



PM/ IS 335/ 2/ March 2019

## PRODUCT MANUAL FOR NEW INSULATING OILS ACCORDING TO IS 335:2018

*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 licence/certificate.*

1.	<b>Product</b>	:	IS 335:2018
	<b>Title</b>	:	New Insulating Oils
	<b>No. of Amendments</b>	:	Nil
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	—
b)	<b>Grouping guidelines</b>	:	Each Classification (as per clause 5.1 of IS 335:2018) of New Insulating Oil shall be tested for GoL and CSoL.
c)	<b>Sample Size</b>	:	10 litres of New Insulating Oil
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – A</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – B</a>
5.	<b>Possible tests in a day</b>	:	Please refer <a href="#">ANNEX – C</a>
6.	<b>Scope of the Licence :</b>		
	“Licence is granted to use Standard Mark as per IS 335:2018 with the following scope:		
	Name of the product	New Insulating Oils	
	Classification	As per clause 5.1 of IS 335:2018	

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**ANNEX A****List Of Test Equipment***Major test equipment required to test as per the Indian Standard*

<b>Sl. No.</b>	<b>Test Equipment</b>	<b>Tests Used in with Clause reference</b>
1	Viscosity Bath	Cl. 6.1
2	Pour Point Analyzer	Cl. 6.2
3	Moisturemeter	Cl. 6.3
4	Motorised Oil Test Set (bdv meter)	Cl. 6.4
5	Density Hydrometer	Cl. 6.16
6	Automatic resistivity meter & tan delta meter	Cl. 6.5
7	Potentiometer	Cl. 6.7
8	Surface tensiometer	Cl. 6.8
9	EDXRF	Cl. 6.9
10	Oven for Corrosive Sulphur Test	Cl. 6.10
11	Gas Chromatograph	Cl. 6.21
12	FTIR	Cl. 6.11.2
13	HPLC	Cl. 6.11.3, Cl. 6.19
14	Oxidation Stability Bath, Potentiometer, Automatic resistivity meter & tan delta meter	Cl. 6.12
15	Flash Point Apparatus	Cl. 6.15
16	Gas Chromatograph	Cl. 6.18

*The above list is indicative only and may not be treated as exhaustive.*

**ANNEX B**

**Scheme Of Inspection And Testing**

**1. 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. LABELLING AND MARKING** – As per the requirements of IS 335:2018.

**4.1 REPACKING OF NEW INSULATING OIL** – If a firm is doing only re-packing of new insulating oils at their premises, then each consignment of new insulating oil received shall be accompanied by a certificate bearing the Standard Mark of the Bureau.

**4.2 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. In case a license is issued only for re-packing of new insulating oil, then the tests as indicated in [Table 2](#) of SIT and the levels of controls specified therein, shall be applicable, instead of [Table 1](#) of SIT.

**5. CONTROL UNIT** – For the purpose of Table 1 of this Scheme, each class of new insulating oil produced in a day shall constitute a control unit.

**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**

<b>(1)</b>				<b>(2)</b>	<b>(3)</b>		
<b>Test Details</b>				<b>Test equipment requirement</b> R: required (or) S: Sub-contracting permitted	<b>Levels of Control</b>		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
6.1	Viscosity	6.1, Table 1, Table 2	IS 335	R	1	Each control unit	If the insulating oil fails in any requirement, two more samples shall be drawn from the same control unit and tested for those particular requirements and the control unit shall be rejected if there is any further failure. The control unit so rejected may be suitably re-processed and the defects rectified. Such re-processed control unit may be marked when tested again in accordance with the Scheme and found conforming to the requirements of the Specification.
6.2	Pour Point	6.2, Table 1, Table 2	IS 335	R	1		
6.3	Water Content	6.3, Table 2	IS 335	R	1		
6.4	Breakdown Voltage	6.4, Table 2	IS 335	R	1		
6.5	DDF at 90 °C	6.5, Table 2	IS 335	S	1	Once in three months from each class of oil	
6.6	Appearance	6.6, Table 2	IS 335	R	1	Each control unit	
6.7	Acidity	6.7, Table 2	IS 335	R	1		
6.8	Interfacial Tension (IFT)	6.8, Table 2	IS 335	R	1		
6.9 7.1	Sulphur Content	6.9, 7.1 Table 2	IS 335	S	1	Once in three months from each class of oil	
6.10	Corrosive Sulphur and Potentially Corrosive Sulphur	6.10, Table 2	IS 335	S	1		
6.11	Additives	6.11, Table 2	IS 335	S	1	Once in six months from each class of oil	
6.12 7.1	Oxidation Stability	6.12, 7.1 Table 2	IS 335	S	1		
6.13 7.3	Gassing Tendency	6.13, 7.3 Table 2	IS 335	S	1	Once in three months from each class of oil	

