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

**Title: ExTAG/563C/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 updated version, *ExTAG/563C/CD, Draft Revised ExTAG Decision Sheet – Compounded wire-feedthrough constructions between motor frame and terminal box* including track changes, is now listed for discussion during the 2020 ExTAG Remote Meeting.

A Compilation of Comments on ExTAG/563B/CD, along with originator observations, are contained in ExTAG/616/CC.

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**COLLECTION OF IECEx / ExTAG DECISION**

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| **Standard:**  IEC 60079-1:2014  (Edition 7.0) | Clause:  6, 13.7, C.2.1.4 | **Draft Decision Sheet:**  ExTAG/563C/CD |
| **Subject:**  Compounded wire-feedthrough constructions between motor frame and terminal box  **Status of document:**  Draft | **Key words:**  Electrical machine  Cemented joints  Bushings specific to an enclosure | **Date: 2020 08 24**  **Originator of proposal**:  CNEX-Global  **TC/SC involved:**  IEC/TC 31 MT 60079-1 |
| **Background**  In the construction of flameproof motors to IEC 60079-1, the electrical connections between stator windings and the terminals in the terminal box, can be established in general in three ways:  1. the stator winding wires are connected to separately certified flameproof bushings within the motor frame housing.  The motor frame and the terminal box are tested as separate flameproof enclosures.  Note The definition from IEC 60079-0 reads:  **bushing**  insulating device carrying one or more conductors, insulated or bare, through an internal or external wall of an enclosure  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.  3. the stator winding wires are led through an opening between the stator frame and the terminal box, after which this opening is NOT compounded, but remains open. This includes cases where there may be a thermal barrier present.  The motor frame and the terminal box are tested together as one enclosure with intercommunicating volumes.  This 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.    **Question:**  Should a compounded wire-feedthrough (as described above) be evaluated and tested as being a ‘Bushing specific to an enclosure’, conform IEC 60079-1 cl. C.2.1.4 - Bushings?  **Answer:**  Yes.  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 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.  Note on overpressure test:  In accordance with the requirements of IEC 60079-1, reference pressure tests shall be performed on any side of the seal that involves Type of Protection “d” (e.g. the stator side of the seal, the terminal box side of the seal).  After this reference pressure testing, the associated overpressure value for each side of the seal that involves Type of Protection “d” shall be determined.  Finally, for each side of the seal that involves Type of Protection “d”, an overpressure test at the determined overpressure value for the side shall be performed. When an increased safety “e” terminal box is employed, only the stator side of the seal is required to be tested.” | | |