IS 662 Anhydrous Ammonia — Specification (Second Revision)

Anhydrous ammonia refers to the high-purity, commercial-grade ammonia gas that contains between **99.90% and 99.98%** ammonia by volume. The term "**anhydrous**" signifies the **absence of water in the ammonia**, ensuring it is essentially pure ammonia gas (NH3). This **gas appears colorless under normal conditions of room temperature and pressure**, and it has a **strong, distinctive, pungent odor**, which is a characteristic indicator of its presence.

Anhydrous ammonia has significant industrial applications. It is widely **used in refrigeration** due to its efficient thermodynamic properties as a refrigerant, providing effective cooling with minimal energy input. Additionally, anhydrous ammonia plays **an essential role in the chemical industry**; it is a key ingredient in the production of nitric acid, which is subsequently used for various purposes, including fertilizers and explosives. It is also used in the **manufacture of liquor ammonia**, which is an aqueous ammonia solution. Beyond these applications, **anhydrous ammonia serves as a fertilizer when directly applied to soil**. However, the standards and specifications for ammonia used in fertilizers are governed by a separate Indian Standard, due to differing purity and application requirements.

The Indian Standard IS 622, **originally published in 1955** and **revised in 1980**, was updated in its second revision to address contemporary needs. This latest version sets forth specific **purity requirements for anhydrous ammonia**, including **permissible levels of oxygen** and **carbon dioxide**, along with prescribed testing methods to ensure these standards are met.

IS 622 categorizes anhydrous ammonia into two grades based on its intended use:

Grade 1 is intended for refrigeration and applications requiring higher purity, while

Grade 2 is suitable for general industrial uses, including nitric acid production and liquor ammonia preparation.

For packaging, IS 622 mandates compliance with the **Gas Cylinder Rules 2016** set forth by the Government of India, ensuring that all cylinders used for storage meet specific safety and quality criteria. However, **safety protocols for handling and transporting** anhydrous ammonia are outside the scope of IS 622 and are instead governed by **IS 4544:1968**, which specifically addresses these critical aspects.