

OPERATIONS MANUAL

COMMERCIAL REFRIGERATED DISPLAY MERCHANTISERS AND STORAGE CABINETS CERTIFICATION PROGRAM



AHRI CRM OM – JANUARY 2017

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PREFACE

The following manual outlines the procedures and policies of the AHRI Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets (CRM) Certification Program 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 General Operations Manual, can be accessed through the AHRI website, www.ahrinet.org.

The CRM Certification Program by AHRI provides for independent verification of the Commercial Refrigerated Display Merchandisers and Storage Cabinets manufacturer's 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 CRM 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 operations 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 this 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*.

Note:

This manual supersedes the AHRI Commercial Refrigerated Display Merchandisers and Storage Cabinets Certification Program Operational Manual - January 2012.

**CERTIFICATION OPERATIONS MANUAL FOR
COMMERCIAL REFRIGERATED DISPLAY MERCHANDISERS AND STORAGE CABINETS**

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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 1200, *Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets* (Standard). A copy of the Standard is available for download from the AHRI website, www.ahrinet.org.

1.2 Product Definitions.

1.2.1 Commercial Refrigerated Display Merchandiser. A cabinet cooled by a refrigerating system for displaying chilled and/or frozen food to be maintained within prescribed temperature limits.

1.2.1.1 Closed Commercial Refrigerated Display Merchandiser. A Commercial Refrigerated Display Merchandiser where food is accessible for removal by opening or moving doors or panels.

1.2.1.2 Open Commercial Refrigerated Display Merchandiser. A Commercial Refrigerated Display Merchandiser where food is accessible for removal without opening or moving doors or panels.

1.2.1.3 Remote Commercial Refrigerated Display Merchandiser. A Commercial Refrigerated Display Merchandiser that has a remote condensing unit.

1.2.1.4 Self-Contained Commercial Refrigerated Display Merchandiser. A Commercial Refrigerated Display Merchandiser that has a completely factory assembled and factory tested refrigerating system in which all of the refrigerant-containing parts are permanently connected at the factory.

1.2.1.5 Self-Service Commercial Refrigerated Display Merchandiser. A Commercial Refrigerated Display Merchandiser, either open or closed, where food is readily accessible and intended to be removed by the consumer.

1.2.1.6 Service Commercial Refrigerated Display Merchandiser. A closed Commercial Refrigerated Display Merchandiser where food is served from behind the unit.

1.2.2 Commercial Refrigerated Storage Cabinet. A closed cabinet cooled by a refrigerating system for storing chilled and/or frozen food to be maintained within prescribed temperature limits.

1.2.2.1 Remote Commercial Refrigerated Storage Cabinet. A Commercial Refrigerated Storage Cabinet that has a remote condensing unit.

1.2.2.2 Self-Contained Commercial Refrigerated Storage Cabinet. A Commercial Refrigerated Storage Cabinet that has a completely factory assembled and factory tested refrigerating system in which all of the refrigerant-containing parts are permanently connected at the factory.

1.2.3 Product Model Operating Modes.

1.2.3.1 Remote Operating Mode. Mode in which a Commercial Refrigerated Display Merchandiser or Storage Cabinet is defined as in Section 1.2.1.3 and 1.2.2.1.

1.2.3.2 Self-Contained Operating Mode. Mode in which a Commercial Refrigerated Display Merchandiser or Storage Cabinet is defined as in Section 1.2.1.4 and 1.2.2.2.

1.2.4 Product Model Operating Temperatures.

1.2.4.1 Medium Temperature. Operating temperature of a Commercial Refrigerated Display Merchandiser or Storage Cabinet that maintains an integrated average product temperature as defined in the Standard for Medium Temperature Applications.

1.2.4.2 Low Temperature. Operating temperature of a Commercial Refrigerated Display Merchandiser or Storage Cabinet that maintains an integrated average product temperature as defined in the Standard for Low Temperature Applications.

1.2.4.3 Ice Cream Temperature. Operating temperature of a Commercial Refrigerated Display Merchandiser or Storage Cabinet that maintains an integrated average product temperature as defined in the Standard for Ice Cream Temperature Applications.

