

OPERATIONS MANUAL

UNIT COOLERS FOR REFRIGERATION CERTIFICATION PROGRAM

AHRI CERTIFIED®
www.ahridirectory.org

Unit Coolers for Refrigeration
AHRI Standard 420

UC OM – DECEMBER 2019

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PREFACE

The following manual outlines the procedures and policies of the Performance Certification Program for Unit Coolers for Refrigeration (UC) operated by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). This manual is to be used in conjunction with the AHRI General Operations Manual for AHRI Certification Programs. Where the AHRI General Operations Manual and this product-specific manual differ, this product-specific operations manual shall prevail.

The revision of this manual supersedes all previous revisions. The current edition of this manual, as well as the AHRI General Operations Manual, can be accessed through the AHRI website, www.ahrinet.org.

The UC Certification Program by AHRI provides for independent verification of the Unit Coolers manufacturers' stated equipment performance. Safety criteria are not within the scope of this program.

Participation in the program is voluntary. Any manufacturer, regardless of AHRI membership, may obtain approval of Program Ratings and use of the AHRI UC Certification Mark, hereinafter referred to as the "Mark". The Mark is the Participant's public representation that the ratings of randomly selected units have been verified by an independent laboratory in accordance with test procedures prescribed by this operation manual. A Certification Agreement is executed between the manufacturer and AHRI specifying the conditions under which such Ratings and the Mark may be used. No manufacturer has the right to use Program Ratings or to state that their products have been tested in conformance with the procedures outlined in this Rating Procedure unless and until they have received written authority from AHRI to use the Mark as applied to the specific approved Program Ratings.

This Operations Manual has been prepared to assure that administration of the program is carried out in a uniform manner. It is an amplification of the Certification Agreement signed by licensees and AHRI. General information, procedural details, and copies of forms are included in this Operations Manual. Provisions of the Operations Manual may be amended as provided in the Certification Agreement.

This certification program complies with requirements of the ISO/IEC Standard 17065:2012, *General Requirements for Bodies Operating Product Certification Systems*.

Notes:

This manual supersedes the Unit Coolers Operations Manual, January 2018.

CERTIFICATION OPERATIONS MANUAL FOR

UNIT COOLERS FOR REFRIGERATION

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1. Program Overview

1.1 Applicable Rating Standard. It is mandatory for program Participants to comply with the provisions of the latest edition of AHRI Standard 420, *Performance Rating of Forced-Circulation Free-Delivery Unit Coolers for Refrigeration* (Standard). A copy of the Standard is available for download from the AHRI website, www.ahrinet.org.

1.2 Product Definitions.

1.2.1 Forced-Circulation Free-Delivery Unit Coolers for Refrigeration (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. These may also be referred to as Air Coolers, Cooling Units, Air Units or Evaporators. Unit Coolers utilize a Volatile Refrigerant fed by either direct expansion or liquid overfeed with ratings based on wet and/or dry conditions.

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

1.2.3 Custom Unit. A unit that is not listed, neither in a catalog, specification sheet, selection program nor generally advertised for sale that is a special order in which customer requested components or additions change the performance such that ratings can no longer be obtained by utilizing the Participant's Selection Rating Software. Custom Units shall not be certified and shall not be listed in the AHRI Directory of Certified Product Performance (Directory).

1.3 Program Scope. This program applies to Production Models of Unit Coolers, as defined in Section 1.2, and meet the following criteria:

- Use refrigerant R-717 for DX and/or liquid overfeed coils;
- Aluminum fin material;
- Single vertical coil;
- Horizontal only air flow direction (the air flows to or from the inlet face of the coil from or to the fan inlet, with no change in direction); and
- Axial fans only.

A Unit Cooler within the program scope but outside the testing capability of the Independent Third-party Laboratory Contracted by AHRI (Laboratory) or AHRI Approved Test Stand within a Facility (Facility) shall be certified under this program, provided that it meets the requirements outlined in Appendix A.

1.3.1 Program Scope Exclusions. This certification program does not include:

- Air-conditioning units used primarily for comfort cooling;
- Unit Coolers operating at latent load conditions with Refrigerant Saturation Temperatures less than 32 °F [0.0 °C] to prevent frost;
- Unit Coolers installed in or connected to ductwork; or
- Unit Coolers using zeotropic refrigerants with temperature Glides greater than 2.0 °F [1.1 °C].

