

REVIEW ANALYSIS OF INDIAN STANDARD

(To be submitted to the Sectional Committee)

1. **Sectional Committee No. & Title:** LITD 24 (Magnetic Components, Ferrite Materials, Piezoelectric and Frequency Control Devices Sectional Committee)
2. **IS No:** IS 14870 : 2000
3. **Title:** Transformers and inductors for use in electronic and telecommunication equipment - Measuring methods and test procedures
4. **Date of review:** September, 2024

5. Review Analysis

- i) **Status of standard(s), if any from which assistance had been drawn in the formulation of this IS.**

Standard (No. & Title)	Whether the standard has since been revised	Major changes	Action proposed
IEC 61007:1994 Transformers and inductors for use in electronic and telecommunication equipment - Measuring methods and test procedures	The latest version of this International Standard has been revised by IEC 61007:2020 Transformers and inductors for use in electronic and telecommunication equipment - Measuring methods and test procedures	This edition includes the following significant technical changes with respect to the previous edition: a) scope: the application of the scope of IEC 61007 was extended; b) Clause 2: added new references and updated the references; c) Clause 3: new definitions were added in 3.3, and in 3.7 the voltage-time product was redefined; d) test procedures were updated:	The standard may be revised accordingly

		<p>1) addition of test method: AC resistance (in 4.4.1.2); short-circuit power test (in 4.4.3.4); efficiency (in 4.4.3.5); phase unbalance (in 4.4.5.7); amplitude unbalance (radio frequency) (in 4.4.5.8); transformation ratio by impedance (in 4.4.7.1); coefficient of coupling (in 4.4.7.2); cross-talk (in 4.4.10);</p> <p>2) modification of test method: Insulation resistance (an error range of the testing voltage, in 4.4.2.3);</p> <p>3) deletion of test method: Effective resistance; e) environmental test procedures: new references were added; f) Annexes A to G were added</p>	
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ii) Status of standards referred in the IS

Referred standards (No. & Title)	IS No. of this standards since revised	Changes that are of affecting the standard under review	Action proposed
IEC 27: Letter symbols to be used in electrical technology	This Indian standard has been withdrawn and superseded by IS 3722 (Part 1) : 2023	Superseded by IS 3722 (Part 1) : 2023	Latest version may be referred
IEC 44-4 (1980) Instrument trans-	IS 11322: 1985 Withdrawn	Withdrawn	The corresponding

formers — Part 4: Measurement of partial discharge			standard for the routine test may be referred from the latest standard. There is an IS/IEC 60270: 2000 High - Voltage test techniques - Partial discharge measurements which may be referred for the same.
IEC 50 International Electrotechnical Vocabulary	IS 1885 (Series) Electrotechnical vocabulary	--	The referred standard is undated hence no action is required
IEC 68-1 (1988) Environmental testing — Part 1 : General and guidance Amendment 1 (1992	This Indian standard has been withdrawn and superseded by IS/IEC 60068-1 : 2013 Environmental Testing Part 1 General and Guidance	The main changes with respect to the previous edition are listed below: – updated normative reference list; – indication of normative and informative annexes; – new informative Annex C, Environmental test tailoring.	Latest version may be referred
IEC 68-2-1 (1990) Environmental testing — Part 2: Tests — Tests A: Cold Amendment 1 (1993)	This International Standard is adopted as IS/IEC 60068-2-1 : 2007 Environmental Testing Part 2 Tests Section 1 Test A: Cold	No Change	No Action Required
IEC 68-2-2 (1974) Environmental testing — Part 2: Tests —Test B: Dry	This International Standard is adopted as	No Change	No Action Required