1.2.4.4 Application Temperature. Operating temperature of a Commercial Refrigerated Display Merchandiser or Storage Cabinet that maintains an integrated average product temperature as defined in the Standard for Application product Temperature.

1.3 Program Scope. This program applies to 60 Hz Commercial Refrigerated Display Merchandisers and Storage Cabinets with Operating Modes and Temperatures, as defined in Section 1.2.

1.3.1 Program Scope Exclusions. The following are excluded from inclusion in the certification program:

- Refrigerated vending machines;
- Ice makers;
- Soft serve extruders; and
- Secondary coolant applications.

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

1.5 Basic Model Groups (BMG). A Participant's listings shall be grouped by the following BMGs:

1.5.1 Vertical Multi-Deck, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets with multiple levels or shelves stacked vertically for the display or storage of food product.

1.5.2 Vertical Multi-Deck with Doors, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets with solid or transparent doors and multiple levels or shelves stacked vertically for the display or storage of food product.

1.5.3 Semi-Vertical Multi-Deck, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets with multiple cascading levels or shelves stacked vertically for a cascading presentation or storage of food product.

1.5.4 Service Over Counter, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets that are enclosed with one or multiple levels or shelves and have access openings or doors in the rear. The Display Merchandisers and Storage Cabinets in this BMG provide a visual presentation of food product from the front of the unit, and require another person to access the food product from the rear.

1.5.5 Horizontal, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets with a single level or bin area for the display or storage of food product.

1.5.6 Horizontal with Doors, Display or Storage. Refrigerated Display Merchandisers or Storage Cabinets with solid or transparent doors with a single level or bin area for the display or storage of food product.

2. Qualification Process

2.1 Original Equipment Manufacturer (OEM) Applicants. With the additions noted below, the OEM qualification process shall 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 Form and Annual Certified Sales Volume Form noted in the AHRI General Operations Manual, Section 4, STEP 1, Applicants shall submit the following:

- Form CRM-DS1. Data Submittal Form;
- One test report for each BMG;
- If the Applicant 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;
- Copy of Applicant's Selection Rating Software (refer to Section 3.7), if applicable;
- Copy of applicant's paper catalog; and
- Additional information may be needed to meet EPA ENERGY STAR® program requirements.

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 2.1.3 Selection and Acquisition of Test Samples.

STEP 2.1.3.1 Number of Qualification Tests. For Applicants with four (4) BMGs or fewer, AHRI shall select one (1) model for qualification. For Applicants with five (5) or more BMGs, AHRI shall select two (2) models for qualification.

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 selection. 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, 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 and/or paper catalogs, 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 and/or paper catalogs. 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 the 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 PBM (Private Brand Marketer) 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 witness test facility inspection or initial 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 Form noted in the AHRI General Operations Manual, Section 5, STEP 1, Applicants shall submit the following:

- Certified product data sheets noting PBM/OEM equipment match-ups;
- Copy of Applicant's Selection Rating Software (refer to Section 3.7) if applicable;
- Copy of applicant's paper catalog; and
- Additional information may be needed to meet EPA ENERGY STAR® program requirements.

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 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. For Participants with four (4) BMGs or fewer, AHRI shall select one (1) model for testing annually. For Participants with five (5) or more BMGs, AHRI shall select two (2) models for testing annually.

3.2 Location of Test. The Participant shall elect to conduct testing at the Laboratory or at the Facility. The Participant's 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. The Certification Program allows for 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 CRM-WT1, Request for Approval of Test Facility;
- Form CRM-WT2, Witness Testing Test Facility Inspection;
- Form CRM-WT3, Witness Testing Personnel Experience Questionnaire;
- 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 shall be performed; and
- Photographs of the test facility in which AHRI certification testing shall 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 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. The Representative shall complete applicable portions of Form CRM-WT2.

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 the AHRI, before approval may 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 test facility of final acceptance and approval, via Form CRM-WT1, to proceed with certified ratings tests. AHRI shall provide the Participant with a certificate of approval that is to be displayed in the approved test 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 the conducting of 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 Participant's Facility.

