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

**To: Members of the IECEx ExMC**

**Title:** Report on ExMC WG15 responses to comments from the US concerning ExMC/1032/CD - Draft OD 005-3 “*Quality System requirements for manufacturers – Part 3: Supplementary requirements for non-electrical equipment to ISO/IEC 80079-34”*

**INTRODUCTION**

This document contains the comments received from the US and the ExMC Working Group WG15 agreed responses to draft document ExMC/1032/CD *Quality System requirements for manufacturers – Part 3: Supplementary requirements for non-electrical equipment to ISO/IEC 80079-34”* and is submitted for information and consideration at the 2016 ExMC Umhlanga meeting.

***Chris Agius***

***IECEx Secretariat***

|  |  |
| --- | --- |
| **Address:**  **Level 33, Australia Square**  **264 George Street**  **Sydney NSW 2000**  **Australia** | **Contact Details:**  **Tel: +61 2 46 28 4690**  **Fax: +61 2 46 27 5285**  **e-mail: info@iecex.com**  [**http://www.iecex.com**](http://www.iecex.com) |

| **Member Body/**  **Country** | **Clause/ Sub-clause** | **Paragraph Figure/ Table** | **Type of**  **comment**  **General/**  **technical/**  **editorial** | **COMMENTS** | **Proposed change** | **Observation**  **Responses from C Agius and J Munro and WG15** |
| --- | --- | --- | --- | --- | --- | --- |
| US | Overall |  |  | The contents of this CD are not mature enough to progress to DV yet. | Member body comments received should be addressed as part of a subsequent CD for subsequent Member Body comment. |  |
| US | 1 |  | G | This document is clearly stated to only apply as a supplement to ISO/IEC 80079-34, Ed 1.0 as it relates to non-electrical equipment, yet this document does not utilize the text and wording from ISO/IEC 80079-34, and thus, does not provide the guidance as it says it does. | Provide a more definitive reference to ISO/IEC 80079-34, Edition 1 throughout the document.  Where a direct reference to ISO/IEC 80079-34, Edition 1 is not sufficient, then include only that information which actually supplements the document.  In some cases, it is likely better to directly copy the wording from ISO/IEC 80079-34, Edition 1 (as shown in some comments below) | Additional text added to scope to reflect this |
| US | 3 | Par 2 | T | References that Annex A shall be considered, yet the annex is an informative annex | Change “shall” to “should” | Change has been made |
| US | 3 |  | T | The most important aspect of Ex protection methods of non-electrical equipment is the identification of potential ignition sources and how to prevent them from becoming effective ignition sources. Thus, the ability of the manufacturer to perform the initial ignition hazard assessment should be part of the quality assurance program which is reviewed. | Incorporate a verification of the list of critical components, aspects and/or parts of the equipment on which the Ex safety depends. | Additional text added to make this clear |
| US | A.1 |  | G | The Annex states that it provides information to those aspects which should be controlled by a manufacturer’s quality system without adding requirements. Many of the details listed in the Annex may be considered as mandatory simply because they are on the list – as opposed to qualifying that those aspects which are critical to the Ex safety of the equipment are intended to be controlled. | Add the following sentence – or similar:  “Not every item listed in this Annex applies to the safety of each Ex equipment. Only those aspects which are considered to be critical to the requirements or safety aspects of the Ex equipment are to be controlled by the quality system.” | Proposed text added |
| US | A.1 |  | G | If the intent is to provide additional requirements which are not listed in IEC/ISO 80079-34, Ed 1.0, then the wording of the Annex should refer to clause A.1 of that standard or copy it directly | Either refer the reader directly to the wording in Clause A.1 General of ISO/IEC 80079-34, Edition 1 or change to:  “This annex provides information on those aspects that the quality system should address with respect to particular types of protection. It does not add to or otherwise change the requirements of this standard.  This annex provides examples of how to meet the requirements of this standard, recognizing that other methods which achieve the same objectives are equally acceptable; in addition, it draws attention to aspects of requirements that may not be readily apparent to those unfamiliar with quality systems for products intended for use in explosive atmospheres.  NOTE The following examples do not cover all types of protection but give some advice and will be supplemented in the next edition of ISO/IEC 80079-34.” | Wording added to reflect this remark taking into account the previous US comment. |
