

Evaluation Report

"Concrecel Lightweight Insulating Concrete"

Manufacturer

Concrecel International, Inc.

281 NE 32nd Street
Fort Lauderdale, FL 33334
(954) 563-0235
For

Florida Product Approval

FL 10500.1 R6

Florida Building Code 8th Edition (2023)

Per Rule 61G20-3

Method: 2 - B

Category: Roofing

Sub - Category: Roofing Insulation

Product Name: Concrecel Lightweight Insulating Concrete

Support Type: Steel Deck, Non-Vented

This item has been digitally signed and sealed by James L. Buckner, P.E., on this date below. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.

Prepared by:

James L. Buckner, P.E., SECB
Florida Professional Engineer # 31242
Florida Evaluation ANE ID: 1916
Project Manager: Diana Wilmeth
Report No. 24-664-LWIC-S-ER
(Revises 20-280-LWIC-S-ER, FL10500.1 R5)
Date: 4/10/2024

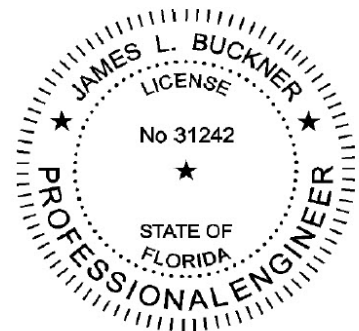
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James L. Buckner, P.E.
FL31242

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Manufacturer: Concrecel International, Inc.

Product Name: Concrecel Lightweight Insulating Concrete

Product Category: Roofing

Product Sub-Category Roofing Insulation

Compliance Method: State Product Approval Rule 61G20-3.005 (2) (b)

Product Description: Lightweight Insulating Concrete (LWIC) on Non-Vented Steel Deck.
Insulating Concrete formulated by mixing a hydrated cementitious matrix around non-interconnecting air cells created by the addition of preformed foam formed from hydrolyzed proteins or synthetic surfactants.

Product Assembly as Evaluated: Refer to Page 4 of this report for product assembly structural components:

- Bonding Agent
- Lightweight Insulating Concrete (Slurry Coat)
- Holey Boards
- Lightweight Insulating Concrete (Top Coat)
- PVA Curing Compound

Support: **Type:**
Steel Deck, Non-Vented

Description:

- Profile: B Deck
- Thickness: 0.030 in (22 Gauge)
- Depth of Ribs: 1.5 in
- Yield Strength: 33 ksi Minimum
- Finish: Galvanized
- Finish Standard: ASTM A525, G90

(Design of support system is outside the scope of this evaluation)

Performance: Wind Uplift Resistance:

- Design Uplift Pressure (ASD)*: - 52.5 PSF

** Allowable design pressure for allowable stress design (ASD) with a margin of safety of 2 to 1.*

Performance Standards: The following test protocols were performed to demonstrate compliance with the intent of the code as this product is not addressed specifically in the code.

- **FM 4454-92** – *Standard for Lightweight Insulating Concrete for use in Class 1 and Noncombustible roof construction.*

Code Compliance: The product assembly described herein has demonstrated compliance with: Florida Building Code 8th Edition (2023), Section 1708.2.

Evaluation Report Scope: This product evaluation demonstrates compliance of this product with the structural wind load requirements of the Florida Building Code, as related to Florida Product Approval Rule 61G20-3.001.

- Limits of Use:**
- Scope of “Limitations and Conditions of Use” for this evaluation:
This evaluation report for “Optional Statewide Approval” contains technical documentation, specifications and installation method(s) which include “Limitations and Conditions of Use” throughout the report in accordance with Rule 61G20-3.005. Per Rule 61G20-3.004, the Florida Building Commission is the authority to approve products under “Optional Statewide Approval”.
 - Option for application outside “Limitations and Conditions of Use”
Rule 61G20-3.005(1)(e) allows engineering analysis for “project specific approval by the local authorities having jurisdiction in accordance with the alternate methods and materials authorized in the Code”. Any modification of the product as evaluated in this report and approved by the Florida Building Commission is outside the scope of this evaluation and will be the responsibility of others.
 - Fire Classification is outside the scope of Rule 61G20-3, and is therefore not included in this evaluation.
 - This evaluation report does not evaluate the use of this product for use in the High Velocity Hurricane Zone code section. (Dade & Broward Counties)

