

### HVAC Performance Verifier

Certification



### the Need

- In North America:
  - More than 50 percent of energy consumed in the home is related to space heating/cooling and water heating.
  - Department of Energy (DOE) estimates that more than 30 percent of that energy usage is wasted
  - Function of improperly sized, installed, or serviced systems.



### the Response

- NATE and the Residential Energy Services Network (RESNET):
  - Collaborated on a new certification:
    - the HVAC Performance Verifier



### the Credential

- HVAC Performance Verifier certification
  - Augments existing whole house energy efficiency certifications to:
    - Further demonstrate the rater has the knowledge and skills necessary, specifically in rating HVAC performance



### the Exam

- Content includes:
  - Current industry-determined and approved design standards, codes, and energy efficiency research
    - Measures the rater's ability to verify proper performance of
      - Load Calculation;
      - Duct Sizing;
      - Sealing of Ducts;
      - Ventilation and Infiltration Diagnosis;
      - Charging of System Refrigerant Component; and
      - Hydronics Distribution Systems



### Becoming a NATE Certified Technician



### Everything You Wanted To Know

- What is certification?
- Certification vs.
   Certificate
- NATE: Who We Are
- NATE Partners
- Elements of a Profession

- KATES
- What distinguishes NATE?
- Recertification
- Why Pursue Certification?
- NATE Examinations
- How do I Study?



### What is Certification?

- Certification a voluntary process to recognize individuals for meeting standards set by a third party
- Accreditation a voluntary process to recognise institutions or organizations for meeting standards set by a third party
- *Licensure* a mandatory governmental requirement necessary for *individuals* to practice in a particular profession



### What is Certification?

- Certification assures the public that an individual demonstrates specific knowledge required of a technician at a certain level.
  - Academic degrees and educational certificates do not certify demonstrated knowledge of the HVACR industry.



### Certification vs. Certificate

- Results from an assessment process
- For individuals
- Typically requires work experience
- Indicates mastery of knowledge usually assessed through an exam
- Awarded by third-party, standard-setting organization

- Results from an educational process
- For individuals
- For newcomers and experienced professionals
- Indicates completion of a course or series of courses with a specific focus
- Awarded by educational programs or institutions



### Certification vs. Certificate

- Standards set by a thorough, defensible, industry-wide process resulting in outline of required knowledge or skills
- Typically results in a designation, for example: NATE certified
- Has on-going requirements in order to maintain; holder must continue to demonstrate he/she meets requirements

- Course content set a variety of ways (dean, faculty, instructor)
- Usually listed on a resume detailing education; may issue a document to hang on the wall
- Is the end result; demonstrates knowledge of course content at the end of a set period in time



### North American Technician Excellence: *who we are*

- North American Technician Excellence (NATE) is an independent certifying body for the HVACR industry.
- NATE is the nation's largest industry-endorsed, non-profit certification organization for heating, ventilation, air conditioning and refrigeration technicians.
- NATE was created in 1997



### NATE: who we are

- Our envisioned future
  - HVACR industry technicians are recognized as trustworthy, reliable, professional, knowledgeable and efficient by home and business owners.
- Core purpose
  - To certify professional competence and instill confidence
- Vision
  - A NATE patch is proudly worn on every technician's shirt



### NATE: who we are

• Core Values and Focus: Technicians

We are committed to stimulating an environment of continuous learning and applied knowledge that leads to excellence in job performance and job satisfaction. We pledge to help technicians realize their true potential.



