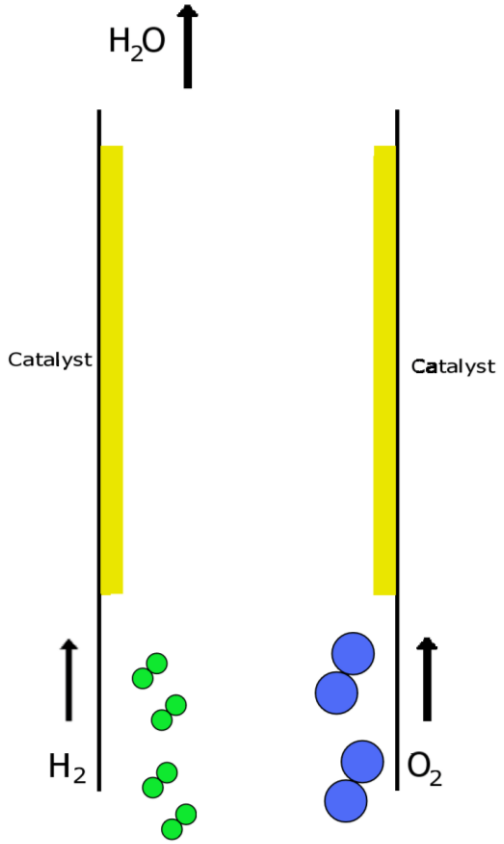
DHC Series - convection type dehydrogenizers

- Eliminate indoor hydrogen leaks
- Zero operation cost (no power required, no consumables)
- UL witness inspection

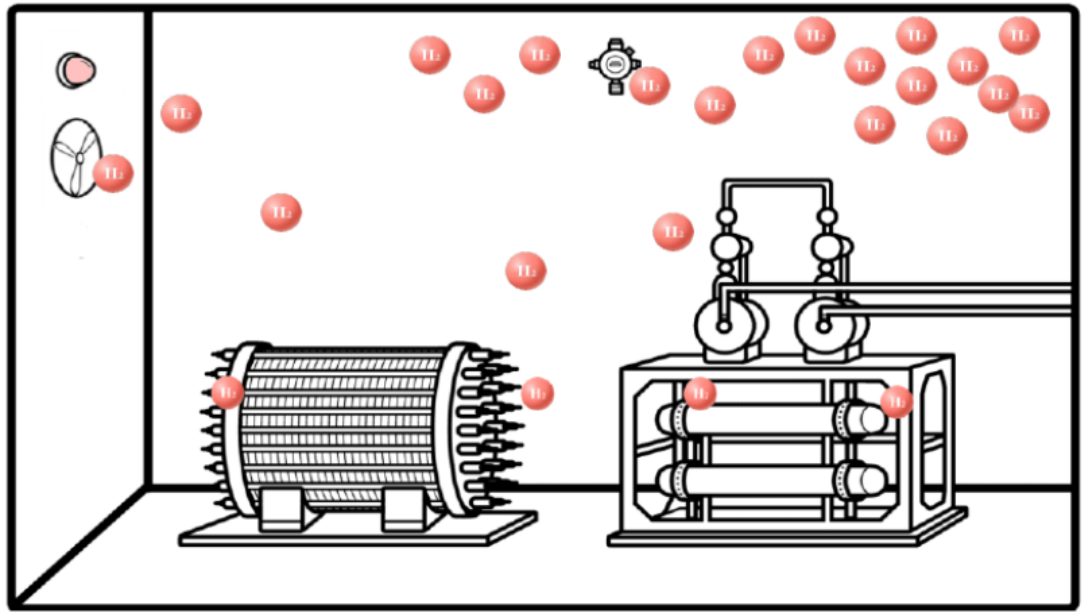


Model	Max. treatment of H_2 leaks	Dimension (mm) (excluding fixtures)	Weight (kg)
DHCVZ2B	2 LPH	121x46±1 (diameter x height)	0.27±0.05