| US | A.2 |  | T | The reader has already been informed that ISO/IEC 80079-34 is a requirement. There is no need to duplicate the information from that document here beyond simply referencing the applicable clause. | Change section to:  “A.2 Requirements which are defined in ISO/IEC 80079-34  The following equipment, parts of equipment, components and/or parts of components are to be verified as described in the identified clauses of ISO/IEC 80079-34: Edition 1.  A.2.1 Flame arresters  Flame arresters should be verified following clause A.12 of ISO/IEC 80079-34, Edition 1  A.2.2 Ingress Protection  The level of ingress protection should be verified following clause A.5.1 of ISO/IEC 80079-34, Edition 1, regardless of the method(s) of protection implemented” | Given that additional text has been added to make a stronger reference to ISO/IEC 80079-34 it is felt that this would require the reader to read and address those requirements.  Suggest awaiting feedback on implementing the OD and work on the new ISO/IEC 80079-34 before making a change.  However later US comments have been inserted into the revised document which also address this |
| US | A.3 |  | G | Title is vague and does not follow the wording used in subsequent headers of the same level | “A.3 Non-electrical Equipment – General requirements (ISO 80079-36)” |  |
| US | A.3 |  | T | The section leaves the reader to wonder what the point is. It seems that clause A.3 is intended to address aspects and verifications which are fairly universal across non-electrical equipment – as in those aspects which can be addressed using ISO 80079-36 (the former EN 13463-1:2009). | Add general aspects which should be controlled:  “The following aspects represent a typical listing of aspects which may impact the Ex safety of non-electrical equipment and should be shown on the manufacturer’s documentation and verified by the manufacturer.   1. Materials used for construction, metallic and nonmetallic 2. Listing of purchase Ex equipment, if any 3. Listing of external coatings and/or paints, if any 4. Thickness of coatings and/or paints applied to equipment, if any 5. Identification of bonding locations, if any 6. Dimensions of bonding locations and associated hardware, if any 7. General layout of equipment” |  |
| US | A.3.1 |  | T | This clause does not fully explain how verification is to be achieved, as some clauses of ISO/IEC 80079-34, Edition 1 do.  Recommend adding a clause with Testing or Verification similar to ISO/IEC 80079-34.  Nowhere is there are requirement to document the verifications, to define test procedures or to document tests which are deemed critical to the Ex safety. | Add clause for  “Verifications and Tests  All verifications against Ex safety parameters/aspects should be documented.  All tests which are used to verify the Ex safety aspects or parameters of the equipment should follow industry standard test methods and should be documented.” | Included as new Clause 3.7 |
| US | A.3.2 |  | T | There is no distinction to explain that only those non-metallic materials of equipment or parts of equipment on which the Ex safety depends is what needs to be controlled. As a result, the auditor is left to verify that the manufacturer verifies 100% of the non-metallic materials used in the equipment, regardless of the potential risk level | Include the following text:  “The requirements for verification of materials should apply to those aspects of non-metallic materials, non-metallic enclosures, and non-metallic parts of enclosures on which the type of protection depends.” | Text included |
| US | A.3.2 |  | T | The required information should be listed in the equipment standard – ISO 80079-36 as it is in EN 13463-1, clause 7.3.  The quality system should only be able to verify the materials used, where they are critical to the Ex safety of the equipment. | Change this section to:  “A.3.2 Non metallic materials  Where the non metallic materials affect the Ex safety of the equipment, the material should be subject to verification that demonstrates conformity to clause xxx of ISO 80079-36. Examples of specific properties to be verified and/or specified:   1. Material name and/or manufacturer 2. Material composition 3. Surface resistance or Temperature Index (TI) or Comparative Tracking Index (CTI), etc. 4. Flammability rating 5. Maximum and minimum surface area 6. Maximum and minimum thickness   Non metallic materials include those used for the following:   1. Coatings and paintings on metallic surfaces 2. Enclosures or parts of enclosures 3. Cementing 4. Light transmitting parts”   Note that the appropriate clause in EN 13643-1 is 7.3. | This comment and the one immediate prior seem to be addressing the same aspect so a combination of the two have been included. |
| US | A.3.3 | Para 1 | G | The sentence states that “Casing and external **parts** should be subjected to verification that demonstrates conformity”  The following list is usually a list of **aspects** and not parts.  I would also expect the technical specifications to be listed in ISO 80079-36 since that is the standard dealing with General Requirements for non-electrical equipment. | Change the sentences to:  “**Aspects of** casings and external parts **of the equipment** should be subjected to verification that demonstrates conformity”  Change A.3.4 accordingly. | Adjustment made |
