



## REFRIGERATING ENGINEERS & TECHNICIANS ASSOCIATION



# CERTIFIED REFRIGERATION SERVICE TECHNICIAN (CRST)

## Information Handbook and Exam Application Handbook

***Valid for examinations offered January 1, 2019 through December 31, 2019***

RETA is fully committed to maintaining the fairness, impartiality, validity and integrity of all RETA certification programs. RETA policies and procedures are designed to assure that all decisions about certifying every candidate are based solely on the candidate's qualifications and performance on RETA examinations and other certification-related activities.

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The Refrigerating Engineers and Technicians Association does not discriminate on the basis of age, sex, race, creed, disabling condition, religion, national origin, or any other protected characteristic.

# Introduction to the Certified Refrigeration Service Technician (CRST) Handbook

The Refrigerating Engineers and Technicians Association (RETA) was established in 1910. RETA's mission is to enhance the professional development of industrial refrigeration operators and technical engineers.

Certification recognizes an individual's qualifications and demonstrated knowledge. This examination started in August 2018 and builds on content that is supported in seven RETA books that are listed in this Handbook.

Certification is based on knowledge shown by meeting designated eligibility requirements and passing the certification examination. The certification process helps individuals improve their skills and provides employers with a benchmark for evaluating job applicants and employees.

## Objectives

- To establish a nationally recognized standard of experience, education, and training for refrigeration plant operators and supervisors.
- To assist the refrigeration industry in developing and recognizing qualified refrigeration plant operators and supervisors.
- To encourage technical training and education, as well as practical experience, for refrigeration plant operators and supervisors.
- To promote safety in industrial refrigeration facilities.
- To increase public recognition of the skills needed in the industrial refrigeration field.

## RETA Certification Programs

|  |  |   |
|--|--|---|
| <b>RETA Credential</b><br>Certified Assistant Refrigeration Operator ( <b>CARO</b> ) | <b>Certification Criteria</b><br>Show entry-level knowledge needed to <b>assist in refrigeration system operations under supervision</b> | <b>Initial Requirements</b> Score 70 or higher on the CARO exam   |
| Certified Industrial Refrigeration Operator ( <b>CIRO</b> )                          | Show knowledge needed to <b>supervise refrigeration system operations</b>  | Two years' experience plus score 70 or higher on the CIRO exam  |
| <b>Certified Refrigeration Service Technician (CRST)</b>                             | <b>Show knowledge and skills related to technical and operational support for refrigeration systems</b>                                  | <b>Current CARO/CIRO or documentation of at least 4 years of progressively responsible experience in the refrigeration field plus score 70 or higher on the CRST exam</b> |
| Certified Refrigeration Energy Specialist ( <b>CRES</b> )                            | Show knowledge required to <b>manage energy efficiency in refrigeration systems and facilities</b>                                       | Score 70 or higher on the CRES exam plus Document three Energy Efficiency Activities  |
| RETA-Authorized Instructor ( <b>RAI</b> )  | Show ability to <b>teach industrial refrigeration</b> operations   | Show evidence of teaching industrial refrigeration plus Score 80 or higher on the RAI exam  |

## How to prepare for these examinations

RETA publishes a series of books to help refrigeration operators gain the knowledge required to operate industrial refrigeration systems safely and efficiently. Other sources also are available to help candidates master these concepts and skills. Candidates may choose many paths and resources to help them qualify for a RETA credential.

### Study Guides

RETA created Study Guides to help candidates prepare for each certification exam. Each Study Guide can be downloaded free from the RETA website. Study Guides include reference information that will be needed to answer questions during each test. These references will appear on-screen during each test. **Candidates are not allowed to use these study guides during a RETA certification examination.** Candidates should become familiar with these references for the RETA credential they are working toward before taking the test.

- The **CARO Study Guide** provides references candidates will need to be familiar with to answer questions on the CARO examination.
- The **CIRO Study Guide** provides references and screens that candidates will need to be familiar with to answer questions on CIRO exam. This Study Guide also illustrates how to use data in CIRO screens to evaluate and resolve problems in refrigeration system operations.
- The **CRST Study Guide** provides references and screens that candidates will use during the test. This Study Guide also illustrates how to use data in RST screens to evaluate and resolve problems in refrigeration system operations.
- The **CRES Study Guide** provides references and screens that candidates will need to be familiar with to answer questions on the CRES exam. This Study Guide also illustrates how to use data in CRES screens to evaluate and resolve problems in refrigeration system operations. It also provides source information that support for other questions on the CRES exam. CRES candidates need to review this information to be able to answer these questions, but they do not have access to the CRES Study Guide during the full examination.

### Practice Tests

- The **CARO Practice Test** is available for \$59 per attempt. It includes questions like those that will appear on the full CARO Examination. The CARO Practice Test also uses the same the onscreen references that will appear onscreen for the full CARO examination.
- The **CIRO Practice Test** is available for \$59 per attempt. It includes questions like those that will appear on the full CIRO Examination. The CIRO Practice Test also uses the same the onscreen references that will appear onscreen for the full CIRO examination.

### Calculators

All the calculations required in this test can be completed with a simple calculator. A scientific calculator is **NOT** required to perform well on this examination. Bring a simple non-printing calculator to the test. The test center is **NOT** required to provide a calculator.

## Using CRST Study Guide and References Effectively

You will improve your chances of earning your RETA credential by treating the Study Guide for your exam as you would the technical manuals in a refrigeration facility where you work. Just as your job requires that you know what is in operating manuals and when to refer to them to understand or resolve a problem, the test requires that you know what is in the References document and when to use it. **You will NOT be told when to use the references for this test.**

## Using References On-Screen

References for each RETA test are in a PDF that appears on the screen next to test questions. You will have the following tools for using the PDF.

