In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

MS 1236 (1991) (English): SPECIFICATION FOR TAMARIND PULP
SPECIFICATION FOR TAMARIND PULP
This Malaysian Standard, which had been approved by the Food and Agricultural Industry Standards Committee and endorsed by the Council of the Standards and Industrial Research Institute of Malaysia (SIRIM) was published under the authority of the SIRIM Council in November, 1991.

SIRIM wishes to draw attention to the fact that this Malaysian Standard does not purport to include all the necessary provisions of a contract.

The Malaysian Standards are subject to periodical review to keep abreast of progress in the industries concerned. Suggestions for improvements will be recorded and in due course brought to the notice of the Committees charged with the revision of the standards to which they refer.

The following references relate to the work on this standard:

Committee reference: SIRIM 481/18
Draft for comment: D197 (ISC A)

Amendments issued since publication

<table>
<thead>
<tr>
<th>Amd. No.</th>
<th>Date of issue</th>
<th>Text affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONTENTS

Committee representation .............................................. 3
Foreword ........................................................................... 4

1 Scope ........................................................................... 5
2 Definition ....................................................................... 5
3 Requirements ................................................................ 5
4 Hygiene ......................................................................... 6
5 Sampling ......................................................................... 6
6 Testing ........................................................................... 6
7 Packing and marking ....................................................... 6
8 Legal requirements ........................................................ 6

Table 1 Requirements of tamarind pulp ................................. 5

Appendices
A Determination of extraneous matter ................................. 7
B Determination of seed content ......................................... 8
C Determination of moisture ............................................... 9
D Determination of total ash .............................................. 10
E Determination of acid insoluble ash ................................ 12
Committee representation

The Food and Agricultural Industry Standards Committee under whose supervision this Malaysian Standard was prepared, comprises representatives from the following Government Ministries, trade, commerce and manufacturer associations and scientific and professional bodies.

Federal Agricultural Marketing Authority
Federation of Malaysian Consumers Associations
Federation of Malaysian Manufacturers
Malaysian Agricultural Research and Development Institute
Ministry of Agriculture
Department of Agriculture
Malaysian Oil Palm Growers' Council
Malaysian Rubber Producers' Council
Rubber Research Institute of Malaysia
Universiti Pertanian Malaysia

The Technical Committee on Spices and Condiments which prepared this Malaysian Standard consists of the following representatives:

Encik Chua Lee Kiang (Chairman)
Puan Normah Ahmad
Encik Isa Mansor / Puan Zaitun Jantan
Encik Ng Siaw Chiung
Encik Au How Wang
Prof. Madya Asiah / Dr. Jinap Selamat
Dr. Osman Hassan
Encik Osman Zakaria
Co-opted member
Encik Teoh Chai Hon
Puan Radziah Mohd. Daud (Secretary)

Jabatan Pertanian
Malaysian Agricultural Research and Development Institute
Pusat Penyelidikan Sains dan Teknologi Pertahanan
Jemaah Pemasaran Lada Hitam Malaysia
Federal Agricultural Marketing Authority
Universiti Pertanian Malaysia
Universiti Kebangsaan Malaysia
Standards and Industrial Research Institute of Malaysia

Seng Hin Brothers Sdn. Bhd.
Standards and Industrial Research Institute of Malaysia
This Malaysian Standard was prepared by the Technical Committee on Spices and Condiments under the authority of the Food and Agricultural Industry Standards Committee.

Cakes of the tamarind pulp are commonly used as a spice and condiment mainly in the preparation of Indian and Malay curries. With the existence of this standard, a guideline of quality control and grading can be followed by traders and large-scale purchasers.

In the preparation of this standard, the following were referred to:

1) Indian standard IS 6364:1971 'Specification for tamarind pulp'.

2) Agriculture Produce (Grading and Marketing Act (1937)] with rules made from 1980 to 1985. Indian Ministry of Agriculture 'Tamarind grading and marketing rules'.


4) Malaysian Standard MS 81:1973 'Methods of test and sampling for spices and condiments'.

5) International Standards Organization ISO 1208:1982 'Spices and condiments - Determination of filth'.


SPECIFICATION FOR TAMARIND PULP

1. SCOPE

1.1 This Malaysian Standard prescribes the quality and methods of sampling and test of tamarind pulp obtained from the mature fruits of *Tamarindus indica* Linn.