### NATE: who we are

- Governed by HVACR professionals appointed by the NATE's Board of Trustees
- NATE works with a consortium of industry representatives including manufacturing, distributing, contracting, educators and utilities
- More than 30,000 + active certificants



### **NATE** Partners

- Affordable Comfort Institute (ACI)
- Air Conditioning Contractors of America (ACCA)
- Air-Conditioning, Heating, and Refrigeration Institute (AHRI)
- Air Movement and Control Association International (AMCA)
- American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE)
- Eastern Heating & Cooling Council (EHCC)
- Heating, Air Conditioning & Refrigeration Distributors International (HARDI)
- The Heating, Refrigeration, and Air Conditioning Institute of Canada (HRAI)
- Hydronics Industry Alliance (HIA)
- Indoor Air Quality Association (IAQA)
- Institute of Heating and Air Conditioning Industries (IHACI)
- International Ground Source Heat Pump Association (IGSHPA)

- National Air Duct Cleaners Association (NADCA)
- National Air Filtration Association (NAFA)
- National Association of Oil and Energy Service Professionals (OESP)
- National Energy Management Institute (NEMI, an organization representing Sheet Metal Contractors and Sheet Metal Workers)
- Partnership for Air Conditioning, Heating, and Refrigeration Accreditation (PAHRA)
- Plumbing-Heating-Cooling-Contractors– National Association (PHCC)
- Refrigeration Service Engineers Society (RSES)
- RESNET
- Service Roundtable
- SkillsUSA
- UltimateAir Inc.



### Elements of a Profession

- Most professions possess the following:
  - Recognized body of knowledge (Knowledge Areas of Technician Expertise– KATES)
  - Continuing education
  - Code of conduct
  - Research studying the industry
  - Certification for technicians in the industry



## Knowledge Areas of Technician Expertise

- Based on a job analysis
- Study of HVACR practice
- The survey listed the HVACR duties and the knowledge which might be required to be a NATE certified technician. Respondents are asked:
  - how frequently they perform HVACR tasks; and
  - how important those tasks and knowledge areas are for successful service outcomes on a job.
- Results are the Knowledge Areas of Technician Expertise (KATES) required to be an effective NATE certified technician



# What Distinguishes NATE certified technicians?

- Certification Requires:
  - Passing rigorous examinations
  - Candidates adhere to the Code of Conduct
- Commitment to ongoing development by certification maintenance



- Certificants are required to keep current with the ever changing aspects of the HVAC industry
- NATE **HVAC Performance Verifier** certification is valid for three (3) years
  - candidates are sent a notice to the last address on record several times at regular intervals prior to the deadline for recertification



### **Certification Maintenance**

- Must submit written application
- Must apply for and be granted recertification in order to continue using the NATE credential
- Certification is maintained by:
  - Completing 18 continuing education hours (CEH) in your specialty and apply for recertification before your certification lapses



#### Credibility

NATE certification serves as an impartial, third party endorsement of your knowledge and experience. It adds to your credibility as a rater and sets you apart from other technicians.



#### Achievement

NATE certification is a reflection of personal achievement because the individual has displayed mastery of his or her field by meeting requirements and standards set in the HVACR/Rating industries.



### Commitment

Receiving NATE certification shows your peers, supervisors and customers your commitment to your chosen career and your ability to perform to set standards. The NATE certification program seeks to stimulate an environment of continuous learning and applied knowledge that leads to excellence in job performance and job satisfaction.



#### Advancement

NATE certification can give you the "edge" when being considered for a promotion or other career opportunities. The NATE certification clearly identifies you as a technician who has demonstrated mastery of HVACR principles and techniques based on accepted best practices.



#### Recognition

As a NATE certified technician, you can expect increased recognition from your peers for taking that extra step in your career.

### Personal Satisfaction

NATE certification is a step toward defining yourself beyond a job description while gaining a sense of personal satisfaction.



#### Responsibility, Knowledge, & Skills

- NATE certification indicates your willingness to invest in your own professional development.
- NATE certification showcases your individual mastery by confirming mastery of knowledge in the field.
- Certification maintenance is required every three years, proving you keep current in the HVACR industry.



