केन्द्रीय मुहर विभाग 3

हमारा संदर्भ- केन्द्रीय मुहर विभाग-3/16: आई एस – ११८०(भाग– 1) 01 जुलाई २०16

विषय- आईएस ११८०:२०१४ के प्रमानन दिशा निर्देश के अनुपालन हेतु दिशानिर्देश

आई एस – ११८० (भाग– 1) : २०१४ के संशोधित प्रमानन दिशा निर्देश को सक्षम अधिकारी द्वारा अनुमोदित किया गया है. सभी क्षेत्रीय एवं शाखा कार्यालयों से अनुरोध है कि उपरोक्त प्रमानन दिशा निर्देश के तुरंत कार्यान्यवन के लिए कार्यवाही करें .

(सुधांशु राय)
वैज्ञानिक बी (सी एम डी-3)

प्रमुख (सी एम डी-3)

सभी शाखा कार्यालय/ भारतीय मानक ब्यूरो प्रयोगशाला/एम.ई.डी
आई टी एस विभाग – BIS Intranet एवं BIS website पर डालने हेतू

CENTRAL MARKS DEPARTMENT-3

Our Ref: CMD-3/16: IS 1180 (Part 1) 01.07.2016

Subject: Revised certification guidelines for IS 1180 (Part 1): 2014
Competent authority has approved the revised certification guidelines for IS 1180 (Part 1): 2014.

These guidelines come into force with immediate effect.

All ROs/BOs are requested to ensure the implementation of the same with immediate effect.

(Sudhanshu Rai)
Sc. B (CMD-3)

Head (CMD-3)

Circulated to all RO/BO/SBOs
Copy to: ITS for hosting on Intranet and BIS website.

BUREAU OF INDIAN STANDARDS
[Central Marks Department– 3]

Our Ref: CMD-3/16: IS 1180 **Date: 28-06-2016**

Subject: Guidelines for Certification of Outdoor Type Distribution Transformers as per IS 1180 (Part 1): 2014

This is with reference to Guidelines in vogue for the certification of Distribution Transformers vide CMD circular CMD-3/16:IS1180 Dated 20-11-2015. This revised guidelines cover instructions specific to Distribution Transformers for Grant of Licence and operation of licence.

I. For Grant of Licence

1. The applicant shall clearly indicate in the application, the ratings of the transformers for which BIS licence is required. The practice of offering a Lot for sampling during Preliminary Inspection is not applicable for this product, as these are costly and manufactured on the basis of orders received from the buyers. Samples shall be drawn as per the grouping guidelines mentioned below:

   a. During Preliminary Inspection, samples shall be drawn from the following group to cover all the ratings of Three Phase Transformers:

Nominal System Voltage	Standard Ratings	
	Up to and including 200 kVA, 3 Phase	Above 200kVA and up to & including 2500 kVA, 3 Phase
3.3 kV,6.6 kV& 11 kV	One sample of highest rating	One sample of highest rating
Above 11 kV &Up to & including 22 kV	-do-	-do-
Above 22 kV & Up to & including 33 kV	-do-	-do-

   b. For Single phase transformers, samples shall be drawn as per the following to cover all the ratings:

Nominal System Voltage	Standard Ratings
11kV	One sample of highest rating
22kV	-do-
33kV	-do-

   c. For Sealed and Non-Sealed construction, separate samples are not required to be drawn for Independent testing. If sealed sample is already drawn, non-sealed variety can be included in the scope of the licence after its conformity to pressure test requirements as per IS 1180(Part 1): 2014 and vice-versa. This testing may be done in factory or independent testing. Inspection charges as applicable shall be collected for factory testing.

   d. Separate sample of transformer is required for change in the core material (CRGO/Amorphous) and winding material (Aluminium/Copper).

   e. Non preferred ratings within the group as mentioned in Table-1 of the ISS may be covered in the scope of the licence based on the declaration submitted by the manufacturer w.r.t

design calculations, maximum total losses and declared technical parameters as per Annex-1.

