RR-1 Insulating Screw Cap

New Fastening System Reduces Energy Use of Buildings

Roofing systems for industrial and commercial buildings continue to make significant strides in their performance and durability. Fasteners are essential to keeping many of these roofs intact by joining of pieces or multiple layers. However, the combination of newer roofing materials, known as singly-ply membranes, with conventional metal fasteners leads to increased heat loss. This loss occurs because the metal screw and plate of the fastener are only minimally insulated from the surroundings and conductive heat flow occurs through the thermal bridge created by the metal fastener.

The RR-1 Insulated Screw Cap Assembly, developed by The Romine Company of Newark, Ohio, with the aid of a grant from the DOE's Inventions and Innovation Program, is a simple but effective solution to heat loss and back-out problems found with many conventional fasteners. This improved fastener consists of an injection-molded fiberglass-reinforced nylon anchor, soft insulating plug, and optional grappel washer. The system is simple to install and extremely strong.

The energy advantage of the RR-1 results from the fastener depth and insulation value. The metal screw portion of the fastener is embedded at least one inch into the insulation board, reducing the heat transfer through the fastener. A foam plug is inserted in the cavity created and acts as an insulator. The new fastener design is more resistant to condensation and corrosion, which makes the fastener less likely to corrode and lose holding strength over time.

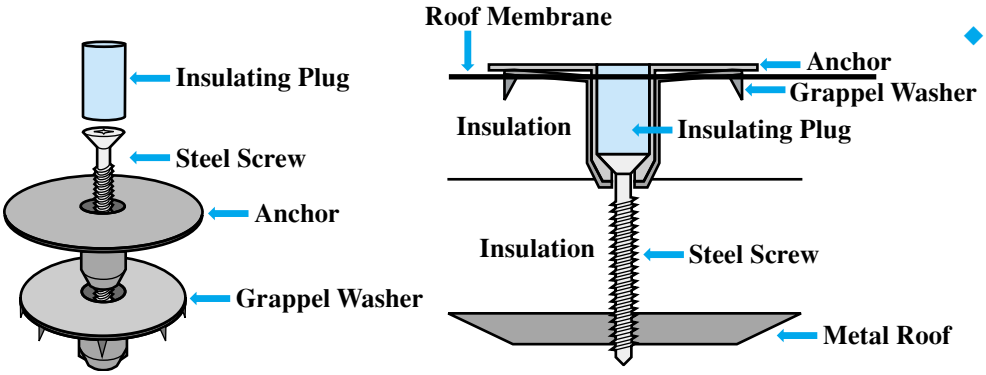
Benefits

Productivity

The simple flush mount requires less torque and time to screw in (no predrilling required) and provides a smoother finish than conventional fasteners. The RR-1 is also produced from less costly materials, so it is a more economical choice than other all-plastic fasteners.

Durability

In tests conducted on wind uplift, the strength of the RR-1 insulating fastener proved to be greater than the holding power of the metal decking. The RR-1 fastener also resists back-out. These features, and fastener tear-out, are particularly critical with the newer flexible membrane roofing materials.



The RR-1 Insulated Screw Cap Assembly

Overview

- Developed and marketed by The Romine Company
- Commercialized in 1997
- 230,000 units sold through 2003

Energy Savings

(Trillion Btu)

Cumulative through 2003	2003
0.006	0.002

Emissions Reductions

(Thousand Tons, 2003)

Particulates	SO_X	NO_X	Carbon
0.0	0.0	0.0	0.029

Applications

The technology may be used on commercial and industrial buildings with membrane roofs and metal roofs. The screw caps may also be applied as a retrofit to older roofs.

Capabilities

- Replaces conventional metal or plastic fasteners to improve the energy performance in building roofs.
- Optimized for fastening single-ply roofing or rigid insulation to metal decking.
- Resists typical problems for fasteners including back-out and corrosion.

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