

TECHNICAL SOURCE GUIDE

POLYURETHANE COATINGS

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In the theatre and entertainment industries, various foams have been used for years to create a multitude of shapes. Their light weight, strengths and malleability have made them ideal for scenic and properties use. One drawback to the use of foam, however, was its lack of surface durability on multi-scene productions and touring shows or when scenery, because of blocking, was subject to heavy use and potential damage.

To solve this problem, users of foam products in the entertainment industry went back to insulation and roofing manufacturers, the originators of many of these foam products, to see what they have developed to cope with these problems. For roofing and other applications manufacturers have developed several types of coatings and although many of the coatings possess different components, they fall basically into one of two categories: (1) a two-part urethane high density coating, and (2) a water- or solvent-based coating. For our purposes, we will concern ourselves with the polyurethane coating.

The two-part polyurethane coating, which can be sprayed in a similar fashion to the expandable foams, produces a finish which is both hard yet somewhat flexible. This enables it to be bumped around without fear of cracking, as is the case with most fiberglass coatings. The polyurethane coatings are usually sprayed in thicknesses of 100 to 250 mils. Additional coatings can be sprayed to create a thicker surface as needed.

The density of the material being used should also be considered.. The typical density of polyurethane foam is 1.5 to 2 lb. density, but 9 lb. or greater density will yield a very workable surface as a sealer for the foam surface. Set-up time is approximately 30 seconds.

Freeman Decorating of Houston produces a large number of props and scenic pieces for industrial display, and the problems they have encountered are that the carved foam props had a short life span because of daily wear and tear. The two-part poly coat solved this problem, unlike fiberglass. the poly coat can be sprayed over polystyrene (bead board) with little or no prep work. The surface is durable and will take paint well. Unlike the water-based acrylic and latex sealers produced for the entertainment and roofing Industries, the polyurethane coatings can produce a stronger, more durable surface able to withstand heavy physical wear.

Michael Moorc, Master Scenic Carpenter with the Seattle Opera, is a firm believer in this product. For a production of A Midsummer Night's Dream, Moorc produced a very large tree stump Created from EPS foam. After spraying it with the two-part poly coat, the surface could withstand heavy actor use. In Painting the finished product, flex glue was added to the paint to ensure its sticking to the surface.

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In all instances the application of polyurethane coatings will require the use of special equipment in order to spray the coating onto scenery or props. Correct pressure and temperature are vitally important to the successful use of the product. However, the average Price for the equipment is about \$15,000, which is out of the budget range of most shops. It would be more advantageous to contact a roofing or insulation contractor to spray it for you, as most Contractors Charge by the square foot plus thickness of material, which is monitored by the equipment. Seattle Opera secured the services of Tom King, a freelance contractor, for this Procedure. The average cost is about \$1 per square foot for one coat at an average thickness of 30 to 100 mils. When talking with the contractor, ask for a sample of the coating they offer, as the finish and consistency of thickness will vary from contractor to contractor.

It is important to exercise the same precautions in working with the two-part poly coatings as you would with the two-part poly foams. Spray only in a well-ventilated room, making sure that all workers in the room have protective clothing, including gloves and eye protection. All working members should wear a self-contained breathing apparatus. If, as was the case for the Seattle Opera, the spraying is to take place in the scene shop, all equipment and supplies within spraying distance should be covered. The spraying technique causes small particles of polyurethane to fall as dust, which can stick onto surface and penetrate fabrics.

The higher density polyurethane coating, unlike the lower density two-part polyurethane expandable foam, does not come in a manual pour configuration but instead requires expensive equipment in order to maintain density and surface consistency. Products will vary from manufacturer to manufacturer—for instance, Styrothane 5329 from the Futura Company in St. Louis, Missouri, sets up in 30 seconds and can be sprayed as thin as 25 mils., about the thickness of a credit card. Rim Seal, the coating used on the Seattle Opera set, boasted a 75 lb. density per square foot with the same thickness. The Futura Company also produces a product called Futura-Thane (Ultrathane) 5201 which is designed to be used over flexible foam to create a durable watertight seal while maintaining the flexible characteristics of the foam. This product also requires the same equipment as the other polyurethane coatings. Most two-part poly coatings contain a fire retardant and are rated as Class One foam. It is best to check with local fire codes regarding the safe indoor use of this coating over various foamy as codes will differ from city to city.

