a 125-ml separator. Wash the graduated flask with 2 ml of water and add the washings to the separator. Add 4 ml of dilute sulphuric acid. Extract with five 10-ml portions of chloroform, shaking vigorously for one minute for each extraction. Let the emulsion break; then drain the chloroform into a 125 ml separator. Add 5 ml of potassium hydroxide solution. Shake vigorously for one minute, let the emulsion break and drain the chloroform through a cotton plug into a 1 OO-ml Kjeldahl flask. Extract the potassium hydroxide solution with 5 ml of chloroform and add to the Kjeldahl flask. To the digestion flask add 1·30 ± 0·50 g of potassium sulphate and 40 ± 5 mg of mercuric oxide. Rinse down the neck of the flask with 3 ml of chloroform. Place the flask on the digestion rack and concentrate

chloroform to about 20 ml. Distill off chloroform. Add 2·0 ± 0·1 ml of concentrated sulphuric acid of sp gr 1·84. Digest for one hour after acid begins to boil. Cool, and add the minimum quantity of water to dissolve solids. Cool and place at thin film of Vaseline on the rim of the flask. Transfer the digest and boiling chips to the distillation apparatus and rinse the flask 5 or 6 times with one to two-millilitre portions of water. Place a 125-ml beaker containing a known quantity of standard sulphuric acid. Add 6 ml of concentrated sodium hydroxide solution carefully through the side to the still so that it does not mix, and assemble the distillation apparatus immediately taking care that the dip tube extends well within the standard sulphuric acid contained in the beaker. Mix the contents of the distillation flask and distill until all ammonia has passed over into the standard sulphuric acid. Shut off the heater and immediately detach the flask from the condenser. Rinse the condenser thoroughly with water into the beaker. Wash the dip tube carefully so that all traces of the condensate are transferred to the beaker. When all the washings have drained into the beaker, add two or three drops of methyl red indicator solution and titrate with the standard sodium hydroxide solution.

L-2.2 Carry out a blank determination using all the reagents in the same quantities but without the material.

L-3 CALCULATION

L-3.1 Caffeine (on dry basis), percent by mass $= \frac{484 \cdot 96 (B - A) N}{M_1 (100 - M)}$

where

B = volume, in ml, of the standard sodium hydroxide used to neutralize the acid in the blank determination;

A = volume, in ml, of the standard sodium hydroxide used to neutralize the excess of acid in the test with the material;

N = normality of the standard sodium hydroxide solution;

M_1 = mass, in g, of the material in the aliquot; and

M = the percentage of moisture as determined in 2.3.

ANNEX M

[*Table 2, Item* (viii)]

DETERMINATION OF PETROLEUM ETHER EXTRACT

M-i APPARATUS

M-l.1 **Soxhlet** Extraction Apparatus

M-2 REAGENT

M-2.1 Petroleum Ether

Distilled below 60%.

M-3 PROCEDURE

M-3.1 Weigh accurately about 10 g of the material in a suitable thimble and dry for 2 hours at 100 ± 2°C. Place the thimble in the Soxhlet extraction apparatus and extract with the solvent for about 16 hours. Dry the extract contained in the Soxhlet flask, the empty mass of which has been previously determined, at 95 to 100°C for an hour. Cool in a desiccator and weigh. Continue the alternate drying and weighing at 30 min intervals until the loss in mass between two successive weighings is not more than one milligram. Record the lowest mass.

M-4 CALCULATION

M-4.1 Petroleum ether extract (on dry basis), percent by mass $= \frac{1\,000 (M_1 - M_2)}{M (100 - X)}$

where

M_1 = mass, in g, of the Soxhlet flask with the petroleum ether extract;

M_2 = mass, in g, of the empty Soxhlet flask, clean and dry;

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

X = the percentage of moisture as determined in Annex E.

ANNEX N

(*Clause* 5.1)

SAMPLING OF ROASTED CHICORY POWDER

N-l GENERAL REQUIREMENT&OF SAMPLING

N-1.0 *In* drawing, preparing, storing and handling samples, the precautions and directions given in **N-1.1** to N-l.6 shall be observed.

N-l.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

N-l.2 The sampling instrument, preferably a spoon or spatula, shall be clean and dry when used.

N-1.3 The samples, the material being sampled, the sampling instrument and the containers for samples, shall be protected from adventitious contamination.

N-l.4 The samples shall be placed in clean and dry glass or tin containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

N-l.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment and lot.

N-l.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature and that they are protected from light.

N-2 SCALE OF SAMPLING

N-2.1 Lot

All the containers of the same size in a single consignment of material drawn from a single batch of manufacture shall constitute a lot.

N-2.2 Samples shall be tested for each lot separately for ascertaining conformity of the materials to the requirements of this specification. The number of containers to be selected from the lot shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Tables 3 and 4.

