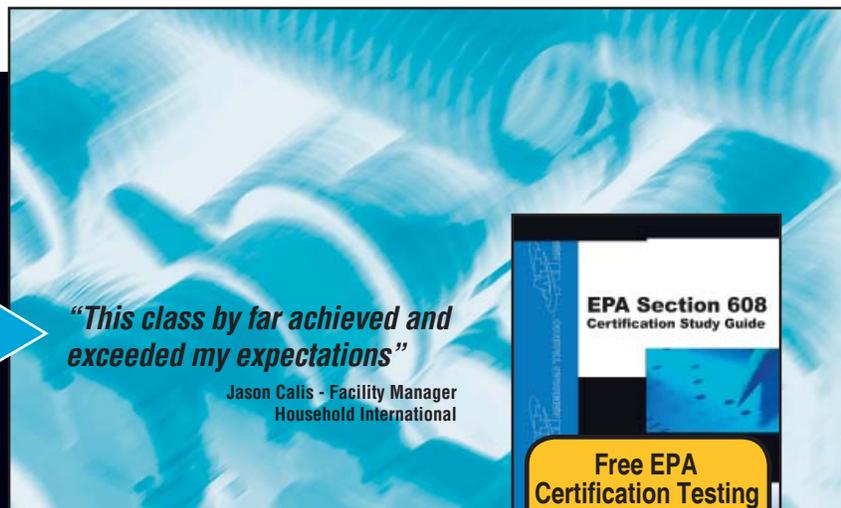


Learning Objectives:

- Fundamentals of air conditioning & refrigeration
- Identification of components in AC&R systems and what they do
- Differences, types, and classifications of refrigerants & oils
- How to accurately read system & component measurements
- Air properties and their effect on the AC&R system
- How to work safely with AC&R systems & refrigerants
- What licensing & certification is required/not required
- How to operate an AC&R system from top to bottom
- How to conduct preventative & repair maintenance activities
- How to troubleshoot and service AC&R systems
- The role of energy conservation
- Applicable regulatory considerations
- How to become EPA 608 certified for handling refrigerants

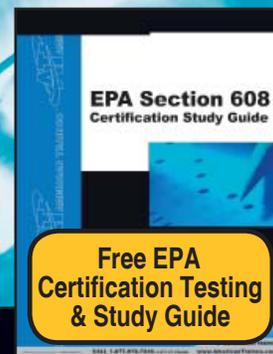
Understanding **Air Conditioning & Refrigeration**™
Systems

Specifically Designed for Maintenance Personnel in Plants, Facilities and Commercial Buildings



"This class by far achieved and exceeded my expectations"

Jason Calis - Facility Manager
Household International



Day 1 - Principles, Components & Systems
Day 2 - Troubleshooting, Maintenance & Operating Efficiency

- This seminar can also be presented at your facility for larger groups
- Reserve your space now! **CALL 1-877-978-7246**
- Check us out online at **www.TPCTrainco.com** for a complete listing of all seminars coming to your area



Understanding Air Conditioning & Refrigeration™ Systems

► *“Having been disappointed by other seminars I’ve attended, I was pleasantly surprised by this outstanding presentation by TPC Trainco.”*

Tom Onuschak – Eastwood Printing

PURPOSE OF SEMINAR

Being able to understand, operate, maintain, and troubleshoot your own air conditioning system is what this HVAC course is all about. It was created to bring students up to speed in their skills and knowledge as quickly and safely as possible. Taught by instructors who have been in the technicians’ shoes, the practical, commonsense approach we take in presenting this course makes it perfect for novice technicians as well as multicraft tradespeople, or even more experienced HVAC technicians who need a well-rounded refresher or who are looking for new ideas and solutions.

Created to have high impact in a short amount of time, this program is designed to extend equipment life, improve HVAC/R efficiency, save energy costs, and enhance comfort control, while establishing a culture of environmentally safe and technically sound work practices among employees.

ABOUT OUR INSTRUCTORS

We only hire industry experts, and many of our instructors have written books and industry articles, are accomplished conference speakers and webinar presenters, and sit on organizational boards. We can provide biographies and credentials for specific instructors upon request. Even though they are the best in their fields, TPC Trainco instructors keep themselves current on technology and industry trends by attending their own seminars and workshops, and by visiting new industrial sites to get to know the tools. They are simply the best instructors in the industrial maintenance and management training industry, hands down.

HIGH QUALITY PRESENTATIONS

All our seminars include a complete, general education on the subject matter, and include enough flexibility to give our instructors the room then need to tailor the courses to address students’ individual needs, concerns, and experience levels. Our instructors deliver content with hands-on exercises, instructor demonstrations, interactive student quizzes, problem solving exercises, role-playing, lectures, videos, graphics, and case study discussions. Their delivery emphasizes practicable learning that makes our seminars some of the most high-impact days most of our students experience.

TRAINING OUTCOMES

1. Fundamentals of air conditioning & refrigeration
2. Identification of components in AC&R systems and what they do
3. Differences, types, and classifications of refrigerants & oils
4. How to read system & component measurements
5. Air properties and their effect on the AC&R system
6. How to work safely with AC&R systems & refrigerants
7. What licensing and certification is required and what is not required
8. How to operate an AC&R system from top to bottom
9. How to conduct preventative and repair maintenance activities
10. How to troubleshoot and service AC&R systems
11. The role of energy conservation
12. Applicable regulatory considerations
13. How to become EPA 608 certified

Students who take and pass the optional EPA 608 Technician Licensing Certification exam at the end of Day 2 will also have the potential to earn EPA 608 certification.

WHO SHOULD TAKE THIS COURSE?

This course is designed for anyone who needs to understand basic operation, maintenance, and troubleshooting of air conditioning and refrigeration systems in order to improve efficiencies and uptime at their industrial plants and large building facilities. Individuals involved with residential HVAC&R systems and those responsible for upkeep of commercial and mobile refrigeration units will also find this course extremely valuable.

- All building maintenance personnel
- All plant & facility maintenance technicians
- Building engineers, managers & superintendents
- Plant & facility managers
- Environmental health & safety personnel
- Apprentice and experienced HVACR technicians
- Stationary engineers
- Refrigeration technicians
- Energy management personnel
- Multi-craft & cross-training personnel
- Mechanical engineers
- Any person needing a basic course in air conditioning & refrigeration

FREE EPA CERTIFICATION TESTING

Testing for EPA section 608 certification is optional. Section 608 of the Federal Clean Air Act requires that all persons who maintain, service, repair, or dispose of appliances that contain regulated refrigerants be certified in proper refrigerant handling techniques by passing the EPA 608 Technician Certification exam. Students may take the test at the end of day 2. While we cover material relevant to the test and make every attempt to help our students pass this exam, we cannot guarantee individual success. Therefore it is recommended that students who want to take the test attend both days and plan time to study beforehand.

ATMT CERTIFICATION® TESTING

An optional ATMT® Certification exam is available for this and some of our electrical courses. Students may take it online or as a written test any time after the class is over. Please visit ATMT® Testing and Certification for more information.

CONTINUING EDUCATION

Upon completion of this seminar, the student will receive a Certification of Completion and .8 TPC Trainco CEUs per day attended. Most employers and many government agencies accept TPC Trainco CEUs to fulfill their continuing education requirements. If the student needs CEUs to renew a state license, please contact us at 303-867-5035 to ensure the state licensing board has approved the seminar. If we are currently not approved by your state licensing board, we are happy to begin the process as long as we receive your request at least one month before the training date.

WHAT YOU WILL TAKE HOME

- An TPC Trainco workbook detailing the material covered in the seminar
- A personalized Training Certificate with 0.8 TPC Trainco Continuing Education Units for each day attended. (1.6 for both days)
- All the information you need from asking our instructors specific questions about your own A/C, chiller or HVAC&R equipment

C O U R S E O V E R V I E W

Day 1

Day 1 of this program has been designed to give the student a broad introduction to air conditioning and refrigeration systems, including every-day operation & important refrigerant safety practices. The course is a great overview for maintenance technicians, multi-craft tradespeople, building managers, HVAC technicians or anyone who wants to improve their AC&R operation and maintenance skills. Understanding basic AC&R operation & how to properly handle EPA regulated refrigerants is the goal of the first day of this training course.

DISCUSSION TOPICS

Fundamentals of AC&R

- Air conditioning versus refrigeration
- Laws of thermodynamics and heat transfer

Regulation, Codes and Standards

- New Energy Efficiency Standards (S.E.E.R.)
- EPA Section 608 of the Clean Air Act
- ASHRAE, ASME
- Technician licensing, testing and certification

Compression Refrigeration Cycle

- Basic system design
- Follow-the-Heat™

Refrigerants

- CFCs, HCFCs, HFCs, Inorganics
- Zeotropic and Azeotropic Refrigerant Mixtures
- Refrigerant safety Including R-410A
- EPA Section 608 Significant New Alternative Policy

Refrigerant Oils

- MO, AB, POE, PAG, PAO Oils
- Properties of the Oil
- Maintaining the Oil Quality in Your AC&R System

Major AC&R System Components

- Evaporator, Compressor, Condenser
- Metering (Expansion) Device

**FREE EPA 608 TECHNICIAN
CERTIFICATION TESTING**
(at the end of day 2 only - optional)

Day 2

Day 2 is designed for people who already have a good foundation in AC&R components and systems. Students are taught common practices (and some "tricks-of-the-trade") for general operation and maintenance of their AC&R systems. Overall, the second day of this program is designed to help you get the maximum life out of your AC&R systems while keeping it up and running as efficiently and consistently as possible.

DISCUSSION TOPICS

Auxiliary System Components

- Crankcase Heater
- Suction Accumulator
- Receiver
- Filter-Drier
- Sight Glass with Moisture Indicator
- Oil Separator
- Service Valves
- Muffler
- Refrigerant Controls

AC&R Electrical Control Circuits

- Electrical Controls and Components
- Relays and Contractors
- Thermostats

Refrigeration Systems

- Commercial Refrigeration
- Other Specialty Refrigeration Systems

System Diagnostics, Servicing & Troubleshooting

- Service Tools and Equipment
- Manifold Gauge Set
- Recovery Machine
- Vacuum Pump
- Micron Gauge
- Leak Detection Equipment
- Recovering Refrigerant
- Charging the AC&R System
- Troubleshooting AC&R System Problems
- Energy Conservation & Operating Efficiency

Air Handling Systems

- Psychrometrics - The Study of Air
- Fans and Filters
- System Maintenance

Heat Pumps and Chillers

- Air, Water, & Ground-Source Heat Pumps
- Heat Pump Operation and Troubleshooting
- Chilled Water System Design & Operation

SEMINAR AGENDA

7:30 am	Registration
8:00 am	Class Begins
12:00 -1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

SEMINAR FEE

\$550 Each Day
\$1100 Both Days

NO RISK REGISTRATION & MONEY-BACK GUARANTEE

If you're not yet sure you'll be able to attend this seminar, we can still hold a spot for you in the class. While payment is due prior to the start of the seminar, you may choose a full refund or credit for cancellations made at least 24 hours in advance. Substitutions are also freely allowed. Please register early!

IN-HOUSE TRAINING

TPC Trainco offers an extensive list of courses available for convenient, in-house training at your facility. We can provide the same expert air conditioning, boilers, HVAC, facility and plant management, fluid hydraulics, piping, and electrical training courses at your facility that we offer in public seminars.

Advantages of On-Site Training

1. Modify the content to your specific needs
2. Protect company privacy
3. Workers remain on site in case of an emergency
4. Saves time and travel costs
5. Instructors can discuss your specific equipment
6. Problems can be openly discussed
7. Flexible scheduling
8. Increased price savings as the groups get larger
9. Promote teamwork & camaraderie among workers
10. More comfortable learning environment

Contact us if you have any questions and to get a no-obligation quote.

Reserve Your Space Now!

CALL 1-877-978-7246

or Online at www.TPCTrainco.com



Still Only \$550 Per Day, \$1100 for 2-Days

PLEASE HELP OUR LOGISTICS TEAM AND REGISTER EARLY. CANCEL UP TO 24 HOURS IN ADVANCE WITHOUT PENALTY.

ATTENDEE NAME	ATTENDEE EMAIL	COURSE TITLE	DATE(S)	CITY/STATE	PRICE
		Air Conditioning and Refrigeration			

(*See Public Seminar Pricing Schedule on Previous Page)

TOTAL \$ _____

AUTHORIZING PERSON / SUPERVISOR:

Name _____

Title _____ Company Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ Email _____

(Needed for Confirmation & Sending Pre-Reading Materials)

BILL TO: *(If Different than Authorizing Person)*

Name _____

Title _____ Company Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ Email _____

(Needed for Confirmation & Sending Pre-Reading Materials)

PAYMENT METHOD: *(Please make Checks Payable to TPC Trainco)*

Visa MC AMEX Discover Check Enclosed Bill Purchase Order #: _____

Card Number _____ Card Authorization Code (CVC) _____ Expiration Date _____

Signature (Required) _____ Name on Card _____

PUB AC-GEN

QUESTIONS & HOW TO REGISTER

Phone: 1-877-978-7246 | Website: www.TPCTrainco.com
 Fax: (303) 531-4565 | E-mail: CustomerService@TPCTrainco.com
 Send by Mail: TPC Trainco, P.O. Box 3397, Englewood, CO 80155

