EVALUATION REPORT Number: 968

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GVP 2.0 HFO and GVP MBI 2.0 HFO

CSI Section:
07 21 00 Thermal Insulation

1.0 RECOGNITION

Green Valley Product's GVP 2.0 HFO and GVP MBI 2.0 HFO closed cell spray polyurethane foam plastic insulations recognized in this report have been evaluated for use as spray foam insulations complying with IBC Section 2603, 2024 Section 303; 2021, 2018, and 2015 IRC Section R316; IECC Sections C303, C402, R303, and R402. The surface burning, physical properties, and thermal resistance of GVP 2.0 HFO and GVP MBI 2.0 HFO comply with the intent of the provisions of the following codes and regulations:

- 2024, 2021, 2018, and 2015 International Building Code® (IBC)
- 2024, 2021, 2018, and 2015 International Residential Code® (IRC)
- 2024, 2021, 2018, and 2015 International Energy Conservation Code® (IECC)

2.0 LIMITATIONS

Use of GVP 2.0 HFO and GVP MBI 2.0 HFO recognized in this report is subject to the following limitations:

2.1 The insulations shall be installed in accordance with the manufacturer's published installation instructions. The insulations 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 insulations 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 insulations shall not exceed the nominal density and thickness.

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

2.5 The contractors that will be installing the insulations shall be approved by Green Valley Products or by the Spray Polyurethane Foam Alliance.

2.6 Use of the insulations in areas of "very heavy" termite infestation shall be in accordance with the IBC Section 2603.8, 2024 IRC Section 305.4, or 2021, 2018, and 2015 IRC Section 318.4, as applicable.

2.7 Labeling and jobsite certification of the insulations and coatings shall comply with the following code sections as applicable:

- IBC Section 2603.2
- IRC Section R316.2
- IRC Section N1101.10.1.1
- IECC Sections C303.1.1.1 or R303.1.1.1

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

2.9 The GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations recognized in this report is produced by Green Valley Products in Lewisville, Texas**.**

3.0 PRODUCT USE

3.1 General: When installed in accordance with Section 3.3 of this report, GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations 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 insulations are used in Type V construction under the IBC and in dwellings under the IRC.

3.2 Design: GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations shall comply with requirements in IECC Sections C402.1 and R402.

3.2.1 Thermal Resistance (R-Values): GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations have 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
	GVP 2.0 HFO and GVP MBI 2.0 HFO
1	7.2
2	14
3	21
3.5	25
4	28
5	35
5.5	39
6	43
7	50
7.25	51
8	57
9	64
9.25	66
10	71

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.

3.2.2 Surface Burning Characteristics: At a maximum thickness of 4 inches (102 mm) and a nominal density of 2.0 pcf (32 kg/m³), GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations have 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: GVP 2.0 HFO and GVP MBI 2.0 HFO, when tested in accordance with the ASTM E96 desiccant method (Procedure A), have a permeance between 0.1 perm (5.7 x 10^9 g/Pa·s·m) and 1 perm (57.4 x 10^9 g/Pa·s·m), at a minimum thickness of 1.1 inches (28 mm) and qualifies as a Class II vapor retarder in accordance with IBC Section 202 and IRC Section R202.

3.2.4 Air Permeability: GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations are classified as air-impermeable insulations when tested in accordance with ASTM E283 at a minimum thickness of 1 inch (25.4 mm) in accordance with 2024, 2021, and 2018 IBC Section 1202.3, 2015 IBC Section 1203.3, and IRC Section R806.5.

3.2.5 Potential Heat: When tested to NFPA 259, the potential heat is 1,850 BTU/in²/inch.

3.2.6 Water Absorption: When tested in accordance with ASTM D2842, has less than 5% water absorption.

3.3 Installation

3.3.1 Installation General: The manufacturer's published installation instructions for GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations and this report shall be available and strictly adhered to at all times on the jobsite during installation.

The spray foam insulations shall be spray-applied on the jobsite using a volumetric positive displacement pump in accordance with the manufacturer's published installation instructions. GVP 2.0 HFO and GVP MBI 2.0 HFO shall be sprayed in multiple passes having a maximum thickness of 4 inches (102 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 insulations shall not be used in electrical outlets or junction boxes or in continuous contact with rain or water. The spray-applied foam plastic insulations 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: GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations 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, 2024 IRC Section 303.4, or 2021, 2018, and 2015 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, GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations shall be installed in accordance with this section. The insulations shall be separated from the interior of the building by an approved thermal barrier as described in Section 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, GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations may be installed within attics or crawl spaces with an ignition barrier in accordance with IBC Section 2603.4.1.6, 2024 IRC Sections 303.5.3 and 303.5.4, or 2021, 2018, and 2015 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 insulations are 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: GVP 2.0 HFO and GVP MBI 2.0 HFO spray-applied polyurethane foam plastic insulations 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 2024, 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:
   - 2024, 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:
   - 2024, 2021, and 2018 IBC Section 1202.4
   - 2015 IBC Section 1203.4
   - IRC Section R408.1

e. GVP 2.0 HFO and GVP MBI 2.0 HFO spray-applied polyurethane foam plastic insulations may be applied at a nominal density of 2.0 pcf (32.0 kg/m^3) to the underside of roof sheathing or roof rafters and vertical surfaces of attics and in crawl spaces without a prescriptive ignition barrier or coating. When applied to the underside of the top of the space, the thickness of the GVP 2.0 HFO and GVP MBI 2.0 HFO shall not exceed 8 inches (203 mm), and when applied to vertical surfaces or floor, the maximum thickness shall not exceed 6 inches (152 mm).
f. In accordance with IMC (International Mechanical Code®) Section 701, combustion air is provided.