f. If transformers with higher energy efficiency level is drawn for testing and found passing, the scope of licence shall also cover transformers with lower energy efficiency levels, as specified in the ISS within the group.

g. During Preliminary Inspection, one sample of highest rating from each group, shall be selected to cover the entire range within the group for which licence has been applied for, as per the above mentioned table at 1(a) and (b). In case it is not possible to draw the highest rating within the group, then the scope of the licence shall be restricted to the range up to the rating of sample tested for a particular group. The relevant drawings of the samples of transformer along with technical parameters as per Annex 1, shall also be collected and sent to the laboratory with the sample.

h. The Independent test reports issued by the labs cover only routine, type and special tests as specified in clause 21 of IS 1180 (Part 1) : 2014.The general requirements as specified in the ISS under cl. 6.9/7.9/8.9, 11, 14, 15.3, 15.5, 16 and 20.1 are not covered. In order to ensure conformity to these general requirements, these shall be verified in the factory during preliminary inspection. In case, any of the above requirements, which could not be verified in the factory, an undertaking shall be obtained from the manufacturer that its product meets the said requirement. Whenever these requirements are verified in the factory and found to be non-conforming, samples shall not be drawn for IT. Corrective action must be taken & verified before sample drawal.

i. An undertaking from the applicant that the ratings/varieties, which are covered in the scope of the license without testing, by virtue of the grouping guidelines, will conform to the requirements of the ISS before applying the standard mark and that the firm at the first instance shall get the transformer tested at BIS recognized laboratories/Group-2 category of Laboratory for all parameters under Routine Tests and Type tests shall be obtained. Such test reports of conformity shall be produced to BIS for records.

   Note: These requirements shall be stated in the Grant of Licence letter.

j. All tests shall be carried out at BIS recognized/Group-2 category of laboratories. The licence shall be granted once the assessment during preliminary inspection is satisfactory, no action is pending and the product passes in the type tests and the routine tests in independent testing and general requirements in factory testing as indicated above.

k. Offering of two samples (one FS + one CS) by the applicant manufacturer during PI is desirable. However, if the firm expresses difficulty in offering two samples and only one sample is offered during PI, the same may be accepted. In case only one piece of the transformer is offered, tests as mentioned under the Routine tests of the above guidelines may be carried out on the sample during the PI. Then, the same sample may be sent for independent testing along with the technical parameters as per Annex 1 and the drawings. In case of any dispute/contradictions between the factory test results and the test results of the independent laboratory, root cause analysis shall be done and further course of action shall be based on results of such analysis. However, an undertaking may be obtained from the applicant firm in such cases that any decision of BIS shall be acceptable to the applicant in this regard.

l. The applicant is mandatorily required to have testing facilities in-house for all routine tests. In-house testing facilities for type tests i.e. 'Lightning Impulse Test', 'Short Circuit Test', 'Temperature Rise Test' &'Permissible Flux Density &Over-fluxing Test', are desirable. However, considering the facts of specialized nature of tests and costly testing equipment, testing facilities of BIS recognized laboratories may be availed by the applicant as per OMPC for type tests only.

m. Conformity of Raw Material:

1) Compliance of CRGO Electrical Steel as per IS 3024(Clause 9.1 a) which is under compulsory BIS certification shall be ensured through test certificate of BIS licensee.
2) Presently the Indian Standard for amorphous material is under preparation. In case of transformer with amorphous core, supplier's certificate & declaration from applicant regarding the material may be accepted till the time the standard is established.
3) Compliance of Copper/Aluminum conductor (Clause 9.1 c) shall be ensured through a Test Report/Certificate from BIS recognized/Group-2 category of laboratories. Refer 'Note' given below for any other situation.
4) Compliance of Kraft Paper (Cl. 9.1 d), Press Board (Cl. 9.1 e) and Gasket (Cl. 15.4) shall be ensured through a Test Certificate from a BIS recognized laboratory/Group-2 category of Laboratory.
Refer 'Note' given below for any other situation.
5) Compliance of Transformer Oil (clause 9) as per IS 335 or any other insulating liquid permitted through the note under Cl. 9.1 shall be ensured through a Test Certificate from supplier of ISI Marked material or applicant firm getting the same tested from a BIS recognized lab. In the case of natural ester being used as insulating liquid supplier's certificate may be accepted.
Refer 'Note' given below for any other situation.
6) Compliance of Bushings (clause 12) as per IS 2099/7421 & relevant part of IS 3347 shall be ensured through a Test Certificate from supplier or applicant firm getting the same tested from BIS recognized/Group-2 category of laboratories.
Refer 'Note' given below for any other situation.

