



# UL Solutions Evaluation Report

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Sublevel 3: 07 21 00 - Thermal Insulation

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## **1. Subject**

**NEXKEMIA PETROCHIMIE MT SERIES EPS RESIN BEADS**



## 2. Scope of Evaluation

- 2021, 2018, 2015, 2012, and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012, and 2009 *International Energy Code*® (IECC)
- 2021, 2018, 2015, 2012, and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code*®(ADIBC) (2009 IBC references in this report are representative of 2013 ADIBC)
- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10)

The products underwent evaluation for the following properties:

- Surface Burning Characteristics (UL723)
- Physical Properties (ASTM C578)

## 3. Referenced documents

- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10)
- UL 723, Standard for Test for Surface Burning Characteristics of Building Materials
- ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

## 4. Uses

The expandable polystyrene resins designated as Nexkemia MT Series are used to produce expanded polystyrene (EPS) insulation products.

## 5. Product description

EPS insulation products manufactured with expandable polystyrene resins are produced through the introduction of heat, without other additives. The process expands the resins, which are then molded into insulation products at the densities and thicknesses specified in this report. The EPS boards are qualified to bear a label with a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with UL 723, provided the finished boards are listed and labeled by an approved agency and are within the maximum densities and thicknesses indicated in Table 1.

**Table 1 – Insulation Board Density and Thickness for UL 723**

Bead Designation	Density (lb/ft <sup>3</sup> )	Maximum Thickness (in.)
MT	1.0 to 3.0	6
MT	0.70	5

Nexkemia MT Series expandable polystyrene resins have been qualified in accordance with Section 4.5.15.1.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). The resins can be used to produce EPS insulation products that comply with the ASTM C578 properties described in Table 2, provided the finished EPS insulation products are listed and labeled by an approved agency.

**Table 2 – ASTM C578 Physical Property Requirements<sup>1</sup>**

	Type XI	Type I	Type VIII	Type II	Type IX	Type XIV	Type XV
Compressive Resistance, min, psi	5.0	10.0	13.0	15.0	25.0	40.0	60.0
Thermal Resistance of 1.00 in. thickness, min, F·ft <sup>2</sup> ·h/Btu (K·m <sup>2</sup> /W)	3.1	3.6	3.8	4.0	4.2	4.2	4.3
Mean temperature: 75°F							
Flexural Strength, min, psi	10	25	30	35	50	60	75
Water Vapor Permeance of 1.00 in. thickness, max. perm.	5.0	5.0	3.5	3.5	2.5	2.5	2.5
Water Absorption by total immersion, max, volume %	4.0	4.0	3.0	3.0	2.0	2.0	2.0
Dimensional Stability (change in dimensions), max, %	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Oxygen Index, min, volume %	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Density, min. (lb/ft <sup>3</sup> )	0.70	0.90	1.15	1.35	1.80	2.40	3.00

<sup>1</sup>Refer to the Standard, ASTM C578 for further information on the requirements for Rigid, Cellular Polystyrene Thermal Insulation

**Table 3 – Minimum Density and Specific Thermal Resistance Results<sup>1</sup> – MT Series**

ASTM C578 Type	Minimum Density (lb/ft <sup>3</sup> )	R-VALUE (F·ft <sup>2</sup> ·h/Btu) Mean temperature: 75°
I	0.90	4.7
VIII	1.15	4.7
II	1.35	4.7
IX	1.80	4.7

<sup>1</sup>Thermal resistance (R-value) is based on tested values at 1.00-inch thickness at 75°F average temperature and must be multiplied by the installed thickness.

## 6. Installation

### 6.1 General

Installation of finished EPS insulation products manufactured from Nexkemia MT Series expandable polystyrene resins must be installed in accordance with the finished EPS manufacturer's installation instructions and in accordance with Section 2603 of the IBC or Section R316 of the IRC, as applicable.

### 6.2 Insulation Boards produced from MT Series resins:

These insulation boards must be attached to the structure in a manner that will hold the insulation securely in place. The insulation boards must not be used structurally to resist transverse, axial, or shear loads.

The interior of the building must be separated from the insulation boards with a thermal barrier as required by Section 2603.4 of the IBC or Section R316.4 of the IRC, as applicable.

The insulation boards may be used as vapor retarders based on water vapor permeance (perm) values described in Table 4 when required in accordance with the applicable sections of the IBC, IRC, and IECC. Vapor retarders are certified as follows:

Class I: 0.1 perm or less

Class II:  $0.1 < \text{perm} \leq 1.0$

Class III:  $1.0 < \text{perm} \leq 10$  perm

**Table 4 – Water Vapor Permeance of Foam-Control Insulation Boards**

ASTM C578 Type	Minimum Density (lb/ft <sup>3</sup> )	Maximum Permeance <sup>1</sup> , perms
XI	0.70	5.0
I	0.90	5.0
VIII	1.15	3.5
II	1.35	3.5
IX	1.80	2.5
XIV	2.40	2.5
XV	3.00	2.5

<sup>1</sup> Water vapor permeance values are based on 1-inch thickness when tested in accordance with ASTM C578 and ASTM E96. Actual water vapor permeance values may be calculated based on insulation thickness, by dividing the perm value shown by the installed thickness in inches.

### 6.3 Attics and Crawl Spaces:

Finished EPS insulation boards produced from Nexkemia MT Series resins used on walls of attics and crawl spaces require the coverings specified in Section 2603.4.1.6 of the IBC and Section R316.5.3 and R316.5.4 of the IRC.

## 7. Conditions of Use

### 7.1 General

The Nexkemia MT Series expandable polystyrene resins described in this report comply with or are suitable alternatives to what is specified in those codes listed in Section 2 of this report, subject to the following conditions:

- 7.2** The maximum density and thickness of the finished insulation boards must be as noted in Section 5 of this report.
- 7.3** Finished EPS insulation products manufactured from the resins must be listed and labeled by an approved agency.
- 7.4** As noted in Section 6.2 of this report, finished insulation products manufactured from the resins must be separated from the building interior by a thermal barrier complying with IBC Section 2603.4 and IRC Section R316.4, as applicable.
- 7.5** See UL Product iQ® for products evaluated for Surface Burning Characteristics and Physical Properties in accordance with UL 723 and ASTM C578, Foamed Plastic – Component, ([BRYX2](#)).

- 7.6** The Nexkemia MT Series resins are manufactured by Nexkemia Petrochimie, located at the manufacturing location(s) named below, under the UL LLC Recognition and Follow-Up Service Program, which includes inspections in accordance with the quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC 10.

Location	Plant ID (if applicable)
Mansonville, QC	None

## 8. Supporting Evidence

- 8.1** Data in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12).
- 8.2** Data in accordance with UL 723, ASTM C578 and ASTM C518.
- 8.3** UL Component Recognition for EPS unexpanded resins. See Product Recognition Category, Foamed Plastic - Component ([BRYX2](#)).
- 8.4** Documentation of quality system elements described in AC10.

## 9. Identification

The **Nexkemia MT Series** expandable polystyrene resins described in this evaluation report are identified by a marking bearing the report holder's name, Nexkemia Petrochimie, Inc; the plant identification; the UL Solutions Component Recognition Mark; and the evaluation report number UL Solutions ER26178-01. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Solutions Recognition Mark certificate.

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