

Tech Note 2

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Some Plastics for Scenic Use

In addition to the wood and metal commonly used for constructing scenery and props, plastics can be used in the building of many scenic elements. There are a variety of plastic products useful in the theater, far too many to describe in detail here; this note explores the applications of a few of them.

Foam

Many types of foams, or expanded plastics, are available. Perhaps the most common is expanded polystyrene, generally known (if not necessarily correctly) as Styrofoam or blue foam. This sort of foam is very useful in other industries because of its compressive strength, buoyancy, and thermal insulation. However, these properties are not especially useful in the theater; instead, it is used because it is lightweight (being composed mostly of air) and can be sculpted easily. It can be used to create shaped three-dimensional scenic elements that would be difficult to create using other materials.

Traditional tools such as knives and saws can be used to cut and sculpt polystyrene foam, but a hot knife, capable of melting the foam, can be used to make cuts more easily. This simple tool can be created by connecting a power source (a couple batteries will serve as a simple power supply) to a resistive nichrome wire, then mounting it on an appropriate frame. This type of cutter can also be used by forming the wire into the desired shape, then pushing the foam board through it to shape it.

Urethane foam is available in many forms, rigid and flexible foams of various densities and sizes. Urethane foams often come as two-part expanding mixtures, which can be sprayed or poured; when combined with an appropriate mold, these can be very effective at forming many complex shapes.

Polyethylene foam can be convenient for scenic decorations because it is available as rounds rods of various diameters. It can be sliced and used to make round moldings.

Working with these products introduces a set of safety concerns. Foams can be flammable and can produce dangerous gases in a fire, so it is important to use a flame-retardant, or purchase foam products that are already treated. When working with foam, especially when using a hot knife, toxic vapors may be released, so it is important to have sufficient ventilation. Polystyrene foam is easily dissolved by many chemicals, including many adhesives, spray paints, etc, so it is important to use a coating (e.g. Sculpt or Coat) to prevent this. The coating can also be used for texturing.

Thermoplastics

Thermoplastics are materials which can be easily shaped when heated. These materials were developed for the medical industry, and in the theater can be useful for details on scenery and props. Their high cost as compared to other materials makes it difficult to use thermoplastics on a larger scale, though it is sometimes possible to heat, reshape, and reuse old pieces. They are generally easy to work with and do not release toxic fumes when heated.

When cold, thermoplastics can be manipulated using saws and sandpaper and other conventional tools. When heated, they become flexible and can be easily molded. Generally, hot water is used to make the plastic shapable; it can then be shaped freehand or poured into a mold before being allowed to cool and set. For reshaping smaller sections or joining multiple pieces, a heat gun can be used to make them pliable.

Protoplast pellets and sheets are some of the most useful forms of thermoplastic materials for construction: the sheets for constructing rigid structures or smooth surfaces, and the pellets for shaping details or for use in molds. Thermoplastic-covered fabrics and meshes are also available, and are useful for texturing.

References

- <http://upstagereview.org/StagecraftArticles/chemical.pdf>
- <http://www.pnta.com/thermots.html>