ISO/TC 197
Hydrogen technologies

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Secretariat: SCC (Canada)

ISO FDIS 19880-3 Collated Comments

Document type:	FDIS ballot
Date of document:	2018-06-29
Expected action:	INFO
Background:	Here are the comments that were received with the successful ISO/FDIS 19880-3 ballot. See the vote results in document N 1014.
Committee URL:	https://isotc.iso.org/livelink/livelink/open/tc197

Template for comments and secretariat observations

Date:2018-05-15	Document: FDIS 19880-3	Project: WG 20

MB/ NC[1]	Line number	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment[2]	Comments	Proposed change	Observations of the secretariat
FR 001				ge	French title " **Carburant d'hydrogène gazeux -- Stations-service -- Partie 3: Vannes** " is not good	French title should be : **Carburant d'hydrogène gazeux – Stations de recharge -- Partie 3: Vannes**	
US 01 002		03.03		ed	Definition is confusing and not correct.	*Replace the definition:* Relative measure of a valve (or device) for efficiency at allowing flow at a given pressure drop.	
US 02 003		03.04		ed	Use definition in 19880-1		
JP 004		03.04	dispenser	ed	Suggest using the same wording as used in ISO 19880-1 for clarity and consistency.	system downstream of the hydrogen supply system comprising all equipment necessary to carry out the vehicle fueling operation, through which the compressed hydrogen is supplied to the vehicle	
JP 005		03.05	hydrogen service level	ed	Suggest using the same wording as used in ISO 19880-1 for clarity and consistency.	pressure level in MPa used to characterize the hydrogen service of the dispenser based on the NWP rating of the vehicle. Note 1 to entry: The numerical value of HSL also matches the number after the “H” in Pressure Class.	
JP 006		03.06	maximum allowable working pressure	ed	Suggest using the same wording as used in ISO 19880-1 for clarity and consistency.	maximum pressure permissible in a system at the temperature specified for the pressure. Note 1 to entry: The maximum allowable working pressure may also be defined as the design pressure, the maximum allowable operating pressure, the maximum permissible working pressure, or the maximum allowable pressure for the rating of pressure vessels and	

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						equipment manufactured in accordance with national pressure vessel codes. Note 2 to entry: See Annex E for discussion of pressure terminology and its application to dispenser system and filling stations, in general.	
US 03 007		03.06	Note 1	ed	A designer is told what the system MAWP is to be and selects components appropriately.	~~The MAWP of a pressure system cannot be greater than the lowest component pressure rating in the system.~~ Following guidance in ISO 19880-1, ~~the~~ individual component pressure ratings are equal to or greater than the MAWP of the system.	
US 04 008		03.08.3		ed	The name “flow control valve” is somewhat confusing in system design because the can also be pressure control valves (PCVs), temperature control valves (TCVs), etc. that can use this type of valve. A flow control does not necessarily require a pressure regulator to be upstream.	~~Flow~~ Process Control Valve a gas flow restricting device~~, installed downstream of a pressure regulator,~~ which performs process control such as flow, pressure, or temperature control ~~controls gas flow~~	
US 05 009		03.08.4		ed	Inaccurate	*Replace the definition:* A device, similar to a quick disconnect valve, installed as part of the fueling assembly that separates when exposed to an excessive axial load and stops flow from the dispensing. ~~which is installed on a dispensing hose and designed to separate when a given pull force is~~ ~~applied in order to cut off the flow of hydrogen to prevent gas leakage and protect the dispenser from damage from vehicles driving away~~	
JP 010		03.08.4	hose breakaway device	ed	Suggest using the same wording as used in ISO 19880-1 for clarity and consistency.	device on the fueling hose that disconnects the hose when a tension limit is exceeded and blocks the flow from the dispenser (for example if the vehicle moves	

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						away with the fuelling hose connected)	
US 06 011		03.08.6		ed	Rupture is more appropriate as it deals with structural damage and leakage from an opening.	pressure activated valve that opens at a specified set point to protect the system from rupture and recloses when the pressure falls below the set point	
JP 012		03.08.6	pressure safety valve	ed	Suggest using the same wording as used in ISO 19880-1 (clause 3.53) for the underlined parts for clarity and consistency. pressure activated valve that opens at a specified set point to protect the system from burst and recloses when the pressure falls below the set point	pressure activated valve that opens at specified set point to protect a system from rupture and re-closes when the pressure falls below the set point.	
US 07 013		03.08.7		ed	It doesn't matter if the actuator is electric, pneumatic or hydraulic. What matters is it can be actuated without having to have physical contact with the valve.	on/off valve for controlling the flow of gas, which is pneumatically, hydraulically or electrically actuated	
US 08 014		04	All	ge	It is very difficult to understand the organization of this document. Section 4 has some general requirements and then there is Clauses 13 and 14 that seem out-of-place relative to the subjects of the other clauses.	*Move the pp1 and pp2 of 4.1 to a new section after 4.3. Title the section as follows:* **4.4 Design Verification** *Also, move Clauses 13 and 14 to Clause 4.*	
US 09 015		04.03	1st pp	te	What about copper alloys?	Resistance to chloride stress corrosion ~~cracking~~ shall be taken under consideration if selecting stainless steel ~~materials~~ alloys. Resistance to season cracking shall be taken under consideration if selecting coper alloys materials. Resistance to sustained load cracking shall be taken under consideration if selecting aluminum ~~materials~~ alloys.	
US 10 016		04.03	2	Te	No requirements or tests are specified for hydrogen compatibility.	After pp2 add the following: The selection of materials, particularly the choice of steels resistant to hydrogen embrittlement, shall be	

