



مجلس أبوظبي للجودة والمطابقة  
ABU DHABI QUALITY & CONFORMITY COUNCIL



# Abu Dhabi Certification Scheme for Air-cooled Unitary Air Conditioners

## Assessment and Surveillance Plan



### Amendment Page

To ensure that each controlled copy of this ASP contains a complete record of amendments, the Amendment Page is updated and issued with each set of revised/new pages of the document.						
<u>Amendment</u>			<u>Discard</u>		<u>Insert</u>	
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## TABLE OF CONTENTS

<b>1</b>	<b>ABOUT THE ABU DHABI QUALITY AND CONFORMITY COUNCIL .....</b>	<b>4</b>
<b>2</b>	<b>FOREWORD .....</b>	<b>4</b>
<b>3</b>	<b>THE ENVIRONMENTAL TRUSTMARK .....</b>	<b>5</b>
<b>4</b>	<b>REFERENCES .....</b>	<b>6</b>
<b>5</b>	<b>CERTIFICATION REQUIREMENTS.....</b>	<b>7</b>
5.1	General Requirements .....	7
5.2	Specific Requirements.....	7
5.3	Demonstration and acceptance through comparable standards.....	9
5.4	Quality Management System Requirements.....	9
<b>6</b>	<b>ASSESSMENT OF THE APPLICATION .....</b>	<b>10</b>
<b>7</b>	<b>IDENTIFICATION AND LABELLING .....</b>	<b>10</b>
<b>8</b>	<b>SURVEILLANCE / AUDIT PROCEDURES .....</b>	<b>10</b>
8.1	General.....	10
8.2	Quality Management System.....	10
8.3	Testing and Inspection .....	10
	<b>APPENDIX 1: PRODUCT ASSESSMENT AND CERTIFICATION PROCESS .....</b>	<b>12</b>

## 1 ABOUT THE ABU DHABI QUALITY AND CONFORMITY COUNCIL

The Abu Dhabi Quality and Conformity Council (QCC) was established by law No. 3 of 2009, issued by His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and ruler of Abu Dhabi.

The QCC consists of a council of regulators that facilitate the provision of quality infrastructure in line with global standards. This quality infrastructure enables industry and regulators to ensure that products, systems and personnel can be tested and certified to UAE and International Standards. In addition to supporting regulators and government organizations through offering quality and conformity facilities, expertise and resources, the council is also engaged in promoting a culture of quality towards consumers. Additionally, the QCC is responsible for raising the quality of local products and ensuring exports meet international standards to improve interactions with global trade and integration into the global economy, as envisioned by Abu Dhabi Vision 2030.

Products, personnel or systems certified by the QCC receive the Abu Dhabi Trustmark. The Trustmark is designed to communicate that products, personnel or systems conform to comprehensive safety, quality and performance standards that are set by Abu Dhabi regulators.

## 2 FOREWORD

The Air-cooled Unitary Air Conditioners Certification Scheme, enables manufacturers, suppliers and distributors of unitary air conditioners to obtain voluntary certification of products that meet quality, safety and performance specifications suitable for the Emirate of Abu Dhabi. These specifications incorporate the following requirements:

- Minimum energy performance standards (MEPS) for unitary air conditioners as defined by ASHRAE 90.1.2013.
- Abu Dhabi Urban Planning Council (UPC) Estidama requirements for 0 ozone depletion potential (ODP) refrigerants as defined in the [Pearl Building Rating System \(PBRS\)](#) and [Pearl Villa Rating System \(PVRS\)](#) credit RE-R3.
- [Abu Dhabi International Energy Conservation Code \(AD-IECC\)](#) Section 503.2.3, as issued by the Abu Dhabi Department of Municipal Affairs in 2013.
- Abu Dhabi Regulation and Supervision Bureau (RSB) requirements for power factor as defined by [The Electricity Wiring Regulations \(Third Edition\)](#).
- Electrical safety requirements as defined by the International Electrotechnical Commission (IEC) under the IEC 60335-2-40 standard.