2. DEFINITION

2.1 Tamarind pulp. The pulp is obtained from the mature fruits of *Tamarindus indica* Linn by removing first the rind, then the fibrous skeleton enclosing the pulp and the seeds. Seeds may or may not be removed depending on the product marketed. The colour of the pulp shall be uniform. The pulp shall have the characteristic taste and flavour and shall be free from any objectionable odour.

2.2 Extraneous matter. Shall be taken to mean foreign matter such as stones, sand, dust and parts of the fruits (e.g. fibre strand, rind but excluding tamarind seed and seed fragments), leaf, stem or any other vegetable matter.

3. REQUIREMENTS

3.1 The material shall be practically free from living and/or dead insects, insect fragments, rodent contamination and moulds visible to the naked eye (corrected, if necessary for abnormal vision), with such magnification as may be necessary in any particular case. In the case of dispute, contamination should be determined by the method prescribed in ISO 1208:1982 ‘Spices and condiments - Determination of filth’.

3.2 The material shall also comply with the requirements specified in table 1.

### Table 1. Requirements of tamarind pulp

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Characteristic</th>
<th>Requirements</th>
<th>Methods of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Extraneous matter, % m/m, max.</td>
<td>0.75</td>
<td>A</td>
</tr>
<tr>
<td>2.</td>
<td>Tamarind seed content, (including seed fragments) % m/m, max.</td>
<td>38.0</td>
<td>B</td>
</tr>
<tr>
<td>3.</td>
<td>Moisture, % m/m, max.</td>
<td>37.0</td>
<td>C</td>
</tr>
<tr>
<td>4.</td>
<td>Total ash (on dry basis), % m/m, max.</td>
<td>23.0</td>
<td>D</td>
</tr>
<tr>
<td>5.</td>
<td>Acid insoluble ash (on dry basis), % m/m, max.</td>
<td>0.70</td>
<td>E</td>
</tr>
</tbody>
</table>

NOTE. For estimation of moisture, total ash and acid insoluble ash and content, the material should be practically free from seeds and seed fragments.
4. **HYGIENE**

4.1 The material shall be processed and packed under hygienic conditions in premises licensed in accordance with the public health legislations currently enforced in Malaysia.

5. **SAMPLING**

5.1 Representative samples for testing the conformity of tamarind pulp to this standard shall be drawn according to MS 81 'Methods of sampling and test for spices and condiments'.

6. **TESTING**

6.1 Tamarind pulp shall be tested according to the relevant appendices in this standard.

7. **PACKING AND MARKING**

7.1 Packing

7.1.1 The material shall be packed in suitable, clean, sound and dry containers and shall also be free from insect infestation or fungal contamination and from objectionable odour.

7.2 Marking

7.2.1 The following particulars shall be suitably marked or labelled on each container:

   a) Name and type of the material
   b) Trade name
   c) Code or batch number
   d) Net weight
   e) Date of packing
   f) Name and address of manufacturer/packer.

8. **LEGAL REQUIREMENTS**

8.1 The product shall in all other aspects comply with the current legislations enforced in Malaysia.
Appendix A

Determination of extraneous matter

A1. APPARATUS

A1.1 Sieve 425 µm.

A1.2 Forcep.

A1.3 Beaker

A1.4 Watch glass or filter paper

A2. PROCEDURE

A2.1 Weigh 100 g sample in a beaker. Add in 200 ml water and mix well. Sieve the mixture through 425 µm sieve. Isolate the extraneous matter on to a tared filter paper or watch glass and dry in the oven at 105 ± 2°C for 12 hours. Cool and weigh ($W_3$).

A3. CALCULATION

A3.1 Extraneous matter, % by m/m,

\[
\frac{W_3 - W_2}{W_1} \times 100
\]

where,

$W_1$ is the weight, in g of sample;

$W_2$ is the weight, in g of filter paper;

$W_3$ is the weight in g of the filter paper and extraneous matter after drying.
Appendix B

Determination of seed content

B1. APPARATUS

B1.1 Knife

B1.2 Forcep

B1.3 Weighing balance

B2. PROCEDURE

B2.1 Thoroughly mix the sample and weigh about 500 g of the sample. Separate seeds and seed fragments preferably by a knife and forcep. After separation of seeds, free them from any adhering pulp. Weigh the seeds and report the percentage.