3.3.5.1 Advance Setup of Unit in an AHRI Facility. A Participant may set up the test unit in the Facility prior to the arrival of the Representative. Prior to test commencement, the Representative 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 Participant 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 Instrumentation. The Representative shall use primary test instruments belonging to the Facility, in accordance with certification program requirements. The Laboratory 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 make a Scheduled Production Model Selection based on data contained in the Directory. Annually, Participants shall submit a production schedule to AHRI. AHRI shall utilize the Participant's AHRI approved Selection Rating Software, if applicable, to select a unit to operate within the limits of rating conditions per the Standard. Refer to Section 9 of the AHRI General Operations Manual.

For models that have more than one Operating Temperature (i.e., dual temperature products), the model shall be listed and tested at the Operating Temperature that results in the highest energy consumption.

Since Remote product models are typically sold and performance rated per linear foot (or door), the remote product length shall be selected for annual testing based on the most frequently sold length for a given Participant for the model selected.

If a miter transition display merchandiser used as a corner section between two (2) refrigerated display merchandisers is selected for annual testing, then the miter transition display merchandiser shall be joined to the adjacent refrigerated display merchandisers as specified by the Participant when performing the test.

3.5 Method of Acquiring Test Samples. Selected samples shall be accompanied by the Participant's published installation instructions in printed or electronic format; or be available for Witness Testing at the Facility.

3.6 Sample Acquisition Timeframe. Upon notification of selections by AHRI, the Participant shall have 90 calendar days to deliver the units to, or conduct witness testing at, the Facility. Extended transit times shall be approved by AHRI prior to selection. Prior to test, AHRI shall supply the Laboratory with the Published Ratings.

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 (if applicable).

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 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 application rating condition per the latest edition of the Standard;
- Provide outputs for:
 - Unit Model Number;
 - Total Display Area (TDA);
 - Refrigerated Volume;
 - TDEC (Self-Contained);
 - CDEC (Remote);
 - Version number or other revision coding;
 - Proper claims to AHRI Certification (Refer to Section 3.7.4);
- 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 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. 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 seven (7) 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 for certified units in accordance with the AHRI Brand Usage Manual.

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 Commercial Refrigerated Display Merchandisers and Storage Cabinets Certification Program, which is based on AHRI Standard 1200. 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 Commercial Refrigerated Display Merchandisers and Storage Cabinets Certification Program, but is rated in accordance with AHRI Standard 1200."

3.7.4.3 For Units Within the Scope of the Program, but for Application Ratings. "Unit is within the scope of AHRI Commercial Refrigerated Display Merchandisers and Storage Cabinets Certification Program and is rated in accordance with AHRI Standard 1200."

3.8 Certified Data. In accordance with the Standard, the following certified ratings are verified by test:

3.8.1 Remote Operating Mode.

Calculated Daily Energy Consumption (CDEC), kW·h [kW·h] per day.

3.8.2 Self-Contained Operating Mode.

Total Daily Energy Consumption (TDEC), kW·h [kW·h] per day.

3.9 Verified Data. In accordance with the Standard, the following non-certified ratings are verified by test:

3.9.1 Remote Operating Mode.

| Parameters | Program Requirement | Parameter Units |
|--------------------------|----------------------------|---|
| Refrigerated Volume | Verify | ft ³ [m ³] |
| Total Display Area (TDA) | Verify | ft ² [m ²] |
| CDEC/Refrigerated Volume | Verify | kW·h/ft ³ [kW·h/m ³] per day |
| CDEC/TDA | Verify | kW·h/ft ² [kW·h/m ²] per day |

3.9.2 Self-Contained Operating Mode.

| Parameters | Program Requirement | Parameter Units |
|--------------------------|----------------------------|---|
| Refrigerated Volume | Verify | ft ³ [m ³] |
| Total Display Area (TDA) | Verify | ft ² [m ²] |
| TDEC/Refrigerated Volume | Verify | kW·h/ft ³ [kW·h/m ³] per day |
| TDEC/TDA | Verify | kW·h/ft ² [kW·h/m ²] per day |

