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**DRAFT ECOWAS STANDARD****DRAFT ECOSTAND 369**

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**Paints and Varnishes – Specification for mineral solvents (turpentine) for paints and other purposes****1. Scope**

This ECOWAS Standard specifies the requirements, methods of sampling and test for mineral solvents for use in paints and varnishes and for other purposes.

**2. Normative references**

The following standards contain provisions which through reference in this text, constitute provisions of this standard. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

**2.1** ISO 3405: 2000 – Petroleum liquids – Determination of distillation characteristics at atmospheric pressure.

**2.2** ISO 2160: 1998 – Petroleum products – Corrosiveness to copper – Copper strip test.

**2.3** ISO 2977: 1998 – Petroleum products and hydrocarbon solvents – Determination of aniline point and mixed aniline point.

**2.4** ISO 2719: 2002 – Determination of flash point – Pensity – Martens closed cup equilibrium method.

**2.5** ISO 3837:1993- Liquid petroleum products- Determination of hydrocarbon types- fluorescent indicators adsorption method.

**2.6** ASTM D 381 – Standard Test method for existence gum in fuels by jet evaporation.

**3 Requirements**

Mineral solvents consist essentially of a mixture of hydrocarbons, but the presence of a denaturant is permitted when agreed between the interested parties. The product shall conform to the requirements given in Table when determined in accordance with the methods given in the Table.1.

## **4. Packing and Marking**

### **4.1 Packing**

The mineral solvent shall be packed in well sealed drums or tankers or any suitable container such that it will have no detrimental effect on the quality of the product during normal transportation and storage.

### **4.2 Marking**

The following shall be marked on each drum or container or tanker.

- a) manufacturer's name and/or trade mark and address.
- b) description of the product
- c) batch identification
- d) volume
- e) safety precautions for handling and use,
- f) country of manufacture; and
- g) storage conditions

## **5. Sampling and Conformity criteria**

### **5.1 Sampling**

**5.1.1** Representative samples, each having a volume of not less than 500 ml, shall wherever possible, be taken in triplicate from one or more original and previously unopened containers or from the bulk during packing, as may be agreed between the interested parties. Samples shall be packed in clean, dry, airtight bottles of dark glass, or of clear glass provided they are protected from light. The containers shall be of such size that they are nearly filled by the sample. Each sample container so filled shall be sealed with a material unaffected by the contents and marked with the full details and date of sampling.

Guidance on sampling is given in ISO 3170 – Petroleum liquids – Manual sampling

**5.1.2** If an agreed sample is required for the purpose of clause 3 in relation to odour, it shall comply in all other respects with the requirements of this specification. It shall have a volume of not less than 500 ml and shall be packed in the manner described in 5.1.1.

### **5.2 Conformity criteria**

The lot shall be deemed to comply with the requirements of this specification if, after inspection and testing, the samples taken in accordance with 5.1 are found to comply with all the relevant requirements of this specification.

## **6. Methods of test**

Use the appropriate methods given in Table 1.

**Table 1 – Required characteristics and their tolerances**

<b>Characteristic</b>	<b>Requirement</b>	<b>Test method</b>
Clarity	Clear, no solid matter present	Visual inspection
Undissolved water at 20°C	Absent	Visual inspection
Odour	If required by purchaser, to conform to agreed sample	As agreed between the interested parties
Colour	Not darker than standard colour solution	Annex A
Distillation at atmospheric pressure: volume of condensate recovered	These limits apply to mineral solvents with or without denaturant: not more than 1 ml below 130°C not more than 10 ml below 145°C not less than 90 ml below 200°C end point, not above 220°C	ISO 3405
Aromatics content, max	50% (v/v)	ISO 3837
Residue on evaporation	Not more than 5 mg per 100 ml.	ASTM D 381 – Standard test method for existent gum in fuels by jet evaporation using the method described for aviation and motor gasoline and the air-jet apparatus
Neutrality	Neutral By agreement between the interested parties, this requirement may be waived or modified in relation to denatured materials	When 50 ml of sample is shaken with 10 ml of distilled water, the water layer shall be neutral to methyl orange.
Freedom from objectionable sulphur compounds	No more than slight tarnish of copper strip	ISO 2160
Aniline point	If required, to be agreed between the interested parties	ISO 2977
Flash point	Not flashing at 32°C	ISO 1516
Viscosity reduction power	If required, to be agreed between the interested parties	Annex B

## **ANNEX A NORMATIVE**

### **Method for the comparison of colour**

#### **A – 1 Standard colour solution**

Dissolve 4,8 mg of pure anhydrous potassium dichromate in 1 litre of distilled water or deionized water of at least equal purity.

#### **A – 2 Apparatus**

Two 50 ml Nessler cylinders with the height of the 50 ml mark above the inside of the base matched to within 1 mm in the range 110 mm to 116 mm.

#### **A – 3 Procedure**

Pass the sample through a filter paper about 150 mm in diameter and reject the first 10 ml of filtrate. Fill one of the Nessler cylinders to the mark with the filtered sample and the other with the standard colour solution. Place the cylinders vertically 75 mm above the surface of an opaque glass sheet reflecting diffuse daylight, and compare the colour of the sample with that of the standard colour solution. Report the colour of the sample as being equal to, or lighter or darker than the colour of the standard colour solution.