3.3.3.4 Unvented Attics: GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations may be installed in unvented attic assemblies and unvented enclosed rafter assemblies in accordance with Section 1202.3 of the 2024, 2021, or 2018 IBC, Section 1203.3 of the 2015 IBC, or Section R806.5 of the IRC, as applicable. The attic shall be protected as required in Sections 3.3.3.2 or 3.3.3.3, as applicable.

3.4 Attic Floors: When tested to ASTM E970, the critical radiant flux of GVP 2.0 HFO and GVP MBI 2.0 HFO exceeds 0.12 watt/cm^2. In accordance with Section 302.5.4 of ICC 1100 and Section 13 of IAPMO ES1000, based on these results, an ignition barrier shall not be required over exposed GVP 2.0 HFO and GVP MBI 2.0 HFO when installed in the attic floor only.

3.5 One-hour, Fire-resistance-rated, Limited Load-bearing Wall Assembly: GVP 2.0 HFO and GVP MBI 2.0 HFO spray foam insulations may be used as part of a limited load-bearing, 1-hour, fire-resistance-rated wall assembly when installed in accordance with Table 3 of this report. The assembly is recognized as meeting ASTM E119 and UL 263 fire-resistance ratings from both the interior and exterior and including applied hose stream test.

4.0 PRODUCT DESCRIPTION

GVP 2.0 HFO and GVP MBI 2.0 HFO is a spray-applied, polyurethane closed cell foam plastic and complies as a low-density insulation in accordance with Section 301.1 and Table 2 of ICC 1100, and Section 4.2 and Table 8.2 of IAPMO ES1000. The insulation is a two-component spray foam plastic with a nominal in-place density of 2.0 pcf (32.0 kg/m^3).

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

GVP 2.0 HFO and GVP MBI 2.0 HFO are identified by the Green Valley Product's name and trademark, product name, and evaluation report number (ER-968).

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

IAPMO UES ER-968

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 X.

6.3 Data in accordance with IAPMO/ANSI ES1000-2020 Standard for Building Code Compliance of Spray-Applied Polyurethane Foam.

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

6.5 Report of testing for water vapor transmission in accordance with ASTM E96, desiccant method.

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

6.7 Reports of critical radiant flux in accordance with ASTM E970.

6.8 Report of potential heat in accordance with NFPA 259.

6.9 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 Green Valley Product's GVP 2.0 HFO and GVP MBI 2.0 HFO 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 at locations noted in Section 2.9 of this report 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 THERMAL BARRIER ASSEMBLIES[1]

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]	14 WFT (9 DFT)	0.87 gal/100 ft^2	7	10
Spray Seal ThB[3]	16 WFT (10 DFT)	1.0 gal/100 ft^2	7	10

For SI: 1 inch = 25.4 mm, 1 mil = 0.0254 mm, 1 gallon = 3.785 L, 1 ft^2 = 0.0929 m^2

[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.

[3] No-Burn, Inc., recognized in IAPMO UES ER-305.

TABLE 3 – ONE-HOUR FIRE-RESISTANCE-RATED LIMITED LOAD-BEARING WALL ASSEMBLY

2x6 wood studs 16 inches on center with $^5/_8$-inch Type X gypsum wallboard with GVP 2.0 HFO or GVP MBI 2.0 HFO insulations applied in the stud cavity
Framing: The framing shall be a minimum of No. 2 Southern Yellow Pine (SYP) 2x6 spaced 16 inches on center with 2x6 wood studs spaced 12 inches from the end of the wall assembly. The studs shall be fastened to the top plate and bottom plate of similar grade and species using 3-inch-long by 0.131-inch diameter smooth shank framing nails. A second top plate shall be fastened to the interior top plate using 3-inch-long by 0.131-inch diameter smooth shank framing nails spaced at 24 inches on center along the 2x6. Staggered blocking shall be installed at mid-height of the wall assembly consisting of No. 2 2x6 SYP within each stud cavity. The blocking was staggered ¾ inch on center from the wall assembly centerline and fastened to the studs using 3-inch long by 0.131-inch diameter smooth shank framing nails. Maximum wall height shall be 120 inches with a maximum unbraced length of 57$^3/_4$ inches. **Wallboard:** $^5/_8$-inch-thick (15.9 mm) Type X gypsum wallboard shall be installed with the long side parallel to the studs on the interior and exterior faces of the framing. The wall board shall be installed using #6 1$^5/_8$-inch-long Type W bugle head drywall screws at 8 inches (203 mm) on center at the panel edges and 12 inches (305 mm) on center in the field. The seams and fasteners shall be brought to a GA-214 Level 2 finish. **Insulation in Stud Cavity:** The GVP 2.0 HFO or GVP MBI 2.0 HFO insulations shall be applied to the stud cavity at a maximum nominal thickness of 4½-inches (114 mm) with a one-inch air gap to the backside of the wallboard layer.
Axial (ASD) Loading shall be the lesser of: **1.** 4661 pounds per stud for 2x6 construction. **2.** For 2x6 construction, a maximum of 70 percent of the load calculated in accordance with Sections 3.6 and 3.7 of the ANSI/AWC NDS (NDS).