heat Amendment 1 (1993)	IS/IEC 60068-2-2 : 2007 Environmental Testing Part 2: Tests - Test B Section 2: Dry Heat		
IEC 68-2-3 (1969) Environmental testing — Part 2: Tests — Test Ca: Damp heat, steady state	This International Standard is replaced by IEC 60068-2-78:2012 Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	This edition includes editorial and format changes with respect to the previous edition: – The test chamber from IEC 60068-3-6 has been introduced.	Latest version may be referred
IEC 68-2-6: 1982, Environmental testing - Part 2: Tests - Test Fc and guidance: Vibration (sinusoidal)	The latest version of this international standard is adopted as IS/IEC 60068-2-6 : 2007 Environmental Testing Part 2 Tests Section 6 Test Fc: Vibration sinusoidal	The major changes with regard to the previous edition concern: – The agreed wording from IEC technical committee 104 meeting held in Stockholm:2000 on the testing of soft packages. – Reference to the latest version of IEC 60068-2-47: Mounting – Simplification of the layout of the standard by replacing some tables with text. – Addition of the test report requirements (see Clause 13).	Latest version may be referred
IEC 68-2-7 (1983) Environmental testing — Part 2: Tests — Test Ga and guidance: Acceleration, steady state	The latest version of this international standard is adopted as IS/IEC 60068-2-7 : 1983	No Change	No Action Required

Amendment 1 (1986)	Basic Environmental Testing Procedures Part 2: Tests - Test Ga and Guidance Section 7: Acceleration Steady State		
IEC 68-2-10 (1988) Environmental testing — Part 2: Tests — Test J and guidance: Mould growth	The latest version of this international standard is adopted as IS/IEC 60068-2-10 : 2018 Environmental testing - Part 2-10: Tests - Test J and guidance: Mould growth	The main changes with respect to the previous edition are listed below: <ul style="list-style-type: none"> – Two test fungi replaced by two others – Concentration of the spores defined for each test fungus – Spores suspension in mineral salt solution additionally introduced – Pre-conditioning of the specimens by damp heat storage prescribed – Supersonic aerosolization of the spores suspension as the preferred inoculation method introduced – Duration of incubation reduced from 84 days to 56 days – Extent of mould growth grade 2 split into grade 2a and grade 2b – Detailed information on methods of inoculation given in Annex B 	Latest version may be referred

		– Annex E: flow-chart deleted	
IEC 68-2-13 (1983) Environmental testing — Part 2: Tests — Test M: Low air pressure	The latest version of this international standard is adopted as IS/IEC 60068-2-13 : 2021 Environmental Testing Part 2 Tests Section 13 Test M: Low air pressure	This edition includes the following significant technical changes with respect to the previous edition: a) alignment with recently revised parts of IEC 60068-2; b) Clause 5: severities aligned with IEC 60721-2-3 and IEC 60721-3 (all parts); c) addition of Annex A (guidance on selecting the duration of exposure).	Latest version may be referred
IEC 68-2-14 (1984) Environmental testing — Part 2: Tests — Test N: Change of temperature Amendment 1 (1986)	The latest version of this international standard is adopted as IS/IEC 60068-2-14:2023 Environmental Testing Part 2 Tests Section 14 Test N: Change of Temperature (First Revision)	The main changes are as follows: a) Updating of the figures for clarification purposes; b) Updating of specimen temperature(s) and severities as well as tolerances for change of temperature tests; and c) Revision of standardized requirements for test reports for Tests Na and Nb.	Latest version may be referred
IEC 68-2-17 (1978) Environmental testing — Part 2: Tests — Test Q: Sealing	The latest version of this international standard is adopted as	The main changes are as follows: a) ‘Survey of sealing tests’ has been deleted and the relevant	Latest version may be referred