#### **A – 4 Alternative methods**

Alternative methods, employing permanent colour standards and giving results equivalent to the specified colour, may be used by agreement between the interested parties.

## ANNEX B (NORMATIVE)

### Method for the determination of viscosity reduction power

#### B – 1 Field of application

Viscosity reduction power is defined as the ratio of the viscosity of a resin dissolved in a control hydrocarbon solvent to the viscosity of a solution of the same resin at the same concentration in the hydrocarbon solvent under test.

This method of test specifies a procedure for determining the comparative viscosity reduction power of mineral solvents for various types of resinous materials.

#### B – 2 Reagents

B – 2.1 Control solvent, a hydrocarbon solvent as agreed between the interested parties.

#### B – 3 Apparatus

B – 3.1 Glass bottles of about 500 ml capacity, some having a narrow mouth with a cork to fit, others having a wide mouth with screw cap and seal of aluminium foil.

**NOTE:** If desired 500 ml friction-top cans may be substituted.

B- 3.2 Balance, sensitivity of 0,05 g.

B – 3.3 Mortar and pestle, or other suitable equipment for grinding hard resin.

B – 3.4 Mechanical agitator

B – 3.5 Temperature regulator, suitable for maintaining temperature at  $25 \pm 0,5^{\circ}\text{C}$ .

B – 3.6 Viscometers, of any approved type agreed between the interested parties, giving accurate results in centistokes, or results that can be converted to centistokes

#### B – 4 Procedure

##### B – 4.1 Preparation of solutions from hard resins.

Prepare duplicate solutions as follows. Into a clean, dry, narrow-mouth bottle of about 500 ml capacity, weigh the appropriate quantity of freshly ground lump resin to the nearest 0,05 g (see note). Add the necessary volume of control solvent. The mass of resin and the volume of solvent shall be agreed between the interested parties and shall be in such proportion that the resultant solution has a viscosity of between 100cSt and 500 cSt. The total volume of the solution shall be at least 300 ml.

Prepare a similar solution with an equivalent amount of the resin and the solvent under test. Cork the bottles tightly and dissolve the resin in the solvents by mixing at room temperature with a mechanical agitator until solution is complete.

The test shall be discontinued if the solution is not perfectly clear, because this indicates incomplete compatibility of resin and solvent.

When the solution is complete, the bottles shall be allowed to stand at room temperature to eliminate air bubbles, but the viscosity shall be determined as soon as possible after the bubbles have cleared.

NOTE: Since many resins are subject to oxidation in storage, only large lumps should be selected for grinding in order to minimize the effects of oxidation. The resin should be ground sufficiently fine to ensure rapid solution of the material but should not be ground to the consistency of a 'flour' because it is difficult to handle in that state.

#### **B – 4.2 Preparation of solutions from liquid resins or resin solutions.**

Prepare duplicate solutions as follows. Into a clean, dry, wide-mouth bottle of about 500 ml capacity, weigh the appropriate quantity of liquid resin or resin solution to the nearest 0,05 g. If the resin or resin solution is very viscous, mild heating to a maximum temperature of 50°C will facilitate transfer to the bottle in which the solution is to be prepared, care being taken that solvents in a resin solution are not allowed to evaporate. Add the necessary volume of control solvent. The mass of resin and the volume of solvent shall be agreed between the interested parties and shall be in such proportion that the resultant solution has viscosity of between 100cSt and 500 cSt. The total volume of the solution shall be at least 300 ml. Prepare a similar solution with an equivalent amount of the liquid resin or resin solution and the solvent under test. Cap the bottles tightly and dissolve the liquid resin or resin solution in the solvents by mixing at room temperature with a mechanical agitator for at least 15 min.

When solution is complete, the bottles shall be allowed to stand at room temperature to eliminate air bubbles, but the viscosity shall be determined as soon as possible after the bubbles have cleared.

#### **B – 4.3 Determination of viscosity**

If there is any lint or dirt in the solution after mixing is complete, the bottle shall be centrifuged before viscosity determinations are made. In order to obtain reliable data, duplicate solutions shall be prepared and tested. Determine the viscosity of each solution at 25°C, using suitable temperature control, by means of any approved apparatus agreed between the interested parties.

#### **B – 5 Calculation**

Calculate the viscosity reduction power (VRP) as follows:

$$VRP = \frac{v_1}{v_2} \times 100$$

where:

$v_1$  is the mean value of the viscosity of the solutions made with the control solvent (in cSt).

$v_2$  is the mean value of the viscosity of the solutions made with the solvent under test (in cSt).

If the result is less than 100, the solvent under test has a lower VRP than the control solvent. If the result is greater than 100, the solvent under test has a higher VRP than the control solvent.

#### **B – 6 Reproducibility**

Results obtained in any one laboratory (mean of at least two determinations) should not be considered suspect unless they deviate from the average of two or more laboratories by more than 15%.