



Bureau of Indian Standards

PRODUCT MANUAL

FOR ACETONE

ACCORDING TO IS 170: 2020

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification license/certificate.

1	<b>Product</b>	:	IS 170 :2020
	<b>Title</b>	:	ACETONE
	<b>No of Amendments</b>	:	0
2	<b>Sampling Guidelines</b>		
A	<b>Raw Material</b>	:	No specific requirement
B	<b>Grouping Guidelines</b>	:	NA – no varieties specified in IS
C	<b>Sample Size</b>	:	Minimum 500 ml
3	<b>List of Test Equipment</b>	:	Please refer Annex- <u>A</u>
4	<b>Scheme of Inspection and Testing</b>	:	Please refer Annex- <u>B</u>
5	<b>Possible Tests in a day</b>	:	All Test as Prescribe in IS 170:2020
6	<b>Scope of the license</b>		
	License is granted to use Standard Mark as per IS 170:2020 with the following scope:		
	Name of the Product		Acetone

**ANNEXURE A****LIST OF TEST EQUIPMENT**

Sl. No	Tests used in with Clause Reference	Test Equipment
1	<b>METHOD FOR DETERMINATION OF PURITY</b>	Any gas liquid chromatograph equipped with on-column injector and flame ionization detector (FID) with other items, reagents and materials as per Annex A (IS 170:2020)
1-ii	Test colour, Pt – Co scale	<p style="text-align: center;"><b>Reference Method IS 8768</b></p> <p><b>APPARATUS</b></p> <ul style="list-style-type: none"> <li>• <b>Colour Comparison Tubes</b> 100 ml, tall form Nessler tubes, provided with ground-on optically clear, glass caps. Tubes should be selected so that the height of 100 ml graduation mark is 275 mm to 295 mm above the bottom of the tub</li> <li>• <b>Colour Comparator</b> Constructed so as to permit visual comparison of light transmitted through tall form Nessler tubes when viewed along the longitudinal axis. This permits reflection of light off a white glass plate which is directed with equal intensity through both the cylinders. The instrument is shielded so that no light enters the cylinders from the sides.</li> <li>• <b>Spectrophotometer</b> equipped for liquid samples and for measurements in the visible region</li> <li>• Spectrophotometer Cells matched cells having 10 mm light path</li> <li>• <b>REAGENTS</b> Cobalt Chloride Hexahydrate Hydrochloric Acid Chloroplatinic Acid or Potassium Chloroplatinate</li> </ul>
1-iii	Relative Density , at 27/27°C <b>Reference Method 6 of IS 82</b>	<p><b>APPARATUS</b></p> <p>Any one of the following may be used</p> <p>a) Standard hydrometer Standard hydrometer Thermometer Jar : the jar shall be at least 2'5 cm greater than the diameter of the hydrometer to be used therein</p> <p>b) Relative density bottle or pycnometer. Density bottle or pycnometer of 25 ml capacity. Weigh balance Thermometer</p>
1-iv	Distillation Range <b>Reference Method P: 18 of</b>	<b>APPARATUS</b> <b>Distillation Flasks ;</b>