### Why NATE Certification?

NATE certificants typically:

- Have higher salaries
- Are considered more valuable to their employer
- Are in greater demand
- Are preferred among customers



### Eligibility Requirements



- HERs certificant in good standing with RESNET
- Agree to abide by Code of Conduct





### Examination

- 100 questions
- Multiple-choice questions
- Developed by subject matter experts in the HVACR industry in conjunction with a professional testing agency







- Equipment Selection
- Duct system design
- Installation Practices
- Airflow Measurements
- Diagnostic Procedures

Whole-Systems Approach to the Conditioned Environment





How Exam was Developed



- NATE Knowledge Areas of Technician Expertise (KATES) are identified by committees of subject matter experts
- RESNET subject matter experts provided guidance on questions
- RESNET subject matter experts chose questions based on current practices and standards
- Questions reviewed by several subject matter experts



# How Do I Study?

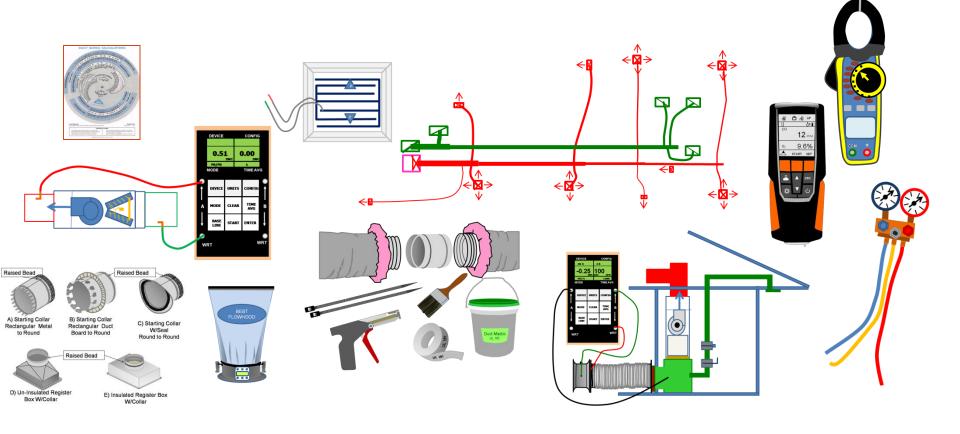


- NATE HVAC Performance Verifier exam measures mastery of knowledge needed to carry out HVAC tasks performed on the job not a prescribed set of texts (such as are used to in academic settings).
- Honestly evaluate your knowledge of the HVAC industry
- Determine what they need to study
  - Exam preparation needs can be different from one candidate to another





### Things You May Want to Know





Question Distribution



#### Section Area Description

#### Section Percentage

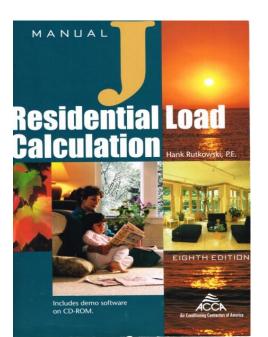
Load Calculation	15%
Equipment Selection	5%
Duct Systems & Airflow	51%
Indoor Air / Environment Performance	9%
System Performance	20%



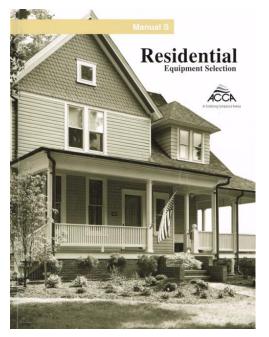
### Reference Materials

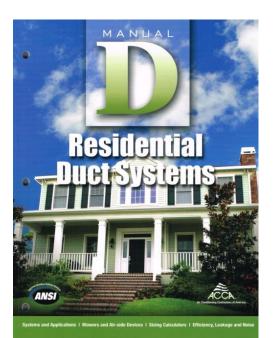


American National Standards Institute (ANSI) / Air Conditioning Contractors of America (ACCA) Manuals -"J", "S", and "D" - Latest Editions



