

HUNTSMAN

BUILDING SOLUTIONS



CLOSED-CELL SPRAY FOAM

FOR A DURABLE, PROBLEM-FREE ROOF

The most important part of a building envelope is the roof. It protects us from rain, snow and harsh weather. The roof is also where the greatest heat loss occurs, which is why the Building Code requires the highest insulation value for this part of the building envelope. A poorly built and insulated roof can result in numerous problems: poor ventilation, heat loss, ice dams, condensation, mold, water infiltration, etc. For both residential and commercial roofing, closed-cell spray foam is a simple, effective and lasting solution for insulating roofs and avoiding all of these problems.



With an average R-value of up to R-7.4/inch closed-cell spray foam can be applied to the required thickness to meet the Building Code¹ requirements. Depending on the location of the project and the type of energy efficiency program chosen, an effective R-value may be required. The HBS team is available to make the calculation since the effective R-value is calculated specifically for each assembly. The product can be sprayed from the interior or exterior and offers seamless, continuous insulation. As per I-Codes, foam plastic insulation can function as a Class II Vapor Retarder, which is required in Climate Zones 5, 6, 7, 8 and Marine 4. The product can achieve a perm rating <math><1</math>, qualifying it as a Class II vapor retarder, making an additional Class I vapor retarder (polyethylene) unnecessary (an additional Class I vapor retarder is required where the interior relative humidity is high, e.g. indoor pools). Considering the many features and details of a roof, for instance: skylights, recessed lights, plumbing vents and chimneys, air and vapor barrier continuity – in short, envelope continuity – is often difficult to achieve with traditional materials. Closed-cell spray foam expands 30 times its initial volume in 5 seconds and selfseals all these joints. Consequently, whether a new construction, a renovation, a cathedral ceiling, or a flat roof, closed-cell spray foam is the ideal choice.

NEW BUILDINGS-APPLICATION

In most cases, insulation is sprayed from the inside. For a cathedral roof or flat roof, closed-cell spray foam is the ideal solution. Cathedral roofs are often problematic due to not enough space to insulate, poor ventilation, condensation, etc. Closed-cell spray foam adheres completely to the surface, preventing condensation from forming. Furthermore, the product will not settle or shift over time, and will maintain its properties during the lifetime of the building.

If the roof structure and geometry allow space for venting, simply mount a rigid support panel (vent baffle) between the roof rafters, leaving an air space of at least 2.5" (65 mm) above the panel, for ventilation. Closed-cell spray foam can then be sprayed directly to the underside of the rigid vent baffle. Continuity of the air barrier is key in this application. See HBS typical details for more information.

If there isn't enough space for venting, or if the roof geometry is too complex for adequate venting, the product can be sprayed directly to the underside of the roof sheathing or decking. This creates an unvented roof assembly, which has been in the building code since 2004. Closed-cell spray foam acts as both air barrier and vapor retarder, fully sealing the roof in addition to providing maximum insulation. Numerous studies demonstrate the excellent performance of unvented roof assemblies^{2,3,4,5}. It is always recommended that an inspection of the roof be performed at least every two years to detect any deficiency in the shingles or roof membrane to prevent water damage.

For a roof with an attic or flat roof, the product can be applied from inside of the attic, directly to the attic floor or ceiling finish. The attic will then be vented and unconditioned.



If you want a conditioned attic to use for storage, to install mechanical ventilation systems, or even to turn your attic into a living space, closed-cell spray foam can be sprayed directly onto the roof deck, with no venting. The soffits will have to be sealed and the attic can then be conditioned and will be completely sealed from the outside air. The same concept can be applied to a flat roof. Venting between closed-cell spray foam and the plywood sheathing is optional.

PROBLEM-FREE ROOF



Roofs like these are frequently the source of problems, inside the structure and in the materials. The cause is often inadequate insulation and/or a discontinuity in the air barrier system.

RENOVATION

Whether you are renovating the inside or the outside, by replacing the shingles and decking, the interior ceiling, or want to make your home more energy-efficient, it is possible to insulate an existing roof sufficiently, even when space is limited. All of the techniques described previously can apply in a roof renovation as well. Closed-cell spray foam's advantage in a renovation is its high R-value per inch. Indeed, the structure of old buildings often does not allow enough space to apply a thick layer of insulation; but with closed-cell insulation, it is now very simple to insulate an old roof to meet modern standards.

ADVANTAGES

- High R value per inch - Lower energy cost and reduce the space needed for the insulation
- Perfect seal – Reduces heat loss and eliminates air infiltration and exfiltration
- Good adhesion over the entire surface - Will not settle or move over time
- Quickness of installation – Saves time for project's completion
- Suitable for all roof structures – fewer complications, simple application
- Fungi resistant – Has been tested for fungi and does not support mold growth
- Durable - Will not deteriorate over time
- ESR or UES evaluated products
- Greenguard Gold certified for indoor air quality
- Installed by certified applicators
- ASTM C1029



HBS CLOSED-CELL INSULATION, for a durable and energy efficient roof.

Huntsman Building Solutions (HBS) converts PET plastic (100% recyclable), diverted from landfills, into energy efficient closed-cell spray foam insulation. Leveraging proprietary polyols, a key component of spray polyurethane foam (SPF), HBS foams deliver the industry's highest insulation values, creating a comfortable work and living environment. This is Huntsman's dedication to reducing energy consumption for a cleaner, greener world.



REFERENCES

1. 2018 International Codes (I-Codes)
2. Building Science Digest 102, Understanding Attic Ventilation;
3. Building Science Digest 149, Unvented Roof Assemblies for All Climates;
4. SPFA, AY 141, Spray Polyurethane Foam in Unvented Cathedral Ceilings and Cathedralized Attics;
5. CMHC, About Your House Fact Sheet 62082, Attic Venting, Attic Moisture and Ice Dams;

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