Protective clothing for the cannabis industry

Cannabis legalization is spreading across the Americas. Over the last decade, several countries and U.S. states have legalized cannabis for recreational and/or medical use.

In 2013, Uruguay became the first country to legalize its production, sale and consumption. A few years later, in 2018, Canada legalized the recreational use of cannabis. More recently, Mexico legalized recreational use in 2021. In the United States, while still illegal at the federal level, legalization for both medical and recreational cannabis use is quickly spreading across the nation. As of February 2025, 24 states and the District of Columbia have legalized recreational cannabis, and an additional 14 states have legalized cannabis for medical use. Beyond the Americas, recreational cannabis has been legalized in the following countries: Georgia, Germany, Luxembourg, Malta, South Africa and Thailand.

There are still legal factors to be sorted out in many of these jurisdictions. And while additional states and countries are likely to legalize cannabis in the near future, less attention has been paid to the consequences for workers the industry employs.

440,445

full-time equivalent jobs supported by the cannabis industry in the U.S.[1]

This is especially important because there are an estimated 440,445 full-time equivalent jobs supported by the cannabis industry in the United States. Projections indicate that the industry could reach nearly $45B in 2025, suggesting continued growth in employment.[1]

Cannabis worker health and safety risks[2]

On the supply end of the industry, cannabis cultivation and processing facilities present applications that potentially expose workers to a wide variety of physical, biological and chemical hazards.

The list of physical hazards is similar to those found in other agricultural and processing industries, including ergonomics, electricity, noise, ultraviolet (UV) light, extraction and other pressurized equipment, walking/working surfaces and confined spaces.

Biological hazards are primarily associated with exposure to mold and sensitizers. Cannabis cultivation requires increased levels of humidity, which can promote mold growth. Molds are associated with a variety of respiratory effects. Moreover, dermal and inhalation exposures to cannabis resin and plant materials have been reported to cause hypersensitivity and allergic reactions[3] in some workers, including rashes, itchy skin and swollen eyes.

The presence of chemical hazards is widespread in both cultivation and processing operations. Examples include carbon dioxide, fertilizers and other nutrients used to enhance plant growth, pesticides used to control insects, fungicides used to limit the formation of molds and disinfectants and other cleaning chemicals used to maintain sanitary conditions. These hazards pose both dermal contact and inhalation exposures that range in impact from oxygen depletion to nervous system effects, rashes and chemical burns.

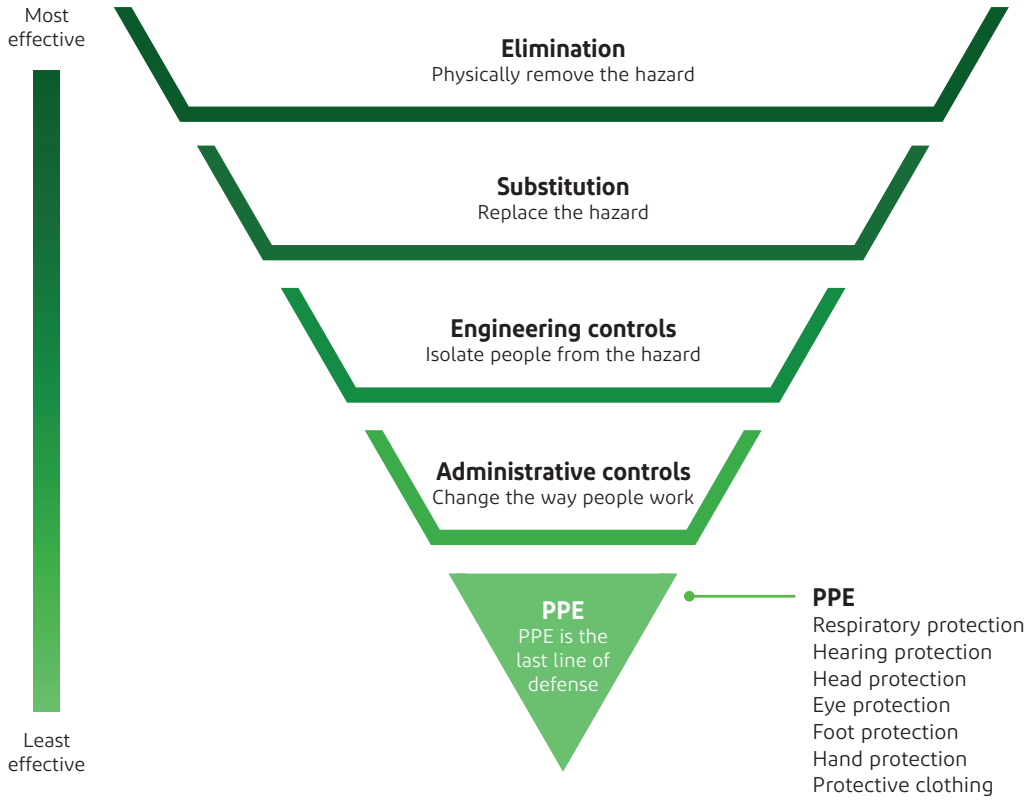
Processing operations involve the extraction of cannabis concentrates as well as the production of marijuana-infused (edible) products. The extraction of oils and resins typically involves handling flammable materials, such as butane, heptane, ethanol and isopropyl alcohol, at elevated pressures and temperatures. Liquefied carbon dioxide also can be used for extraction processing.