The scope of the certification scheme applies to the following types of air conditioning systems:



- **Unitary Air-Conditioner:** One or more factory-made assemblies which normally include an evaporator or cooling coil(s), compressor(s), and condenser(s). Where such equipment is provided in more than one assembly, the separated assemblies are to be designed to be used together. The primary function is to provide air-circulation, air cleaning, cooling with controlled temperature and dehumidification.
- **Split System:** Any unitary air conditioner with separate indoor and outdoor component that are connected with refrigerant piping. The indoor unit usually lies within the conditioned space.
- **Single Package Unit:** Any central air conditioner that has all major assemblies enclosed in one cabinet.
- **Condensing Unit:** A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. It consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively-cooled, and/or water-cooled), condenser fans and motors (where used) and factory supplied accessories.
- **VRF Multi-Split System:** A split system air-conditioner incorporating a single refrigerant circuit, with one (1) or more outdoor units, at least one (1) variable speed compressor or an alternative compressor combination for varying the capacity of the system by three (3) or more steps, multiple indoor fan coil units (each of which is individually metered), and individually controlled by an integral control device and common communications network.

It is anticipated that implementation of this certification scheme will significantly benefit the Emirate of Abu Dhabi by reducing energy consumption and maintenance expenses, as well as ensuring compliance with the Montreal Protocol on substances that deplete the ozone layer.

### 3 THE ENVIRONMENTAL TRUSTMARK

Products that achieve certification, through formal evaluation against the QCC certification scheme criteria defined in this document, will be granted a Certificate of Conformity and are licensed to bear the Abu Dhabi Trustmark for Environmental Performance in product promotion and merchandising. The Certificate of Conformity enables manufacturers, distributors and suppliers of unitary air conditioners to present evidence of meeting appropriate standards for Abu Dhabi's built environment.

The Certificate of Conformity can be used to support the submission requirements of the Estidama Pearl Rating System:

- **PBRS and PVRS credits RE-R1 and RE-1:** to demonstrate the product coefficient of performance (COP) claimed; and
- **PBRS and PVRS credit RE-R3:** to demonstrate that the product uses a refrigerant with an ozone depletion potential (ODP) of zero.

The QCC's market surveillance inspectors actively ensure the integrity of the Trustmark for Environmental Performance is maintained through market surveillance and testing of products bearing the Trustmark. This is further detailed in clause 8.

**Advisory note:** A number of factors additional to the characteristics addressed in this assessment and surveillance plan may influence the performance of products, e.g. installation, maintenance, modification, incorrect operation. Such factors are beyond the scope of the third party product certification described in this document. The QCC recommends that suitable precautions, such as the use of competent and/or accredited/approved building designers, air conditioning installers, commissioners and building maintenance managers, to improve the likelihood of continued compliance of installed products. To support the improvement in the quality of service provided by Heating, Ventilation and Air Conditioning (HVAC) technical personnel, the QCC also administrates an HVAC technician certification program. For details regarding Personnel Certification Schemes, contact the QCC on [conformity@qcc.abudhabi.ae](mailto:conformity@qcc.abudhabi.ae).

The requirements herein may from time to time be varied by the issue of one or more 'QCC Notices' issued as controlled documents to certificate holders.

#### 4 REFERENCES

The following standards, codes and regulatory documents are referenced within this Assessment and Surveillance Plan. Familiarity and/or access to these documents, dependant on the product(s) applying for certification, is expected of the applicant. In all cases, the most recent edition of the document is considered the preferred version.

- **AHRI 210/240**, Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment
- **AHRI 340/360**, Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment
- **AHRI 365**, Performance Rating of Commercial and Industrial Unitary Air-Conditioning Condensing Units
- **AHRI 1230**, Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment
- **ANSI/ASHRAE/IES 90.1.2013** (SI Edition), Energy Standard for Buildings Except Low-Rise Residential Buildings
- **EN 14511**, Performance Testing for Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling
- **EN 14825**, Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling. Testing and rating at part load conditions and calculation of seasonal performance
- **IEC 60335-2-40**, Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
- **ISO 5151**, Non-ducted air conditioners and heat pumps — Testing and rating for performance



- **ISO 13253**, Ducted air-conditioners and air-to-air heat pumps -- Testing and rating for performance
- **ISO 15042**, Multiple split-system air-conditioners and air-to-air heat pumps -- Testing and rating for performance
- **ISO 9001**, Quality Management Systems
- **ISO 17025**, General requirements for the competence of testing and calibration laboratories
- **UAE.S GSO 1006**, Methods of Test for Room Air Conditioners
- **Abu Dhabi International Energy Conservation Code**
- **The Pearl Rating System for Estidama: Building Rating System** – Design and Construction
- **The Pearl Rating System for Estidama: Villa Rating System** – Design and Construction
- **The Electricity Wiring Regulations** (Third Edition) issued by The Regulation and Supervision Bureau for the water, wastewater and electricity sector in the Emirate of Abu Dhabi.

