HUX SAFETY SOLUTIONS LLC
Raising the Bar for Safety in Industry!
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Case Study: VOC Containment & Ventilation Optimization in a Pharmaceutical Tank

Overview

- **Worksite**: Confined space tank in pharmaceutical facility
- **Hazard Identified**: Elevated VOCs—130 ppm isopropylamine
- **Initial Setup**: HEPA tent enclosure with internal positive-pressure fan
- **Core Issue**: Airflow short-circuit led to VOC recirculation
- **Sensor Used**: MultiRAE PID (4-gas monitor showed no alarms)

Respiratory Protection Confirmed

As part of the pre-job briefing, the team reviewed the **Safety Data Sheet (SDS)** for isopropylamine and recognized the potential for airborne concentrations to exceed both TWA and STEL thresholds during internal tank cleaning. Based on this hazard evaluation, the worker entering the confined space was equipped with **appropriate respiratory protection**, aligned with projected exposure levels and site safety protocol.

Thoughtful planning and proactive PPE selection were in place *before* entering the space—not after VOCs were detected.

Sequence of Events

1. **Initial VOC Readings**
   - Tank interior: 130 ppm
   - Inside tent: 100 ppm
   - 4-gas monitor: No alarms
2. **Cause Identified**
   - Fan intake was pulling air from *inside* the tent
   - Enclosure airflow was short-circuiting and trapping VOCs
3. **Action Taken**
   - Fan intake relocated *outside* the tent to draw clean air
4. **Result**

- Tent VOCs dropped to 5 ppm in minutes
- Tank VOCs dropped to 30 ppm in minutes
- Isopropylamine Exposure Guidelines

Metric	Limit	Purpose
TWA (8-hour avg)	5 ppm	Long-term exposure safety
STEL (15-min max)	10 ppm	Prevent short-term effects
IDLH	750 ppm	Life-threatening level

- **Context**: At 130 ppm, exposure exceeded safe working limits by over 25× (TWA) and 13× (STEL).

Key Takeaways

- 4-gas monitors **don't detect most VOCs** unless they're flammable
- PIDs expand detection to **non-LEL chemical vapors** like isopropylamine
- **Enclosure design can amplify hazards** if airflow isn't correctly routed
- **Real-time VOC sampling** allows for rapid course correction
- **Supplied air or full-face APRs** should be part of PPE planning when VOC risks are present

Practical Lessons for the Field

- Always **verify airflow path**—positive pressure is only effective if clean air is sourced correctly
- A tented HEPA enclosure is not a full solution without **ventilation verification**
- Cross-check your air monitor strategy: PIDs + 4-gas + judgment
- Include **VOC thresholds and PPE selections** in your job hazard analysis (JHA)

Hux Safety Solutions

"Good air isn't lucky—it's built."

Real-world experience. Real-time decisions. Real results.