

SELECT THE RIGHT GLOVES TO PROTECT YOURSELF WHEN HANDLING CHEMICALS

"Impervious gloves are the most important thing a person can have when handling pesticides," according to Dr. Bruce Augustin, Director of Technical Support for Lesco Inc. of Rocky River, Ohio. Augustin said neoprene gloves are impervious, but not latex gloves, *"I have seen people using latex gloves who got more exposure than they normally would have, because they thought they were safe"* (Augustin, 1987).

The above statements should be limited, qualified and explained. Gloves are manufactured from several, distinctly different materials. Each type of glove has specific appropriate uses and inappropriate uses. When selecting gloves and clothing to help protect workers, consult a published chemical resistance guide for suggestions and recommendations; for any chemicals not listed, contact a representative of the glove or chemical manufacturer.

The solvent must be considered when selecting which type of glove material will provide the best protection when handling emulsifiable concentrates (ECs) or other liquids or gases. The solvent is the liquid constituent of a solution of a solid or gas. Two general types of solvents are used in the formulation of emulsifiable concentrates: 1. Toluene, xylene and similar materials that evaporate after spraying to leave a deposit of the chemical on the sprayed areas. 2. Non-volatile solvents (alkylated naphthalenes, petroleum oil) which leave the treated surface coated with a solution of the chemical in oil after the water carrier has evaporated.

Edmont Chemical Resistance Guide, 3rd edition, 1986, published by Edmont and Becton Dickinson Company, is an eight-page, printed guide to selecting gloves and protective clothing and preparing MSDs in accordance with OSHA's Hazard Communication Standard. Testing for material in the Guide was conducted by Edmont Research and Development Department. In the Guide, three categories of information are presented for each Edmont product and corresponding chemical: 1) overall degradation resistance rating; 2) permeation breakthrough time and 3) permeation rate. Specific glove materials for which test results are reported in the guide are: Nitrile, Neoprene, PVA (polyvinyl alcohol), PVC (polyvinyl chloride), and natural rubber (latex).

It is critical that the protective clothing and glove material be chosen to provide protection against the specific chemical being handled.

Each of the 5 types of gloves has its specific appropriate uses and its inappropriate uses. For example, because of degradation or permeation, natural rubber gloves (latex gloves) are not recommended for wear when handling chemicals in benzene, carbon disulfide, carbon tetrachloride, methylene bromide, naphtha vm&p, pentachlorophenol, toluene, xylene solvents. But, natural rubber gloves are rated "good" to "excellent" for wear when handling chemicals in solvents such as dimethyl sulfoxide, formaldehyde, phenol, propyl alcohol, etc. Neoprene gloves are not recommended for wear when handling chemicals with xylene as the solvent, but PVA gloves are rated as excellent for this purpose. Nitrile gloves are not recommended for wear when handling methylene bromide while PVA gloves provide good-excellent protection against methylene bromide.

Resistance to cuts, snags, abrasion, punctures or tears when used in actual workplace conditions must also be considered in selecting gloves and clothing. A glove or article of clothing made from materials with excellent permeation resistance can be worthless if it tears or punctures easily. Once the protective material has been damaged, you are dealing with direct contact. Gloves made of very thin material -whether latex, polyvinyl chlorides, neoprene, or polyvinyl alcohol- will not stand up under the wear and tear of application of agricultural chemicals as well as gloves made of the same, but thicker material.

In summary

There are five kinds of materials from which protective gloves are made: (1) nitrile, (2) neoprene (synthetic rubber), (3) Poly Vinyl Alcohol (PVA), (4) Poly Vinyl Chloride (PVC), and (5) natural rubber (latex). Each of these works well to protect against certain chemicals, and none is best for all types of chemicals. There are oil solvents, water soluble solvents, corrosives, acids, bases and so on. For the chemicals often used (or can be considered as representative) in pesticide formulations such as emulsifiable concentrates (EC) (for example, toluene, xylene, Methyl Ethyl Ketone (MEK), MBK, Stoddard Solvent, Naphtha, Ethylene Dichloride) and for which degradation and penetration measurements have been made (Edmonton), the general performance of these materials is as follows (1) PVA generally ranks best. (2) Nitrile and neoprene were pretty good, with nitrile perhaps a little better than neoprene. (3) PVC and natural rubber (latex) scored well least often.

The performance of a specific glove will depend not only on the material from which it is made, but the quality of construction. We think of no circumstances for which the common, thin latex gloves, often used in painting and laboratories, are suitable for work in mixing and application of pesticides.

Select gloves and clothing made of the appropriate material and appropriate material-thickness to provide protection against the specific chemical being handled and to resist puncture-tear conditions in the actual workplace.

References:

Augustin, Bruce. 1987. "Use the Right Kind of Gloves When Spraying", Gardenland 13-10:16, November 1987.

Schlatter, Dr. Nelson (Research Chemist, EDMONT, 1300 Walnut St., Coshocton, OH 43812, telephone 614622-4311 ext 291), 1988. Oral presentation at the Oregon State University Extension Service Chemical Applicators Short Course, January 20, 1988, in Portland, OR.

Edmont Chemical Resistance Guide, 3rd edition. Edmont, 1300 Walnut St, Coshocton, OH 43812.

Pesticide Use - Due to constantly changing laws and regulations, no liability for the suggested use of chemicals in this Newsletter is assumed by the ONW Newsletter. Pesticides should be applied according to label directions on the pesticide container.

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