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(Committee in confidence)

**INTERNATIONAL ELECTROTECHNICAL COMMISSION SYSTEM FOR**

**CERTIFICATION TO STANDARDS RELATING TO EQUIPENT FOR USE**

**IN EXPLOSIVE ATMOSPHERES (IECEx SYSTEM)**

**Circulated to: IECEx Management Committee (ExMC)**

**Title: Compilation of Comments on ExMC/1842/CD – Draft Operational Document OD 290 - Guide to the Certification of Hydrogen Fuel Dispensing Equipment, Components and Systems**

**Introduction**

This document contains the compilation of Comments received from IECEx Member Bodies on Document ExMC/1842/CD – Draft Operational Document OD 290.

Comments contained were received from CA, CZ, ES, FR, HR, IN, JP, RU, US

Comments contained in this Document were considered the WG19 work to produce a revised version of Draft OD 290 which has been issued to ExMC Members as ExMC/1842A/DV for consideration at the September 2022 Annual meeting of the IECEx Management Committee, ExMC.

In consideration of each of the comments received, this compilation document also includes the responses from the WG19 and its Task Team 2.

This document should also be read in conjunction with the WG19 Conveners Report, ExMC/1868/R.

**Document Title:** Draft IECEx Operational Document OD 290 - Guide to the Certification of Hydrogen Fuel Dispensing Equipment, Components and Systems

**Compilation of Comments**

|  | **IECEx Member Body**  **(Country)** | **Clause/ Sub-clause** | **Paragraph Figure/**  **Table** | **Type of**  **comment**  **General/**  **technical/**  **editorial** | **COMMENTS** | **Proposed change** | **Observation + Recommendations from the Task Team 2 Members and WG 19 Members** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **IN** |  |  | **GENERAL** | Dear Sir,  We have consulted the stakeholders through our national working group and it is to inform that we agree with the draft document OD 290. | ***No Changes proposed*** | **Noted** |
| **2** | **ES** |  |  | **GENERAL** | **We agree with this**  **Draft Operational Document as it is written.** | ***No Changes proposed*** | **Noted** |
| **3** | **US-1** | **OD 290** |  | **GENERAL** | Area of concern, for the document owners to consider for future enhancement:   1. The scope of the standard is Hydrogen Fuel Dispensing Equipment, Components and Systems. But the standard mainly focuses on the dispenser. 2. The testing in annex A and the associated ExTR are dispenser specific. Minimal guidance is provided for the testing and ExTR additions or items other than the dispenser, such as compressor, nozzle, hose and breakaway. 3. This OD references the use of IEC TS 60079-46. This should be applied to the dispenser or other systems, but this would not be the applicable Ex protection standard for hydrogen components. Examples: A nozzle would use 80079-36, electrically operated valve could use 60079-18. 4. Important safety aspects are not included in modified 60079-46 ExTR. This includes items such as material embrittlement, refueling communication protocol, pressure rating. | ***No Changes proposed*** | **Noted**  **Agree with the US observations. The OD is meant to enable the issuing of IECEx Certificates for parts such as hoses and values while at the same time also enable IECEx certification of an assembly of product parts that come together as a H2 dispenser.**  **To help clarify, Section 7 is to be split to clarify approaches for individual equipment parts and components and dispensers.** |
| **4** | **RU** | **Title** | **-** | **General** | As the guide is intended to coverIECEx certification bodies (ExCBs) and IECEx testing laboratories (ExTLs); Manufacturers/applicants seeking IECEx certification; and assessment processes including the assessment of ExCB and ExTL the title shall be changed. | ***Certification*** is proposed to be changed to ***conformity assessmen***t: Guide to the ***conformity assessment*** of Hydrogen Fuel Dispensing Equipment, Components and Systems. | **While this proposal may make sense to those that are closely involved within the IECEx System, it is intended that IECEx Certification is to be available to all aspects of equipment and systems related to the production, distribution and dispensing of Hydrogen and hence will involve many persons that are not familiar with the Ex field nor IECEx, hence it is proposed to keep the title as is.** |
