

ROOFING NO. 3012

SUBJECT: USE OF R-SHIELD INSULATION DIRECT TO DECK APPLICATION & UL CONSTRUCTION 458

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R-Shield® insulation can be applied directly to a fluted metal deck without a thermal barrier and be in compliance with the building code. This bulletin explains the recognition of R-Shield insulation installed directly to a metal deck as part of a UL fire classified roof deck construction or an ICC-ES code report.

The requirements for thermal barrier application with foam plastics are covered by the 2012 International Building Code (IBC). IBC Section 2603.4 requires that foam plastic shall be separated from the interior of a building by an approved thermal barrier unless approved for in sections 2603.4.1 or 2603.9. Thus, most installations of foam plastics in building construction require a thermal barrier. However, the code recognizes that roof deck constructions may not require a thermal barrier when evaluated under recognized test methods.

The code recognized application of foam plastics in roofing without a thermal barrier is covered specifically by section 2603.4.1.5 of the IBC. This section states:

“A thermal barrier is not required for foam plastic insulation that is part of a Class A,B, or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM4450 or UL1256.”

Underwriters Laboratories

Underwriters Laboratories (UL), a leader in the investigation of fire safety issues, has investigated the performance of R-Shield insulation in accordance with UL1256 as required by the building code. As evidence of compliance with UL1256, UL publishes fire classified roof constructions to educate users on suitable roof deck constructions. UL published roof deck Construction no. 458 as a fire resistant assembly in compliance with UL1256. This listing is attached to this bulletin.

As a requirement of Construction 458, the insulation must comply with UL listings for BRYX or TGFU. R-Shield insulation is manufactured under UL file R11812 with compliance to BRYX and TGFU. Thus, R-Shield insulation is suitable roof insulation for use in UL Construction 458.

ICC-ES

ICC-ES publishes evaluation reports to inform Building Officials that the subject products of the evaluation reports are in compliance with the International Building Code (IBC) and International Residential Building Code (IRC). Testing and data evidence submitted to ICC-ES demonstrated that R-Shield insulation met all IBC requirements including ASTM C578, ASTM E84, and most importantly the UL1256 large scale fire test. ICC-ES has recognized R-Shield insulation for application direct to a metal deck without a thermal barrier. Please refer to ICC-ES ESR-1006 for complete details of the ICC-ES recognition including specifications and application requirements.

Historical Note:

Large scale flame spread testing under metal roof decking was first conducted as a combined effort by UL and FM in the 1950's. The original test method employed a 20'x100' building with bar joists and metal decking with a complete roof assembly above the metal deck. This test method was known as the “White House Test” due to the white color of the building. Part i of UL 1256 documents this large scale “White House Test”. In addition to the large scale test, UL and FM have developed smaller scale tests to evaluate the flame spread under metal roof decking. These tests are documented in UL 1256 part ii and FM 4450.

Summary

1. Use of foam plastic insulation in a roof assembly without a thermal barrier must comply with the building code by meeting section 2603.1.4.5 of the IBC.
2. Section 2603.1.4.5 of the IBC requires that the assembly be evaluated by FM4450 or UL1256.
3. UL has investigated R-Shield insulation as part of an assembly in accordance with UL1256 full scale fire test.
4. UL published fire classified roof deck Construction 458 as a result of these investigations.

Foam plastic insulation used in UL Construction 458 must conform to UL listings for BRYX or TGFU.

R-Shield insulation is listed by UL File R11812 as a BRYX and TGFU compliant material.

5. ICC-ES has recognized R-Shield insulation as part of an assembly in accordance with UL1256 large scale fire test.
6. ICC-ES issued ESR-1006 as a result of their evaluation.
7. R-Shield insulation is suitable for direct to metal deck application when installed in conformance with UL Construction 458 or ICC-ES ESR 1006.