



उत्पाद मैनुअल  
इथाइल एसीटेट  
IS 229: 2021 के अनुसार

PRODUCT MANUAL FOR  
ETHYL ACETATE —  
SPECIFICATION  
According to IS 229 : 2021

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.*

|    |                                                                                                    |   |                                                                                                                                                               |
|----|----------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | उत्पाद<br>Product                                                                                  | : | IS 229 : 2021                                                                                                                                                 |
|    | शीर्षक<br>Title                                                                                    | : | ETHYL ACETATE - SPECIFICATION                                                                                                                                 |
|    | संशोधन संख्या<br>No. of amendments                                                                 | : | 2                                                                                                                                                             |
| 2. | नमूनाकरण दिशा निर्देश<br>Sampling Guidelines                                                       |   |                                                                                                                                                               |
| a) | कच्चा माल<br>Raw material                                                                          | : | -NA-                                                                                                                                                          |
| b) | समूहिकरण दिशा निर्देश<br>Grouping Guidelines                                                       | : | - Please refer Annexure – A-                                                                                                                                  |
| c) | नमूने का परिमाण<br>Sample Size                                                                     | : | 1 L                                                                                                                                                           |
| d) | परीक्षण अनुरोध में घोषित<br>किए जाने वाले पैरामीटर<br>Parameters to be Declared in<br>Test Request | : | <p>i) Grade of the material</p> <p>Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.</p> |

|    |                                                                                                                                                                                                             |                  |                           |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|
| 3. | परीक्षण उपकरणों की सूची<br>List of Test Equipment                                                                                                                                                           | :                | Please refer Annexure - B |
| 4. | निरीक्षण व परीक्षण स्कीम<br>Scheme of Inspection and Testing                                                                                                                                                | :                | Please refer Annexure - C |
| 5. | एक दिन में संभावित परीक्षण<br>Possible tests in a day                                                                                                                                                       | :                | All Tests                 |
| 6. | लाइसेन्स का कार्यक्षेत्र<br>Scope of the Licence :                                                                                                                                                          |                  |                           |
|    | IS 229 : 2021 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है<br>Licence is granted to use Standard Mark as per IS 229 : 2021 with the following scope: |                  |                           |
|    | Name of the product                                                                                                                                                                                         | ETHYL ACETATE    |                           |
|    | Grade                                                                                                                                                                                                       | Grade 1/ Grade 2 |                           |

**BUREAU OF INDIAN STANDARDS**  
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**ANNEXURE A**

**GROUPING GUIDELINES**

1. Each grade intended to be covered in the scope of the licence is to be tested.
2. Scope of licence shall be restricted based on the manufacturing and testing facilities available.
3. During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

**ANNEXURE B**  
**LIST OF TEST EQUIPMENTS**

**(INDICATIVE LIST, FOR GUIDANCE ONLY)**

| Sl No. | Test Used in with Clause Reference                     | Test equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Relative Density, Clause 4.2, Table 1, Sl.No.i)        | <ol style="list-style-type: none"> <li>1. Relative density bottles (Regnault type or Pycnometer)</li> <li>2. Weighing balance</li> <li>3. Water bath</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2      | Residue on evaporation, Clause 4.2 Table 1, Sl.No.ii)  | <ol style="list-style-type: none"> <li>1. Oven</li> <li>2. Platinum/Silica/ Borosilicate Glass basin or Porcelain dish</li> <li>3. Weighing balance</li> <li>4. Water bath</li> <li>5. Desiccator</li> <li>6. Measuring cylinder</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3      | Acidity as acetic acid, Clause 4.2 Table 1, Sl.No.iii) | <ol style="list-style-type: none"> <li>1. Burette</li> <li>2. Rectified spirit/ Methanol Pure</li> <li>3. Phenolphthalein indicator</li> <li>4. Sodium Hydroxide Solution</li> <li>5. Measuring cylinder</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4      | Purity as ethyl acetate, Clause 4.2 Table 1, Sl.No.iv) | <ol style="list-style-type: none"> <li>A. For determination of ester content as ethyl acetate <ol style="list-style-type: none"> <li>1. Round Bottom flask</li> <li>2. Reflux condenser</li> <li>3. Burette</li> <li>4. Alcoholic Sodium Hydroxide Solution</li> <li>5. HCL</li> <li>6. Phenolphthalein indicator</li> </ol> </li> <li>B. Determination of ester content and Ethyl alcohol by GC method <ol style="list-style-type: none"> <li>1. Gas Chromatograph with FID detector</li> <li>2. Capillary Column as per IS 229:2021</li> <li>3. Stopper Flask</li> <li>4. Pipette</li> <li>5. Weighing balance</li> <li>6. Ethyl Acetate Pure</li> <li>7. Acetaldehyde Pure</li> <li>8. Ethanol Pure</li> <li>9. Propyl Acetate Pure</li> </ol> </li> </ol> |
| 5      | Distillation range, Clause 4.2 Table 1, Sl.No.v)       | <ol style="list-style-type: none"> <li>1. Distillation Apparatus</li> <li>2. Thermometer</li> <li>3. Draught Screen</li> <li>4. Liebig Condenser</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6      | Water content, Clause 4.2 Table 1, Sl.No.vi)           | <ol style="list-style-type: none"> <li>1. Karl Fischer Titrator</li> <li>2. Pipette</li> <li>3. Karl Fischer Reagent</li> <li>4. Methanol</li> <li>5. 2- Methoxyethanol</li> <li>6. Iodine</li> <li>7. Pyridine</li> <li>8. Sulphur dioxide</li> <li>9. Sodium Tartarate</li> <li>10. Aluminium Silicate/ Activated Silica</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 7      | Colour, Clause 4.2 Table 1, Sl.No.vii)                 | <ol style="list-style-type: none"> <li>1. Cobaltous Chloride Hexahydrate</li> <li>2. HCL</li> <li>3. Potassium Chloroplatinate or Chloroplatinic Acid</li> <li>4. Nessler tubes</li> <li>5. Spectrophotometer</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|   |                                                           |                                                                                                                                                                                                                                                                                                                                                                                      |
|---|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 | Ethyl alcohol content, Clause 4.2<br>Table 1, Sl.No.viii) | <ol style="list-style-type: none"><li>1. Gas Chromatograph with FID detector</li><li>2. Capillary Column as per IS 229:2021</li><li>3. Stopper Flask</li><li>4. Pipette</li><li>5. Weighing balance</li><li>6. Ethyl Acetate Pure</li><li>7. Acetaldehyde Pure</li><li>8. Ethanol Pure</li><li>9. Propyl Acetate Pure</li><li>10. Methanol Pure</li><li>11. Methyl Acetate</li></ol> |
|---|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## ANNEXURE- C