| **5** | **US-2** | **1** | 1st paragraph | Technical | It is unclear if these requirements cover light and heavy duty applications | This document provides guidance on certification of gaseous Hydrogen Fuel Dispensing equipment, components and systems for light and heavy duty vehicles in the IECEx Equipment Certification Scheme. It supplements existing Scheme documents such as IECEx 02, OD 009 and OD 280. It covers information relevant to: | **Agree Scope has been modified to suit** |
| **6** | FR | 1 |  | G | Does the scope of IECEx certification of Hydrogen Fuel Dispensing Equipment concern all aspects/requirements of the ISO standards listed in point 3  (eg. Protection against process related overpressure, testing and validation of fueling protocols…) or only requirements related with the risk associated with explosive atmosphere (eg. Electrical conductivity in ISO 19880-3)? | Clarification of the scope | **Agree**  **Scope of the document has been updated to reflect that IECEx certification is available to equipment, components and systems associated with the production, distribution and use of hydrogen** |
| **7** | **IECEx Chair** | 1 | Last | Editorial |  | Delete “*also*” from last sentence as this is redundant | **Agree** |
| **8** | **US-3** | **3** | 1st paragraph | Technical | Refuelling standards should be added. | Add: SAE J2601 and ISO 14687-2 | **While according to the IEC Basic Rules, IEC CA 01, IECEx is permitted to use IEC or ISO International standards, use of other standards such as SAE requires approval by IEC CAB with a business case to be developed ahead of a submission to CAB.**  **Suggest at this stage focus is on ISO and IEC standards**  **In this sense, ISO 14687 could be used and has been inserted in Clause 3. Noting that ISO 14687:2019 is a combination of three former standards ISO 14687-1, -2, -3** |
| **9** | **JP** | 3 | NOTE | general | Is there a requirement of scope extension to use Annex A of OD 290 during certification process? | If the answer to the question in COMMENTS is yes, statements should be added to clause 3 and/or 5 how to handle Annex A. | **It is felt that Clause 5.2 covers this aspect but perhaps a review of 5.2 may assist.** |
| **10** | **RU** | **3, 5** | **-** | **General** | Parts of ISO 19880 series, ISO 17268, ISO/TR 15916 contain other safety requirements, in addition to explosion protection requirements. It is necessary to clarify whether the standards will be applied in the IECEx system in whole or in part (some particular clauses), what and how ExCB/ExTL will be accepted for, and what will be the responsibility of ExCB/ExTL, what the manufacturer himself will be responsible for.  For example, in clause 3 Standards to be used there is a statement for ISO 19880-1**:** (parts as declared by the IECEx Certificate Applicant for declaring on the IECEx Certificate), but at the same time in clause 5.1 this standard is listed as a whole when the application is submitted for the acceptance of CB/TL, then in clause 5.1 parts of ISO 19880 series are selected by ExCB/ExTL, but up to now there are only two parts: ISO 19880-3 and ISO 19880-5. | The list of standards (or clause of standards) to be used for certification, the application of the acceptance of ExCB/ExTL shall be detailed. | **The opening statement to Clause 3 has been adjusted to clarify that the standards listed are those that are to be used for certification of gaseous Hydrogen Fuel Dispensing equipment, components and systems in the IECEx Equipment Certification Scheme.** |
| **11** | **RU** | **3 standards to be used** | **-** | **General** | As in item c) of clause 5.2 it is stated that ExCB/ExTL shall submit the declaration for scope extension that they have staff resources with a thorough understanding of ISO/TR 15916, this standard shall be included in clause 3 of the draft OD 290. | ISO/TR 15916 Basic considerations for the safety of hydrogen systems shall be added to clause 3 of the draft OD 290 | **Agree** |
| **12** | **RU** | **3 standards to be used** | **2nd paragraph** | **general** | The statement “Other standards may be identified or developed and this guide will updated as necessary to address them” is informative. | It can be modified to NOTE:  NOTE: Other standards may be identified or developed and this guide will updated as necessary to address them. | **Agree** |