Quality Assurance: The manufacturer has demonstrated compliance of products in accordance with the Florida Building Code and Rule 61G20-3.005 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through Keystone Certification, Inc. (FBC Organization #: QUA 1824)

Component(s)

Material Standards:

Bonding Agent

Type: Concrecel Bonding Agent
Application Rate: 600 ft² per Gallon

Slurry Coat

Type: Concrecel Lightweight Insulating Concrete
Cast Density: 46.4 pcf Nominal
Thickness Above Deck Flange: 1/4" Minimum

Hole Board Insulation

Material Type: Expanded Polystyrene
Nominal Board Sizes: 2' x 4' & 4' x 4'
Thickness: 1 in Minimum
Board Density: 1.0 pcf Nominal
Keyholes: 8 Keyholes per 2' x 4' Board nominal 2 ½ in Diameter
16 Keyholes per 4' x 4' Board nominal 2 ½ in Diameter

Concrecel Lightweight Insulating Concrete (Top Coat)

Type: Cellular Lightweight Insulating Concrete
LWIC Volume: 1 Cu.Yd
Wet Density: 34 – 44 pcf
Compressive Strength: 300 – 360 psi
Minimum Thickness: 2-1/4 in

LWIC Admixture Components

Portland Cement

Standard: ASTM C150
Quantity: 625 – 675 lbs/Cu.Yd

Water

Quality: Potable
Quantity: 32 - 40 gals

Concrecel Foam Agent

Standard: ASTM C869
Quantity: 15.96 – 20.52 CuFt

Curing Compound

Type: Concrecel Poly Vinyl Alcohol Curing Compound (PVA)
Application Rate: 600 ft² per Gallon

Installation:

1. Metal Deck Cleaning
 - Oil, dirt, debris, loose gravel, paint, standing water, and foreign objects shall be cleaned from concrete slab, metal deck, and existing roof surfaces.
2. Metal Deck Preparation
 - Concrecel Bonding Agent should be applied over the surface at a rate of 600 ft² per gallon. When dry, pour Concrecel LWIC over the corrugations.
3. Weather Limits
 - Concrecel Lightweight Insulating Concrete shall be mixed and placed when the temperature is 40° F. (4.4° C) and rising.
4. Foam Quality Control
 - The wet density of the preformed foam must weigh 2.5 lbs. + or – ¼ lb. per cubic foot throughout the entire foam cycle.
5. Mixing Operations
 - A. All foam equipment used shall be approved by Concrecel. Water and then the cement are charged into the mixer to create a homogeneous slurry. The foam is then charged into the mixer and blended into a homogeneous mix. The mix is charged into a pump and placed.
 - B. The batching time depends on the condition of the equipment and the manufacturers recommendations.
6. Lightweight Concrete Quality Control
 - Field testing shall comply with FBC Section 1917.2. The wet density is sampled from hose end. The cylinders are made from density sampled and tested according to ASTM C-495. The size of the cylinders may be the diameter to a height ratio of 1:2. The cylinders should be filled in two equal layers. Each layer is raised 1 in nominally and then the cylinder is dropped on a hard surface, repeat three times.
7. Placing Concrecel Lightweight Concrete
 - A. A Slurry Coat of Concrecel is placed over the bonding agent to a depth of ¼ in over deck corrugations.
 - B. EPS board Shall be placed in the slurry coat with staggered joints and tap into place. No activity shall disturb the slurry coat bond to the underside of the EPS board.
 - C. Within 24 hours any EPS board not bonded to the slurry coat shall be adhered again with Concrecel concrete during the pouring of the topping.
 - D. Minimum topping of 2 ¼ in of Concrecel concrete over the metal deck, EPS board, and all existing roof substrates.
8. Curing Application
 - The Curing Compound shall be applied at the specified rate within 24 hours after the topping pour.
9. Roofing Installation
 - Roofing operations may start three days after topping pour if LWIC complies with FBC, Section 1917.4.9.