	<b>IS 1448</b>	<p>125 ml</p> <p><b>Condenser and Cooling Bath:</b> 560 mm length, 14 mm in outside diameter,</p> <p><b>Metal Shield or Enclosure for Flask:</b> 480 mm high, 280 mm long, 200 mm wide, made of sheet metal of approximately 0.8 mm.</p> <p><b>Heat Source:</b> Gas burner Electric Heater</p> <p><b>Flask Support:</b> 37.5 mm or a 50 mm</p> <p><b>Graduated Cylinder:</b> 100-ml graduated cylinder with 1 ml subdivisions</p> <p><b>Thermometers:</b></p> <p>Range            -2°C to 300°C</p> <p>Graduation      1°C</p> <p>Overall length   380 ± 10mm</p> <p>Stem              5.5 to 8.0 mm diameter</p> <p>Bulb shape       Cylindrical</p> <p>Bulb length       5 to 16mm</p> <p>Longer lines     5°C at each</p>
1-v	<b>Test for water Content Reference Method IS 2362</b>	<p><b>APPARATUS</b></p> <p>Automatic Burette 10 to 25 ml capacity with a fine pointed tip and graduations of 0.05</p> <p>Titration Vessel : 100 ml capacity</p> <p>Electrode : Double platinum</p> <p>Magnetic stirrer with PTFE coated stirring bar.</p> <p>Electrometric end point detection device utilizing a micrometer</p> <p>Glass syringe; Suitable capacity.</p> <p>Aluminum Sodium Silicate/Activated Silica Gel</p> <p>Silicone Base Grease</p> <p><b>REAGENTS</b></p> <p>Methanol</p> <p>2-Methoxyetbanol (Ethylene Glycol Monomethyl Ether)</p> <p>Iodine</p> <p>Pyridine</p> <p>Karl Fischer Reagent</p>

		Sodium Tartarate Crystalline
1-vi	<b>RESIDUE ON EVAPORATION</b> <b>Reference Method 8 of IS 82</b>	<b>APPARATUS</b> Glass or silica crucible of 150 ml capacity. Water -bath. Oven with controlled heating. Measuring cylinder 100 ml capacity Desiccators weigh balance
1-iv-1	<b>REQUIREMENTS FOR THE THERMOMETER</b> Clause B-1 <i>[Table 1, SI No. (iv)]</i>	Thermometer (schedule Mark 22 of IS 4825)
1.iv-2	<b>B-1.1</b>	<p>Range : 48 to 102°C Immersion : 100 mm</p> <p><b>Graduations</b> :</p> <p>1) Subdivisions : 0.2°C 2) Long lines at each : 1°C 3) Number at each : 2°C</p> <p>Scale error, Max : 0.2°C Total length : 395 ± 5 mm Outer diameter of stem</p> <p><b>Bulb:</b></p> <p>a) Length : 15 to 20 mm b) Outer diameter : Not greater than that of stem.</p> <p><b>Scale location: Distance</b></p> <p>a) Bottom of bulb to line : 125 to 145 mm at 48°C b) Bottom of bulb to line : 335 to 360 mm at 102°C</p>
1-vii	<b>TEST FOR ACIDITY ANNEX C</b> <i>[ Table 1, SI No. (vii)]</i> Clause C-1	<b>Reagent</b> <ul style="list-style-type: none"> <li>• Phenolphthalein Indicator</li> <li>• Standard Sodium Hydroxide Solution – 0.01N</li> <li>• Ethyl alcohol</li> </ul>
1-viii	<b>TEST FOR ALKALINITY ANNEX D</b> <i>[ Table 1, SI No. (viii)]</i> Clause D-1	<b>Reagent</b> <ul style="list-style-type: none"> <li>• Hydrochloric Acid – approximately 0.02N</li> <li>• Sodium Hydroxide Solution – approximately 0.02N</li> <li>• Bromothymol Blue Indicator Solution( see IS 2263 )</li> </ul>
1-ix	<b>PERMANGANATE TEST ANNEX E</b> <i>[Table 1, SI No. (ix)]</i> Clause E-3,E-4	<b>Apparatus</b> <ul style="list-style-type: none"> <li>• Two Matched Cylinders- capacity 100 ml graduated at 50 ml</li> <li>• Constant Temperature Bath-- Capable of maintaining a temperature of 25 ±0.2 °C.</li> <li>• Pipette – Capable of delivering 2.0 ml solution</li> <li>• Interval Timer or Clock- Capable of measuring a time interval of 120 min or more</li> </ul>

