Hydrogen Purity Standard

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Compressed Gas Association

- 150 Members
  - Industrial Gas Companies
  - Equipment Manufacturers
  - Other Gas Industry Associations
  - Other SDOs
- Manufacturers, Fillers, Distributors, and Transporters of Industrial and Medical Gases

Hydrogen Activities

- Committees
  - Hydrogen Fuel Technology
  - Bulk Distribution Equipment
  - Hazardous Materials Codes
  - Gas Specifications
  - Cylinders, Valves & PRD's
- International
  - Europe (EIGA)
  - Japan (JIGA)
  - Asia (AIGA)
  - United Nations

Hydrogen Purity Standard

- Draft hydrogen purity standard for stationary fuel cells and ICE's in 10 months
- Use G-5.3 – 2004 *Commodity Specification for Hydrogen* as a starting point
- Gas Specification Committee
- Multinational gas companies participate
- Committee open to non-member SDOs
- Full Participation
  - Attend meetings
  - Submit comments
  - Participate in comment resolution
  - Voting rights

G-5.3 – 2004 *Commodity Specification for Hydrogen*

- Basis for further supplier/user refinements
- Specifications for gaseous and liquid hydrogen
- Typical uses by grade
- General sampling methods
- General analytical procedures for impurities

CGA G-5.3, Table 1

Table 1—Directory of limiting characteristics
(Units in ppm [v/v] unless otherwise stated)

Quality verification levels							
	Maxima for Type I (gaseous) hydrogen				Maxima for Type II (liquid) hydrogen		
Limiting characteristics	B [1]	D	F [1]	L	A	C	B
Hydrogen min. %	99.95	99.99	99.995	99.999	99.995 [2]	99.999	99.9997 [2]
Argon					1		1
Carbon dioxide	10	0.5		2	1	2	
Carbon monoxide	10	1					
Helium					39		
Nitrogen	400	25	2	2		2	2
Oxygen	10	5	1	1	1	1	1
Para content min. %					95		95
Permanent particulates				[3]	Filtering req See 5.11	[3]	
Total hydrocarbon content (as methane)	10	5	0.5	1	9 [4]	1	
Water Dew point °F °C	34 –60 –51.1	3.5 –91 –68.3	1.5 –101 –73.9	3.5 –91 –68.3		3.5 –91 –68.3	

NOTES

1) If hydrogen is produced by mercury brine cell, then analysis for mercury vapor is required.

2) Can include up to 50 ppm neon plus helium.

3) To be determined between supplier and user.

4) Includes water.

CGA G-5.3, Table 2

Table 2—Typical uses *

Quality Verification Level (QVL) Type I	Typical uses Type I	Quality Verification Level (QVL) Type II	Typical uses Type II
B	General industrial applications	A	Standard industrial, fuel, and propellant applications
D	Fuel, hydrogenation, and water chemistry applications	B	High-purity industrial, fuel, and propellant applications
F	Analytical instrumentation, and propellant applications	C	Semiconductor applications
L	Semiconductor, analytical, and specialty applications		

* Uses defined in this table are not all inclusive.