



ISO/TC 197  
Hydrogen technologies

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Secretariat: SCC (Canada)

**Compiled Comments CD2 19880-3**

Document type: Summary of voting

Date of document: 2015-11-19

Expected action: INFO

Background: Here are the comments that were submitted with the CD2 19880-3 ballot (see N 726 for the ballot results).

Committee URL: <http://isotc.iso.org/livelink/livelink/open/tc197>

## Template for comments and secretariat observations

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MB/NC <sup>1</sup>	Line number (e.g. 17)	Clause/Subclause (e.g. 3.1)	Paragraph/Figure/Table/ (e.g. Table 1)	Type of comment <sup>2</sup>	Comments	Proposed change	Observations of the secretariat
US 1		General			This document should not proceed past the draft stage until it has been attempted in the real world.	The U.S. recommends that the test methods and criteria utilized in this document be verified prior to DIS ballot to:  1) Demonstrate practicality of the tests; and  2) Demonstrate that components proven to be acceptable for hydrogen service can pass the tests.	
US 2	11	Title	Title	ge	-Valves Title does not match content – this document is not intended to be a design specification.	Change to:  "Gaseous hydrogen — Fueling stations — Valve qualification"	
US 3	209	1		ed	Not exclusively 35 or 70 MPa fuelings.	up to 35 MPa or 70 MPa nominal working pressure (NWP) fueling.	
US 4		2		tech	ISO 15649 should be included as a normative reference as it is the primary reference for piping systems in ISO/CD 19880-1.	Add:  <b>ISO 15649, Petroleum and natural gas industries — Piping</b>	
US 5		3.4	Note	Te	The maximum operating pressure is typically below the MAWP. This should be removed from the note.	Note 1 to entry: The maximum allowable working pressure may also be defined as the design pressure, <del>the maximum allowable operating pressure</del> , the maximum permissible working pressure, or the maximum allowable pressure for the rating of pressure vessels and equipment manufactured in accordance with national pressure vessel codes.	

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US 6	323	4.1	1	tech	<p>The purpose is not stated – but should be stated.</p> <p>Additionally, many valves and components have been used successfully by the hydrogen industry and do not need further verification testing to demonstrate compliance.</p> <p>To avoid unnecessary testing and cost, the wording should be modified.</p>	<p>The requirements contained within this standard are <b>not</b> intended <b>to provide performance-based tests to verify capability of valves for high pressure hydrogen service but not to prevent alternative methods to demonstrate acceptable capability.</b> <del>the design and construction of components not specifically prescribed in this standard, provided that such alternative components have been tested or listed to demonstrate equivalency. The materials or</del> <b>Such</b> alternative methods, <b>if used, used in such alternative designs or construction</b> shall be evaluated as to <b>their compliance with ISO 15649 and</b> their ability to yield <b>equivalent acceptable</b> performance and <del>reasonable concepts level</del> of safety to that prescribed by this standard.</p>	

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US 7	334	4.2		Te	Add requirements regarding service temperature range	The valve assembly shall be suitable for use in a temperature range of -40C (-40F) to 85C (185F) or another range may be selected by agreement between the purchaser and the manufacturer.	
US 8	335	4.3		ge	Add service temperature range for materials expected to be selected for hydrogen fueling station use.	Materials shall be suitable for use in accordance with 4.2.	
US 9	346	4.3		ed	Use the adverb	Change “much easier” to “much more easily”.	
US 10	370	4.4		tech	Inclusion of “H”-rating should also be considered for inclusion.	Add the following to list after MAWP: - <b>H-rating for components (as defined in ISO 19880-1)</b>	
US 11	377	4.4	Dash 6	ge	“...the names of parts that require periodic replacement.” A requirement for manufacturers recommended replacement frequency is also needed.	“the names of parts that require periodic replacement and their frequency of replacement.”	
US 12	389	4.5.1		tech	Inclusion of “H”-rating should also be considered for inclusion as it may avoid errors during repair activities.	Modify MAWP item as follows: - <b>MAWP and/or H-rating for components (as defined in ISO 19880-1)</b>	
US 13	401	5		Te	The valves should be required to be fire resistant. Valves can and should not fail when exposed to a fire of the magnitude required for vehicle tanks. A valve that shuts off the main supply of hydrogen to say a dispenser that is on fire should not fail when exposed to the same fire.	Consider adding fire test, external leakage for all valves.  Consider adding fire test internal leakage for selected valves, e.g. shut off valves.	
US 14		5.1.4, 5.3.1, 5.6.2, 6.7, and 11.6	413, 445, 516, 566, and 906	te	“The tests in these requirements shall be conducted at - 40°C and at 85°C. If the manufacturer specifies the temperature range for use, the test temperatures are the minimum and the maximum of the range.”  I presume the - 40°C and 85°C define the smallest test range but this needs to be clearly stated.	“The tests in these requirements shall be conducted at - 40°C or lower and at 85°C or higher. If the manufacturer specifies the temperature range for use, the test temperatures are the minimum and the maximum of the range.”  A similar change can be made in the four other instances where the minimum and maximum test temperatures are stated.	