Table 3 Sampling of Containers of Net Content Less than 500 g

(*Clauses* N-2.2 *and N-3.0*)

Number of Containers in the Lot N	Total Number of Containers to be Selected n	Number of Groups into which Sample Containers have to be Divided
(1)	(2)	(3)
5lp to 50	9	1
301 ,,300 500	18	2
,,	20	2
501 ,, 1 000	30	3
1001 ,, 3ooo	40	4
3·001 and above	50	5

N-2.2.1 The containers shall be chosen at random from the lot.

In order to ensure randomness of selection, procedures given in IS 4905: 1968 may be followed.

Table 4 Sampling of Containers of Net Content 500 g or More

(*Clauses* N-2.2 *and N-3.0*)

Number of Containers in the Lot N	Number of Containers to be Selected n
(1)	(2)
Up to 50	2
51 ,, 300	3
301 ,, 500	4
501 ,, 1000	5
1 001 and above	6

N-3 TEST SAMPLES AND REFEREE SAMPLES

N-3.0 The sample containers of net contents less than 500 g selected according to N-2.2 and col 1 and 2 of Table 3 shall be equally divided at random into a number of groups specified in col 3 of Table 3. Each sample container of net content 500 g or more selected according to N-2.2 and col 1 and 2 of Table 4 shall be treated as one group.

N-3.1 Preparation of Individual Samples

The contents of all the containers in a group shall be poured out and mixed thoroughly. About 360 g of material shall be taken from this and divided into three equal parts. Each part so obtained, shall be transferred to a sample container which shall be sealed air-tight and labelled with the particulars given in N-1.5. The sample so obtained shall be divided into three sets in such a way that each set has a sample representing each group. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

N-3.2 Preparation of Composite Sample

From the mixed material of each selected container remaining after taking the sample according to N-3.1, approximately equal quantities of material shall be taken and mixed together so as to form a composite sample weighing not less than 90 g. This composite sample shall be divided into, three equal parts and transferred to sample containers and labelled with all the particulars given in N-1.5. One of these composite samples shall be for the purchaser, another for the vender and the third for the referee.

N-3.3 Referee **Sample**

Referee sample shall consist of a set of samples, obtained in N-3.1 and a composite sample obtained according to N-3.2, marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place and under conditions agreed to between the purchaser and the vendor.

N-4 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

N-4.1 The tests for the visual characteristics, particle size, water soluble matter and evaluation for cup-test shall be conducted individually on each of the sample containers from the lot.

N-4.2 The tests for the determination of the remaining requirements of the standard other than moisture shall be done on the composite sample as obtained in N-3.2. The test for moisture shall be made for each batch on the samde meant for this purpose (*see* 5.1).

N-5 CRITERIA FOR CONFORMITY

N-5.1 The lot shall be declared as conforming to the requirements of this specification if N-5.1.1 and N-5.1.2 are satisfied.

N-5.1.1 Thh results of the tests conducted on the individual samples for the requirements specified in N-4.1 shall satisfy the corresponding specification requirements as given in 3.1 to 3.5 and Sl No. (vi) of Table 2.

N-5.1.2 The results of the tests conducted on the composite sample for the remaining requirements shall satisfy the corresponding specification requirements as given in 2, and the sample meant for moisture shall satisfy the requirements for moisture.

Standard Mark

The use of the Standard Mark is governed by the provisions of the Bureau of *Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986 to* promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

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AMENDMENT NO. 1 OCTOBER 1995
TO
IS 3077 : 1992 ROASTED AND GROUND COFFEE — SPECIFICATION

(Second *Revision)*

(Foreword, para 3) — Add the following paras after pan 3:

'A scheme for labelling environment friendly products with the ECO logo has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark would be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR No. 85(E) dated 21 February 1991. For a product to be eligible for ECO logo it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environmental friendly (EF) requirements. The EF requirements for roasted and ground coffee are, therefore being included through an Amendment No. 1 to this standard.

This amendment is based on the Gazette Notification GSR No. 678(E) dated 30 August 1994 for Labelling Edible Oils, Tea and Coffee as environment friendly products, published by the Ministry of Environment and Forests.'

(*Page* 1, *clause* 3.7) -Add the following clauses after 3.7:

'3.8 Optional **Requirements for ECO Mark**

3.8.1 *General Requirements*

3.8.1.1 The product shall conform to the requirements prescribed under clauses 3.1 to 3.7.

3.8.1.2 The manufacturers shall produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the provisions of the ***Water (Prevention and Control of Pollution) Act,*** **1974;** and the Air ***(Prevention and Control of*** Pollution) ***Act,*** 1981; along with the authorization, if required under the ***Environment (Protection) Act,*** 1986, while applying for ECO Mark. The product shall also conform to the requirements laid down under the prevention of ***Food Adulteration Act,*** 1954 and the ***Rules*** made thereunder.

3.8.2 *Specific Requirements*

3.8.2.1 The product shall be free from infestation due to insects, fungus and rodents.

3.83.2 The product shall be free from extraneous matter like strings, stones, dirt, wood, glass and metallic pieces and from any added colouring and flavouring. It shall also be free from rancidity and shall have its characteristic flavour.

