

Understanding the Hazards and Potential Impacts of Ammonia Released to the Atmosphere

Thomas O. Spicer, PhD, PE

Ammonia is well known to be a toxic and also flammable material. The consequences of the loss of containment of ammonia depend importantly on its storage conditions (temperature and pressure) prior to release. Ammonia released from pressurized storage has been shown to form an air/ammonia cloud which will be denser-than-air. Ammonia released from refrigerated storage at ambient pressure can form an air/ammonia cloud which can be positively buoyant near the release point. Denser-than-air materials behave quite differently from positively buoyant materials in releases to the atmosphere, and the consequences of a denser-than-air release are typically more significant than those of a positively buoyant release. This paper discusses the importance of storage conditions (and quantity stored) on the potential consequences of an ammonia release from containment with regard to its toxic and flammable hazards.

