

SPRAY FOAM INSULATION AND COASTAL FLOODING



ICYNENE®

OVERVIEW

Spray Foam Insulation and Coastal Flooding

Storm surges, extreme storm rainfall, hurricanes and flooding can cause massive damage in coastal communities. In the immediate aftermath of these calamities, it becomes necessary to assess:

- The extent of damage and contamination
- The removals that are required to affect a proper clean up
- The point at which retrofit can begin (i.e. when the site is sufficiently 'clean')
- Design and re-construction strategies to provide better flood resistance

This white paper is intended to provide a concise roadmap to the clean-up and rebuilding process for spray foam contractors and potential customers. It is not an exhaustive resource on clean-up methods and materials. (Government agencies such as FEMA—the Federal Emergency Management Agency can provide far more comprehensive resources.) Rather, it is an overview to guide the use of spray foam in these key situations.

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Assessing Flooding Damage

When significant weather events cause flooding, one must almost always assume that the water is contaminated. In addition to the dissolved salts, one might find in sea water it is highly likely that the incoming water contains other contaminants such as:

- Decaying organic matter and debris
- Raw sewage
- Fuel, oil and solvents
- Microbes, mold and pathogens
- Various forms of marine life

The fact that these contaminants are moved by flood waters under hydrostatic pressure (the weight of the water on submerged materials) forces contamination deeply into porous materials, and into cracks and gaps behind and around materials. Then, by wicking, moisture and contaminants will be drawn up into areas above the actual flood level. The water damage can be extreme but the contamination can be more extensive. Further, the freezing and thawing of moist building materials can accelerate the effects of flood damage.

Removals

For these reasons, it is desirable to have a qualified clean-up contractor assess the extent of removals that are required, necessary cleaning, drying and disinfecting of surfaces. Proper cleaning drying and disinfecting of some porous materials may take days or even weeks to carry out. The fact that mold can begin to thrive in as little as 48 hours when contaminated water floods an assembly makes it likely that many porous materials will, in fact, require removal.

Note: neither open cell foam or closed cell foam will not support mold growth but contaminants will.

Many sources (including FEMA) identify certain materials such as closed cell spray foam as flood-resistant. This does not mean that they will not need to be cleaned and possibly removed to access other materials that do require removal, cleaning, and/or drying. It should be a qualified remediation contractor who makes the determination as to which materials need to be removed.

In some cases, there may be concerns that water has migrated into interstitial spaces behind spray foam. In the cases where the plywood subfloor is to be removed, above the closed cell foam, additional foam is to be added to fill the cavity between the plywood and the foam and the contractor must assure that the air seal from below is intact. Note all areas must be dry before this is contemplated. It may be difficult to remove sub-floors without damaging the spray foam.

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Getting Ready for Retrofit

When retrofit work is about to begin, it will be necessary to determine the readiness of insulated assemblies for spray foam. It is most desirable that surfaces be clean and dry to accept spray foam. Wood should have a moisture content of less than 19%. Concrete should be visibly dry and free of residue. Metals should be free of dirt and oil. Any surfaces subjected to flooding should be disinfected and treated to address mold. Residual salt should not impact spray foam.

It is often advisable that spray foam be 'test-sprayed' to determine if it will bond to treated lumber, sheathings and other materials where an interaction is possible. Based on the test spray, it may be necessary to clean or prime surfaces to accept a coating of spray foam.

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Retrofit Strategies for Flood Zones

FEMA recommends that moisture sensitive materials be kept elevated to avoid flooding. Retrofit work will often involve raising older buildings and constructing new buildings on piers or platforms above the Base Flood Elevation (BFE) and ensuring that construction below the BFE be done with flood-resistant materials.

As previously mentioned, FEMA recognizes closed cell foam as flood-resistant and suitable below the BFE. However, there are other considerations as well. Some building designs with construction below the BFE incorporate sacrificial 'knock out' walls that fall away and do not imperil the rest of the building in the event of surge or flood. It may not be necessary to insulate with flood resistant materials if such portions of the building are non permanent and it may be desirable to insulate with materials that can be easily removed if required (e.g. soft, open cell foam).

Above the BFE both open cell and closed cell foams can be used. The choice of materials should be made based on sound building science principles. For instance, in a floor above a damp crawlspace it may be desirable to use closed cell foam because of its vapor retarding characteristics. Some designers of floor assemblies that may have occasional flooding above the floor surface, prefer to install open cell foam so that the water from above can drain through the foam keeping the plywood subfloor drier after the flood waters recede. An Icynene Certified Dealer can assist in identifying the right product for the right application.

For helpful advice, go to www.icynene.com to get the product information you need. As a handy reference for those working in flood zones, the chart below identifies key requirements for the use of Icynene spray foam in basements and crawlspaces subject to flooding.

Application	Open Cell	Closed Cell	Ignition Barrier	Thermal Barrier
	e.g. LD-C-50	e.g. MD-C-200		
Floors/Walls above/near the BFE	Acceptable	Acceptable	Not Required	Not Required
Headers/Band Joists near BFE	Acceptable	Acceptable	Not Required ¹	Not Required ¹
Crawlspace Walls below BFE	Not Acceptable	Acceptable	Not Required ²	Not Required ²
Basement Walls below BFE	Not Acceptable	Acceptable	Not Required	Required
Crawlspace Flood Knock-out Walls	Acceptable	Acceptable	Not Required	Required ³

Notes:

1. Protection not required if foam thickness is less than 3 1/4" (IRC Section R316.5.11)
2. TB Protection required if crawlspace is part of return air supply for Heating/Cooling System.
3. Supply same protection as found in the rest of basement / crawlspace

Call 888.741.5475 or visit www.icynene.com to learn more about the application of ICYNENE 's portfolio of open and closed cell spray foam insulation products for coastal flooding and extreme weather events.