<p>Amendment 4 (1991)</p>	<p>IS/IEC 60068-2-17 : 2023 Environmental Testing - Part 2 Tests i_{1/2} Section 17 Test Q: Sealing (First Revision)</p>	<p>content moved to a new 4 'General'; b) The scope has been revised; c) The figures have been updated for clarification purposes; d) All non-SI units have been removed; and e) The information to be given in the relevant specification has been revised.</p>	
<p>IEC 68-2-20: 1979, Environmental testing - Part 2: Tests - Test T: Soldering Amendment 2 (1987)</p>	<p>The latest version of this international standard is adopted as IS/IEC 60068-2-20 : 2021 Environmental testing Part 2 Tests Section 20 Tests Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads</p>	<p>This edition includes the following significant technical changes with respect to the previous edition: a) update of and clarification of pre-conditioning (former "aging") and its relation to natural aging</p>	<p>Latest version may be referred</p>
<p>IEC 68-2-21: 1983, Environmental testing - Part 2: Tests - Test U: Robustness of terminations and integral mounting devices Amendment 2 (1991), Amendment 3 (1992)</p>	<p>The latest version of this international standard revised by IS 9000 (Part 19/ Sec 1 to 5) : 1986 Basic environmental testing procedures for electronic and electrical items: Part 19 test u: robustness of terminations and integral</p>	<p>This edition includes the following significant technical changes with respect to the previous edition: a) integration of parts of IEC 60068-2-77 (see Annex X); IEC 60068-2-77 is withdrawn with the publication of this document;</p>	<p>Latest version may be referred</p>

	mounting devices (First Revision)	b) Annex X is added to show the correlation of the clauses and sub clauses in this edition of IEC 60068-2-21 with the clauses in IEC 60068-2-21:2006 and IEC 60068-2-77:1999.	
IEC 68-2-27: 1987, Environmental testing - Part 2: Tests - Test Ea and guidance: Shock	The latest version of this international standard has been adopted as IS 9000 (Part 7/Sec 1) : 2018 Basic environmental testing procedures for electronic and electrical items: Part 7 impact test: Sec 1 shock (Test Ea) (Second Revision)	The major changes with regard to the previous edition concern: <ul style="list-style-type: none"> - the merging of IEC 60068-2-29 into this edition of IEC 60068-2-27; Part 2-29 will be withdrawn as soon as this edition is published; - the introduction of soft packaged specimens as defined in the IEC ad hoc working group document agreed in Stockholm:2000. 	Latest version may be referred
IEC 68-2-29: 1987, Environmental testing - Part 2: Tests - Test Eb and guidance: Bump	The latest version of this international standard has been replaced by IEC 68-2-27: 1987 and the standard already adopted by IS 9000 (Part 7/Sec 1) : 2018	The major changes with regard to the previous edition concern: <ul style="list-style-type: none"> - the merging of IEC 60068-2-29 into this edition of IEC 60068- 	Latest version may be referred

	Basic environmental testing procedures for electronic and electrical items: Part 7 impact test: Sec 1 shock (Test Ea) (Second Revision)	2-27; Part 2-29 will be withdrawn as soon as this edition is published; – the introduction of soft packaged specimens as defined in the IEC ad hoc working group document agreed in Stockholm:2000	
IEC 68-2-30 (1980) Environmental testing — Part 2: Tests — Test Db and guidance : Damp heat, cyclic (12+12 - hour cycle) Amendment' 1 (1985)	The latest version of this international standard is adopted as IS/IEC 60068-2-30 : 2005 Environmental testing Part 2 Tests Section 30 Test Db: Damp heat cyclic 12 h 12 h cycle	The main changes with respect to the previous edition are listed below: – editorial changes, – addition of normative references, – addition of guidance for temperature tolerances, – period for recovery has been extended.	Latest version may be referred
IEC 68-2-42 (1982) Environmental testing — Part 2: Tests — Test Kc: Sulphur dioxide test for contacts and connections	The latest version of this international standard is adopted as IS/IEC 60068-2-42 : 2003 Environmental testing - Part 2 Tests Section 42 Test Kc: Sulphur dioxide test for contacts and connections	No Change	No Action Required
IEC 68-2-45 (1980) Environmental	The latest version of this	No Change	No Action Required

<p>testing — Part 2: Tests — Test XA and guidance: Immersion in cleaning solvents</p>	<p>international standard is adopted as IS/IEC 60068-2- 45 : 1980 Basic environmental testing procedures Part 2 Tests Test XA and guidance Sec 45 Immersion in cleaning solvents</p>		
<p>IEC 68-2-52 (1984) Environmental testing — Part 2: Tests — Test Kb: Salt mist, cyclic (sodium chloride solution)</p>	<p>The latest version of this international standard has been revised by IEC 60068-2-52: 2017 Environmental testing - Part 2- 52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)</p>	<p>This edition includes the following significant technical changes with respect to the previous edition: a) the entire content has been harmonized with ISO 9227 as far as possible; b) an introduction has been added; c) the scope has been simplified; d) normative references have been updated; e) the general description of the test has been changed; f) a dry chamber has been added to the test apparatus; g) severities have been changed to test methods; h) test methods 7 and 8 have been added; i) information on the test report has been added;</p>	<p>Latest version may be referred</p>

		<p>j) Figure 1 has been changed to Table 1;</p> <p>k) a typical test apparatus example has been added in a new Annex A;</p> <p>l) a description of each test method has been added in a new Annex B;</p> <p>m) bibliographical references have been added.</p>	
IEC 270 (1981) Partial discharge Measurements	The latest version of this international standard is adopted as IS/IEC 60270 : 2000 High - Voltage test techniques - Partial discharge measurements	No Change	No Action Required
IEC 367-1 (1982) Cores for inductors and transformers for telecommunications —Part 1 : Measuring methods Amendment 1 (1984) Amendment 2 (1992)	The latest version of this international Standard replaced by IEC 62044-1: 2002 Cores made of soft magnetic materials - Measuring methods - Part 1: Generic specification	No Change	No Action Required
IEC 551 (1987) Determination of transformer and reactor sound levels	The latest international Standard has been replaced by IEC 60076-10:2016 Power transformers - Part 10: Determination of sound levels	This edition includes the following significant technical changes with respect to the previous edition: – additional useful definitions introduced;	Latest version may be referred

		<ul style="list-style-type: none">– definition of distribution type transformers introduced for the purpose this standard;– new clause for sound level measurement specification introduced;– requirement for 1/3 octave band measurements introduced for transformers other than distribution type transformers; standard measurement distance changed from 0,3 m to 1 m for transformers other than distribution type transformers;– height of measurement surface is now clearly defined to count from the reflecting plane;– measurement surface formula unified;– correction criteria for intensity method introduced;– rules for sound measurements on dry-type reactors introduced;– figures revised;– new informative test report templates introduced (Annex B);	
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		– IEC 60076-10-1 (application guide) revised in parallel providing worthwhile information for the use of this standard.	
IEC 617 Graphical symbols for Diagrams	IS 12032 (Series) Graphical symbols for Diagrams	No Change	The referred standard is undated hence no action is required
IEC 651 (1979) Sound level Meters Amendment 1 (1993)	The latest international Standard has been replaced by IEC 61672-2:2013+AMD1:2017 CSV Electroacoustics - Sound level meters - Part 2: Pattern evaluation tests	The main technical changes with regard to the previous edition are as follows: In this second edition, conformance to specifications is demonstrated when: a) measured deviations from design goals do not exceed the applicable acceptance limits, and b) the uncertainty of measurement does not exceed the corresponding maximum permitted uncertainty, with both uncertainties determined for a coverage probability of 95 %.	Latest version may be referred
ISO 3:1973 Preferred numbers— Series of preferred numbers	The latest version of this international standard is adopted as	No Change	No Action Required

	IS 1076 (Part 1) : 1985 Preferred numbers: Part 1 series of preferred numbers (Second Revision)		
ISO 497: 1973 Preferred numbers- Part 3 Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers	The latest version of this international standard is adopted as IS 1076 (Part 3) : 1985 Preferred numbers: Part 3 guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers (Second Revision)	No Change	No Action Required
ISO 1000: 1992 S1 units and recommendations for the use of their multiples and of certain other units	The latest version of this international standard is replaced by ISO 80000-1:2022 Quantities and units Part 1: General	The main changes are as follows: — More focus on concepts and terminology based on a system of quantities, particularly following the recent major revision of the International System of Units (SI) and the proposed revisions of the International vocabulary of metrology (VIM). — At the same time, subclauses of previous editions of this document which essentially	Latest version may be referred

		reproduced content from other sources – particularly metrological vocabulary, descriptions of SI units and compilations of fundamental constants – have been substantially removed from the present edition, in accordance with a resolution taken by ISO/TC 12 in 2020.	
IEC 68-2-58 (1989) Environmental testing—Part 2: Tests—Test Td: Solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	The latest version of this international standard is adopted as IS/IEC 60068-2-58 : 2015 Environmental testing Part 2 Tests Section 58 Test Td: Test methods for solderability resistance to dissolution of metallization and to soldering heat of surface mounting devices SMD	This edition includes the following significant technical changes with respect to the previous edition: – the addition of Sn-Bi low temperature solder alloy; – the addition of several reflow test conditions in Table 7 – Resistance to soldering heat – Test conditions and severity, reflow method; – introduction of reflow test method for Test Td3: Dewetting and resistance to dissolution of metallization; – implementation of guidance for the choice of a test severity in Clause B.3.	Latest version may be referred

<p>IEC 695-2-2 (1991) Fire hazard testing — Part 2: Test methods — Section 2: Needle-flame test</p>	<p>The latest version of this international standard is replaced by IEC 60695-11-5:2016 Fire hazard testing - Part 11- 5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance</p>	<p>This edition includes the following significant technical changes with respect to the previous edition: a) The scope has been broadened to allow this test method to also simulate the effects of small flames from outside the equipment; b) Propane and butane gas are the specified fuel source with a minimum purity of 95 %; c) A new concept has been added which allows the burner to be moved during the test to avoid dripping material from falling onto the tip of the burner tube; d) The burner tube material is now a referenced source; e) The reference for the copper block material has changed – the ISO publication (ISO 1337) has been withdrawn with no replacement. A new callout is now used; f) Informative Annex C and a</p>	<p>Latest version may be referred</p>
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		bibliography have been added. The text of this standard is based on the following documents:	
IEC 695-2-4/0(1991) Fire hazard testing — Part 2: Test methods — Section 4/Sheet O: Diffusion type and pre-mixed type flame test methods	The latest version of this international standard is replaced by IEC 60695-11-3:2012 Fire hazard testing - Part 11-3: Test flames - 500 W flames - Apparatus and confirmational test methods	No Change	No Action Required
IEC 695-2-4/1(1991) Fire hazard testing — Part 2: Test methods — Section 4/Sheet 1:1kW nominal pre-mixed test flame and guidance	The latest version of this international standard is replaced by IEC 60695-11-2:2017 Fire hazard testing - Part 11-2: Test flames - 1 kW pre-mixed flame - Apparatus, confirmatory test arrangement and guidance	No Change	No Action Required

iii) **Any other standards available related to the subject & scope of the standard being reviewed (International/regional/other national/association/consortia, etc or of new or revision of existing Indian Standard)**

Standard (No. & Title)	Provisions that could be relevant while reviewing the IS	Action proposed
Nil	Nil	Nil

iv) **Technical comments on the standard received, if any**

Source	Clause of IS	Comment	Action proposed
Nil	Nil	Nil	Nil

- v) **Information available on technical developments that have taken place (on product/processes/practices/use or application/testing/input materials, etc)**

Source	Development	Relevant clause of the IS under review that is likely to be impacted (Clause & IS No.)	Action proposed
Nil	Nil	Nil	Nil

- vi) **Issues arising out of changes in any related IS or due to formulation of new Indian Standard**

Related IS and its Title (revised or new)	Provision in the IS under review that would be impacted & the clause no. or addition of new clause/provision	Changes that may be necessary in the Standards under review	Action proposed
Nil	Nil	Nil	Nil

- vii) **Any consequential changes to be considered in other IS**

Related IS to get impacted	Requirements to be impacted
Nil	Nil

6. **Any other observation: NIL**

7. **Recommendations:** This Indian Standard IS 14870: 2000 is identical with IEC 61007:1994. The base standard has been revised by IEC 61007:2020, therefore, it is recommended to take up the revision in line with the latest base standard and initiate the revision of this standard. The committee in its meeting held on 31 May 2024 decided

to reaffirm the standard till revised version is published. The committee may decide regarding the referred standards and if required the same may be taken up with IEC.