- Move the red vertical line separating the two sections from side to side to assign more screen space to the References or to questions.
- Zoom in or out to make pages in the References PDF larger or smaller by clicking on the plus (+) or minus (-) symbols at the top of the screen. This tool bar disappears after a few seconds. The toolbar reappears when you move the mouse over the References document.
- Scroll from page to page to find the location in the References that has the table, formulas or other information you want to use.

The following screens show how this will work during the test.

Screen 1 The sample question asks about controlling an ammonia fire. The References document title page appears on the right side of the screen.

The screenshot shows a split-screen interface. On the left, a question is displayed with a time remaining of 2:59:35. The question asks: "Which of these becomes a risk from trying to control an ammonia fire with a CO<sub>2</sub> extinguisher?" with four multiple-choice options: A. Carbon dioxide may displace oxygen, B. Ammonia becomes more explosive in confined spaces, C. Water spray increases the risk of injury from ammonia gas, and D. Ammonia gas usually ignites at vapor concentrations above 60%. Below the question are buttons for "Next", "Review All", and "Submit Exam". On the right, the "CARO Exam References" document is open to the title page of the "Refrigerating Engineers & Technicians Association" (RETA). The title page features the RETA logo, which is a gear with "RETA" in the center and "EDUCATION", "EFFICIENCY", and "DEVELOPMENT" around the perimeter. Below the logo is the text "CARO EXAM REFERENCES" and "Table of Contents". The table of contents lists: Formulas (2), Refrigerant Characteristics (3), Theoretical Discharge Temperatures of Ammonia (3), Conditions of Ammonia at Various Operating Pressures (4), Ammonia Safety Data Sheet (SDS) (5), Ammonia Saturated Properties Table (14), and HCFC-22 Saturated Properties Table (22). At the bottom of the title page is the copyright notice: "© 2015 REFRIGERATING ENGINEERS & TECHNICIANS ASSOCIATION".

The toolbar at the top of the References document allows you to zoom in and zoom out by clicking the plus (+) or minus (-) symbols. The toolbar disappears after a few seconds. The toolbar reappears when you move the mouse over the References document. You cannot use the save or print functions in the toolbar during the test. If you click on those icons, you need to click "Cancel" in the menu that appears for either function to return to References.

Information to help answer the question appears in the Ammonia SDS. Scroll to the opening page of the SDS.

**Time Remaining: 2:58:30**

1. Which of these becomes a risk from trying to control an ammonia fire with a CO<sub>2</sub> extinguisher?

- A.  Carbon dioxide may displace oxygen.
- B.  Ammonia becomes more explosive in confined spaces.
- C.  Water spray increases the risk of injury from ammonia gas.
- D.  Ammonia gas usually ignites at vapor concentrations above 60%.

Mark this item for later review.

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**Section 1 – Identification of the Product and Manufacturer**

**GHS Safety Data Sheet**  
 Revision Issued: 5/20/2014 | Supersedes: 2/22/2012  
 (Sections changed: No Changes) | First Issued: 12/01/85

**Product Identifier: Anhydrous Ammonia**  
**Synonyms/Common Names:** Ammonia; NH<sub>3</sub>  
**Product Use & Restrictions:** Refer to label

CAS Number: 7664-41-7 | HBCC MSDS No. CA10000

Hill Brothers Chemical Company  
 1675 No. Main Street, Orange, California 92867  
 Telephone No: 714-998-8800 | Outside CA: 800-821-7234  
 Emergency: Chemtrec: 800-424-9300

**Section 2 – Hazard Identifications**

**Classifications of the Product**  
 Flammable Gases – Category 2  
 Gases Under Pressure – Compressed Gas  
 Acute Toxicity: Inhalation – Category 3  
 Skin Corrosion/Irritation – Category 1B  
 Serious Eye Damage/Eye Irritation – Category 1  
 Aquatic Toxicity (Chronic) – Category 1

Labels | Signal Word: DANGER

**Pictograms:**

**Hazard Statements**  
 Flammable Gas  
 Contains gas under pressure; may explode if heated  
 Toxic if inhaled  
 Causes severe skin burns and eye damage  
 Very toxic to aquatic life with long lasting effects

The answer to the question appears in the first paragraph of Section 5, Fire Fighting Measures, in the ammonia SDS. In this screen the vertical red line has been moved to the left to increase the screen space assigned to the References document.

**Time Remaining: 2:57:30**

1. Which of these becomes a risk from trying to control an ammonia fire with a CO<sub>2</sub> extinguisher?

- A.  Carbon dioxide may displace oxygen.
- B.  Ammonia becomes more explosive in confined spaces.
- C.  Water spray increases the risk of injury from ammonia gas.
- D.  Ammonia gas usually ignites at vapor concentrations above 60%.

Mark this item for later review.

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**Section 5 - Fire Fighting Measures**

**Extinguishing Media:** Use Water Spray or Water Fog, Carbon Dioxide, Polar or Alcohol Foam, Dry Chemical. Halon may decompose into toxic materials. Carbon dioxide can displace oxygen. Use caution when applying halon or carbon dioxide in confined spaces.

**Unusual Fire and Explosion Hazards:** Gas may ignite at vapor concentrations between 16% and 25% in air. However, ammonia-air mixtures are difficult to ignite and burn with little vigor. In the absence of oxygen enrichment, the risk of initiating an accidental fire or explosion is low. Do not allow ammonia vapors to accumulate in confined areas where ignition may occur. Intense heating particularly in contact with hot metallic surfaces may cause decomposition of ammonia generating hydrogen, a flammable gas.

**Special Protective Equipment for Firefighters:** Stop flow of gas. Use water fog to keep fire-exposed containers cool and to protect personnel effecting the shut-off. Wear self-contained breathing apparatus (SCBA) and encapsulating chemical protective clothing. Approach fire upwind and evacuate area downwind. Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage (29CFR 1910.156). In addition, wear other appropriate protective equipment as conditions warrant (See Section VIII).

Isolate damage area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. If this cannot be done, allow fire to burn. Move undamaged containers from danger area if it can be done with minimal risk. Stay away from ends of container. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk.

**Additional Description Requirement:** Inhalation Hazard  
**NFPA Rating:** Health - 3; Flammability - 1; Instability - 0  
 0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme  
 According to the (UFC) Uniform Fire Code Standard 79-3 (2000), the degree of

# CRST Examination References and Content

The CRST examination is based on concepts presented in the following RETA study course books:

1. Industrial Refrigeration 1 (IR-1)
2. Industrial Refrigeration 2 (IR-2)
3. Industrial Refrigeration 3 (IR-3)
4. Industrial Refrigeration 4 (IR-4)
5. Basic Electricity 1 (BE-1)
6. Basic Electricity 2 (BE-2)
7. RETA Ammonia Refrigeration Compliance Guidelines

Other publications are available that introduce the content areas examined in the CRST test. RETA does not endorse or guarantee that all content areas in the CRST exam are covered in these materials. The last page of this handbook lists alternative study references and training options.

## The following content areas are in the Certified Refrigeration Service Technician (CRST) examination.

|   |               |
|---|---------------|
| A. Safety                                 | 24 Qs         |
| B. Compressors                            | 16 Qs         |
| C. Oil Analysis                           | 7 Qs          |
| D. Condensers & Cooling Towers            | 11 Qs         |
| E. Vessels, Piping, Valves & Controls     | 11 Qs         |
| F. Insulation Systems                     | 6 Qs          |
| G. Evaporators & Heat Exchangers          | 9 Qs          |
| H. Pumps & Transfer Systems               | 9 Qs          |
| I. Purgers                                | 6 Qs          |
| J. Electric Service, Motors, etc.         | 12 Qs         |
| K. Controls Maintenance                   | 8 Qs          |
| L. Shaft & Bearing Maintenance            | 6 Qs          |
| M. Leak Monitoring & Detection            | 8 Qs          |
| N. Troubleshooting System Operations      | 7 Qs          |
| O. Ammonia Refrigeration Compliance & PSM | 10 Qs         |
| <b>Total</b>                              | <b>150 Qs</b> |

## Eligibility for RETA Certification

No individual is eligible for RETA certification unless he/she is in compliance with the RETA Code of Conduct. RETA may deny, revoke, suspend, or otherwise act upon certification or membership of any individual who is not in compliance with the RETA Code of Conduct.

1. The individual must truthfully complete and sign the RETA application for certification and shall provide additional information as requested. All documents and information provided to RETA as part of the certification process are the property of RETA and will not be returned.
2. All RETA members, certification candidates and certificate holders agree to waive all claims against and will hold harmless RETA, its staff, volunteers and agents which arise out of or relate to any RETA investigation and review of alleged violations of the RETA Code of Conduct.

## RETA Code of Conduct

The RETA Code of Conduct sets the professional standards required of all RETA members and certificate holders. RETA certification and membership affirms your agreement to abide by these standards to advance the integrity, honor and prestige of all persons and organizations in the refrigeration industry. By signing the RETA Code of Conduct you agree to strive to meet the following professional standards of behavior:

1. I recognize the urgency of protecting the health and safety of all personnel in refrigeration facilities and the public and agree to safely handle and operate refrigeration equipment and supplies at my level of knowledge, skill and experience.
2. I accept responsibility for assuring that those persons for whom I am responsible will be qualified by training, education and experience to operate the specific equipment in the refrigeration facility at which I am employed.
3. I will promote training and education of those refrigeration personnel with whom I come in contact to assure that they are qualified to maintain and improve the safety and energy-efficient operation of refrigeration facilities for which they have any responsibility.
4. I accept responsibility for my own continued professional development as well as that of those I supervise and will participate in appropriate certification and training activities to acquire, demonstrate and maintain competence in the refrigeration industry.
5. I will comply with all laws, rules and regulations that apply to safe operation of refrigeration facilities.
6. I will act responsibly and with integrity in all refrigeration industry and RETA activities by adhering to high standards of professional conduct to protect the health and safety of employees, employers, the public and all others affected by refrigeration facilities and practices.
7. I will avoid conduct or practices that could discredit the refrigeration industry like deceiving or harming employees, employers or the public.
8. I will provide accurate and truthful information related to all aspects of my RETA membership, certification and refrigeration training and experience.
9. I will follow all requirements established by RETA regarding references to my RETA certification and membership when describing my qualifications, training and experience in the refrigeration industry.
10. I will cooperate with RETA in any investigation of test security, validity, conflicts of interest or possible violations of the RETA Code of Conduct that warrants my participation.
11. I will maintain open and constructive relationships with those governmental and regulatory authorities relevant to the refrigeration industry with the intent of fostering an atmosphere of mutual trust and respect on behalf of myself and those for whom I am professionally responsible.
12. I will refuse to engage in any behavior that could be perceived as a threat to the health and safety at refrigeration facilities, of other employees and the public. This includes but is not limited to problems with chemical dependency, substance abuse, verbal threats or physical violence that could adversely affect the safety of refrigeration facilities.
13. I will support RETA local chapters to advance local influence and adherence to the RETA Code of Conduct.
14. I agree to inform RETA without delay of any changes that restrict my capacity to perform competently, safely and effectively without endangering the welfare of myself or others if I can no longer fulfill my obligations as a RETA-credentialed professional.
15. I agree to return any RETA credential to REA if it is suspended or revoked.

## Adhering to the RETA Code of Conduct

All activities of the Refrigerating Engineers and Technicians Association (RETA) shall be conducted with policies and procedures consistent with RETA Bylaws and the RETA Code of Conduct. The RETA Code of Conduct shall apply to all RETA members, directors, officers, staff, task force members, certification candidates, certificate holders, employees and consultants. The RETA Code of Conduct is intended to maintain the confidence and respect of industry employers and their employees. It also is intended to protect the public's health and safety as well as every person in a position of responsibility in the refrigeration industry.

## Candidate Behavior during RETA Certification Exams

**You must present TWO forms of identification to test center staff on the day you are scheduled to take a RETA exam.** They will be looking for a second signature that matches the one presented as your primary identification. Be sure that you have signed the reverse side of your credit card if you are going to use one as a second form of ID.

Any use of unauthorized materials during administration of a RETA certification examination may result in immediate disqualification and an automatic failing score. RETA may withdraw eligibility for certification from any candidate who uses prohibited materials during an examination, has any unauthorized contact with anyone other than test center staff during an examination, or engages in other unethical, disruptive or unprofessional behavior at a test center.

RETA may determine that a test score is invalid if evidence of misconduct or suspicious circumstances threaten the validity and security of RETA testing and certification programs. All candidates agree to cooperate in such investigations if evidence of problems in test administration or inappropriate candidate behavior before, during or after a test are reported as part of their application for a RETA credential. If doubts are raised about a score because of these or other circumstances, RETA expects cooperation in any RETA investigation of possible violations of test validity and security.

RETA reserves the right to cancel any exam score if, in the sole opinion of RETA, there is adequate reason to question its validity. RETA, in its discretion, may offer the individual an opportunity to take the examination again at no additional fee, offer the individual an opportunity to take the examination again including payment of all fees, or proceed with disciplinary action as described in these procedures.

Following any administrative exam irregularities, the Executive Director, on advice from the Consulting Psychometrician, will review the matter and decide whether to cancel scores, and whether the candidate may be offered a retest at RETA expense or at his/her expense. Such actions may be subject to appeal as described in these procedures.

## Disciplinary Action

RETA may reject or suspend the eligibility of any certification candidate, suspend or revoke the certification of any certificate holder, or refuse to recertify any person who is found to have engaged in any of the following violations or any part of the RETA Code of Conduct:

1. Obtaining or seeking to obtain RETA certification through submission of fraudulent, misleading or untruthful statements or documentation of qualifications, training and experience.
2. Unauthorized possession or use of RETA examination materials in any form, including but not limited to recreating from memory, copying, posting on any website, reproducing or disclosing to others any examination question or test-related materials or content not released by RETA to all certification candidates.
3. Any conviction for criminal acts in connection with activities for which the individual is certified by RETA, including but not limited to drug- or alcohol-related offenses which could make the RETA-certified individual a possible threat to the health and safety of refrigeration facilities, other employees and the public.
4. Unauthorized or illegal use of any registered certification mark or logo owned by RETA.

*RETA Disciplinary Policy and Procedures provide detailed information for bringing charges and for hearings and appeals related to disciplinary charges.*

## Completing the Application

Your RETA membership must be current at the time of application to qualify for the member rate. If your company is a corporate member, you (the certification applicant) must be one of the company's designated members to qualify for the member rate.

1. Complete all sections of the application
2. Print or type all information except your signature.
3. If you are an RETA member, attach a photocopy of your current membership card to the application. This photocopy assists staff to ensure the correct processing of your application.
4. Include the appropriate application fee in the form of personal or company check, money order, or credit card information. Make your check payable to Refrigerating Engineers & Technicians Association. **Purchase orders are accepted, but a test cannot be scheduled until the purchase order has been paid by the company.**
5. Mail the application form with attachments and your payment to RETA.

RETA Certification  
1725 Ferry Street SW  
Albany, OR 97322

You also can scan the application and email it to [dan@reta.com](mailto:dan@reta.com) or fax it to 541-497-2966.

6. **ALL RETA CERTIFICATION APPLICATIONS EXPIRE AFTER ONE YEAR UNLESS YOU REQUEST A 90-DAY EXTENSION BEFORE THE END OF YOUR ELIGIBILITY PERIOD. YOU FORFEIT YOUR EXAM FEES IF YOU DO NOT MEET THIS REQUIREMENT.**
7. Your application is incomplete until all information is provided and your fees are paid. You will be informed of any steps needed to finish your application. No test can be scheduled until these steps are completed. RETA reserves the right to verify the eligibility of any applicant.

## **Returned Check Fee \$50**

Any applicant whose personal check is returned for insufficient funds is required to pay this fee. Remittance of fees thereafter must be by money order or certified check.

## **Scheduling an Examination**

Test center appointments are scheduled through RETA. Contact RETA on business days between 8:00 am and 4:30 pm, Pacific Time. Be prepared to commit to securing a location, date and time before you call RETA. Most Kryterion® test centers have from 2 to 4 test stations available at a time. Staff will do their best to find a site and time that suits your needs.

## **Test Authorization Code**

When your application is approved, and all required fees are paid, you may schedule your exam. After you select a test location and date, you will receive an email from RETA that includes your examination authorization code. You will choose the location and will make an appointment with the test center. You will not be admitted to the examination without your test authorization code and photo identification.

## **Absences and Late Withdrawals**

You will forfeit all fees if you fail to show at the test center at the appointed time without rescheduling at least four business days before your scheduled test date. If you withdraw your application for RETA certification at least five business days before your scheduled test date, **you may request a refund of up to half the RETA application fee.** If you are not able to test, you may not transfer your registration to another candidate.

## **Taking the Test and Receiving Your Scores**

Each question will appear on the test center screen one at a time. You can record your answer to each question, skip the question, or mark it for review. You can review questions you have skipped or marked for review at any time. After you indicate that you have finished answering and reviewing questions, you may end the test. The test will end automatically if your time expires.

After you finish the test, a short survey will a few questions about your RETA testing experience. This is the best place to inform RETA about any concerns you might have about the test. RETA uses this feedback to improve the exam. You are encouraged to participate.

Your score report will tell you whether you passed or failed the examination, the percent of questions answered correctly, and section subscores. This report is e-mailed to you after you take the exam (this is one reason that it is essential that you have a valid e-mail address). A follow up report and your certificate will be mailed to you by Headquarters.

## **Rescheduling an Examination**

Candidates may reschedule a test by contacting RETA Headquarters no less than four business days (96 hours) before the scheduled date of their test. **Tests that are rescheduled after the 96 hour deadline will require a processing fee of \$135 to cover the charges that RETA will be charged by the testing company.**

## Examination Fees for the CRST Examination

|             |          |
|-------------|----------|
| RETA member | \$680.00 |
| Non-member  | \$975.00 |

Your RETA membership must be current at the time of application in order to qualify for the member rate. If your company is a corporate member, the certification applicant must be one of the company's designated members to qualify for the member rate.

## Re-examination

If you do not pass the examination, you may take the examination again one time at two thirds of the fee paid within one year following your initial test (\$455 member / \$650 non-member). To do so, you must submit a new application and fee. Minimum time between testing sessions is two weeks when accounting for US Postal Service delivery service. **YOU WILL HAVE 90 DAYS AFTER APPROVAL AND PAYMENT OF FEES TO SCHEDULE AND COMPLETE A NEW TEST.**

## Confidentiality and Public Information

To ensure the security of the examination, the test materials are confidential and individual results will not be released to any person or agency except the candidate and RETA. A candidate's individual test results will be released to others only upon the candidate's written request. **To avoid the possibility of a release of your test results to others it is necessary that you provide RETA an email address that you control.** The instructions and communications, including test results, are emailed to the address you provide. If you use some other person's email address as the contact address for you, they may have access to your results information.

When an operator has achieved RETA certification, that fact is considered public information. It is RETA's policy to verify certification upon request. RETA does not provide information about certification status other than whether an individual is certified.

## Comments about Your Testing Experience

All candidates have the opportunity to comment about their RETA testing experience, the test center, and the test in a short survey at the end of each examination. All candidate comments are reviewed by the RETA psychometrician and the RETA Certification Committee.

## Comments about Test Questions

Any candidate may request a review of the validity of a question on a RETA examination in their comments at the end of each examination period by listing the question number and describing why he/she thinks the question warrants further review. All questions on each RETA certification exam have been validated by the RETA Certification Committee and RETA's psychometrician (testing consultant). Candidate comments about any RETA exam question result in further review and revalidation of the question.

RETA also conducts periodic statistical reviews of candidate performance on each question. Even if no candidate(s) comment about a question, this performance data may trigger review and revalidation of a question. If changes in a question are justified during these reviews, all scoring adjustments are applied automatically to all candidate scores. Revised score reports are issued to any candidate whose status changes from fail to pass as a result of these procedures.

## Appealing Scores

An appeal procedure is available to individuals who wish to contest an adverse RETA decision.

Candidates do not have the right of appeal of actions: (1) resulting from failure to meet published procedure(s), or (2) based on RETA's actions in setting a passing score which resulted in the individual's failure to pass the certification examination.

Candidates may appeal the results of an examination in writing via U.S. Mail, facsimile or E-mail to RETA headquarters within 14 calendar days after their examination date. RETA will respond in writing to all appeals after review of the candidate's results by the RETA Certification Committee.

## Requests for Special Accommodations

Candidates who are unable to complete a RETA certification exam under standard conditions must submit documentation to support their request for special accommodations. This request must specify the modifications of the test procedure that they believe are appropriate and must be submitted with their initial application for certification or recertification. RETA will evaluate each request to determine that it does not interfere with the candidate's ability to perform the work of a certified refrigeration professional.

Test centers may accommodate candidates with disabilities that interfere with test taking. RETA will confirm with the testing center that they have the necessary facilities to address specific needs.

Any special accommodations must meet the criteria defined by the Americans with Disabilities Act (ADA). Candidates who qualify for such arrangements should be able to document similar steps that were part of their prior training and testing experiences. ADA also requires that RETA determine that a candidate who receives such accommodations must still demonstrate the ability to safely and effectively perform the duties required to qualify for the credential being awarded. ADA does **NOT** allow special accommodations that would substantially alter the skills required to perform a job or could limit a candidate's ability to protect the health and safety of employees and the public.

Test centers may accommodate candidates with disabilities that interfere with test taking.

Call RETA HQ to confirm that the testing center has the necessary fixtures and facilities to address your specific needs.

## Improper Use of RETA Identification and Certification

RETA examinations and their content are the property of RETA. These examinations are available only to those persons who desire in good faith to become certified by meeting RETA certification requirements. By applying for RETA certification, each candidate agrees to the following provisions.

1. Refrigeration professionals may use the CARO, CIRO, CRES, CRST or RAI designations when they meet all requirements established by RETA for those credentials.
2. All RETA examinations, certificates, cards, logos, patches and emblems and the names CARO, CIRO, CRES, CRST and RAI are property of RETA and may not be used in any way without the express written consent of RETA. Individuals who pass current RETA examinations must comply with RETA rules in all references to RETA certification.
3. Any individual RETA suspends, reprimands, limits or revokes from RETA certification or authorization due to failure to meet RETA requirements shall immediately relinquish, refrain from using and correct at their own expense any outdated, inaccurate or otherwise inappropriate use of any RETA certificate, card, logo, patch, emblem, and references to CARO, CIRO, CRES, CRST RETA certification.
4. If the individual refuses to relinquish immediately, refrain from using and correct at his or her expense any misuse or misleading use of such items when requested, the individual agrees that RETA shall be entitled to obtain injunctive relief, damages costs and attorney's fees incurred in obtaining any such or other relief.

## Changes in Certification Criteria

RETA may approve changes in these certification requirements at its discretion. The current version of this Handbook constitutes notice of these changes to applicants, candidates and certified persons. RETA policies at the time a candidate is initially certified remain in effect for the three-year term of certification. Any new or amended requirements must be met at the time a candidate applies for recertification.

## Renewal of Certification

The RETA Code of Conduct requires all RETA certificate holders to participate in appropriate certification and training activities to demonstrate and maintain their competence in the refrigeration industry. Each RETA certificate expires three years after it is issued. Recertification candidates may establish that their knowledge and skills are still current for their level of RETA certification either by taking the current examination or by providing RETA with the required documentation of his/her qualifications for recertification. Recertification candidates whose past RETA credential has expired must retest. RETA does not accept PDHs from candidates whose RETA credential has expired.

Continuing education credits can be earned by documenting participation in professional training related to RETA certification at RETA chapter meetings, the RETA Annual Meeting, employer-sponsored training and refrigeration training seminars.

Training is measured in Professional Development Hours (PDHs) as determined by RETA. Each RETA credential requires PDHs relevant to the practice of refrigeration operation / service / repair / maintenance / engineering. One PDH can be earned for 50 minutes of instruction or participation. If a program awards continuing education units (CEU) rather than professional development hours, one CEU equals 10 professional development hours of class in an approved continuing education course. Documentation of PDHs for recertification may be submitted in the RETA Recertification Database or with a completed recertification application.

### Professional development activities may include:

- Successful completion of a college or university course in the area of refrigeration operating / servicing / installation, related sciences\*, and engineering ethics. RETA will award PDHs based on a transcript documenting successful completion of any such course(s).
- Successful completion of professional engineering courses or programs in which professional development hours are earned.
- Successful completion of refrigeration operating programs, seminars, tutorials, workshops, short courses, on-line or in-house courses.
- Completing classes using RETA course books can earn 20 PDHs after the candidate passes a RETA examination on the content of the course.
- Attending program presentations at related technical or professional meetings, including the RETA Annual Conference.
- Teaching or instructing. Teaching credit is valid for teaching a course or seminar for the first time only. Two PDHs may be earned for every hour of teaching.
- Authoring papers or articles that appear in nationally circulated journals or trade magazines or presented to a professional society or organization. A maximum 10 PDHs per paper or presentation per renewal are allowed for this activity;
- Active participation on a RETA committee or holding an office in a Chapter as an elected officer. Two PDHs will be awarded per committee membership or office held. A maximum of 8 PDHs may be accepted per renewal period.

### **PDH programs, activities and course requirements**

- Each approved course, program or activity must contribute to the advancement of professional skills and/or scientific knowledge of the recertification candidate in the practice of refrigeration system operations, services, design, installation and/or maintenance.
- Each approved course, program or activity must foster the enhancement of general or specialized practice and values of refrigeration operations, related sciences and/or engineering ethics.
- Each approved course, program or activity must be developed and presented by persons with education and/or experience in the subject matter of the program.

### **Acceptable providers for PDHs shall include, but not be limited to the following.**

- Coursework provided by RETA Authorized Instructors (RAIs) using RETA educational materials.
- Chapter meetings with an educational presentation by a guest speaker (name/date/topic needs to be recorded on a roster certified by a Chapter Officer and filed with RETA HQ).
- RETA Annual Conference workshop courses.
- Regional RETA conference workshop courses.
- Colleges, universities or other educational institutions presenting courses related to industrial refrigeration.
- Other technical or professional societies or organizations including manufacturers (factory training either site-specific or in factory – procedures for documenting this training will be made available from RETA HQ).

**RETA shall evaluate whether to award PDHs for training requested in an application for recertification or in the RETA Certification Database based on documentation provided by the candidate.**

### **Candidate Notification and Appeals**

- RETA will inform the candidate in writing whenever PDHs requested as part of a recertification application cannot be applied toward renewing a RETA credential. The candidate must respond in writing within 30 days with any new evidence in support of the candidate's recertification before a decision to deny credit toward recertification will be reconsidered by RETA. Unsupported claims will be denied.
- RETA may require additional evidence demonstrating compliance with these requirements from any candidate. Each recertification applicant must provide evidence that training meets these recertification requirements before PDHs will be applied toward recertification.
- Candidate appeals of decisions regarding recertification are subject to the policies documented in Section 1800, Membership, of the RETA Policy and Procedures Manual.

# Refrigerating Engineers & Technicians Association

## CERTIFIED REFRIGERATION SERVICE TECHNICIAN EXAM APPLICATION

Please print or type all information. Completed applications may be submitted:

- By mail to RETA Certification, 1725 Ferry Street SW, Albany, OR 97322
- By fax to 541-497-2966
- By Email as an attachment in a PDF to [dan@reta.com](mailto:dan@reta.com).

Call RETA at 541-497-2955 or toll-free at 844-801-3711 between 8 am and 4:30 pm Pacific Time if you have questions regarding your application or membership status. Please be sure to return all required pages of the application. **Penmanship counts – please write or print clearly. Applications that cannot be read clearly may delay processing or result in errors in your RETA records.**

You will receive your initial instructions, scheduling confirmation, and your test results via email. It is very important that you provide a valid e-mail address that you control when applying for certification. **Your signature below acknowledges that you waive any Privacy Act issues if the email address provided by you is not one that is yours.** Please contact RETA Headquarters if you do not have an e-mail address.

\_\_\_\_\_  
Your Name Exactly as You Want it on Your Certificate

\_\_\_\_\_  
Your RETA Membership Number and Expiration Date:

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Business Address City State Zip

\_\_\_\_\_  
Home Address City State Zip

\_\_\_\_\_  
Home Phone Work Phone

\_\_\_\_\_  
E-mail address IMPORTANT: A VALID E-MAIL ADDRESS IS MANDATORY – SEE THE CONFIDENTIALITY AND PUBLIC INFORMATION STATEMENT ON PAGE 7 OF THIS APPLICATION.

\_\_\_\_\_  
Do you have a need for special accommodations at the testing center? Please describe what you need. Use additional sheet of paper if needed

**CARO Certificate #** \_\_\_\_\_ **CIRO Certificate #** \_\_\_\_\_

### WHERE I PLAN TO TAKE MY RETA EXAMINATION

RETA examinations are administered in RETA Network Test Centers and in over 400 Kryterion Testing Network (KTN) locations in the U.S. Please check where you plan to take your RETA exam. A current list of KTN centers in the US is available on the RETA website.

**Please check where you plan to take your RETA examination.**

#### RETA Network Test Centers

- |   |   |
|---|---|
| <input type="checkbox"/> 2019 RETA Annual Conference, Las Vegas, NV | <input type="checkbox"/> Garden City Community College (GCCC) |
| <input type="checkbox"/> Industrial Consultants, Owasso, OK         | <input type="checkbox"/> IRTC, Lyndhurst, VA                  |
| <input type="checkbox"/> Lanier Tech, Oakwood, GA                   | <input type="checkbox"/> Modesto Tech, Modesto, CA            |
| <input type="checkbox"/> Polk State College, Bartow, FL             | <input type="checkbox"/> Other RETA Test Center               |
| <input type="checkbox"/> Wagner-Meinert, Fort Wayne, IN             | _____   |

A Kryterion Testing Network (KTN) Center near \_\_\_\_\_  
CITY STATE

To find a Kryterion location near you, go to the website: <https://www.kryteriononline.com/Locate-Test-Center>

## EXAMINATION FEES

The fee must be in the form of personal or company check, money order, credit card.

**All applications submitted without the required fee are incomplete until the fee is paid. You will not be permitted to schedule or take a test until the fee is paid.** Be sure to include your membership number (if applicable) and expiration date. For corporate memberships, the applicant must be one of the designated members to qualify for the member rate.

**ALL RETA CERTIFICATION APPLICATIONS EXPIRE AFTER ONE YEAR UNLESS YOU REQUEST A 90-DAY EXTENSION BEFORE THE END OF YOUR ELIGIBILITY PERIOD. YOU FORFEIT YOUR EXAM FEES IF YOU DO NOT MEET THIS REQUIREMENT.**

### Certified Refrigeration Service Technician (CRST)

- \$680.00 RETA member
- \$975.00 Non-member
- Retesting Fee \$445.00 / \$650.00

Previous date: \_\_\_\_\_

### Payment method:

- Check payable to Refrigerating Engineers & Technician Association
- Credit card (VISA, MasterCard, American Express, Discover)
- Purchase order from a corporation or business followed by a check to RETA  
**(Purchase order must be paid before the exam can be scheduled)**

\_\_\_\_\_  
Credit card number

\_\_\_\_\_  
Expiration date

\_\_\_\_\_  
Security Code #

\_\_\_\_\_  
Print Name as it Appears on Card

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Billing Address

\_\_\_\_\_  
Billing Phone Number

Send a receipt to:  Email \_\_\_\_\_  Fax \_\_\_\_\_

**STATEMENT OF UNDERSTANDING**

***(This section must be completed by all candidates)***

I hereby apply for RETA certification and verify that all information provided is accurate and I have read the CRST certification application handbook. I understand that any misrepresentation on this application will result in failure to become certified, and my application and examination fee will be forfeited. I understand that if I provide RETA an email address for my results transmittal that is not my own, I waive all rights that are associated with the Privacy Act. I authorize the evaluation and validation of my credentials by RETA. In furtherance of my application, I authorize any individual or organization who may have information concerning my credentials to provide such information to RETA. I hereby waive any claim for damages that I may have against RETA and any individual or organization that supplies such information by reason of any act or omission by any of them taken in good faith in connection with this application. I understand that the decision as to whether I qualify for certification rests solely and exclusively in RETA and that its decision is final. By signing and submitting this application, I also agree to adhere to the RETA Code of Conduct.

