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

**TITLE: Compilation of comments and observations on ExTAG/563A/CD – Draft Revised ExTAG Decision Sheet – Compounded wire-feedthrough constructions between motor frame and terminal box.**

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

**INTRODUCTION**

This document contains the compilation of comments received on ExTAG/563A/CD Draft Revised ExTAG Decision Sheet – Compounded wire-feedthrough constructions between motor frame and terminal box. with observations from the originator, CNEX, NL.

As a result of comments received and considered, a revised Draft Decision Sheet ExTAG/563B/CD has now been published for consideration and is issued for additional consideration over a six week period.

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

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

***ExTAG Secretariat***

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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)** |
| --- | --- | --- | --- | --- | --- | --- |
| **DEKRA / EXAM**  **DE** |  |  |  | We are in favour with the proposed DS |  | **Noted** |
| **EUROFINS**  **CML GB** |  |  |  | Eurofins CML agrees with this decision sheet |  | **Noted** |
| **Eurofins E&E**  **US** |  |  |  | **Our organization has no comments.** |  | **Noted** |
| **FIDI**  **HR** | **-** | **-** | **G** | **We think that this topic is clear in standard but anyway we support the Decision Sheet: ExTAG/563A/CD as proposed and no further comments** |  | **Noted** |
| **FMG** |  |  | **ed** | Since this DS is specific to “motors”, or more accurately, “electrical machines”, and it deals with “bushings” both as (1) separately certified and (2) as an integral part of the electrical machine; the Key words should be revised | Key words:  Electrical machine  Cemented joints  Bushings ~~specific to an enclosure~~ | **Accepted in principle**  **However, it is important to clarify that these bushings are in fact specific for that enclosure, as stated explicitly in C.2.1.4.**  **Therefor the Key words must include ‘Bushings specific to an enclosure’** |
| **FMG** |  |  | **ed** | As part of the background, it would be useful to include the definition of a “bushing” from IEC 60079-0. After the text of “3”  Both options 1 and 2 create a “bushing”. Option 3 does not. | Add:  **bushing**  insulating device carrying one or more conductors, insulated or bare, through an internal or external wall of an enclosure  *(the word insulating appears in IEC 60050-426 and is anticipated to be added to IEC 60079-0, Ed 8)* | **Accepted, but added under (1), because (3) does not use bushings at all.** |
| **FMG** |  |  | **ed** | Suggest revising background “2” to incorporate the defined term “bushing”. | 2. The stator winding wires are led through an opening between the stator frame and the terminal box, after which this opening is compounded to form a bushing which then creates separate flameproof enclosures for the frame and the terminal box.  The motor frame and the terminal box are tested as separate flameproof enclosures. | **Accepted** |
| **FMG** |  |  | **ed** | Correct typo in “Answer”.  Delete extra word “it” | Answer:  Yes.  Regardless of the shape and size of the construction of the compounded wire-feedthrough, the construction it is to be evaluated and tested as a bushing that is formed by molding insulation compound on metallic parts and regarding it as being a bushing specific for a flameproof enclosure (that type/size of flameproof motor). The joints between compound and metal housing, and between compound and wires, are considered as cemented joints. | **Accepted** |
| **NANIO CCVE (RU)**  **ExCB/**  **ExTL** |  |  | **General** | We agree in principle that “Regardless of the shape and size of the construction of the compounded wire-feedthrough, the construction is to be evaluated and tested as a bushing”.  However we consider that “moulding insulation” and “potting” are not the same things; for motors, such a design solution may be subject to additional tests, since in motors these through contacts may be subjected to increased vibration and temperature effects. |  | **Noted**  **No text change requested** |
