Report of voting on ISO/DIS 15869-4

Compilation of comments

Date:2004-04-19	**ISO/TC 197 N 298 Annex B**
	Reference document: ISO_DIS_15869-4

1	2	(3)	4	5	(6)	(7)
MB[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/ Table/ Note** (e.g. Table 1)	**Type of comment**[2]	Comment (justification for change) by the MB	Proposed change by the MB	**Secretariat observations** on each comment submitted
DE			ge	Germany agrees with this draft international standard. However, this standard requires for its application the existence of ISO 15869-1, to the draft thereof we object. Therefore it is recommended to consider forwarding of processing this draft only after amendment of ISO/DIS 15869-1.		
FR			ge	We consider that this document shall cover not only tanks on vehicles but complete high pressure hydrogen system. With components as valves, pressure relief devices, connecting devices .. The EIHP document is considering that this way (here above) should be followed.		
**	General		ed	As specific clauses of norm refs are cited in text, these are correctly given as dated refs in clause 2 but are not always correctly cited as dated refs in text. See ISO/IEC DIrectives Part 2, 2001, 6.6.7.5.3.	Please use correct format for citing dated refs. in text. For this purpose, the year of publication of the various parts of ISO 15869 can be given as 2004.	
SE	General		ge	The DIS varies from the harmonised technical requirements agreed at the joint GRPE/ISO meetings in 2002 & 2003 in a number of aspects and without discussion in the appropriate TC197 working group. A joint GRPE/ISO meeting to be held to discuss the variations.		
SE	General		te	At the joint GRPE/ISO meetings in 2002 & 2003 the term nominal working pressure was agreed as a more accurate description than working pressure together with representatives from SAE. The use of “nominal” was intended to clarify that it does not represent the maximum in service pressure experienced by a component and to avoid misinterpretation used in other key standards. Pressure definitions must be standardised and acceptable.	Change “working pressure” to “nominal working pressure”	
FR	Scope		ge	We request, as agreed on EIHP draft, that removable cylinder assembly should be also considered in the document. This approach is indeed innovating and interesting in captives fleet	Scope …as fuel for land vehicle with fixed or removable tanks.	

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UK	Title		ED	Spelling mistake	Change “vehicule” to “vehicle”	
US	TITLE		ed	Spelling error	Change vehicule to vehicle	
US	TITLE		ge	Word selection and alignment to other hydrogen documents	Change tanks to containers	
SE	Cover page & heading on Page 1	Main heading	ed	i) Vehicle spelt incorrectly ii) -	i) Change “vehicule” to “vehicle” ii) Change “with metal liner” to “with a metal liner”	
UK	Table 1		TE	see above	Remove references to stress ratios.	
**	2		ed	Pls use correct fixed introductory text to norm refs. See Directives Part 2, 6.2.2.		
UK	2		TE	Need to make reference to Stainless Steel Liners	add suitable reference	
IT	2. Normative references		ed	Editorial mistake: reference to ISO 9809-2:2000 is missing even if that standard is mentioned in several clauses		
UK	5.2		TE	Need to ensure Hydrogen Compatibility	Materials should be comply with ISO 11114-4	
UK	5.3		TE	It is widely acknowledged that aluminium alloys are compatible with hydrogen.	Remove second sentence.	
UK	6		GE/ TE	This standard should be a purely performance based standard, therefore the concept of stress ratios is not appropriate.	Remove references to stress ratios.	
JS	6.1		te	Leakage can occur due to any type of crack not just a fatigue crack	Remove the word fatigue” and rephrase as “… only by the growth of a crack.”	
UK	6.1		TE	The term “feasible” should be quantified. The second sentence is irrelevant. the Note should be removed.	Replace 6.1 with “ This International Standard does not provide design formulae nor list permissible stresses or strains, but requires adequacy of design to be demonstrated by testing to show that the tanks are capable of consistently passing the material, design qualification, production and batch tests specified in this International Standard”.	

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FR	6.3		te	We do recommend that the value of burst pressure to working pressure made on type agreement should be confirmed by test made on batch test. This should be done to keep an homogeneity of performance.	The metal tank shall have a minimum actual burst pressure of 2.25 time working pressure, at time of type approval. For batch the actual burst pressure shall be ≥ to the minimum value obtained at time of type approval.	
UK	6.3		TE	This is a performance based standard, so the burst test is sufficient	Change Heading to “Burst Pressure” Remove all references to “Stress Ratios” Finish sentence after “Table 1.”	
US	6.3	Table 1	Te	Reduce stress ratio requirements. The proposed values are incorporated in ANSI/CSA NGV2 and in use for over 10 years, and have proven safe in service. CNG service in the US has been with a 21C reference temperature. The specific stress ratios and reference temperature for hydrogen were discussed in the U.S. NGV2/HGV2 is now using these stress ratio values for hydrogen service with a 15C reference temperature. Note that the pressure increase vs. temperature for hydrogen is lower than that for natural gas, for which the higher stress ratios were developed. Also note that the minimum burst pressure would drop accordingly. The 2.25 minimum burst ratio is currently allowed in ISO 15869-2. Similar changes to stress ratio requirements need to be made to ISO 15869-3 and ISO 15869-5	Change the stress ratio for glass fiber from 3.65 to 3.5. Change the stress ratio for aramid fiber from 3.10 to 3.0. Change the stress ratio for carbon fiber from 2.35 to 2.25. Change the minimum burst pressure for glass fiber tanks from 3.5 to 3.4. Change the minimum burst pressure for aramid fiber tanks from 3.0 to 2.9. Change the minimum burst pressure for carbon fiber tanks from 2.35 to 2.25. Note: similar changes need to be made to ISO 15869-3 and ISO 15869-5.	
UK	6.3 continued		TE	See above	Remove b) c) d) e) f) g)	
UK	6.4		TE	This should not be necessary in a performance based standard.	Remove	
UK	6.5		TE	More information is required on this concept.	Remove	
US	6.5		te	It is stated that “the tank manufacturer shall specify the maximum defect size at any location in the tank.” It is not specified how this is to be determined.	The specific requirements for the maximum defect size must be specified in the standard or a method must be specified to determine the defect size.	

