



Class XI: Refrigerant Charge & Airflow

Class Code: 121109RN

Location: CalCERTS, Inc.
133 L St., Ste C, Sacramento, CA 95814
Phone: (916) 985-3400 x301

Times: 8:00 am-5:00 pm, 9 hours

Instruction Time: 6.5 Hours of Instruction

CEUs: .65 continuing education units are offered by CalCERTS after successful completion

Cost: \$250 per person*

You can sign up for the class on-line and pay via credit card at:
www.calcerts.com or call 916.985.3400 x301

***Please Note:** There is an annual \$120.00 subscription fee due if you choose to become a CalCERTS HERS Rater. This fee covers your CalCERTS HERS membership and the administrative duties on our part to maintain your records.

***Prices subject to change without notice.**

Project uploads for compliance verifications, whole-house ratings, and/or Energy Star certifications are subject to additional fees.

Target Market for this Course:

The **Refrigerant Charge & Air Flow** class is only for current CalCERTS Field Verification and Diagnostic Testing Raters who are seeking the credential to be authorized to test and verify refrigerant charge and air flow for ducted HVAC systems for T-24 compliance.

Learning Objectives:

Class XI: Refrigerant Charge & Airflow is a 1 day class taught by qualified CalCERTS, Inc. trainers and long-time experts on energy efficiency programs and diagnostic testing. The intent of this class is to provide candidates with background knowledge about, and the California rules/standards/calculations for the tests, as well as detailed hands-on instruction on how to perform the Refrigerant Charge & Airflow test and inspection as outlined in Section RA3.2 of the California 2008 Reference Appendices (CEC-400-2008-004-CMF). This course will take place in a classroom and in a lab setting, where stations are specifically designed to train candidates on the proper procedure to conduct a Refrigerant Charge & Airflow test on an Air Conditioning unit. After successful completion of this class candidates will be qualified to perform the following:

- Obtain Accurate pressure/temperature readings from refrigeration gauges
- Obtain accurate temperature readings from electronic thermometer and temperature sensors.
- Check the calibration of refrigerant gauges
- Check the calibration of electronic thermometers/sensors
- Determining appropriate locations for instrument attachment
- Calculate the measured superheat and temperature split

- Determine the required superheat and temperature split based on conditions
- Determine if measured values are within acceptable range

Contractors and HVAC technicians who are already EPA certified and are experienced charging residential A/C systems may challenge the exam (take the exam without sitting through the class) by providing a copy of your EPA certificate and evidence of previous training (e.g., NATE, Check-Me, utility training, etc.). You must also sign an affidavit stating that you are qualified to perform refrigerant charge verification and provide a copy of your driver's license. Candidates seeking to "challenge" the course but take the exam are highly advised to study section RA3.2, as referenced above, before taking this test or it is very unlikely that you will pass.

For questions about the training call the CalCERTS training office at 916-985-3400 x301 or e-mail training@calcerts.com.

Incoming Skills Necessary:

If you intend to collect the credential that allows refrigerant charge verification by a Rater, the EPA certification that you need is EPA 608 Type II or Universal. You can find a location near you to take this exam by visiting www.epatest.com or look in the yellow pages (or online) for an HVAC supplier near you. This training and certificate is **NOT** included in our course.

Raters who are already EPA certified will need to bring a valid copy of their EPA 608 Type II or higher certification along with photo ID.

In addition, to better prepare candidates for work in the HERS industry, we strongly suggest candidates possess some knowledge, skills, and abilities in the California HERS Program (HERS Basics) and the construction industry. An understanding of the diagnostic tests required of a HERS Rater is also expected.

In the course of your rater work you may also be required to have the following knowledge, skills, and abilities required which are not taught in any CalCERTS trainings:

- High School diploma or GED
- 10th Grade English & Math minimal (especially fractions, percentages, geometry)
- Computer literacy
- Firm grasp of the English language (most codes and regulations are only in English)
- Ability to lift heavy objects (50 lbs. or more)
- Ability to inspect dark, tight, spaces

Prerequisites (for achieving a HERS Rater credential that allows refrigerant charge testing):

To be able to conduct Refrigerant Charge & Air Flow verifications for T-24 you must be a 2008 CalCERTS HERS Compliance Rater for Alterations **OR** Newly Constructed Homes **AND** meet the EPA 608 Type II or Universal requirements listed above.

