

 GOVERNMENT OF DUBAI	<b>Organization/Unit:</b> إدارة مختبر دبي المركزي Dubai Central Laboratory Department	<b>الوحدة التنظيمية:</b> 	 بلدية دبي Dubai Municipality
	<b>Document Title:</b> Certification of Factory –Made Air Duct and Air Cconnectors as per UL 181:2013 (R2017)	<b>عنوان الوثيقة:</b> 	
	<b>Doc Ref.</b> DM-DCLD-RD-DP21-2215 (IC)	<b>رقم الوثيقة:</b> 	



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Issue Date	Rev. No.	Summary Of Amendments
10/06/2020	0	First draft for comments
25/10/2020	0	Second draft for comments
29/12/2020	1	Issue for Use
26/09/2021	2	Revised to reflect the Removal of the documents in clause 2.1.2, in addition to further amendment in the provision for accepting valid test reports ( clause 2.4.2.1b), in line with DM 30% reduction of requirements (both service and specialized). Modifications in the auditing part for the factories already certified against ISO 9001 to opt for auditing only the areas of production and monitoring stages of product realization, quality control and final product testing and evaluation.
07/10/2022	3	Changing section name as per the new organizational structure, and replace HOU by CQPSM (Section's Manager), also addition of surveillance in the clause 2.4.2.1b
27/03/2023	4	Full re-structuring and transfer of common provisions to the general rule. Clauses are re-numbered and document title has been revised accordingly. Adding reference to SA'AFAT relevant section under additional references. Use of New DM Logo

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## 1. INTRODUCTION

- 1.1 This document prescribes the specific rule for certification of the product(s) as identified herein, in accordance with the requirements of DM Third Party Product Certification Scheme Through Factory Assessment, taking into consideration the applicable normative references and standard specification, in addition to the requirements for conformity evaluation, as stated below.
- 1.2 The applicant/client shall comply with this specific rule, and to all provisions under the “**General Rule for DM Third Party Product Certification Scheme Through Factory Assessment**”**DM-DCLD-RD-DP21-2001 (IC)**.
- 1.3 This specific rule **is an integral part of the general rule** and both shall always be read together.



## 2. SCOPE

- 2.1 This specific rule specifies the basic requirements of the materials for the fabrication of air duct and air connector system for use in accordance with the International Mechanical Code, International Residential Code, and Uniform Mechanical Code, Standards of the National Fire Protection Association for the installation of Air conditioning and Ventilating Systems, NFPA No. 90A, and the installation of Warm Air Heating and Air Conditioning systems, NFPA No. 90B.
- 2.2 The air ducts and air connectors covered in this specific rule include preformed lengths of flexible or rigid ducts, materials in the form of boards for field fabrication of lengths or rigid ducts, and preformed flexible air connectors.
- 2.3 Air ducts and air connectors covered in this specific rules are classified as follows:
- Class 0 – Air ducts and air connectors having a surface burning characteristics of zero
- Class 1 - Air ducts and air connectors having a flame spread index (FSI) of not over 25 without evidence of continued progressive combustion and smoke develop index (SDI) of not over 50.
- 2.4 This specific rule does not -by itself- permit the use of the below product in the construction sites. However, it does provide the necessary general conformity assessment criteria, which are required for the evaluation and issuance of the certification and the authorization of the use of the DCLD Conformity Mark. Other relevant requirements issued by the regulatory bodies if any; shall always be fulfilled.

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### 3 PRODUCT IDENTIFICATION AND APPLICABLE STANDARD/NORMATIVE REFERENCE

- 3.1 Product name: Factory-Made Air Ducts and Air Connectors
- 3.2 Applicable standard/Normative reference: UL 181: 2013 (R2017) – Standard for Safety: Factory – Made Air Ducts and Air Connectors
- 3.3 Additional reference:
- ISO 9001 - Quality Management System – Requirements
- ISO 19011 - Guidelines for Auditing Management System.
- Al Sa'fat – Dubai Green Building System-2nd edition, January 2023 – Section 701.01 (Thermal and Acoustical Insulation Materials).