1.4 Intended Market. The Intended Market for this certification program, , includes all products defined in Section 1.3 that are sold for use in the US and Canada (U.S., U.S. Territories, and Canada).

1.5 Basic Model Groups (BMGs). A Participant's listing shall be grouped by (BMG). At minimum, a BMG is a model or models and all iterations of tube pattern (e.g., horizontal and vertical spacing and alignment).

1.5.1 Further Optional Definitions of BMG. The Participant may sub-divide its BMGs. The following are examples of additional parameters, which may be used to sub-divide BMGs.

- Fin spacing;
- Fin thickness;
- Fin type, e.g., flat or other;

- Tube diameter;
- Tube material;
- Tube type, e.g., smooth or enhanced;
- Refrigerant; or
- Refrigerant feed.

2. Qualification Process

2.1 Original Equipment Manufacturer (OEM) Applicants. With the additions noted below, the OEM qualification process will proceed according to the AHRI General Operations Manual, Section 4.

STEP 2.1.1 Certification Application Package. In addition to the Application for AHRI Certification, Annual Certified Sales Volume Form, and product-specific ratings and data, noted in the AHRI General Operations Manual, Section 4, STEP 4.1, Applicants shall submit the following documentation to AHRI:

- Test reports for 100% of BMGs or minimum of four BMGs, whichever is greater;
- If the Applicant manufactures R-717 samples within the program scope and chooses to conduct witness testing at its AHRI Approved Test Stand within a Facility (Facility), all required forms per Section 3.3.1 of this manual for Witness Testing Facility Approval shall also be submitted; and
- Copy of or access to Applicant’s Selection Rating Software (refer to Section 3.7).

STEP 2.1.2 Processing Application Package.

STEP 2.1.2.1 Performance Certification Agreement for Original Equipment Manufacturer (OEM Agreement). No further action required beyond that listed in Section 4, STEP 4.2 of the AHRI General Operations Manual.

STEP 2.1.2.2 Participation and Licensing Fee Invoice. Payment of the Participation and Licensing Fee is due within 30 calendar days of the invoice issue date. Testing shall not be conducted until the invoice is paid in full. No further action required beyond that listed in Section 4, STEP 4.2 of the AHRI General Operations Manual.

STEP 2.1.2.3 Selection Rating Software Approval. AHRI shall provide the Applicant with a login/password to a personalized Virtual Machine (VM) to install their Selection Rating Software, or to create a shortcut to the Software’s webpage Once the Applicant notifies AHRI that the Selection Rating Software has been successfully installed, AHRI shall compare the Software at Application Rating Conditions for proportionality (refer to Tables 1 and 2) and grant approval of the Selection Rating Software.

Table1: Capacity Change with Temperature Change		
Temperature Difference (TD)	Evaporator Temperature (°F)	Capacity Change
Increase	Constant	Approx. Proportional Increase
Decrease	Constant	Approx. Proportional Decrease
Constant	Increase	Increase
Constant	Decrease	Decrease

Table 2: Capacity Change with Enthalpy Change				
Evaporator Temperature (greater than 32°F)	Entering Dry-Bulb Temperature	Entering Wet-Bulb Temperature	Enthalpy Difference (HD)	Capacity Change*
Constant	Constant	Increase	Increase	Increase
Constant	Constant	Decrease	Decrease	Decrease

* Capacity Change is approx. proportional to the change in enthalpy difference.

STEP 2.1.3 Selection and Qualification Testing.

STEP 2.1.3.1 Number of Qualification Tests. 20% of an Applicant's BMGs shall be tested, with a minimum of two (2) models. Fractional numbers shall be rounded to the nearest whole number using traditional rounding methods.

STEP 2.1.3.2 Acquisition of Qualification Test Samples/Selection Criteria. Within 90 calendar days of a request from AHRI, the Applicant shall have samples available for testing. AHRI shall choose the point(s) of operation for the sample as applicable based on the Standard and this manual. The point(s) of operation shall be selected from Table 1 of the Standard. The point(s) of operation, used in conjunction with the verified computer rating methods provided by the Applicant, shall be used to generate Published Ratings. AHRI shall supply the Applicant with the point(s) of operation so that proper Unit Cooler configuration can be supplied. Samples shall be acquired in accordance with Section 3 of this manual.

