

PRODUCT SPECIFICATION



ICYNENE INC.

1. PRODUCT NAME

ICynene® and The ICynene Insulation System® are registered trademarks for polyicynene insulation manufactured by ICynene Inc. ICynene® spray formula is a 1/2 lb density free rise, open celled material.

2. MANUFACTURER

ICynene® is made on site from liquid components manufactured by ICynene Inc. Installation and on-site manufacturing is supplied by independent ICynene Licensed Dealers.

3. PRODUCT DESCRIPTION

ICynene® insulates and air seals at the same time. Its performance is less installation sensitive than factory manufactured insulation materials. It is an effective “breathing” air barrier that can adjust with the building to maintain a seal against energy-robbing air leakage for the life of the building. Convective air movement inside cavities is virtually eliminated, providing more uniform temperatures throughout the building. The result is superior quality construction, with higher comfort levels and lower heating and cooling costs. Energy savings vary depending on building design, location, etc.

ICynene® is applied by spraying liquid components onto an open wall, crawl space or ceiling surface. There they expand 100:1 in just seconds to provide a flexible foam blanket of millions of tiny air cells, filling building cavities and sealing cracks and crevices in the process. It adheres to virtually all surfaces, sealing out air infiltration. Excess material is easily trimmed off, leaving a surface ready for drywall or other finish.

4. TECHNICAL DATA

(Based on Core Samples)

Thermal Performance

Thermal resistance (R-value) ASTM C518:
 R3.6 hr. ft² °F/ BTU
 R_{s1} 0.62 m² °C/W per 25 mm

Average insulation contribution in stud wall:
 2" x 4" = R13 2" x 6" = R20

The ICynene Insulation System® provides more effective performance than the equivalent R-value of air permeable insulation materials. ICynene® is not subject to loss of R-value due to aging, windy conditions, settling, convection or air infiltration; nor is it likely to be affected by moisture related conditions. A FACT SHEET with R-value data is available upon request.

Air Permeance/Air Barrier /Air Seal

The ICynene Insulation System® fills any shaped cavity, and adheres to all materials, creating assemblies with very low air permeance. No additional interior or exterior air infiltration protection is necessary.

Air permeability of core foam:
 ASTM E283 data
 0.0049 L/S-m² @75 Pa for 5.25"
 0.0080 L/S-m² @75 Pa for 3.25"

In all buildings, adequate mechanical ventilation/air supply should be provided for optimum IAQ (Indoor Air Quality). See ASHRAE Guidelines.

Water Vapor Permeance

ICynene® is water vapor permeable and allows structural moisture to diffuse and dissipate. It will not entrap moisture in materials to which it is applied.

Water vapor transmission properties:
 ASTM E96 data

16 perms 941 ng/(Pa•s•m²) @ 3" (76mm) thick
 10 perms 565 ng/(Pa•s•m²) @ 5" (127mm) thick

Because of its low air permeance, ICynene® is not infiltrated by moisture-laden air. Computer modeling of moisture movement in walls using a program (MOIST) developed by Doug Burch of the National Institute of Standards and Technology (NIST) suggested that a 1.0 perm rating was not required when ICynene® insulation was used, except in climates as cold or colder than Madison, Wisconsin (7500 Heating degree days). This conclusion was in general agreement with other computer modeling of moisture movement in building envelopes performed in Canada. In those situations that warrant a vapor barrier, the use of

low vapor permeable paint on the interior drywall is adequate.

Water Absorption Properties

ICynene® is hydrophobic and does not exhibit capillary properties. It does not wick and is water repellent. Water can be forced into the foam under pressure because it is open celled. Water will drain by gravity rather than travel horizontally or vertically through the foam. Upon drying, thermal performance is fully restored.

Acoustical Properties

Performance in a 2"x4" wood stud wall:

STC Sound Transmission Class - 37
 Hz. Freq. 125 250 500 1000 2000 4000
 ASTM E90 19 30 31 42 38 46

NRC Noise Reduction Coefficient - 70
 Hz. Freq. 125 250 500 1000 2000 4000
 ASTM E90 .11 .43 .89 .72 .71 .67

Actual performance is superior than reported test results because of ICynene's® ability to control air leakage.

