
 GOVERNMENT OF DUBAI	Organization/Unit:	إدارة مختبر دبي المركزي Dubai Central Laboratory Department	الوحدة التنظيمية:	 بلدية دبي Dubai Municipality
	Document Title:	Certification of Rigid Cellular Polystyrene Thermal Insulation per ASTM C578-18	عنوان الوثيقة:	
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Issue Date	Rev. No.	Summary Of Amendments
22/01/2005	0	First draft for comments
06/02/2005	0	Final draft for approval
19/02/2005	1	Issue for use
26/06/2006	2	Reviewed with the requirements of the current version of the standard (2006) and found to be suitable.
10/11/2008	3	Reviewed with the requirements of the current version of the standard (2008) and found to be still suitable.
25/06/2009	4	Reviewed with the requirements of the current version of the standard (2009) and found to be still suitable.
09/08/2009	5	Document reference number and format is changed according to the new IMS, statement for the independent testing plan was changed, and the statement for surveillance was shortened by referring the appropriate procedure, RD-DP21-2096 (IC).
10/06/2010	6	Reviewed with the requirements of the current version of the standard (2010) and found to be still suitable.
16/08/2011	7	Reviewed with the requirements of the current version of the standard (2011) and found to be still suitable. Provision for minimum required density for block insert thermal insulation in 7.2.1.1 Upgrading RD-DP21-2098 to IMS-RD-13 in clause 10.1
13/12/2011	8	Reviewed with the requirements of the current version of the standard (2011) and found to be still suitable. Amended as per new documentation structure.
19/03/2012	9	Typographical corrections and updating referenced document
11/07/2013	10	Reviewed with the requirements of the current version of the standard (ASTM C578-12b) and found to be still suitable
06/04/2014	11	Reviewed with the requirements of the current version of the standard (ASTM C578-14) and found to be still suitable
19/06/2016	12	Reviewed with the requirements of the current version of the standard (ASTM C578-15) and found to be still suitable. Provision for carrying water absorption.
15/03/2017	13	n test has been amended Re-calculated the Thermal Transmittance values to 35°C and incorporated the Tables within the Specific Rule as
01/07/2017	14	Annex A. Amendment to align the fire test requirement with the UAE Fire and Life Safety Code 2016. Reviewed with the requirements of the current version of the standard (ASTM C578-16) and found to be still suitable.
16/07/2017	15	Update to comply with the font type (Dubai).
14/11/2018	16	Added Annex A - Tables from the UAE Fire and Life Safety Code of Practice 2016 Amendment to align the fire test requirement with the UAE Fire and Life Safety Code 2018. Reviewed with the requirements of the current version of the standard (ASTM C578-18) and found to be still suitable.
21/03/2019	17	Revision of scope to reflect that the DCL certification of rigid cellular polystyrene thermal insulation material does not cover compliance to the requirements of UAE Fire & Life Safety Code of Practice 2018.
21/07/2020	18	Add the options for initial audit by the approved CAB and remotely by PCAS. Adding definition for authorized auditor. Update for the new numbering system and followed terminologies. Add provision for accepting valid test reports
26/09/2021	19	Removal of the documents in clause 2.1.2, in addition to further amendment in the provision for accepting valid test reports (clause 2.4.2.3), 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.

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27/01/2022	20	Added a Note under sub-clause 2.4.2.1.4 (thermal resistance) “For gray colored EPS, the minimum value of thermal resistance (R) or maximum value of thermal conductivity (k) can be declared by the manufacturer, provided however that it will be more stringent than the standard requirement [Not less than (R) value and not more than (K) value) for the particular type”.]
04/10/2022	21	Changing section name as per the new organizational structure, and replace HOU by CQPSM (Section's Manager).
27/03/2023	22	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 requirements for the types, physical properties and dimensions of Rigid Cellular Polystyrene thermal insulation made by molding (EPS) or extrusion (XPS) as per the products mentioned in the applicable standard specifications.
- 2.2 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.

3 PRODUCT IDENTIFICATION AND APPLICABLE STANDARD/NORMATIVE REFERENCE

- 3.1 Product name: Rigid Cellular Polystyrene Thermal Insulation
- 3.2 Applicable standard/Normative reference: ASTM C 578-18 Standard Specification for Rigid Cellular Polystyrene Thermal Insulation
- 3.3 Additional reference:
- ISO 9001 Quality Management System – Requirements
- ISO 19011 Guidelines for Auditing Management Systems
- Al Sa'fat – Dubai Green Building System-2nd edition, January 2023 – Section 701.01 (Thermal and Acoustical Insulation Materials).

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4 DEFINITION OF TERMS

4.1 In addition to the definitions given in ASTM C 168, ASTM C 578, ASTM C 390 and the General Rule of the scheme [DM-DCLD-RD-DP21-2001 (IC)], the following shall apply:-

4.1.1 Standard Specification – ASTM C 578-18 Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.

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:

- Weighing Scale.
- Dimensional measuring instruments.
- Trueness & Squareness measuring equipment.

