2001 STANDARD for

REMOTE TYPE REFRIGERANT-COOLED LIQUID COOLERS

AIR-CONDITIONING & REFRIGERATION INSTITUTE

Standard 480

4100 N. FAIRFAX DR.,STE. 200 • ARLINGTON, VIRGINIA 22203

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 480-1995.

Price $10.00 (M) $20.00 (NM)
Printed in U.S.A.

TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose	1
Section 2.	Scope	1
Section 3.	Definitions	1
Section 4.	Test Requirements	2
Section 5.	Rating Requirements	2
Section 6.	Minimum Data Requirements for Published Ratings	4
Section 7.	Marking and Nameplate Data	5
Section 8.	Conformance Conditions	5

TABLES

Table 1.	Standard Rating Conditions	3

APPENDICES

Appendix A.	References - Normative	6
Appendix B.	References - Informative	6

REMOTE TYPE REFRIGERANT-COOLED LIQUID COOLERS

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish for Remote Type Refrigerant-Cooled Liquid Coolers: definitions; test requirements; rating 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 Remote Type Refrigerant-Cooled Liquid Coolers of the Shell-and-Tube, Shell-and-U-Tube, Shell-and-Coil, and Tube-in-Tube types using single component and azeotropic refrigerants only.

2.2 *Exclusions.*

2.2.1 This standard does not apply to liquid coolers supplied as part of factory-assembled liquid-chilling packages.

2.2.2 This standard does not apply to liquid coolers of the following types:

a. Baudelot-type coolers
b. Open-tank and coil coolers
c. Open shell-and-tube coolers
d. Drinking-water coolers as covered in ARI Standard 1010

2.2.3 This standard does not include sanitary provisions necessary for the handling of potable Liquids.

2.2.4 This standard does not apply to liquid coolers using zeotropic refrigerants.

Section 3. 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 *Evaporating Temperature.* The saturation temperature corresponding to the refrigerant pressure at the liquid cooler refrigerant outlet.

3.2 *Field Fouling Allowance.* Provision for anticipated Fouling Factor during use.

3.2.1 *Fouling Factor.* The thermal resistance due to fouling accumulated on the heat transfer surface.

3.3 *Liquid.* Where used in this standard, the term Liquid by itself shall denote the fluid being cooled.

3.4 *Mechanically-Cleanable Liquid Cooler.* A liquid cooler in which Liquid flows through tubes which are accessible from both ends for cleaning by mechanical means, or accessible from one end when U-tubes are used, providing the U-tube bend radius is large enough for such cleaning.

3.5 *Net Refrigerating Capacity.* The useful heat exchange between the refrigerant and the Liquid being cooled. This value is the product of the Liquid mass flow rate and the difference in enthalpy between the Liquid entering and the Liquid leaving the cooler.

3.5.1 *Clean Tube Capacity.* The Net Refrigerating Capacity in Btu/h [W] of the liquid cooler with clean tubes at the Rating Condition chosen per Table 1.

3.6 *Published Rating.* A statement of 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 Remote Type Refrigerant-Cooled Liquid Coolers of like nominal size and type (identification) produced by the same manufacturer. As used herein, the term Published Rating includes all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated Rating Conditions.

3.6.1 *Application Rating.* A rating based on tests performed at Application Rating Conditions.

3.6.2 *Standard Rating.* A rating based on tests performed at Standard Rating Conditions.

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