3.833 The product shall be free from adulterants like dandelion, roots acorns, figs, dates, stones and cereals.

3.8.2.4 The pesticide residues in the product shall not exceed the limits given below when tested by the methods as shown against each:

Name of Pesticide	*Tolerance Limit* mg/kg	*Method of Test* *Ref to*
Monocrotophos	0.1	IS 11374 : 1985

(Page 1, *clause* 4.1) -Add the following clause after 4.1:

'4.1.1 For ECO Mark the product shall be packed in packages which are made from recyclable, reusable or biodegradable materials which shall be declared by the manufacturer and may be accompanied with detailed instructions for proper use.'

(*Page* 2, *clause* 43) — Add the following clause after 4.2.1 and renumber the subsequent clause:

'43.1 The following additional information shall also be marked on the label for ECO Mark:

a) The criteria for which the product has been labelled as ECO Mark.'

(FAD 23)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 OCTOBER 1996
TO
IS 3077 : 1992 ROASTED AND GROUND COFFEE — SPECIFICATION

(Second *Revision)*

(Amendment No. 1, *page* 1, *clause* 3.8) — Delete the word **'Optional'.**

(Amendment No. 1, *page* 1, *clauses* **3.8.1.1** *and* **3.8.1.2)** — Substitute the following for the existing:

'3.8.1.1 The product shall conform to the quality standards of BIS.

3.8.1.2 The product manufacturer shall produce the consent clearance as per the provisions of *Water (Prevention and Control of Pollution) Act, 1974* and *Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Cess Act, 1977* respectively alongwith the authorisation, if required, under *Environment (Protection) Act, 1986* and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO Mark; and the product shall be in accordance with the *Prevention of Food Adulteration Act, 1954* and the Rules made thereunder unless otherwise specified.

3.8.1.3 The product/packing shall display in brief the criteria based on which the product has been **labelled** environment friendly.

3.8.1.4 The material used for product/packaging shall be recyclable (that is, which can by reprocessed to manufacture any other useful product) or biodegradable and the parameters evolved under the SLEFP on the specific subject of packaging shall apply.'

(*Amendment No.* 1, *page* 2, *clause* 312.1, *line* 1) — Substitute 'coffee **beans'** *for* 'product.

(Amendment No. 1, *page* 2, clauses 3.8.2.3 *and* 3.8.2.4) — Substitute the following for the existing:

'3.8.2.3 The product shall be free from adulterants like dandelion and other roots, **nerons,** figs, dates, stones and cereals.

3.8.2.4 The pesticides residues (if any **),** in the product shall not exceed the limits as prescribed in *Prevention of Food Adulteration Act, 1954* and Rules made thereunder, when tested by the methods given in the relevant Indian Standard Specifications.'

Amend No. 2 to IS 3077 : 1992

[***Page*** **2, c&use 4.1.1 (see** ***also Amendment No.*** 1) **]** — Delete.

[***Page*** **2, clause 4.2 (see also** ***Amendment*** *No.* 1) **]** — **Substitute the** following for the **existing:**

"4.2 Marking

Each container shall be legibly and indelibly marked with the following information:

a) Name of the material;

b) Grind and roast (optional);

c) Name and address of the manufacturer,

d) Net mass;

e) Batch or code number,

f) 'Best before . . . .' (date to be given by the manufacturer) (optional);

g) Month of manufacture;

h) The following cautionary note shall be printed on flexipack containers:

'ONCE OPENED, TRANSFER CONTENTS IMMEDIATELY INTO AIR-TIGHT **CONTAINER'** and

j) Any other requirements as given under the Standards ***of*** *Weights and Measures (Packaged* ***Commodities)*** *Rules,* **1977/** *Prevention of Food Adulteration Rules, 1955.*

4.2.1 Standard Mark and ***ECO*** *Mark*

Details available with the Bureau of Indian Standards."

(FAD23)

AMENDMENT NO. 3 JANUARY 2007
TO
IS 3077 : 1992 ROASTED AND GROUND COFFEE — SPECIFICATION

(Second Revision)

(*Page* 1, *clause* **2**) — Add 'IS 1699 : 1995 Methods of sampling and tests for food colours (*second revision*)' at the appropriate place.

(*Page* 1, *clause* **3.5**) — Add the following new clause after **3.5** and renumber the subsequent clauses:

'**3.6** The copper content in roasted and ground coffee shall not exceed 30 ppm when tested by atomic absorption spectrophotometer as per the method prescribed in **15.1** of IS 1699.'

(*Page* 2, *Table* 2, *Note*) — Delete.

(FAD 6)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 4 DECEMBER 2009
TO
IS 3077 : 1992 ROASTED AND GROUND COFFEE — SPECIFICATION

(Second Revision)

[*Page* 2, *clause* **4.2**, *Sl No.* (d) (*see also Amendment No.* 2)] — Substitute 'Net quantity' *for* 'Net mass'.

(FAD 6)

Reprography Unit, BIS, New Delhi, India