



Division 232300

Refrigerant Piping

DESIGN GUIDE

1 General

1.1 General

- A. Reserved for future.

2 Materials

2.1 Refrigerant Piping

- A. Copper Tubing: ASTM B280 and ANSI B9.1
- B. Nitrogenized type ACR hard drawn or annealed
- C. The use of annealed (soft copper) piping is restricted to use of ductless splits 2 tons and less when allowed or recommended by the manufacturer.
- D. Annealed piping shall not be used for the following applications:
Variable refrigerant flow (VRF/VRV) systems between the outdoor unit and the branch controller, piping that is uninsulated, piping that is located on the roof, piping located in mechanical rooms
- E. Rated for use for 700 psig maximum working pressure at 250 degrees F
- F. Fittings: ASME B16.22 wrought copper, long radius elbows
- G. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy melting range 1,190 to 1,480 degrees F



- H. Traps: Standard one piece

3 Execution

3.1 General

- A. Dry nitrogen shall be run continuously through the pipe in the soldering process.
- B. Make evacuation and leak tests in presence of Owner's representative after completing refrigeration piping systems. A positive pressure test will not suffice for the procedure outlined below.
- C. Leak test the system by charging the system to a pressure of 10 psig with refrigerant, with the compressor suction and discharge valves closed and with all other system valves open. Increase pressure to 300 psig with dry nitrogen. Rap all joints with a mallet and check for leaks with an electric leak detector having a certified sensitivity of at least one ounce per year. Seal any leaks that may be found and retest.
- D. Draw vacuum on each entire system with vacuum pump to 200 microns using a vacuum gauge calibrated in microns. Do not use cooling compressor to evacuate system nor operate it while system is under high vacuum.
- E. Break vacuum with refrigerant to be used and re-establish vacuum test. Vacuum shall hold for twenty-four (24) hours at 200 microns without compressor running.
- F. Conduct tests at 70 °F ambient temperature or above.
- G. Do not run systems until above tests have been made and systems started up as specified. Inform Owner's Representative of status of systems at time of final inspection and schedule start-up testing if prevented by outdoor conditions before this time.
- H. After testing, fully charge system with refrigerant and conduct test with Halide Leak Detector.



3.2 Piping

- A. Group piping whenever practical at common elevations and locations. Slope piping one (1) % in direction of oil return. Exception: Piping in VRF/VRV applications shall be installed flat, without slope, and vertically up/down at offsets and in accordance with the Manufacturer's requirements.

4 Appendix

4.1 Reserved for future.