| **NCC**  **BR** | **6**  **13.7 C.2.1.4** |  |  | **We keep the previous comments.**  **We understand that this assembly shall be evaluated as sealed joint.** |  | **Accepted in principle**  **NCC BR to provide examples**  **The assembly shall be tested conform IEC 60079-1 cl. C.2.1.4 - Bushings** |
| **NEPSI**  **CN** |  |  | **G** | **We support the revised draft DS ExTAG/563A/CD.** |  | **Noted** |
| **PTB**  **DE** | **6, 13.7, C.2.1.4** |  | **Technical** | **Question:**  Should a compounded wire-feedthrough (as described in the Decision Sheet ExTAG/563A/CD, second option) be evaluated and tested as being a ‘Bushing specific to an enclosure’, conform IEC 60079-1 cl. C.2.1.4 - Bushings? | **Answer to question:**  Yes. We suppose the Draft Decision sheet. | **Noted** |
| **QPS CA** |  |  |  | QPS supports the revised ExTAG DS and has no comments. |  | **Noted** |
| **SIMTARS**  **AU** |  |  |  | We have no comments. |  | **Noted** |
| **TC 31** |  |  | **ed** | Since this DS is specific to “motors”, or more accurately, “electrical machines”, and it deals with “bushings” both as (1) separately certified and (2) as an integral part of the electrical machine; the Key words should be revised | Key words:  Electrical machine  Cemented joints  Bushings ~~specific to an enclosure~~ | **Accepted in principle**  **However, it is important to clarify that these bushings are in fact specific for that enclosure, as stated explicitly in C.2.1.4.**  **Therefor the Key words must include ‘Bushings specific to an enclosure’** |
| **TC 31** |  |  | **ed** | As part of the background, it would be useful to include the definition of a “bushing” from IEC 60079-0. After the text of “3”  Both options 1 and 2 create a “bushing”. Option 3 does not. | Add:  **bushing**  insulating device carrying one or more conductors, insulated or bare, through an internal or external wall of an enclosure  *(the word insulating appears in IEC 60050-426 and is anticipated to be added to IEC 60079-0, Ed 8)* | **Accepted, but added under (1), because (3) does not use bushings at all** |
| **TC 31** |  |  | **ed** | Suggest revising background “2” to incorporate the defined term “bushing”. | 2. The stator winding wires are led through an opening between the stator frame and the terminal box, after which this opening is compounded to form a bushing which then creates separate flameproof enclosures for the frame and the terminal box.  The motor frame and the terminal box are tested as separate flameproof enclosures. | **Accepted** |
| **TIIS**  **JP** |  |  | **ge** | TIIS supports the revised draft DS without comments. |  | **Noted** |
| **UL-**  **USA** | **Question and Answer** |  | **Editorial** | **The last 3 paragraphs of the question are going into supposition that is not a necessary part of the question. The answer can also be made simpler.** | In the question, beginning with the 5th paragraph:  …….This ~~draft~~ DS considers the requirements for the second option only, as the requirements for the first and third option are considered to be clearly stated in the standards.  The compounded wire-feedthrough construction is basically a hole with wires which is closed by filling the hole with hardening compound.  ~~It is not really a cemented joint, as a cemented joint is normally considered as an application of cement in the flameproof joint between two parts of a flameproof enclosure, where the flameproof joint cannot, or does not, comply with the joint requirements from the Tables 2 and 3 in the IEC 60079-1. A hole with wires which is filled with compound is not really a cemented joint between two parts of a flameproof enclosure.~~  ~~It is also not really a ‘bushing’, as a bushing typically is a separate device (separately certified or not), where the wires are led through a (mostly-) cylindrical opening in a removable device that is installed in the wall of a flameproof enclosure (per IEC 60079-1 cl. 13.7).~~  ~~So a compounded wire-feedthrough does not really fit in the current standard requirements. This leads to different testing/certification practices among ExTLs.~~ | **Accepted, deleted the sentence ‘The compounded wire-feedthrough construction is basically a hole with wires which is closed by filling the hole with hardening compound.’** |
