

Lightweight Insulating Concrete (LWIC) Roof Decks

LWIC is a cementitious insulating roof substrate material which is site-cast and cured. It is used as 1) a fill material to add slope, or 2) as a topping over a structural substrate.

Common Requirements:

Expanded EPS insulation board may be encapsulated in LWIC assemblies to increase insulation value.

Minimum recommended thickness: 2-inches.

Minimum fastener withdrawal resistance: 40 pounds.

Mixing and placement of LWIC requires a relatively large amount of water. Thus, venting and drying are critical for overall roof performance. Venting is accomplished from the underside with permeable form boards or slotted metal form deck.

The cured material is “nailable.” As a result, a base sheet or separator sheet should be mechanically-fastened to the surface before installing insulation or a roof membrane.

Two Types:

Lightweight Aggregate Insulating Concrete

- Portland cement, water, and *lightweight aggregates*, such as perlite or vermiculite.
- Oven dry density: 20-40 pounds per cubic foot.
- Compressive strength: 125-140 pounds per square inch.
- Longer drying period compared to Lightweight Cellular Insulating Concrete.

Lightweight Cellular Insulating Concrete

- Portland cement, water, and *pre-generated foam*.
- Oven dry density: 26-40 pounds per cubic foot.
- Compressive strength: 160-350 pounds per square inch.

Not recommended:

- Mechanically attached insulation.
- Mechanically-attached seam-fastened single ply membrane roof systems.
- Direct application of adhered membranes or liquid membrane roofing systems without a mechanically-attached base sheet or separator sheet.



Sources:

The NRCA Roofing Manual: Membrane Roof Systems – 2019, Chapter 2 – Roof Decks.

“Roof Decks A to Z: Part 1: LWIC and AWC,” Lyle D. Hogan, *Interface Magazine*, Sept 2010, p. 16-18.

NRDCA Publications (Available free online at nrdca.org)

: Technical Information Bulletin 1001 Venting LWIC Installed Over Structural Concrete and Other Non-Venting Substrates

NRDCA 100 – Guideline for Field Application of Aggregate Insulating Concrete Roof Deck Systems

NRDCA 175 – Guideline for Field Application of Cellular Insulating Concrete Roof Deck Systems

NRDCA 400 – Guideline for Field Application of Insulating Concrete Reroofing / Recover Systems

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