

**HySafe Estimation of the  
Allowable Hydrogen Permeation Rate From Road Vehicles  
(16 June 2009 with check on 9 April 2010, & extra option on 26 May 2010)**

Test Level	Test Conditions		Scenarios (Using GM/JARI Material Data)		
			Large Car 70 MPa	Small Car 70MPa	Minimum Garage
		Free Volume In Facility (m3)	46	31	18
		Hydrogen Storage Volume (L)	249	149	75
		Max H2 Conc (%)	1	1	1
		Natural Ventilation Rate (ach/hr)	0.03	0.03	0.03
		Air Flow Rate Qa (m3/min)	0.023	0.016	0.009
		EoL/MMT	Qp (m3/min)	0.000	0.000
Vehicle	SAE EoL/MMT Per std pax vehicle	Qp (NmL/min)	232	157	91
!?!?!	ISO Option ii) EoL/20C Per vehicle NOT per container as used in ISOTS15869	Qp (NmL/min)	66	45	26
Component	EoL/MMT (55C)	Qp55 (NmL/hr/L)	56.0	63.0	72.7
Component	EC/ISO Opt.i) New @ 20C	Qp20 (NmL/hr/L)	8.0	9.0	10.4
Component	EC/ISO Opt.i) New @ 15C	Qp15 (NmL/hr/L)	6.0	6.7	7.7
Component	CHECK: Calc according ICHS3 paper of EC/ISO Opt.i) New @ 20C	Qp20 (NmL/hr/L)	8.0	9.0	10.4

For abbreviations see ICHS3 paper distributed at the Ottawa SGS meeting

Note:

The values in this row should be reduced by a number equivalent to the number of containers likely to be used; the calculation assumes 1 container.

The ISO requirement should be corrected to the same conditions and specifications as the SAE test.

NEW OPTION

Check calc.