#### http://www.acca.org/



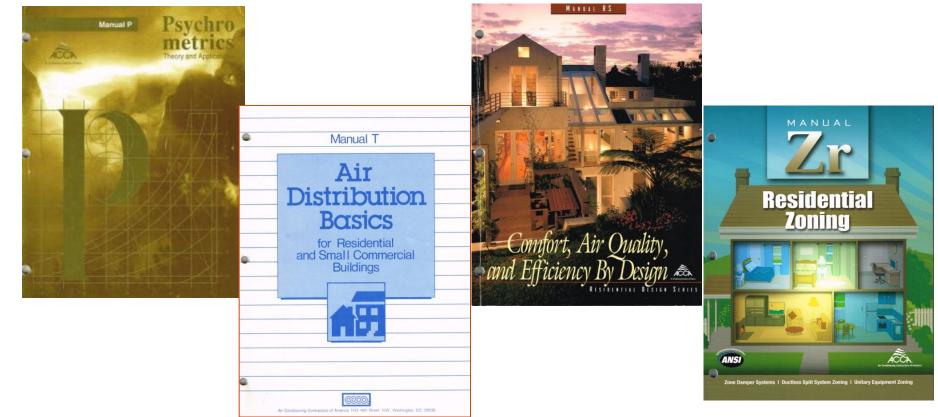






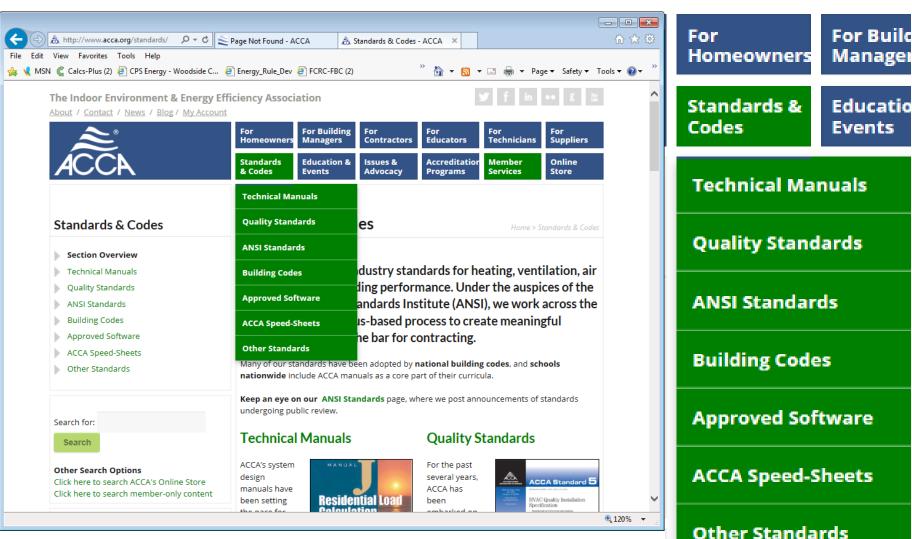
#### ACCA Manuals "P", "T", "RS", and "Zr" - Latest Editions

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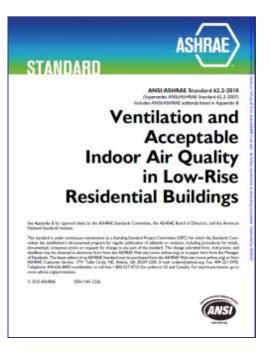
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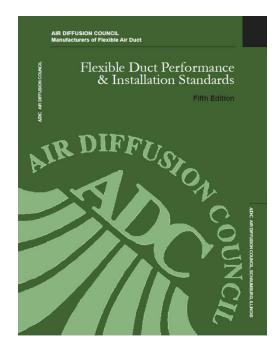


ASHRAE Standard 62.2 – Latest Edition with Addendum Air Diffusion Council: Flexible Duct Performance & Installation Standards, Installation Guidelines