5.3 Product Evaluation and testing

5.3.1 The tests to be carried out shall be in accordance with the test method mentioned in section 11 of the Standard Specification as follows (where applicable);

5.3.1.1 Dimension and Density as per ASTM C 303 or ASTM D 1622

Note: For Block Insert Thermal Insulation, minimum density required is 25 kg/m³

5.3.1.2 Trueness and Squareness as per ASTM C 550 (if applicable on the product)

5.3.1.3 Workmanship, finish and appearance as per ASTM C 578

5.3.1.4 Thermal Resistance as per ASTM C 177, C 518, C 1114, C 1363 or ASTM C 1045 or ASTM C 1058

Note: For gray-colored EPS, the minimum value of thermal resistance (R) or maximum value of thermal conductivity (k) can be declared by the manufacturer, provided however that it will be more stringent than the standard requirement [Not less than (R) value and not more than (K) value] for the particular type.]

5.3.1.5 Compressive Resistance as per ASTM C 165 Procedure A or ASTM D 1621

5.3.1.6 Flexural Strength as per ASTM C 203, Method I, Procedure A

5.3.1.7 Water Vapor Permeance as per ASTM E 96

5.3.1.8 Water Absorption as per ASTM C 272 (Note: Test shall be carried in accordance with clause 11.8 of ASTM C578 and specimen thickness shall be the original product thickness)

5.3.1.9 Dimensional stability as per ASTM D 2126

5.3.2 The results of testing must comply with the standard specification requirements.

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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-DP21-2097 (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.

ANNEX A

STANDARD SPECIFICATION LIMITS AND PRODUCTS TYPES FOR EXPANDED AND EXTRUDED POLYSTYRENE ACCORDING TO ASTM C 578-18 - PHYSICAL PROPERTY REQUIREMENTS OF RIGID CELLULAR POLYSTYRENE THERMAL INSULATION

TABLE 1. (EXPANDED)

SN	PROPERTIES	TYPE XI	TYPE I	TYPE VIII	TYPE II	TYPE IX	TYPE XIV	TYPE XV
1	COMPRESSIVE RESISTANCE @ yield or 10% deformation, which occurs first, min kPa	35	69	90	104	173	276	414
2	THERMAL RESISTANCE of 25.4 mm thickness, @ mean temp. of @ 35°C and 60% RH min, K-m ² /W	0.53	0.60	0.64	0.67	0.71	0.71	0.73
3	THERMAL CONDUCTIVITY, max, W/m·K @ 35°C and 60% RH	0.0482	0.0419	0.0394	0.0377	0.0356	0.0356	0.0347
4	FLEXURAL STRENGTH, min, kPa	70	173	208	240	345	414	517
5	WATER VAPOR PERMEANCE of 25.4 mm thickness, max, perm	5.0	5.0	3.5	3.5	2.5	2.5	2.5
6	WATER ABSORPTION by total immersion, max volume %	4.0	4.0	3.0	3.0	2.0	2.0	2.0
7	DIMENSIONAL STABILITY (change in dimension), max, %	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8	OXYGEN INDEX, min, volume %	24	24	24	24	24	24	24
9	DENSITY, min, kg/m ³	12	15	18	22	29	38	48

NOTE: THE ABOVE SPECIFICATION VALUES ARE EXTRACTED FROM TABLE 1 OF ASTM C578-18

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TABLE 1. (EXTRUDED)

SN	PROPERTIES	TYPE XII	TYPE X	TYPE XIII	TYPE IV	TYPE VI	TYPE VII	TYPE V
1	COMPRESSIVE RESISTANCE @ yield or 10% deformation, which occurs first, min kPa	104	104	138	173	276	414	690
2	THERMAL RESISTANCE of 25.4 mm thickness, @ mean temp. 35°C and 60% RH min, K-m ² /W	0.77	0.84	0.65	0.84	0.84	0.84	0.84
3	THERMAL CONDUCTIVITY, max, W/m·K @ 35°C and 60% RH	0.0330	0.0303	0.0392	0.0303	0.0303	0.0303	0.0303
4	FLEXURAL STRENGTH, min, kPa	276	276	310	345	414	517	690
5	WATER VAPOR PERMEANCE of 25.4 mm thickness, max, perm	1.5	1.5	1.5	1.5	1.1	1.1	1.1
6	WATER ABSORPTION by total immersion, max volume %	0.30	0.30	1.0	0.30	0.30	0.30	0.30
7	DIMENSIONAL STABILITY (change in dimension), max, %	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8	OXYGEN INDEX, min, volume %	24	24	24	24	24	24	24
9	DENSITY, min, kg/m ³	19	21	26	23	29	35	48

NOTE: THE ABOVE SPECIFICATION VALUES ARE EXTRACTED FROM TABLE 1 OF ASTM C578-18

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