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						based on industry-accepted standards such as ISO/TR 15916, ISO 11114-1, ISO 16573, CSA CHMC1, and SAE 2579.	
US 11 017		04.03	7th pp	ed	Should also consider permeation and explosive decompression.	- Hydrogen permeation rates - The effect of rapid decompression on the material and component design	
US 12 018		04.04	All	te	Missing requirements for quality control.	*Add the following as 2nd sentence:* The manufacturer's quality system shall be in accordance with an industry-accepted quality standard such as the ISO 9000 series.	
US 13 019		04.04	All	ed	Appears to try to address Routine Testing but is mixed into quality systems requirements. Suggest opening a new clause. The hydraulic proof test at 150% component rating meets ISO 15649 (ASME) and exceeds 1.43 x rating of PED. Either hydraulic or pneumatic proof tests satisfy both the pressure and leakage requirements.	*Put Routine Tests in a separate section (or at least a second pp). Define a new subclause after Clause 4.4:* **Clause 4.5 Routine Production Tests** Routine production tests shall be defined and conducted to ensure that valves conform to requirements set forth in this document. *Follow with the last 2 sentences currently in 4.4 with the following modifications:* As part of meeting this requirement, the following routine tests shall be performed: 1) A hydraulic proof test as defined in 5.6 shall be conducted with valve open (to test the pressure-bearing shell). 2) A hydraulic or pneumatic pressurized leak test shall be conducted at a minimum of 110% of the component pressure rating with the valve closed. After hydraulic proof testing, all contaminants shall be flushed/removed from the valve and the valve shall be thoroughly dried after testing is performed. Additional gas leak tests shall be performed if required to satisfy the manufacturer's quality plan or risk assessment.	
US 14 020		05.01	2nd pp	ed	There is no way a valve manufacturer can be held accountable on how their product is used. The best that can be hoped is the product is tested at the 19880-1 extremes and that those extremes are	~~Any component to be installed downstream of the precool system shall be subject to a cold gas in warm valve test.~~	

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					adequate.	<u>All components are to be tested at the temperatures stipulated in 5.2.2.4.</u>	
JP 021		05.02.3		ed	20 in the parentheses shall be placed before the opening parenthesis for consistency.	--- conducted at 20°C (± 5°C)	
US 15 022		05.02.3 and 5.2.4		ed	What is the purpose of these clauses? Many cf the clauses already specify temperatures and tolerances, but others such as 5.6 do not. If a temperature is not specified in another clause, do we use 5.2.3 or 5.2.4? This is not clear.	Consider deleting these sections and include specific temperatures to be tested as part of specific test description. An alternative possibility is to use these sections to define tolerances for each temperature level which may make the reading of the test plans easier.	
CA 023		05.03		te	Clause 5.3 (Hydrogen gas pressure cycle test) which is referenced often in subsequent sections for different valves, does not define what a cycle is. It mentions that the outlet is sealed but it does not say if the valve is to remain open or closed in the static condition while the pressure is applied. Alternatively, it does not mention if the valve should in fact be opened and closed as part of the cycling procedure – the latter makes the most sense. As presently written, a test lab cannot conduct the test without a massive amount of interpretation/guessing and it is certain that each lab will have its own opinion on how to conduct the test.	Proposed change is a function of the WG intent for this test. Is the component to remain open or closed in the static position and then pressure cycled, or is the component to be subjected to open/close cycling against a pressure differential?	