“The Concrecel Lightweight Insulating Concrete” shall be installed in compliance with the installation method listed in this report. The installation method described herein is in accordance with the scope of this evaluation report. Refer to manufacturer’s installation instructions as a supplemental guide for attachment.

**Evaluated Referenced
Data:**

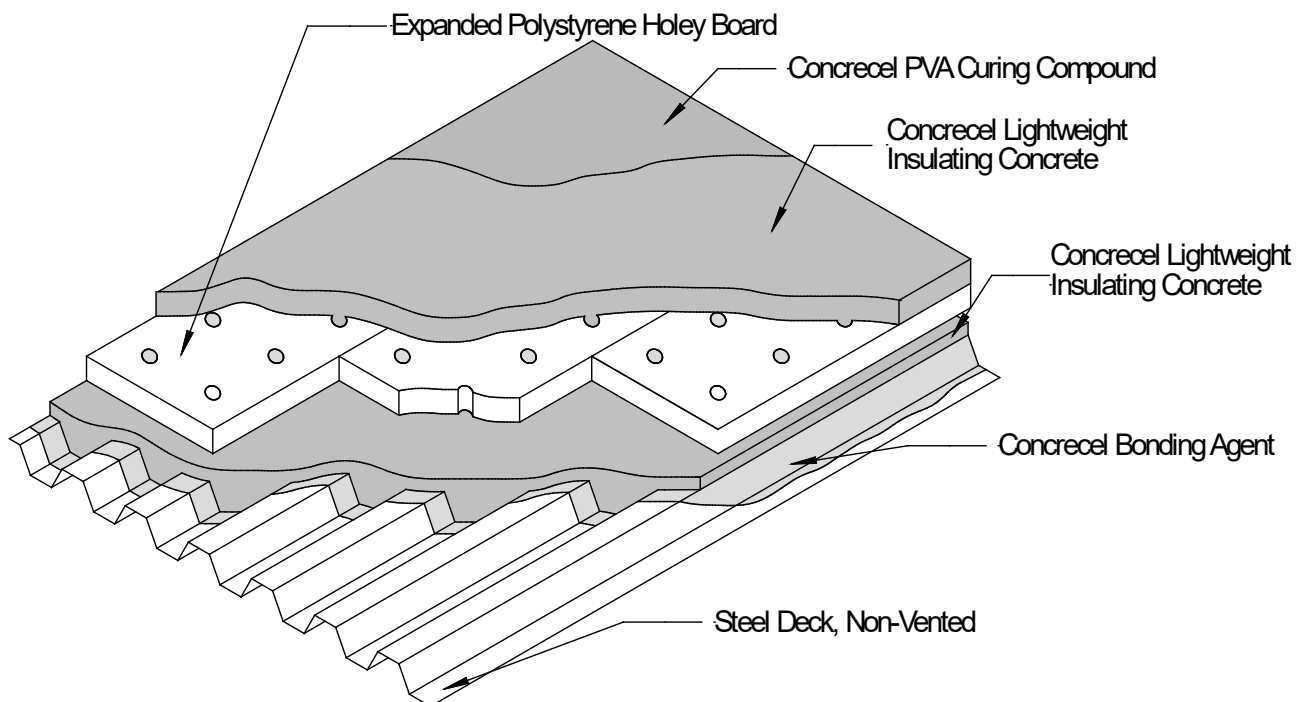
1. FM 4454 Uplift Pressure Test
By Factory Mutual Research Corporation (FBC Organization ID# TST 1867)
Report #: 1D7A4.AM, Report Date: 11/09/98, Certification Date: 10/18/07
Conclusion Section: 4.1, Sample #5, for Non-Vented Deck
2. Quality Assurance
By Keystone Certifications, Inc. (FBC Organization ID# QUA 1824)
Concrecel International, Inc Licensee #563
3. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)
4. Engineering Analysis
By CBUCK Engineering
Report #C08-176, Dated: 3/28/08

Installation Method

Concrecel International, Inc.

Concrecel Lightweight Insulating Concrete Adhered to Steel Deck, Non-Vented

Typical Assembly



Isometric View (Schematic)