| US | A.3.4 |  | T | Nowhere is the reader reminded to leave bonding and grounding locations non-coated and non-painted. There is also no requirement regarding the physical dimensions or specification of voltage equalization cable construction requirements. | Change the clause to the following:  “The following aspects of earthing and bonding locations of conductive parts should be subjected to verification that demonstrates conformity to the applicable clauses of the applicable standards:   1. Earthing terminal or connection location 2. Means of maintaining connection against rotation and accidental loosening 3. Dimensions of connection locations 4. Evidence of electrical continuity at location (no coating or paint present, etc) 5. Conductor sizes (minimum and maximum cable, lug or ferrule size, maximum current capability needed for bonding conductors, etc)” | Text change made |
| US | A.3.5 |  | T | This is an unnecessary clause as non-metallic materials are addressed in A.3.2 | Delete clause | Leave in for the moment and review based on feedback. |
| US | A.3.6 |  | T | This clause does not provide supplemental information and should either reference ISO/IEC 80079-34, Edition 1 (as shown in comment relating to A.2) or should reference the applicable clause(s) in ISO/IEC 80079-34, Edition 1 which are: A.5.1, A.6.1, A.9.3 and A.10.6. | Delete clause or reference ISO/IEC 80079-34, Edition 1 directly | Altered wording added to refer to ISO/IEC 80079-34 |
| US | A.4.1 |  | G | The statement is quite binding in that it claims A.3 identified safety aspects (which it did not). Clause A.3 is identifying aspects which should be verified IF the safety of the equipment may be impacted by the aspects.  It would be better to make a general statement about verification means (as ISO/IEC 80079-34, Edition 1 does in each of the sections relating to a specific method of protection).  It would also be good to remind the reader that this clause may only apply to sections of components of the equipment, as defined in the standard. The sections of this clause should then follow the sections as defined within the ISO 80079-37 as equivalent to EN 13463-5. | Change the wording to the following:  “Those parts or sections of the equipment which are identified as using the constructional safety method of protection may include additional requirements for verifications.  The following are examples of aspects or parameters which should be verified and documented, based on the type of component, part or equipment.  A.4.2 Ingress Protection  The verifications as described in A.2 apply.  A.4.3 Seals for moving parts  The verification of the materials used for seals of moving parts should follow those for the appropriate material (metallic or non-metallic) with the following additions, as applicable.   1. Resistance to distortion 2. Resistance to degradation   A.4.4 Equipment lubricants/coolants/fluids  The verification of the materials used as lubricants/coolants/fluids should follow those for non metallic materials.  A.4.5 Moving parts  The verification of the materials used for moving parts and casings should follow those for the appropriate materials (metallic or non-metallic).  The verification should also include:   1. dimensional checks 2. clearance between moving and non-moving parts   A.4.6 Bearings  The verification of bearings should include:   1. bearing type 2. bearing ratings 3. bearing fit 4. alignment when fitted   A.4.7 Power Transmission Systems  Any materials should be verified using the applicable verifications (metallic versus non-metallic materials).  In addition, the following aspects should be verified:   1. type of drive (gear vs. belt, etc.) 2. electrical resistance of support frame 3. Dimensional checks or parts 4. Dimensional checks on clearance between moving and non-moving parts 5. Flammability rating of non-metallic materials 6. Filter media, if applicable   A.4.8 Brakes and Braking Systems  The verification of the materials used for brakes and braking systems should follow those for the appropriate materials (metallic or non-metallic).  A.4.9 Springs and absorbing elements  The verification of the materials used for springs and absorbing elements and their associated casings should follow those for the appropriate materials (metallic or non-metallic).  A.4.10 Conveyor Belts  The verification of the materials used for conveyer belts and the associated casing and support structure should follow those for the appropriate materials (metallic or non-metallic).” | Additional items as listed in the US comments have been inserted into the revised document |
| US | A.4.2 |  | G | This is actually a general requirement that the materials of use be defined and controlled if the Ignition Hazard Assessment determines there is a potentially effective ignition source.  This clause should be moved into Clause A.3. | Move into Clause A.3 | Review at next revision. |
| US | A.4.3 |  | G | The word parts implies physical components or equipment yet the list which follows describes aspects which should be verified. | Change wording to:  “Documented procedures should ensure that the following aspects are verified:   1. Dimensional characteristics as defined in the technical documents (e.g.: shape, position, concentricity, quality of finish) 2. Dimensional accuracy of the functional surfaces (e.g.: tolerances for diameters) 3. Depth and configuration of cut-in as related to stress concentration of construction” | Opening statement changed to US proposal |