3.10 Test Failures.

3.10.1 Options Following 1st Sample Failure. When the Participant is notified of a first sample certified rating failure, it has seven (7) calendar days to select one (1) of the following options:

- Re-rate all models within the failed unit's BMG proportionate to the failed test's results;
- Test second sample of the same model (sample shall be available within 90 calendar days 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 2nd Sample Failure. When the Participant is notified of a second sample certified rating failure, the Participant has seven (7) calendar days to select one (1) of the following options:

- Re-rate all models within the failed unit's BMG proportionate to the failed test's results; or
- Obsolete the model, which also obsoletes all models within the corresponding BMG.

3.11 Consequences for Improper Ratings.

3.11.1 Double Selection Mode Requirements. Except as noted below, the Double Selection Mode Requirements shall proceed according to Section 9 of the AHRI General Operations Manual.

3.11.1.1 For Witness Testing at the Facility and Units Tested at the Laboratory. Upon notification of selection from AHRI, the Participant shall provide one (1) sample of each model. If the first sample fails and the Participant chooses to test a second sample, a sample shall be available within 90 calendar days following notification of decision to AHRI via Manufacturer's Decision Form (MDF).

3.11.2 Probation Mode Requirements. Except as noted below, the Probation Mode Requirements shall proceed according to Section 9 of the AHRI General Operations Manual.

3.11.2.1 For Witness Testing at the Facility and Units Tested at the Laboratory. Upon notification of selection from AHRI, the Participant shall provide one (1) sample of each model. If the first sample fails and the Participant chooses to test a second sample, a sample shall be available within 90 calendar days following notification of decision to AHRI via Manufacturer's Decision Form (MDF).

3.11.3 Penalty Mode Requirements. Except as noted below, the Probation Mode Requirements shall proceed according to Section 9 of the AHRI General Operations Manual.

3.11.3.1 For Witness Testing at the Facility and Units Tested at the Laboratory. Upon notification of selection from AHRI, the Participant shall provide one (1) sample of each model. If the first sample fails and the Participant chooses to test a second sample, a sample shall be available within 90 calendar days following notification of decision to AHRI via Manufacturer's Decision Form (MDF).

3.11.4 Penalty Test. Participants who have only one (1) Refrigerated Display Merchandisers or Storage Cabinets tested within the program year shall be subject to Penalty Test in the event of an involuntary re-rate. (Refer to Section 9.15.3.1 of the AHRI General Operations Manual).

4. Challenge Tests

Refer to Section 10 of the AHRI General Operations Manual.

5. AHRI Directory of Certified Product Ratings

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

- AHRI Reference number;
- Model Status;
- Trade/Brand Name of Model;
- Manufacturer;
- Model Number(s) or Designation(s) ;
- Product Model Type;
- Product Model Operating Mode;
- Product Model Operating Temperature, ° F [° C];
- Refrigerant Type;
- Refrigerated Volume, ft³ [m³];
- Adjusted Volume (Refrigerator/Freezers), ft³ [m³];
- TDEC (Self-Contained), kW·h [kW·h] per day;
- CDEC (Remote) kW·h [kW·h] per day;
- TDEC/ Volume (Self-Contained), kW·h/ft³ [kW·h/m³] per day;
- Total Display Area (TDA) (Self-Contained),ft²[m²];
- TDEC/TDA (Self-Contained), kW·h/ft² [kW·h/m²] per day;
- CDEC/Volume (Remote), kW·h/ft³ [kW·h/m³] per day;
- CDEC/TDA (Remote), kW·h/ft² [kW·h/m²] per day;
- Merchandiser Lights;
- Number of Shelves;

- Shelf Lights;
- Fan Motor Type;
- Defrost Method;
- Merchandiser Heat;
- Doors;
- Approved Selection Rating Software Version Number, if applicable.

5.2 Data Forms. Each Participant shall list its products, by BMG, on Form CRM-DS1. OEM and PBM Participants shall submit/edit product data via the Directory or data submittal sheets, as applicable.

6. Assessment and Payment of Certification Fees

Except as noted below, the assessment and payment of certification fees shall proceed according to the AHRI General Operations Manual, Section 12.

