Protective Clothing for Agricultural Workers

Tyvek® garments meet the EPA Agricultural Worker Protection Standard requirements for "coveralls".

Tychem® garments meet the "chemical-resistant" suit requirements of this standard. The design of the suit, seam construction, duration of exposure, amount of exposure, concentration of active ingredients, permeation data and physical working environment should all be considered when making a garment selection.

Unlike most worker protection standards, the EPA has federal responsibility for the protection of agricultural workers from pesticides in 40 CFR 170, "Worker Protection Standard" and 40 CFR 156 "Labeling Requirements for Pesticides and Devices". While the following information is intended to provide guidance, the final federal authority is found in these regulations. Copies can be obtained over the Internet at http://www.epa.gov or from the Federal Government Printing Office (GPO).

Requirements for certain pesticides may exceed these minimum levels. States can implement more stringent regulations. Assistance on specific state regulations can be obtained from local cooperative extension agents. Specific PPE topics from the California regulations will be addressed below.

The federal agricultural Worker Protection Standard (WPS) was adopted to reduce the risks of illness or injury resulting from worker exposure to pesticides on farms, or in nurseries, greenhouses and forests. This standard covers a wide range of worker protection topics, including training, certification, notification, work and administrative practices as well as PPE. Unless added by a state, the WPS does not apply to the following pesticide applications:

- Wide-area, government sponsored public pest control programs such as mosquito abatement and Mediterranean fruit fly eradication;
- On livestock or other animals, or in or about animal premises;
- On non-commercial, non-research plants including plants in habitations, home fruit and vegetable gardens, and home greenhouses;
- On ornamental gardens, parks, and public or private lawns and grounds intended for only aesthetic purposes or climatic modification;
- By direct injection directly into agricultural plants, ("hack and squirt," “frill and spray,” chemigation, soil-incorporation, or soil-injection are covered in the Worker Protection Standard)
- Structural pest control, control of vegetation along rights-of-way, pasture and rangelands; and in other non-agricultural production areas;
- Control of vertebrate pests, such as mice, rats and other rodents
- As attractants or repellents in traps;
- On the harvested portions of agricultural plants or on harvested timber; and
- For research of unregistered pesticides.

The federal WPS recognizes two work activities with potential pesticide exposure risk: 1.) pesticide handling, and 2.) early-entry. The requirements for PPE selection, care, use and maintenance for “early-entry” and for pesticide handling are similar. A “handler” is essentially any worker who is at risk of pesticide exposure during the handling or application of the pesticides or subsequent cleanup and maintenance of equipment or containers. “Early-entry” occurs after application and before the end of the “restricted-entry interval” for that pesticide. A number of preconditions must be met before early-entry is permitted and only certain work activities are permitted.

Selection

The minimum PPE for “handlers” are listed in the “HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)” section of the pesticide product label. The “DIRECTIONS FOR USE” section describes the minimum PPE for early entry. Both sections list requirements for body protection: clothing, gloves, footwear, and eyewear. If applicable, requirements for headgear and respiratory protection will also be listed.

Examples of body protective clothing are coveralls, chemical-resistant suits, chemical-resistant aprons, and chemical-resistant headgear. Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment in the federal regulation, although pesticide labeling may require that such work clothing be worn during some activities.

Coveralls are loose fitting, one- or two-piece garments made from woven or nonwoven fabrics. They cover, at a minimum, the entire body except head, hands, and feet.

Chemical-resistant means no measurable movement of the pesticide through the material during use. A chemical-resistant suit is a loose-fitting coverall made from chemical resistant material. A chemical-resistant suit may be substituted for coveralls and any required additional layer of clothing. A chemical-resistant apron covers the front of the body from mid-chest to the knees. A chemical-resistant suit may be substituted for coveralls and a chemical-resistant apron. Chemical-resistant headgear can be either a chemical resistant hood or a chemical-resistant hat with a wide brim.

The protective clothing requirements are modified when “closed” handling system, enclosed tractor cabs and aerial application methods are used.