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http://www.flexibleduct.org





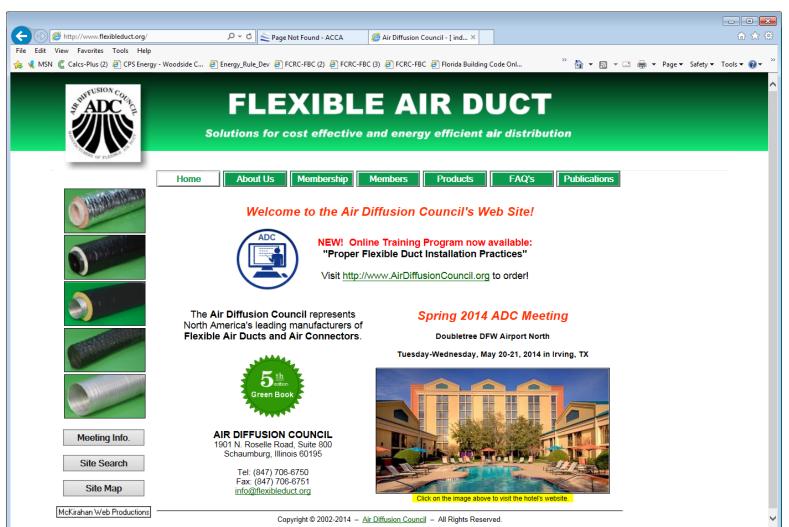


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# ACCA Technician Guide for Quality Installation (Support Document for Standard 5)



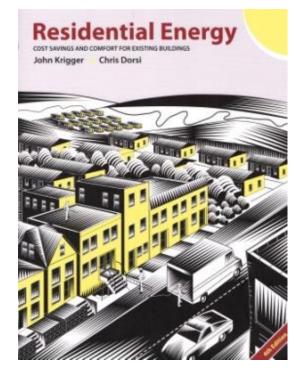


#### http://www.acca.org





#### Residential Energy (Krigger & Dorsi)



#### Energy Star V3



ENERGY STAR Certified Homes, Version 3 (Rev. 07) Inspection Checklists for National Program Requirements



ENERGY STAR Certified Homes, Version 3 (Rev. 07) HVAC System Quality Installation Contractor Checklist <sup>1</sup>

Home Address:	City:	State:	Zip	Code:	
System Description 2	Cooling system for tempo	orary occupant load?	<sup>3</sup> Yes 🗆 No		
1. Whole-Building Mechanical Ventilation Design <sup>4</sup>			Builder Verified <sup>5</sup>	Cont. Verified <sup>6</sup>	N/A
1.1 Ventilation system installed that has been designed to m but not limited to, requirements in Items 1.2-1.5. <sup>7</sup>	eet ASHRAE 62.2-2010 requi	rements including,			-
1.2 Ventilation system does not utilize an intake duct to the re is designed to operate intermittently and automatically ba when not in use (e.g., motorized damper).					-
<ol> <li>Documentation is attached with ventilation system type, lo of each ventilation cycle.</li> </ol>	cation, design rate, and freque	ency and duration			-
1.4 If present, continuously-operating vent. & exhaust fans dea	signed to operate during all oc	cupiable hours.			



ENERGY STAR Certified Homes, Version 3 (Rev. 07) HVAC System Quality Installation Rater Checklist <sup>1</sup>

Home Address:	City:	State:	Zip Cod	e:	
1. Review of HVAC System Quality Installati	on Contractor Checklist <sup>2</sup>		Must Correct	Rater Verified	N/A
1.1 HVAC System Quality Installation Contractor C with documentation on ventilation system (1.3)					
1.2 Review the following parameters related to system cooling design, selection, and installation from the HVAC Contractor Checklist (Contractor Checklist Item # indicated in parenthesis): <sup>3</sup>					
1.2.1 Outdoor design temperatures (2.4) are e contractor-designated design location <sup>4</sup>	equal to the 1% and 99% ACCA Manual J d	esign temperatures for			
1.2.2 Home orientation (2.5) matches orientat	ion of rated home				
1.2.3 Number of occupants (2.6) equals number	er of occupants in rated home <sup>5</sup>				
1.2.4 Conditioned floor area (2.7) is within ±1	0% of conditioned floor area of rated home				
1.2.5 Window area (2.8) is within ±10% of cal	culated window area of rated home				





