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

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

**TITLE: Compilation of comments and observations on ExTAG/477/CD Draft ExTAG Decision Sheet – The resistance to impact test according to IEC 60079-0**

**INTRODUCTION**

This document contains the compilation of comments and originator observations received on ExTAG/477/CD Draft ExTAG Decision Sheet – The resistance to impact test according to IEC 60079-0

In light of the comments received a revised version, *ExTAG/477A/CD Revised Draft Decision Sheet – The resistance to impact test according to IEC 60079-0* has been prepared and issued for comment.

***Please inform the Secretariat immediately of any omissions or errors at-***

[***Christine Kane***](mailto:christine.kane@iecex.com)

On behalf of Mr. Julien Gauthier

***Julien Gauthier***

***ExTAG Secretary***

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| **ExCB/**  **ExTL** | **Clause/ Sub-clause** | **Paragraph Figure/**  **Table** | **Type of**  **comment**  **General/**  **technical/**  **editorial** | **COMMENTS** | **Proposed change** | **Observation**  **(to be completed by the originator)** |
| --- | --- | --- | --- | --- | --- | --- |
| **CESI**  **IT** |  |  |  | **CESI - fully support proposed (ExTAG/477/CD) ExTAG Decision Sheet** |  | **N/A** |
| **DEKRA Certification B.V**. |  |  |  | We do not support this sheet.  The answers on the two questions in this draft DS are additional requirements and therefore not allowed.  In addition this sheet is in contradiction with FDIS of IEC 60079‑0 Ed. 7  The standard requires to the impact at 20 °C unless …  The first line of the answer requires always an impact test on the low temperature for glass, this is an additional requirement and therefore not allowed.  The standard does not require a datasheet of the glass.  The second line of the answer requires always a data sheet, this is an additional requirement and therefore not allowed.  Note that in practice this is a non issue since most glass windows are cemented where the cement is a part of the Ex d enclosure or relevant for the required IP grade. | Withdraw this sheet | **Different kinds of glass has different characteristics.**  **Moreover each ExCB/**  **ExTL has different opinions. So this DS is necessary.** |
| **EXA**  **HR** |  |  | **T** | **We do not support proposed text of ExTAG/477/CD**  Clarification:  Proposed text set requirement that is different from requirement given in future 7th edition of IEC 60079-0. In document 31/1345/FDIS (Approved see 31/1356/RVD) is stated:  NOTE It is generally acknowledged that the impact resistance of glass and ceramic parts is not adversely affected by the temperature.  When the equipment has an enclosure or a part of an enclosure made of a non-metallic material other than glass or ceramic, including non-metallic fan hoods and ventilation screens in rotating electric machines, the test shall be carried out at the upper and lower test temperatures, in accordance with 26.7.2. | **Withdraw the proposal** | **Different kinds of glass has different characteristics.**  **Moreover each ExCB/**  **ExTL has different opinions. So this DS is necessary.** |
| **FME**  **GB** |  | **26.4.2** | **te** | We do not support the issue of the Decision Sheet as drafted as it conflicts with the revised requirements of IEC 60079-0, Ed 7, approved for publication 2017‑11‑03. | Consider the issue of a Decision Sheet stating that further guidance with respect to the application of the impact test to glass can be found in Edition 7. | **Different kinds of glass has different characteristics.**  **Moreover each ExCB/**  **ExTL has different opinions. So this DS is necessary.** |
| **FMG**  **US** |  | **26.4.2** | **te** | FM Approvals LLC does not support the issue of the Decision Sheet as drafted as it conflicts with the revised requirements of IEC 60079-0, Ed 7, approved for publication 2017‑11‑03. | Consider the issue of a Decision Sheet stating that further guidance with respect to the application of the impact test to glass can be found in Edition 7. | **Why is impact resistance of glass not adversely affected by the low temperature? Is there any data sheet of the glass to certify?** |
| **ITS**  **US** | IEC 60079-0:2011 Edition 6.0 Clause 26.4.2 | N/A | Technical | Request data which supports claim “But tests shown the lower temperature will affect the mechanical strength of the glass”  Available technical papers that I have been able to find, suggest an increase in strength of glass at higher temperatures. Though strength may differ to susceptibility of fracture/rigidity.  (example presented in fig. 10 in the following journal: <https://www.idosi.org/mejsr/mejsr18(11)13/14.pdf)> | Propose ExTAG not be issued until additional information can be provided to support ExTAG premise. | **Each ExCB/**  **ExTL has different opinions. So this DS is necessary in order to get to a common view .** |
| **NANIO CCVE (ExCB and ExTL** |  |  | General | We support ExTAG/477/CD with the following rewording | **Question:**  Are there any requirement for data and information about glass which should be provided by manufacture?  Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2.?  **Answer:**  Yes, also data sheet for glass which includes mechanical character should be provided by manufacture.  Where the material data shows a reduction in resistance to impact at lower temperature the test of resistance to impact for glass shall be done at the lower test temperature which is specified in clause 26.7.2. | **It is difficult to provide data and information about glass by the manufacturer in practice. So we think ExTAG/477/CD with the following rewording:**  **Question:**  **Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2?**  **Answer:**  **Yes, impact test of glass should be carried out at the lower test temperature which is specified in clause 26.7.2,**  **except where the material data about glass shows it have no reduction in resistance to impact at lower temperatures within the specified ambient range.** |