		Reagent <ul style="list-style-type: none"> <li>• Potassium permanganate solution (0.2 g/l )</li> <li>• Cobalt (II) Chloride and Uranyl Nitrate, Colour Standard Solution</li> </ul>
1-x	<b>TEST FOR ALCOHOLIC IMPURITIES</b> <b>ANNEX F</b> <i>[ Table 1, SI No. (x) ]</i>	Reagent <ul style="list-style-type: none"> <li>• Agulhon's Reagent(relative density 1.33 ) (conforming to IS 250)</li> </ul>
1-xi	<b>BENZENE CONTENT</b> <i>[ Table 1, SI No. (xi) ]</i>	Any gas liquid chromatograph equipped with on-column injector and flame ionization detector (FID) with other items, reagents and materials as per Annex A (IS 170:2020)
1-xii	<b>METHANOL CONTENT</b> <i>[ Table 1, SI No. (xi) ]</i>	Any gas liquid chromatograph equipped with on-column injector and flame ionization detector (FID) with other items, reagents and materials as per Annex A (IS 170:2020)
2	<b>SAMPLING OF ACETONE</b> <b>ANNEX G</b> <i>(Clauses 5.1, 5.2.1 and 5.2.2)</i>	Apparatus Clean, dry and air-tight glass containers. ➤ <b>SAMPLING INSTRUMENTS</b> <ul style="list-style-type: none"> <li>• <b>Weighed Sampling Can</b> suitable capacity, 500 to 1000 ml(see IS 82)</li> <li>• <b>Sampling Tube</b> Sampling Tube is made of metal or thick glass and is 20 to 40 mm in diameter and 400 to 800 mm in length (see Fig. 2). 5 to 10 mm internal diameter at the narrow ends</li> </ul>
3	<b>Description and miscibility</b> <b>(clauses 3.2)</b>	AC for maintaining temperature of 27 degree centigrade

The above list is indicative and may not be taken as exhaustive

## **ANNEXURE B**

### **Scheme of Inspection and Testing**

**LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

**2. TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. PACKING AND MARKING** – – The Standard Mark, as given in the Schedule of the license, shall be marked on the container provided always that material so marked conform to requirements of the specification.

3.1 Packing and Marking shall be done as per the provisions of the Indian Standard. In addition, the following shall be incorporated on each container:

- i) BIS License Number CM/L—and
- ii) BIS website details i.e. —For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in)

**4. CONTROL UNIT** – For the purpose of this scheme, the entire quantity of the material produced in a continuous run of not more than 8 hours shall constitute a control unit.

**5. LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the license should be marked with Standard Mark.

**6. REJECTIONS** – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**TABLE 1**  
**LEVELS OF CONTROL**

SI No.	(1)				(2)	(3)		
	Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
	cl.	requirement	Test method			No. of Sample	frequency	Remarks
Clause			Reference					
	3.1	Description	3.1	IS 170	R	One	Each control unit	
	3.2	Miscibility with water	3.2	IS 170	R	One	-do-	
(i)	3.3, Table 1	Purity percent by mass	Annex A	IS 170	R	One	-do-	
(ii)	-do-	Colour, Pt-Co scale		IS 8768	R	One	-do-	
(iii)	-do-	Relative density, at 27/27 °C	6	IS 82	R	One	-do-	
(iv)	-do-	Distillation range	Method B	[P:18] of IS 1448 with the thermometer containing to the requirements given to Annex B of this standard	R	One	Once a month	
(v)	-do-	Water content, percent by mass		IS 2362	R	One	Each control unit	
(vi)	-do-	Residue on evaporation	8	IS 82	R	One	Once a month	
(vii)	-do-	Acidity (as CH <sub>3</sub> COOH), g/100 ml	Annex C	IS 170	R	One	Each control unit	
(viii)	-do-	Alkalinity	Annex D	IS 170	R	One	-do-	
(ix)	-do-	Permanganate test	Annex E	IS 170	R	One	Once a week	
(x)	-do-	Alcoholic impurities	Annex F	IS 170	R	One	-do-	
(xi)	-do-	Benzene Content	Annex A	IS 170	R	One	-do-	

(xii)	-do-	Methanol Content	Annex A	IS 170	R	One	-do-	
-------	------	---------------------	---------	--------	---	-----	------	--

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval to BO head.