B3. CALCULATION

B3.1 Seed and seed fragment content, % m/m

\[ \frac{w_1}{w_0} \times 100 \]

where,

\( w_0 \) is the mass in g of the sample;

\( w_1 \) is the mass in g of the seed and seed fragments.
Appendix C

Determination of moisture

C1. APPARATUS
C1.1 Dish, porcelain, silica or platinum.
C1.2 Air oven, at 105 ± 2°C.
C1.3 Desiccator

C2. PROCEDURE
C2.1 Weigh accurately about 5 g of the material (practically free from seeds and seed fragments) and dry in a previously weighed porcelain, silica or platinum dish in an air oven maintained at 105 ± 2°C for 10 hours. Cool the dish in a desiccator and weigh with the lid on. Heat again at 105 ± 2°C in the air oven for 4 hours. Cool the dish in the desiccator and weigh.

C3. CALCULATION
C3.1 Moisture, % m/m = \( \frac{100 (W_1 - W_2)}{W_1 - W} \)

where,

\( W \) is the mass in g of the empty dish;
\( W_1 \) is the mass in g of the dish with the material before drying;
\( W_2 \) is the mass in g of the dish with the material after drying.
Appendix D

Determination of total ash

D1. APPARATUS

Usual laboratory apparatus not otherwise specified, and the following items.

D1.1 Dish. Flat-bottomed, having a surface area of at least 15 cm², made of platinum or of other material unaffected by the conditions of the test.

D1.2 Muffle furnace. Regulated at 550 ± 25°C.

D1.3 Filter paper. Ashless, medium-fine.

D2. REAGENTS

D2.1 Ethanol

D3. PROCEDURE

D3.1 Test portion

D3.1.1 Weigh, to the nearest 0.001 g, about 2 g of the sample (practically free from seed and seed fragments) into the tared flat-bottomed dish.

D3.2 Determination

D3.2.1 Pour about 2 ml of ethanol on the material in the tared dish (D1.1) and ignite it. When the ethanol is burnt off, heat the dish carefully over a small flame to char the material. Then ignite in the muffle furnace (D1.2) at 550 ± 25°C for 2 hours. Cool and wet the ash with several drops of water, evaporate carefully to dryness and heat in the muffle furnace for further 1 hour at 550 ± 25°C. If the wetting shows the ash to be carbon-free, remove the dish to a desiccator containing fresh, efficient desiccant, allow to cool to room temperature and weigh without delay. If the wetting shows the presence of carbon, repeat the wetting and heating until no specks of carbon are visible and ignite in the muffle furnace for 1 hour after the disappearance of carbon. If carbon is still visible, leach the ash with hot water, filter through the ashless filter paper, wash the filter paper thoroughly, transfer the filter paper and contents to the ashing dish, dry and ignite in the muffle furnace at 550 ± 25°C until the ash is white. Cool the dish, add the filtrate and evaporate it to dryness on a water bath. Heat in the muffle furnace again at 550 ± 25°C, cool in the desiccator and weigh as previously. Repeat these operations until the difference in mass between two successive weighings is less than 0.002 g. Record the lowest mass. Retain the total ash for determining acid-insoluble ash.
D4. CALCULATION

Total ash (on dry basis), % m/m

\[
\text{ash} = \left( \frac{W_2 - W_0}{W_1 - W_0} \right) \times \frac{100}{106 - M}
\]

where,

- \( W_0 \) is the mass in g of the empty dish;
- \( W_1 \) is the mass in g of the dish and test portion;
- \( W_2 \) is the mass in g of the dish and total ash;
- \( M \) is the moisture content of the sample as received (see Appendix C).
Appendix E

Determination of acid insoluble ash

E1. APPARATUS
E1.1 As in D1.

E2. REAGENTS
E2.1 Hydrochloric acid solution. Dilute 1 volume of hydrochloric acid ($p_{20} = 1.19$ g/ml) with 9 volumes of water.
E2.2 Silver nitrate solution. 10 percent (v/v).

E3. PROCEDURE
E3.1 Test portion. Use the total ash obtained in D3.2.
E3.2 Determination. Add to the test portion 15 to 25 ml of the hydrochloric acid and boil for 10 minutes covering the dish with a watch-glass to prevent spattering. Allow to cool and filter the contents of the dish through the ashless filter paper (medium fine). Wash the filter paper with hot water until the washings are free from hydrochloric acid, as tested by silver nitrate solution, and return it to the dish. Evaporate carefully at $550 \pm 25^\circ$C for 1 hour. Cool the dish in the desiccator and weigh. Repeat the operations of igniting for 1 hour, cooling and weighing till the difference in mass between two successive weighings is less than 1 mg. Note the lowest mass.

