

Ammonia Refrigeration Process Chemistry Statement

RMP (CFR 40 § 68.65): Process Safety Information

There are no chemical reactions involving ammonia that occur in a closed loop mechanical refrigeration system. The principle involved is the ability of a refrigerant, in this case ammonia, to absorb heat as it changes state from a liquid to a gas, and to give up that heat as it changes back to a liquid. The change in pressure levels required to accomplish this is supplied by the compressors. The heat is absorbed in the cooling evaporators of various designs, and removed from the system by the condensers.

Contamination of the ammonia refrigeration system by oil, air, water, dirt, and other foreign matter may cause operational problems in the system, but there are no chemical reactions which typically occur between ammonia and these contaminants. Air and other non-condensable gases may potentially lead to increased high side operating pressures. Dirt and foreign matter lead may lead to malfunctioning solenoids, regulating valves, and may prevent the full seating of manual valves. Dirt also may lead to excessive parts replacement. Water may mix with oil to form sludge and may cause parts to malfunction. Water may also decrease system efficiencies and may cause metal system components to corrode.