### **SCHEME OF INSPECTION AND TESTING**

#### **1. QUALITY ASSURANCE PLAN**

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

#### **1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:**

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : the entire quantity of the product produced in a batch at a time shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

**2. ENSURING COMPLIANCE THROUGH TESTING-** It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.**

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1),** where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website [www.bis.gov.in](http://www.bis.gov.in). (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

**2.4 TEST RECORDS-** The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

**3. PACKING AND MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each packaging provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 If material is supplied in tank cars, tank trucks, container ships etc. the Standard Mark as given in Schedule of the licence and Licence Number (i.e. CM/L ) shall be incorporated on a test certificate to be provided along with each tank car/tank truck/container ship as per the format at Appendix-1 enclosed, provided always that the product thus marked conforms to all the requirement of the specification. Packing shall be done as per provisions of Indian Standard and the marking details as per Cl 5.2 of IS 229: 2021 shall also be indicated on the test certificate.

**3.3 Additional Marking requirements:** The material shall also be marked with the following additional requirement on each packaging:

a) “For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)”

**4. REJECTION** - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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.

## ANNEXURE C

TABLE 1: LEVELS OF CONTROL (For Guidance Purpose Only)

| TEST DETAILS |                         |             |           | Test equipment requirement<br>R: required<br>(or) S:<br>Subcontracting permitted | LEVELS OF CONTROL                                                                                                                                                                                                 |                   | REMARKS |
|--------------|-------------------------|-------------|-----------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------|
| Clause       | Requirements            | Test Method |           |                                                                                  | No. of Samples                                                                                                                                                                                                    | Frequency         |         |
|              |                         | Clause      | Reference |                                                                                  |                                                                                                                                                                                                                   |                   |         |
| 4.1          | Description             | 4.1         | IS 229    | R                                                                                | Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity. |                   |         |
| 4.2          | Relative Density        | Annex A     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Residue on evaporation  | Annex B     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Acidity as acetic acid  | Annex C     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Purity as ethyl acetate | Annex D     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Distillation range      | Annex E     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Water content           | -           | IS 2362   | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Colour                  | -           | IS 8768   | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |
| 4.2          | Ethyl alcohol content   | Annex D     | IS 229    | R                                                                                | 1                                                                                                                                                                                                                 | Each Control Unit | -----   |

Appendix-1

TEST CERTIFICATE XYZ COMPANY  
(REGISTERED OFFICE ADDRESS AND WORKS ADDRESS)  
TEST CERTIFICATE FOR PYRIDINE AS PER IS 229:2021

TEST CERTIFICATE NO. \_\_\_\_\_

Dated:

SUPPLIED TO M/s \_\_\_\_\_ (Name and Address of Consignee)

It is certified that the material described below fully conforms to IS 229:2021. The properties of the product, as tested in accordance with the Scheme of Inspection

and Testing contained in the BIS Certification Marks License No. CM/L \_\_\_\_\_ are as indicated below against each order no. etc.

(PLEASE REFER TO IS 221:2021, FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

| Order no and date | Name and Grade of the material | Control Unit/ Batch Number | Month and Year of manufacture | Qty | Requirements |                  |                        |                        |                         |                    |               |        |                       | Remarks |
|-------------------|--------------------------------|----------------------------|-------------------------------|-----|--------------|------------------|------------------------|------------------------|-------------------------|--------------------|---------------|--------|-----------------------|---------|
|                   |                                |                            |                               |     | Description  | Relative Density | Residue on evaporation | Acidity as acetic acid | Purity as ethyl acetate | Distillation range | Water content | Colour | Ethyl alcohol content |         |
|                   |                                |                            |                               |     |              |                  |                        |                        |                         |                    |               |        |                       |         |

The material supplied conforms to specified requirements of IS 229:2021

REMARKS: Tank Car / Tank Truck / Container ship no.

(Signature)  
For XYZ Company