E4. CALCULATION
E4.1 Acid insoluble ash (on dry basis), $\% \text{ m/m} =$

$$= \frac{(W_2 - W_0) \times 100}{W_1 - W_0} \times \frac{100}{100 - M}$$

where,

$W_0$ is the mass in g of the empty dish;
$W_1$ is the mass in g of the dish and test portion;
$W_2$ is the mass in g of the dish and acid-insoluble ash;
$M$ is the moisture content of the sample as received (see Appendix C).
TANDA-TANDA STANDARD SIRIM


Keterangan-keterangan lanjut mengenai syarat-syarat lesen boleh didapati dari:

Ketua Pengarah,
Institut Standard dan Penyelidikan Perindustrian Malaysia,
Persiaran Dato' Menteri, Seksyen 2, Peti Surat 7035,
40911 Shah Alam,
Selangor.

SIRIM STANDARD MARKS

The SIRIM Standard Marks shown above are registered certification trade marks. They may be used only by those licensed under the certification marking scheme operated by SIRIM and in conjunction with the relevant Malaysian Standard number. The presence of these Marks on or in relation to a product is an assurance that the goods have been produced under a system of supervision, control and testing, operated during production, and including periodical inspection of the producer's works in accordance with the certification marking scheme of SIRIM designed to ensure compliance with a Malaysian Standard.

Further particulars of the terms of licence may be obtained from:

Director-General,
Standards and Industrial Research Institute of Malaysia,
Persiaran Dato' Menteri, Section 2, P.O. Box 7035,
40911 Shah Alam,
Selangor.

Dicetak dan diterbitkan oleh: Institut Standard dan Penyelidikan Perindustrian Malaysia.
Printed and Published by: Standards and Industrial Research Institute of Malaysia.
INSTITUT STANDARD DAN PENYELIDIKAN PERINDUSTRIAN MALAYSIA


Standard-Standard Malaysia disediakan hanya setelah penyesuaian yang lengkap menunjukkan bahawa sesuatu projek itu disahkan sebagai yang dikehendaki dan berpadanan dengan usaha yang terlibat. Hasil ini berasaskan persetujuan sukarela, dan memberi pertimbangan kepada kepentingan pengguna. Standard-Standard Malaysia adalah sukarela kecuali ia dimesiikan oleh badan-badan berkuasa melalui peraturan-peraturan, undang-undang persekutuan atau cara-cara lain yang sepertinya.


STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA

The Standards and Industrial Research Institute of Malaysia (SIRIM) is established with the merger of the Standards Institution of Malaysia (SIM) and the National Institute for Scientific and Industrial Research (NISIR) under the Laws of Malaysia Act 157 on 16th September, 1975: Standards and Industrial Research Institute of Malaysia (Incorporation) Act 1975. The Institute is vested with the power to provide for the promotion and undertaking of industrial research and for the preparation and promotion of standards for commodities, processes, practices and services; and to provide for matters incidental to or connected with those purposes.

One of the functions of the Institute is to prepare Malaysian Standards in the form of specifications for materials and products, methods of testing, codes of sound and safe practice, nomenclature, etc. Malaysian Standards are prepared by representative committees which co-ordinate manufacturing capacity and production efficiency with the user’s reasonable needs. They seek to achieve fitness for purpose, simplified production and distribution, replacement interchangeability, and adequate variety of choice without wasteful diversity.

Malaysian Standards are prepared only after a full enquiry has shown that the project is endorsed as a desirable one and worth the effort involved. The work is based on voluntary agreement, and recognition of the community of interest of producer and consumer. The use of Malaysian Standards is voluntary except in so far as they are made mandatory by statutory authorities by means of regulations, federal and local by-laws or any other similar ways.

The Institute operates entirely on a non-profit basis. It is a grant aided body receiving financial aid from the Government, funds from membership subscriptions and proceeds from sales of Standards and other publications, testing fees and licence fees for the use of SIRIM Certification Mark and other activities associated with Standardization, Industrial Research and Consultancy Services.