Note: Incase it is not possible to get a test report/certificate from BIS recognized Laboratory / Group-2 category of Laboratory for any or more of the above mentioned raw material(s), then only test report/certificate from any NABL accredited Government/Private Laboratory may be accepted. If there exists no possibility of getting test report from any of the above mentioned independent testing laboratory, test report/certificate from suppliers may be accepted in such a circumstance for ascertaining conformity.

2 **Scope of License:** The scope of the license shall clearly indicate the following-

a) Standard Rating in kVA
b) Nominal System Voltage in kV
c) Single/Three phase
d) Sealed/Non sealed
e) Aluminium/Copper wound
f) CRGO/Amorphous core
g) Energy Efficiency Level
h) Maximum Total Loss, in case of non-preferred ratings

Note: The GOL letter shall clearly mention the details regarding submission of independent test reports by the licensee on the first instance of manufacturing of a variety as mentioned at 1 i) above.

3 **For Operation of Licence**

a) The grouping guideline for sampling and testing of the product aims at assessing the manufacturer's capability. The ratings/varieties, which are covered in the scope of the license without testing, by virtue of the grouping guidelines, must conform to the requirements of the

ISS before applying the standard mark. The licensee at the first instance shall get the transformer tested at BIS recognized laboratories/Group-2 category of Laboratory for all parameters under Routine Tests and Type tests requirements as already stated in 1 (i). Such test reports of conformity shall be produced to BIS for records. Factory visit for verification of general requirements is not required. On subsequent manufacturing of such ratings/varieties, testing shall be carried out as stipulated in the STI. In case of any non-compliance to the above guideline, action as per the provisions of OMPC shall be taken on the applicant/licensee.

Note: Complete Routine and Type test reports available with the licensee as per IS 1180(Part 1): 2014 of varieties included in the license can be accepted up to 31 Aug 2016.

b) During operation of licence, surveillance inspections shall be carried out as per the provisions of OMPC. During surveillance inspections, it shall be verified that, all those ratings/varieties which were covered in the scope of the licence as per the grouping guidelines (without testing), have been got tested for the routine and type test requirements as per IS 1180(Part 1):2014 from a BIS recognized laboratory on the first instance of production, as per the undertaking submitted while grant of licence. Sample shall be tested in factory for all Routine Tests. Sample shall be drawn for independent testing at BIS recognized laboratories/Group-2 category of Laboratory for all parameters under Routine Tests. For this purpose the licensee shall inform BIS about its production schedule in advance for timely planning of surveillance inspection. If during the periodic inspection stock is not found, licensee shall be advised to inform production schedule and the period in which inspection could be undertaken by BIS IO, at least two weeks in advance. If licensee doesn't offer sample for IT or test reports covering routine test from IT lab is not made available in-spite of our advice, it should be construed as non-compliance to STI and action as per OMPC shall be taken.

c) For Market Surveillance, as the product is heavy and difficult to transport, apart from being costly to purchase, feedback from the organised buyers (State Electricity Boards, Utilities, and DISCOMs etc.) may be obtained. In case the buyer has tested any such product in the factory of the manufacturer or at any independent laboratory, such test results may be obtained from them and treated as feedback on the BIS Standard Marked products.

d) Practice of offering a lot during periodic inspection is also not applicable in this case, if firm expresses difficulty in offering two samples and only one sample is offered during periodic inspection, the same may be accepted.