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US 15	418	5.1.5		tech	Gas tests <u>used as part of component qualification</u> should be conducted with hydrogen has it is the only gas that allows accurate evaluation of permeation/leakage.  Note: For production, alternative gases approved by the manufacturer are acceptable -- but these should be handled by item e without change.	a) Hydrogen <b>or helium</b> for leak tests, b) Hydrogen <b>or helium</b> for permeation,	
US 16		5.2 through 5.7 <i>and</i> 6 through 12		tech	In order to ensure that degradation of basic safety functions does not occur during the normal design life of a valve, leak tests (currently in 5.3) and the ultimate strength test (currently in 5.2) should follow the pressure cycling (currently in 5.6) as well as specific operating cycle tests (where applicable in 6).	In Section 5 and Sections 6-12, re-order the tests such that pressure cycling and operating cycling tests are performed first and then followed by the leak tests and ultimate strength test.  Tests (that are not subject to the normal design life sequence discussed above) can follow.	
US 17	425	5.2.1		tech	The 4 x MAWP test pressure is significantly higher than the minimum acceptable values in ISO 15649 <u>for high pressure systems</u> .	Review and establish an appropriate value for code compliance.  U.S. recommends 3 X MAWP for consistency with ISO 15649.	
US 18	441	5.3.1		ed	Specify test gas with hydrogen being recommended for 85C testing.	Test gas shall be hydrogen.	
US 19	460	5.3.3		ed	Clarify that there are two tests being conducted for internal leakage, one at high pressure and one at low pressure.  Use a comma for decimals per IEC convention.	The pressure for the high pressure test shall be 100% of MAWP, and the pressure for the low pressure test shall be 2,5% of the MAWP.	
US 20	463 466a)	5.3.3		ed	..add pipe	...fittings <b>or pipe</b> shall be capable....	
US 21	497	5.5	Table 1	Te	This is a wimpy test. The applied forces are equivalent to only about 20% of the yield strength of the tubing. The valve should not leak even when subjected to loads high enough to bend the tubing.	Increase the forces in Table 1 to five times the current values. Possibly make the applied force a function of the valve material.	

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CN	500	5.5	Fig.1	ge	It was written in the text “apply a force according to Table 1, at 300 mm from the inlet”, so that in the figure.1, the direction of the force should be shown; Meanwhile, there were two points signed 1 and 2 in Figure 1, however, there is no explanation about the points.		
US 22	511	5.6.2		T	The valve pressure cycle should use the valve in question for the cycle testing when appropriate. Further, for some types of valves, the outlet must be used to allow the pressure to be relieved.	The outlet of the valve shall be attached to either an outlet that can accept the relieved gas in the case of an actuated valve, or a block valve that is connected to an appropriate outlet, and the inlet shall be attached to hydrogen pressure supply.	
US 23		5.7.1		Ed	Fix grammar as shown	<b>5.7.1 General</b> <b>A</b> non-metallic synthetic material in contact with high pressure hydrogen gas expands when the pressure of hydrogen decrease <u>s</u> in a short time from a high level. When the pressure is reduced rapidly, <u>blisters</u> <b>may can</b> occur in the material. To evaluate the effects of expansion and blisters <u>s</u> , non-metallic synthetic material <u>s</u> shall be tested according to the following procedure.	
US 24	544	6.3		ed	5.3.2 is for External Leakage Test not 5.3.1	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct 5.3.1 to 5.3.2.	
US 25	550	6.4		ed	110% instead of 100% and 10%	The pressure for the high pressure test shall be 100% of MAWP, and the pressure for the low pressure test shall be 10% of the MAWP.	

