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Jawaharlal Nehru
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Indian Standard
SPECIFICATION FOR
TURMERIC OLEORESIN
( First Reprint AUGUST 1996 )

UDC 664.5 : 668.44 : 633.861.3
Indian Standard

SPECIFICATION FOR

TURMERIC OLEORESIN

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Saiba Industries Private Limited, Bombay
The Bombay Oil Industries Private Limited, Bombay

(Continued on page 9)
AMENDMENT NO. 1 DECEMBER 1995
TO
IS : 10925 : 1984 SPECIFICATION FOR TURMERIC OLEORESIN

(Page 4, clause 2.1) — Substitute ‘in IS 6597 : 1988*’ for ‘under 2 of IS 326 : 1968*’.

[ Page 4, clause 3.2(b) ] — Substitute ‘IS 170 : 1986‡’ for ‘IS 170 : 1976‡’.


(Page 4, clause 3.2) — Insert the following after 3.2(f):

‘g) Hexane, solvent grade.’

(Page 4, clause 4.1) — Substitute the following for the existing text:

‘4.1 Packing — The material shall be packed in tightly closed aluminium or suitably lined/coated steel or paper containers, or containers of food grade polymers. The containers shall be nearly full.’

(Page 4, foot-notes) — Make the following modifications:

a) Marked ‘*’ — Substitute ‘Glossary of terms relating to natural and synthetic perfumery materials (first revision)’ for the existing matter.

b) Marked ‘‡’ — Substitute ‘(second revision)’ for ‘(second revision)’.

c) Marked ‘||’ — Substitute ‘(first revision)’ for ‘(first revision)’.

d) Marked ‘***’ — Substitute ‘(third revision)’ for ‘(second revision)’.

(Page 5, clause 4.2) — Substitute the following for the existing matter:

‘4.2 Marking — The container shall be marked with the following particulars directly or on a label affixed on it:

a) Name and address of the manufacturer or packer;

b) Name of the material;

c) Colour value;
d) Curcumin content;
e) Trade name or brand name, if any;
f) Batch or code number;
g) Net mass when packed;
h) Best before (month and year); and

(Please note replacements and additions mentioned at the end of the text for clarity and accuracy.)

(FAD9)
Indian Standard

SPECIFICATION FOR
TURMERIC OLEORESIN

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 April 1984, after the draft finalized by the Spices and Condiments Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Spices in the form of oleoresins are increasingly used by food, pharmaceutical and flavour industries. The oleoresins are preferred as their quality, flavour and strength can be standardized for better uniformity of the end product.

0.3 Turmeric oleoresin is obtained by extracting turmeric with food grade solvent and subsequent careful removal of solvent by distillation. As obtained, oleoresin will be mixture of non-volatile colouring pigment, curcumin and the essential oil (turmeric oil). Deoiled oleoresin is also used since oil does not have a very attractive flavour and aroma characteristics. The curcumin gives a bright yellow colour to the product.

0.4 In the preparation of this standard considerable assistance has been derived from EOA specification No. 271 ‘Oleoresin turmeric’ issued by the Essential Oil Association of USA.

0.5 This standard is subject to the restrictions 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.

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

1.1 This standard prescribes the requirements and methods of sampling and test for turmeric oleoresin.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given under 2 of IS: 326-1968* shall apply.

3. REQUIREMENTS

3.1 Raw Materials— Turmeric oleoresin shall be obtained from ground dried rhizomes of Curcuma longa L.

3.2 Solvents— The following solvents either singly or in mixture shall be used. As far as possible they should conform to the specifications indicated against each:

   a) Isopropanol (see IS: 2631-1976†)
   b) Acetone (see IS: 170-1976‡)
   c) Dichloromethane (see IS: 4566-1979§)
   d) Trichloroethylene (see IS: 245-1970Ⅰ)
   e) Rectified spirit (see IS: 323-1959¶)
   f) Ethyl acetate (see IS: 229-1972**)

3.3 Description— The material shall be a viscous to powdery yellow to orange red material or shall consist of an upper oily layer and a lower viscous yellow to orange red mass, free from extraneous matter and adulterants.