STEP 2.1.3.3 Facility Approval and Sample Selection. If the Applicant has applied to conduct witness testing at its facility (only for R-717 samples), the Independent Third-Party Laboratory contracted by AHRI (Laboratory) shall contact the Applicant to schedule a preliminary witness test facility inspection. Upon final approval of the Applicant's witness test facility and the approval of the Applicant's Selection Rating Software, the Laboratory shall contact the Applicant to schedule initial qualification testing. Section 3 further explains the requirements and procedures for applying and conducting witness testing.

Qualification testing may be scheduled simultaneously with facility inspection; however, should the facility fail inspection the testing shall be delayed until the facility is brought into compliance.

If the Applicant has not applied to conduct witness testing at its facility, the qualification process shall continue with the approval of the Applicant's Selection Rating Software. Upon approval by AHRI, the Laboratory shall contact the Applicant to schedule initial qualification testing.

STEP 2.1.4 Qualification Testing. AHRI shall supply the Laboratory with the Published Ratings. The Laboratory shall conduct testing of the samples in accordance with the Standard, against the Published Ratings.

STEP 2.1.4.1 Successful Completion of All Qualification Tests. If all qualification tests pass proceed to STEP 2.1.5.

STEP 2.1.4.2 First Sample Qualification Test Failure. Refer to Section 4, STEP 4.4.2 of the AHRI General Operations Manual for details regarding the first sample qualification failure options:

STEP 2.1.4.3 Second Sample Qualification Test Failure. Refer to Section 4, STEP 4.4.3 of the AHRI General Operations Manual for details regarding the second sample qualification failure options.

STEP 2.1.5 Welcome to the Program. No further action required beyond that listed in Section 4, STEP 4.5 of the AHRI General Operations Manual.

2.2 Private Brand Marketer (PBM) Applicants. With the additions noted below, the PBM qualification process shall proceed according to the AHRI General Operations Manual, Section 5.

PBM Applicants are not required to undergo qualification testing. PBM product certification is contingent upon the certification of the associated OEM product.

STEP 2.2.1 Certification Application Package. In addition to the Application for AHRI Certification and product-specific ratings and data noted in the AHRI General Operations Manual, Section 5, STEP 5.1, Applicants shall submit the following documentation to AHRI:

- Copy of or access to Applicant's Selection Rating Software (refer to Section 3.7)

STEP 2.2.2 Processing Application Package.

STEP 2.2.2.1 Performance Certification Agreement for Private Brand Marketer (PBM Agreement). No further action required beyond that listed in Section 5, STEP 5.2.1 of the AHRI General Operations Manual.

STEP 2.2.2.2 OEM Agreement on Behalf of the PBM Applicant. No further action required beyond that listed in Section 5, STEP 5.2.2 of the AHRI General Operations Manual.

STEP 2.2.2.3 Licensing Fee Invoice. Payment of the Licensing Fee is due within 30 calendar days of the invoice issue date.

STEP 2.2.3 Selection Rating Software Approval. AHRI shall provide the Applicant with a login/password to a personalized Virtual Machine (VM) to install their Selection Rating Software, or to create a shortcut to the Software's webpage. Once the Applicant notifies AHRI that the Selection Rating Software has been successfully installed, AHRI shall compare the Software at Application Rating Conditions for proportionality (refer to Tables 1 and 2) and grant approval of the Selection Rating Software.

STEP 2.2.4 Welcome to the Program. No further action required beyond that listed in Section 5, STEP 5.3 of the AHRI General Operations Manual.

3. Equipment Selection and Testing

3.1 Annual Testing Requirement. 20% of a Participant's BMGs shall be tested annually, with a minimum of two (2) models. Fractional numbers shall be rounded to the nearest whole number using traditional rounding methods.

3.2 Location of Tests. Testing shall be performed at the Facility. The sample shall be installed in the test facility in accordance with the Participant's published installation instructions in printed or electronic format.

. The Facility shall be approved by AHRI prior to any test being conducted. Testing shall continue to be conducted at the Participant's Facility, contingent upon it remaining AHRI-approved, or until the Participant notifies AHRI, in writing, of its desire to change facilities. All tests, regardless of location, shall be conducted or witnessed by the Laboratory's Representative (Representative).