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US 16 024		05.03.1	PP3	ed	16 000 cycles should be a minimum value. A component supplier should have freedom to require less maintenance.	A valve shall withstand 102 000 hydrogen gas pressure cycles without damage or leakage. The replacement of valve seals shall be acceptable at intervals of no less than 16 000 cycles. Prior to conducting this test, the valve shall comply with 5.4 at room temperature only.	
JP 025		05.03.2	Para 1	ed	Suggest inserting the following sentence after the 1st sentence for clarity. "The valve shall be in the open position unless otherwise provided in the clause applicable to a specific valve to be tested."	The outlet of the valve shall be plugged and the inlet shall be attached to hydrogen pressure supply. The valve shall be in the open position unless otherwise provided in the clause applicable to a specific valve to be tested. Cycling shall be between less than 5 % of the component pressure rating and the component pressure rating (+3 %, −0 %) within a period of not less than 6 s (10 cycles per minute). 100 000 cycles shall - - - -	
US 17 026		05.04.1	1st pp	te	The test should be conducted with pure hydrogen.	Prior to conditioning, purge the valve with nitrogen and then hydrogen, pressurize on hydrogen and seal at approximately 30 % of component pressure rating.	
US 18 027		05.04.2	2	te	Test pressure is typically a multiple of the Design Pressure; see ASME B31.3, ASME B31.12, ISO 15649, and PED. And, pneumatic leakage tests are performed at 110% of the design pressure (that is, Component Pressure Rating).	The test pressure shall be at least ~~100 %~~ 110 % of the component pressure ~~rating~~.	
JP 028		05.05	Para 3	ed	Suggest inserting the following sentence after the 1st sentence for clarity. "Follow the test method of the hydrogen gas cycle test for the valve."	The inlet of the valve shall be connected to a source capable of supplying the necessary test pressure with the outlet closed. Follow the test method of the hydrogen gas cycle test for the valve. Cycling shall be between 5 % or less of 110 % of the component pressure rating and at least - - - - -	

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US 19 029		05.06		te	Temperature condition for the test is not specified.	Add the following after pp1: This test shall be conducted at room temperature (20 ± 5 °C).	
US 20 030		05.07		ed	Suggest changing the title to be more technically meaningful.	Ultimate strength (hydraulic) test.	
US 21 031		05.07.1	2	te	Test pressure of 2.4x (while technically correct) assumes favourable conditions such as tension-tension (R=0) load cycling and designs free of stress risers (notches, for example). ISO 15649 (B31.3) requires at least 3-times ultimate.	Valves shall be capable of withstanding without rupture the test pressure of ~~2,4~~ 3 times the component pressure rating or alternatively to at least 2,4 times the component pressure rating if use of the lower test pressure is justified by a detailed design including consideration of hydrogen material compatibility and cycle fatigue.	
JP 032		06.01	Table 2	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 033		06.02	last line	ed	6.3 and 6.7 must be 6.3 to 6.7 as it is required to pass these tests as a series of tests. In Clause 9 onwards to is used.	6.3 to 6.7	
US 22 034		06.04	3rd pp	ed	Use proper SI units (Nml/h)	Change units to Nml/h.	
JP 035		06.10	Title	ed	Delete synthetic from Non-metallic synthetic material. Ensure to reflect the change to the table of contents	Non-metallic material	

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JP 036		07.02.11	Title	ed	Delete synthetic from Non-metallic synthetic material test. Ensure to reflect the change to the table of contents.	Non-metallic material test	
JP 037		07.02.2	Table 3	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 038		07.02.3	2nd Paragraph	ed	Replace and with to.	7.2.4 to 7.2.8	
US 23 039		08.01		te	What about hydraulically actuated valves? Power draw may prohibit intrinsically safe.	Add “hydraulically-activated valves” to the list. *Change final sentence as follows:*<br ~~Electrically actuated~~ Actuators for valves shall ~~also~~ meet ~~the requirements of “intrinsically safe” as defined in~~ IEC 60079-0 using applicable parts of IEC 60079 and, if such parts are not protected according to the requirements in IEC 60079, ISO/IEC 80079.	
US 24 040		08.01		te	What is role of actuator during the test? Can actuators be replaced without retest?	Specify if production bill-of-material actuators need to be installed for the tests and, if so, what tests need to repeated if actuators are replaced.	
JP 041		08.02.1	Table 4	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 042		08.02.2	2nd Paragraph	ed	Replace and with to.	8.2.3 to 8.2.6	
JP 043		08.02.6	Title	ed	Add test to the name of the test. Ensure to reflect the change to the table of contents.	Hydrostatic strength test	
JP 044		08.02.7	Title	ed	Add tests to the name of the test. Ensure to reflect the change to the table of contents.	Excess torque resistance test	

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JP 045		08.02.8	Title	ed	Add test to the name of the test. Ensure to reflect the change to the table of contents	Bending moment test	
JP 046		08.02.9	Title	ed	Add test to the name of the test and delete synthetic. Ensure to reflect the change to the table of contents.	Non-metallic material test	
JP 047		09.02.1	Table 5	ed	Delete synthetic from Non-metallic synthetic material	Non-metallic material	
US 25 048		09.02.13		ed	Need figure showing how the force is applied.	Define a picture showing how the force is applied.	
JP 049		09.02.13.2	Paragraph 2	ed	Delete under bar from the degree mark after 180.	180°	
JP 050		09.02.9	Title	ed	Delete synthetic. Ensure to reflect the change to the table of contents.	Non-metallic material test	
JP 051		10.02.1	Table 7	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 052		10.02.10	Title	ed	Delete synthetic. Ensure to reflect the change to the table of contents.	Non-metallic material test	
JP 053		10.02.13	Title	ed	Add test to the name of the test. Ensure to reflect the change to the table of contents.	Excess torque operation test	

