

Approval Standard Established for LWIC Contractors

By Factory Mutual

Imagine a block of concrete the size of a large toaster oven, yet light enough for a small child to lift. Lightweight insulating concrete (LWIC) is not only light, but also strong, non-combustible, extremely resistant to wind uplift, and easy to slope for positive drainage over irregular surfaces. These favorable characteristics make LWIC ideal for new roof decks and reroofing applications. Despite these favorable qualities, however, LWIC remains a largely underutilized technology. Why?

According to Hubert Dudley, executive director of the National Roof Deck Contractors Association (and a speaker at RCI's upcoming convention in Galveston), the failure of LWIC to catch on in the marketplace can be attributed primarily to a lack of uniform industry standards and market momentum that favors roofing systems featuring rigid insulation and membrane coverings.

"As an industry, LWIC has never had uniform application or quality control standards," Dudley explained. "The user did not have a benchmark against which to measure whether an LWIC application was performed correctly. Therefore, user concerns relative to improper applications, coupled with competitive market pressures, have impaired industry growth. The development of uniform industry standards will overcome a key issue restricting that growth."

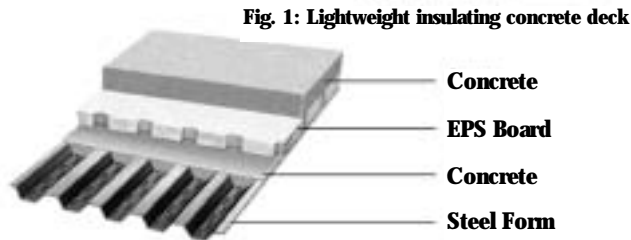


Fig. 1: Lightweight insulating concrete deck

Cooperative Effort

Enter Factory Mutual Research. In the summer of 2000, following a careful evaluation of third-party agencies, the NRDCA approached Factory Mutual Research (FMR) to propose the two organizations work together to develop the first-ever Approval program for LWIC roof-deck contractors. The culmination of the 18-month development effort is the soon-to-be-released Approval Standard 4491 – *Approval of Lightweight Insulating Concrete Roof-Deck Contractors*.

The new standard is designed to improve the performance of Factory Mutual Research-approved LWIC roof-deck assemblies and the roofing assemblies in which they are used by examining and approving LWIC contractors. According to George Smith, manager of the FMR materials section, nearly 65% of commercial roofing losses are due to the misuse of Approved products or use of non-Approved products and systems.

Positive Impact

"We firmly believe that this new Approval program for LWIC contractors will make a positive impact on roof-assembly installation quality and, thereby, help reduce losses," Smith said. "This

is the second Approval standard we have developed for contractors – our firestop contractors standards was the first. We are hoping to offer our first Approval examination under the new LWIC standard at the NRDCA meeting in April 2002."

The new LWIC contractor Approval standard has undergone extensive review both by Factory Mutual Research and industry



If applied correctly, lightweight insulating concrete is one of the best wind uplift performers available. (Photo by Celcore Inc.)

representatives. A key part of the new standard is an examination that Factory Mutual Research is developing with the help of the NRDCA. The new exam will test the contractor's Designated Responsible Individual (DRI) in his or her knowledge of the:

- Factory Mutual Research Approval Guide.
- FM Global roofing-related Loss Prevention Data Sheets, and
- New LWIC-industry standards and other documents referenced in the new Factory Mutual Research standard.

Along with a written examination, the new standard also requires:

- Verification that the DRI has been actively involved in the installation of LWIC roof-deck assemblies for at least two years;
- A review of the training and education received by the DRI; and
- An initial in-house and job-site Facilities and Procedures Audit (F&PA) inspection of the contractor's quality control program.

A Look at LWIC

Lightweight insulating concrete decks are poured in place as slurry over an Approved galvanized concrete deck. In some cases, a perforated expanded polystyrene (EPS) board is then placed into the wet concrete and an additional 2 in. (51 mm) layer of LWIC is poured over the EPS. After curing, a base sheet is fastened to the LWIC deck using Approved base sheet fasteners or Approved adhesive. A built-up roof (BUR), modified bitumen cover, or single-ply roof cover is then installed.

Descriptions of various Approval assemblies are described in the Approval Guide.

LWIC is typically produced on-site using aggregates such as expanded vermiculite, perlite, or air in the form of loam (cellular

concrete). These aggregates and entrained air help reduce the density of the concrete, weighing as little as 22 lb. (10 kg) per cubic foot when fully cured.

Concrete Benefits

LWIC has many benefits in roofing and reroofing applications, including durability, stability, self-leveling characteristics, shock absorption, high freeze-thaw resistance, excellent thermal protection, fire- and wind-uplift resistance, and relative low cost. According to Smith, most of the drawbacks to LWIC are typically associated with errors made in its application.

“Unless the applicator or contractor takes the time and effort to do things right, they can end up with a poor quality product on the roof,” Smith said. “This product is sensitive to the amount of moisture in the mix and many other factors. The LWIC industry is in the same position as the spray-applied polyurethane foam (SPF) industry used to be. The SPF industry was able to improve the quality of its product and the level of education among its contractors through new training programs and product research. The NRDC is attempting to achieve similar gains for LWIC by helping us develop this new Approval Standard and by developing new training modules for its membership.”

According to Smith, when LWIC is applied correctly, it is one of the best wind uplift performers available. “This material is truly monolithic.” There are no seams or fasteners to worry about. Plus, you have gravity on your side when you are using concrete, even lightweight concrete,” he said. LWIC is very popular in the Southwest and Southeast U.S., which include some of the highest wind exposure regions in the country.

Demonstrates Commitment

According to NRDC's Dudley, the reception of the new Approval program for LWIC contractors has had a generally

favorable reception among LWIC contractors. “Industry contractors typically fall into two camps,” Dudley noted. “In the first camp are those companies that have historically specialized in LWIC. These contractors want the FMR program because it will improve consistency, quality, and the perception of the industry. The second group is composed of general roofing contractors who also work with LWIC. A small segment of this group opposes any third-party intervention. This group knows it will have great difficulty overcoming the FM-approved LWIC requirement that will eventually be written into specifications. Despite this small minority, this program will be a huge benefit to the construction industry.”

As with Approval Standard 4991, Approval of Firestop Contractors, the new standard for LWIC contractors offers Approved contractors a way to distinguish themselves in a crowded market by showing their commitment to quality and education. Approved LWIC contractors are required to have received training from the NRDC or equivalent training. Once Approved, LWIC contractors will be listed in both the FM Research *Approval Guide* and on the NRDC website at www.nrdca.org.

“The Firestop Approval program was our first-ever for contractors and it has been a huge success – we are hoping the same thing will happen with the LWIC program,” Smith stressed. “For many of these organizations, working with Factory Mutual Research is a natural fit. The organizations gain the credibility that comes with the “Approved” designation, and we help prevent losses, which benefits FM Global and its insureds.”

To learn more about the new Approval standard for LWIC roof-deck contractors, please contact George Smith at (781) 255-4870 or e-mail at george.smith@fmglobal.com.

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