

**INTERPRETATION IC 15-2022-8 OF
ANSI/ASHRAE STANDARD 15-2022
SAFETY STANDARD FOR REFRIGERATION SYSTEMS**

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Request from: Nicholas Zupp, Modine Manufacturing Company, 360 Collierstown Rd., Lexington, VA 24450.

Reference: This request for interpretation refers to the following requirements presented in ANSI/ASHRAE Standard 15-2022:

Section 3.1 Defined Terms, regarding the terms “*pressure vessel*” and “*pipng*”,
Section 9.3 Refrigerant-Containing Pressure Vessels,
Section 9.4 Pressure Relief Protection, and
Section 9.7 Pressure Vessel Protection.

Background:

Considered here is the *refrigerant* distributor and the *header* connected to a direct expansion shell-and-tube heat exchanger operating as part of an *evaporator* of a packaged chiller. *Refrigerant* circulates in the tube-side of the *evaporator* while water or *secondary coolant* circulates through the shell-side. The tube-side of the heat exchanger, including inlet and outlet heads, is exposed to low side *refrigerant* pressure.

Two interpretations of Standard 15-1989 are related to requirements for *pressure relief devices*. These are:

Interpretation IC 15-1989-1 – March 20, 1990 (*referring to requirements for low-side pressure relief on packaged chillers, especially whether pressure relief is required when a shell-and-tube, direct-expansion heat exchanger is used on the low pressure side*)

Interpretation IC 15-1989-2 – August 23, 1990 (*referring to definitions for piping, pressure vessel, evaporator, evaporator coil, condenser, and condenser coil. It also refers to paragraph 7.5.1 concerning strength of miscellaneous pressure containing parts and paragraph 9.4.1 concerning pressure vessel relief*)

In both of these past interpretations to a prior edition (not applicable to the current edition) the comments supporting the answer from ASHRAE stated that the *refrigerant headers* and distributors on direct expansion shell-and-tube heat exchangers, *evaporator coils*, and *condenser coils* are considered to be part of the *refrigerant piping*.

In Section 3.1 of the 2022 edition, the defined term “*pressure vessel*” specifically excludes “*evaporator coils*”, “*condenser coils*”, “*headers*” and “*pipng*”. The defined term “*pipng*” states that it is used to convey fluid from one part of a refrigeration system to another, and that it includes devices that distribute or control flow. The defined term “*pressure vessel*” specifically excludes *evaporators* where each separate *evaporator* section does not exceed 0.5 ft³ (0.014 m³) of *refrigerant*-containing volume, regardless of the maximum *inside dimension*.

Interpretation #1: The *refrigerant* distributor and *header* connected to a direct expansion shell and tube heat exchanger is considered to be a part of the *refrigerant piping* and not part of a *pressure vessel* when establishing the need for *pressure relieving devices* in accordance with Sections 9.3, 9.4, and 9.7.

Question #1: Is this Interpretation correct?

Answer #1: Yes

Interpretation #2:

Where the *refrigerant*-containing volume of the tube-side of a shell-and-tube direct expansion heat exchanger, including inlet and outlet heads, does not exceed 0.5 ft³ (0.014 m³) of volume per *independent circuit*, that shell-and-tube heat exchanger is not a *pressure vessel* due to being below the volume threshold for the defined term, and is therefore not subject to the pressure relief requirements applicable to *pressure vessels*.

Question #2: Is this Interpretation correct?

Answer #2: Yes

Comment #2: If the direct expansion shell and tube heat exchanger is marked in accordance with a pressure vessel code, then the direct expansion shell & tube heat exchanger should meet the requirements of the code for which it is marked.

Interpretation #3: Where the *refrigerant*-containing volume of the tube-side of a shell-and-tube direct expansion heat exchanger, including inlet and outlet heads, exceeds 0.5 ft³ (0.014 m³) of volume per *independent circuit*, that shell-and-tube heat exchanger is a *pressure vessel* due to being above the volume threshold for the defined term, and is therefore subject to the pressure relief requirements applicable to *pressure vessels*.

Question #3: Is this Interpretation correct?

Answer #3: Yes