

Sprayed polyurethane foam and closed-cell plastic foams are the only materials that FEMA classifies as acceptable flood damage-resistant insulation materials for floors, walls and ceilings in its building design criteria for special flood hazard areas (SFHAs).

This requirement applies to new construction, repair of substantially damaged buildings, and substantial improvement of existing buildings in SFHAs. To protect buildings constructed in SFHAs, FEMA's National Flood Insurance Program (NFIP) requires the use of building materials that are "resistant to flood damage."

FEMA designates sprayed polyurethane foam and closed-cell plastic foams as a Class 5 flood damage-resistant building material. Class 5, which is FEMA's highest rating, are materials considered highly resistant to floodwater damage, including damage caused by moving water, and can survive wetting and drying and may be successfully cleaned after a flood to render them free of most harmful pollutants.



# FEMA

## Home Builder's Guide to Coastal Construction Technical Fact Sheet Series (FEMA P-499)

FEMA has produced a series of 37 fact sheets to provide technical guidance and recommendations concerning the construction of coastal residential buildings. The fact sheets present information aimed at improving the performance of buildings subject to flood and wind forces in coastal environments.

The documents illustrate National Flood Insurance Program (NFIP) regulatory requirements, the proper siting of coastal buildings, and recommended design and construction practices for building components, including structural connections, the building envelope, and utilities.

Section 1.7, titled "Coastal Building Materials" includes references to closed-cell spray polyurethane foam insulation.

Section 1.8 – titled "Non Traditional Building Materials" contains an entire section about the usage and benefits of closed-cell spray foam insulation as a flood resistant material.

FEMA Technical Bulletin 2 – "Flood Damage-Resistant Materials Requirements" for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program shows closed cell spray foam as the only Class 5 insulation.



NOTE: FEMA specifically discusses Closed-cell foam as being classified as "acceptable," however to the trained eye, you will notice the photo they use shows open-cell foam.

Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
	Floors	Walls/Ceilings	Acceptable	3	4	5	1
Finish Materials (floor coverings, wall and ceiling finishes, insulation, curtains, doors, partitions, and windows)							
Glass (panels, colored film, panels)							
Glass blocks							
Insulation							
Sprayed polyurethane foam (SPUR) or closed-cell plastic foams							
Fiberglass – fiberglass, mineral wool, batts, blankets, or boards							
All other types (cellulose, cotton, open-cell plastic foams, etc.)							

Sprayed closed-cell foam polyurethane insulation is used to fill wall cavities in framed construction (see Figure 5). When sprayed, it expands and hardens forming a rigid air barrier and acting as a moisture retardant.

### Advantages:

- Sprayed closed-cell foam insulation expands to fill wall cavities, small holes, and gaps as it expands, producing a rigid barrier that results in reduced energy costs.
- It is quick to apply and may require less time to install than conventional batt insulation.
- It offers acceptable flood resistance, which is shown in NFIP Technical Bulletin 2-08, Flood-Resistant Material Requirements for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program.

Things to consider if building with sprayed closed-cell foam insulation:

- Tests have shown that sprayed foam insulation can improve the strength of structural framing systems and connections. However, structural framing systems and connections must be designed and constructed in accordance with all applicable building codes.
- While closed-cell foam is a flood-resistant material, it should be used in conjunction with preservative-treated, or naturally durable, wood or corrosion-resistant metal framing.
- Closed-cell foam should not be confused with other types of insulation. Some varieties of insulation on the market may be more cost effective and more environmentally friendly; however, many of these products are not considered flood-resistant materials. Testing reports and provisions of the building code should be consulted for applicability in a coastal environment.
- Sprayed foam systems (such as those used in a wall system) create an assembly that when inundated by floodwaters may not be easily dried. For this reason, they are not appropriate to use below the BFE and are not considered flood-resistant material unless the entire assembly has been determined to be flood-resistant.

### Coastal Building Materials

