



مجلس أبوظبي للجودة والمطابقة  
ABU DHABI QUALITY & CONFORMITY COUNCIL



# Abu Dhabi Certification Scheme for Polyethylene Plastic Pipe Systems Used for Utilities

## Assessment and Surveillance Plan

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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>	
<u>No</u>	<u>Date</u>	<u>*Sections Changed</u>	<u>Page(s)</u>	<u>Issue no</u>	<u>Page(s)</u>	<u>Issue no</u>
1	01/08/2013	Scheme launched	-	-	7	1.0
2	23/04/2014	-Addition of Appendix A -Addition of ADS titles -Rewording of Quality Management Processes and addition of Process C	-		-	2.0

## 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.

QCC is responsible for the development of Abu Dhabi Emirate's Quality Infrastructure, which enables industry and regulators to ensure that products, systems and personnel can be tested and certified to UAE and International Standards.

QCC aims to coordinate with the concerned entities and different stakeholders including regulators and manufactures to ensure that all products whose production or circulation requires conformity with certain specifications or specific levels of quality comply with current legislations of the Emirate to achieve safety, health and environmental protection within the Emirate. QCC also aims at raising the overall levels of product safety and quality, and enhancing product competitiveness on local, regional and international levels through encouraging government entities, the private and public sectors to deal with products that bear the Abu Dhabi Trustmark.

Certified products by QCC receive the Abu Dhabi Trustmark. The Trustmark of the QCC is designed to communicate that a product or system conforms to various health, safety, performance and environmental standards that are set by Abu Dhabi regulators.

### 1 FOREWORD

This Assessment and Surveillance Plan (ASP) is a controlled document issued by QCC as a product certification scheme.

Advisory note: A number of factors additional to the characteristics addressed in this ASP may influence the safety and quality of products (Manufactured products). Such factors are beyond the scope of the third party product certification described in this ASP. QCC recommends that suitable precautions, such as third party inspection and the use of qualified installers are taken by the end users, to improve the likelihood of compliance of manufactured products.

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

### 2 SCOPE

This schedule defines and specifies the procedures for the certification of Polyethylene plastic pipe systems used for utilities according to the standards referenced in section 3.

### 3 REFERENCES

Standard Reference	Description title
UAE.S/GSO ISO 4427: 2007 Part 1 Part 2 (ADS 4) Part 3 (ADS 4)	Plastics Piping Systems — Polyethylene (PE) Pipes and Fittings for Water Supply — Part 1: General Part 2: Pipes

Part 5	Part 3: Fittings Part 5: Fitness for Purpose of the System
ADS 3 / ISO 4437:2014 <sup>1</sup> (For pipes in contact with gaseous fuels) Part 1 Part 2 Part 3 Part 5	Buried polyethylene (PE) pipes for the supply of gaseous fuels — Metric series — Specifications Part 1: General Part 2: Pipes Part 3: Fittings Part 5: Fitness for Purpose of the System
EN 12201-1:2011 <sup>2</sup>	Plastic Piping Systems for Water Supply, and for drainage and sewerage under pressure – Polyethylene (PE)

Other references	Description Title
PE 100 + Association	PE 100+ Quality Materials list
ADS 5/ BS 6920: 2000 (Tests at up to 60 degrees C for potable water applications ) <sup>3</sup>	Suitability of Non-Metallic Products for <u>Use in Contact with Water Intended for Human Consumption with Regards to Their Effect on the Quality of the Water</u>

Note: The latest version of the Standards shall be considered the preferred version when evaluating the test reports - although test reports against the previous version of the standard may be allowed for a suitable transition period after the publication of the latest version. If the standard refers to a transition period, this period will regularly be applied. Otherwise the certification committee will determine the transition period if any.

<sup>1</sup> An ISO 4437: 2007 will be accepted until the end of 2014. This grace period is yet to be confirmed. Additionally, refer to Table 9 in Appendix A for the list of batch tests this scheme requires test reports for.