**TABLE 1**

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
6.14 7.2	Electrostatic Charging Tendency (ECT)	6.14, 7.2 Table 2	IS 335	S	1	Once in six months from each class of oil	If the insulating oil fails in any requirement, two more samples shall be drawn from the same control unit and tested for those particular requirements and the control unit shall be rejected if there is any further failure. The control unit so rejected may be suitably re-processed and the defects rectified. Such re-processed control unit may be marked when tested again in accordance with the Scheme and found conforming to the requirements of the Specification.
6.15	Flash Point	6.15, Table 2	IS 335	R	1	Each control unit	
6.16	Density	6.16, Table 2	IS 335	R	1		
6.17	Polycyclic Aromatics (PCA)	6.17, Table 2	IS 335	S	1		
6.18	Polychlorinated Biphenyls (PCB)	6.18, Table 2	IS 335	S	1		
6.19	2-Furfural (2-FAL) and Related Compounds Content	6.19, Table 2	IS 335	S	1	Once in six months from each class of oil	
6.20	Particle Content	6.20, Table 2	IS 335	S	1		
6.21	DBDS Content	6.21, Table 2	IS 335	S	1		
6.22	Stray Gassing of Oil	6.22	IS 335	S	1		

Note- 1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled 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 by BO Head.

**TABLE 2**  
**(FOR REPACKING UNIT)**

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
6.1	Viscosity	6.1, Table 2	IS 335	R	1	*	If the insulating oil fails in any requirement, two more samples shall be drawn from the same consignment and tested for those particular requirements and the consignment shall be rejected if there is any further failure. The consignment so rejected may be returned to the supplier for re-processing.
6.2	Pour Point	6.2, Table 2	IS 335	R	1		
6.3	Water Content	6.3, Table 2	IS 335	R	1		
6.4	Breakdown Voltage	6.4, Table 2	IS 335	R	1		
6.5	DDF at 90 °C	6.5, Table 2	IS 335	S	1	Once in six months from each class of oil received from each manufacturer	
6.6	Appearance	6.6, Table 2	IS 335	R	1	*	
6.7	Acidity	6.7, Table 2	IS 335	R	1		
6.8	Interfacial Tension (IFT)	6.8, Table 2	IS 335	R	1		
6.9 7.1	Sulphur Content	6.9, 7.1 Table 2	IS 335	S	1	Once in six months from each class of oil received from each manufacturer	
6.10	Corrosive Sulphur and Potentially Corrosive Sulphur	6.10, Table 2	IS 335	S	1		
6.11	Additives	6.11, Table 2	IS 335	S	1	Once in a year from each class of oil received from each manufacturer	
6.1 7.1	Oxidation Stability	6.12, 7.1 Table 2	IS 335	S	1		
6.1 7.3	Gassing Tendency	6.13, 7.3 Table 2	IS 335	S	1	Once in six months from each class of oil received from each manufacturer	

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Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
6.14 7.2	Electrostatic Charging Tendency (ECT)	6.14, 7.2 Table 2	IS 335	S	1	Once in a year from each class of oil received from each manufacturer	If the insulating oil fails in any requirement, two more samples shall be drawn from the same consignment and tested for those particular requirements and the consignment shall be rejected if there is any further failure. The consignment so rejected may be returned to the supplier for re processing.
6.15	Flash Point	6.15, Table 2	IS 335	R	1	*	
6.16	Density	6.16, Table 2	IS 335	R	1		
6.17	Polycyclic Aromatics (PCA)	6.17, Table 2	IS 335	S	1	Once in a year from each class of oil received from each manufacturer	
6.18	Polychlorinated Biphenyls (PCB)	6.18, Table 2	IS 335	S	1		
6.19	2-Furfural (2-FAL) and Related Compounds Content	6.19, Table 2	IS 335	S	1		
6.20	Particle Content	6.20, Table 2	IS 335	S	1		
6.21	DBDS Content	6.21, Table 2	IS 335	S	1		
6.22	Stray Gassing of Oil	6.22	IS 335	S	1		

\* From each class of New Insulating Oil produced in a day by each manufacturer, in each consignment received.

Note- 1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled 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 by BO Head.

**ANNEX C**

**Possible Tests in a day**

- (i) Appearance
- (ii) Viscosity at 40 °C
- (iii) Viscosity at 0 °C
- (iv) Density at 20 °C
- (v) Flash Point
- (vi) Interfacial Tension
- (vii) Water content
- (viii) Breakdown Voltage
- (ix) Acidity