AHRI

AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

we make life better ®

Webinar

Importance of Certification

Agenda

1	**AHRI Introduction**
2	**Importance of Certification**
3	**Regional Regulations and Trends**

AHRI

1 AHRI Introduction

AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

APPLIED

UNITARY

HEATING

REFRIGERATION

NOT-FOR-PROFIT ORGANIZATION

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

o Strong, global industry voice
o Standards & certification programs
o Compliance & market surveillance

AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

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

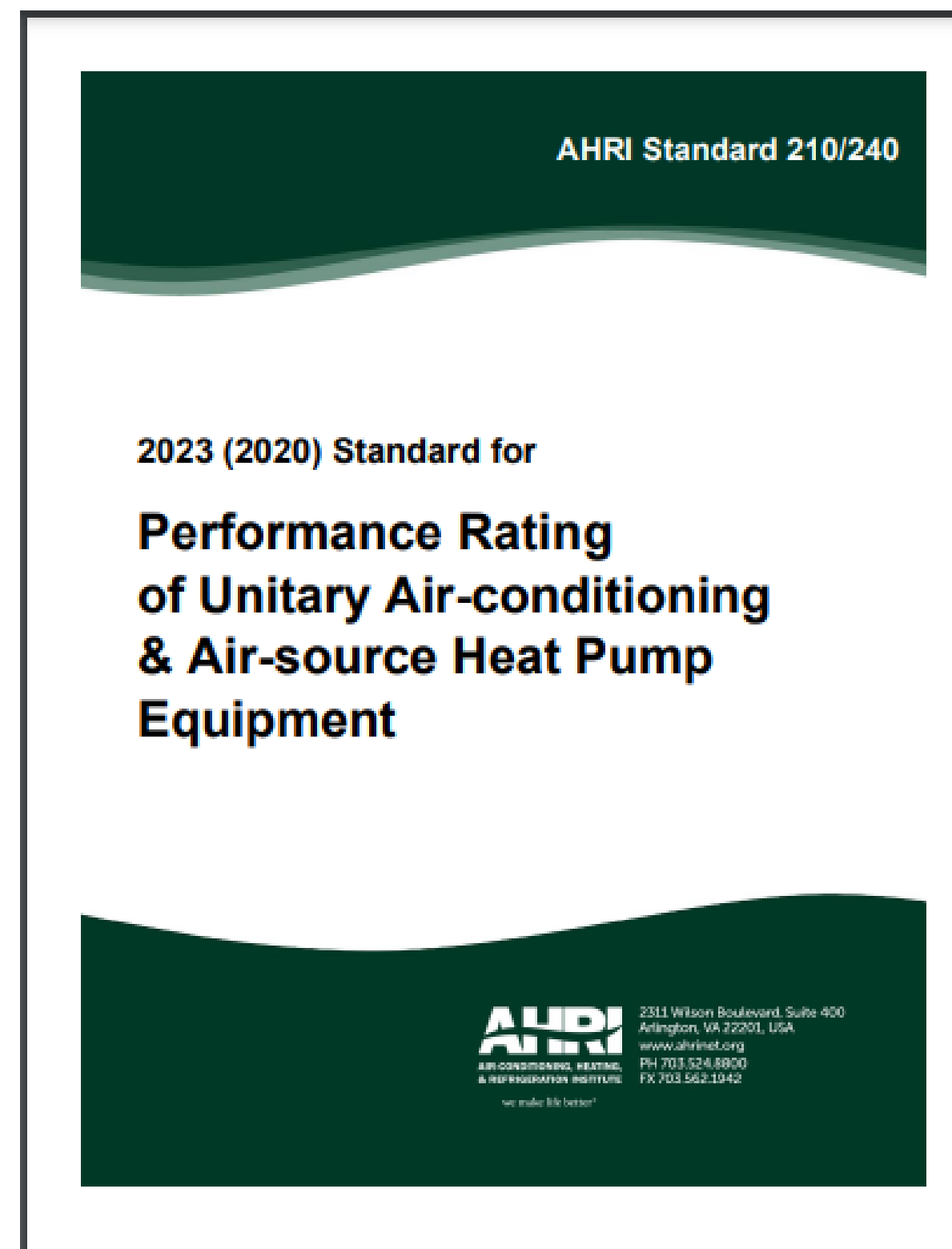### NORTH AMERICAN MARKET

Federal & State Level Advocacy

GLOBAL MARKET

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

INDUSTRY STANDARDS

STANDARDS & GUIDELINES

AHRI Standard 210/240

2023 (2020) Standard for

**Performance Rating
of Unitary Air-conditioning
& Air-source Heat Pump
Equipment**

AHRI
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CERTIFICATION

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

