



ICYNENE™

ICYNENE LD-R-50™ and LEED for Homes

This is a general guide as to ways in which the installation of **ICYNENE LD-R-50™** can help contribute to LEED for Homes requirements and credits, either directly or through assisting strategies that are complementary.

It is based on the LEED for Homes Rating System (*) released January, 2008 by the U.S. Green Building Council.

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Resource Category

Credit Area / Path

Credits

Innovation and Design Process (ID)

ID 2. Durability Management Process

Prerequisites

2.1 Durability Planning

- a) Complete the Durability Risk Evaluation Form to identify all moderate and high-risk durability issues for the building enclosure.
- b) Develop specific measures to respond to those issues
- c) Identify and incorporate all the applicable indoor moisture control measures listed in Table 1
- d) Incorporate measure from 2.1 (b) and (c), above, into project documents...
- e) List all durability measures and indicate their locations in the project documents in a durability inspection checklist. Include the checklist in project documents for use in verification.

Credits

2.3 Third Party Durability Management Verification

- Have the Green Rater inspect and verify each measure listed in the durability inspection checklist created for 2.1 (e)

Credits: 3

Significance: ICYNENE LD-R-50™ can be an integral part of specific strategies employed to address any areas of concern as identified on the Durability Inspection Checklist, such as: air infiltration, heat loss and natural disaster. In appropriate climates, ICYNENE LD-R-50™, as part of an unvented attic (roof) design, can exhibit enhanced resistance to rainwater ingress and airborne embers as well as improved fire performance.

Location and Linkages (LL)

LL 1. LEED for Neighborhood Development (Pathway)

Credits

1. Complete the requirements of the LEED for Neighborhood Development (LEED-ND)

Credits: 10

Significance: A threshold percentage of buildings in the project that are ENERGY STAR qualified contribute a potential credit in Green Construction and Technology (GCT) Credit 2 of LEED-ND.

Using ICYNENE LD-R-50™ to effectively air seal and insulate the building envelope, conditioned spaces from unconditioned spaces, cantilevers and other architectural projections can facilitate the achievement of an ENERGY STAR qualification for the home. Alignment of the insulation with the air barrier, continuity of insulation, and encapsulation of services and penetrations is assured. Blower door test performance result as well as HERS Grade rating is optimized.

Energy and Atmosphere (EA)

EA 1. Optimize Energy Performance (Pathway)

Prerequisites

1.1 Meet requirements for ENERGY STAR for Homes, including third-party inspections

Mandatory

Significance: Using ICYNENE LD-R-50™ to effectively air-seal and insulate the building envelope, conditioned spaces from unconditioned spaces, cantilevers and other architectural projections can facilitate the achievement of an ENERGY STAR qualification for the home. Alignment of the insulation with the air barrier, continuity of insulation, and encapsulation of services and penetrations is assured. Blower door test performance result as well as HERS Grade rating is optimized.

Optional Credits

1.2 Exceptional Energy Performance

Credits: 2 to 34

(Exceed requirements of ENERGY STAR for Homes)

Note: Exact credit allocation is determined from the equation provided or from “Table 15”. Credits from 2 to 34 are possible. Credit values increase with every 1-point decline in HERS Index. For a given HERS Index, the credit allocation varies depending on whether the project is in Climate Zone 1-5, or 6-8. Fewer credits are awarded for a given HERS Index in the Northern Climate Zones.

OR
(Alternative Pathway)

Credit EA 2 through EA 10 (Pathway)

EA 2. Insulation

Prerequisites

2.1 Basic Insulation

Meet all the following requirements:

- a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code.
- b) Install insulation to meet the Grade II specifications set by the National Home Energy Rating Standards (Table 16). Installation must be verified by an energy rater or Green Rater conducting a pre-drywall thermal bypass inspection, as summarized in Figure 3.

Significance: In one step, and using a single trade, installation of ICYNENE LD-R-50™ contributes to satisfying every Thermal Bypass checklist item that concerns air-sealing, insulation and alignment of insulation with air barrier.

Credits

2.2 Enhanced Insulation

Credits: 2

Install above code insulation that exceeds the 2004 International Energy Conservation Code (IECC) by at least 5% as demonstrated by RESCheck compliance software AND meet at least RESNET “Grade I” specifications.

EA 3. Air Infiltration

Prerequisites

3.1 Reduced Envelope Leakage

Meet the air leakage requirements shown in Table 17. The air leakage rate must be tested and verified by an energy rater.

Credits

3.2 Greatly Reduced Envelope Leakage

Meet the air leakage requirements shown in Table 17. The air leakage rate must be tested and verified by an energy rater.

Credits: 2

OR

3.3 Minimal Envelope Leakage

Meet the air leakage requirements shown in Table 17. The air leakage rate must be tested and verified by an energy rater.

Credits: 3

Table 17
Performance Requirements (in ACH50)

LEED Criteria	IECC Climate Zone 1-2	IECC Climate Zone 3-4	IECC Climate Zone 5-7	IECC Climate Zone 8
EA 3.1 Reduced Envelope Leakage (Mandatory)	7.0 ACH50	6.0 ACH50	5.0 ACH50	4.0 ACH50
EA 3.2 Greatly Reduced Envelope Leakage (Optional)	5.0	4.25	3.5	2.75
EA 3.3 Minimal Envelope Leakage (Optional)	3.0	2.5	2.0	1.5

(CZ = IECC Climate Zone)

Significance: "Greatly Reduced" to "Minimal" envelope leakage highly likely. Air leakage rates of less than 2.0 ACH50 are typical with ICYNENE LD-R-50™ installations.

