



ISO/TC 197
Hydrogen technologies

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WG18 Treated CD 19882 Comments 2016-08

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Background: Here is the compilation of comments from the CD 19882 ballot and their treatment by WG 18.

This information was previously sent to the WG 18 experts as document N 8.

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

Comments form

Date: 2016-07-09

Document: **CD 19882**

Project: WG 18

	Org	Clause (ex. 3.1)	Paragraph/ Figure/ Table/ (ex. Table 1)	Type of comments	Comments	Proposed changes	TC decision
1.	FR			ge	For a complete type approval, 38 specimens are needed. The type approval is complex and expensive.	This ISO project shall be informative instead of normative.	Reject – 35 specimens are required; this project has been mandated as a normative document; the tests are harmonized with the UN GR 13 requirements and therefore the testing is not more onerous than the regulation.
2.	FR	1 Scope 1.1 General	4	ed/te	The use of “reasonable concepts of safety” is not appropriate in an ISO standard.	Improve language	Accept – clause deleted.
3.	CA	5.3.2		ge	The combined requirements of 5.2 (ISO 9001 registration) and 5.3.1 (independent review) are more than adequate. The annual system audit of 5.3.1 adds effort and expense for no foreseeable quality, safety or reliability benefit.	Delete 5.3.1 entirely	Reject – PRD serves a critical safety function and as such this requirement should be retained.
4.	FR	6.1		te	ISO 11114-1 and ISO 11114-2 shall be mentioned as well as ISO 11114-4 if tests are needed.	Incorporate those standards within the section 6.1.	Accept
5.	US	6.1	Paragraph 3	ge	“Materials shall be sufficiently resistant to the chemical and physical action of the fluids.... “It is unclear as to what fluids this phrase is referring. Is it hydrogen or fluids from the controlled temperature oven or bath stated in 7.3.2?	Clarify the phrasing. I cannot provide a suggestion as I am unclear as to the intent of the current phrasing.	Reject – phrasing suggests hydrogen.
6.	CA	6.1	7 th line	te	The reference to electrical properties is not relevant to any requirements in the standard. Presumably, the reference is somehow connected to ESD (electrostatic discharge). However, the only references to ESD are vague and in the non-binding appendices	Remove reference to electrical conductivity	Accept

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7.	JP	7.2.2		te	<p>The same comments as WG18 in October 2015. There ara some parts which still need changing. <u>Pressure cycling / Procedure</u> The condition of pressures shall meet 7.1 General. <u>7.1 General</u> Pressures 2 MPa or less: +0 / -1 MPa</p>	<p>The sentences shall be changed as below. 'followed by 2 240 pressure cycles from not greater than 2 MPa to not less than 125 percent of the manufacturer's specified nominal working pressure,' ' followed by 10 000 pressure cycles at a sample temperature not less than 20 °C from not greater than 2 MPa to not less than 125 percent of the manufacturer's specified nominal working pressure,' 'followed by a final 2 750 pressure cycles at a sample temperature not more than -40 °C from not greater than 2 MPa to not less than 80 percent of the manufacturer's specified nominal working pressure.'</p>	Accept
8.	CA	7.3.3	1	te	<p>Clause 7.3 has circular requirements. They may be workable and/or necessary for eutectic type PRD's. They are not workable for thermobulb PRD's and are likely unworkable for shape memory alloy type PRD's. Clause 7.3 .2 specifies a test-temperature variation of $\pm 1^\circ\text{C}$. Thus, per 7.3.3 (sentence1) all 3 samples must trigger in <10 hours when exposed to $T_f - 1^\circ\text{C}$. So, T_f is not actually the manufacturers specified value; instead, $T_{f(\text{max})}$ is $\leq T_f - 1^\circ\text{C}$. Per the 2nd sentence in 7.3.3, all 5 PRD's exposed to T_L must NOT trigger during 500 hours. Thus, $T_{f(\text{min})}$ is $> T_L + 1^\circ\text{C}$. Combining those, $T_L + 1^\circ\text{C} \leq T_f \leq T_f - 1^\circ\text{C}$. That equation cannot be solved. For $T_f = 110^\circ\text{C}$, the equation becomes (using $T_L = 9.1 \bullet T_f^{0.503}$)</p>	<p>Proposal 1: add a sentence specifically excluding thermobulb type PRD's from this clause. Proposal 2: require thermobulb PRD's to trigger at their actual specified $T_f \pm 5^\circ\text{C}$ in a much shorter amount of time than 10 hours (amount TBD). That is. none must trigger at $T_f - 5^\circ\text{C}$ and all must trigger at $T_f + 5^\circ\text{C}$.</p>	Accept Proposal 1