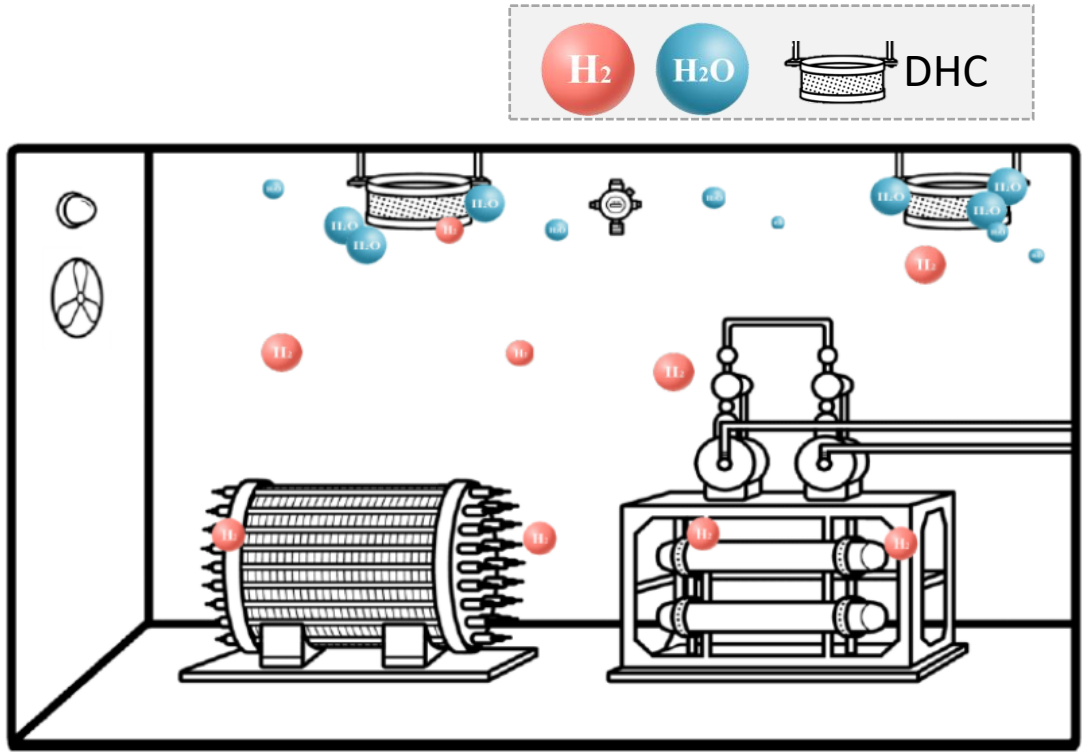
DHC Operating Principle and Uniqueness

Principle: DHC uses a catalyst to initiate the spontaneous reaction of hydrogen with ambient oxygen at room temperature, forming water vapor. The heat generated from this reaction enhances the catalytic efficiency and drives natural convection, which further facilitates hydrogen elimination.

Uniqueness: DHC is the only one can eliminate H_2 leaks when the rest measures are failure (such as ventilation/sensor failure or power outage).