3.4 The material shall comply with the requirements given in Table 1.

4. PACKING AND MARKING

4.1 Packing— The material shall be supplied in tightly closed glass, pure aluminium or suitably lined containers or containers of high density polyethylene, food grade which shall be nearly full.

*Methods of sampling and test for natural and synthetic perfumery materials (first revision).
†Specification for isopropyl alcohol (first revision).
‡Specification for acetone (second revision).
§Specification for methylene chloride (dichloromethane) technical (first revision).
ⅠSpecification for trichloroethylene technical (first revision).
¶Specification for rectified spirit (revised).
**Specification for ethyl acetate (second revision).
4.1.1 The material shall be protected from light and stored in a cool place.

4.2 Marking — The containers shall be marked with the following particulars:

a) Name of the material;
b) Manufacturer's name and trade-mark, if any;
c) Net mass of the material when packed; and
d) Batch or code number.

5. SAMPLING

5.1 Representative samples of the material, sufficient to give a composite sample for triplicate determinations, shall be drawn from the containers selected from the lot as prescribed under 3 of IS: 326-1968*.

5.2 Tests for all the characteristics shall be conducted on the composite sample.

5.3 Criterion for Conformity — The lot shall be declared to have conformed to this specification if the result of tests on composite sample meet the corresponding requirements.

6. TEST METHODS

6.1 Tests shall be conducted as prescribed in Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (see IS: 1070-1977†) shall be employed in tests.

Note — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

---

*Methods of sampling and test for natural and synthetic perfumery materials (first revision).
†Specification for water for general laboratory use (second revision).
### TABLE 1 REQUIREMENTS FOR TURMERIC OLEORESIN
(Clauses 6.1)

<table>
<thead>
<tr>
<th>SL No.</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of Test, Ref to Appendix</th>
<th>App of IS : 5832-1984*</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Odours and taste</td>
<td>Typical of turmeric; No off odours or off flavours due to residual solvent or other causes.</td>
<td>A</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep yellow to orange red colour of the mass with or without top oily layer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>Colour value</td>
<td>As labelled</td>
<td>B</td>
<td>—</td>
</tr>
<tr>
<td>(3)</td>
<td>Curcumin content</td>
<td>As labelled</td>
<td>B</td>
<td>—</td>
</tr>
<tr>
<td>(4)</td>
<td>Residual solvent, mg/kg, Max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Acetone, ethylene, dichloride</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or trichloroethane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) isopropanol, methanol or</td>
<td>50</td>
<td>—</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>ethyl acetate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Hexane</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Specification for black pepper oleoresin (*first revision*).

### APPENDIX A

**Table 1, Item (i)**

**ASSESSMENT OF ODOUR AND TASTE**

**A-0. GENERAL**

**A-0.1 Outline of the Method** — The odour and taste of the material are evaluated by comparing with a prepared standard oleoresin.

**A-1. PROCEDURE**

**A-1.1 Preparation of Standard Oleoresin of Turmeric** — Separate the oil of turmeric from ground turmeric by steam distillation. Extract the dry residue so obtained with 95 percent ethanol and distill off ethanol.
completely, using high vacuum towards the end. Mix the oil of turmeric already obtained with the residue and homogenize the mixture. This two-step procedure avoids loss of essential oil during solvent removal and high vacuum helps to remove last traces of alcohol.

A-1.2 Odour — Test the odour quality of the sample by comparing with the standard oleoresin by smelling strip technique as prescribed under 4 of IS : 2284-1963*.

A-1.2.1 The material shall be deemed to have passed the test if it gives no off-odours but only the typical odour of turmeric.