APPROVED CERTIFICATION BODY

AHRI Introduction
AIR CONDITIONING HEATING AND REFRIGERATION INSTITUTE

AHRI INDUSTRY EVENTS

THE GLOBAL EVENT FOR HVACR INDUSTRY

TRAINING & CERTIFICATION

TECHNICIAN TRAINING & CERTIFICATION

REFRIGERANT DRIVING LICENSE

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

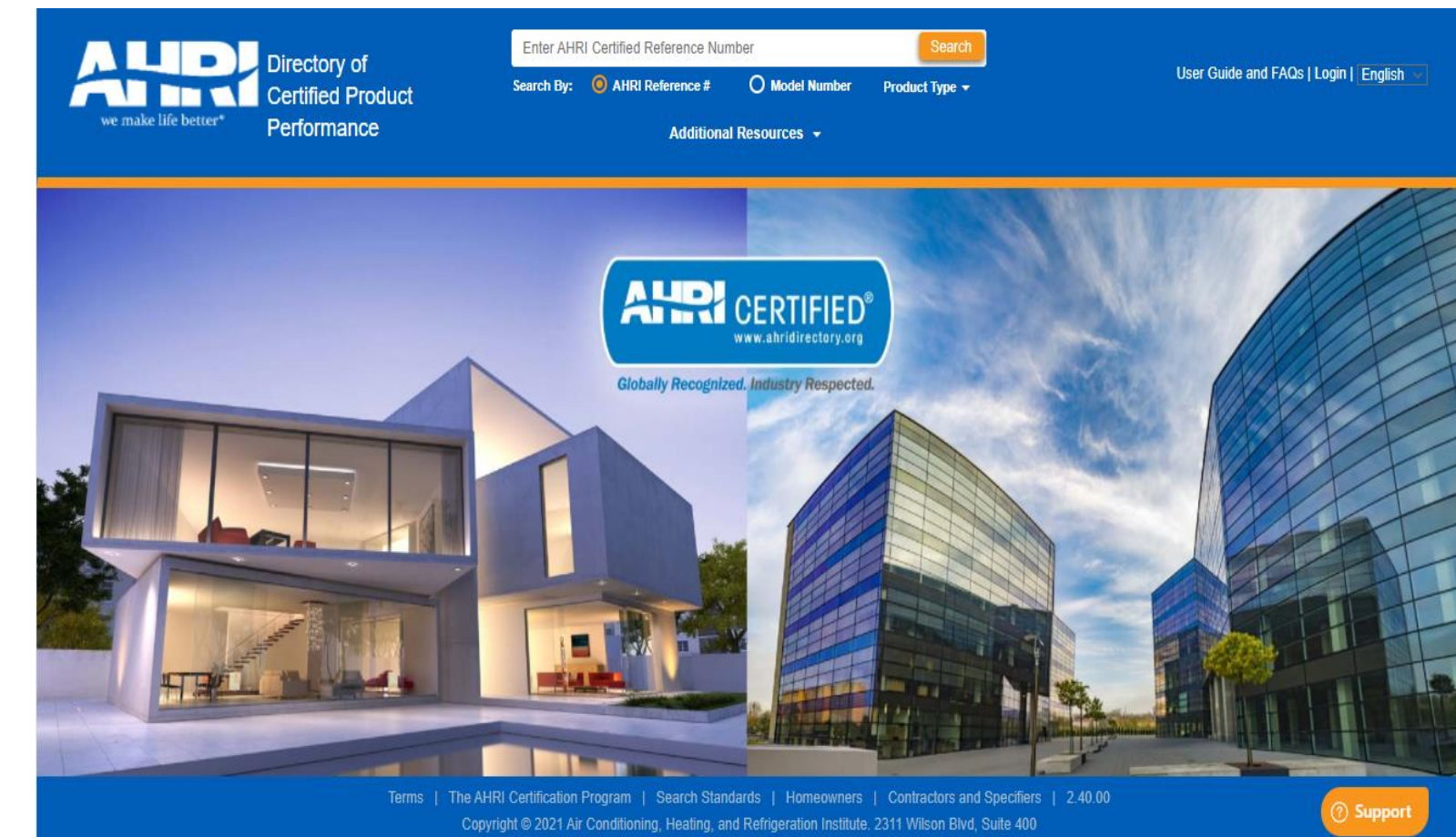### U.S. FEDERAL REGULATIONS

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

OUR STRENGTH : GLOBAL MEMBERSHIP – INDUSTRY EXPERTISE & BEST PRACTICES

2 Importance of Certification
AHRI Certification as a Compliance Tool

Equipment Selection Criteria

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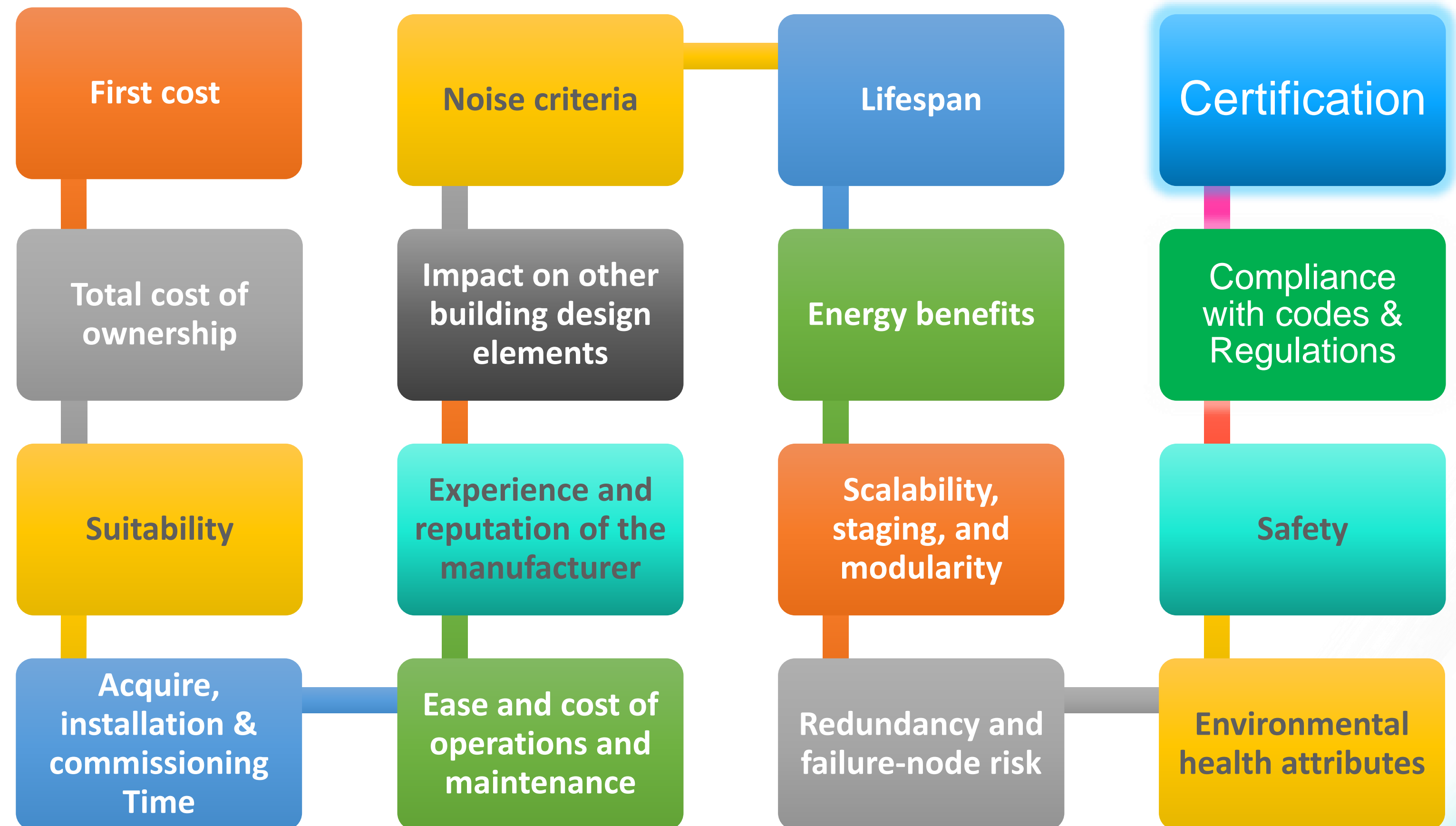
AHRI

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.

Performance certification programs that certify residential and commercial equipment

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

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

Uses recognized industry test standards

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

Verify equipment performance ratings through extensive and continuous testing