4. **Inclusion of New Varieties**: for inclusion of new rating of the transformer, licensee shall submit a complete test report indicating conformity of the product from BIS recognized laboratory, along with the certified drawings and design parameters. Verification of General requirements at factory is not required to be done for inclusion of varieties. Grouping of varieties to be covered shall be as per the grouping guidelines.

This revised guideline supersedes the previously issued guidelines vide CMD circular dated 20-11-2015.

This revised guidelines come into force with immediate effect.

(M.A.J. Vinod)
Sc-E, CMD-3

Head (CMD – III)

Sc-G & DDG (Certification)

(Annex-1)

TECHNICAL PARAMETERS FOR TESTINGOF TRANSFORMER
AS PER IS 1180(Part 1):2014

	Sample Code		
1	Rated kVA		
2	Serial Number of Transformer		
3	Energy Efficiency level		
4	Rated Voltage at no load (Volts)	HV	
		LV	
5	Rated Currents (Amps)	HV	
		LV	
6	No. of phases (HV/LV)		
7	Vector Group connection		
8	Rated Frequency (Hz)		
9	Type: Sealed/Non-Sealed		
10	Type of Cooling		
11	Basic Insulation Level	HV	
		LV	
12	Rated Temp. rise of (°C) as per IS 1180 (Part 1):2014	Oil/winding.	
13	Guaranteed percentage Impedance		
14	Type of Winding		
15	Winding Material (Al./Cu.)		
16	Weight of Core & Winding		
17	Total Weight		
18	Quantity of Oil (in liters & Kg)		
19	Total losses at 50% load		
20	Total losses at 100% load		
21	Specification for impulse test (with chopping/without chopping)		
22	Drawings: I. Name plate drawing as per IS 1180.		Drawing No.(s) – (Enclosed)

	II. GA drawing with following details (with Tolerance if any) and standard/optional fittings. a. Tank dimensions(inside & overall) b. Size of fins : c. No. of radiator : d. No. of fins per radiator : e. Ph – Ph clearance, Ph – N clearance, Ph – E clearance III. Flux density design calculation sheet. IV. Core Coil Assembly drawing mention HV & LV conductor size with material(copper/Aluminum)	Drawing No.(s) with the details as referred– (Enclosed) L = __mm, W=___mm, H=____mm L=__mm, W=___mm Enclose Details Enclose Details
23	Details of tests required as per IS 1180-2014 **(Please mark against test/category to be conducted)**	☐ **21.2 Routine Tests** a) Measurement of winding resistance IS 2026 (Part 1). b) Measurement of voltage ratio and check of phase displacement IS 2026 (Part 1). c) Measurement of short-circuit impedance (principal tapping, when applicable) and load loss at 50 percent and 100 percent load IS 2026 (Part 1). d) Measurement of no-load loss and current IS 2026 (Part 1). e) Measurement of insulation resistance IS 2026 (Part 1). f) Induced over-voltage withstand test IS 2026 (Part 3). g) Separate-source voltage withstand test IS 2026 (Part 3). h) Pressure test. j) Oil leakage test. ☐ **21.3 Type Tests** a) Lightning impulse test IS 2026 (Part 3). b) Temperature-rise test IS 2026 (Part 2). c) Short-circuit withstand test IS 2026 (Part 5) (up to 200 kVA). d) Pressure test ☐ **21.4 Special Tests** a) Determination of sound levels IS 2026 (Part 10) b) Short-circuit withstand test IS 2026 (Part 5) (above 200 kVA) c) No load current at 112.5 percent voltage.

		d) Paint adhesion tests. The test is performed as per ASTM D3359 e) BDV and moisture content of oil in the transformer (IS 335). ☐**Test other than Type, Routine & special test.** a) Cl.6.9.1 (maximum flux density)- Destructive test & transformer is not usable after this test. b) Cl.11 (minimum clearances in air) c) Cl.14 (mounting arrangement) d) Cl.16 (conservator) e) Cl.20.1 (standard fittings)
24	Tapping Details	

Tapping Range

Tap position	Primary. Voltage	Primary Current	Secondary Voltage	X/R Ratio	Impedance (%)

Signature of Manufacturer's Representative

Signature of BIS Inspecting Officer: