

STANDARD INFORMATION

Standard: UL 1446

Standard ID: Systems of Insulating Materials - General [ANSI/CAN/UL 1446:2019 Ed.8+R:19Nov2020]

Previous Standard ID: Systems of Insulating Materials - General [UL 1446:2019 Ed.8]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **November 19, 2022**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard.

Overview of Changes: Addition of requirements for thermal aging test for electrical insulation systems. Specific details of new/revise requirements are found in table below.

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.



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CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</i>
7A		<i>New section added;</i> Electrical Insulation Systems – Defined Life Thermal Aging
7A.1		General
7A.1.1		For an EIS where the intended application has a designed service life of 5000 hours or less, representative samples of the candidate EIS shall be subjected to a thermal aging as outlined in IEC 61857-31.
7A.1.2		Additional components not present in the thermally aged samples shall be added by methods outlined in Supplement SA.
7A.2		Samples
7A.2.1		Test samples of the candidate insulation system shall be prepared and screened as outlined in 7.2, Samples, with the exception that no reference insulation system is required.
7A.3		Test procedure
7A.3.1		The test procedure and samples are the same as outlined in Section 7, Electrical Insulation Systems – Full Thermal Aging, with the exception of the number of test samples and aging test temperatures as specified in Procedure A, Procedure B and Procedure C below.
7A.3.2		Procedure A (One temperature aging) – Applications with a designed service life of 1500 hours or less shall utilize ten (10) test samples and the aging test temperature shall be 10°C (18°F) higher than the desired temperature class rating with a heat aging cycle of 168 hours accumulating a minimum of 1500 hours. If there are no sample failures 1500 hour will be achieved in 9 cycles.
7A.3.3		Procedure B (One temperature aging) – If the samples tested under Procedure A have exceeded 1500 hours, the testing may be continued in the same manner until all samples fail or 5000 hours of aging time is reached, whichever comes first.
7A.3.4		Procedure C (two temperature aging) – As an alternative to Procedures A and B for applications with a designed service life of 5000 hours or less to be evaluated at two (2) elevated temperatures. The higher test temperature shall utilize ten (10) test samples and are heat aged 30°C (54°F) to 35°C (63°F) higher than the desired temperature class rating with a heat aging cycle period between 24 – 72 h. The lower test temperature shall utilize ten (10) test samples and are heat aged 20°C (36°F) to 30°C (54°F) higher than the desired temperature class rating with a heat aging cycle period between 48 – 168 h.



CLAUSE	VERDICT	COMMENT
7A.4		Analysis and evaluation
7A.4.1		<p>For Procedure A and B, If there are no sample failures prior to achieving the Defined Service Life hours, then testing may be discontinued and the obtained hours of aging shall be used as the Defined Life. If samples fail during the test procedure, the failure time is reported for each of the samples as described in 7.4.4, and the average life of all samples is to be calculated as a geometric mean time for that temperature and shall be used as the Defined Life.</p>
7A.4.2		<p>For Procedure C, All samples tested at the higher aging temperature shall be aged to completion of end of test-life as described in 7.4.4 and the average life of all samples calculated as a geometric mean time. The lower aging temperature samples shall be aged to end of test-life as described in 7.4.4 with the average life of all samples calculated as a geometric mean time. The highest and lower test temperature geometric mean times shall be expressed as a linear function and the Defined Life is determined by intercepting the line at the desired temperature class. The Defined Life result shall be rounded down to the nearest 500 hour. The Defined Life shall not exceed 5000 hours.</p> <p>Exception: Aging of the lower test temperature samples to end of test-life is not required if the accumulated hours for the lower test temperature is sufficient when in combination with the completed highest test temperature expressed as a linear function that results in the desired Defined Life at the desired temperature class.</p>
7A.4.3		<p>For all three Procedures A, B and C, the Defined Life result shall be rounded down to the nearest 500 hour and the Thermal Endurance Rating assigned shall be expressed as Thermal Class / Hours (h). e.g. 130(B) / 1500h; 130(B) / 2000h; 130(B) / 2500h; 130(B) / 3000h; 130(B) / 3500h; 130(B) / 4000h; 130 (B) / 4500h; 130(B) / 5000h and etcetera for each higher thermal class 155(F), 180(H), 200(N); 220(R), 240(S).</p>