A-1.3 Taste — Weigh out in a beaker 4.5 g of the neutral soup base containing 18 parts of sodium chloride 22 parts of castor sugar and 60 parts of corn flour. Mix into a smooth cream with 10 ml of cold water. Add, while stirring well, 100 ml of boiling water. Place the beaker on a hot-plate and bring the soup to boil for one minute. Add one gram of sample and stir thoroughly. Cool to about 60°C and submit to tasting panel for evaluation. A similar soup mixed with the standard oleoresin shall be prepared for comparison.

A-1.3.1 The material shall be deemed to have passed the test if it has no off-flavours.

APPENDIX B

[ Clause 3.4, and Table 1, Items ( ii, and iii ) ]

DETERMINATION OF CURCUMIN CONTENT AND COLOUR VALUE

B-0. PRINCIPLE

B-0.1 To determine the percent curcumin and colour value of the turmeric oleoresin sample by dilution and spectrophotometric measurement.

B-1. APPARATUS

B-1.1 Volumetric Flask — two 100 ml volumetric flasks.

B-1.2 Spectrophotometer — capable of accurately measuring absorbance at 425 nm.

---

B-2. REAGENTS
B-2.1 Ethyl alcohol (or suitable Denatured Alcohol) — 95 percent.

B-3. PROCEDURE
B-3.1 Weigh accurately 0.1 g of the turmeric oleoresin sample into a small beaker and transfer into a 100 ml volumetric flask with alcohol. Dilute to mark with the alcohol and pipette 10 ml of this solution into another 100 ml volumetric flask. Dilute to volume with the alcohol. Measure the absorbance of the extract at 425 nm in 1 cm cells against an alcohol blank.

B-4. CALCULATIONS
B-4.1 Absorbance of Standard Curcumin Solution — A standard solution containing 0.002 5 g/l of curcumin gives absorbance value of 0.42 at 425 nm.

B-4.2 Colour value of turmeric oleoresin = a × 1 000

B-4.3 Absorptivity of curcumin

\[
A = \frac{0.42}{l \times 0.0025}
\]

B-4.4 Curcumin in oleoresin, percent = \[
\frac{a \times 100}{l \times A \times m}
\]

where

a = absorbance of extract at 425 nm,
l = cell length in cm,
A = absorptivity, and
m = mass in g of sample.
(Continued from page 2)

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\end{tabular}
### INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

#### Base Units

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<thead>
<tr>
<th>Quantity</th>
<th>Unit</th>
<th>Symbol</th>
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</tr>
<tr>
<td>Mass</td>
<td>kilogram</td>
<td>kg</td>
</tr>
<tr>
<td>Time</td>
<td>second</td>
<td>s</td>
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<td>Electric current</td>
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<td>Thermodynamic</td>
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<td>temperature</td>
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<tr>
<td>Luminous intensity</td>
<td>candela</td>
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<tr>
<td>Amount of substance</td>
<td>mole</td>
<td>mol</td>
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#### Supplementary Units

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<th>Quantity</th>
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<tr>
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<td>Solid angle</td>
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#### Derived Units

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<th>Unit</th>
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<th>Definition</th>
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<tr>
<td>Force</td>
<td>newton</td>
<td>N</td>
<td>1 N = 1 kg.m/s²</td>
</tr>
<tr>
<td>Energy</td>
<td>joule</td>
<td>J</td>
<td>1 J = 1 N.m</td>
</tr>
<tr>
<td>Power</td>
<td>watt</td>
<td>W</td>
<td>1 W = 1 J/s</td>
</tr>
<tr>
<td>Flux</td>
<td>weber</td>
<td>Wb</td>
<td>1 Wb = 1 V.s</td>
</tr>
<tr>
<td>Flux density</td>
<td>tesla</td>
<td>T</td>
<td>1 T = 1 Wb/m²</td>
</tr>
<tr>
<td>Frequency</td>
<td>hertz</td>
<td>Hz</td>
<td>1 Hz = 1 c/s (s⁻¹)</td>
</tr>
<tr>
<td>Electric conductance</td>
<td>siemens</td>
<td>S</td>
<td>1 S = 1 A/V</td>
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<td>Electromotive force</td>
<td>volt</td>
<td>V</td>
<td>1 V = 1 W/A</td>
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<tr>
<td>Pressure, stress</td>
<td>pascal</td>
<td>Pa</td>
<td>1 Pa = 1 N/m²</td>
</tr>
</tbody>
</table>
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331 13 75
371 94 02