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UK	7.5		TE	Other resin types are available and should be considered.	Revise	
UK	7.5 2nd para.		TE	Amend wording.	Change to " …aluminium alloy liners shall not adversely affect…"	
UK	7.6		ED	Amend wording	Change to "The auto-frettage pressure shall be within the limits specified. The tank manufacturer shall verify that …"	
US	7.7		te	It is stated that the surface finish must give "adequate" protection and the manufacturer should provide guidance on coating treatment during inspection.. How is this defined?	Define what tests are required to determine that the surface finish is adequate. Define what guidance the manufacturer must specify during inspection.	
UK	7.7 Last para.		TE	Further clarification is required in relation to coatings. The sentence " The coating shall be designed to facilitate subsequent in service inspection" is not understood. It is not always desirable or realisable to remove all coatings.	Revisit	
UK	8		GE	To clarify what prototype testing is required, it would be very helpful to indicate the testing by use of a table.		
SE	8.1		te	The DIS varies from the harmonised technical requirements agreed at the joint GRPE/ISO meetings in 2002 & 2003 by not including prototype tests for: i) Resin: Glass transition temperature ii) Coatings.	Add requirements as appropriate (see proposed changes to ISO15869-1). i) Resin: Glass transition temperature: Three samples shall be tested in accordance with ISO 15869-1, clause C.? and shall meet the requirements therein. ii) Coatings: Where exterior environmental protective coating is used, e.g. organic coating/paint, samples shall be tested as specified in ISO 15869-1, clause C.7 and shall meet the requirements therein.	
US	8.1.2		Te	ISO 11114-4 is referenced for hydrogen compatibility. ISO 11114-4 only applies to steels. Reference to ISO 15869-1 C.22 is technically correct only if the proposed changes to C.22 are accepted.	Hydrogen compatibility shall be demonstrated in accordance with ISO 11114-4:- <u>for steels</u>, using a minimum of 3 samples. <u>Hydrogen compatibility for</u>	

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					other materials shall be demonstrated by equivalent methods or by use of materials know to be resistant to hydrogen embrittlement.	
UK	8.1.2 Last sentence		ED	Amend wording	Change to " The material properties shall meet…"	
UK	8.1.3 Last sentence		TE	This standard should be a purely performance based standard, therefore the concept of stress ratios is not appropriate.	Change to " The tank burst pressure shall exceed minimum specified burst pressure given in Table 1."	
UK	8.1.5		TE	More information is required on this concept.	Remove	
KATS	8.1.11	title	ed	The term of "test" should be added to the title as in other titles.	Extreme temperature pressure cycling test.	
KATS	8.1.12	title	ed	The term of "test" should be added to the title. as in other titles	Rein shear strength test	
SE	8.1.12		te	The DIS varies from the harmonised technical requirements agreed at the joint GRPE/ISO meetings in 2002 & 2003.	Change "One sample coupon…." to "Three sample coupons….."	
UK	9.2 (d)		TE	To what coating is this referring? Clarification is required	Explain more clearly what is equired.	
UK	9.2 Last sentence		TE	This standard should be a purely performance based standard, therefore the concept of stress ratios is not appropriate.	Change to " The tank burst pressure shall exceed minimum specified burst pressure given in Table 1."	
UK	9.2 2nd para.		ED	The term "heat treated witness sample" needs to be defined.	Add definition of clarify what is required.	
UK	9.3		TE	The logic behind a) b) c) and d) is not understood. The	Revisit.	

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				need to have higher requirements for improved consistency is not understood. For large scale production, Statistical Process Control (SPC) methods should be used for process control not this method of increasing performance requirements.		
SE	10	b)	te	The DIS varies from the harmonised technical requirements agreed at the joint GRPE/ISO meetings in 2002 & 2003. Add thread details.	Change to "to verify the critical dimensions, thread details and mass……"	
UK	10 a)		TE	Amend wording.	Change to "…of steel liners in accordance with …" "…defect size is not exceeded."	
UK	10 c)		TE	No requirements are specified for surface finish.	Clarify	
UK	10 e)		TE	Other methods to ensure homogeneity of the batch are available and should be allowed.	Change to "by hardness tests, or equivalent, ….."	
UK	10 2nd para.		TE	Why is it necessary to carry out these test both during manufacture and after completion? It is unnecessary to duplicate these tests.	Change to "Each tank shall be examined after heat treatment as follows:"	
UK	Table A.1		GE	The clarity table should be improved. See table in ISO 11119	Revise	
UK	Table A.1		TE	The affect of changes to more than one parameter is not clear. e.g. what if length and diameter are changed?	Clarify	
SE	Annex A	A.1	te	A change of metallic liner, fibre and resin material is permitted but appears not to require any material tests on the new material.	Add a new column "K" with an "x" in the row for metallic material, fibre material and resin material. Add a new note "K is the material tests described in 8.1.1, 8.1.2, 8.1.2 *[and the tests in comment 5 above for resins and fibres*] as appropriate."	
SE	Annex A	A.1	te	Changes in other factors than the type of pressure relief device may affect performance in the bonfire test.	Change final row "Pressure relief device" to "Fire protection system or pressure relief device or pressure relief device location"	

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US	Annex A	Table A.1	Ed	Clarify note “a”.	a) Only when thickness changes proportional to diameter and/or pressure change, otherwise, qualify as a new design.	