

# THE ELEMENTAL

Placing Safety at the Center of Hydrogen



## HYDROGEN VENTILATION

Ventilation is an important safety consideration when working with all flammable gases, including hydrogen. Through proper ventilation, you can reduce the likelihood of a flammable mixture of hydrogen forming in an enclosure, following a release or leak. Appropriate ventilation can include passive or active features.

### Passive Ventilation

Passive ventilation with roof or eave vents can prevent hydrogen buildup if a leak or discharge occurs.

#### For indoor installations:

- Evaluate passive ventilation thoroughly to ensure that a hydrogen leak will dissipate safely for both normal conditions and emergency situations
- Locate inlet openings at floor level in room exterior walls
- Locate outlet openings at highest point in room exterior walls or the roof to avoid pockets of hydrogen

#### For outdoor installations:

- Avoid pockets under weather awnings
- Ensure at least 75% open on sides



Outdoor hydrogen storage with weather protection

### Active Ventilation

When passive ventilation is insufficient, active ventilation can be used to prevent the accumulation of flammable mixtures. Such installations should consider the following:

- Use fan motors, actuators for vents and valves with applicable electrical classification, approved for hydrogen use
- Ensure active ventilation is operational at all times when hydrogen is present or could be accidentally released
- Automatically shut down hydrogen equipment and/or isolate the hydrogen source if active ventilation system fails
- Consider installing hydrogen sensors at the exhaust inlet



Compressor enclosure with mechanical ventilation (red arrow shows exhaust outlet)

The above provides basic safety considerations. Projects/facility design teams should utilize hydrogen safety experts for detailed analysis and design. In addition, the Hydrogen Tools Portal has a best safety practices resource that provides additional information on this and other related topics pertaining to the safe handling and use of hydrogen (<https://h2tools.org/best-practices/best-practices-overview>).

Please contact us at [chs@aiche.org](mailto:chs@aiche.org) if you have a suggestion for a future topic.



The Elemental is brought to you by the Center for Hydrogen Safety (CHS). CHS is a global, neutral, and nonprofit resource that supports and promotes the safe handling and use of hydrogen across industrial and consumer applications in the energy transition. The CHS facilitates access to hydrogen safety experts; develops comprehensive safety guidance, outreach and education materials and activities; and provides a forum to partner on worldwide technical solutions. See [www.aiche.org/chs](http://www.aiche.org/chs) for more information.



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