Importance of Certification

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 refrigrants

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 governemts and nongovernment entities to ensure compliance

AHRI

SYSTEMATIC, STRINGENT, INDUSTRY DRIVEN CONFORMITY ASSESSMENT PROGRAM

Data Submittal → Qualification Testing → Annual Testing and Penalties

Application

- 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

Compliance

- 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

Survelliance

- 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

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Importance of Certification

HVAC INDUSTRY'S 65+ YEARS GOLD STANDARD

AHRI EXPANDING LABORATORY FOOTPRINT

AHRI-APPROVED LABORATORIES ACROSS THE GLOBE

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

AHRI

Importance of Certification
HVAC INDUSTRY'S 65+ YEARS GOLD STANDARD

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

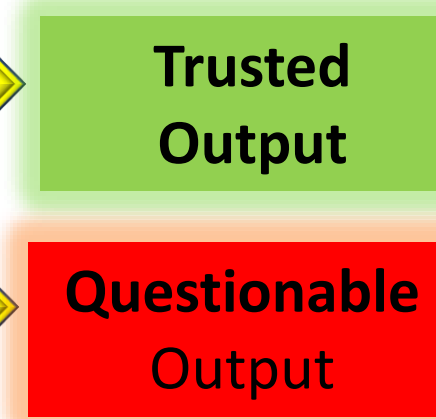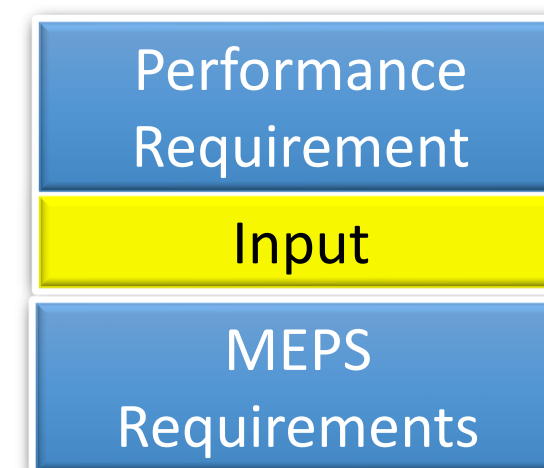Rated per performance is @ AHRI standard operating temperatures

