

Liquid ammonia pipelines and cable trays



Overview

The liquid ammonia pipe-in-pipe – Design and project execution from. Beyond ammonia, prior cryogenic projects with the similar insulation technology have.

Key Takeaways

Cable trays near liquid ammonia pipelines require corrosion-resistant materials and careful spatial planning to ensure safety and operational reliability.

Corrosion Risks for Cable Trays in Ammonia Environments

Standard galvanized steel cable trays are prone to rapid corrosion, known as white rust, when exposed to even trace amounts of ammonia vapors indoors. This corrosion attacks the zinc coating, compromising structural integrity and potentially causing cable damage, electrical faults, and operational downtime. Factors that accelerate corrosion include poor ventilation and the presence of condensable ammonia vapors.

To mitigate these risks, facilities should consider: heavy-duty galvanizing, powder-coated galvanized trays, or stainless steel alternatives (Type 304 or 316), depending on the severity of ammonia exposure. Suppliers should provide certifications or test reports demonstrating resistance to chemical and humid environments.

Liquid Ammonia Pipeline Considerations

Liquid ammonia pipelines are typically pressurized and may operate at cryogenic temperatures (-33°C). They are constructed from low-alloy carbon steel or specialized pipe-in-pipe systems for refrigerated transport. Modern pipelines often include double containment, where an outer pipe acts as a secondary barrier in case of inner pipe leaks, and 24/7 leak monitoring systems to ensure operational safety.

Pipelines can be installed subsea, above-ground, buried, or via horizontal directional drilling, providing flexibility in congested industrial areas.

Safety and Operational Integration

When cable trays are installed near ammonia pipelines, consider the following:

Material Compatibility: Use ammonia-resistant coatings or stainless steel for trays to prevent corrosion. **Buffer Zones:** Maintain adequate spacing between pipelines and cable trays to reduce exposure to potential leaks or vapor accumulation. **Leak Detection and Monitoring:** Pipelines should have SCADA systems, flow meters, and remote control valves to detect and respond to leaks promptly.

Environmental and Health Safety: Ammonia is toxic and contributes to environmental hazards if released. Proper ventilation, containment, and emergency response plans are essential.

Best Practices

Conduct an environmental audit to identify ammonia sources and vapor concentrations. Specify chemical-resistant cable tray materials in procurement documents. Implement double-containment pipelines with continuous monitoring for liquid ammonia transport.

Ensure regular inspections and maintenance of both cable trays and pipelines to prevent corrosion and leaks. Consider thermal insulation and cryogenic design for pipelines to minimize boil-off and maintain ammonia in liquid form. By integrating corrosion-resistant cable trays with robust ammonia pipeline design, facilities can enhance safety, reduce maintenance costs, and ensure reliable operation in industrial environments handling liquid ammonia.

Article Content

The liquid ammonia pipe-in-pipe – Design and project execution from ...

Beyond ammonia, prior cryogenic projects with the similar insulation technology have demonstrated U-values below $0.1 \text{ W}/(\text{m}^2 \cdot \text{K})$ with higher insulation thicknesses for LNG-class services, highlighting

Threats and Challenges Associated with Ammonia

This article reviews both passive and active methods for preventing and mitigating incidents in ammonia pipeline systems. Passive measures include

Design and Safety Aspects for large-scale Clean Ammonia Pipelines

This Ammonia Pipeline Safety study assesses the necessary design and safety aspects for the long-distance pipeline transport of large volumes of anhydrous ammonia through rural and urban areas.

Ammonia pipelines: existing networks, future deployments, and safety ...

The ammonia pipeline would be an alternative to existing ammonia transportation modalities such as barges and railcars. The ISPT report details the best available technology for safe

Pipeline sharing: Optimal design of downstream green ammonia

Liquid ammonia pipelines and multi-product pipelines have good emission reduction effects on the supply system, while carbon emissions caused by the construction of liquid ammonia

Liquid Ammonia Transport Solutions

Our refrigerated pipeline solutions are tailored to meet the specific requirements of ammonia transportation. Leveraging decades of expertise in double-containment

Industrial Scale Ammonia Pipeline Transfer System and

This paper designs a novel hybrid process for simultaneous production of liquid methanol, ammonia, and heavy hydrocarbons using the

Ammonia Pipeline Design and Analysis

Anhydrous ammonia is a key raw material in fertilizer production but requires careful transport and storage due to its cryogenic properties. The author analyzes an industrial scale ammonia pipeline

Pipeline Transportation of Ammonia

NuStar has received the International Liquids Terminals Association's (ILTA) Safety Excellence Award 10 times, which is awarded based in part on OSHA safety reports

Report: Clean Ammonia Pipeline Safety Study

The Clean Ammonia Pipeline Safety Study offers critical insights into the safe, scalable transport of clean ammonia via pipelines.

MATERIALS FOR LIQUID HYDROGEN, LIQUID AMMONIA AND LIQUID

LIQUID AMMONIA e of Cargoes and Containers (CCC) 7, Appendix 2, specifies compatibility test requirements for ammonia service. The American Society for Testing and Ma

The liquid ammonia pipe-in-pipe – Design and project execution from ...

Firstly, this paper presents the design of a field-proven liquid ammonia pipeline based on a pipe-in-pipe cross-section developed by ITP Interpipe. It includes a robust and highly sensitive leak monitoring

Issues affecting safety risks with ammonia storage, transport and ...

Continue to build contribution to the Refrigeration Industry Ramp up involvement with the Fertilizer and Storage Terminal sectors Engage with the ammonia maritime sector in research and review of safety

Pipeline Transportation of Ammonia

NuStar's Ammonia Pipeline System The Ammonia Pipeline System is a common carrier pipeline system Approximately 2,000 miles long, completed in 1971, consisting of 4", 6", 8" and 10" pipe Transports

Liquid Ammonia Transport Solutions

About our solution Ammonia is becoming an important fuel or hydrogen transport vector, helping to drive the shift to a sustainable future. To meet growing demand, our refrigerated pipelines offer highly

Cable tray

ABB designs and manufactures cable tray systems, including perforated tray, cable ladder, channel tray and strut (metal framing).

49 CFR Part 195 -

(a) Covered. Except for the pipelines listed in paragraph (b) of this Section, this Part applies to pipeline facilities and the transportation of hazardous liquids or carbon dioxide associated with those facilities

Pipeline transportation of liquid anhydrous ammonia and liquid ...

Also, such means of transportation of anhydrous ammonia presents a constant hazard problem. It is an object of the present invention to transport through pipelines anhydrous liquid ammonia in a liquid

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

