



Product Information

Safety in Handling and Use

DuPont™ Elvax®

EVA resins

General Comments

DuPont resins have a history of safe manufacture, processing, use and disposal. Nevertheless, molding, extrusion and other melt processing operations with any plastic material can expose personnel to potentially hazardous situations. Some are obvious, such as handling hot machine parts and contact with molten plastic. Others are not as obvious, such as exposure to fumes produced during melt processing operations and waste disposal by burning. This bulletin is provided as a guide but because of different processing operations, it cannot be considered all inclusive in all situations. User should independently verify suitability of this information under the specific processing operations being used.

Elvax® resins are not classified as hazardous at room temperature. Before using, please read the Material Safety Data Sheet and, if applicable, the "Suggested Hopper Car Unloading Guidelines" (H-78657).

Description

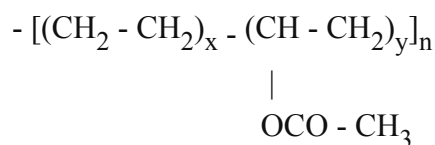
Resins of Elvax® are supplied in the form of small, free flowing pellets. They have narrow-to-broad molecular weight distributions and, depending on resin type, can be used in either blown or cast extrusion operations. When processed as mono-films or coextrusions, these resins will impart qualities such as good impact toughness, puncture resistance, hot tack, formability, flexcrack resistance, low temperature heat sealing and adhesion to other materials along with a good balance of processing characteristics.

General Properties

At ambient temperatures, resins of Elvax® are quite inert, toxicologically. They are resistant to attack by most aqueous acids and bases at ambient temperatures, but can be attacked by strong oxidizing acids at elevated temperatures. Elvax® resins, particularly those with high vinyl acetate content, can be dissolved in several types of organic solvents. Resins of Elvax® should not be exposed to direct sunlight for long periods of time unless an ultraviolet stabilizer is used.

Chemical Name and Formulation

Ethylene/Vinyl Acetate Copolymer



Processing

A maximum temperature of 204°C should be considered for long exposure times such as for formulation of hot melt adhesives or coatings while a maximum temperature of 230°C should be considered for short exposure time processes such as extrusion, cast and blown film manufacturing.

Depending on time/temperature conditions, the fumes evolved during thermal degradation of Elvax® resins may contain:

- Monomers used in the resin's manufacture.
- Decomposition products consisting of low molecular weight hydrocarbons and acetic acid.
- Oxidation products, such as carbon monoxide and acrolein which are believed to have the greatest toxicity potential.

Ventilation hoods are recommended to prevent fumes from being discharged into and accumulating in the work area. Proper hood design is important to provide collection and disposal of these by-products. Hood design and calculation of minimal functional air velocity by knowledgeable design engineers is recommended.

Visual observation or reliance upon odor detection should not be used to determine the effectiveness of ventilation. While worker discomfort from odors is usually a sign that ventilation problems exist, it should be noted that the exposure limit for acrolein is below the concentration at which its odor can be generally detected. Use of an industry standard device for fume detection is recommended.

Toxic fumes can also occur in immediate post-processing operations. Therefore, it is important that adequate ventilation and proper operating conditions be provided and periodically checked to insure that no hazardous fumes are present in the work area.

In the event of a fire, personnel entering the area should use a fresh air supply. All types of extinguishers including water, dry chemical, carbon dioxide, and foam can be used to fight fires involving Elvax® resins.

Unusual Fire, Explosion Hazards

An electrostatic charge can potentially build up during pouring powder or pellets. Grounding of all equipment is recommended, especially when blending Elvax® with volatile combustible substances. Elvax® packaged in plastic bags should not be used in flammable solvent environments, due to possible static discharge.

Cross-Linking Reactions

Elvax® resins can be crosslinked in either foamed or unfoamed articles. The peroxides used are in many cases very unstable and care should be used in formulating and handling. In addition, the hydrazide type blowing agents are flammable and care should be used to avoid sparks and open flames when handling them.

Flammability

During normal processing, storage and use, Elvax® resins do not present a significant flammability hazard; but like nearly all organic materials, they will burn under suitable conditions.

Combustion and Pyrolysis

Thermal decomposition of resins produces fumes that can be potentially hazardous. Decomposition is a function of both processing temperature and time at that temperature. It should be noted further that some decomposition can occur at a very slow rate below the recommended processing temperature limits for all resins.

Toxicity

Various polyolefins, in film form, have been used for more than 25 years in fabrics, industrial applications and food packaging. Most grades of Elvax® comply with the Food and Drug Administration regulation 21 CFR 177.1350 for use in direct food contact subject to the extraction provisions of the regulation on the finished food contact article.

Thermal Burns

Precautions for working around resin processing equipment should be obtained from the vendors of these machines.

If contact with molten polymer is made, immediately flush the burned areas of the skin with cold running water or treat with ice packs. Continue the treatment for 15 minutes or until the pain has diminished. Do not attempt removal of the hardened polymer. Obtain immediate medical attention.

Advice to the treating physician from DuPont's Haskell Laboratory for Toxicology and Industrial Medicine is as follows: Removal of hardened polymer from the skin is generally not advised as the polymer will eventually slough from the skin surfaces. Application of silver sulphadiazine cream at the margins of hardened polymer may reduce the likelihood of subsequent infection. Wrap affected area with sterile gauze and monitor daily for signs of possible complications.

Spills

Spills of any process material are a safety hazard. Spilled resin pellets can be very slippery underfoot and should be swept up immediately and disposed of properly.

Scrap Disposal

Disposal of scrap Elvax® resin presents no special problems. Because it is an inert material, the preferred method is burial in a properly operated landfill. However, any disposal procedure must comply with all local, state, and federal regulations.

Incineration is the alternate disposal procedure. Under good combustion conditions, such as found in forced draft incinerators, Elvax® resins are converted to carbon dioxide, water and trace components.

As with any combustible material, incomplete combustion of Elvax® resins results in the generation of volatiles which may be toxic. Carbon monoxide and low molecular weight aldehydes are believed to be the most hazardous fume components produced by incomplete combustion. For this reason, combustion of waste product is not recommended unless the oxygen supply can be maintained in amounts adequate for full combustion. Smoke produced under limited oxygen supply conditions should be considered toxic and should not be inhaled, as is also true for smoke produced from wood, paper or other materials burned under similar poor combustion conditions.



©2005 DuPont Company.
All rights reserved.



We welcome and respond promptly to [e-mail](#).

The technical data contained herein are guides to the use of DuPont resins. The advice contained herein is based upon tests and information believed to be reliable, but users should not rely upon it absolutely for specific applications because performance properties will vary with processing conditions. It is given and accepted at user's risk and confirmation of its validity and suitability in particular cases should be obtained independently. The DuPont Company makes no guarantees of results and assumes no obligations or liability in connection with its advice. This publication is not to be taken as a license to operate under, or recommendation to infringe, any patents.

CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "[DuPont Medical Caution Statement](#)", H-50102.