It DOES NOT MEAN compliance to standards

There IS NO independent verification of claim

There ARE NO clear test methods or basis of calculation

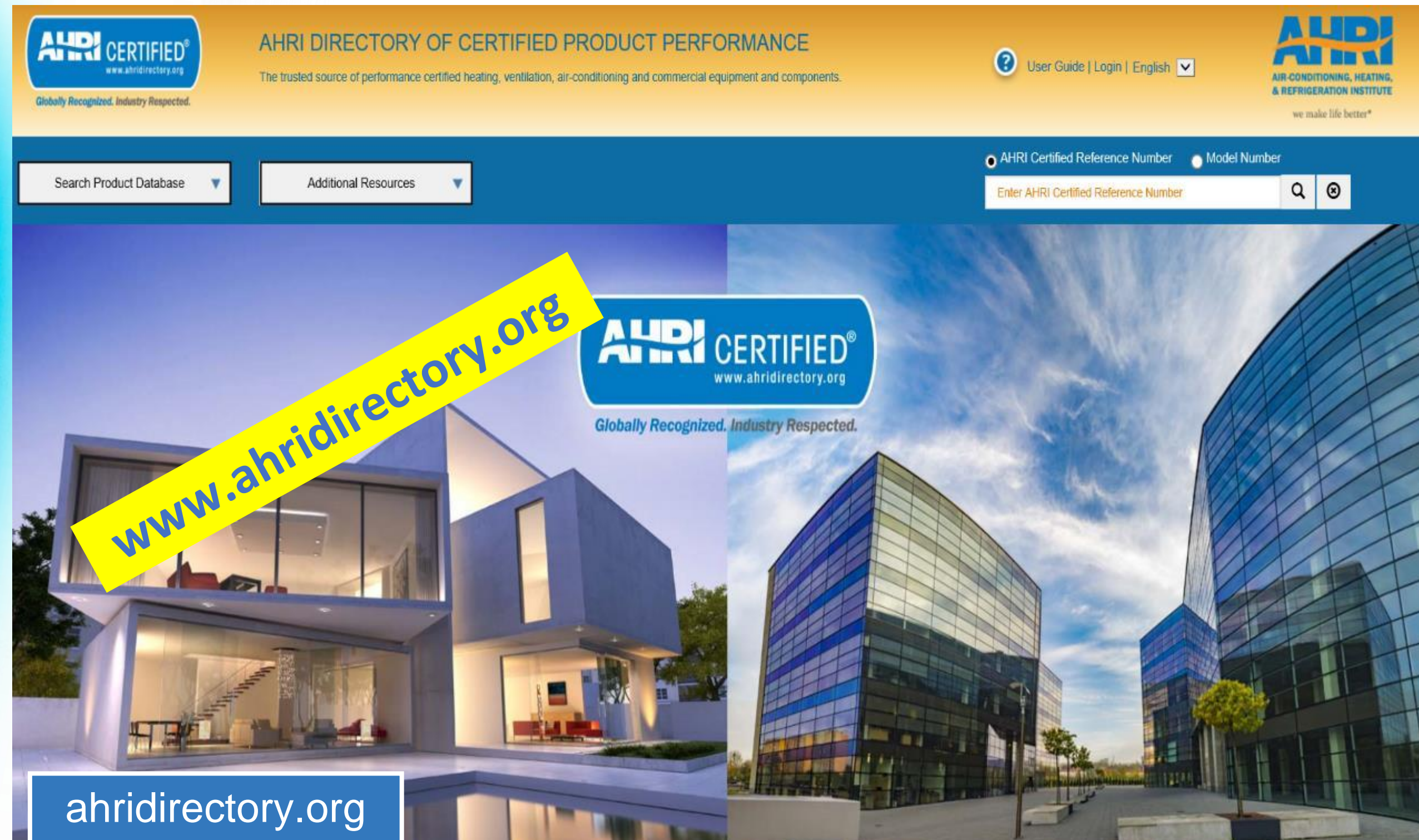It IS NOT possible to fairly or accurately compare supplier's performance

Performance Requirement	→	Certified Equipment	→	Trusted Output	✓ Certified
Input					
MEPS Requirements	→	Non-Certified Equipment	→	Questionable Output	✗ Rated

Importance of Certification

HVAC INDUSTRY'S 65+ YEARS GOLD STANDARD

AHRI DIRECTORY : GLOBAL PUBLIC FREE ACCESS

ahridirectory.org

- 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 DIECTORY AS A TOOL**

AHRI DIECTORY AS A TOOL list:

