Importance of Certification
Agenda

1. AHRI Introduction
2. Importance of Certification
3. Regional Regulations and Trends
AHRI
Introduction
Global trade association representing .......
Equipment manufacturers in four industry sectors:

Applied, Unitary, Heating, Refrigeration, covering:
- Residential and commercial air conditioning and heating equipment and components
- Residential and commercial water heating equipment and components
- Commercial refrigeration equipment and components
  - Strong, global industry voice
  - Standards & certification programs
  - Compliance & market surveillance
<table>
<thead>
<tr>
<th>AHRI Introduction</th>
<th>AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE</th>
</tr>
</thead>
</table>
| **Global Trade Association** | 320+ members: global companies  
1st HVACR trade association  
65+ years tradition |
| **Standards Development Organization** | 140+ standards & guidelines  
created by the industry’s top experts |
| **Globally recognized, industry respected certification program** | 1000+ certification licensees  
40+ certification programs  
Recognized global gold standard |
AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

INDUSTRY VOICE

NORTH AMERICAN MARKET
Federal & State Level Advocacy

GLOBAL MARKET
Collaboration with UNEDO/ KIGALI
Standards adoption & Harmonization
Climate Change & Ozone Issues

INDUSTRY STANDARDS

STANDARDS & GUIDELINES

2023 (2020) Standard for
Performance Rating of Unitary Air-conditioning
& Air-source Heat Pump Equipment

CERTIFICATION

40+ Certification Programs
1000+ Licensees, Including
280+ International Players

APPROVED CERTIFICATION BODY

AHRI CERTIFIED™

EPA
ENERGY STAR
SASO
AHRI INDUSTRY EVENTS
THE GLOBAL EVENT FOR HVACR INDUSTRY

TRAINING & CERTIFICATION
TECHNICIAN TRAINING & CERTIFICATION

RESEARCH
REFRIGERANTS

AHRI-led program tests alternative refrigerants for major product categories
http://www.ahrinet.org/saferefrigerant
AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

REGULATIONS

U.S. FEDERAL REGULATIONS

GCC NATIONAL REGULATIONS

MARKET SURVEILLANCE

COMPLIANCE DATA
Provide performance information on behalf of participants to

• U.S. Department of Energy
• U.S. Environmental Protection Agency
• U.S. Federal Trade Commission
• California Energy Commission
• Natural Resources Canada

CERTIFICATION DIRECTORY
AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

OUR STRENGTH: GLOBAL MEMBERSHIP – INDUSTRY EXPERTISE & BEST PRACTICES
Importance of Certification

INTRODUCTION

- First cost
- Total cost of ownership
- Suitability
- Acquire, installation & commissioning Time
- Noise criteria
- Impact on other building design elements
- Experience and reputation of the manufacturer
- Lifespan
- Energy benefits
- Scalability, staging, and modularity
- Ease and cost of operations and maintenance
- Redundancy and failure-node risk
- Certification
- Compliance with codes & Regulations
- Safety
- Environmental health attributes
Importance of Certification

WHAT IS AHRI CERTIFICATION?

Widely recognized as the gold-standard for heating and cooling certification, AHRI provides an accurate and unbiased evaluation of heating, ventilation, air conditioning and commercial refrigeration (HVACR) equipment. With over 80 years’ experience certifying heating and cooling hardware, AHRI is an internationally recognized certification standard.

Simply put, AHRI certification provides you with an unbiased means of comparing several HVAC units.
Importance of Certification

WHAT IS AHRI CERTIFICATION?

Performance certification programs that certify residential and commercial equipment

- Capacity
- Energy efficiency
- Pressure drop
- Power consumption
- Refrigerant purity
- Water consumption rate/usage

Uses recognized industry test standards

- ANSI/AHRI
- ASHRAE
- EN
- ISO/IEC
- Regional (CSA, ISHRAE/IS)

Verify equipment performance ratings through extensive and continuous testing

- Selection rating software
- Sound rating
- Fan speed
- Seasonal Energy Efficiency Ratio
- Sensible and latent effectiveness
- Air transfer ratio
Importance of Certification