|  |  |  |  |  | **In the answer:**  Yes.  Regardless of the shape and size of the construction of the compounded wire-feedthrough, the construction it is to be evaluated and tested as a bushing that is formed by molding insulation compound on metallic parts and regarding it as being a bushing specific for a flameproof enclosure (that type/size of flameproof motor). The joints between compound and metal housing, and between compound and wires, are considered as cemented joints.  ~~Required tests: per IEC 60079-1 cl. 6.1.2 – Cemented joints – Mechanical strength.~~  The Overpressure test is permitted to be based upon the reference pressures determined for the stator side and terminal box side of the cement.  *~~Note:~~*  *~~A compounded wire-feedthrough construction, formed by an intermediate plate (e.g. a separate plate between stator frame and terminal box containing the compounded wire-feedthr~~*~~ough), can be certified as flameproof component, if all tests per (IEC 60079-1 cl. 6.1.2) have been passed successfully. The component certificate shall specify the maximum allowed explosion pressure on both sides of the component.~~ | **Accepted in principle**  **However, whereas Group I/II bushings are tested with 2000/3000kPa, it should be noted that it is possible to have HIGHER reference pressures arising at the stator-side, due to pressure piling effects.**  **Testing bushing constructions with ‘only’ 2000/3000kPa may not be enough if actual reference pressures would be higher.**  **I would therefore propose to EITHER:**  **- NOT include the proposed statement but have it added in the next edition of the standard,**  **OR**  **- include ‘The overpressure test SHALL be based upon the reference pressures determined for the stator side and terminal box side of the cement, or on 2000kPa (for Group I) or 3000kPa (for Group II), whichever is the greater.’** |
| **ULBR**  **BR** | **Question and Answer** |  | **Editorial** | **The last 3 paragraphs of the question are going into supposition that is not a necessary part of the question. The answer can also be made simpler.** | In the question, beginning with the 5th paragraph:  …….This ~~draft~~ DS considers the requirements for the second option only, as the requirements for the first and third option are considered to be clearly stated in the standards.  The compounded wire-feedthrough construction is basically a hole with wires which is closed by filling the hole with hardening compound.  ~~It is not really a cemented joint, as a cemented joint is normally considered as an application of cement in the flameproof joint between two parts of a flameproof enclosure, where the flameproof joint cannot, or does not, comply with the joint requirements from the Tables 2 and 3 in the IEC 60079-1. A hole with wires which is filled with compound is not really a cemented joint between two parts of a flameproof enclosure.~~  ~~It is also not really a ‘bushing’, as a bushing typically is a separate device (separately certified or not), where the wires are led through a (mostly-) cylindrical opening in a removable device that is installed in the wall of a flameproof enclosure (per IEC 60079-1 cl. 13.7).~~  ~~So a compounded wire-feedthrough does not really fit in the current standard requirements. This leads to different testing/certification practices among ExTLs.~~ | **Noted and corrected** |
|  |  |  |  |  | **In the answer:**  Yes.  Regardless of the shape and size of the construction of the compounded wire-feedthrough, the construction it is to be evaluated and tested as a bushing that is formed by molding insulation compound on metallic parts and regarding it as being a bushing specific for a flameproof enclosure (that type/size of flameproof motor). The joints between compound and metal housing, and between compound and wires, are considered as cemented joints.  ~~Required tests: per IEC 60079-1 cl. 6.1.2 – Cemented joints – Mechanical strength.~~  The Overpressure test is permitted to be based upon the reference pressures determined for the stator side and terminal box side of the cement.  *~~Note:~~*  *~~A compounded wire-feedthrough construction, formed by an intermediate plate (e.g. a separate plate between stator frame and terminal box containing the compounded wire-feedthr~~*~~ough), can be certified as flameproof component, if all tests per (IEC 60079-1 cl. 6.1.2) have been passed successfully. The component certificate shall specify the maximum allowed explosion pressure on both sides of the component.~~ | **Accepted in principle**  **See answer stated above** |