**ETHACURE® 300 Curative**
Dimethylthiotoluenediamine (DMTDA)

**Introduction**
ETHACURE 300 curative (E-300) is Albemarle’s registered trade name for dimethylthiotoluenediamine (DMTDA), a compound used to make strong, flexible materials called elastomers that can be formed into coatings, adhesives, rigid foam insulation, flexible foam cushions and countless other items from pickup-truck bed liners to fan belts, laser-printer parts, wheels and golf ball covers. Because it reacts with other ingredients as it cures during manufacturing, none of these products actually contain DMTDA when they are sold and used. Without E-300, however, many such products could be more difficult, expensive or hazardous to make.

**Description and Properties**
ETHACURE 300 curative is a clear yellow liquid that darkens when exposed to air. The product is shipped with a nitrogen pad to prevent darkening. It has a relatively low vapor pressure, so it typically gives off no detectable fumes or vapors. Although a little heavier than water, it is only slightly soluble in water and is considerably more viscous.

**Uses**
ETHACURE 300 curative is a widely used chain-extender or curative component for man-made, rubber-like compounds called elastomers, such as polyurethane and polyurea, that are used for everything from high-durability coatings to flexible foam seating, rigid insulation, seals and gaskets, even wheels and tires.
Elastomers get their strength and flexibility from their chain-like molecular structure, and ETHACURE 300 curative helps to create that structure. To produce the final product, manufacturers mix the curative with special compounds called prepolymers and then either apply the mixture as a coating or use it to fill molds that shape finished products. The mixture “cures” by linking the molecules into long chains, which makes the material harden or solidify into the desired form.

Because ETHACURE 300 curative is a liquid this process is very adaptable and can work well at room temperature. Elastomeric coatings can be sprayed or applied by roller or brush, and elastomers can be molded in a variety of ways to create solid parts or flexible foams with many desirable properties, including resilience, durability and moisture resistance.

Prototype parts are often made this way because the process is economical and easy to control. Many electronic components are encapsulated with E-300-cured elastomers because they are good insulators and provide excellent protection from humidity and water immersion.

Industrial wheels made with ETHACURE 300 curative-cured elastomers are far more resistant to abrasion than rubber. This also is beneficial in mining applications such as protective coatings on chutes. E-300-cured gaskets resist oil, gasoline and chemicals, reducing maintenance and lengthening the life of cars, trucks and aircraft, as well as industrial equipment.

E-300-based systems are used in bridge construction as sealants in expansion joints and deck coatings. Adhesives, caulks, sealants and countless hard-plastic parts are made with it, too. ETHACURE 300 curative has a number of performance and safety advantages over other curatives. It can be used at room temperature, which reduces energy costs during manufacturing. ETHACURE 300 curative is a liquid, so it does not require melting and it has important handling advantages. It will not produce toxic dust, nor does it produce fumes or vapors. These beneficial characteristics can reduce the potential for worker exposure.

**Health Information**

ETHACURE 300 curative is not expected to be a health hazard or an eye irritant. Extensive laboratory testing indicates that acute toxicity is low, and test data reveal no mutagenic or carcinogenic risk. Even so, it should be handled with the same care you would use with any industrial chemical compound. Workers should use good ventilation and wear eye protection, gloves and protective clothing when skin contact or clothing contamination is possible. Please consult our MSDS for further information.

**Exposure Potential**

As ETHACURE 300 curative is a liquid with relatively low vapor pressure, workers are less likely to be exposed to fumes or vapor. With correct use industrial hygiene monitoring should be unable to measure any ETHACURE 300 curative in the air even at extremely low limits of detection (50 parts per billion), either in the laboratory or during use at industrial plants. And because the compound reacts with the other ingredients during processing, there should be no potential for exposure in finished coatings, foam or molded products.
Environmental Information

Because ETHACURE 300 curative reacts with other ingredients during the curing process, it is no longer in its original form in the final cured elastomer. E-300 therefore does not have any direct impact on the environment when properly used for its intended purpose.

ETHACURE 300 curative is not regulated as a hazardous waste or material. If spilled, waste containing uncured ETHACURE 300 curative should be disposed of according to good waste-management practices and in compliance with applicable local, state, and federal regulations.

Physical Hazards

ETHACURE 300 curative is chemically stable, but can react with strong acids and oxidizers and should therefore be stored apart from such materials. Although it will burn, ETHACURE 300 curative must be heated to relatively high temperatures to do so – far in excess of the boiling point of water. If ETHACURE 300 curative does burn, the fire can be extinguished with water or with standard dry-chemical, carbon dioxide or foam extinguishers.

Derivation/Manufacturing

Albemarle Corporation manufactures ETHACURE 300 curative at its Magnolia, Arkansas manufacturing complex.

Regulatory Information

The Emergency Planning and Community Right-to-Know Act (also known as SARA Title III or EPCRA) classifies ETHACURE 300 curative as an immediate (acute) health hazard and a delayed (chronic) health hazard. It is classified as a marine pollutant, and as Environmentally Hazardous Substances, Liquid, NOS under U.S. and EU regulations. The compound is on the European List of Notified Chemical Substances (ELINCS) and has been notified under the EU Dangerous Substances Directive 67/548/EC. This means that E-300 also is deemed registered under REACH. In North America, the Canadian Workplace Hazardous Materials Information System (WHMIS) requires that ETHACURE 300 curative be labeled as a Class D material in Division 2B.

Product Stewardship

Albemarle Corporation is committed to manage ETHACURE 300 curative so that it can be safely used by our customers. Our relationships with our customers encourage communication about safety and environmental stewardship, and we work with them to minimize the risks of personnel exposure and spills.

Albemarle is staffed and organized to investigate and provide advice regarding appropriate corrective actions if such incidents occur.

Conclusion

ETHACURE 300 curative is a valuable chemical compound that is used to manufacture thousands of important products worldwide. It replaces solid materials that are more difficult to handle safely and often require energy-intensive heating prior to use.

As a result, ETHACURE 300 curative helps manufacturers produce and sell dependable, better-performing products worldwide. Many of these products help us live and work more comfortably while using less energy, and help us do so while protecting ourselves and our environment from harmful emissions.

Note

This document provides general information about ETHACURE 300 curative and does not supplant or replace required regulatory and/or legal communication documents, nor is it intended to provide an in-depth discussion of health and safety information. Always consult the product’s material safety data sheet, product label and technical data sheet before using the chemical.
References

Albemarle ETHACURE 300 Curative Product Data Sheet
SC-7001, September 2007

Albemarle ETHACURE 300 Curative Brochure
ALB524, September, 1999

ETHACURE 100 - 300 Product Stewardship Manual
October 10, 2007

Novel Raw Materials Increase Pot Life, Ease of Applying Polyureas
(www.paintsquare.com)

Albemarle ETHACURE 300 Toxicology Flyer
SC-7006, September 1997

Polyurethane Manufacturers Association (PMA) and the Center for the Polyurethanes Industry (CPI)

Albemarle MSDS Number: 28.5.5-A
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Albemarle Corporation is a member of the American Chemistry Council and, through ACC's participation with the International Council of Chemical Associations (ICCA), has prepared this document to improve product stewardship within the chemical industry and with suppliers and customers.

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