3.3 Witness Testing Procedures and Operations. This Certification Program allows witness testing where Participant personnel, witnessed by the Representative, conduct testing at a Facility. Witness testing requirements are covered in the AHRI General Operations Manual, Section 9 and as specified below.

3.3.1 Application for Witness Testing. A Participant shall submit all of the following to AHRI:

- Form UC-FA1, Application for Witness Testing;
- Form UC-FA2, Personnel Experience Questionnaire;
- Form UC-FA3, Facility and Equipment Questionnaire;
- Form UC-FA4, Calibration Summary;
- A complete list of all instruments and equipment being used to perform certification testing in accordance with the Standard and a copy of each calibration report showing date of last calibration;
- A schematic drawing of the area of the test facility in which AHRI certification testing will be performed; and
- Photographs of the test facility in which AHRI certification testing will take place, which shall include sufficient views to show the location and connection of each instrument.

Electronic copies of these forms are available from AHRI.

3.3.1.1 Acknowledgement of Request. AHRI shall acknowledge receipt of the Participant's application to conduct witness testing. AHRI shall review the material and shall inform the Participant if additional information and/or changes are required for the Facility to meet the Standard.

3.3.2 Inspection of Witness Test Facility. Following preliminary test facility approval based on submitted data, the Representative shall inspect the test facility to verify compliance to the data submitted and to the certification program. Testing may be scheduled simultaneously with facility inspection; however, should the facility fail inspection, the testing shall be delayed until the facility is brought into compliance.

3.3.2.1 Non-Compliant Inspection Results. If the results of the inspection indicate that a Facility is non-compliant with the certification program all discrepancies shall be resolved and resubmitted to AHRI, before approval can be granted to proceed with certified rating tests.

3.3.2.2 Final Approval of Witness Test Facility. Upon acceptable results of the inspection, AHRI shall notify the Facility of final acceptance and approval to proceed with certified ratings tests. AHRI shall provide the Participant with a certificate of approval that shall be displayed in the Facility.

3.3.3 Scheduled Witness Test Facility Re-approval. The Facility shall remain approved for no more than two (2) years. At this time, re-approval shall be required, including submittal of the documents outlined in Section 3.3.1 and inspection outlined in Section 3.3.2.

3.3.4 Unscheduled Facility Re-approval. Any changes that may affect a Facility's ability to function per the certification program requirements shall be required to be re-approved by the Laboratory personnel prior to conducting any witness testing. At this time, re-approval shall be required, including submittal of the documents outlined in Section 3.3.1 and inspection outlined in Section 3.3.2.

3.3.5 Witness Test Operations at a Facility.

3.3.5.1 Advance Set-Up of Sample in the Facility. The Facility personnel may set up the test sample in the Facility prior to the arrival of the Representative. Prior to test commencement, the Representative and the Participant shall verify that the sample is the model selected by AHRI for testing and that the sample has been set up in the Facility in accordance with the Participant's installation instructions and referenced method of test.

3.3.5.2 Duty Assignments of Representative. Sample testing, data acquisition, and data reduction shall be performed by the Facility personnel and assisted and witnessed by the Representative. Participant or Facility personnel shall be on-hand to assist the Representative as requested and are permitted to be present but are not permitted to tamper or adjust samples during tests, unless specifically approved by the Representative responsible for the test.

Verification of instrument application (in accordance with the procedures defined in the Standard) and verification of calibrations shall be performed by the Representative.

3.3.5.3 Use of Laboratory Instrumentation. The Representative shall use primary test instruments belonging to the Facility, in accordance with certification program requirements. The Representative shall provide secondary instrumentation to verify measured data. If the measurement(s) indicate that the Facility instrumentation accuracy may not be in accordance with the certification program requirements, AHRI shall be consulted and the issue resolved prior to conducting the test.

3.3.5.4 Sample Start-Up and Operation. Start-up and operation of the sample shall be in accordance with the Participant's published installation instructions in printed or electronic format.

3.4 Selection of Test Samples. AHRI shall utilize the Participant's AHRI approved Selection Rating Software to select a sample to operate at applicable standard rating conditions per the Standard. The Participant shall build one (1) sample of each model selected.