6.1 Equipment Disposal Fees. The Participant is responsible for the delivery and expenses associated with shipping test samples to and from the Laboratory. Following the completion of the test, the Participant shall provide instruction to the Laboratory regarding the disposal/shipment of the sample(s). The Laboratory shall invoice the Participant for expenses associated with the disposal/shipment of the sample from the Laboratory's facility to a location designated by the Participant.

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.

Except as noted below, the Program hierarchy, complaints and the appeals process shall proceed according to the AHRI General Operations Manual, Section 15.

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

Except as noted below, refer to the AHRI Brand Usage Manual.

9.1. Publication of Non-Certified Ratings. Some products certified through the AHRI CRM Certification Program may be capable of operation at conditions outside the scope of the certification program. Units where full load operation is within the scope of the certification program shall be considered certified. Participant's printed materials and Selection Rating Software may contain non-certified ratings; however it shall be clearly indicated that such ratings are outside the scope of the AHRI CRM Certification Program as per Section 3.7.4.

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

9.2.1 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 by AHRI.

9.2.2 Responsibility of Participant for Catalog/Software Revisions. Whenever a Participant's catalog and/or Selection Rating Software is revised, the Participant shall promptly supply the revised version(s) to AHRI. Version numbers shall comply with the following:

- Version number shall be in increasing numerical order so that the revision level can be determined by AHRI;
- Software outputs shall prominently display a revision code, software name, date, or version identification;
- Version number shall match the number listed on the performance output data sheet generated from the Selection Rating Software and the Directory; and
- Version number shall be tied to ratings; if any ratings are changed, a new version of the software shall be issued.

Once the Participant notifies AHRI that the Selection Rating Software has been successfully installed, AHRI shall grant approval of the Selection Rating Software within seven (7) calendar 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 Software Rating version updates until the Participant has obtained approval by AHRI.

9.2.3 Data Comparison Between Rating Software and Catalog. Catalogs shall be consistent with the current Selection Rating Software at time of publication. Current versions shall be listed in the Directory at the time of release. Any published catalog shall make reference to the version number of the Selection Rating Software to which it corresponds. AHRI considers the Selection Rating Software output to be the primary source of information.

If, at any time, the referenced Selection Rating Software is not in agreement with the catalog, or if the catalog or Selection Rating Software does not correspond to the version listed in the Directory, the Participant shall be issued a program violation notifying them of the discrepancy and shall have 60 calendar days to resolve the discrepancy.

APPENDIX A. TEST REPORT PARAMETERS

Remote Operating Mode

The following parameters, at minimum, shall be recorded on each test report for remote-operating mode models.


| Parameter | Parameter Units |
|---|--|
| Manufacturer's Name | None |
| AHRI Test Number | None |
| AHRI Reference Number | None |
| Date of Test | None |
| Location of Test | None |
| Model Number | None |
| Product Model Operating Temperature Type | (Ice Cream, Low, Medium, or Application) |
| Length | ft [m] |
| Adjusted Dew Point | ° F [° C] |
| Q _{rt} Load Capacity | Btu/h [kW] |
| Test Voltage | V |
| Evaporator Dew Point Temperature | ° F [° C] |
| Integrated Average Temperature of Product Simulators | ° F [° C] |
| Compressor Energy Consumption (CEC) | kW·h [kW·h] per day |
| Fan Energy Consumption (FEC) | kW·h [kW·h] per day |
| Light Energy Consumption (LEC) | kW·h [kW·h] per day |
| Condensate Evaporator Pan Energy Consumption (PEC) | kW·h [kW·h] per day |
| Anti-condensate Energy Consumption (AEC) | kW·h [kW·h] per day |
| Defrost energy Consumption (DEC) | kW·h [kW·h] per day |
| Ambient Dry-Bulb Temperature | ° F [° C] |
| Ambient Wet-Bulb Temperature | ° F [° C] |
| Calculated Daily Energy Consumption (CDEC) | kW·h [kW·h] per day, indication of PASS or FAIL per tolerances of AHRI Standard 1200, % PASS or FAIL (Tested Value/Published Rating x 100) |
| Refrigerated Volume | ft ³ [m ³], % verified value to published value (verified value/published value x 100) |
| Total Display Area | ft ² [m ²], % verified value to published value (verified value/published value x 100) |
| Calculated Daily Energy Consumption/Refrigerated Volume | kW·h/ft ³ [kW·h/m ³] per day, % verified value to published value (verified value/published value x 100) |
| Calculated Daily Energy Consumption/Total Display Area | kW·h/ft ² [kW·h/m ²] per day, % verified value to published value (verified value/published value x 100) |