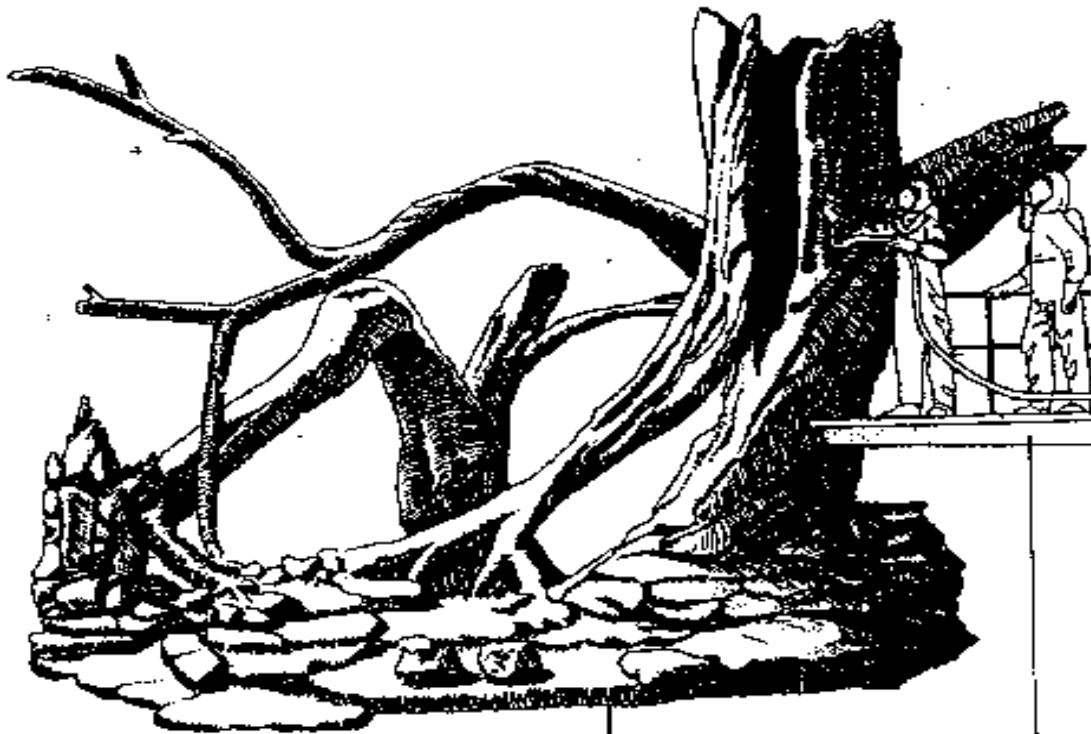
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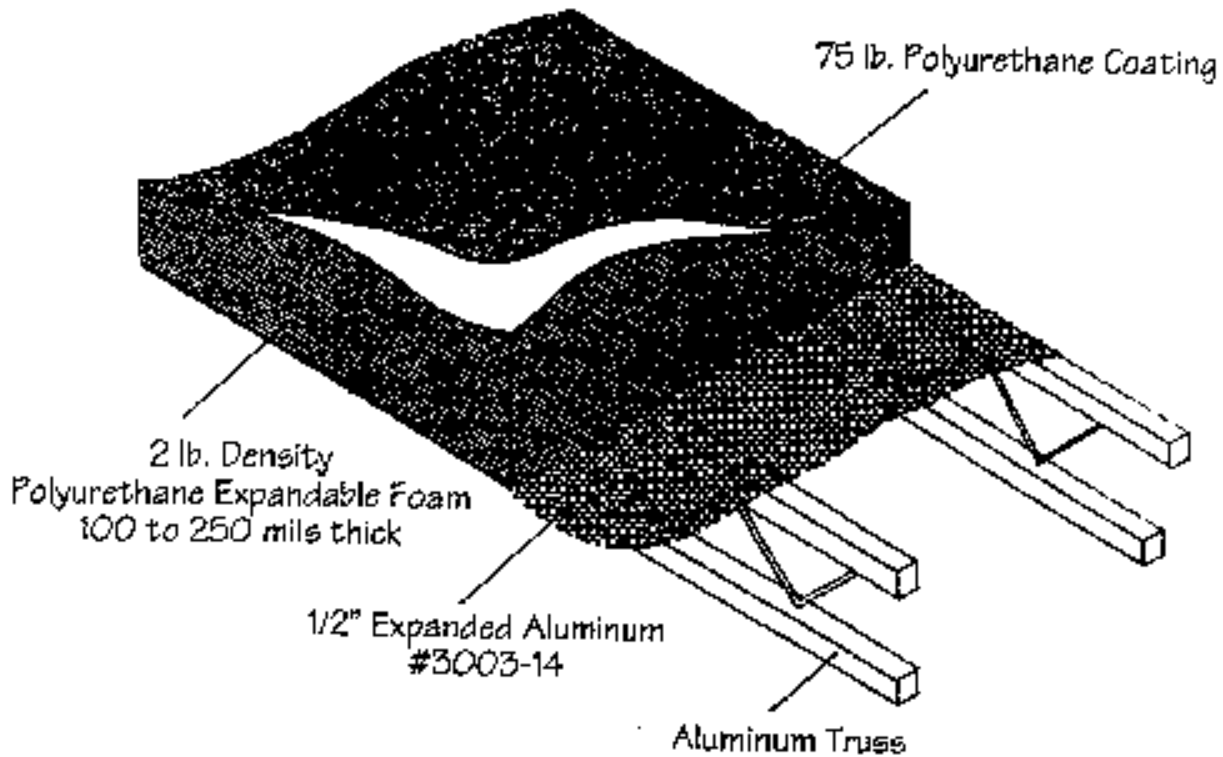
Metal and Foam Structure
Spray-coated in High Density Polyurethane

Forklift Platform for
Accessibility

**Seattle Opera's Design for A Midsummer Night's Dream with
Polyurethane Coating**

Thank you for taking time to read this "classic" Technical Source Guide! Because it has been published a relatively long time ago, addresses (physical & web) and any phone numbers, might not be current!

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Detail of Seattle Opera's Design for A Midsummer Night's Dream

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