| **13** | **US-4** | 5.2 | subparagraph b) | Technical | A compressor module may rely on negative pressure ventilation and IEC 60079-13 would be appropriate. | b) Existing ExCBs/ExTLs seeking to include IEC 60079-1, IEC 60079-2, IEC 60079-7, IEC 60079-11, IEC 60079-13, IEC 60079-18, IEC TS 60079-46, ISO 80079-36 and ISO 80079-37 within their scope would be treated under existing scope extension approaches requiring a scope extension assessment and ballot voting by the ExMC. | **Agree this has been added** |
| **14** | **IECEx Chair** | **5.2 item c)** | **Item c)** | **Editorial** |  | Change “additionally” to “In addition “ | **Agree** |
| **15** | **RU** | **3 and 5.2** | **-** | **general** | ISO 19880-2 is at the draft stage. The requirements to the qualification and routine tests are contained in Annex A of OD 290.  The procedure of the ExCB/ExTL acceptance shall be detailed in this case, as the ExCB/ExTL shall be used this annex according to item c) of clause 7 OD 290. | The procedure of the ExCB/ExTL acceptance to Annex A of OD 290 shall be developed. | **Agree**  **Based on this comment it is proposed to expand on the opening statement of 5.2 “Acceptance of ExExCBs and ExTLs to read:**  In order for ExCBs and ExTLs to have the relevant parts of ISO 1988 **and according to this OD 290,** included in their scope, they must also have IEC 60079-0, IEC 60079-1, IEC 60079-2, IEC 60079-7, IEC 60079-11, IEC 60079-18, IEC/TS 60079-46, ISO 80079-36 and ISO 80079-37 within their scope |
| **16** | **RU** | **5.2** | **3rd paragraph** |  | In addition to the completed F-011 the applicant ExCB/ExTL shall submit the written procedure based on OD 290, especially if it is related to the assessment of the gaseous hydrogen dispensers as an assembly, since ISO 19880-2 is at the draft stage and hasn’t been published yet. | The following shall be added to item c) clause 5.2:  ExCB/ExTL shall also developed and submitted the written procedure based on OD 290, especially if it is related to the assessment of the gaseous hydrogen dispensers as an assembly(annex A of OD 290) | **The text proposed by RU has been inserted under item c) of Clause 5.2 for consideration by WG19** |
| **17** | **RU** | **5.2** | **1st paragraph** | **editorial** | There is a misprint in the document IEC/TS 60079-46 | It shall be IEC TS 60079-46 | **Agree** |
| **18** | **HR** | **5.2** | **2nd par.** | **Editorial** | **Correct error** | Therefore, acceptance of ExCBs and ExTLs to conduct testing and certification according to this OD shall be according to the following as applicable | **Statement altered to address this** |
| **19** | FR | 5.2 |  | G | If the scope is larger than only the explosive atmosphere, is the capability only assessed based on the knowledge of the relevant ISO standards or are there other capabilities to be demonstrated and how will they be assessed by ExTL and certify by ExCB?  Will it be possible to subcontract to Testing Lab which is already accredited |  | **New bullet added to item c) of 5.2 to require the submission of written procedures of the ExTL and ExCB. It is also planned that the IECEx Technical Capability Document (TCD) will be updated to address ExTL requirements, once requirements of OD 290 are completed.**  **This comment also aligns with comment 16 from RU.** |
| **20** | **RU** | **5.3** | **1st paragraph** | **editorial** | If the essential requirement of OD 290 is to have ISO 80079-36 and ISO 80079-37 within the scope of ExCB and ExTL that the procedure on OD 280 shall be implemented.  The reference to clause 5.3 of OD 280 shall be used not to repeat again the requirements of OD 280**.** | The reference to clause 5.3 of OD 280 shall be added:  ~~The following is an extract from IECEx OD 280 and~~ **The clause 5.3 of OD 280** shall be applied when conducting an ignition hazard assessment.  The further requirements shall be deleted. | **Given that this new OD 290 is covering new areas for the IECEx Equipment Scheme, it is felt that at the commencement, it would be better to repeat the text of OD 280 but at the next update and when OD 280 passes its maintenance period a direct reference to the OD 280 would be more appropriate.** |
| **21** | **JP** | 5.4.1 | 1st para. | ge | The words, ISO 19880 Parts, appear in the first sentence in 5.4.1, but no further explanation is present in the second sentence. If it is not necessary, ISO 19880 Parts should be removed. | Remove “ISO 19880 Parts” from the first sentence of 5.4.1. | **ISO 19880 reference is now included in the second sentence.** |
