**INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC) SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEx SYSTEM)**

**Title:** **ExTAG/706A/CD Draft ExTAG Decision Sheet –** **Revision of ExTAG DS 2020/003 Verification and Operation of Climate Chambers**

**Circulated to: ExTAG – IECEx Testing and Assessment Group**

**INTRODUCTION**

This document, ExTAG/706A/CD, *Draft ExTAG Decision Sheet – Revision of ExTAG DS 202/003 Verification and Operation of Climate Chambers* has been prepared by the ExMC WG 02 Convenor taking into account comments received on ExTAG/706/CD, contained in ExTAG/714/CC, and is issued for consideration during the ExTAG Edinburgh Meeting.

Changes to the original draft are shown by the tracking tool.

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COLLECTION OF IECEx / ExTAG DECISION

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| Standard: IEC 60079-0 (Ed 6)  IEC 60079-0 (Ed 7) | **Clause:**  26.8  26.8 | **Draft Decision Sheet:**  **ExTAG/588/CD** |
| **Subject:**  **Verification and Operation of Climate Chambers.**  **Status of document:**  **approved** | **Key words:**   * Temperature * Humidity | Date: 2020/02/20 **Originator of proposal:** SGS Baseefa  **TC/SC involved:** IEC/TC31 WG 22 |
| **Background**  A questionnaire (ExTAG/510/Q) was circulated in July 2018 to all ExTLs requesting information on how they calibrated and used their Climatic (Humidity) Chambers for the tests of IEC 60079-0 clause 26.8. Just less than half the ExTLs responded and the responses indicated a wide variance in the methods used to verify the chambers.  The results of the questionnaire formed the basis for a presentation and discussion at the ExTAG Training session held on 2018-09-18 at Cannes. During the presentation and discussion, it was particularly noted that at a nominal test condition of 95°C and 90%RH, the permitted tolerance of ±2K on temperature was too wide, if the permitted tolerance of ±5%RH was not to be exceeded, since a change of 1K in the temperature, could result in a change of at least 4% in the Relative Humidity at that temperature.  At the formal ExTAG session following the training session, the meeting accepted the need to issue a Decision Sheet and accepted in principle the content of this draft.  At the ExTAG meeting on 24 September 2019, the text was accepted in principle, subject to additional clarification on the relationship to an IECEE draft DS on the same subject but with a wider scope. In accordance with IECEE PDSH 2141 The term Verification is used in relation to confirmation of the ability of the chamber to provide the required temperature and humidity condition.  IECEE GD 5015, Committee of Testing Laboratories (CTL) Guidance - Test Chamber Verification, Edition 1.0 was published on 2021-06-01 and replaces IECEE PDSH 2141.  **Question**  Noting that TC31 WG22 thought it important to provide for testing with a climatic chamber setting of 90°C 90%RH as an alternative to the previously specified 95°C 90%RH, albeit with an increase in the exposure time by 50%, what is required to verify and use Climatic Chambers at the extreme conditions envisaged in IEC 60079-0 Clause 26.8?  **Answer**  In order to ensure comparability of results between testing laboratories, the following points should be taken into account:  1. Nine Point (or 15 point for over 2000 litre capacity) temperature verification is to be conducted initially and at least every 3 years (See IEC 60068-3-5) unless supporting data indicates longer intervals are appropriate. IECEE GD 5015 indicates a suitable regime for deciding on appropriate intervals for full and interim verification.  1.1 For 95°C testing, the gradient should not exceed 2K from highest to lowest of the nine (15) points, otherwise the ±5% RH requirement throughout the chamber cannot be achieved.  1.2 For 90°C testing (and lower) the gradient should not exceed 4K from highest to lowest of the nine (15) points.  2. The Climatic Chamber cannot be used for testing at a condition higher than the maximum temperature at which it is verified.  2.1 A chamber verified at both 80°C and 90°C can be used at any intermediate temperature.  3. TC31 WG22 introduced the alternative 90°C test for 3 weeks to replace the 95°C test for 2 weeks, to enable laboratories to use chambers that could not be verified at 95°C.  3.1 It is preferable to use the 90°C condition, the 95°C condition having been retained in the standard primarily to cover pre-existing equipment.  4. Verification of the chamber is considered to be an additional activity beyond the calibration of the chamber sensors and the chamber controller to which they are connected.  4.1 Calibrated temperature and humidity measuring equipment is to be sited at the centre of the empty chamber to get the comparison between the actual chamber conditions and the temperature and humidity indicated by the chamber controller.  4.2 Depending on the comparison between the chamber controller setting, and the actual temperature and humidity achieved in the representative centre of the chamber, it may be necessary to work with an offset between the chamber controller settings and the required condition.  4.3. Samples should never be located outside the designated working area of the chamber, i.e., the boundary of the eight corner mounted temperature sensors for the nine point method.  4.4 The chamber must be operated in accordance with the chamber manufacturer’s instructions and the chamber’s intended use when performing verifications.  **Notes**  1. IECEE GD 5015, prepared by IECEE CTL WG01, is available on the IECEE website at: [Rules, Operational documents & Guides | IECEE](https://www.iecee.org/resource/rules-operational-documents-guides). This ExTAG DS is consistent with the contents of IECEE GD 5015, and contains additional information related to the very specific test conditions applicable to IEC 60079-0.  2. The relevant standards are:  IEC 60068-3-5 Confirmation of the performance of temperature chambers;  IEC 60068-3-6 Confirmation of the performance of temperature/humidity chambers; and  IEC 60068-3-11 Calculation of uncertainty of conditions in climatic chambers  (Part 3-11 is particularly useful in considering how to calibrate for, and test with, a chamber that is more than minimally loaded.). | | |