## 5 CERTIFICATION REQUIREMENTS

### 5.1 General Requirements

In order to receive the Trustmark for Environmental Performance, the product applying for certification must be assessed according to QCC's criteria (clause 5.2).

The general requirements for certification, along with the terms and conditions for QCC certification of products and license of the Trustmark are contained in the application form, which is available in the QCC website (refer to APPENDIX 1).

In addition, the applicant shall provide the following:

- Valid UAE Trade License
- Authorisation letter from the manufacturer to deal with the product(s) seeking certification (if applying on the manufacturers' behalf).

### 5.2 Specific Requirements

1. **Minimum Energy Performance:** In order to gain certification, the equipment shall meet the minimum efficiency performance standards (MEPS) as defined in ASHRAE 90.1.2013 and outlined in Table 1 below, when tested and rated in accordance with the appropriate testing standard. Where components, such as indoor or outdoor coils, from differing manufacturing facilities are used, calculations and supporting data shall be supplied by the applicant that demonstrate that the combined efficiency (end to end) of the specified components meets the required MEPS.



**Table 1. The QCC minimum energy performance standards for unitary air cooled air conditioning systems certification**

Equipment Type	Rated cooling capacity at T3 conditions (kW) <sup>1</sup>	Minimum Efficiency (at T1 – 35°C) <sup>2, 3, 4</sup>		Acceptable test procedures		
		EER (Btu/Wh)	COP <sup>5</sup> (W/W)	ANSI/AHRI	ISO	EN
Split system and single package units	< 19	11.6	3.40	210/240	5151	14511 14825
	≥ 19 and < 40	11.6	3.40	340/360	13253	
	≥ 40 and < 70	11.3	3.30			
	≥ 70 and < 223	10.7	3.13			
		9.8 IPLV	2.87 IPLV			
≥ 223	10.3	3.02	365			
9.5 IPLV	2.78 IPLV					
Condensing units	≥ 40	11.3	3.30	1230	15042	
VRF multi split air conditioners	< 19	11.6	3.40	1230	15042	
	≥ 19 and < 40	11.2	3.28			
	≥ 40 and < 70	11.0	3.22			
	≥ 70	10.0	2.93			

1. For each unit tested, the measured capacity shall be ≥0.95 of the rated value
2. For each unit tested, the measured energy input shall be ≤1.05 of the rated value
3. For each unit tested, the calculated EER / COP shall be ≥0.95 of the rated value
4. IPLVs are only applicable to equipment with capacity modulation
5. COP = EER x 0.2928

- 2. Ozone-Friendly Refrigerant:** The refrigerant used by the equipment applying for certification shall have an ozone depletion potential (ODP) of zero (0). The test report must clearly identify the refrigerant used.
- 3. Maximum Operating Conditions:** The equipment applying for certification shall be able to operate effectively at 52°C outdoor dry bulb temperature for at least two (2) hours continuously as defined by the UAE.S GSO 1006 Clause 12 – Maximum operating condition test, or a comparable test procedure.
- 4. Minimum Power Factor:** The equipment applying for certification shall have a power factor between 0.9 lagging and unity, as required by the RSB Wiring Regulations. Units with power factor under 0.9 can only be installed with a system (e.g. capacitor bank) that will achieve at least 0.9. The power unit of the A/C unit shall be demonstrated by either following the UAE.S GSO 1006 test for electric power consumption and power factor in the case of single phase units, or by way of calculations from the testing values obtained from the energy performance test reports in the case of three phase units.



**5. Safety Certification:** The equipment applying for certification shall meet all relevant safety requirements, demonstrated by submitting either a valid [Emirates Quality Mark Certificate](#), Emirates Conformity Assessment Scheme (ECAS) certificate or [QCC Trustmark Certificate](#), that demonstrates compliance with IEC 60335-2-40.