| **22** | **HR** | **5.4.2** | **1st par.** | **Technical** | For product related standards (eg valves, hoses, nozzles, hydrogen dispensers) the requirements of the relevant clauses of the ISO 19880 series standard would be applied as they relate to the equipment being certified. In practice it is expected that manufacturer would provide test reports and certificates issued by independent testing laboratories accredited under ISO/IEC 17025 by ILAC Members. | This sentence suggests what might be available in practice, but does not instruct what to do if required data is not available.  Add the following in continuation of text: Testing by manufacturer under witnessing of independent testing laboratories representative according to OD-024 shall also be acceptable to assess the conformity with the requirements of the relevant clauses of the ISO 19880 series standard. | **Reference to OD 024 is added to 5.4.2 as suggested** |
| **23** | FR | 5.4.2 |  | G | Apart from test requirements, product standards include general design requirements, some of them not related with explosion risk (eg. 5.5 or 8.2 of ISO 19880-1) the assessment shall also include these requirements. |  | **Agree**  **New A1.2 “General construction” has been added** |
| **24** | FR | 5.4.2 |  | G | For many of the tests required by H2 specific product standards there is today no ISO 17025 accredited laboratories. Would it be possible to apply the Witness Testing in accordance with OD 024. | Mention the possibility to proceed to witness testing | **Agree**  **Additional paragraph added to 5.4.2 to make specific reference of use of IECEx OD 024 Testing at Other Locations.**  **Also, as mentioned under comment 19 response, updating of the IECEx TCD is planned once this OD 290 is finalized.** |
| **25** | **US-5** | 5.5 | Note | Technical | The 1st paragraph of 5.5 is too broad, each 3rd party could make a different decision for acceptance. Suggest making the note mandatory. | The following list provides examples of aspects of the above items of concern that third party test data shall be required to address: | **Agree** |
| **26** | **US-6** | 5.5 | 2nd bullet point after note | Technical | Embrittlement is an important safety consideration and documentation of this should be recorded. | Recognizing that existing 60079-x standards do not currently address embrittlement, it is important to add clauses in regards to embrittlement in ExTR, making use of the ISO standards. (see comment on A.2.X) | **Agree**  **ExTAG WG1 to add this to the ExTR under development** |
| **27** | **CZ** | **5.6** | **NOTE** | **technical** | There is given reference to the standard IEC 60079-10-1  The above standard does not include requirements for establishing temperature class. | Text of the last sentence above this Note should be changed accordingly:  It can also be used to assist in classification of areas of the dispenser, in particular where this needs to be done by calculation. | **Agree** |
| **28** | **US-7** | 7 | 1st paragraph | Technical | Permissive language, change to shall. | When assessing hydrogen fuel dispensing equipment for the purposes of IECEx Certification, equipment shall be covered as follows: | **Agree** |
| **29** | **RU** | **7** | **a)** | **general** | Hoses are assessed as part of the equipment according to ISO 80079-36. | Item a) clause 7:  Individual items such as pressurised enclosures, flowmeters, hoses **as part of assembly**, valves and other items may be treated as equipment and covered by an IECEx Certificate of Conformity.  Or Hoses shall be deleted from this item. | **While it may be likely that hoses will be assessed as part of the equipment according to ISO 80079-36,**  **There is a need for manufactures of parts such as hoses, valves and other parts to be able to obtain their own certification according tom the corresponding ISO TC 197 Standard in similar fashion as electrical parts obtain their own certification.**  **Then when such parts covered by an IECEx certificate are used within an assembly then there is no need to repeat the testing already done for that part.** |
| **30** | **US-8** | 7 | subparagraph a) and b) | Technical | What are the additional requirements besides Ex protection methods are to be applied to individual items and component parts. | Suggest addition of Annex B for individual items and component parts. | **Section 7 has been expanded to cover both equipment not related to fuel dispensers and fuel dispensers** |