Burn Characteristics

ICynene® will be consumed by flame, but will not sustain flame upon removal of the flame source. It leaves a charcoal residue. It will not melt or drip. It should be applied in accordance with applicable building codes.

<u>U.S.A. Specifications</u>	
Surface Burning Characteristics of Building Materials ASTM E84	
Flame Spread	<20
Smoke Development	<400
Fuel Contribution	0
Oxygen Index ASTM D2863	23%
N.Y. State Fire gas toxicity	LC ₅₀ -12

<u>CANADA Specifications</u>	
Corner Wall Test CAN4-S102 FSC3	
Flame Spread	510-530
Smoke Development	95-150

Electrical Wiring

Icynene® has been evaluated with both 14/3 and 12/2 residential wiring (max. 122°F/50°C). It is chemically compatible with all electrical wiring coverings.

Note: For any insulation of knob and tube wiring, please reference local electrical code.

Corrosion

Icynene® did not cause corrosion when evaluated in contact with steel under 85% relative humidity conditions.

Bacterial or Fungal Growth and Food Value

Independent testing conducted by Texas Tech University has confirmed that Icynene® is not a source of food for mold; and as an air barrier, Icynene® reduces the airborne introduction of moisture, food, and mold spores into the building envelope. It has no food value for insects or rodents.

Environmental / Health / Safety

Icynene® contains no formaldehyde CFC's, HCFC's, HFA's or volatile organic compounds. It has been thoroughly evaluated for in-situ emissions by industry and government experts. After 10 days there are no detectable emissions.

Limitations

Not intended for exterior use. Not to be installed within 2" (50 mm) of heat emitting devices, where the temperature is in excess of 200°F(93°C).

5. INSTALLATIONS

The Icynene Insulation System® is installed by a network of Licensed Dealers, trained in the installation of Icynene®. Installation is generally independent of environmental conditions. It can be installed in hot, humid or freezing conditions. Surface preparation is generally not necessary. Within minutes, the foaming process is complete.

6. AVAILABILITY

Check regional yellow pages or contact Icynene Inc. at 888-946-7325 or our website at www.icynene.com.

7. WARRANTY

WHEN INSTALLED PROPERLY IN ACCORDANCE WITH INSTRUCTIONS, THE COMPANY WARRANTS THAT THE PROPERTIES OF THE PRODUCT MEET PRODUCT SPECIFICATIONS AS OUTLINED IN THIS PRODUCT SPECIFICATION SHEET.

8. TECHNICAL

Icynene Licensed Dealers and Icynene Inc. provide support on both technical and regulatory issues. Architectural specifications in CSI 3-Part format are available upon request.

9. RELATED REFERENCES

All physical properties were determined through testing by accredited third party agencies. Icynene Inc. reserves the right to change specifications in its effort to enhance quality features. Please confirm that technical data literature is current.

10. PACKAGING AND STORAGE

Packaging - 55 U.S. gallon open top steel drums

Component 'A' - 550 lb. per drum
Base Seal® - Polyisocyanate MDI
Component 'B' - 500 lb. per drum
Gold Seal® - Resin

Storage

Component A should be protected from freezing.

Component B can be frozen but must be protected from overheating (120°F/49°C) and prolonged storage above 100°F/38°C. Component B separates during storage and should be mixed thoroughly prior to use.

11. OPERATING SPECIFICATIONS

Operating Parameters:

Pressure - 500 - max.
Preheaters - 120°F - max.
- 49°C - max.
Line Heat - same setting as preheaters

Preparation

Component B is viscous and separates when left standing. It should be heated to about 80°F (27°C) in the drum and mixed thoroughly to achieve a homogenous mix prior to and during use.

Yield

Yield will vary with the temperature of the substrate but minimum of 15,000 bd. ft. per drum set can be expected, with higher yields expected in warm weather and lower yields in cold weather.

Refer to Icynene Installer's Manual for expanded information.



ICYNENE^{INC.}

The Icynene Insulation System®

Healthier, Quieter, More Energy Efficient™

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