Compare product performance

Download print certificate

T1 & T3 certificates

Confirm compliance

Certificate# / product

Date stamp

Assurance of performance

Green fund tool

3 **Regional Regulations and Trends**

GREEN BUILDING CODES AND ASHRAE 90.1

ASHRAE STDS: FOUNDATION OF REGION'S GREEN BUILDING CODES

STANDARD 90.1 - STANDARD 55 - STANDARD 62 - ASHRAE HANDBOOK – FUNDAMENTALS
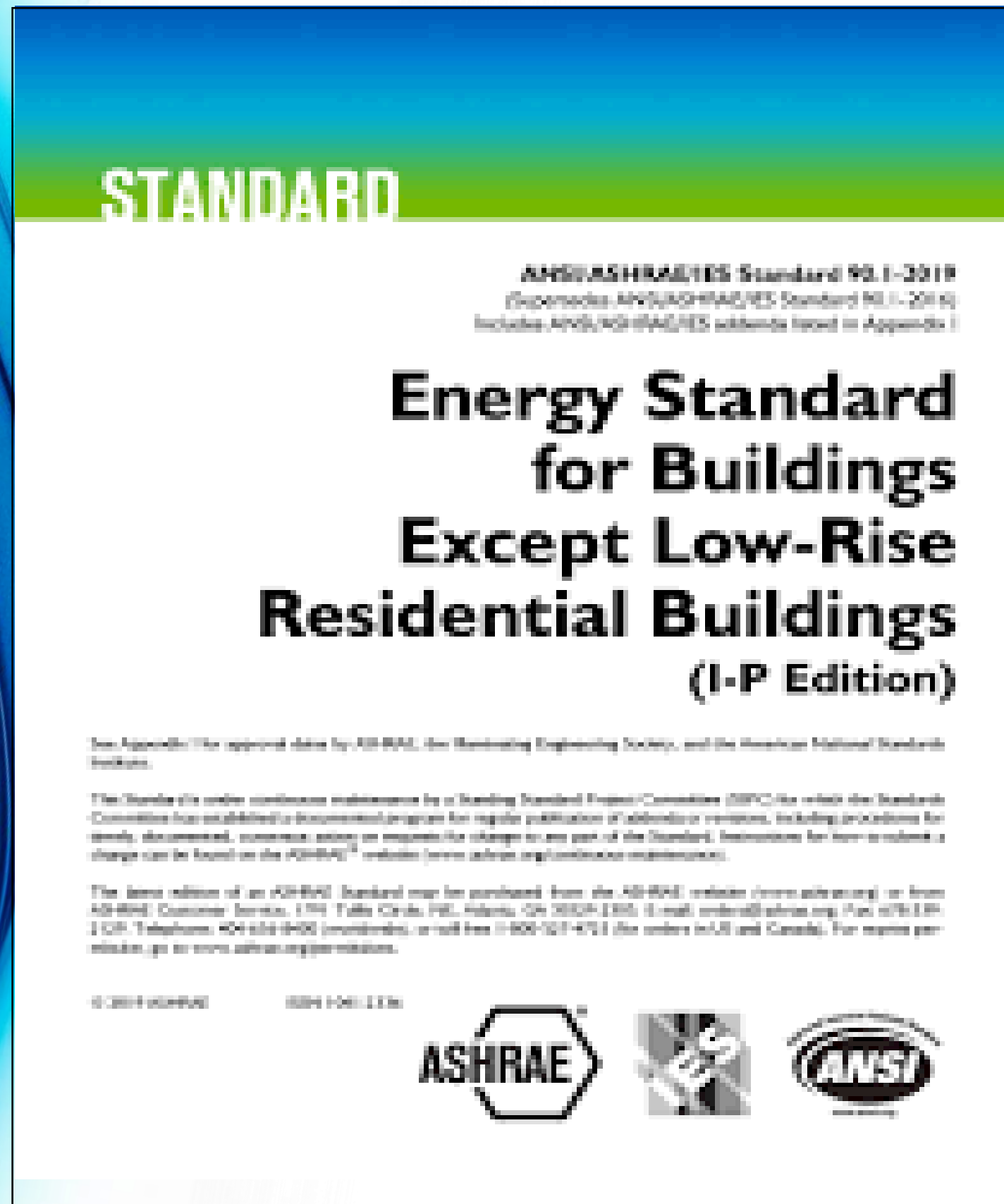
Green Building Codes

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
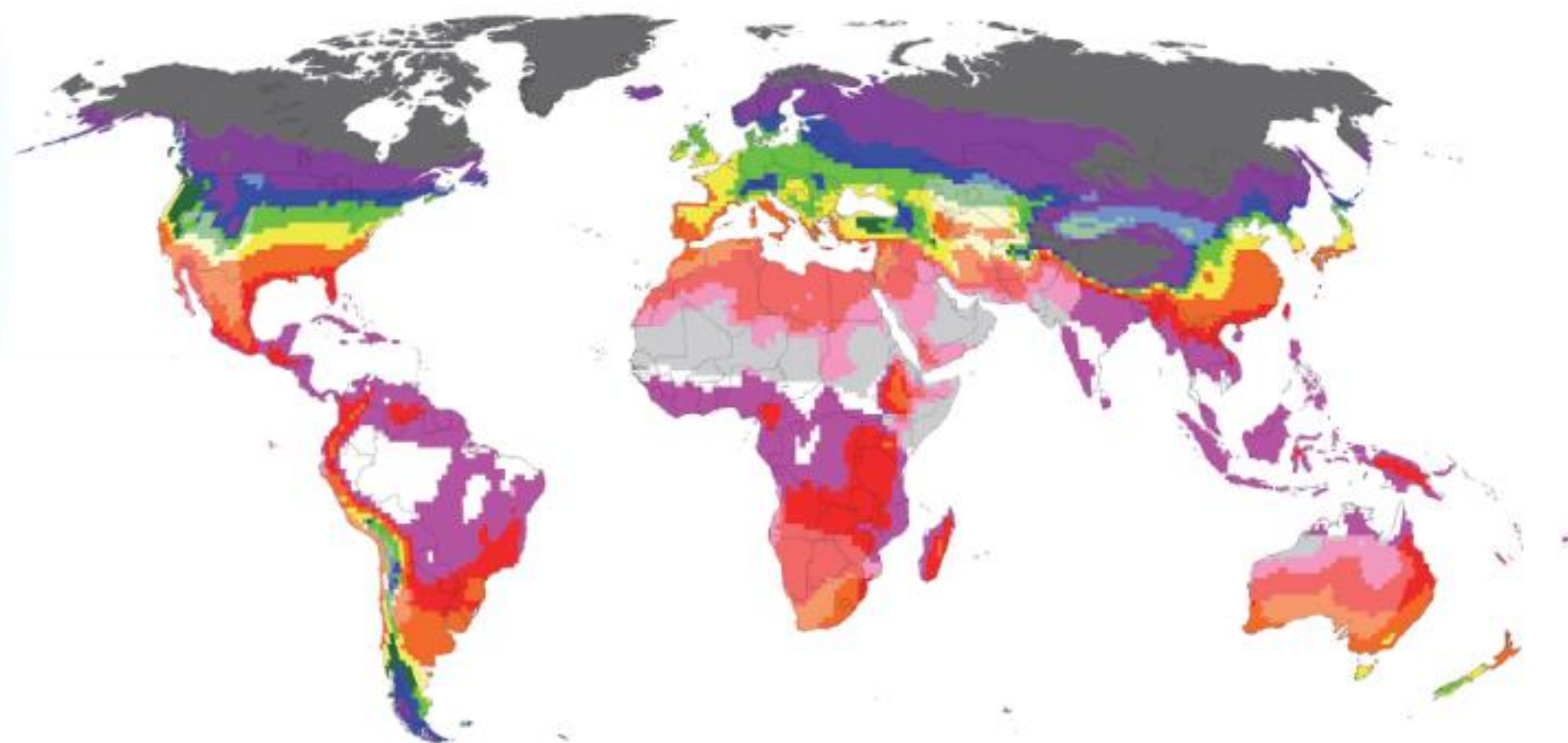
Green Building Codes