AHRI CERTIFIED PRODUCT ADVANTAGES

Concerning points

➢ Higher capital cost

➢ Expensive Maintenance

➢ Power consumption & sustainability

➢ Noisy operation

➢ Green technology

AHRI Certified Product

✓ Cost of Compliance is below 1% of product cost

✓ Certified product is performance tested

✓ Verified efficiency, complies with MEPS with minimum variations

✓ AHRI has sound standards that test and certify noise levels

✓ AHRI is leading global research on low-GWP refrigerants
Importance of Certification

AHRI CERTIFIED PRODUCT ADVANTAGES

Concerning points

➢ Country Of Origin & Premium Product
➢ Works in local climate
➢ 3rd party test & specs verification
➢ Ensure consistency
➢ Compliance with regulatory standards

AHRI Certified Product

✓ Only reputable companies acquire AHRI certifications
✓ AHRI has hot climate-specific standards & certifications
✓ AHRI verifies detailed specs beyond basic specs
✓ AHRI conducts consistent inspections to verify that manufacturing practices remain consistent over time
✓ Certification is trusted by many governments and nongovernment entities to ensure compliance
Importance of Certification

HVAC INDUSTRY’S 65+ YEARS GOLD STANDARD

SYSTEMATIC, STRINGENT, INDUSTRY DRIVEN CONFORMITY ASSESSMENT PROGRAM

Data Submittal
- Performance Data for units in scope
- Basic Model Groupings (BMGs) defined
- Manufacturer own test report per BMG
- Additional Data:
  - for Regulatory Compliance
  - testing, facility, data validation

Qualification Testing
- 10% - 30% of all BMGs tested
- Labs & test samples randomly selected
- Failure Penalty:
  - entire BMG is rerated proportionally
  - another BMG is tested
- Acceptance into the program only after PASSING all qualification tests

Annual Testing and Penalties
- 10 to 30% of BMG annually tested
- Analytics based sample selection
- Random production BMG selection
- Labs Random Selection
- Verification provision – challenge test
- Penalties for test failures
Importance of Certification

HVAC INDUSTRY’S 65+ YEARS GOLD STANDARD

AHRI APPROVED LABORATORIES ACROSS THE GLOBE

AHRI EXPANDING LABORATORY FOOTPRINT

AHRI APPROVED LABORATORIES:

- Air Movement and Control Association (AMCA) – USA
- Canadian Standards Association (CSA) – USA
- CETIAT - France
- DMT GmbH & CO KG - Germany
- Heat Transfer Research, Inc. – USA
- Hefei General Machinery & Electrical Product Inspection (GMPI) – China
- Intertek (NY – OH – TX, USA)
- UL – USA
- UL – Middle East
- Lucerne University (HSLU) Switzerland

ISO 17025  AHRI 140  AMCA 51
ASHRAE Method of Testing
Importance of Certification

HVAC INDUSTRY’S 65+ YEARS GOLD STANDARD

“AHRI CERTIFIED” IS NOT TO BE CONFUSED WITH:
”RATED OR TESTED PER AHRI STD”

- Rated per performance is @ AHRI standard operating temperatures
- It DOES NOT MEAN compliance to standards
- There IS NO independent verification of claim
- There ARE NO clear test methods or basis of calculation
- It IS NOT possible to fairly or accurately compare supplier’s performance

Performance Requirement
Input
MEPS Requirements

Certified Equipment
Trusted Output

Non-Certified Equipment
Questionable Output

Trusted Output
Questionable Output

Certified Equipment

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MEPS Requirements

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Trusted Output

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Trusted Output
Questionable Output

Certified Equipment
Importance of Certification
HVAC INDUSTRY’S 65+ YEARS GOLD STANDARD

AHRI DIRECTORY : GLOBAL PUBLIC FREE ACCESS

- Download certified performance ratings: residential, commercial, and industrial products
- Real-time data and on demand current certificate printout
- Quick search functions
- Gives end user / designer confidence in certified high efficiency products and ability to confirm certification and compare product performance.
Importance of Certification
HVAC INDUSTRY’S 65+ YEARS GOLD STANDARD

AHRI DIRECTORY: REAL TIME SEARCH FOR PERFORMANCE DATA AND CERTIFICATES

DOWNLOADABLE CERTIFICATES OF PERFORMANCE

SEARCH FOR AND COMPARE CERTIFIED PRODUCT PERFORMANCE:

AHRI DIRECTORY AS A TOOL

- Compare product performance
- Download print certificate
- T1 & T3 certificates
- Confirm compliance
- Certificate# / product
- Date stamp
- Assurance of performance
- Green fund tool
Regional Regulations and Trends
Regional Regulations and Trends

ASHRAE 90.1 SCOPE

Minimum energy-efficient requirements (design/construction, O&M)

1. new buildings and their systems,
2. new portions of buildings and their systems,
3. new systems and equipment in existing buildings, and

Criteria for determining compliance with these requirements.

