Proposed Measures to Reduce Refrigerant Leaks from Commercial Refrigeration Systems

Measure #1: *Piping runs using threaded pipe must not be used for refrigeration lines (e.g., if steel piping is used, it must be welded*). *This does not include threaded connections at the compressor rack.*

Measure #2: *The use of copper tubing with an outside diameter (OD) smaller than ¼" is prohibited in all but systems with a refrigerant charge of 5 lbs or less. When using ¼" tubing, it must be securely clamped to a rigid base so that the vibration level is below 8 mils.*

Measure #3: *Flared tubing connections are prohibited from use on all refrigerant applications with the exception of pressure controls, valve pilot lines, and oil lines. In these exception cases, the tubing on a flare connection must be either (1) double-flared or (2) single-flared with a multi-ring seal coated with an industrial sealant suitable for use with refrigerants. All flared tubing connections with a multi-ring seal must be properly tightened to the manufacturer's recommendations.*

Measure #4: *Pressure relief valves installed on a refrigerant vessel containing a high-GWP refrigerant shall have a rupture disc installed between the outlet of the vessel and the inlet of the pressure relief valve. The space between the pressure relief valve inlet and rupture disc shall have a pressure gauge, pressure transducer, or other device to indicate a disc rupture and discharge of the relief valve.*

Measure #5: *Only Schrader access valves (which are defined as access fittings with a valve core installed) with a brass or steel body are permitted for use. For systems with a refrigerant charge of 5 lbs or more, valve caps shall be brass or steel (not plastic); a neoprene O-ring seal must be in place, if the cap is designed for it.*

Measure #6: *Valves that are designed to have seal caps must be in place with chain tethers to fit over the stem. Valves with seal caps that are not removed from the valve during stem operation are exempted from using chain tethers.*

Measure #7: *Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils coated to prevent corrosion from these substances or be made of a*

corrosion-resistant material, such as stainless steel. The heat transfer efficiency of the coil coating should be considered when selecting the coating to ensure maximum energy efficiency.

Measure #8: *Refrigerant piping shall be installed in such a way so that it is accessible for leak detection and repairs.*

Measure #9: *Refrigerant receivers with capacities greater than 200 lbs. shall be fitted with a device that indicates the level of refrigerant in the receiver.*

Measure #10: *Pressure test system during installation prior to evacuation & charging: (1) Charge the system with regulated dry nitrogen and the appropriate tracer gas to bring system pressure up to 300 psig minimum; and (2) after the system has been checked for leaks and all leaks have been repaired and retested, the system must stand, unaltered, for 24 hours with no more than a +/- 1 pound pressure change from 300 psig, using the same gauge.*

Measure #11: *Evacuate system following pressure testing & prior to charging: (1) Pull a system vacuum down to at least 1000 microns (+/- 50 microns) and hold for 30 minutes; (2) Pull a second vacuum to a minimum of 500 microns and hold for 30 minutes; and (3) Pull a third vacuum to a minimum of 300 microns and hold for 24 hours with a maximum drift of 100 microns over the 24 hour period.*

Measure #12: *Short radius elbows are prohibited from use on commercial refrigeration systems unless space limitations physically prohibit the use of long radius elbows. Only under these circumstances can short radius elbows be installed. [Note: definitions of "short" and "long" radius elbows are based on catalogued terminology]*