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US 26	559	6.7		ed	5.3.3 is for Internal Leakage not 5.3.2.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct 5.3.2 to 5.3.3.	
US 27	563	6.7		ed	Add pressure	Cycling shall be between <b>a pressure</b> less than 5% of the MAWP and the MAWP.....	
US 28	597	7.2	Table 4	ed	External leakage should be 5.3.2 and Internal Leakage should be 5.3.3.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct External and Internal Leakage references 5.3.1 and 5.3.2 to 5.3.2 and 5.3.3.	
US 29	603	7.2.3		ed	Correct 5.3.1 to 5.3.2	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 30	605	7.2.4		ed	Correct 5.3.2 to 5.3.3	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct reference 5.3.2 to 5.3.3.	
US 31	618	7.2.9		ed	Reference 8.2.10 does not exist.	Correct 8.2.10 reference.	
US 32	637	7.2.11		ed	Reference 8.2.7 is not an operations test.	Should be 7.2.10.	
US 33	646 651	8 8.2.3	Table 5	ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	

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US 34	668	9	Table 6	ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.  If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 35	668	9.2.1	Table 6	te	Document is not ready to be a DIS. The tabular presentation of "General Test Requirement" and "Specific Test Requirement" is very confusing. For example, Table 6 indicates that an external leakage test must be performed to clause 5.3.1 and this is a specific test requirement. However, clause 5.3.1 is a general test requirement.	Document needs substantive technical review for internal technical consistency. The phrases "General Test Requirement" and "Specific Test Requirement" need to be defined.	
US 36	732	9.2.6.1		T	Not all break away connectors will be used in outdoor, refrigerated H2 service, so not all will need to accept the -40C gas under ambient conditions.	Add a similar test that does not require -40C gas, and allow for appropriate marking on the valve.  "...with additional 1 000 cycles at - 40 °C <b>or as otherwise specified in 4.2</b> and 1 000 cycles at 65 °C.	
US 37	698	9.2.3		ed	Leakage rate needs a time 10 ml/h. Also correct units in line 713 and elsewhere.	Correct leak rate to 10 <b>ml (normal)/h</b> .	
CN	698	9.2.3		Ed, te	"10 cm <sup>3</sup> (normal)" should be "10 cm <sup>3</sup> (normal)/h";  What is the reason that the requirement for this device is higher than others (20 cm <sup>3</sup> (normal) /h)?	10 cm <sup>3</sup> (normal)/h	
CN	753	9.2.7		te	The maximum pull force of 667 N but not less than 222 N is different with the required value in ISO/DTR 19880-1 as mentioned in 8.13.1 (" a maximum force of 1000N but not less than 220 N" ) .		
US 38	802	9.2.8		ed	Ref. 10.2.7 is not a Separation test.	Correct reference to 9.2.7	
US 39	852	10	Table 8	ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted.	

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					Internal leakage should be 5.3.3 instead of 5.3.2	If earlier comment not accepted, correct references 5.3.1 and 5.3.2 to 5.3.2 and 5.3.3.	
US 40	857	10		ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 41	859	10		ed	Internal leakage should be 5.3.3 instead of 5.3.2	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.2 to 5.3.3.	
US 42	885	11	Table 9	ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 43	892	11.3		ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 44	953	12.3	Table 2	ed	External leakage should be 5.3.2 and Internal Leakage should be 5.3.3.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct External and Internal Leakage references 5.3.1 and 5.3.2 to 5.3.2 and 5.3.3.	
US 45	958	12.3.3		ed	External leakage should be 5.3.2 instead of 5.3.1.	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.1 to 5.3.2.	
US 46	959	12.3.4		ed	Internal leakage should be 5.3.3 instead of 5.3.2	Correct cross references throughout document if earlier U.S. comment to reorder tests is accepted. If earlier comment not accepted, correct reference 5.3.2 to 5.3.3.	

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