CLIMATE ZONES IN ASHRAE 90.1

ANNEX A1 REFERENCE ASHRAE 169 FOR CLIMATE ZONE DESIGN

AHRI CERTIFICATION & RATING

Zone 0B Extremely Hot Dry
Zone 1A Very Hot Humid
Zone 1B Very Hot Dry
Zone 2A Hot Humid
Zone 2B Hot Dry

Region's Climate Zone: A0-3 and B0-3

AHRI Standard 211/241-0B/1B-2021 (SI)

Table 9. Test Conditions for Air-cooled Products[1]				
Test Name	Air Entering Outdoor Unit [2] (°C)	Air Entering Indoor Unit [2] (°C)	Compressor Speed [3]	Indoor Airflow [4]
Cooling Mode				
$T_{3,Full}$	46.0 / 24.0 [5,6]	29.0 / 19.0	$Full_C$[8]	$Full_C$
$T_{4,Full}$	48.0 / 24.0 [5,6]	26.6 / 19.4	$Full_C$[8]	$Full_C$
$T_{1,Full}$	35.0 / 24.0 [5,6]	27.0 / 19.0	$Full_C$	$Full_C$
$T_{1,Int}$	35.0 / 24.0 [5,6]	27.0 / 19.0	Int_C	Int_C
$T_{1,Low}$	35.0 / 24.0 [5,6]	27.0 / 19.0	Low_C	Low_C
B_{Full}	27.8 / 18.3 [5,6]	26.7 / 19.4	$Full_C$	$Full_C$
B_{Low}	27.8 / 18.3 [5,6]	26.7 / 19.4	Low_C	Low_C
C_{Full}	27.8 / 14.4 [5,6]	26.7 / 13.9 [7]	$Full_C$	$Full_C$
C_{Low}	27.8 / 14.4 [5,6]	26.7 / 13.9 [7]	Low_C	Low_C
D_{Full}	27.8 / 14.4 [5,6]	26.7 / 13.9 [7]	$Full_C$	$Full_C$[9]
D_{Low}	27.8 / 14.4 [5,6]	26.7 / 13.9 [7]	Low_C	Low_C[9]
E_{Int}	30.6 / 20.6 [5,6]	26.7 / 19.4	Int_C	Int_C
F_{Low}	19.4 / 11.9 [5,6]	26.7 / 19.4	Low_C	Low_C
G_{Low}	19.4 / 14.4 [5,6]	26.7 / 13.9 [7]	Low_C	Low_C
I_{Low}	19.4 / 14.4 [5,6]	26.7 / 13.9 [7]	Low_C	Low_C[9]
Cooling Mode Operation Tests				
Voltage Tolerance	35.0 / 23.9 [6]	26.7 / 19.4	$Full_C$	$Full_C$
Low Temperature	19.4 / 13.9	19.4 / 13.9	$Full_C$	$Full_C$
Insulation Efficiency	26.7 / 23.9	26.7 / 23.9	$Full_C$	$Full_C$
Condensate Disposal	26.7 / 23.9	26.7 / 23.9	$Full_C$	$Full_C$
Extra High Maximum Operation (Optional)	52.0 / 31.0	26.7 / 19.4	$Full_C$[8]	$Full_C$

