

Annex II – Ammonia Refrigerants (R717) in RACHP Systems Casualties (selected incidents)

Ammonia Refrigerants Casualties

There is no systematic monitoring of accidents due to thermodynamic systems (AC, HVAC, refrigeration, heat pumps, etc.) charged with ammonia refrigerants (R717) - also so-called “*natural refrigerant*” - installed in- or outside buildings or industrial installations/workshops/storages. Until now, fire brigades, hospitals and house insurances do not survey natural refrigerant casualties. Despite few installations, the number of accidents happening in field services, with human injuries, is abnormally high. Repair and disposal risks are considerably high due to human error.

A non-exhaustive selection of accidents reported in the media, in the last two years, are set out below:

- 1) [Man Dead After 'Horrific' Ammonia Incident in Norwood; Second Worker Hospitalized \(2022\)](#)

<https://www.nbcboston.com/news/local/person-dead-after-ammonia-incident-in-norwood/2924571/>

The district attorney's office said it is investigating a fatal incident at a food processing facility on Morgan Drive in Norwood; the victim has been identified as 68-year-old Richard J. Arguin, of Dighton.

- 2) [Pilgrim's faces \\$110,000 fine following OSHA probe of ammonia leak \(2022\)](#)

<https://www.meatpoultry.com/articles/27005-pilgrims-faces-110-000-fine-following-osh-probe-of-ammonia-leak>

The agency said the incident resulted in two workers being hospitalized and 50 people evacuated from the Canton, Ga., poultry processing plant. One person was treated at the scene.

- 3) [Gas leak incidents: Top 10 gas leak ..](#)

http://timesofindia.indiatimes.com/articleshow/99887839.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst



Please look in particular at the following four cases within the 10:

1. *Ammonia gas leak in Haryana's Jhajjar*
6. *Ammonia gas leak in Aligarh*
8. *Ammonia gas leak at Kamalgazi Pepsi plant in West Bengal*
9. *Ammonia gas leak in Kakdwip ice factory in West Bengal*
- 4) **U.S. EPA Penalizes Four California Facilities More Than \$800,000 for Clean Air Act Chemical Safety Violations** – <https://www.epa.gov/newsreleases/us-epa-penalizes-four-california-facilities-more-800000-clean-air-act-chemical-safety>

"It is paramount that facilities properly manage the handling of extremely hazardous substances to prevent dangerous incidents," said EPA Pacific Southwest Regional Director of Enforcement and Compliance, Amy Miller. "Industry needs to properly manage dangerous substances or face significant Clean Air Act penalties."

- 5) See also [Study on the Regularity of Ammonia-Related Refrigeration Accidents in China from 2010 to 2020](#), Cong Luo, Yunsheng Zhao, Ke Xu , July 6 2022.

<https://pubmed.ncbi.nlm.nih.gov/35886081/>

The frequent occurrence of ammonia-related refrigeration accidents (ArRAs) restricts the safety and sustainable development of cold storage. As an essential tool for safety management, accident statistical analysis can provide a crucial decision-making basis for accident prevention and control. The present study combined descriptive statistics and comparative analysis methods to explore the characteristics and regularities of 82 ArRAs in China from 2010 to 2020.

- 6) Also [A Review of Safety Issues and Risk Assessment of Industrial Ammonia Refrigeration System](#), Dheyaa Ashour Khudhur, Tuan Amran Tuan Abdullah, and Norafneeza Norazahar*, ACS Chem. Health Saf. 2022, 29, 5, 394–404

<https://pubs.acs.org/doi/full/10.1021/acs.chas.2c00041>

Several industries like cold storage and ice plants heavily rely on ammonia (NH₃) due to its low cost, excellent thermophysical traits, and zero effects on the ozone layer. Despite its widespread use as a refrigerant, the hazardous nature of ammonia remains a significant health concern. Since the industrial revolution, ammonia leakage has led to numerous major accidents, including fire and vapor cloud explosions.