<sup>2</sup> The ISO 4427 certificate covers the requirements in this EN

<sup>3</sup> WRAS Scheme to be renewed every 4 years

## 4 CERTIFICATION REQUIREMENTS

### 4.1 General requirements

The general requirements are contained in the following QCC documents:

- Terms and Conditions for general use of the Trustmark;
- Terms and Conditions for certification of products and licence of the Trustmark.

The applicant may pursue one of three processes (A or B or C) preference as outlined below:

#### Process A:

The applicant submits the following:

- Test reports from a QCC designated laboratory
- A valid product certificate from a QCC designated certification body. The certificate must certify conformity with the standards mentioned in the product-specific ASP document and conformity with ISO/IEC 17067:2013, system5
- Samples of the product (when and if deemed necessary by QCC);

#### Process B:

The applicant submits the following:

- Valid Type Test Report(s) / Certificate(s) from a third party accredited ILAC MRA member Laboratory / QCC Designated Laboratory
- Batch Test report(s) / certificate(s) performed in the manufacturers laboratory
- Samples of the product selected by QCC coming from the AD market or from production line or both to be submitted to an accredited laboratory for verification testing – If deemed necessary;
- Valid ISO 9001:2008 certificate of the manufacturing facility/ies or audit by QCC personnel

#### Process C:

The applicant submits the following:

- Test report(s) by a recognized or designated laboratory not older than 1 year
- Valid ISO 9001:2008 certificate of the manufacturing facility/ies; or audit by QCC personnel if deemed necessary

### 4.2 Technical File Requirements

In order to gain certification, the applicant shall submit the following documents:

- A complete application form;
- The technical file shall include:
- Company profile including a profile of the manufacturing facility:
- Manufacturer declaration of conformity, the product description, photos, diagrams/block diagram of functional blocks,
- List of applicable standards, list of parts/components and their certifications, instruction, maintenance and installation manuals, quality control procedures.

- Up to date certification of the material to PE 100+ for PE 100 pipes and fabricated fittings

Depending on the process chosen, the following also need to be submitted:

Process A:

- All test reports on which the certification has been based;
- A valid product certificate from a QCC designated certification body. The certificate must certify conformity with the standards mentioned in (3.) in an ISO/IEC 17067:2012 system 5 scheme;
- Samples of the product (when and if deemed necessary by QCC);

Process B and C:

- Test report by a designated laboratory not older than 1 year;
- Samples of the product (when and if deemed necessary by QCC)<sup>4</sup>;

### 4.3 Quality Management System (QMS) Requirements

Process A: No additional requirements.

Process B and C: 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 17021:2011 by an accreditation body signatory of the IAF MRA.

## 5 ASSESSMENT OF APPLICATION

Process A: No additional requirements. A QCC representative will review the application and all the submitted documents formally, i.e. for completeness and correctness and check the identity of the product. If it is found compliant he/she will submit his recommendation to the Certification Committee.

Process B and C: A QCC representative will review the application and all the submitted documents formally, i.e. for completeness and correctness. The submitted samples will be inspected and (if deemed necessary) subjected to verification testing to assure that they are identical to the one described in the test report. In case this can be confirmed, a favourable recommendation to the Certification Committee will be issued.

## 6 PRODUCT INFORMATION

Approved product information, clearly detailing the materials utilised in the manufacturing of the product covered under the certification, shall be retained by the applicant and QCC. This product information shall include a list of constituents / suppliers and details of the product, technical brochures, supporting

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<sup>4</sup> For Process B and C: 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 17021:2011 by an accreditation body signatory of the IAF MRA. Alternatively, CSS shall perform factory production audit according to ISO 9001

documentation and typical quality control plans, as applicable, photographs of the product and shall be reviewed and stamped by QCC.

## **7 IDENTIFICATION AND LABELLING**

Each certified product may be provided with an evident label (depending on product and subject to agreement). Where this is not possible the immediate packaging of the unit for sale shall be marked in accordance with brand guidelines specified in the Terms and Conditions.

The certified product shall be despatched with a copy of the conformity certificate.

## **8 SURVEILLANCE AND AUDIT**

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

Moreover the following needs to be done:

Process A: The continued validity of the certificate and designation status of the certification body is to be demonstrated.