Green Building Codes

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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*—
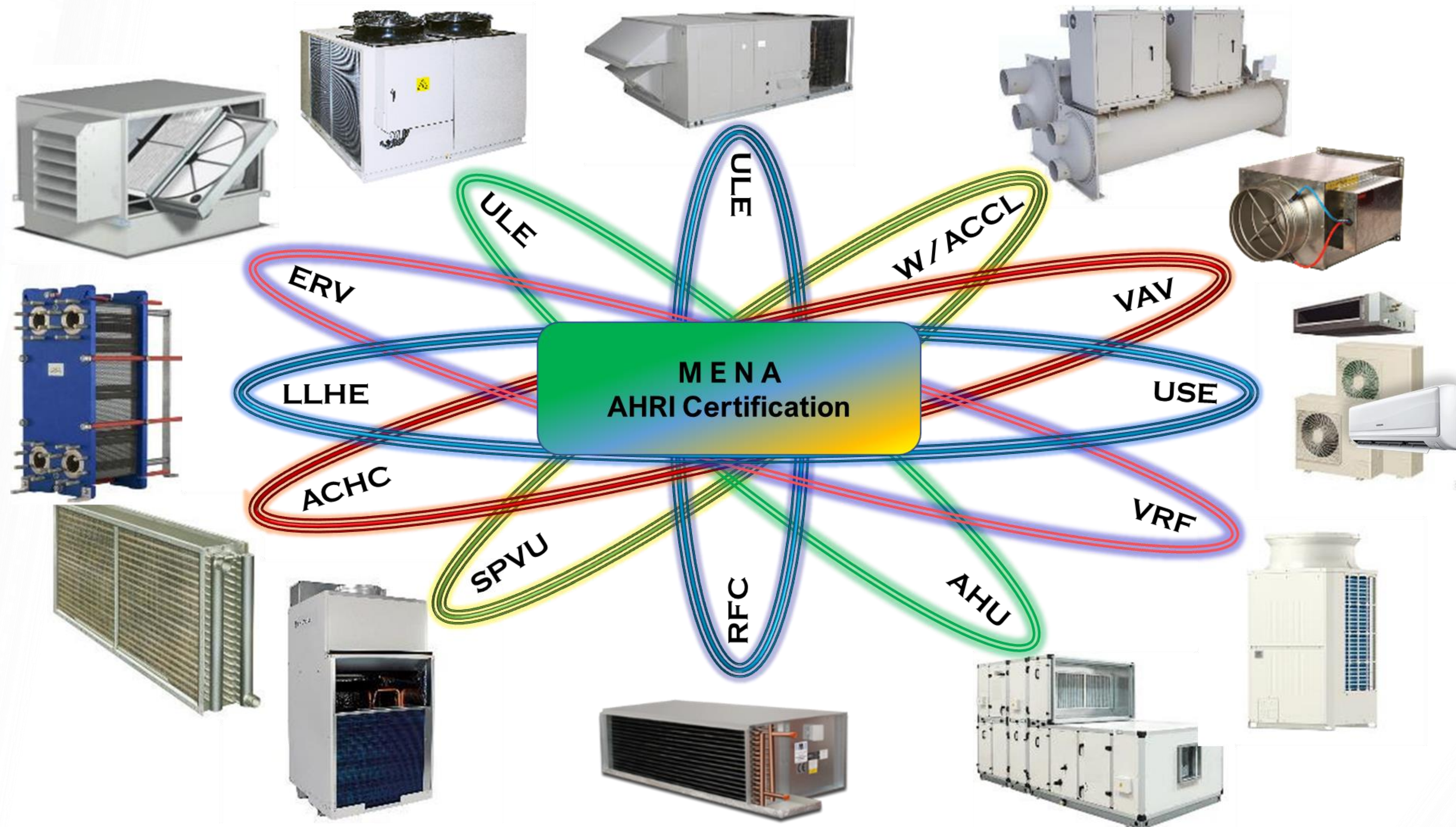Minimum *Efficiency* Requirements

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum *Efficiency*	Test Procedure[a]
Air conditioners, air cooled	<65,000 Btu/h[b]	All	Split *system*, three phase	13.0 *SEER*	AHRI 210/240
			Single package, three phase	14 *SEER*	

Green Building Codes

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MENA RELEVANT STANDARDS (HIGH AMBIENT)

	Name	AHRI Standard	Yr	SI	50 Hz	International Directory /Certficate	T3 46 C	T3 (Max) 52 C	Description
1	WCCL & ACCL (Chillers)	550/590 – 551/591	2020	X	Yes	X	☀ Yes,	Yes	550/590 (IP) & 551/591 (SI), Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle
2	Unitary Large	340/360	2019		Yes	X	☀ Yes	Yes	Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment > 65K BTU/h <250K Btu/h
3	Unitary Small	211/241-0B/1B	2021	X	Yes	X	☀ Yes	Yes	Performance Rating of Unitary AC & Air-source Heat Pump < 65K Btu/h bbbb
4	VAV (Variable Air Volume)	880-881	2.		Yes	X	Not Required	N/A	Performance Rating of Air Terminals
5	VRF (Variable Refrigerant Flow)	1230	2021						
6	AHU (Air Handling Units & Casing)	430/1350 – 431	2020	X	Ye..				..lling
7	RFC (Room Fan Coils)	440-441	2019	X	Yes				
8	ACHC (Forced Circ Coils)	410	2001		N/A				
9	LLHE (Heat Exchangers)	400-401	2015	X	N/A				
10	ERV (Energy Recovery Ventilation)	1060-1061	2018	X	Yes				..s for
11	DCOM EQP	1360-1361	2017	X	Yes				
12	TSE (Thermal Storage Equipment)	900-901	2014	X					..Conditioners
13	SPVU (Single Packaged Vertical Unit)	490	2003						Performance Rating of Computer and Data Processing Room Air Conditioners

Example

3	Unitary Small	211/241-0B/1B	2021

AHRI 211-241 Released in 2021

Cover T3 (46°C) & (48°C)

Calculates SEER based on custom BIN hours

For SI units add 1 to the standard (e.g. 400 --> 401)