The Participant shall notify AHRI, within seven (7) calendar days of receiving the selection notice, of any difficulty in producing the samples in the specified time frame. The Participant shall also provide AHRI with the Recirculation Rate for Liquid Overfeed Unit Coolers within seven (7) calendar days of the selection notice. Refer to Section 9 of the AHRI General Operations Manual.

3.5 Methods of Acquiring Test Samples. Selected samples shall be accompanied by the Participant's published installation instructions in printed or electronic format.

3.6 Sample Acquisition Timeframe. Upon notification of selections by AHRI, the Participant shall have 90 calendar days to deliver the samples to the Facility, or conduct witness testing. Extended transit times shall be approved by AHRI staff prior to selection. Prior to test, AHRI shall supply the Facility (if applicable) with the Published Ratings and Mass Flow Rate for Liquid Overfeed Unit Coolers.

Upon notification of selections by AHRI, the Participant shall work with AHRI to determine mutually agreed upon test date which may require the Participant to accelerate product production.

3.7 Selection Rating Software

3.7.1 Requesting Approval of Rating Methods. A Participant shall request approval of its Selection Rating Software by submitting all of the following to AHRI:

- Selection Rating Software, which shall be either personal computer (PC) based, run on MS Windows® platform, or web-based software and allow for selection of any certified product at any Standard Rating Condition per the latest edition of the Standard;
 - For web-based software, the Applicant shall provide AHRI with a link to the Selection Rating Software.
- At Standard Rating Conditions, provide outputs for:
 - Name of Participant;
 - Model Number;
 - Gross Total Cooling Effect, Btu/h;
 - Entering Liquid Temperature, °F;
 - Temperature Difference, °F;
 - Refrigerant Designation;
 - Refrigerant Saturation Temperature, °F;
 - Rated Power, W or hp;
 - Number of Motors;
 - Coil Fin Density, fins per inch or coil fin spacing;
 - Airflow Rate, cfm;
 - Type of Defrost (if applicable);
 - Defrost Heater Power (if applicable), W, and Voltage, V;
 - Feed Type, DX or Liquid Overfeed;
 - Software Name and Version Number;
 - Date of Output Generation;
 - Statement Regarding Certification (Section 3.7.4);
- At Application Rating Conditions, provide outputs for:
 - All parameters listed above;
 - Entering Wet Bulb or Relative Humidity (if applicable), °F
 - Superheat;
 - Mass Flow Rate (Recirculation Rate), lb/min;
 - Nearest Standard Rating Condition;
 - Gross Total Cooling Effect, Btu/h, at the nearest Standard Rating Condition.
- All necessary passwords to access software and updates;
- Instructions for use of the Selection Rating Software; and
- A copy of the Participant(s) published catalog, if applicable.

If the Participant has more than one (1) Selection Rating Software available to users, each software shall be verified by AHRI.

3.7.1.1 Installation of Selection Rating Software. AHRI shall provide the Participant with a login/password to a personalized Virtual Machine (VM) to install their Selection Rating Software, or to create a shortcut to the Software's webpage. The Participant shall generate two (2) random selections to ensure successful software installation and operation. Once the Participant notifies AHRI that the Selection Rating Software has been successfully installed, AHRI shall grant approval of the Selection Rating Software within ten (10) calendar days.

3.7.2 Initial Approval of Selection Rating Software through Published Rating Comparison. AHRI upon receiving the necessary materials shall, if applicable, utilize the Participant's Selection Rating Software to determine computer ratings for a certain set of conditions and compare them for the same conditions as those in the published catalog, if a published catalog exists. The Selection Rating Software output (printout and on-screen display) shall match the published certified ratings from the catalog, if applicable. AHRI may also request selection sheets from customers who have received bids. These selection sheets shall match the Selection Rating Software output.

The Participant shall be notified when the Selection Rating Software has been approved for certification. Upon approval from AHRI, the Participant may release the software to other users. Selection Rating Software released to other users prior to obtaining AHRI approval shall result in a program violation. Also, the Selection Rating Software shall be approved by AHRI prior to field release.