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JP 054		11.01	Table 8	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 055		11.03.1	Title	ed	Add test to the name of the test. Ensure to reflect the change to the table of contents.	External leakage <u>test</u>	
US 27 056		11.06	2nd & 3rd pp	te	Where does the 2.4 times maximum back pressure come from?	Align with the pressure test level specified in 5.7.	
JP 057		11.09	Title	ed	Delete synthetic from the name of the test. Ensure to reflect the change to the table of contents.	Non-metallic material test	
US 26 058		11.x		ed	<u>CGA and NFPA have determined that PSV's with lift handles should not be used.</u>	*Add a note:* <u>The hazard associated with using a lift handle is much greater than the inconvenience of removing the valve for inspection.</u>	
US 29 059		12		te	What is role of actuator during the test? Can actuators be replaced without retest?	Specify if production bill-of-material actuators need to be installed for the tests and, if so, what tests need to repeated if actuators are replaced.	
US 28 060		12	All	te	Clarify which type(s) of operators are included / excluded from this section.	*Add the following:* This clause addresses shut-off valves with the following actuators: • Electric • Pneumatic • Hydraulic	
US 30 061		12.01	All	te	The classes are confusing and could lead to inadequate testing of critical valves. For example, is the valve that controls the flow of hydrogen from a dispenser Class A because it is cycled as a normal part of operation or Class B because it shuts off the flow of hydrogen to the vehicle?	Delete 12.1.	

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					And, shutting of the gas flow is typically a safety function. Therefore, “Class B” valves should have to meet a higher standard not a lower one as required in 12.3.2.1. And, introducing arbitrary classifications of shut-off valves that are not used anywhere else in the piping industry is unnecessary and confusing.		
US 31 062		12.02	3	te	“Intrinsically safe” is just one of many different specific types of protection for electrical equipment in hazardous (classified) areas – see IEC 60079-11. There are other types of protection that are just as appropriate, ex. non-incendive (IEC 60079-15), flame proof (IEC 60079-1), etc. Should not limit to just one protection technique. IEC 60079-0 is the base standard for electrical equipment for explosive atmospheres and includes references to the potential protection techniques including “intrinsically safe” and all the others techniques. Simply requiring compliance with IEC 60079-0 is both necessary and sufficient.	*Revise to read:* In addition to the requirements of this document, ~~electrically actuated~~ valve~~s~~ actuators shall also meet the requirements of ~~“intrinsically safe” as defined in~~ IEC 60079-0 using applicable parts of IEC 60079 and, if such parts are not protected according to the requirements in IEC 60079, ISO/IEC 80079.	
US 32 063		12.02	3	te	Missing electrical safety requirements for valves with hazardous voltage.	Add: Shut-off valves with hazardous voltage shall comply with IEC 60204-1.	
JP 064		12.03.1	Table 9	ed	Delete synthetic from Non-metallic synthetic material.	Non-metallic material	
JP 065		12.03.10	Title	ed	Delete synthetic from the name of the test. Ensure to reflect the change to the table of contents.	Non-metallic material test	
US 33 066		12.03.2.1	All	Te	Shutting of the gas flow is typically a safety function. Therefore, “Class B” valves should have to meet a higher standard not a lower one as required in 12.3.2.1.	~~A Class A~~ Shut-off valve~~s~~ shall withstand 102 000 hydrogen gas pressure cycles without damage or leakage. The replacement of valve seals shall be acceptable at intervals of 16 000 cycles. ~~A Class B valve shall withstand 100 cycles of opening and closing at room temperature.~~	
US 34		12.03.2.2	4	te	Shutting of the gas flow is typically a safety	~~The Class A~~ Shut-off valve~~s~~ shall comply with	

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067					function. Therefore, “Class B” valves should have to meet a higher standard not a lower one as required in 12.3.2.1.	12.3.3 to 12.3.7 upon completion of the 102 000 cycles.	
US 35 068		13.01	1	te	Recommend that valve marking include an indication that the valve is suitable for use with hydrogen. This would be very helpful for equipment and systems designer and integrators who need to get approval from local authorities having jurisdiction (AHJs) and for the AHJs themselves who have to be responsible to their communities for determining whether or not a particular piece of equipment or system is safe.	The valves shall include the following information as required: — manufacturer’s or agent’s name, trademark or symbol; — model designation (part number); — rated pressure; — suitability for hydrogen service or pressure class (H35 or H70, for example).	

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