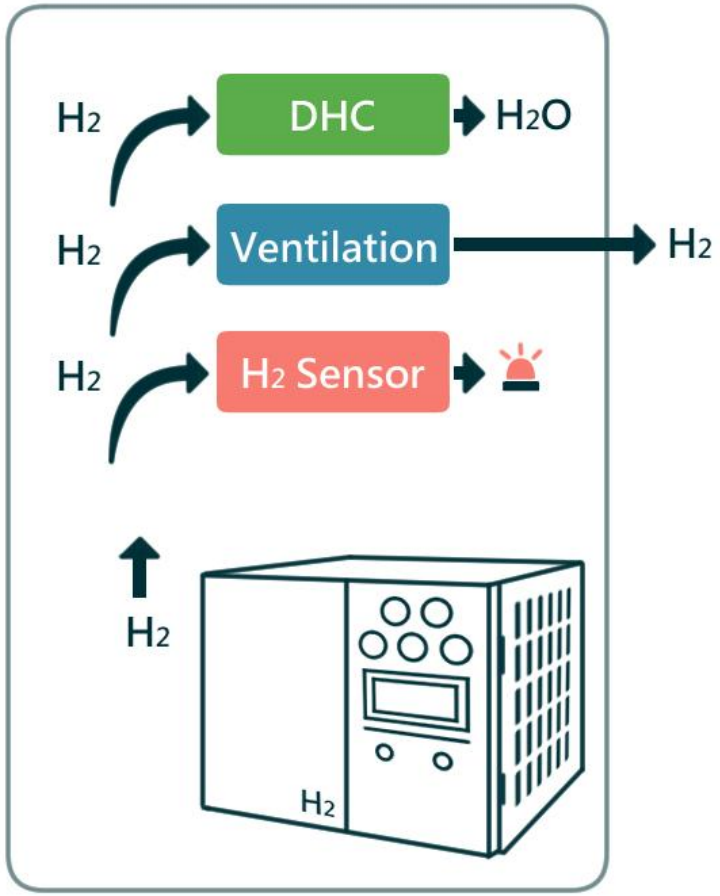
w/o DHC (prone to accumulate H_2)



w/ DHC (eliminate and avoid H_2 accumulation)

Video Source: https://www.youtube.com/watch?v=3jjC7JtBsgA

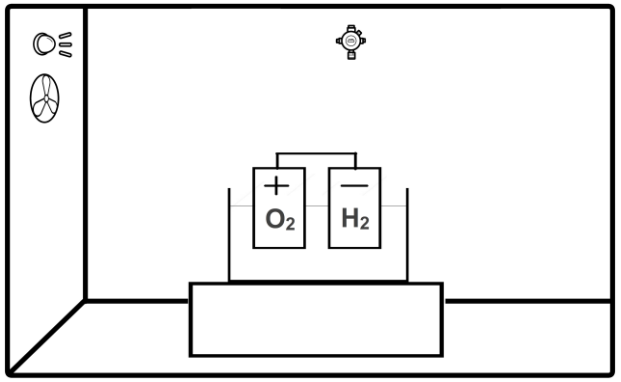
A multi-layered H_2 leak safety approach



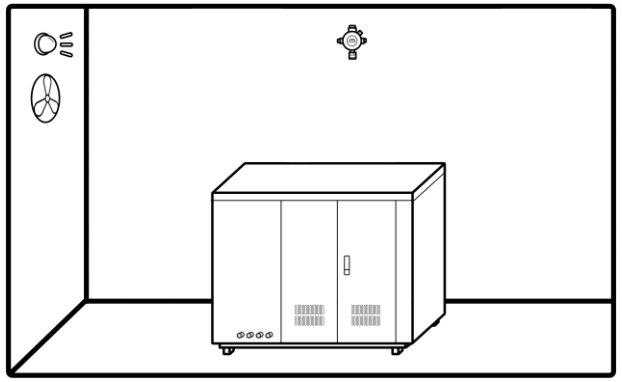
DHC – A Proactive Hydrogen Safety Gatekeeper

- DHC works in conjunction with H_2 sensor and ventilation system to form a multi-layer safety protection mechanism.
- DHC does not replace or interfere with H_2 sensor or ventilation functions.
- Relying solely on H_2 sensor with insufficient ventilation may result in hydrogen accumulation and potential hazards.
- In continuous leakage scenarios, DHC helps suppress hydrogen concentration below 4,000 ppm (10% LEL), ensuring comprehensive safety protection for operators.