Topics Covered in This Class:

- Refrigerant Charge & Airflow types
- Refrigeration Basics
- Refrigeration Definitions & Concepts
- RA3.2 Purpose and Scope
- Standard Charge Measurement Procedure
- Equipment & Instruments

- Calibration of Equipment
- Refrigerant Charge and Metering Device Calculations
- Minimum System Air Flow
- Alternate Charging Method
- Hands-On Lab Testing

Some of the state mandated HERS tests/inspections are not covered in this class if they are specific to a certain credential (e.g., the identification of ice storage air conditioners is only required for Newly Constructed Buildings inspections). These topics are covered in the appropriate class.

Standards of Student Evaluation (for individual certificate issuance):

At the end of Class XI: Refrigerant Charge & Airflow training, all participants will take an open-book, multiple-choice written exam based upon; all the written materials (including resource materials) provided to the student, the presentations in class, and the verbal education by the Trainer(s) within the classroom and the lab.

CalCERTS HERS Rater Written Exam Policies

These rules are intended to ensure fairness, accuracy, consistency and validity of exam results. Failure to abide by these rules could result in ejection, or other disciplinary action.

1. At the beginning of each exam, the proctor will announce the time allowed for the exam. The time allowed is based on the number of questions on the exam. (i.e. 20 questions = 1 hour)
2. The written exam must be taken on the day of instruction (or on the last day if multiple day delivery), no exceptions.
3. A score of 80% overall is required to pass the CalCERTS written exam.
4. Students will not be informed which questions they have missed. They will only be informed of their score and whether they passed or failed.
5. Students must *Pass* the written Exam before they are able to move on and take any associated *Field House Exam*.
6. Candidates must be prepared to show a valid Photo ID.
7. No cell phones may be used during the exam. Calculators will be provided.
8. No laptop computers may be used during the written exam.
9. The CalCERTS training manuals are the only written materials that may be referenced during the written exam. No other books or notes may be used. The answers to every question may be found or deduced from information in the training manuals. No other materials are needed to pass the exam.
10. Students may leave the room during the exam to use the restroom, but must hand over exam packet to Proctor until their return.
11. Students may NOT write in training manual or exam booklet during exam. Scratch paper will be provided.
12. THERE IS NO TALKING OR COMMUNICATING ALLOWED WITH OTHER STUDENTS DURING THE EXAM. This is a professional level exam. You must demonstrate your knowledge of the subject matter without assistance. You may NOT assist others during the exam.
13. There are multiple versions of the exam. They are similar to each other in terms of the topics covered and types of questions. Students will take a different version than those sitting to either side of them.
14. ALL exam packets must be turned in to proctor at the end of the exam.
15. Under no circumstances may exam packets leave the control of the Proctor.

Written Exam Re-test Policies

1. Students will be given one re-test opportunity to pass each written exam (the initial attempt plus one re-test attempt).
2. Students must wait at least 48 hours to re-take the exam.
3. There will be a \$50 charge for each re-test attempt.
4. All of the above exam policies apply to the re-tests as well (except item #2 above).
5. Students who do not pass the second attempt of any written exam must retake the entire class (at full price) and pass the written exam if they wish to continue their pursuit of becoming a HERS Rater.
6. If a student does not pass the written exam after retaking the course for the 2nd time, they will be excluded from becoming a CalCERTS HERS Rater indefinitely.

Materials utilized in this Course:

Each participant will be given a Student Binder with all the applicable written course materials as described in the Course Outline above.

Candidates should bring to class; pencil/pen, calculator, and notepad.

Any required diagnostic testing equipment and associated sundries will be provided by CalCERTS, Inc. Students are welcome to bring their own equipment if they'd like (may not be appropriate for all classes).

For questions about any of our trainings call 916-985-3400 x301 or e-mail training@calcerts.com.