3.7.3 Updates to Previously Approved Software. Per the AHRI General Operational Manual, Section 9.4.1, AHRI shall have an updated copy of any software being used in the field. Any updates shall promptly be provided to AHRI via installation to the Participant's VM. Major changes to software shall go through an Initial Approval as per Section 3.7.2 and adhere to the requirements in Section 7.2.3. The Directory shall be locked and Participants shall not be allowed to make changes to Selection Rating Software version updates until the Participant has obtained approval from AHRI.

3.7.4 Statements Regarding Certification. When possible, for units within the scope of the program, the Mark should be included on the Selection Rating Software outputs.

All Selection Rating Software outputs from an approved Selection Rating Software shall include one of the following statements:

3.7.4.1 For Units Within the Scope of the Program. "Certified in accordance with the AHRI Unit Coolers Certification Program, which is based on AHRI Standard 420. Certified units may be found in the AHRI Directory at www.ahridirectory.org"

3.7.4.2 For Units Outside the Scope of the Program. "Unit is outside of the scope of AHRI Unit Coolers Certification Program, but is rated in accordance with AHRI Standard 420."

3.7.4.3 For Custom Units. "Custom Unit which is not listed or certified within AHRI Unit Coolers Certification Program, but is rated in accordance with AHRI Standard 420."

3.8 Repairs and Adjustments Prior to Testing. Prior to initiation of the test by the Representative, the Participant may request the Representative to make minor adjustments to the unit. Once the thermal test commences, no further adjustments or changes shall be made to the unit.

3.9 Certified Data. At Standard Rating Conditions designated in the Standard, the following certified ratings are verified, by test:

- Rated Power, W or hp; and
- Gross Total Cooling Effect, Btu/h.

3.10 Test Failures

3.10.1 Options Following First Sample Failure. When the Participant is notified of a first sample certified rating failure, the Participant has seven (7) calendar days to select one of the following options:

- Re-rate all models within the failed sample's BMG proportionate to the failed test's results;
 - o If test results for Rated Power are outside the tolerance specified in the Standard, the Participant may be allowed to test an additional model from the same BMG to save the ratings of the BMG:
 - If this unit passes, then only the models with same or similar fan and motor combinations, across all BMGs, will be re-rated.

- If this unit fails, then the representing BMG and models with same or similar fan and motor combinations, across all BMGs, will be re-rated.
- Test second sample of the same model (sample shall be available within the timeframe and procedure allotted in Section 3.6 following notification of decision to AHRI via Manufacturer's Decision Form [MDF]); or
- Obsolete the model, which also obsoletes all models within the corresponding BMG.

3.10.2 Options Following Second Sample Failure. When the Participant is notified of a second-sample certified rating failure, the Participant has seven (7) calendar days to select one of the following options:

- Re-rate all models within the failed sample's BMG proportionate to the failed test's results; or
 - o If test results for Rated Power are outside the tolerance specified in the Standard, the Participant may be allowed to test an additional model from the same BMG to save the ratings of the BMG:
 - If this unit passes, then only the models with same or similar fan and motor combinations, across all BMGs, will be re-rated.
 - If this unit fails, then the representing BMG and models with same or similar fan and motor combinations, across all BMGs, will be re-rated.
- Obsolete the model, which also obsoletes all models within the corresponding BMG.

4. Challenge Tests

Except as noted below, the Challenge Test process shall proceed according to the AHRI General Operations Manual, Section 10.

4.1 Selection Software Verification of Challenged Product. Within seven (7) calendar days of the date the challenge is presented to AHRI, the challenged party's Directory ratings will be locked and an official challenge verification will be run utilizing its selection software. If the software has already been corrected by the challenged party, the verification shall be performed in the new software. If the verification shows a re-rate of the challenged product, the challenger has the option to challenge the re-rated data or drop the challenge.

4.2 Obtaining Equipment for a Challenge Test. Due to the complexities and costs of Unit Coolers, Challenging parties will provide a list of potential third parties to AHRI. AHRI will choose one of the third parties to obtain a sample. AHRI shall approach the challenged party to obtain a sample. It will be necessary to reveal that a product rating has been challenged; however, AHRI will not divulge the name of the challenger.