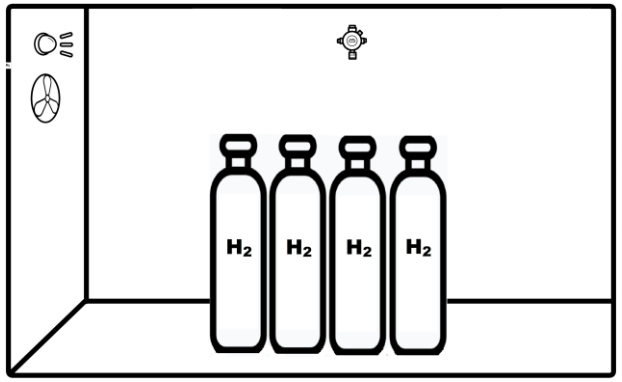
Occasions where H_2 leaks are possible



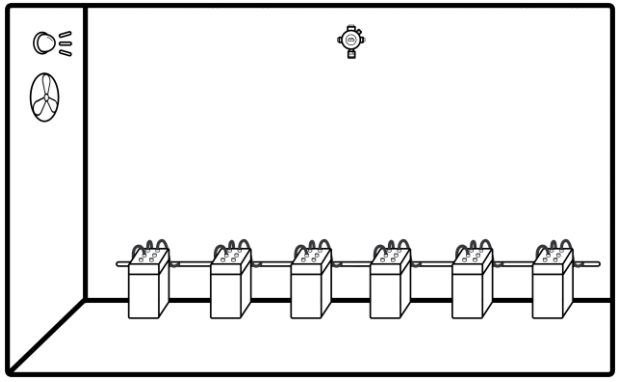
laboratory



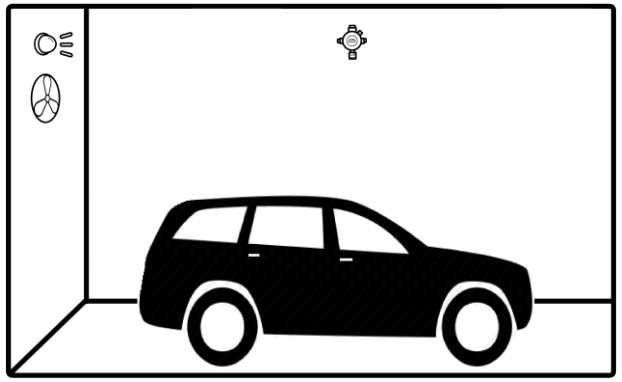
fuel cell room



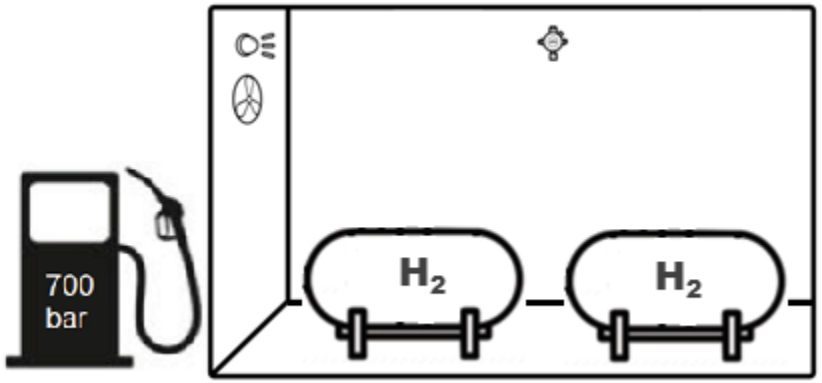
H_2 cylinder room



battery charging room



FCV & garage

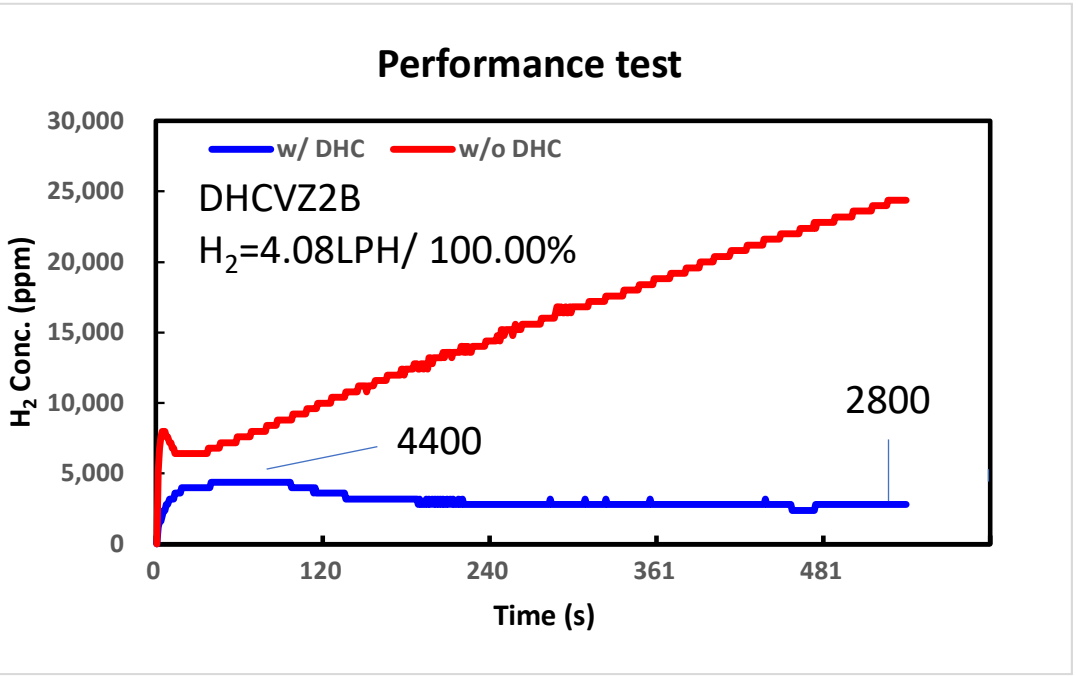


hydrogen refueling station

and more…

UL Verification of DHC

- The 2 LPH DHC (DHCVZ2B) passed the verification of UL.



Test Procedure and Criteria:
Test procedure, document number QP24-D05B prepared by Toplus Energy Corp., as summarized below:

Test procedure:
Control group (without DHC):
1. Purge with CDA until the reading of hydrogen gas detector is zero for 300 seconds.
2. Input hydrogen gas. 68 sccm. ~4.08 LPH, 2X of the rated capacity.
3. Stop input hydrogen, when the reading of hydrogen detector is over 75 (30,000 ppm) or keeps in a specific range for 300 seconds.
4. Purge with CDA until the reading of hydrogen gas detector is zero for 300 seconds.
5. End the test.

Experimental group (with DHC):
1. Purge with CDA until the reading of hydrogen gas detector is zero for 300 seconds.
2. Install the DHC in the space.
3. Input hydrogen gas. 68 sccm for DHCVZ2B.
4. Stop input hydrogen, when the reading of hydrogen detector keeps in a specific range and the variation is between ±800 ppm for 300 seconds.
5. Purge with CDA until the reading of hydrogen gas detector is zero for 300 seconds.
6. End the test.

Criteria:
1. The max environmental hydrogen concentration is < 10,000 ppm
2. The stable environmental hydrogen concentration is ≤ 4000 ppm (reading of H2 detector ≤ 10), when the reaction reaches balance.

Test Observation:

Model	DHCVZ2B	
Test condition	w/o DHC	w/ DHC
Test box volume W x L x H (mm)	300 x 300 x 360	
Environment temperature before test (˚C)	28.8	29.2
Environment humidity before test (%RH)	25.5	32.2
Environment H_2 concentration after purge (ppm)	0	0
Inlet gas flow (sccm)	68	68
Environment temperature after test (˚C)	29.0	29.2
Environment humidity after test (%RH)	39.2	56.2
Max H_2 concentration during test (ppm)	30,800	4,400
Balance H_2 concentration (ppm)	N/A	2,800

Conclusion:
The measured values meet the criteria in test procedure.