Workers in both cannabis extraction and edible marijuana production jobs can be exposed to cleaning chemicals, especially in the latter industry since edible products are generally produced in sanitary environments. Related health effects include skin rashes, burns, frostbite and danger from potential fires or explosions.

Protecting workers

With all workplace hazards, the U.S. Occupational Safety and Health Administration (OSHA) expects employers to apply the hierarchy of exposure controls to protect workers. Employers should eliminate hazards or substitute lower-hazard alternatives first. Next, engineering solutions should be implemented, followed by administrative controls. If these controls have been applied and residual risk remains, then the use of personal protective equipment (PPE) is warranted. In many cases, PPE is used in conjunction with other exposure controls to protect workers from hazards. OSHA standards require employers to perform and document hazard risk assessments as a basis for the selection of PPE. OSHA requirements for PPE, including the requirement for documented hazard assessments, can be found in the regulations at 29 CFR 1910, Subpart I, Sections 132–138 for general industry. Additionally, the U.S. Environmental Protection Agency (U.S. EPA) provides employers with agricultural worker protection standards and guidance in 40 CFR 170, "Worker Protection Standard", and 40 CFR 156, "Labeling Requirements for Pesticides and Devices". PPE requirements for safe pesticide use are found on individual product labels.

OSHA-mandated hierarchy of exposure controls



Protecting products

Since the products from marijuana cultivation are destined for human consumption, prevention of contamination from several potential sources (e.g., bacterial and fungal microorganisms) must also be incorporated into the production process. Consequently, garments and accessories, such as gloves and shoe covers, must be factored into a protective clothing program, even in some instances when worker protection is not the primary concern.

Protective apparel for cannabis production

Exposure means the potential need for PPE; hence, employers engaged in cannabis cultivation and processing operations must complete hazard risk assessments and provide workers with appropriate PPE, including protective garments. Hazardous particle exposures in the form of solid pesticides, molds and dusts; and liquid chemical exposures in the form of liquid pesticides, disinfectants/cleaning products and extraction solvents would be the focus for selection of protective garments.

DuPont Personal Protection offers a range of apparel options for hazardous particle and liquid chemical protection, as well as garments and accessories that help control contamination.

DuPont™ Tyvek® 400 garments (along with other appropriate PPE such as respirators, face and eye protection, gloves and protective footwear) are an excellent option for particle exposures like solid pesticides, dust and mold. They provide a superior balance of protection, durability and comfort compared to microporous film (MPF) or spunbond-meltblown-spunbond (SMS) alternatives. In addition to providing barrier protection from hazardous particles, Tyvek® 400 garments may help to contain certain hazards and possibly mitigate their spread beyond the workplace.

DuPont™ Tyvek® IsoClean® and DuPont™ ProClean™ garments and accessories are specifically designed for controlled environment applications and can help reduce the risk of product and process contamination. Many Tyvek® IsoClean® garment styles are available clean-processed, for exceptionally low-linting apparel. Additionally, Tyvek® 400 and DuPont™ ProShield® fabrics can be considered for product protection applications and non-hazardous dirty jobs. See the chart below for the various garment and accessory options for the DuPont fabrics mentioned in this section. Tyvek® 800 can be considered for disinfectant cleaning product use and contact with oils and resins. The taped seams of this garment provide enhanced protection, and the higher-level liquid resistance of Tyvek® 800 provides advantages for these applications.

DuPont™ Tychem® 2000, Tychem® 4000 and Tychem® 6000 are likely garment options available for higher hazard liquid chemical exposure applications. Please refer to DuPont™ SafeSPEC™ for specific barrier performance information for extraction solvents and other hazardous liquid chemicals.