### 4 DEFINITION OF TERMS

- 4.1 In addition to the definitions given in UL 181: 2013 (R2017) and DM-DCLD RD-DP21-2001 (IC), the following shall also apply:
- 4.1.1 Standard Specification – UL 181: 2013 (R2017) – Standard for Safety: Factory –Made Air Ducts and Air Connectors.



### 5 REQUIREMENTS FOR INITIAL CERTIFICATION

- 5.1 The process of application, initial assessment and product sampling shall be in line with the related provisions in the general rule and the standard specifications.
- 5.2 The factory shall have a laboratory with the following testing equipment as a minimum:
- a. Dimensional test equipment
- 5.3 Product Evaluation and testing
- 5.3.1 DCLD-CQPS shall accept available valid test reports conducted by an approved DCLD-CQPS independent laboratory within three years from the date of the initial/surveillance assessment provided there are no changes on the fabrication procedure and the materials used in the fabrication as referred to in the said test reports., in line with the internal quality control testing plan of the factory. In such case, the testing of that particular parameter(s) shall be waived accordingly.

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### 5.3.2 Product Evaluation Criteria

a. The product shall conform to the requirements as specified in Table 6.1 (Test Program) specified in UL 181:

Tests	Air ducts		Air Connectors	Joining Materials
	Rigid	Flexible		
Surface Burning	x	x	x	-
Characteristics	-	-	-	x
Flame Resistance	x	x	-	-
Flame Penetration	x	x	x	-
Burning	x	x	x	x
Corrosion <sup>1</sup>	x	x	x	x
Mold Growth & Humidity	x	x	x	-
Temperature	x	x	-	-
Puncture	x	x2	x2	-
Static Load	x	x	-	-
Impact	x	x	x	-
Erosion	x	x	x	-
Pressure	x	x	x	-
Collapse	-	x	x	-
Tension	-	x	x	-
Torsion	-	x	x	-
Bending	x	x	x	-
Leakage				
Notes x Test applicable - Test not applicable 1 Applicable to parts of metals not inherently corrosion resistant x2 Test applicable for flexible air ducts and air connectors that incorporate vapor barrier supported by grommets or other means of field support				



b. Materials for Construction

- Metals used in the assembly of air ducts and air connectors shall be resistant to atmospheric corrosion and shall not be used in combinations that results in galvanic action which deteriorates any part of the system formed from such material.
- The corrosion-resistant coating shall provide protection against atmospheric corrosion as determined

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by Section 12 Corrosion Resistance, as specified in the Standard Specification, at least equivalent to steel having a uniform coating of zinc of not less than 0.3 ounce per square foot (91.6 g/m<sup>2</sup>) of surface area.

- Materials which have their protective coating damaged or the effectiveness reduced by the manufacturing / fabrication process are to be tested after being subjected to such process.
- Panels, sealants, and adhesives used in the fabrication of air duct and air connector shall be DCLD Certified.

c. Samples drawn for independent tests shall meet the relevant clauses of the Standard Specification (SS) as follows:

#### C.1 Performance

- Test For Surface Burning Characteristic (for Air Ducts and Air Connectors) shall comply with clause 7
- Flame Resistance Test (for Joining Materials) shall comply with clause 8
- Bending Test (for Flexible Air Duct & Air Connector) shall comply with clause 9
- Flame Penetrating Testing (for Air Ducts) shall comply with clause 10
- Burning Test (for Air Ducts and Air Connectors) shall comply with clause 11
- Corrosion Resistance (for Air Ducts, Air Connectors and Joining Materials) shall comply with clause 12
- Mold Growth & Humidity Test (for Air Ducts, Air Connectors and Joining Materials) shall comply with clause 13
- Temperature Test (for Air Ducts and Air Connectors) shall comply with clause 14
- Puncture Test (for Air Duct) shall comply with clause 15
- Static Load Test (for Air Ducts and Air Connectors) shall comply with clause 16
- Impact Test (for Air Duct) shall comply with clause 17
- Erosion Test (for Air Ducts and Air Connectors) shall comply with clause 18
- Pressure Test (for Air Ducts and Air Connectors) shall comply with clause 19
- Collapse Test (for Air Ducts and Air Connectors) shall comply with clause 20
- Tension Test (for Flexible Air Duct & Air Connector) shall comply with clause 21
- Torsion Test (for Flexible Air Duct & Air Connector) shall comply with clause 22
- Leakage Test (for Air Ducts and Air Connectors) shall comply with clause 23

