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DYNAMO 50 NO MIX OC

CSI Section:
07 21 00 Thermal Insulation

1.0 RECOGNITION

Dynamo Polyurethane System’s Dynamo 50 No Mix OC open cell spray polyurethane foam plastic insulation recognized in this report has been evaluated for use as spray foam insulation complying with IBC Section 2603, IRC Section R316, IECC Sections C303, C402, R303, and R402. The surface burning, physical properties, and thermal resistance of Dynamo 50 No Mix OC complies with the intent of the provisions of the following codes and regulations:

- 2021, 2018, and 2015 International Building Code® (IBC)
- 2021, 2018, and 2015 International Residential Code® (IRC)
- 2021, 2018, and 2015 International Energy Conservation Code® (IECC)

2.0 LIMITATIONS

Use of Dynamo 50 No Mix OC recognized in this report is subject to the following limitations:

2.1 The insulation shall be installed in accordance with the manufacturer’s published installation instructions. The insulation shall also be installed in accordance with this evaluation report and the applicable code, and if there are any conflicts between the manufacturer’s published installation instructions and this report, the more restrictive governs.

2.2 The insulation shall be separated from the interior of the building by a code approved thermal barrier.

2.3 As noted in Section 3.2.2 of this report, the insulation shall not exceed the nominal density and thickness.

2.4 During installation, the insulation and the surfaces to which it is applied shall be protected from exposure to weather.

2.5 The contractors that will be installing the insulation shall be approved by Dynamo Polyurethane Systems or by the Spray Polyurethane Foam Alliance.

2.6 Use of the insulation in areas of “very heavy” termite infestation shall be in accordance with the IBC Section 2603.8 or IRC Section 318.4, as applicable.

2.7 Labeling and jobsite certification of the insulation and coatings shall comply with IBC Section 2603.2, IRC Sections N1101.10 and N1101.10.1.1, and IECC Sections C303.1.1 and C303.1.2, as applicable.

2.8 Foam plastic used in plenums as interior finish or interior trim shall comply with Section 2603.7 of the IBC.

3.0 PRODUCT USE

3.1 General: When installed in accordance with Section 3.3 of this report, Dynamo 50 No Mix OC spray foam insulation can be used in wall cavities, floor assemblies or ceiling assemblies, and in attic and crawl spaces as nonstructural thermal insulation material. The spray-applied foam plastic insulation is used in Type V construction under the IBC and in dwellings under the IRC.

3.2 Design: Dynamo 50 No Mix OC spray foam insulation shall comply with requirements in IECC Sections C402.1 and R402.

3.2.1 Thermal Resistance (R-Values): Dynamo 50 No Mix OC spray foam insulation has a thermal resistance (R-Value) at a mean temperature of 75°F (24°C) as shown in Table 1 of this report.

TABLE 1
Thermal Resistance (R-Value)^{1,2}
(°F·ft²·h/BTU)

Thickness (inch)	R-Value
	DYNAMO 50 NO MIX OC
1	3.9
2	7.7
3	11
3.5	13
4	15
5	19
5.5	21
6	23
7	27
7.25	28
8	30
9	34
9.25	35
10	38
11	42
12	46
14	53
16	61

For SI: 1 inch = 25.4 mm, 1°F·ft²·h/Btu = 0.176 110 K·m²/W.

¹ R-Values are calculated based on tested K values at 1-inch and 3.5-inch thicknesses.

² R-Values greater than 10 are rounded to the nearest whole number.

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with Section 104.2.3 of the 2024 IBC and Section 104.11 of previous editions. This document shall only be reproduced in its entirety.

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3.2.2 Surface Burning Characteristics: At a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pcf (16 kg/m³), Dynamo 50 No Mix OC spray foam insulation has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

3.2.3 Vapor Permeance: Dynamo 50 No Mix OC, when tested in accordance with the ASTM E96 desiccant method (Procedure A), has a permeance of less than 10 perms (574 x 10⁹ g/Pa·s·m), at a minimum thickness of 3½ inches (76 mm) and qualifies as a Class III vapor retarder in accordance with IBC Section 202 and IRC Section R202.

3.2.4 Air Permeability: Dynamo 50 No Mix OC spray foam insulation is classified as an air-impermeable insulation when tested in accordance with ASTM E283 at a minimum thickness of 3½ inches (89 mm) in accordance with 2021 and 2018 IBC Section 1202.3, 2015 IBC Section 1203.3, and IRC Section R806.5.

3.3 Installation

3.3.1 Installation General: The manufacturer's published installation instructions for Dynamo 50 No Mix OC spray foam insulation and this report shall be available and strictly adhered to at all times on the jobsite during installation.

