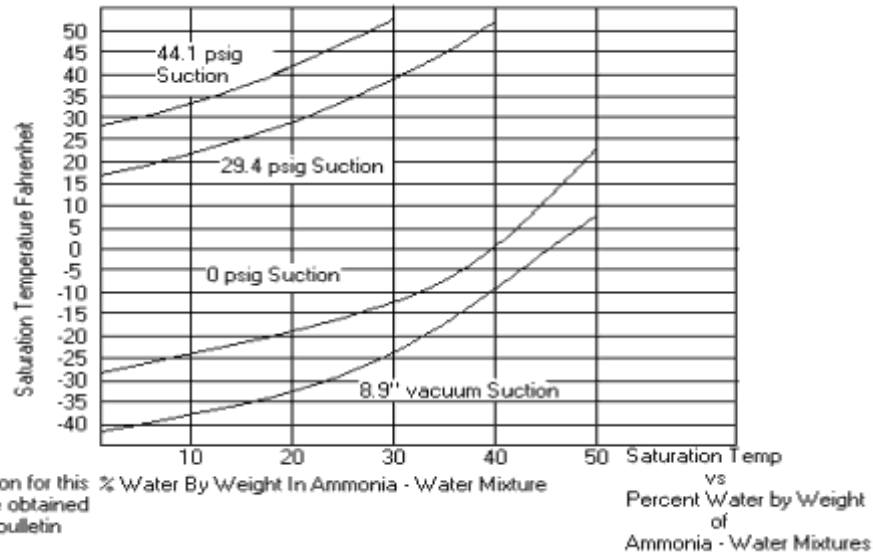


THE EFFECT OF WATER CONTAMINATION IN AMMONIA REFRIGERATION SYSTEMS



Water contamination is common in most refrigeration systems. The purpose of this bulletin is to explain the efficiency losses that are experienced at different concentrations of water. The effects of the water contamination are many.

1. Pressure-Temperature is impaired.
2. Organic acids and sludges are formed in compressor oils.
3. Pump operation, piping pressure drop and evaporator performance is adversely affected.

Sources of water are from improperly drained systems prior to start-up, condensation during construction, lack of purging, and leaks on packing glands in the suction side of the system.

Ammonia has a great affinity for water. The graph at the bottom shows the saturation temperature of ammonia-water at 4 different suction pressures. You will notice that the suction temperature increases as the water content increases. Therefore it is necessary to operate equipment at lower suction pressures to maintain temperatures.

With such a change in operating conditions, a costly penalty results. For each degree Fahrenheit that suction temperature is lowered, compressor capacity is reduced approximately 2-½ % for high stage and 3 % for boosters.

If the average system costs \$20.00 per hr. per compressor to operate there would be an **additional cost of \$4380.00 per year for each high stage compressor and \$5256.00 for each booster compressor**. This is based on a 1°F increase. (All cost increases are power consumption only. This does not include labor and parts.)

To find out if your system has water contamination, Airgas Specialty Products will take a sample of your ammonia using our patented Cold Flo Sampler.