Use

When personal protective equipment is specified, the employer shall provide, daily, the appropriate personal protective equipment in clean and operating condition. The employer shall assure that personal protective equipment is used correctly for its intended purpose and is used according to the manufacturer’s instructions.
Care and Maintenance

The employer shall assure that, before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

The employer shall not allow or direct any employee to wear home or to take home personal protective equipment contaminated with pesticides. The employer shall assure that contaminated personal protective equipment is kept separately and washed separately from any other clothing or laundry. The employer shall assure that all personal protective equipment is cleaned according to the manufacturer’s instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water. The employer shall inform anyone who cleans or washes that such equipment may be contaminated with pesticides; the potentially harmful effects of exposure to pesticides, the correct way(s) to clean personal protective equipment and to protect themselves when handling such equipment.

Storage

The employer shall assure that all clean personal protective equipment shall be either dried thoroughly before being stored or shall be put in a well ventilated place to dry. The employer shall assure that all personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas. The employer shall assure that employees have a clean place, or places, away from pesticide storage and pesticide use areas; where they may store personal clothing not in use; where they can put on personal protective equipment at the start of any exposure period; and where they remove personal protective equipment at the end of any exposure period.

Disposal

If any personal protective equipment cannot be cleaned properly, the employer shall dispose of the personal protective equipment in accordance with any applicable Federal, State, and local regulations. Coveralls or other absorbent materials that have been drenched or heavily contaminated with an undiluted pesticide that has the signal word DANGER or WARNING on the label shall be not be reused.

Heat Stress

When the use of personal protective equipment is specified by the labeling of any pesticide, the employer shall assure that no employee is allowed or directed to perform work unless appropriate measures are taken to prevent heat-related illness.

California Regulations

Garments made of Tyvek® and Tychem® meets the agriculture worker protective clothing requirements in the State of California.

- Tyvek® may be utilized where the California regulations require a “coverall”.
- Tychem® garments meet the requirements for “chemical resistant” clothing.

Under the California Code of Regulations, Title 3 - Food and Agriculture, Division 6 Pesticide and Pest Control Operations, Section 6736 sets the minimum requirement when it states “The employer shall provide coveralls for each employee who handles any pesticide with the signal word DANGER or WARNING. The California standard definition of coveralls is similar to the federal definition and also advises that coveralls are different from the work clothing that the employee or employer may be required to provide.

Coveralls made from uncoated Tyvek® have been recognized as acceptable under these regulations since 1989.

Section 6738(g) instructs the employer to provide “chemical-resistant” clothing if required by the pesticide label. The California definition of chemical-resistant mirrors the federal definition. However, under California regulations, if the temperature exceeds 80°F during daylight 85°F at night, the employer must address the risk of heat stress from chemical-resistant coveralls. The employer can implement engineering controls that limit worker exposure (like closed load/mix systems or enclosed cabs), provide a cooled chemical-resistant suit or use other methods that maintain the effective working environment at or below the temperature limits.

Tychem® garments meet the California requirements for “chemical-resistant” clothing. Tychem® QC and Tychem® SL have been recognized as acceptable since 1989. Tychem® QC prevents penetration of the following pesticide formulations when tested according to ASTM F 903 (procedure D).

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<thead>
<tr>
<th>DuPont Ally® Herbicide</th>
<th>BASF Basagram®</th>
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<td>2,4-D</td>
<td>DuPont Basagam®</td>
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<td>Monsanto Lasso®</td>
<td>Bayer Provado®</td>
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<td>Bayer Guthion®</td>
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<td>Monstanto Roundup®</td>
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Representatives of the California Department of Pesticide Regulation have ruled that a chemical-resistant material must provide a vapor-barrier and can not be microporous and can not be designed to be “breathable”. Garments made of microporous composites, such as Kleenguard® Ultra from Kimberly-Clark and DuPont NexGen® and ProShield® 1 are microporous and can not be utilized as “chemical-resistant” under these regulations.

The State of California does not approve or register protective apparel, despite the claims of some protective apparel manufacturers. The only claim that a garment manufacturer can make is that their garment “meets the requirements” of regulations enforced by the California Department of Pesticide Regulations. In the past, the agency has reviewed manufacturer’s claims and “confirmed” or “agreed” that the claimed performance meets the requirements of the standard. There is not independent verification or certification.

This information is based on public information available from the California Department of Pesticide Regulations as well as correspondence with the agency representatives. It is always the user’s responsibility to determine the appropriate level of toxicity and proper personal protective equipment. The final authority is the California regulations, which can be reached via the Internet at http://www.cdpr.ca.gov/docs/inhouse/calcode/3ccr/covr.htm