Building Envelope / HVACR / DHW / Power / Lighting / Other Equipment

Green Building Codes
Regional Regulations and Trends

AHRI CERTIFICATION > ASHRAE 90.1 COMPLIANCE TOOL

CLIMATE ZONES IN ASHRAE 90.1

ANNEX A1 REFERENCE ASHRAE 169 FOR CLIMATE ZONE DESIGN

AHRI CERTIFICATION & RATING

Region’s Climate Zone: A0-3 and B0-3

Green Building Codes
Regional Regulations and Trends

AHRI CERTIFICATION > ASHRAE 90.1 COMPLIANCE TOOL

AHRI STANDARDS REFERENCED IN ASHRAE 90.1

NORMATIVE STANDARDS

ASHRAE 90.1 - SECTION 12

Normative Table Lists 18 AHRI Standards. These include, but are not limited to:
AHRI 210/240 (DX Splits < 5.4 RT)
AHRI 340/360 (DX Units > 5.4 RT)
AHRI 1230 VRF Systems
AHRI 550/590 Chillers

4.1.7 Definitions:
Normative appendices are considered to be integral parts of the mandatory requirements of ASHRAE 90.1

MANDATORY PROVISIONS

ASHRAE 90.1 - HVAC SECTION 6.4

Mandatory minimum SEER Rating and operating conditions per AHRI standard
Tables 6.8 List of equipment and respective AHRI standard

6 Heating, Ventilating, and Air Conditioning

Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Size Category</th>
<th>Heating Section Type</th>
<th>Subcategory or Rating Condition</th>
<th>Minimum Efficiency</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioners, air cooled</td>
<td>&lt;65,000 Btu/h²</td>
<td>All</td>
<td>Split system, three phase</td>
<td>13.0 SEER</td>
<td>AHRI 210/240</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single package, three phase</td>
<td>14 SEER</td>
<td></td>
</tr>
</tbody>
</table>
### Regional Regulations and Trends

#### MENA RELEVANT STANDARDS (HIGH AMBIENT)

<table>
<thead>
<tr>
<th>Name</th>
<th>AHRI Standard</th>
<th>Year</th>
<th>SI</th>
<th>50 Hz</th>
<th>International Directory/Certificate</th>
<th>T3 46°C</th>
<th>T3 Max 52°C</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCL &amp; ACCI (Chillers)</td>
<td>550/590 - 551/591</td>
<td>2020</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle</td>
</tr>
<tr>
<td>Unitary Large</td>
<td>340/350</td>
<td>2019</td>
<td>Yes</td>
<td>Yes</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
<td>Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment &gt; 65K BTU/h &lt; 250K BTU/h</td>
</tr>
<tr>
<td>Unitary Small</td>
<td>211/241-08/1B</td>
<td>2021</td>
<td>X</td>
<td>Yes</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
<td>Performance Rating of Unitary AC &amp; Air-source Heat Pump &lt; 65K BTU/h</td>
</tr>
<tr>
<td>VAV (Variable Air Volume)</td>
<td>880-891</td>
<td></td>
<td>Yes</td>
<td>Not Required</td>
<td>N/A</td>
<td>Performance Rating of Air Terminals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VRF (Variable Refrigerant Flow)</td>
<td>1230</td>
<td>2021</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHU (Air Handling Units &amp; Casing)</td>
<td>430/1350-431</td>
<td>2020</td>
<td>X</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFC (Room Fan Coils)</td>
<td>440-441</td>
<td>2019</td>
<td>X</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACHR (Forced Circ Coils)</td>
<td>410</td>
<td>2001</td>
<td></td>
<td></td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHHE (Heat Exchangers)</td>
<td>400-401</td>
<td>2015</td>
<td>X</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERV (Energy Recovery Ventilation)</td>
<td>1050-1061</td>
<td>2018</td>
<td>X</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCM ECP</td>
<td>1360-1361</td>
<td>2017</td>
<td>X</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSE (Thermal Storage Equipment)</td>
<td>900-901</td>
<td>2014</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPVU (Single Packaged Vertical Unit)</td>
<td>490</td>
<td>2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example**