# Consortium for Energy Efficiency: Efficient Installation and Maintenance Practices for Residential HVAC Systems

#### Specification of Energy-Efficient Installation and Maintenance Practices for Residential HVAC Systems

White Paper

#### Consortium for Energy Efficiency One State Street, Suite 1400 Boston, MA 02109-3507

Rick Karg R.J. Karg Associates John Krigger Saturn Resource Management July 2000

ftp://66.195.117.239/public/Tech\_Service/2008%20Airon%20Supply%20Service %20Update/Whitepapers/energy%20white%20paper.pdf





ACCA Standard 9 HVAC Quality Installation Verification Protocols

#### http://www.acca.org

AIR CONDITIONING CONTRACTORS OF AMERICA	ACCA Standard 9
2800 Shirlington Road Suite 300 Arlington, VA 22208	STANDARD NUMBER: ANSI/ACCA 9 QIVP - 2009
703.575.4477 Fax 703.575.8107 www.acca.org	HVAC Quality Installation Verification Protocols
	Establishes Minimum Requirements for Verifying That Residential and Light Commercial HVAC Systems Meet the ANSI/ ACCA 5 GI - 2007 (HVAC Quality Installation Specification) Standard.
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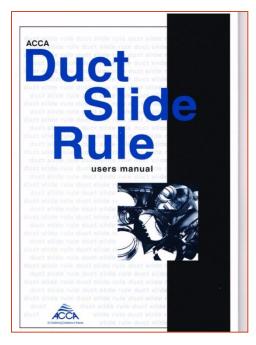
ASHRAE 152 Method of Test for Determining the Design and Seasonal Efficiencies of Residential Thermal Distribution Systems http://www.techstreet.com/publishers/33

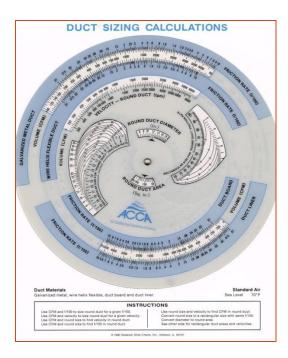
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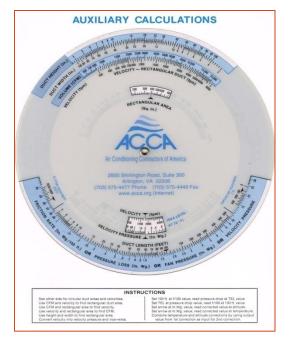




#### ACCA Duct Slide Rule







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**Regarding Prep.** & **Review Courses** 



- <u>Any</u> educational programs will help support your overall knowledge base, thus helping you prepare for an exam.
- Candidates should not expect a course to "teach to the exam" and tell you how to answer questions on the exam.
- Each candidate's study plan should be as unique as that candidate's own experiences.
- To locate a RESNET Training Organization:
  - <u>http://www.resnet.us/professional/programs/training\_providers</u>
- To locate NATE Recognized Training Providers:
  - <u>http://www.natetesting.com/natex/ceu\_courses\_search.asp</u>



# Taking the Test



Contact the nearest RESNET Training Organization

 <u>http://www.resnet.us/professional/programs/</u>
 <u>training providers</u>

#### Questions



## NATE Program Information

- For more information: www.natex.org
- Please call with any questions at 1-877-420-6283



# **RESNET Program Information**

- For more information: www.resnet.us
- Please call with any questions at: 770-529-3630