As a RETA Certified Professional I will:

- Comply with the relevant provisions of the RETA Certification program.
- Adhere to the requirements of the RETA Code of Conduct.
- Make no claims of being certified outside of the certification credential(s) I hold.
- Not use my RETA Certification status in any manner that brings disrepute to RETA or misrepresents RETA Certification with false or misleading statements.
- Not use my RETA Certification in a misleading manner.
- Discontinue my claim to RETA Certification if my certificate is revoked or if I fail to maintain my certificate through evidence of on-going training and the accrual of recognized Professional Development Hours and Continuing Education Units.
- Inform RETA without delay of any changes that restrict my capacity to perform competently, safely and effectively without endangering the welfare of myself or others if I can no longer fulfill my obligations as a RETA-credentialed professional.
- Return any RETA credential to RETA if it is suspended or revoked.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Print Name \_\_\_\_\_

**Material you studied to prepare for this examination (Check all that apply)**

|   |  |
|---|--|
| <input type="checkbox"/> RETA IR-1  | <input type="checkbox"/> <i>Modern Refrigeration &amp; Air Conditioning</i>                            |
| <input type="checkbox"/> RETA IR-2  | <input type="checkbox"/> <i>Refrigeration and Air Conditioning Technology – 5<sup>th</sup> Edition</i> |
| <input type="checkbox"/> RETA IR-3  | <input type="checkbox"/> <i>Refrigeration Equipment - A.C. Bryant</i>                                  |
| <input type="checkbox"/> RETA IR-4  | <input type="checkbox"/> <i>Refrigeration Principles, Practice &amp; Performance - C.</i>              |
| <input type="checkbox"/> RETA BE-1  | <input type="checkbox"/> <i>Industrial Refrigeration Handbook - Wilbert Stoecker</i>                   |
| <input type="checkbox"/> RETA BE-2  | <input type="checkbox"/> <i>TPC Training Series - SchoolCraft</i>                                      |
| <input type="checkbox"/> RETA IR-1 – Spanish  | <input type="checkbox"/> <i>Industrial Refrigeration Energy Efficiency Guidebook - IRC</i>             |
| <input type="checkbox"/> RETA Ammonia Refrigeration Compliance Guidelines   | <input type="checkbox"/> <i>Industrial Refrigeration Best Practices Guide – Cascade Energy</i>         |
|   | <input type="checkbox"/> Other (Please identify) _____   |
| <input type="checkbox"/> Check here if you took an 8~40 hour course to prepare for this exam.<br>IF YES – Where did you receive this instruction? _____ |  |
| <input type="checkbox"/> Check here if you took the CARO or CIRO On-Line Practice Exam to prepare for this exam   |  |

# References and Training Options to Prepare for RETA's CRST Examination

Several pathways exist to enable RETA certification candidates to acquire the knowledge and skills required to pass the RETA examinations. While RETA neither endorses nor guarantees that these study materials include all of the content areas in the RETA examinations, candidates who cannot or do not wish to use RETA course books can prepare for RETA certification using other materials such as these. Successful completion of a study course or review of materials such as these does not guarantee a passing score on any RETA certification examination.

## Alternate References and Training

1. *Refrigeration Principles, Practice and Performance* (2007). Chris Langley. Thomson Delmar Learning.
2. *Modern Refrigeration and Air Conditioning*, 2004 Edition (2004). Andrew Althouse, et. al. Thomson Delmar Learning.
3. *Electricity for Refrigeration, Heating and Air Conditioning* (2006). Gene Smith. Thomson Delmar Learning.
4. *Refrigeration Equipment* (1998). A.C. Bryant. Elsevier Science & Technology.
5. *Industrial Refrigeration Handbook* (1998). Wilbert Stoecker. McGraw-Hill.
- 6.\* *Practical Problems in Mathematics for Heating and Cooling Technicians, 3<sup>rd</sup> Edition* (1998). Russell DeVore. Thomson Delmar Learning.
- 7.\* *Industrial Refrigeration Best Practice Guideline – 3<sup>rd</sup> Edition* (2010) - Cascade Energy Engineering
8. TPC Training Series – SchoolCraft
  - 102\* Reading Schematics and Blueprints
  - 109\* Industrial Safety and Health
  - 110\* Troubleshooting
  - 210\* Electrical Troubleshooting
  - 301\* Basic Mechanics
  - 461 Ammonia Refrigeration Basics
  - 462 Positive-Displacement Compressors
  - 463 Evaporators, Condensers and Controls
  - 464 Purging, Piping and Safety
- 9.\* *Industrial Refrigeration Energy Efficiency Guidebook – 2<sup>nd</sup> Edition* - Industrial Refrigeration Consortium  
University of Wisconsin-Madison
- 10.\* IIAR Andy Ammonia Series

\* Materials available for purchase from RETA

## CRST Application checklist

Be sure to:

- Obtain a valid e-mail address.
- Fill out the application form completely on pages 16, 17 and 18.
- Include your payment. If using a company purchase order, the exam cannot be scheduled until the purchase order has been paid.
- Mail to: RETA Certification  
1725 Ferry St SW  
Albany, OR 97322  
  
or FAX to: 541-497-2966  
  
or Email as an attachment in a PDF to: dan@reta.com
- Download the RST Study Guide for your exam from the RETA website, ([www.reta.com](http://www.reta.com)) under the **Certification** tab, then **Certification Study Resources**. Review the Study Guide carefully.
- Review available Kryterion Testing Network (KTN) Test Center and RETA NETWORK TEST CENTER locations in the list on the RETA website.
- DO NOT CALL THE KTN TEST CENTER DIRECTLY – they cannot schedule your examination date or time. Call RETA HQ @ 541-497-2955**
- Bring your RETA email provided test authorization code to the exam center on the day you test. Report to the test center 15-20 minutes before your appointment

Bring at least one government-issued form of photo ID such as a driver's license or passport to the test center **PLUS** a second form of identification (this is a security and validity measure).

Bring a simple calculator with you to the test center. The test center is not responsible for providing a calculator.