Self-Contained Operating Mode

The following parameters, at minimum, shall be recorded on each test report for self-contained operating mode models.

| Parameter | Parameter Units |
|--|--|
| Manufacturer's Name | None |
| AHRI Test Number | None |
| AHRI Reference Number | None |
| Certified Number | None |
| Date of Test | None |
| Location of Test | None |
| Model Number | None |
| Product Model Operating Temperature Type | (Ice Cream, Low, Medium, or Application) |
| Length | ft [m] |
| Test Voltage | V |
| Integrated Average Temperature of Product Simulators | ° F [° C] |
| Ambient Dry-Bulb Temperature | ° F [° C] |
| Ambient Wet -ulb Temperature | ° F [° C] |
| TDEC | kW·h [kW·h] per day, indication of PASS or FAIL per tolerances of AHRI Standard 1200, % PASS or FAIL (Tested Value/Published Rating x 100) |
| Refrigerated Volume | ft ³ [m ³], % verified value to published value (verified value/published value x 100) |
| TDA | ft ² [m ²], % verified value to published value (verified value/published value x 100) |
| TDEC/Refrigerated Volume | kW·h/ft ³ [kW·h/m ³] per day, % verified value to published value (verified value/published value x 100) |
| TDEC/TDA | kW·h/ft ² [kW·h/m ²] per day, % verified value to published value (verified value/published value x 100) |