The spray foam insulation shall be spray-applied on the jobsite using a volumetric positive displacement pump in accordance with the manufacturer's published installation instructions. Dynamo 50 No Mix OC shall be sprayed in multiple passes having a maximum thickness of 6 inches (152 mm) maximum per pass up to the maximum insulation thickness specified in this report.

The maximum in-service temperature for all areas shall not exceed 180°F (82°C). The spray-applied foam plastic insulation shall not be used in electrical outlets or junction boxes or in continuous contact with rain or water. The spray-applied foam plastic insulation shall be sprayed onto a substrate that is protected and clean from any debris or weather-related conditions during application.

3.3.2 Installation with a Prescriptive Thermal Barrier: Dynamo 50 No Mix OC spray foam insulation shall be separated from the interior by an approved thermal barrier of minimum ½-inch-thick (12.7 mm) gypsum wallboard or an equivalent thermal barrier. When installed in accordance with this section, the spray foam may be any thickness when installed behind a prescriptive thermal barrier. The barrier shall comply with and be installed in accordance with IBC Section 2603.4 or IRC Section R316.4, as applicable.

3.3.3 Installation for Attics and Crawl Spaces

3.3.3.1 General: When used in an attic or crawl space where entry is made only for service of utilities, Dynamo 50 No Mix OC spray foam insulation shall be installed in accordance

with this section. The insulation shall be separated from the interior of the building by an approved thermal barrier as described in Sections 3.3.2 of this report.

3.3.3.2 Installation with a Prescriptive Ignition Barrier: Where entry is made only for the service of utilities, Dynamo 50 No Mix OC spray foam insulation may be installed within attics or crawl spaces with an ignition barrier in accordance with IBC Section 2603.4.1.6, or IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier shall be installed in a manner such that the foam plastic insulation is not exposed and is consistent with the requirements of the type of construction required by the applicable code.

3.3.3.3 Installation in Attics and Crawl Spaces Using an Alternative Ignition Barrier Assembly: Dynamo 50 No Mix OC spray-applied polyurethane foam plastic insulation may be installed in attics and crawl spaces without a prescriptive ignition barrier or fire-protective coating provided:

- a. Entry is only to service utilities in the attic or crawl space and no storage is permitted.
- b. Attic or crawl space areas cannot be interconnected.
- c. Air from the attic or crawl space cannot be circulated to other parts of the building.
- d. Attic ventilation is provided as required by 2021 and 2018 IBC Section 1202.2, and 2015 IBC Section 1203.2, or IRC Section R806 except where air-impermeable insulation is permitted in unvented attics and shall comply with the following code sections as applicable:

For Unvented Attics:

- 2021 and 2018 IBC Section 1202.3
- 2015 IBC Section 1203.3
- IRC Section R806.5

Ventilated crawl spaces shall be provided with ventilation as required by the following code sections as applicable:

- 2021 and 2018 IBC Section 1202.4
- 2015 IBC Section 1203.4
- IRC Section R408.1

- e. Dynamo 50 No Mix OC spray-applied polyurethane foam plastic insulations may be applied at a nominal density of 0.5 pcf (8.0 kg/m³) to the underside of roof sheathing or roof rafters and vertical surfaces of attics and in crawl spaces without a prescriptive ignition barrier when meeting the requirements of Table 2 of this report.
- f. In accordance with IMC (International Mechanical Code®) Section 701, combustion air is provided.

3.3.3.4 Unvented Attics

3.3.3.4.1 General: Dynamo 50 No Mix OC spray foam insulation may be installed in unvented attic assemblies and



unvented enclosed rafter assemblies in accordance with Section 1202.3 of the 2021 or 2018 IBC, Section 1203.3 of the 2015 IBC, or Section R806.5 of the 2015 and 2012 IRC, as applicable. The attic shall be protected as required in Sections 3.3.3.2, 3.3.3.3, or 3.3.3.4 of this report as applicable.

3.3.3.4.2 Installation without Prescriptive Ignition Barrier or Coating: Dynamo 50 No Mix OC spray foam insulation, when installed in unvented attics at a maximum thickness of 14 inches on wall cavities and 14 inches on ceiling joists and a minimum thickness of 3½ inches on walls and ceilings (89 mm), is not required to be installed with a prescriptive ignition barrier or alternative ignition barrier assembly as required in Section 3.3.3 of this report when meeting the following limitations as required by Appendix U in AC377: The insulation shall be separated from the interior of the building by an approved thermal barrier as described in Section 3.3.2 of this report.

- Entry to the attic is only to service utilities, and no storage is permitted.
- There are no interconnected attic areas.
- Air in the attic is not circulated to other parts of the building.
- The foam plastic insulation is limited to the maximum thickness and density tested.
- Combustion air is provided in accordance with IMC Section 701.
- If hot work is required to be performed, all necessary procedures, precautions, and limitations must be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirements for hot work (welding/cutting) performed in the vicinity of combustible materials.
- A downward opening hatch shall be required. The hatch shall remain closed at all times except for when servicing of utilities is required. The hatch shall be able to be opened freely without disengaging a latching or locking mechanism.