| **NCC**  **BR** | **26.4.2** |  |  | **We agree. The manufacturer should provide the material data (including glass) to check if there is reduction in resistance to impact at lower temperatures.** |  | **It is difficult to provide data and information about glass by the manufacturer in practice. So we think ExTAG/477/CD with the following rewording:**  **Question:**  **Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2?**  **Answer:**  **Yes, impact test of glass should be carried out at the lower test temperature which is specified in clause 26.7.2,**  **except where the material data about glass shows it have no reduction in resistance to impact at lower temperatures within the specified ambient range.** |
| **NEPSI**  **CN** |  |  | **G** | **In general, only tempered /toughened glass is used in Ex equipment and may have sufficient strength required by IEC 60079 ff.**  **As we see from the manufacturing process, tempered /toughened glass has strong thermal stability, as described in clause 26.8 and 26.9 of IEC 60079-0:2011. And there is no requirement for glass to be subjected to thermal endurance tests. However, tempered/toughened glass is sensitive to thermal shock. So IEC 60079-0 clause 26.5.2 has required to perform thermal shock test on glass itself.**  **Normally, the glass is cemented/glued to the part of Ex equipment. The intention to perform the impact test at lower temperature is to verify the strength of cement/glue and the characteristics for explosion protection relied.** | **All the requirements have been clearly defined by the IEC 60079-0. There is no need to have the DS. We recommend to withdraw the DS.** | **General case can’t represent all cases. It is not specified tempered /toughened glass should used in Ex equipment in the IEC 60079 standards. Moreover the strength of the glass depends on the manufacturing process, thickness of the glass etc..**  **Sometimes, the glass is not cemented to the part of Ex equipment. The intention to perform the impact test at lower temperature is not only to verify the strength of cement/glue, but also the strength of the glass.** |
| **PTB**  **DE** | **Cl. 26.4.2**  **26.7.2 of IEC 60079-0:2011** **Edition 6.0** |  | **Technical** | **Question #1:**  Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2?  **Question #2:**  Are there any requirement for data and information about glass which should be provided by manufacture? | **Answer #1:**  Yes. Because the mechanical strength properties of the glass reduce at lower temperature, the impact test for glass shall be carried out at the lower test temperature specified in the clause 26.7.2 of this standard.  If the glass is cemented to the enclosure with help of an adhesive, this union between the glass and the enclosure is also critical for the impact test at a lower temperature.  **Answer #2:**  Information about the type of glass and the properties of the glass like mechanical characteristics shall be provided by the applicant in form of a data sheet from the manufacturer of the glass.  A data sheet helps also to have a control or register of the glass that are been tested. In case of a change of the properties of the glass or change from manufacturer of the glass, the applicant may conduct new tests. | **We agree.**  **Just because it is difficult to provide data and information about glass by the manufacturer in practice. So we think ExTAG/477/CD with the following rewording:**  **Question:**  **Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2?**  **Answer:**  **Yes, impact test of glass should be carried out at the lower test temperature which is specified in clause 26.7.2,**  **except where the material data about glass shows it have no reduction in resistance to impact at lower temperatures within the specified ambient range.** |
| **TC31/WG22** |  | **26.4.2** | **te** | WG22 does not support the issue of the Decision Sheet as drafted as it conflicts with the revised requirements of IEC 60079-0, Ed 7, approved for publication 2017‑11‑03. Note the highlighted changes to the text of 26.4.2 below. The text for Ed 7 was revised as a result of comments on 31/1197/CD address differing applications of the existing Ed 6 requirements.  “The test shall be carried out at an ambient temperature of (20  5) °C, except where the material data sheet of the metal shows it to have a reduction in resistance to impact at lower temperatures within the specified ambient range. In this case, the test shall be performed at the lower test temperature, in accordance with 26.7.2.  NOTE It is generally acknowledged that the impact resistance of glass and ceramic parts is not adversely affected by the temperature.  When the equipment has an enclosure or a part of an enclosure made of a non‑metallic material other than glass or ceramic, including non-metallic fan hoods and ventilation screens in rotating electric machines, the test shall be carried out at the upper and lower test temperatures, in accordance with 26.7.2. “ | Do not issue the Decision Sheet. It is a dis-service to the stakeholders to establish a particular direction for Edition 6 when the direction for Edition 7 is known and is different.  However, it might be helpful to issue a Decision Sheet that stated that further guidance with respect to the application of the impact test to glass can be found in Edition 7. |  |
| **TIIS**  **JP** |  |  | **General** | **TIIS supports the draft DS in terms of complying with the standard. Any relaxation should be addressed by TC31.** |  | **N/A** |
| **UL-**  **USA** | **Answer** |  | **technical** | We agree with the decision sheet, except for the words “mechanical character” in the last sentence. This may not be clearly understood. | Replace “mechanical character” with “the glass manufacturer’s name and material designation” | **It is difficult to provide data and information about glass by the manufacturer in practice. So we think ExTAG/477/CD with the following rewording:**  **Question:**  **Is it necessary to carry out resistance to impact test of glass at lower temperatures according to clause 26.7.2?**  **Answer:**  **Yes, impact test of glass should be carried out at the lower test temperature which is specified in clause 26.7.2,**  **except where the material data about glass shows it have no reduction in resistance to impact at lower temperatures within the specified ambient range.** |
| **UL**  **BR** |  |  |  | **ULBR understands that the requirements of impact test at lower temperature is clearly described in the standard and having or not the datasheet of the glass material will not change the need of the impact test at lower temperature.**  **So there is no need to publish this DS.** |  | **Each ExCB/**  **ExTL has different opinions. So this DS is necessary in order to get to a common view .** |