APPENDIX B: FORM CRM-DS1

| | |  |
|---|---|--|
| AHRI SYSTEM | | REQUIRED SECTION (complete all) |
| 1 | OEM: | Manufacturer Name as listed in the directory |
| 2 | Location: | Manufacturer Location |
| PROGRAM & PRODUCT IDENTIFIERS | | REQUIRED SECTION (complete all) |
| 3 | AHRI Program: | CRM |
| 4 | Trade/Brand Name: | AHRI Certification Program - CRM |
| PRODUCT MODEL CHARACTERISTICS | | COMPLETE ONLY THE APPROPRIATE FIELDS |
| 5 | BMG | REQUIRED - Select one: Vertical Multi-Deck, Display and Storage; Vertical Multi-Deck with Doors, Display and Storage; Semi-Vertical Multi-Deck, Display and Storage; Service Over Counter, Horizontal, Display or Storage; Horizontal with Doors, Display and Storage |
| 6 | Product Model Operating Mode | REQUIRED - Select one: Self-Contained, Remote Condensing |
| 7 | Product Model Operating Temperature | REQUIRED - Select one: Medium-Temperature; Low Temperature; Ice Cream Application Temperature |
| 8 | Refrigerant Type | REQUIRED - Select one: R-11; R-12; R-23; R-113; R-114; R-123; R-125; R-134A; R-245A+; R-401A; R-401B; R-402A; R-402B; R-404A; R-407A; R-407B; R-407C; R-407D; R-407E; R-408A; R-408A; R-409A; R-410A; R-411C+; R-414A+; R-414B+; R-416A; R-502; R-507; R-507A; R-508; R-508A; R-508B; R-600 |
| 9 | Model Number: | REQUIRED - alpha numeric up to 50 characters |
| 10 | Merchandiser/Cabinet Lights | REQUIRED - Select one: Fluorescent Lamps, Fiber Optic Lighting, Incandescent Lights, LED Lamps, No Lights |
| 11 | Number of Shelves | REQUIRED - Whole number |
| 12 | Shelf Lights | REQUIRED - Select one: Fluorescent Lamps, Fiber Optic Lighting, LED Lamps, Non-Lighted Shelves |
| 13 | Type of Fan Motor | REQUIRED - Select one: Electrically Commutated Motor, Permanent Split Capacitor Motor, Shaded Pole Motor |
| 14 | Method of Defrost | REQUIRED - Select one: Electric Defrost, Off-time Defrost |
| 15 | Merchandiser/Cabinet Heat | REQUIRED - Select one: Anti-Sweat and Evaporator Pan Heater(s), Anti-Sweat Heater(s), Condensate Evaporator Pan Heater, Non-Heated |
| 16 | Doors | REQUIRED IF BMG includes 'with doors' - Select one: Anti-Sweat and Evaporator Pan Heater(s), Anti-Sweat Heater(s), Condensate Evaporator Pan Heater, Non-Heated |
| 17 | Product Category | REQUIRED IF BMG includes 'with doors' and Operating Mode - Self-Contained - Select one: Refrigerators with solid doors, Refrigerators with transparent doors, Freezers with solid doors, Freezers with transparent doors, Refrigerators/Freezers with solid doors |
| 18 | CDEC (k-Wh/ft-day) | REQUIRED IF - Remote Condensing. Two decimals, no negative values |
| 19 | TDEC (k-Wh/ft-day) | REQUIRED IF - Self Contained. Two decimals, no negative values |
| 20 | AHAM Volume (ft³) | REQUIRED IF BMG includes 'with doors' and Operating Mode - Self-Contained - One or the other values, not both. Two decimals, no negative values |
| 21 | Adjusted Volume Refrigerators/Freezers | REQUIRED IF - Remote Condensing. Two decimals, no negative values |
| 22 | Volume (ft³) | REQUIRED IF - Remote Condensing. Two decimals, no negative values |
| 23 | TDA (ft²) | REQUIRED IF - Remote Condensing. Two decimals, no negative values |
| 24 | TDA (ft²) | REQUIRED IF - Self Contained and BMG does not contain 'with doors'. Two decimals, no negative values |
| 25 | Energy Usage for Alternate Configuration | REQUIRED IF - Remote Condensing. Voluntary if Self-Contained. Must be an html link to your program |
| 26 | Program Version Certified | REQUIRED IF - Remote Condensing. Voluntary if Self-Contained. |
| 27 | Sold in California | REQUIRED - Yes or No |
| COMMENTS | | OPTIONAL SECTION |
| 28 | Testing Comments: | remarks used for testing purposes |
| DIRECTORY FOOTNOTES | | OPTIONAL SECTION |
| 29 | Footnotes: | |
| that the model listed above meets all of the requirements of the applicable AHRI standards. | | |
| Signed: _____ | | Title: _____ |

APPENDIX C: WITNESS TESTING DOCUMENTS

Form CRM-WT1

REQUEST FOR APPROVAL OF TEST FACILITY

**AHRI COMMERCIAL REFRIGERATED DISPLAY MERCHANDISERS AND STORAGE CABINETS
CERTIFICATION PROGRAM**

We, the undersigned, hereby request the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) to approve our test facility, located at *(state exact address)*:

for the purpose of conducting certification tests on Commercial Refrigerated Display Merchandisers and Storage Cabinets per the latest edition of AHRI Standard 1200. We certify that all testing shall be done according to the testing codes and certified rating programs approved by AHRI.

Accompanying this request is the following information:

1. Forms CRM-WT2, Witness Testing Facility Inspection;
2. and CRM-WT3, Witness Testing Personnel Experience Questionnaire;
3. A complete list of all instruments and equipment being used to perform certification testing in accordance with AHRI Standard 1200 and a copy of each calibration report showing date of last calibration;
4. A schematic drawing of the area of the test facility in which AHRI certification testing shall be performed; and
5. Photographs of the test facility in which AHRI certification testing shall take place, which shall include sufficient views to show the location and connection of each instrument.

In signing this form and submitting all information requested above, we acknowledge that the test facility is in conformance with all of the provisions of the latest edition of AHRI Standard 1200.