Information shall be provided to the local code official to show that the maximum uniform pressure required to open the downward opening attic hatch shall be less than or equal to 10 psf.

3.3.4 Installation Certificate: When meeting installation as required in Sections 3.3.3.3 or 3.3.3.4.2 of this report, an installation certificate shall be posted at each entrance to the attic or crawlspace, as applicable. The certificate shall be made of durable materials and red in color. The installation certificate shall include the following information as required by AC377:

- Dynamo 50 No Mix OC spray foam insulation product name and installation thickness.
- Dynamo Polyurethane System's name, address, and contact information, as applicable.

- If coating is used as shown in Table 2 of this report, the coating product name, installation rate, wet and dry film thickness shall be shown as applicable.
- Installation contractor name, address, and contact information.
- Attestation that the spray foam has been installed in accordance with the manufacturer's installation instructions and the requirements of this report.
- A notice that the certificate shall not be removed or altered.
- The following notices shall also be included on the certificate:

1. Entry to the space is only to service utilities, and no storage is permitted.
2. When meeting the requirements of Section 3.3.3.4.2 of this report, notification that the hatch shall always remain closed, except for when servicing of utilities is required. No lock or latches that would prevent the hatch from opening freely may be added to the hatch.
3. FIRE SAFETY WARNING: If hot work (welding/cutting) is required to be performed, all necessary procedures, precautions, and limitations shall be observed in accordance with OSHA 1926 Subpart J Standard 1926.352 requirements for hot work performed in the vicinity of combustible materials.
4. When meeting the requirements of Section 3.3.3.4.2 of this report, notification that the space has been designed and constructed/installed as an unvented attic assembly, introduction of any penetrations to the exterior or alterations to the insulation shall be designed by a registered design professional. The design of the change shall be submitted to the local code official for approval, as required by the local jurisdiction.

4.0 PRODUCT DESCRIPTION

Dynamo 50 No Mix OC is a spray-applied, polyurethane open cell foam plastic and complies as a low-density insulation in accordance with Section 3.1.1 and Table 1 of AC377. The insulation is a two-component spray foam plastic with a nominal in-place density of 0.5 pcf (8.0 kg/m³).

The spray-applied insulation is mixed in the field by combining a polymeric isocyanate (A component) and a resin blend (B component). The liquid components shall be stored in 55-gallon (208 L) drums at temperatures between 50°F and 90°F (10°C and 32°C). When Component A and Component B are stored in factory-sealed containers at the recommended temperatures, the maximum shelf life is six months.

5.0 IDENTIFICATION

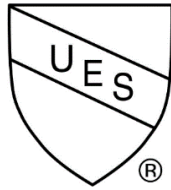
Dynamo 50 No Mix OC is identified by the Dynamo Polyurethane System's name and trademark, product name, and evaluation report number (ER-930).



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The IAPMO Uniform Evaluation Service Mark of Conformity may also be used as shown below:



IAPMO UES ER-930

6.0 SUBSTANTIATING DATA

6.1 Manufacturer’s descriptive literature and installation instructions.

6.2 Data in accordance with the Acceptance Criteria for Spray-applied Foam Plastic Insulation, ICC-ES AC377, dated June 2023, including Appendix U and Appendix X.

6.3 Data in accordance with 2019 ICC 1100 Standard for Spray-applied Polyurethane Foam Plastic Insulation.

6.4 Report of testing for water vapor transmission with ASTM E96, desiccant method.

6.5 Reports of air permeance testing in accordance with ASTM E283.

6.6 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Dynamo Polyurethane System’s Dynamo 50 No Mix OC to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

**TABLE 2
ALTERNATIVE IGNITION BARRIER ASSEMBLIES¹**

FIRE-PROTECTIVE COATING/COVERING			MAXIMUM SPF THICKNESS (inch)	
TYPE	MINIMUM THICKNESS (mils)	THEORETICAL APPLICATION RATE	WALLS AND VERTICAL SURFACES	CEILING AND OVERHEAD SURFACES
DC315 ²	6 WFT (4 DFT)	0.38 gal/100 ft ²	10	16

For SI: 1 inch = 25.4 mm, 1 mil = 0.0254 mm, 1 gallon = 3.785 L, 1 ft² = 0.0929 m²

¹ Fire-protective coatings and coverings shall be applied over all exposed SPF surfaces in accordance with the coating/covering manufacturer’s instructions and this report.

² International Fireproof Technology Inc., recognized in IAPMO UES ER-499