d. Marking. Each piece of air duct or air connector shall be marked with the following:

- The Manufacturer's or vendor's identification
- The rated air velocity
- The rated negative and positive pressure, and
- Specific information relative to fabricating and joining materials and methods
- In addition, each piece of material for the field-fabrication of air ducts or air connectors shall be marked with information covering the maximum and minimum dimensions of air ducts or air connectors for which

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the material is intended, and each piece of rigid air duct or air connector shall be marked with the manufacturer's specified support spacing.

- Detailed information relative to the fabricating and joining materials and methods to be employed for an air duct or air connector shall not be included in instructions packaged with each carton of material, unless the marking on the air duct or air connector shall identify the joint treatment to be employed. In addition, the marking on the instructions is to be referenced to that treatment.
- Each material furnished separately for use in fabrication of an air duct or air connector system, such as tape, cement, and adhesive, shall be marked with identification (such as name and catalog designation of product) to associate it with the marking on the air duct or air connector and the manufacturer's or vendor's installation instructions.
- All required markings shall be grouped and appropriately located on each piece at intervals of 10 feet (3.0 m) or fractions thereof. Markings shall be permanent, by means such as printing or stenciling with waterproof ink or paint on the surface of the material or on labels not affected by water, and shall be attached to the material by means of water-insoluble adhesive.
- When a manufacturer produces material at more than one factory, each individual piece or assembly shall have a distinctive marking to identify it as the product of a particular factory.

- e. Installation Instructions shall be as per clause 25.
- f. If the result of the test conducted by the independent testing laboratory shows non-conformance to the specified requirements, the retest shall be carried out on the reference sample kept by the manufacturer or on new samples collected by DCLD-CQPS authorized representative(s), on which full testing shall be carried out, if necessary.
- g. If the re-test passed, the initial product assessment is considered conforming to standard specification. If not, the fabricators will be advised to take corrective action.
- h. Only after reassessment and subsequent product compliance shall the fabricator be allowed to use DCL Conformity Mark on the product(s) which found complying with the certification requirements.

#### 5.3.2.1 Factory Production Control System (Internal Product Quality Assurance Plan)

5.3.2.1.1 The client shall prepare and submit to DCLD-CQPS for approval of an internal product quality assurance plan.

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5.3.2.1.2 This will include as a minimum, the following details: (1) location of sampling; (2) frequency of sampling; (3) quantities of samples; (4) tests to be carried out; (5) results acceptance criteria; and (6) responsible person to carry out the activity. The plan shall cover all inspections carried out thru out the whole manufacturing process; i.e. (raw materials – production lines- finished product testing and evaluation as per standard specifications – final packing).

5.3.2.1.3 The plan shall take into consideration the production process, the volume of production, the criticality of the test to be specified, and other relevant factors.

## 6 GRANTING OF THE DCLD CERTIFICATION

6.1 The DCLD product conformity certificate and the authorization to use the DCLD conformity mark shall be granted upon conformance with all related provisions in the general rule.

6.2 Fees shall be as per DM-DCLD-RD-DP21-2074 (IC) and other relevant provisions in the general rule.

6.3 DCLD-CQPS shall carry out surveillance of certified clients based on the approved periodic plans and related provisions in the general rule.

6.4 Appeals, disputes and complaints shall be in line with the relevant provisions in the General Rule.

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