Signature of Certification
Program Compliance Officer

Signature of Chief Engineer
or Test Facility Director

Printed Name

Printed Name

Title and Company

Title and Company

Date

Date

Final approval of this test facility to conduct witness testing in support of the AHRI Certification Program for Commercial Refrigerated Display Merchandisers and Storage Cabinets is contingent upon AHRI's approval of the information provided and satisfactory completion of a facility and equipment inspection. AHRI shall notify the Participant, in writing, when final approval of the test facility to conduct witness testing has been granted. Final approval shall be received before any AHRI certification tests, including program qualification tests, can be conducted in the test facility.

Form CRM-WT2

WITNESS TESTING FACILITY INSPECTION

AHRI COMMERCIAL REFRIGERATED DISPLAY MERCHANDISERS AND STORAGE CABINETS CERTIFICATION PROGRAM

Instructions: Participant shall complete all applicable portions of form at time of request for preliminary witness test facility approval. At time of inspection the Laboratory Representative shall verify the Participant's data and initial each section to signify verification and acceptance of the Participant's data. Any discrepancy shall be noted and explained by the Laboratory Representative in the "Notes" section of the form.

Participant's Name: _____

Location: _____

| TO BE FILLED OUT BY PARTICIPANT | LABORATORY REPRESENTATIVE'S INITIALS SIGNIFYING VERIFICATION AND ACCEPTANCE |
|--|---|
| Facility Operating Range | |
| (a) Refrigeration Capacity, BTU/H | |
| Minimum: | |
| Maximum: | |
| (b) Condensing Water Flow, gpm | |
| Minimum: | |
| Maximum: | |
| (c) Ambient Condition Control | |
| (d) What type of instrumentation is used for humidity control? | |
| (e) Humidity Range | |
| (f) What type of instrumentation is used for dry bulb temperature control? | |
| (g) Dry Bulb Range | |
| (h) Power Requirement | |
| List all Voltage Service Available (Voltage, Ampacity, Phase) | |
| | |
| | |
| | |

| | |
|---|--|
| Physical Facility Characteristics | |
| (i) What is the lift capacity? | |
| (j) What is the largest unit your facility can accommodate? L: H: D: | |
| Instrumentation [also see section (p)] | |
| (k) Are the temperature measuring instruments capable of the range and accuracy specified in AHRI Standard 1200? | |
| (l) Are the pressure measuring instruments capable of the range and accuracy specified in AHRI Standard 1200? | |
| (m) Are the flow measuring instruments capable of the range and accuracy specified in AHRI Standard 1200? | |
| Data Acquisition System | |
| (n) Explain your total data acquisition system should you employ a computer. List all hardware and software. What data do you obtain? | |

Facility Staffing and Testing Issues

- (o) How many man-hours does it take for you to install a unit for test (fully instrumented)? _____
- (p) How long does it take you to conduct a standard rating test (start to finish, including calculations)? _____
- (q) How many shifts per day shall you employ for AHRI testing? _____

FOR INDEPENDENT LAB REPRESENTATIVE: Instruments in the facility match those listed on Form CRM-WT1. Initials: _____

- (r) Other data pertinent to compliance with AHRI Standard 1200, if necessary: _____

NOTES: _____

Participant

Date

Laboratory Representative

Date

Form CRM-WT3

WITNESS TESTING PERSONNEL EXPERIENCE QUESTIONNAIRE

AHRI COMMERCIAL REFRIGERATED DISPLAY MERCHANDISERS AND STORAGE CABINET CERTIFICATION PROGRAM

Participant (Company) Name: _____

Test Facility Address: _____

Brand Name(s) to be Tested in Facility: _____

The following personnel are directly responsible for conducting the testing that will be witnessed at the Participant's test facility in accordance with the AHRI Commercial Refrigerated Display Merchandisers and Storage Cabinets Certification Program:

1. Name (Primary) _____

Title: _____

Area of Responsibility for Certification Testing:

2. Name (Alternate) _____

Title: _____

Area of Responsibility for Certification Testing:

Submitted by:

Signature: _____

Title: _____

Printed Name: _____

Date: _____