



***Phenolic Foam Roofing by Gary S Mays – Professional Roofing Consultant
Forwarded by Scott Fischer CRP***

Based on my research, Phenolic Foam roof insulation was specified and sold as a component in many low-slope Built-Up Roof (BUR) and Single-Ply Roof Systems from 1981 through 1992. Phenolic foam insulation was also specified as a composite component in steep-slope roof systems such as clay tile roofs, but not to the extent as with low-slope systems. Phenolic foam can and has produced the same corrosive effects to the steel components of steep-slope roofs as it has in low slope roofs, i.e., if the Phenolic Foam becomes wet, accelerated corrosion of metal components can be expected.

Research indicates that the United States-based Phenolic Foam technology used an aromatic sulfonic acid as a catalyst in the process to create the cells of the foam. It appears that the high rate of water absorption by the Phenolic Foam allows the water to dissolve the sulfonic acid, forming a highly-acidic compound. This highly-acidic compound readily breaks down the typical structural metal deck and metal roof component coatings (organic and inorganic). It has also been reported that formic acid gaseous vapors are also released from Phenolic Foam insulation, thus contributing to the corrosion process of metals in the immediate vicinity of the phenolic material. Once the coatings have been destroyed, the corrosion of steel progresses at an accelerated rate.



Roof Deck Corrosion

Unlike other plastic foam insulations, Phenolic Foam readily absorbs water and has been noted in some installations to shrink excessively. Joints in the insulation have been found in some installations to have opened to as much as 1-1/2 inches wide from an original butted condition. Corrosion is found to be typically more severe at the edges of the insulation boards where condensate-producing conditions occur within the voids.



When a small amount of water is leaking in, or as in condensate-producing conditions found in high relative humidity applications, the Phenolic Foam seems to act like a sponge. When water saturates the Phenolic Foam insulation, it picks up chemicals out of the insulation. As it exits the board, it is very corrosive (with a low pH factor in the 1.5 to 3.5 range). The low pH precipitant is highly corrosive to steel components found within the roof and roof structure (fasteners and structural steel). In addition, the structural steel roof deck which is in direct contact with the saturated Phenolic Foam insulation is highly susceptible to premature corrosion. When structural steel roof deck corrosion occurs, it can lead to an unsafe condition; and, if left uncorrected, it could lead to property damage or bodily injury.

Where evidence of Phenolic Foam insulation exists, caution should be exercised in traversing the roof. Where corrosive Phenolic Foam insulation is found within a roofing system, the insulation and all of its residue should be completely removed from the roof and roof structure. In addition, all severe corrosion-damaged structural steel should be removed and replaced with new materials. Minor structural steel deck corrosion can be arrested by completely removing the corrosion and applying a quality rust-inhibitive epoxy coating or equivalent protective coating system.

Product History: U.S. Based Phenolic Foam

1. Koppers Company, Inc., produced Phenolic Foam roof insulation from 1981 through January 15, 1989. The material was sold under the trade name of Koppers RX Exotherm. The Phenolic Foam insulation came in several colors. (I have found Phenolic Foam insulation colors ranging from light pink, mustard yellow, to dark brown, almost black).

The Koppers Company, Inc., was taken over by a British conglomerate named Beazer East, Inc. The corporate entity that is legally responsible for the Koppers product sold through January 15, 1989, is Beazer East, Inc.

Note: When Beazer East, Inc., bought out Koppers, there was a spin-out of the roofing business by primary management. The spin-out is actually a new corporation called Koppers Industries, Inc. They did not buy the assets and liabilities of the Koppers Company, Inc. Koppers Industries, Inc., sells coal tar felts and coal tar pitch, etc.

2. Manville, Inc., purchased the Phenolic Foam technology and business from the Koppers Company, Inc., and started selling Phenolic Foam roof insulation on January 19, 1989. The product was sold through March 31, 1992, when it was discontinued.

Schuller International, Inc., of Denver, Colorado, purchased Manville, Inc. Johns Manville Corporation then purchased Schuller International, Inc. Johns Manville Corporation is the corporate entity that is responsible legally for the Manville product.



Schuller (now Johns Manville Corporation) marketed the Phenolic Foam formerly manufactured and marketed by Manville Roofing Systems through the Schuller Roofing Systems Division until March 31, 1992.

Canadian Based Phenolic Foam

1. Domtar, Inc. - Domtar Construction Materials Division produced Phenolic Foam roof insulation from approximately 1987 through 1993. The Domtar, Inc., Phenolic Foam insulation technology was acquired from the Koppers Company, Inc. Therefore, it has approximately the same characteristics as the United States-produced Phenolic Foam insulation.

2. Owens Corning Corporation/Fiberglass Canada produced a Phenolic Foam roof insulation product from approximately 1989 through 1994, at which time Schuller International bought the commercial roofing business from Owens Corning. Schuller International did not buy the Phenolic Foam insulation line. Owens Corning stopped production of Phenolic Foam insulation. **Note:** The Fiberglass Canada Phenolic Foam utilized a chemical technology acquired from Monsanto. The Fiberglass Canada Phenolic Foam insulation appeared to be a superior product, being dimensionally stable with low water absorption and low corrosivity rates.

Note:

1. Private labeling for miscellaneous marketing companies appears to have taken place by the major manufacturers. This further confuses the trail to the responsible party.

2. To my knowledge, the manufacture of Phenolic Foam insulation has ceased within the United States and Canada.



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