| US | A.4.4 |  | G | This section is nearly identical to clause A.3.4 of ISO/IEC 80079-34, Edition 1. The removal of the item which specifies that the “application e.g.: filling instructions, freedom from voids and temperature conditions” is a significant reduction in the requirements and may negatively impact the safety of the equipment, considering that this clause only applies to those aspects of the equipment on which the safety depends.  The controls for the use of encapsulation and cementing materials are similar in that they must be tightly controlled to ensure proper adhesion and curing of the material. | Move clause to A.2 as described above (which references clause A.3.4 of ISO/IEC 80079-34, Edition 1 directly)  Or  Add the removed item back to the list:  “d) application e.g.: filling instructions, freedom from voids and temperature conditions” | Review at next revision |
| US | A.4.5 |  | G | Assemblies do need additional verifications, however, the list does not provide guidance on the aspects which are important to the Ex protection. | Change the wording to:  “Documented procedures should ensure that the following aspects are verified:” | New opening statement added |
| US | A.4.6 |  | T | The title of this clause is Routine Testing but there is no specification of testing in the clause. | Change the wording to:  “Any tests specified in Ex certificate should be controlled by documented procedures and conducted on a 100% basis, unless otherwise permitted.”  Or  “All tests should be documented. Typical tests include:…   1. Sealing system (e.g.: fit, lubrication, initial tension, primary pressure) 2. Clearance between moving and non-moving parts (e.g.: clamping clearance and tolerances, free room of motion) 3. Dynamic vibration of system (e.g.: critical rotation speed, bearing at standstill or at transport)” | Adjustment made to current text to take these into account |
| US | A.4.7 |  | G | Once again, the word “parts” is used in place of the more appropriate word of “aspects” or “parameters” or “features”.  Each aspect which is listed under Power Transmission Systems is addressed by changes previously recommended. | Change the wording to:  “Documented procedures should ensure that the following aspects are verified:”  Or  Delete entire section, if comment regarding restructuring of A.4 is implemented. | Opening statement changed |
| US | A.5.1 |  | G | This statement should be made at the introduction section of the Annex instead of being repeated at each main subclause.  In addition, there is a typo in the sentence which makes the meaning undeterminable:  “Additional to the safety aspects for non-electrical equipment defined in A.10 of ISO/IEC 80079-34 Edition 1 **A.3the following safety aspects are relevant**.”  It is completely unclear of the intent of this statement because clause A.10 of ISO/IEC 80079-34 Edition 1 is related to Ex t – Dust ignition protection by enclosure and addresses aspects such as Casting, Enclosure Parts, Gaskets, Protection Devices, Cemented and Cast Enclosure Parts, Ingress Protection and Examinations.  Of these topics listed in A.10 of ISO/IEC 80079-34 Edition 1, none seem to apply to equipment used as part of Control of Ignition Sources.  If earlier suggestions are accepted, regarding general requirements for all non-electrical equipment, then this clause and statement are completely unnecessary. | Move to clause A.3 | Review at next revision |
| US | A.5.2 |  | G | The use of the word “parts” implies equipment and does not match the topic of the list below. | Change the wording to:  “Documented procedures should ensure that the following aspects are verified:” | Change made |
| US | A.5.3 |  | T | The use of the word “parts” implies equipment and does not match the topic of the list below. | Change the wording to:  “Documented procedures should ensure that the following aspects are verified:” | Change made |
| US | A.5.4 |  | T | Nowhere is the reader reminded to document the tests and examinations completed. | Add the following (unless it is incorporated in a general location):  “Any tests specified in Ex certificate should be controlled by documented procedures and conducted on a 100% basis, unless otherwise permitted.”  Or  “All tests should be documented. Typical tests include:” | Adjustment made |
| US | A.6.1 |  | G | This statement should be made at the introduction section of the Annex instead of being repeated at each main subclause.  It is completely unclear of the intent of this statement because clause A.10 of ISO/IEC 80079-34 Edition 1 is related to Ex t – Dust ignition protection by enclosure and addresses aspects such as Casting, Enclosure Parts, Gaskets, Protection Devices, Cemented and Cast Enclosure Parts, Ingress Protection and Examinations.  Of these topics listed in A.10 of ISO/IEC 80079-34 Edition 1, none seem to apply to equipment used as part of Control of Ignition Sources.  If earlier suggestions are accepted, regarding general requirements for all non-electrical equipment, then this clause and statement are completely unnecessary. | Move to clause A.3 | Leave as is until next revision |
|  |  |  |  |  |  |  |