*Telegrams*: Manaksantha
(Common to all Offices)

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<table>
<thead>
<tr>
<th>Region</th>
<th>Region Office</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002</td>
<td>331 6617</td>
</tr>
<tr>
<td></td>
<td><em>Eastern</em>: 1/14 CIT Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054</td>
<td>37 86 62</td>
</tr>
<tr>
<td></td>
<td>Northern: SCO 335-336, Sector 34-A, CHANDIGARH 160022</td>
<td>60 38 43</td>
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<tr>
<td></td>
<td>Southern: C.I.T. Campus, IV Cross Road, MADRAS 600113</td>
<td>235 23 15</td>
</tr>
<tr>
<td></td>
<td>†Western: Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093</td>
<td>832 92 95</td>
</tr>
</tbody>
</table>

**Branch Offices**:

<table>
<thead>
<tr>
<th>Branch Office</th>
<th>Telephone</th>
</tr>
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<tbody>
<tr>
<td>'Pushpak', Nurmohamed Shaikh Marg, Khampur, AHMADABAD 380001</td>
<td>30 13 48</td>
</tr>
<tr>
<td>‡Peenya Industrial Area, 1st Stage, Bangalore-Turnkur Road, BANGALORE 560058</td>
<td>839 49 55</td>
</tr>
<tr>
<td>Gangotri Complex, 5th Floor, Bhadbhada Road, T.T. Nagar, BHOPAL 462003</td>
<td>55 40 21</td>
</tr>
<tr>
<td>Plot No. 21 Satyanagar, BHUBANESHWAR 751007</td>
<td>40 36 27</td>
</tr>
<tr>
<td>Kalaikathir Building, 6/48 Avanashi Road, COIMBATORE 641037</td>
<td>21 01 41</td>
</tr>
<tr>
<td>Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001</td>
<td>8-28 88 01</td>
</tr>
<tr>
<td>Savitri Complex, 116 G.T. Road, GHAZIABAD 201001</td>
<td>8-71 19 96</td>
</tr>
<tr>
<td>53/5 Ward No. 29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003</td>
<td>54 11 37</td>
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<tr>
<td>5-8-56C L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001</td>
<td>20 10 83</td>
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<tr>
<td>R 14, Yudhister Marg, C Scheme, JAIPUR 302005</td>
<td>38 13 74</td>
</tr>
<tr>
<td>117/418 B Sarvodaya Nagar, KANPUR 208005</td>
<td>21 68 76</td>
</tr>
<tr>
<td>Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001</td>
<td>23 89 23</td>
</tr>
<tr>
<td>Patliputra Industrial Estate, PATNA 800013</td>
<td>26 23 05</td>
</tr>
<tr>
<td>T.C. No. 14/1421, University P.O., Palayam, THIRUVANANTHAPURAM 695034</td>
<td>6 21 17</td>
</tr>
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**Inspection Offices** (With Sale Point):

<table>
<thead>
<tr>
<th>Inspection Office</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushpanjali, 1st floor, 205-A, West High Court Road, Shankar Nagar Square, NAGPUR 440010</td>
<td>52 51 71</td>
</tr>
<tr>
<td>Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005</td>
<td>32 36 35</td>
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</table>

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†Sales Office is at Novelty Chambers, Grant Road, BOMBAY 400007
‡Sales Office is at "F" Block, Unity Building, Narasimharaja Square, BANGALORE 560002

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