

2000 STANDARD for

UNIT COOLERS FOR REFRIGERATION



AIR-CONDITIONING &
REFRIGERATION
INSTITUTE

Standard 420

IMPORTANT

SAFETY RECOMMENDATIONS

It is strongly recommended that the product be designed, constructed, assembled and installed in accordance with nationally recognized safety requirements appropriate for products covered by this standard.

ARI, as a manufacturers' trade association, uses its best efforts to develop standards employing state-of-the-art and accepted industry practices. However, ARI does not certify or guarantee safety of any products, components or systems designed, tested, rated, installed or operated in accordance with these standards or that any tests conducted under its standards will be non-hazardous or free from risk.

Note:

This standard supersedes ARI Standard 420-94.

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UNIT COOLERS FOR REFRIGERATION

Section 1. Purpose

1.1 Purpose. The purpose of this standard is to establish, for unit coolers for refrigeration: definitions; test requirements; ratings requirements; minimum data requirements for Published Ratings; marking and nameplate data; and conformance conditions.

1.1.1 Intent. This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, and users.

1.1.2 Review and Amendment. This standard is subject to review and amendment as technology advances.

Section 2. Scope

2.1 Scope. This standard applies to factory-made Forced Circulation, Free-Delivery Unit Coolers for refrigeration, as defined in Section 3, for operation under either frosting or non-frosting conditions, using Volatile Refrigerants.

Section 3. Definitions

Definitions. All terms in this document shall follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air Conditioning and Refrigeration* unless otherwise defined in this section.

3.1 Forced-Circulation Free Delivery Unit Coolers. A factory-made assembly, including means for forced air circulation and elements by which heat is transferred from air to refrigerant without any element external to the cooler imposing air resistance.

3.2 Gross Total Cooling Effect. The heat absorbed by the refrigerant expressed in Btu/h [W]. This is the sum of the Net Total Cooling Effect and the heat equivalent of the energy required to operate the unit cooler. This includes both sensible and latent cooling.

3.3 Net Total Cooling Effect. The refrigeration capacity available for space and product cooling expressed in Btu/h [W]. It is equal to the Gross Total Cooling Effect less the heat equivalent of energy required to operate the unit cooler. This includes both sensible and latent cooling.

3.4 Published Rating. A statement of the assigned values of those performance characteristics, under stated rating conditions, by which a unit may be chosen to fit its application. These values apply to all units of like nominal size and type (identification) produced by the same manufacturer. As used herein, the term Published Rating includes the rating of all performance characteristics shown on the unit or published in specification, advertising or other literature controlled by the manufacturer, at stated rating conditions.

3.4.1 Application Rating. A rating based on tests performed at Application Rating Conditions (other than Standard Rating Conditions).

3.4.2 Standard Rating. A rating based on tests performed at Standard Rating Conditions.

3.5 Rating Conditions. Any set of operating conditions under which a single level of performance results and which causes only the level of performance to occur.

3.5.1 Standard Rating Conditions. Rating conditions used as a basis of comparison for performance characteristics.

3.6 "Shall" or "Should". "Shall" or "should" shall be interpreted as follows:

3.6.1 Shall. Where "shall" or "shall not" is used for a provision specified, that provision is mandatory if compliance with the standard is claimed.

3.6.2 Should. "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.7 Temperature Difference (TD). The difference between the dry-bulb temperature of the air entering the unit cooler and the saturation temperature corresponding to the refrigerant pressure at the suction connection of the unit cooler, °F [°C].

3.8 Volatile Refrigerant. A refrigerant which changes from liquid to vapor in the process of absorbing heat.

Section 4. Test Requirements

4.1 Test Requirements. All Standard Ratings shall be verified by tests conducted at Standard Rating Conditions in accordance with ASHRAE Standard 25.