| **31** | **US-9** | 7 | subparagraph b) | Technical | A (U) certificate may be too restrictive for a hose, breakaway, nozzle. | Delete paragraph | **Item b) reworded to address the US remark** |
| **32** | **US-10** | 7 | subparagraph c) | Technical | Permissive language, change to shall.  Left as permissive language an ExCB could issue a certification by using the proposed clause 19 of 60079-0 when published. | Collection of individual items/components forming a single operational unit (eg hydrogen fuel dispensers) shall be regarded as an Assembly and covered by a single IECEx Certificate of Conformity, with IEC TS 60079-46 used as the primary standard for certification. In this situation, gaseous hydrogen fuel dispensing units shall also be subjected to the qualification and routine tests detailed in Annex A. The IECEx Report package shall include the Report Cover, the IECEx ExTR Blank for IEC TS 60079-46, dedicated to Hydrogen dispensers and other IECEx ExTR’s as necessary for the individual items/components. | **Agree** |
| **33** | **US-11** | 7 | subparagraph c) | Technical | Very specific for dispenser units but what about other operational units such as compressor, cooling unit. | In this situation, gaseous hydrogen fuel dispensing units and other operational units, such as compressor or cooling unit, shall also be subjected to the qualification and routine tests detailed in Annex A. | **The separation made for Section 7 is considered to address the US comment** |
| **34** | **RU** | **7** | **5th paragraph** | **Editorial** | There is a misprint in the document IEC/TS 60079-46 | It shall be IEC TS 60079-46 | **Agree** |
| **35** | **HR** | **7** | **1st par. under b)** | **T** | Specific component parts which may include hoses, valves, nozzles may be treated as Ex components and an IECEx Component Certificate (U) be issued. | Add “Ex” before “components”. | **There maybe items that do not directly contribute to Explosion protection but yet industry seek third party assurance that the relevant ISO standard for that part / component has been met. This is where, to avoid confusion in the H2 community, IECEx are extending its coverage to provide a one-stop shop for International Certification and not just limit itself to the Ex aspects**  **Suggest no change.** |
| **36** | **US-12** | 7 | Sentence after note. | Technical | This is a broad choice. Recommend this sentence be deleted. |  | **Agree** |
| **37** | FR | 7 |  | G | Can components having no source of ignition apart from electrostatic such as hoses can be certified in accordance with IECEx scheme?  Will the future IECEx certificate cover all the aspects of the product standard (eg. Pressure resistance, ageing)? |  | **Agree**  **Scope of the OD 290 has been clarified to cover parts and components such as hoses for compliance with the ISO TC 197 standards, which cover all aspects of the ISO standard.** |
| **38** | FR | 7 |  | G | Is IECEx OD 024 applicable for testing not related to explosion risk? |  | **Agree**  **Refer to response to comment 24 and reference to OD 024 witness testing added to Clause 5.4.2** |
| **39** | **US-13** | 8 | Equipment field on Page 1: | Technical | The field should be expanded for components, such as valves, meters and pressure transmitters. | *‘Gaseous* *Hydrogen fuel dispenser type XXXXX’*  *“**Gaseous* *Hydrogen fuel valves XXXXX’*  *“Gaseous* *Hydrogen fuel meters XXXXX’*  *“Gaseous* *Hydrogen (part name) valves XXXXX’* | **Agree** |
| **40** | **RU** | **9** | **1st paragraph** | **General** | The clarification is required for the options of the certification listed in items a) and b) clause 7. | The following shall be added after the first sentence:  **The Ex marking code for b) and c) clause 7 shall be according to IEC 60079 and ISO 80079.**    The Ex marking code for **c) clause 7**  will be similar to that provided in IEC 60079-46, with next line after the Ex code to contain the following “Meant for Gaseous Hydrogen Fuelling Hxx” where the H number is the Pressure Class according to ISO 19880-1 | **Agree on the need for clarification.**  **Clause 9 to be expanded to include**  **9.1 General**  **9.2 requirements for assemblies**  **With references back to Clause 7 as per the RU proposal.** |