Process B and C: In cases (i) or (ii) a new test report is to be submitted and the accreditation status of the NCB/CBTL is to be demonstrated. In case (iii) an affidavit by the supplier and the manufacturer that the production system has not been modified and the specification of the product remains unchanged. In all cases the continued validity of the ISO 9001:2008 certification needs to be shown.

In all cases QCC will also verify through market surveillance the continued compliance with the scheme.

## **9 EFFECTIVE DATE**

This document shall take effect immediately.



## 10 APPENDIX A

### ADDITIONAL STANDARD REFERENCES

EN ISO 6259 Thermoplastic pipes - Determination of tensile properties

### CERTIFICATION, DOCUMENTATION AND TESTING

The raw material and pipe system manufacturers shall document and certify all products and shall undertake all testing required by ISO 4427 or ISO 4437, as applicable, depending on what application the pipe system is to be used for. The testing and its reporting shall take the form of type tests and batch release tests.

Type tests shall have been undertaken to prove that pipes, fittings and their components are capable of conforming to the requirements of ISO 4427 or ISO4437, as applicable. They shall have comprised all of the tests listed in the relevant part of each standard and have been undertaken by an independent third party laboratory.

Batch release tests shall comprise those tests undertaken by raw material and pipe system manufacturers before the release of the system components from the manufacturer's facilities. As a minimum they shall comprise the tests given in section 4 of this appendix.

### INSPECTION AND TESTING PLAN

The pipe and/or fitting producer shall have in place a comprehensive inspection and testing plan that shall detail all the certificates and documents that shall be provided by the pipe manufacturer to their customers, together with details of the type testing and batch release testing that they have previously undertaken and/or shall undertake. Where the pipe manufacturer cannot themselves undertake the required testing they shall employ an accredited third party laboratory to undertake the testing on their behalf.

### DEFINITION OF BATCHES

A raw material batch shall be considered as a batch of material supplied by the resin producer having an individual identification number or code. For the purposes of this specification it shall also be the raw material used to manufacture a particular pipe batch.

A pipe batch shall be considered as a continuous production run of a particular pipe OD and wall thickness manufactured from one resin grade with no change in the manufacturing process.

A batch of fabricated fittings shall be considered as group of fittings within a range of ODs fabricated from pipe manufactured from one resin grade on the same welding machine using the same weld parameters over a period of 12 months

Batch ranges shall be:

1. Up to 315mm
2. 355-1000mm
3. Above 1000mm

A batch of injection moulded fittings shall be considered as group of fittings of similar dimensional characteristics, the same nominal diameter and pressure rating, manufactured from one resin grade with no change in the manufacturing process.

## BATCH RELEASE TESTING OF PIPES AND FITTINGS FOR WATER UTILITY APPLICATIONS

As a minimum, the resin producer and pipe manufacturer, between them, shall undertake the following batch release testing.

**Table 1 –Release Tests to be Undertaken on Each Raw Material Batch**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Compound density	ISO 4427-1 section 4	All once per raw material batch	1
Oxidation induction time	ISO 4427-1 section 4		1
Melt mass-flow rate	ISO 4427-1 section 4		1
Volatile content	ISO 4427-1 section 4		1
Water content	ISO 4427-1 section 4		1
Carbon black content	ISO 4427-1 section 4		1
Carbon black dispersion	ISO 4427-1 section 4		1

**Table 2 – Release Tests to be Undertaken on Each Batch of Pipes**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4427-2 section 5	Continuously	-
Geometrical	ISO 4427-2 section 6	Continuously	-
Tensile strength at yield on a sample cut from the pipe	ISO 6259 Tensile strength PE100 ≥ 19 MPa PE80 ≥ 15 MPa	Once per batch	1
Melt mass-flow rate	ISO 4427-2 section 8	Once per batch	1
Elongation at break	ISO 4427-2 section 8	Once per batch	1
Oxidation induction time	ISO 4427-2 section 8	Once per batch	1
Marking (Minimum)	ISO 4427-2 section 11	Each pipe / coil	1

Pipe wall thickness shall be measured and controlled on a continuous basis using a device that shall be regularly calibrated in accordance with the gauge manufacturer's recommendations.

