Frick® Pressure Vessel Quality **Advantage**

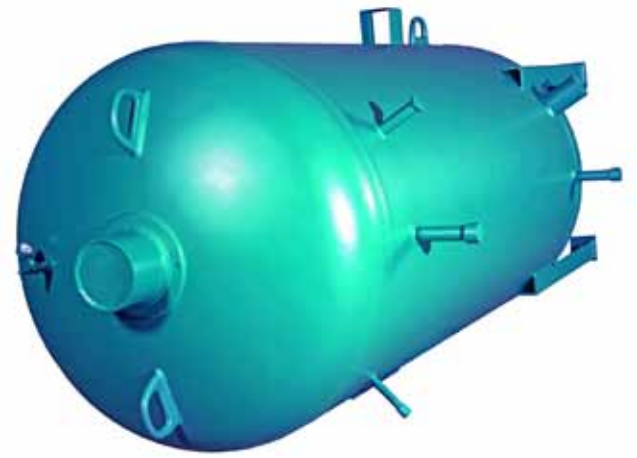
Importance of Proper Dehydration of Pressure Vessels

Refrigeration engineers and technicians are aware of the negative effects when water is mixed with refrigerant in mechanical cooling systems. Water in CFC & HCFC systems may produce acids. And, since water does not mix well with the liquid refrigerant, it may freeze and cause blockages in strainers and metering valves. Water in an ammonia system changes the vaporization and condensation properties of the refrigerant in such a way that operational costs will increase in relation to the amount of water in the mixture.

To maximize efficiency and system service life, most manufacturers, specifying engineers, and discerning refrigeration system end users impose specifications to limit the presence of moisture. This may take the form of requiring filter driers in the liquid refrigerant lines and/or defining the purity of the refrigerant installed in a system. There are also procedures for dehydrating a system or portion of a system when it is initially installed and whenever the system is opened for service.

Most installing contractors of industrial refrigeration systems give credence to the need for dehydrating piping and equipment before bringing it online. Taking the steps necessary to remove water involves extended periods of time and expense. Water evaporates and disperses slowly inside piping and pressure vessels unless localized heat is applied and any air/moisture mixture is forcibly relocated. Because of time constraints, most construction crews only evacuate to remove moist air and other non-condensable items inside the piping system. They often do not allow enough time to evaporate and remove water puddles.

Manufacturers of industrial refrigeration pressure vessels have some additional interests beyond those of installation crews. Codes require manufacturers to verify their products ability to withstand certain pressures. They are also



concerned with the safety of plant personnel as they perform this verification. Hydro-testing the pressure vessel is more cost effective and safer when done by the manufacturer. Should a vessel fail the test it unlikely to be a catastrophic event. The use of water however, does introduce the possibility of promoting rust on the unpainted internal surfaces of the vessel. Quality minded manufacturers utilize a rust inhibitor in the test water because of this possibility.

Most Frick pressure vessels undergo hydro testing with water and a rust inhibitor. These vessels are first flushed with dry air to begin the dehydration process and then attached to a vacuum pump to continue the process of removing all remaining moisture and rust inhibitor. Only after passing a pressure and time lapse test, assuring that all water has been removed, is the vacuum broken with a dry nitrogen charge. The nitrogen charge prevents further moisture from entering the vessel and the formation and propagation of rust.

The best way to prevent the presence of moisture, rust and debris in a mechanical refrigeration system is to use a Frick quality pressure vessel.

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