EA 5. Heating and Cooling Distribution Systems

A. Forced Air Systems

Prerequisites

5.1 Reduced Distribution Losses

c) Use at least R-6 insulation around ducts in unconditioned spaces.

Significance: Installation of ICYNENE LD-R-50™ can assist in satisfying this mandatory measure.

Note: Other mandatory measures apply.

OR

5.3 Minimize Distribution Losses

b) Locate the air handler unit and all ductwork within the conditioned envelope and minimize envelope leakage (i.e. meet all the requirements of EA 3.3)

Credits: 3

Significance: An unvented attic design insulated with ICYNENE LD-R-50™ provides an opportunity to locate the air handler and ductwork in this manner.

Note: Other requirements to achieve this credit are applicable.

EA 6. Space Heating and Cooling Equipment

Significance: Design of HVAC using ACCA Manual “J” (“right-sizing” or optimized design) is facilitated by an effectively sealed building envelope, such as is realized with the installation of ICYNENE LD-R-50™.

Note: One of 3 prerequisites.

Materials and Resources (MR)

MR 2. Environmentally Preferable Products

Credits

2.2 Environmentally Preferable Materials

Use building component materials that meet one or more of the criteria below. Except as noted in Table 24, a material must make up 90% of the component, by weight or volume. A single component that meets each criterion can earn credits for each.

Insulation: (roof and wall and floor):

(b) Low Emissions

Comply with California "Practice of Testing of VOC's from Building Materials Using Small Chambers".

Credits: 0.5

Significance: ICYNENE LD-R-50™ is CHPS E.Q. 2.2/Section 01350 Compliant as it has been tested to the CA/DHS protocols and meets the criteria for a classroom.

(c) Local Materials:

Use products that were extracted, processed and manufactured within 500 miles of the home.

Credits: 0.5

Significance: ICYNENE LD-R-50™ is manufactured right on the job site, in the exact volume required.

MR 3. Waste Management

Credits

3.2 Construction Waste Reduction

Credits: 0 to 3

Significance: ICYNENE LD-R-50™ is light in weight and predominantly composed of air (1:100 expansion ratio), and is easily compacted, resulting in optimization of waste reduction score as calculated by weight or by volume.

ICYNENE LD-R-50™ installed in building cavities using "smooth spray" techniques would contribute to minimizing construction waste reduction.

Note: Prerequisites related to Construction Waste Management Planning apply (refer to 3.1).

Indoor Environmental Quality (EQ)

EQ Credit 1

ENERGY STAR with Indoor Air Package (Pathway)

Credits: 13

Significance: Depending on design, installation of ICYNENE LD-R-50™ would facilitate Indoor Air Package checklist items: 1.13 (attic air barrier and air-sealing), 1.22 (IECC-compliant exterior wall insulation), and 4.8 (ACCA Manual J used for heating and cooling design loads), depending on design.

Note: Achieving the measures in EPA's Indoor Air Package may qualify a home to receive points in other categories of the LEED for Homes Rating System (see Table 28).

OR
(Alternative Pathway)

EQ 6. Distribution of Space Heating and Cooling (EQ 2 to 10 Pathway)

A. Forced Air Systems

Prerequisites

6.1 Room-by-Room Load Calculations.

Perform design calculations (using ACCA Manuals J and D, the ASHRAE Handbook of Fundamentals, or an equivalent computation procedure) and install ducts accordingly.

Note: ACCA Manual "D" calculations are based on Manual "J" calculations. As previously mentioned, Manual "J" calculations can be optimized as a consequence of a well-sealed building envelope – ICYNENE LD-R-50™ optimizes that performance.

EQ 10. Garage Pollutant Protection

Prerequisites

10.1 No HVAC in Garage.

Place all air-handling equipment and ductwork outside the fire-rated envelope of the garage.

Credits

10.2 Minimize Pollutants from Garage.

Credits: 2

Tightly seal shared surfaces between garage and conditioned spaces, including all of the following:

- a) In conditioned spaces above the garage:
 - i) seal all penetrations
 - ii) seal all connecting floor and ceiling joist bays

Note: Other requirements also apply for conditioned spaces above and next to the garage – refer to IEQ 10.2.

Significance: Only a material like Icynene® can, in one step, provide an effective air-seal as well as the required insulation for a critical areas such as the shared surfaces between the garage and conditioned space.

Guidance for Users

This document is presented in good faith as a general guide to where the installation of Icynene® can contribute to mandatory or optional credits in the LEED for Homes rating system. The impact of the installation of Icynene® may depend on several factors, including but not limited to:

- technical or administrative changes to the LEED for Homes rating system,
- other design considerations/details of the particular home,
- the extent of strategies employed that are complementary to insulation and air-sealing.
- the successful acceptance by USGBC of Credit Interpretation Requests as submitted by the LEED for Homes provider.

ICYNENE INC.