The maximum thickness of the tensile strength test samples cut from the pipe wall shall be 14 mm. In the event of the pipe wall being thicker than 14 mm the pipe manufacturer shall machine the test samples in accordance with the Table 3.

**Table 3 – Preparation of Samples for Tensile Testing**

Pipe Wall Thickness (WT) (mm)	Test Sample Thickness (mm)	No. of samples to be taken from the pipe wall
≤ 14	WT	1
14 < WT ≤ 28	WT/2	2
28 < WT ≤ 42	WT/3	3
42 < WT ≤ 56	WT/4	4
56 < WT ≤ 72	WT/5	5

All testing shall be undertaken in accordance with ISO 6259 and all samples shall achieve a minimum tensile strength at yield of 19 MPa in the case of PE100 pipes and 15 MPa in the case of PE80 pipes in order for the pipe to successfully pass the test.

**Table 4 – Release Tests to be Undertaken on Each Batch of Fabricated Fittings**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4427-3 section 5	Each fitting	-
Geometrical	ISO 4427-3 section 6	Each fitting	-
Hydrostatic strength at 80°C, 165hrs and hoop stress of: PE100 - 5.4MPa x <i>f</i> PE80 - 4.5 MPa x <i>f</i>	ISO 4427-3	Once per batch	1 piece only
Melt mass-flow rate	ISO 4427-3 section 8	Once per batch	1 piece only
Oxidation induction time	ISO 4427-3 section 8	Once per batch	1 piece only
Marking	Proposed by the pipe manufacturer	Each fitting	-
Tensile test of weld	ISO 13953* Ductile Failure	1% of welds	As Table 3

The fabricated fitting to be hydrostatically tested shall be a tee or branch provided the batch in question contains this type of fitting, otherwise a bend shall be tested. Material samples for the testing melt mass-flow rate and oxidation induction time may be taken from the pipe used to fabricate the fitting.

\*or equivalent

**Table 5 – Release Tests to be Undertaken on Each Batch of Injection Moulded Fittings**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4427-3 section 5	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-
Geometrical	ISO 4427-3 section 6	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-
Hydrostatic strength at 80°C, 165hrs and hoop stress of: PE100 - 5.4MPa PE80 - 4.5 MPa	ISO 4427-3	Once per batch	1 piece only
Melt mass-flow rate	ISO 4427-3 section 8	Once per batch	1 piece only
Oxidation induction time	ISO 4427-3 section 8	Once per batch	1 piece only
Marking	ISO 4427-3 section 11	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-

**BATCH RELEASE TESTING OF PIPES AND FITTINGS FOR GAS UTILITY APPLICATIONS**

As a minimum, the resin producer and pipe manufacturer, between them, shall undertake the following batch release testing.

**Table 6 –Release Tests to be Undertaken on Each Raw Material Batch**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Compound density	ISO 4437-1 section 6	All once per raw material batch	1
Oxidation induction time	ISO 4437-1 section 6		1
Melt mass-flow rate	ISO 4437-1 section 6		1
Volatile content	ISO 4437-1 section 6		1
Water content	ISO 4437-1 section 6		1
Carbon black content	ISO 4437-1 section 6		1
Carbon black dispersion	ISO 4437-1 section 6		1

**Table 7 – Release Tests to be Undertaken on Each Batch of Pipes**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4437-2 section 5	Continuously	-
Geometrical	ISO 4437-2 section 6	Continuously	-
Tensile strength at yield on a sample cut from the pipe	ISO 6259 Tensile strength PE100 $\geq$ 19 MPa	Once per batch	1
Melt mass-flow rate	ISO 4437-2 section 7	Once per batch	1
Elongation at break	ISO 4437-2 section 7	Once per batch	1
Oxidation induction time	ISO 4437-2 section 7	Once per batch	1
Marking	ISO 4437-2 section 10	Each pipe / coil	1

Pipe wall thickness shall be measured and controlled on a continuous basis using a device that shall be regularly calibrated in accordance with the gauge manufacturer's recommendations.