| **41** | **US-14** | 9 | 2nd paragraph | Technical | For an electrically operated valve the certification may be done to IEC 60079-18, for example.  The marking should follow the applicable 60079 or 80079 series that are applied. | The Ex marking code will be similar to that provided in IEC 60079-46 or other applicable 60079 or 80079 series marking requirements, with next line after the Ex code to contain the following “Meant for Gaseous Hydrogen Fuelling Hxx” where the H number is the Pressure Class according to ISO 19880-1 | **Agree** |
| **42** | **US-15** | 9 | 2nd paragraph | Technical | H is not being replaced, xx is being replaced with the number. | The Ex marking code will be similar to that provided in IEC 60079-46, with next line after the Ex code to contain the following “Meant for Gaseous Hydrogen Fuelling Hxx” where the xx number is the Pressure Class according to ISO 19880-1 | **Agree** |
| **43** | **HR** | **9** | **Examples** | **T** | For gaseous Hydrogen Fuelling H70, some components might not meet the requirements for Equipment Group IIC | Add:  Or  IECEx ABC 22.0001X  Ex ‘60079-46’ IIB+H2 T3 Gc  ‘Meant for Gaseous Hydrogen Fuelling H70’  (if some of Ex components or Ex equipment is not intended for explosive atmosphere of acetylene) | **Agree**  **Second example is proposed to be included.** |
| **44** | **JP** | 9 |  | ge | According to clause 7, an individual item can be certified as Equipment certificate.  Even when the individual item certified as hydrogen fuelling, is the marking 60079-46 required? | Add an explanation for the case of marking for individual items. | **Agree**  **This is remark is similar to that of RU and a expansion to Clause 9 is now included to provide an explanation of the different situations.** |
| **45** | **JP** | 9 | example | ed | The quotation marks in the example marking should be removed. | Example:  IECEx ABC 22.0001X  Ex 60079-46 IIC T3 Gc  Meant for Gaseous Hydrogen Fuelling H70 | **Agree** |
| **46** | **CA** | **Annex A** |  | **General** | **It should be specified if Annex A is “informative” or “normative”** | **Include “informative” or “normative” under ANNEX A title** | **Agree**  **Annex A to be shown as Normative** |
|  | FR | A.1 |  | G | It is not clear whether these tests are directly issued from the standards or adaptations and also that they are in addition to the tests required by the specific ISO TC 197 standards and IEC/ISO standard regarding explosion risk. | Clarify the intention and validity of the tests | **Annex A applies to tests that must be conducted when issuing IECEx certification for gaseous Hydrogen dispensers. Refer to Note of A1.1 which advises that these tests have been selected in close consultation with ISO TC 197 experts as they are preparing a new ISO 19880-2, which is where these tests have come from. It is planned that once ISO 19880-2 is published then this OD 290 will be amended to refer to the ISO 19880-2 standard.**  **Maintaining on-going close cooperation with ISO TC 197 will be important.** |
| **47** | **US-16** | A.2.X | New Clause | Technical | Add 4.3 of 19880-2 to the Annex and to ExTR.  Specifically the items related to pressure and material compatibility. | A.2.X construction requirements  a component pressure rating equal to or greater than 138 % of the dispenser hydrogen service level (HSL);  material compatibility of materials normally in contact with hydrogen. Particular attention should be given to hydrogen embrittlement, permeability and hydrogen accelerated fatigue. The material compatibility shall be documented by the component manufacturer or an independent third party. See ISO 19880-1 and ISO/TR 15916. | **Agree**  **A new Clause A 1.2 “General construction” clause is added to address the US comments** |
| **48** | **US-17** | A2 | 1st paragraph | Technical | Repeated “the” twice | The following tests have been selected in consultation with ISO TC 197 experts to support a common approach in assessing gaseous hydrogen fuel dispensers and shall be conducted by the ExTL as part of the Type testing program when issuing an IECEx Test Report (ExTR) using the IECEx ExTR Blank IEC 60079-46-H2\_Dispensers, which is available from the IECEx Website which is available at <https://www.iecex.com/members-area/documents/extr-blanks/>. | **Editorial** |