* Max temperature 49˚C

Regional Regulations and Trends
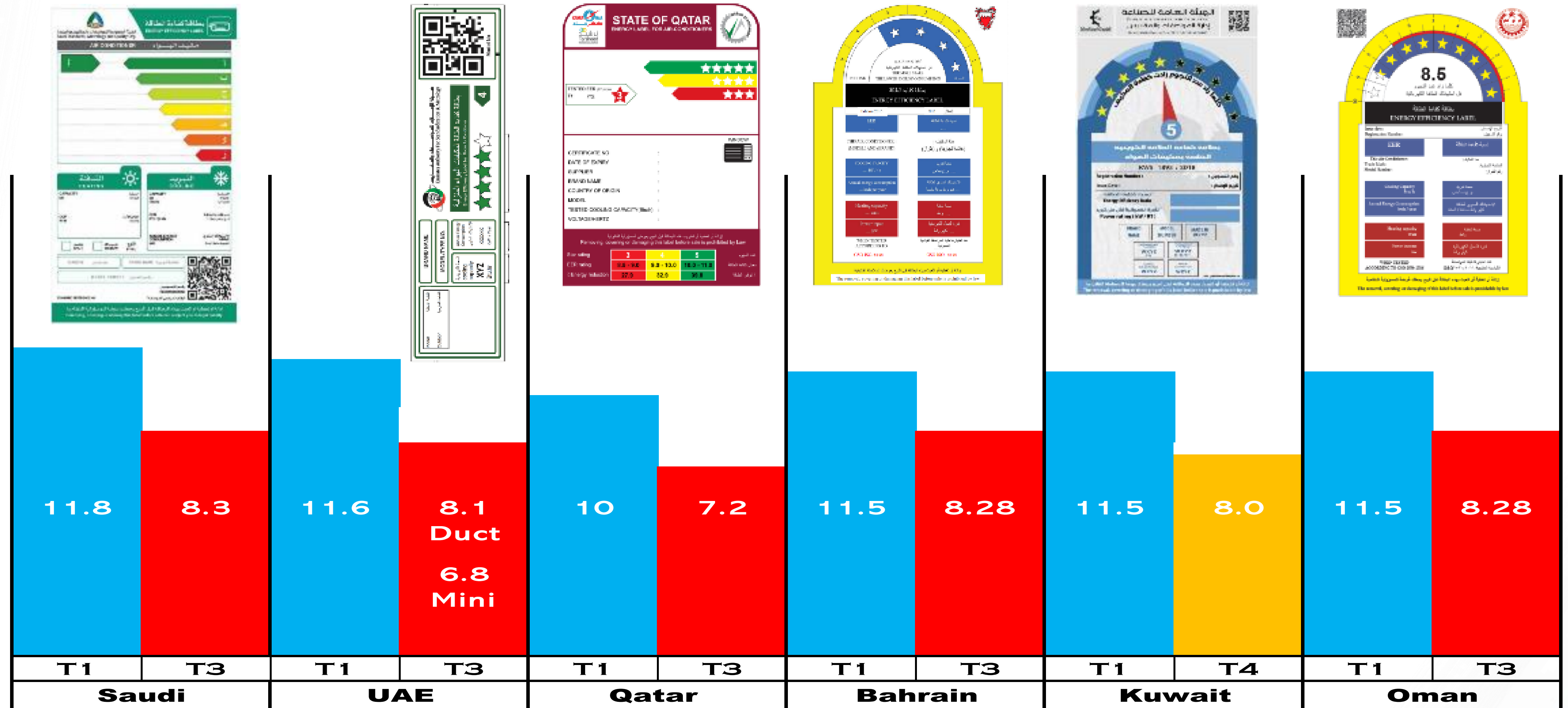
GCC STANDARDS AND PRODUCT COMPLIANCE REQUIREMENTS

Country	Standard	Description	Products Included						
			Mini Split	Ducted Split	Rooftop	VRF	Chillers	FCU	AHU
SAUDI	SASO 2663:2021	Energy Efficiency labelling and testing requirements for small Unitary	X	X					
	SASO 2874:2016	Energy Efficiency and testing requirements for large unitary		X	X	X	X		
UAE	ESMA : UAE.S 5010-1:2019	Energy efficiency label for household AC	X						
	ESMA : UAE.S 5010-5:2019	Energy efficiency label for commercial and central AC		X	X	X	X		
	Dubai Municipality	AL SA'FAT- Green Building evaluation system	X	X	X	X	X	X	X
	Dubai FZ Trakhess	EHS Green Building Regulations	X	X	X	X	X		
	Abu Dhabi - ESTIDAMA	Urban planning council : Pearl rating system for Estidama	X	X	X	X	X		
QATAR	QS SASO 2663: 2015	Energy labeling and minimum energy performance requirements for AC	X	X					
BAHRAIN	BSM, EWA	Energy labeling and minimum energy performance requirements for AC	X	X					
OMAN	GSO 2530: 2016	Energy labeling and minimum energy performance requirements for AC	X	X					
KUWAIT	MEW R6: 2018	Energy Conservation Program - Code of Practice	X	X	X	X	X		
GCC	GSO-BD-142004-01	Safety - Gulf Technical Regulation for Low Voltage Electrical Equipment and Appliances	X	X					

Regional Regulations and Trends
MINIMUM ENERGY PERFORMANCE STANDARDS

Minimum E E R

11.8	8.3	11.6	8.1 Duct 6.8 Mini	10	7.2	11.5	8.28	11.5	8.0	11.5	8.28
T1	T3	T1	T3	T1	T3	T1	T3	T1	T4	T1	T3
Saudi		UAE		Qatar		Bahrain		Kuwait		Oman	

Testing Temperatures & Voltages	T1°C ID/OD (WB/DB) (19-27/24-35) 230V-1pH	T3°C ID/OD (WB/DB) (19-29/24-46) 230V-1pH	T4°C ID/OD (WB/DB) (19.4-26.6/26.9-48) 240-1pH	High Ambient °C ID/OD(WB/DB) (23-32/ 31-52) 230V+/-10%-1pH

T1 = 35° C
T3 = 46 °C
T4 = 48 °C

Thank You
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