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				97.80 °C ≤ 110°C ≤ 109°C. A "perfect" 110°C thermobulb triggering in the middle of that range would have $T_f = 103.4 \pm 5.6^\circ\text{C}$. BUT: $103.4 \pm 5.6^\circ\text{C} \neq 110^\circ\text{C}$.		
9.	JP	7.4.2	te	The same comments as WG18 in October 2015. There are some parts which still need changing. <u>Thermal cycling / Procedure</u> The conditions of temperatures and pressures shall meet the UN GTR.	The sentences shall be changed as below. 'a) Place an unpressurized pressure relief device in a liquid bath maintained at -40 °C or lower for a period of two hours or more. Transfer to a liquid bath maintained at 85 °C or higher within five minutes.' 'b) Maintain the unpressurized pressure relief device in a liquid bath maintained at 85 °C or higher for a period of two hours or more. Transfer to a liquid bath maintained at -40 °C or lower within five minutes.' 'd) d) With the pressure relief device conditioned for a minimum of two hours in the -40 °C or lower liquid bath, ... The liquid bath shall be maintained at -40 °C or lower during this test.'	Accept
10.	JP	7.4.3	te	The same comments as 7.4.2.	The sentence shall be changed as below. 'the pressure relief device shall meet the requirements of Clause 7.10 except that the test shall be conducted at -40 °C or lower , Clauses 7.11 and 7.12.'	Accept
11.	CA	7.5	te	There is no evidence that the extreme time and cost of this test is necessary to determine safety, reliability or function.	Change the corrosion test to the more typical ISO 9227 test, consistent with the requirements of ISO 15500-3 and EC79/2009.	Reject – the present test is an automotive grade corrosion test. See Clause B.1.4 for further explanation.

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12.	US	7.10.3	Paragraph 1	ge	Can references to “appropriate method”s be added?	Add “appropriate method” references.	Accept
13.	CA	7.11.2	4 th paragraph	te	Per 4.3: this standard is meant to apply to 25 MPA to 70 MPA systems. Thus, all activation tests are <u>actually</u> done at 2 MPa; the 25% NWP has no meaning. A 2 MPa pressure is unlikely to ever occur in service. A higher pressure (such as 0.25•NWP) would be more representative. Activation tests at 0.25•NWP might also generate colder temperatures and thus be more insightful about the behavior of eutectic type PRD’s.	Proposal 1: change activation test pressure to 25% of NWP. Proposal 2: change activation test pressure to 6.25 MPA (25% of 25 MPa...the lowest NWP mentioned in this standard). Proposal 3: if this test is meant to catch eutectic PRDs that don’t trigger properly at 2 MPa, have 2MPa tests for eutectic PRD’s and 6.25 MPa tests for thermobulb PRD’s.	Accept Proposal 1
14.	JP	7.11.2		te	The same comments as WG18 in October 2015. There ara some parts which still need changing. <u>Bench top activation / Procedure</u> The pressure condition shall meet the UN GTR.	Unnecessary descriptions shall be deleted as below. 'Pressurize the pressure relief devices that were subject to the tests of Clauses 7.2, 7.4, 7.5, 7.6 and 7.9 to no more than 25 percent of manufacturer's specified nominal working pressure or 2.07 MPa, whichever is less and test under the same conditions.'	Accept
15.	JP	7.11.3		te	The same comments as 7.11.2.	Unnecessary descriptions shall be deleted as below. ' and subjected to no more than 25 percent of manufacturer's specified nominal working pressure or 2.07 MPa, whichever is less. '	Accept
16.	CA	7.12.3		te	Cylinders are emptied by mass flow rate, not PRD variability. Sentence 1 set the ratio of maximum and minimum flow rates at ≤1.11:1 (i.e. 100% ÷ 90%). That is an allowable variation of ±5.4% (i.e. $1.11^{0.5} = 1.054 = \pm 5.4\%$). The standard would better serve the public if it	Proposal 1: delete sentence 1 of 7.12.3. Change sentence 2 to require labelling of mass flow rate as the <u>minimum value</u> out of the 9 measured flow rates. Proposal 2: same as above but labelled mass flow rate to be 105.4% of the minimum of the 9 values, or the average, whichever is lower.	Accept Proposal 1

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					controlled labelling of minimum flow capacity (i.e. minimum mass flow rate).		
17.	CA	9			This clause is focused on eutectic PRD's... which are prone to thermal variability and high pressure creep. It should not be applied to thermobulb PRD's. Their production process effectively ensures that each thermobulb has the correct activation temperature and the bulb is not prone to creep.	Proposal 1: add a note that this clause does not apply to thermobulb style PRD's Proposal 2: for thermobulb PRD's instead apply a crush test and an activation temperature test for each bulb batch (i.e. "instant tests" vs time consuming cyclic tests that provide no additional insights or "pass/fail" functions).	Reject – these are highly relevant tests that apply to all PRD designs. Cyclic tests can evaluate the performance of the thermobulb holding mechanism.
18.	US	9.4.2	Section heading	ed	9.4.2 appears twice	Delete one 9.4.2	Accept
19.	US	A.4.3	Sentence 2	ed	"pressure relief device (PRD)" appears twice in the same sentence.	Replace the second "pressure relief device (PRD)" statement with "PRD".	Accept – deleted all (PRD) references.
20.	US	A.4.3.1	Sentence 1	ed	As PRD was already defined, restating pressure relief device" is unnecessary.	Replace "pressure relief device" with PRD	Reject – see comment 19.
21.	US	A.4.3.1	Sentence 4	ge	How should accumulation of electrostatic charge during discharge be mitigated?	Add guidance or a reference.	Accept
22.	US	A.4.3.2	Sentence 1	ed	As PRD was already defined, restating pressure relief device" is unnecessary.	Replace "pressure relief device" with PRD	Reject – see comment 19.

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