| **49** | FR | A.2 |  | G | When tests are described in a standard, the reference of the standard shall be given  It seems that some of the tests methos described differ from the methos specified in the product standards (e.g. ISO 19880-3) What is the intention to include these methods? | Specify testing methods only for aspects not already or insufficiently covered by the relevant standard | **The tests of Annex A are for assessing H2 Dispensers as an Assembly according to IEC 60079-46 only.**  **When certifying parts such as Valves or Hoses then the tests of Annex A to OD 290 would not be used. Rather the tests of the relevant ISO standard would apply such as ISO 19880-3 for Valves.** |
| **50** | **JP** | A2.1 | list after 1st paragraph | ed | Strength tests in b) are not appeared in the following clauses. | remove item b | **Agree** |
| **51** | **US-18** | A2.1 | b) | Technical | There are no strength tests. | Samples selected for testing shall be representative of production and be conducted with the test gas and liquids specified for the tests as   1. hydrogen, helium, hydrogen mixtures or helium mixtures for leakage tests; 2. , or 3. hydrogen, helium, nitrogen or dry air for all other tests. | **Agree** |
| **52** | **US-19** | A2.1 | Last paragraph | Technical | MAWP is used in the document. This is the 1st location maximum allowable working pressure is described add (MAWP) after this text. | All tests shall be conducted with the inlet pressure maintained at least 110 % of the manufacturer’s specified maximum allowable working pressure (MAWP), unless otherwise specified.  Tests are to be conducted at room temperature. Unless otherwise stated, testing at room temperature shall be conducted between 15 °C minimum and 30 °C maximum | **Agree** |
| **53** | **CZ** | **A2.2.2** |  | **Technical** | There is mentioned criterion: not show detectable pressure loss.  Detectable pressure loss depend on pressure gage resolution used for the tests. We suggest to delete this criterion, bubble-free criterion is sufficient.  Otherwise maximum allowed value of pressure drop has to be determined. | Text should be changed accordingly:  Excluding leakage to a safe vent during the disconnection of a nozzle, all dispenser parts, including joints and connections, shall be bubble-free for 1 min. | **WG19 Task Team Members to consider**  **XJP: Agree but also to refer to ISO TC 197 experts.** |
| **54** | **US-20** | A2.2 | A2.2.2 | Technical | Stopping a test at exactly 1 min every time is hard to accomplish. Adding at least allows some flexibility.  What is detectable pressure loss? Recommend this be deleted. | Excluding leakage to a safe vent during the disconnection of a nozzle, all dispenser parts, including joints and connections, shall be bubble-free for at least 1 min. | **Agree** |
| **55** | **JP** | A2.3.2 | 1st para. | te | Non-metallic (plastic) is unspecific expression.  It should clearly show whether it includes glass and ceramic or only means plastic. | Non-metallic panels used as...  or  Plastic panels used as... | **Text has been changed to read**  Non-metallic (including plastic) panels used as part………….. |
| **56** | **US-21** | A2.3 | A2.3.1 2nd paragraph | Technical | For clarification add:  Non-metallic (plastic) panels  And a single | The non-metallic (plastic) panel should be in place on the dispenser cabinet. It shall be struck with a single impact produced by a pendulum consisting of a 50 mm diameter steel ball weighing 0,525 kg suspended by a cable that provides a minimum of 1,3 m between the centre of the ball and the hinge point at the other end of the cable. See Figure 1 for the test setup. | **Agree** |
| **57** | **US-22** | A2.3 | A2.3.1 5th paragraph | Technical | Add that only the impact test in IEC 60079-0 is used. | Alternatively, the resistance to impact test in IEC 60079-0 may be used. | **Agree** |
| **58** | **IECEx Chair** | A2.4.2 |  | technical | A criteria is needed for the time to activate | Change to read  A dispenser shall disable the flow of gas to the vehicle within 5s when the ESS is activated | **Agree but also to refer to ISO TC 197 experts** |
| **59** | **IECEx Chair** | A2.5.1 | 1st Para | editorial | Clarification is required | Change 6th sentence to read  The tank size (storage container in Figure 2? Or supply tank (dispenser)?) shall be between 50 l and 249 l. | **Agree** |
| **60** | **US-23** | A2.6 | A2.6 Title | Technical | ISO 19880-3 calls this 9.2.10 Separation Test | Separation Test | **However, we are advised by the ISO TC 197 experts that they are using the term Hose Breakaway test in their work on the 2nd final draft for the dispenser standard.** |
