

Insulating Cavity Walls During Renovations

Many older buildings may be beautiful examples of architecture, but they all tend to suffer from the same problem; they are energy wasters. Old buildings cost much more to heat and cool than newer ones, are drafty and uncomfortable, and allow outside noise and pollutants inside. One of the single biggest improvements that can be made to older buildings is the addition of thermal insulation into wall cavities.

The challenge

However, one of the challenges faced by renovators is how to insulate cavity walls in older buildings without dismantling the wall. Materials like cellulose, rockwool or vermiculite have been tried. These were blown into the cavity through holes made through the outside cladding or the inside plaster.

This method could result in material getting “hung-up” on some inside obstruction, preventing it from completely filling the cavity. The solution typically involves hammering the wall in the hope that this would shake the material down. Because no additional air or vapor protection could be installed, it left serious concerns about moisture becoming a problem later on. Similarly there was the possibility that these materials would settle in time, leaving a void at the top of the cavity. In extreme cases there was the possibility of the insulation being vulnerable to rain penetrating the outer wall. The flaws in these methods left serious doubts about their long-term performance and overall effectiveness.

The solution: The Icynene Insulation System® pour fill formula

The Icynene Insulation System® pour fill formulation is a very different alternative. It is installed by injecting a liquid into wall cavities, through small ½-inch (13 mm) holes. As a two-component liquid material, Icynene® runs to the bottom of the cavity, filling every void. Over 2 to 3 minutes, the material expands into low-density

cellular foam that is 60 times the volume of the original liquid. While it expands it remains in a pliable state, filling every contour of the cavity. When the expansion is completed, Icynene® sets into inert, soft, fine-celled foam.

Site assessment and installation

An assessment of the wall is the first step in deciding if The Icynene Insulation System® is suitable.

1. The wall cavity must be empty. If it already contains insulation material, the existing material must be removed before upgrading to The Icynene Insulation System®.
2. The interior plaster/drywall must be in sound condition. While very little pressure is exerted by the foam as it expands (it expands along a path of least resistance), there is a risk of damage to the interior plaster; this risk is low but it does exist.
3. The width and depth of the cavities are measured (using a probe) so that the amount of insulation to be injected may be determined. Diagonal cross bracing is detected this way, and additional holes are made below so that the foam may be injected into the space below the bracing.

Injection of material can be made from inside or outside of the building. The method employed often depends on whether interior or exterior surfaces and finishes are to be renovated. Application of Icynene® proceeds by injecting liquid material into ½ inch (13 mm) application holes. The injections are timed so that there is minimal risk of bowing or blowing off interior finishes. Any excess material that oozes through the application holes is easily broken off by hand.

When the application is complete, infrared thermography can be used to determine whether any inaccessible places have been missed. With Icynene® there is little risk of the material getting “hung-up”



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1 800 758 7325

on plaster keys or nails, because the foam expands upward from the bottom of the cavity, totally filling the space through which it moves. Additional repairs are limited to the small application holes. The finishing contractor or homeowner typically takes responsibility for repairs to application holes.

The net result: Better performance from old buildings

Icynene[®], installed in 1½ inch (38 mm) wide cavity, will provide about R-6 (RSI-1.03) insulation which in most climates results in a 90% reduction in heat flow through the cavity. The material will not sag with time, because it adheres to everything with which it comes in contact, creating a monolithic wall structure.

Icynene[®] will not shrink, break down or settle over time. In combination with the other building components, Icynene[®] is an excellent air barrier and will provide a much more thermally efficient building. The Icynene Insulation System[®] does not suffer from moisture problems over the long term, or any of the other drawbacks associated with the other insulation materials and methods mentioned previously.

Moisture will not degrade the performance of Icynene[®] because only very small quantities of moisture can propagate through the cavity by diffusion. This moisture remains in a vapor state and passes through the foam without condensing on exterior or interior surfaces. Rain penetration is not a problem either, because Icynene[®] repels and does not absorb water.

In summary, adding The Icynene Insulation System[®] cavity fill material may be the single most effective way to improve on the performance of old buildings. The interior space will be healthier, quieter, more energy efficient[™] than ever before.

