

Foam Concepts, LLC Equipmentless-Foam Sealant (EFS)

Manufacturers Recommendations for extreme weather installations

EFS is a two-part water blown, rigid polyurethane foam (PUF). The two sides are known generically as A or ISO and R or Resin. PUF is exothermic and is also an insulator. Therefore the installations are influenced by temperature. The time and temperature of reaction will vary with the chemical and ambient temperatures and the dispersion of the heat of reaction will vary with substrate (rock or soil) and ambient temperatures. Hot rock will pull out less heat and very cold rock may slow the reaction to the point where the installed density and adhesion are affected.

Because the R side contains water, the chemicals must be above freezing prior to mixing. The ideal temperature range for installing EFS is 50-80F. Foam Concepts does not recommend installing foam in air temperatures above 105F, or below 35F even when heating the chemicals. Hoarding is allowable, assuming the added heat raises the rock and air temperatures into the recommended range. Substrate temperatures above 30F and free of frost and snow are also recommended. Lower temperatures will affect density, uniformity and adhesion. Also, the smoother a surface is the more dry it should be to assure good adhesion.

Care should also be taken at high altitudes in summer or in any bright, high angle sun that the substrate temperature does not exceed 130F. Shade can be an effective way to control both chemical temperature and substrate temperature. When shading the chemicals or the feature be sure to leave headspace for air circulation. If a pour begins to overheat, stop and shade the feature, allowing air circulation, to bring the plug back to a safe temperature range.

You can pour EFS directly on standing water. The foam in direct contact with the water may not cure properly, but the top of that layer will cure. From that point up the foam will react as if poured on a typical false bottom. Therefore, try and pour as thin a layer of foam as possible on the water and let it spread out, float up and cure. The improper cure is due to several factors. Water is generally cold and is a very effective heat sink capable of rapidly stopping the reaction and expansion of PUF. Also, any residual A will react with the water and may change the A:R ratio in the contact layer. The water may also delay the reaction, so if you pour the next layer too soon, the added heat may set off any uncured foam and cause tension cracking. Regardless of how thin the first layer is, once the standing water is fully covered allow the foam to go through a full 20-30 minutes of cooling.

Similar to the cooling effect of standing water, rain can affect the quality of an installation as well. Water hitting the reacting foam can change the A:R ratio, as well as locally cool the rising foam. If water can be seen running down the shaft walls or pooling on the foam it is raining too hard. If rain drops cause indentations larger than a half an inch, or glassy bubbles appear, stop foaming. Once the rain stops and the surface has dried you can resume pouring.

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Summary of Recommendations for extreme weather installations

For hand mixing, maintain chemical temperatures between 35 and 85F.

For machine placement, keep the chemical temperatures above 60F.

Do not foam if air temperatures are below 35F or above 105F.

Do not foam if substrate (rock) temperatures are below 30F or above 150F.

If adding heat to a feature (hoarding), meet the above recommendations and maintain those conditions until the pour is complete.

Do not foam if rain is visible running down shaft walls or pooling on the foam, or if the rain is causing indentations or glassy bubbles to form.

Do not pour foam on smooth, wet surfaces like concrete or clay.

Do not pour on snow or frost covered surfaces.

Do not pour on running water.

If pouring on standing water, pour a thin, widely dispersed layer into the water. Allow that first layer to completely spread and cover the water. Once all the water is covered, allow the foam to cool for 20-30 minutes, regardless of how thin the first foam layer is.