4.3 Challenge of Application Ratings. When a Participant's AHRI Certified Unit Cooler's Application Ratings are challenged, the Unit Cooler shall be tested at the nearest Standard Rating Condition as listed on the Standard, and at the Application Rating Condition. Should the Unit Cooler pass at the Standard Rating Condition, its certified ratings shall not be affected. Should the Unit Cooler fail at the Application Rating Condition, the challenged party's Selection Rating Software shall be adjusted to make the calculated performance match the test performance within the allowed tolerance, as per the Standard, for the test parameter that failed. The Selection Rating Software revision shall apply to all models within the BMG and the challenged party shall have 90 calendar days from the date of failure notification to revise its Selection Rating Software. AHRI shall use the challenged party's Selection Rating Software to randomly check other models within the BMG at the failed Application Rating Condition before and after the software revision is implemented to confirm that the software revision has been completed. On the Directory, the model that failed the challenge test at the Application Rating Condition shall be denoted with an "S" next to the model number. The "S" designation shall be displayed on the Directory for one (1) calendar year from the date of failure notification.

4.4 Challenge of Ratings of Unit Cooler Capacities outside the Capability of the Laboratory. When Standard Ratings of an AHRI Certified Unit Cooler whose cooling capacity and/or airflow is too large or too small to test at the Laboratory or the Participant's Facility are challenged, a smaller or larger Unit Cooler with the same fin and tube geometry, fin spacing, fin thickness, rows, and similar air velocity (target within +/-5%) shall be selected by AHRI for testing at the Standard Rating Condition. The selected unit shall be the largest or smallest Unit Cooler, respectively, in the Participant's BMG that can be tested in the Laboratory or the Participant's Facility. The number of refrigerant circuits for the selected and challenged units shall be approximately proportional to face area. If the selected Unit

Cooler passes the test at the challenged Standard Rating Condition, and the challenged Unit Cooler has a Gross Total Cooling Effect that is proportional to the selected unit on a coil face area basis, then the challenged Unit Cooler's capacity rating shall remain unaffected. If the challenged Unit Cooler's Gross Total Cooling Effect is proportionally larger than the selected unit on a coil face area basis and exceeds the allowed tolerance for Gross Total Cooling Effect, then the challenged Unit Cooler's Gross Total Cooling Effect and all other too large or too small Unit Cooler capacity ratings shall be adjusted by the following ratio:

$$\frac{\text{Coil Face Area, Challenged}}{\text{Coil Face Area, Selected}} * \frac{\text{Gross Total Cooling Effect, Selected}}{\text{Gross Total Cooling Effect, Challenged}}$$

If the challenge test is for Application Ratings, the above procedure shall be completed accordingly as described in Section 4.3 of this Operations Manual. If a software adjustment is made, both the selected and challenged Unit Cooler model numbers in the AHRI Directory shall be denoted with an "S" for one (1) calendar year.

5. AHRI Directory of Certified Product Performance

All certified products shall be listed in the Directory, www.ahridirectory.org. Certification shall not be implied nor claimed for any product not listed in the Directory. Except as noted below, the Participant shall follow the steps outlined in Section 11 of the AHRI General Operations Manual.

5.1 Publication of Certified Ratings in Certified Directory. The following information pertaining to each model certified shall be published in the Directory:

- AHRI Certified Reference Number;
- Manufacturer;
- Brand Name;
- Model Status;
- Model Number(s) or Designation(s);
- Approved Computer Rating Software Version Number;
- Temperature Difference, °F;
- Refrigerant Type;
- Feed Type;
- Refrigeration Saturation Temperature, °F;
- Gross Total Cooling Effect, Btu/h;
- Rated Power, W or hp;
- Number of Motors;
- Coil Fin Density; and
- Airflow Rate, cfm.

5.2 Data Forms. Each Participant shall list its products by BMG. OEM and PBM Participants shall submit/edit product data via the Directory.

6. Assessment and Payment of Certification Fees

Refer to Section 12 of the AHRI General Operations Manual

7. Issuance of Violations and/or Termination

Refer to Section 14 of the AHRI General Operations Manual.

8. Program Hierarchy, Complaints, and the Appeals Process

Refer to Section 15 of the AHRI General Operations Manual.

9. Proper Use of the AHRI Certification Mark and Claims to Certification

Refer to Section 8 of the AHRI General Operations Manual.

9.1 AHRI Verification and Monitoring of Selection Rating Software and Selection Methods.

9.1.1 Random Comparisons. AHRI shall make random comparisons of the catalog ratings, if applicable, and the computer ratings as a further check procedure to guard against a Participant using software not approved for AHRI Certification.