| **61** | **US-24** | A2.6 | A2.6.1 2nd paragraph | Technical | In the 1st paragraph it states MAWP applied, so the sample will be pressurized. The last sentence states “if pressurized” | A direct tensile force shall be applied in the most critical direction beginning at a force less than 220 N and increasing until the device separates. The device shall separate between 220 N and 1 000 N. The flow of gas from either half shall cease and shall not leak in excess of the specification in ISO 19880-3 | **Agree** |
| **62** | **US-25** | A2.6 | A2.6.2 1st paragraph | Technical | The method is described in section A2.6.1.  Bleed down the attached hose through a maximum 1,5 mm orifice is in conflict with ISO 198880-3. 1,5 mm orifice is only one example. | The device shall separate upon application of a maximum pull force of 1 000 N but not less than 220 N when the device is installed as specified by the manufacturer. Upon separation under the pressurized condition, the flow of gas from the inlet component shall cease, and the flow of gas from the outlet component shall either (1) cease within 1 s or (2) relieve the hydrogen in a safely controlled manner, for example, through a maximum 1,5 mm orifice. | **Agree**  **Also for consultation with ISO TC 197 experts** |
| **63** | FR | A.2.6 |  | G | Example of the previous point. The method in ISO 19880-3 specifies temperature conditions that are very specific and in relation with the H2 fueling process. These are not specified in the draft OD 290. So, what will be the validity of this method? | Specify testing methods only for aspects not already or insufficiently covered by the relevant standards | **See response to comment 49, re Annex A Tests are only applied to H2 dispensing units that are considered an assembly and being certified to IEC 60079-46. The tests of Annex A ensure that all ExTLs and ExCBs apply IEC 60079-46 in a consistent manner when applying IEC 60079-46 to H2 Dispensers.**  **For valves, hoses and other equipment, the construction and test requirements of the associated ISO standard apply and not Annex A of OD 290.**  **Hence for IECEx certificates issued to valves the standards shown on the certificate would be ISO 19880-3**  **When issuing an IECEx certificate to H2 dispensing units, the standard shown on the IECEx certificate would be IEC 60079-46, but the description may mention assessed and certified using OD 290, so that this is clear.** |
| **64** | **US-26** | A2.9 | A2.9.1 2nd paragraph | Technical | Stopping a test at exactly 1 min every time is hard to accomplish. Adding at least allows some flexibility. | During the dielectric withstand tests, a 500 V-A or larger transformer, having an essentially sinusoidal output voltage which can be varied, shall be used. The applied potential shall be increased gradually from zero until the required test voltage is reached and shall be held at that value for at least 1 min. The use of a 500 V-A or larger transformer is not necessary if the high-potential testing equipment used maintains the specified high-potential voltage at the equipment during the test.  a) A dispenser shall be capable of withstanding, for at least 1 min without breakdown, the application of a rated frequency potential between high-voltage live parts and dead metal parts, and between live parts of high- and low-voltage circuits. The test potential shall be:  b) A low-voltage circuit shall be capable of withstanding, for at least 1 min without breakdown, a rated frequency potential of 500 V applied between low-voltage live parts of opposite polarity and between low-voltage live parts and dead metal parts. | **Agree** |
| **65** | **JP** | A2.6.2 | 1st para. | te | Time to cease the flow at the inlet has no condition. It is helpful to make a requirement of ceasing time for inlet, like within 5s. | for example,  the flow of gas from the inlet component shall cease within 5 s | **Recommend to refer to ISO TC 197 for consideration in their development of ISO 19880-2** |
| **66** | **JP** | A2.7.1 | first sentence,  last sentence | te | We couldn’t understand the first sentence which says electrical potential ranging from 0 to 1000 V dc. Is any voltage within them fine for the test?  On the other hand, the last sentence says the resistance test at a value less than or equal to 24 V.  Are both of them intend the same test, A.2.7.1? Or intend other tests | Show the test method clearer. | **Recommend to refer to ISO TC 197 for consideration in their development of ISO 19880-2** |