The product's performance shall be verified through at least one of the following certification programmes currently accepted by the QCC:

- Emirates Authority for Standardization and Metrology (ESMA): Energy Efficiency Standardization & Labelling (EESL) program, Emirates Quality Mark certification
- Air Conditioning Heating & Refrigeration Institute (AHRI) certification
- Eurovent certification
- Alternative third party certification scheme to ISO standards

If no certification programme exists, the equipment efficiency rating and operating capacity shall be supported by data furnished by the equipment manufacturer and meet the requirements defined in clause 5.3.

### **5.3 Demonstration and acceptance through comparable standards**

Demonstration of compliance through comparable standards may be accepted by QCC provided suitable evidence, such as performance test reports and verified manufacturer's product declarations are supplied by the applicant, demonstrating the ability for the equipment to meet the minimum performance requirements given in clause 5.2.

Where an applicant chooses to supply test evidence of air conditioning system efficiency independent of an established certification programme, the testing laboratory used for performance rating shall be certified to ISO/IEC 17025 within the scope of the testing performed, with the certification being issued by a qualified accreditation body which is a signatory of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC/MRA).

Clarification of acceptance by QCC of compliance through testing by comparable standards may be sought by the applicant via email or face to face meeting prior to preparing the application.

### **5.4 Quality Management System Requirements**

The manufacturer (not the importer, or distributor, or retailer) must be certified according to ISO 9001:2008, the certificate being issued by a certification body accredited according to ISO/IEC 17021:2012 by an accreditation body signatory to the International Accreditation Forum Multilateral Recognition Agreement (IAF MLA).

## 6 ASSESSMENT OF THE APPLICATION

The assessment is based on the submitted documentation defined in clauses 5.2 and 5.3, including additional product information such as; product specifications, product descriptions and product photo documentation, which is evaluated for consistency, completeness and overall quality. Refer to APPENDIX 1 for diagram of the application-assessment process.

## 7 IDENTIFICATION AND LABELLING

Each certified product must be provided with an evident label bearing the Trustmark for Environmental Performance (depending on product and subject to agreement with the QCC Communications department) in accordance with brand guidelines specified in the Application, Terms and Conditions and License for Certification (QCC-QP-CSSPCS-F01).

## 8 SURVEILLANCE / AUDIT PROCEDURES

### 8.1 General

At a minimum, the surveillance and audit requirements listed under this section shall be applied to the certified product(s) on an annual basis.

### 8.2 Quality Management System

Proof of continued compliance (certification) is to be presented to QCC annually or 30 days after expiry of the submitted ISO 9001:2008 certificate (whichever comes first).

### 8.3 Testing and Inspection

Products carrying the Trustmark of Environmental Performance will be subject to the following unannounced inspection activities:

- Annually, the QCC will sample at minimum the integer less than or equal to the square root of the total number of products certified by this scheme from the applicant. Samples will usually be taken from certified products available in the Abu Dhabi market.
- Samples can be inspected i) on-site at installed locations of Abu Dhabi government/municipal owned buildings, ii) at point of entry to the Abu Dhabi Market, and/or iii) on the market.
- Samples will be assessed for compliance to selected specific requirements given in clauses 5 and 7 including review of the current 3<sup>rd</sup>-party certification status.
- The sampling schedule will target previously untested products on a year-on-year basis to ensure eventual testing of all certified products.
- If any product fails to meet the certification requirements during inspection the product certification in question will be suspended and the applicant required to perform testing of at least two samples from the market to verify compliance.



- If one of these additional samples also fails to meet the certification specifications, the certification status of all products from the applicant will be reviewed.

Proof of continued compliance must be provided if; i) a referenced standard listed in clause 4 has changed, or ii) the product has been modified, or iii) annually following issuance of the first certificate, whichever comes first.

In cases i) or ii), the continued validity of the certificate shall be demonstrated; in case iii) an affidavit shall be provided by the applicant and the manufacturer that the production system has not been modified and the specification of the product remains unchanged.



## APPENDIX 1: PRODUCT ASSESSMENT AND CERTIFICATION PROCESS