9.1.2 Additional Monitoring. AHRI may request Participants, users, consulting engineers, etc. to submit copies of specific job conditions and ratings that they have utilized. Additionally, parties may request that AHRI verify the claimed product ratings. AHRI shall compare the ratings with the results obtained through use of the Participant's Selection Rating Software and any significant variations may result in the Participant receiving a program violation. Comparison shall only be made on jobs in which the Selection Rating Software implemented by the user matches that of the verified rating method, including issue date or code, of the current software held by AHRI.

9.1.3 Responsibility of Participant for Software Revisions. Whenever a Participant's catalog and/or Selection Rating Software are revised, the Participant shall promptly supply the revised version(s) to AHRI. Version numbers shall be constructed such that the revision level can be determined by AHRI. The Selection Rating Software shall prominently include a revision code, date, or version identification. The version number must match the version number listed on the performance output data sheet generated from the Selection Rating Software. Once the Participant notifies AHRI that the Selection Rating Software has been successfully installed, AHRI shall grant approval of the Selection Rating Software within five (5) business days.

Upon approval from AHRI, the Participant may release the software to other users. Selection Rating Software released to other users prior to obtaining approval from AHRI shall result in a program violation. The Directory shall be locked and Participants shall not be allowed to make changes to Selection Rating Software version updates until the Participant has obtained approval from AHRI.

9.2 Conflicting Data between Rating Software and Published Ratings. If, at any time, the computer rating output is not in agreement with the certified Published Ratings, AHRI shall notify the Participant of the discrepancy and the Participant shall have 60 calendar days to resolve the discrepancy. If the discrepancy has not been resolved within 60 calendar days, the Participant's approved computer rating software(s) for the line of unit coolers in question shall be removed from the AHRI Directory. Failure to comply with program rules regarding publication/software correction will result in a program violation.

10. Law of Pertinent Jurisdiction

10.1 Use of Manufacturer Test Facilities for Another Manufacturer's Testing. Several manufacturers' test facilities shall be made available to a manufacturer not having a test facility. Manufacturers contemplating such an arrangement should be aware that the delivery of a unit by manufacturer "A" to the test facility of manufacturer "B" may create a relationship between "A" and "B" under the law of pertinent jurisdiction concerning such things as the care and return of the unit.

The respective rights and responsibilities of "A" and "B" may possibly be modifiable by agreement between them, to the extent that the agreement does not violate the law or contravene public policy. In some jurisdictions, the rights of the parties are governed by specific statute. Any concerns regarding such arrangements between manufacturers should be addressed to a competent attorney.

AHRI is not a party to such an arrangement between manufacturers, and bears no responsibility for, and shall not be subject to liability for, any damage, harm or liability of any nature that might result from, arise from, or be associated with such an arrangement or the delivery, testing, or return of a unit involved with such an arrangement.

10.2 *Provisions for Manufacturer's Representative(s)*. The manufacturer being tested (guest manufacturer) shall be permitted to provide personnel to witness the setup, testing, and tear down of the unit. These personnel shall be escorted at all times by the host test facility personnel.

Personnel of the test facility (host manufacturer) shall operate the test facility when conducting the testing to be witnessed by the Representative. The Participant personnel being tested (guest manufacturer) shall not be permitted to participate in the operation of the Facility during test but may supervise the operation and adjustment of the sample.

APPENDIX A:

Criteria for Certifying Large Unit Coolers that are within the Program Scope but cannot be Tested at the Laboratory or the Participant's Facility

Large Unit Coolers that cannot be tested in the Laboratory or the Participant's Facility shall be certified under the AHRI Unit Coolers Certification Program providing that the following conditions are met:

1. The Unit Cooler coil number of rows, fin spacing, and fin thickness match a model that can be tested.
2. The air velocity entering the coil face falls within the range of calculated air velocities for Unit Coolers that can be tested.
3. The Participant's Selection Rating Software used to predict Unit Cooler capacity accounts for circuit temperature change and refrigerant side heat transfer as a function of refrigerant circuit loading and length.

AHRI shall approve the large Unit Cooler ratings if all of the above conditions are met and the large Unit Cooler Ratings are proportional to Unit Coolers that can be tested.