- **AHRI 211-241 Released in 2021**
- **Cover T3 (46°C) & (48°C)**
- **Calculates SEER based on custom Btu/hours**

*For SI units add 1 to the standard (e.g. 400 → 401)

*Max temperature 49°C
## Regional Regulations and Trends

### GCC STANDARDS AND PRODUCT COMPLIANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Standard</th>
<th>Description</th>
<th>Products Included</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAUDI</strong></td>
<td>SASO 2663:2021</td>
<td>Energy Efficiency labelling and testing requirements for small unitary</td>
<td>Mini Split</td>
</tr>
<tr>
<td></td>
<td>SASO 2874:2016</td>
<td>Energy Efficiency and testing requirements for large unitary</td>
<td>Ducted Split</td>
</tr>
<tr>
<td><strong>UAE</strong></td>
<td>ESMA : UAE.S 5010-1:2019</td>
<td>Energy efficiency label for household AC</td>
<td>Rooftop</td>
</tr>
<tr>
<td></td>
<td>ESMA : UAE.S 5010-5:2019</td>
<td>Energy efficiency label for commercial and central AC</td>
<td>VRF</td>
</tr>
<tr>
<td></td>
<td>Dubai Municipality</td>
<td>AL SAFAT- Green Building evaluation system</td>
<td>Chillers</td>
</tr>
<tr>
<td></td>
<td>Dubai FZ Trakhes</td>
<td>EHS Green Building Regulations</td>
<td>FCU</td>
</tr>
<tr>
<td></td>
<td>Abdu Dhabi - Estidama</td>
<td>Urban planning council : Pearl rating system for Estidama</td>
<td>AHU</td>
</tr>
<tr>
<td><strong>QATAR</strong></td>
<td>QS SASO 2663: 2015</td>
<td>Energy labeling and minimum energy performance requirements for AC</td>
<td></td>
</tr>
<tr>
<td><strong>BAHRAIN</strong></td>
<td>BSM, EWA</td>
<td>Energy labeling and minimum energy performance requirements for AC</td>
<td></td>
</tr>
<tr>
<td><strong>OMAN</strong></td>
<td>GSO 2530: 2016</td>
<td>Energy labeling and minimum energy performance requirements for AC</td>
<td></td>
</tr>
<tr>
<td><strong>KUWAIT</strong></td>
<td>MEW R6: 2018</td>
<td>Energy Conservation Program - Code of Practice</td>
<td></td>
</tr>
<tr>
<td><strong>GCC</strong></td>
<td>GSO-BD-142004-01</td>
<td>Safety - Gulf Technical Regulation for Low Voltage</td>
<td></td>
</tr>
</tbody>
</table>

### Products Included

- Mini Split
- Ducted Split
- Rooftop
- VRF
- Chillers
- FCU
- AHU
<table>
<thead>
<tr>
<th>Minimum</th>
<th>E</th>
<th>E</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>11.8</td>
<td>8.3</td>
<td>11.6</td>
</tr>
<tr>
<td>T3</td>
<td>8.1</td>
<td>8.0</td>
<td>8.28</td>
</tr>
</tbody>
</table>

- **Duct**: 6.8
- **Mini**: T1, T3, T1, T3, T1, T3, T1, T3, T1, T4, T1, T3

<table>
<thead>
<tr>
<th>Region</th>
<th>T1°C ID/OD (WB/DB)</th>
<th>T3°C ID/OD (WB/DB)</th>
<th>T4°C ID/OD (WB/DB)</th>
<th>High Ambient °C ID/OD (WB/DB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qatar</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bahrain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuwait</td>
<td></td>
<td></td>
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<tr>
<td>Oman</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Testing Temperatures & Voltages**
- **T1**: 35°C
- **T3**: 46°C
- **T4**: 48°C