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

**Circulated to: IECEx Testing and Assessment Group (ExTAG) and IECEx Assessor**

**INTRODUCTION**

During the recent ExTAG WG6 meeting (WG responsible for maintenance of OD 024), discussion took place concerning use of manufacturers’ humidity Chambers and the issue of calibration. In subsequent discussion, ExMC WG 2 felt that an ExTAG Decision Sheet concerning use and calibration of humidity chambers in general would be helpful, with SGS Baseefa agreeing to prepare an initial draft for consideration by ExTAG.

To assist SGS Baseefa in this task, Mr Sinclair of SGS Baseefa has requested input on this topic from other ExTLs and has prepared this Questionnaire for ExTLs to complete.

We would appreciate ExTLs completing this questionnaire and submitting their responses directly to Mr Sinclair via email at ron.sinclair@sgs.com with copy to Ms Christine Kane at christine.kane@iecex.com no later than 31 July 2018.

Should you have any questions on this topic please feel free to contact Mr Sinclair directly.

***Julien Gauthier***

***ExTAG Secretary***

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**Questionnaire, prior to possible issue of an ExTAG Decision Sheet**

**Subject: Calibration of Humidity Chambers**

**Background**

Following an approach by a manufacturer who wanted to use his own humidity chambers under an OD 024 Agreement, SGS Baseefa entered discussions which revealed that the manufacturer concerned had been advised by the chamber manufacturer that as the chamber manufacturer held ISO/IEC 17025 accreditation for the calibration of its chambers, the user did not need to do anything additional beyond engaging the chamber manufacturer to perform routine calibration. However, the chamber manufacturer had refused to hand over details of its calibration procedure, and did not declare the uncertainty of measurement applicable to the calibration procedure. The manufacturer has reported subsequently that they have contacted at least one other testing laboratory who has confirmed that the laboratory relies only on calibration by this same chamber manufacturer.

As SGS Baseefa has two chambers manufactured by this chamber manufacturer, and know that the routine calibration is only of the sensors, rather than the chamber, we do not routinely accept the chamber manufacturer’s data but always do our own calibration. Initial calibration involved nine-point determination of the temperature profile – as recommended by our accreditation body – to confirm evenness of conditions throughout the chamber. Routine calibration is based on our own standard transfer probe, situated at the centre of the chamber (i.e. where a sample is likely to be placed), measuring relative humidity and temperature at the same time.

With one chamber, our results are nearly the same as the calibration performed by the manufacturer. With the other chamber, there are significant differences.

**Previous Discussions**

IEC TC31 WG 22 recognised that there are considerable difficulties in achieving reliable calibration with a combination of 95C and 90% RH, resulting in the introduction of the alternative longer duration testing at 90C and 90% RH, where calibration is easier. WG 22 also recognised that it was essential that the calibration of temperature and humidity should be done at the stated combined condition, and not separately. The uncertainty of measurement attributable to humidity sensors increases with temperature, particularly as the temperature approaches the boiling point of water; hence calibration of humidity at 95C is significantly more difficult than at 90C.

**Current Discussions**

SGS raised the topic for discussion at the ExTAG WG 6 meeting (concerning OD 024) at Weimar in May. Subsequently, the topic was also raised (not by SGS Baseefa) at the ExMC WG 2 meeting (concerning the content of the Technical Capability Documents) at Weimar. SGS Baseefa was asked to take the issue forward, with the possible introduction of an ExTAG Decision Sheet, prior to the possible addition of material to the TCD for IEC 60079-0. SGS Baseefa considers that it is appropriate for a questionnaire to be circulated initially, prior to drafting an ExTAG DS.

**Questions:**

In order to assist preparation of a decision sheet which would ensure that all ExTLs are working on an equivalent basis, laboratories are requested to answer the following questions:

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| --- | --- | --- | --- | --- |
| 1. Who calibrates your chambers? | ExTL |  | Chamber Manufacturer |  |
| 2. What is your maximum condition? | 90C/90%RH |  | 95C/90%RH |  |
| 3. What is your declared uncertainty of measurement at that condition? |  |  |
| 4. Have you performed nine-point temperature calibration at least initially? | Yes |  | No |  |
| 5. Do repeat nine-point calibration regularly? | Yes |  | No |  |
| 6. Is temperature and humidity calibration simultaneous? | Yes |  | No |  |
| 7. Is temperature and humidity calibration done at the centre of the chamber? | Yes |  | No |  |
| 8. If not at the centre, please indicate where |  |