The maximum thickness of the tensile strength test samples cut from the pipe wall shall be 14 mm. In the event of the pipe wall being thicker than 14 mm the pipe manufacturer shall machine the test samples in accordance with the Table 3.

**Table 8 – Release Tests to be Undertaken on Each Batch of Fabricated Fittings**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4427-3 section 5	Each fitting	-
Geometrical	ISO 4427-3 section 6	Each fitting	-
Hydrostatic strength at 80°C, 165hrs and hoop stress of 5.4MPa x <i>f</i>	ISO 4427-3 Annex B	Once per batch	1 piece only
Melt mass-flow rate	ISO 4427-3 section 8	Once per batch	1 piece only
Oxidation induction time	ISO 4427-3 section 8	Once per batch	1 piece only
Marking	Proposed by the pipe manufacturer	Each fitting	-
Tensile test of weld	ISO 6259 Ductile Failure	1% of welds	As Table 3

**Note:** ISO 4437-3 : 2014 states in section 1 that fabricated fittings are normally not used for gas applications except for larger dimensions or in the absence of other solutions. Guidance can be found in ISO 4427-3 Annex B. Hence any testing of fabricated fittings for gas applications is in accordance with ISO 4427.

The fabricated fitting to be hydrostatically tested shall be a tee or branch provided the batch in question contains this type of fitting, otherwise a bend shall be tested. Material samples for the testing melt mass-flow rate and oxidation induction time may be taken from the pipe used to fabricate the fitting.

**Table 9 – Release Tests to be Undertaken on Each Batch of Injection Moulded Fittings**

Characteristics	Reference	Sampling Frequency	No. of Tests or Inspections
Appearance and colour	ISO 4437-3 section 5	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-
Geometrical	ISO 4437-3 section 6	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-
Hydrostatic strength at 80°C, 165hrs and 5.4MPa	ISO 4437-3 section 7	Once per batch	1 piece only
Melt mass-flow rate	ISO 4437-3 section 8	Once per batch	1 piece only
Oxidation induction time	ISO 4437-3 section 8	Once per batch	1 piece only
Marking (Minimum)	ISO 4427-3 section 11	At start of production, after 1 <sup>st</sup> hour and then every 4 hours	-

#### HYDROSTATIC TESTING OF PIPES AND FITTINGS FOR WATER UTILITY APPLICATIONS

The inspection and test plan shall detail the pipe or fitting manufacturer's hydrostatic testing regime. As a minimum, the pipe manufacturer shall at 12 monthly intervals, produce and hydrostatically test sample pipes manufactured using the same grade of resin or resins that are to be used to produce the pipes and fittings covered by this document.

The testing shall comprise all three hydrostatic tests detailed in Table 3 of ISO 4427-2 in the case of pipes, Table 4 of ISO 4427-3 in the case of injection moulded fittings and Table B1 of ISO 4427-3 in the case of fabricated fittings. In each case the pipe manufacturer shall test 3 identical pieces, as required by the standard. The size and SDR of the pieces shall be determined by the manufacturer, but with a minimum size of 110 mm OD.

#### HYDROSTATIC TESTING OF PIPES AND FITTINGS FOR GAS UTILITY APPLICATIONS

The inspection and test plan shall detail the pipe or fitting manufacturer's hydrostatic testing regime. As a minimum, the pipe manufacturer shall at 12 monthly intervals, produce and hydrostatically test sample pipes manufactured using the same grade of resin or resins that are to be used to produce the pipes and fittings covered by this document.

The testing shall comprise all three hydrostatic tests detailed in Table 4 of ISO 4437-2 in the case of pipes, Table 4 of ISO 4437-3 in the case of injection moulded fittings and Table B1 of ISO 4427-3 in the case of fabricated fittings. In each case the pipe manufacturer shall test 3 pieces, as required by the standard. The size and SDR of the pieces shall be determined by the manufacturer, but with a minimum size of 110 mm OD.