Tychem® 2000 SFR and Tychem® 6000 SFR can be considered for oil and resin extraction operations where a flash fire risk has been identified.

See the next page for a list of DuPont garment fabrics suitable for protecting your workforce from the potential hazards encountered during cannabis cultivation and processing.

Contamination control

	Tyvek® fabrics		PE-coated SBPP fabric		Microporous film fabrics		SMS fabric
Garment design	Tyvek® IsoClean™	Tyvek® 400	ProShield® 30	ProShield® 70	ProClean™	ProShield® 50	ProShield® 10
Clean-processed coveralls	✓						
Coveralls (bulk)	✓	✓			✓	✓	✓
Lab coats & frocks	✓	✓			✓		✓
Bib aprons		✓				✓	
Bouffants	✓						
Hoods	✓	✓					
Sleeves	✓	✓				✓	
Shoe covers	✓	✓	✓	✓			
Boot covers	✓	✓	✓	✓	✓		

Comparison within the DuPont portfolio: ✓ Available options (Blank) Not available

PE-coated SBPP = polyethylene-coated spunbond polypropylene

SMS = spunbond-meltblown-spunbond

DuPont Garment Fabric & Hazard Matrix

	DuPont™ ProShield® fabrics			DuPont™ Tyvek® fabrics				DuPont™ Tychem® fabrics				
	ProShield® 10†	ProShield® 50†	ProShield® 70†	Tyvek® 400†	Tyvek® 400 SFR††	Tyvek® 600†	Tyvek® 800†	Tychem® 2000†	Tychem® 2000 SFR††	Tychem® 4000†	Tychem® 6000†	Tychem® 6000 SFR††
Non-hazardous particles/dirty work	✓	✓	✓	✓	✓	✓	✓					
Hazardous particles			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extracted oils & resins*							✓	✓	✓	✓	✓	✓
Cleaning chemicals*							✓	✓	✓	✓	✓	✓
Liquid pesticides*										✓	✓	✓
Extraction solvents										✓	✓	✓
Flash fire risk					✓				✓			✓

Comparison within the DuPont portfolio:

✓ Acceptable for use
(Blank) Not recommended

*Hazards may vary from plant to plant. Please consult our Sales team for more detailed information.

**The user must ensure suitable reagent to garment compatibility before use. Please refer to chemical protection data available in SafeSPEC™ to determine the level of protection needed.

DuPont Personal Protection
Customer service 1 800 931 3456
safespec.dupont.com
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DuPont™ Tyvek®

DuPont Personal Protection

WARNING:

† Tyvek®, ProShield® and most Tychem® garments should not be used around heat, flames, sparks or in potentially flammable or explosive environments. Do not wear non-flame-resistant garments in potentially flammable or explosive environments. Instead, consider use of flame-resistant or secondary flame-resistant garments, which must be worn over primary flame-resistant garments.

††Tyvek® 400 SFR, Tychem® 2000 SFR and Tychem® 6000 SFR garments provide only secondary flame-resistant protection. They must always be worn over appropriate primary flame-resistant protective clothing in an environment that needs flame protection, along with other personal protective equipment that protects your face, hands and feet. For Tyvek® 400 SFR, Tychem® 2000 SFR and Tychem® 6000 SFR hooded garments, a primary flame-resistant hood/balaclava should be worn.

Do not knowingly enter an environment in which the concentration of flammable gas is within flammable or explosive limits when wearing a Tyvek® 400 SFR, Tychem® 2000 SFR or Tychem® 6000 SFR garment. Retreat immediately if you encounter such an environment.

Tyvek® 400 SFR, Tychem® 2000 SFR and Tychem® 6000 SFR garments are not intended for firefighting activities, nor for protection from hot liquids, steam, molten metals, welding or thermal radiation. Consult the Tychem® User Manual, located on our website, for instructions on proper use, care and maintenance of your Tychem® garments.

*Liquid barrier performance varies based on the amount of liquid that may get on the garment, the length of time the liquid is on the garment, applied pressure and certain physical properties of the liquid. Tyvek® 800 offers improved liquid barrier but may not be appropriate if spotting is observed on the skin or garments worn under the protective garment. In applications where a higher liquid barrier is needed, consider Tychem® 2000 and Tychem® 4000 garments with taped seams.

Latex statement: As of January 2023, all DuPont Personal Protection products are manufactured under specifications that exclude components containing natural rubber latex. Tyvek® 500, Tyvek® 600 and Tyvek® 800 styles made before January 2023 contain natural rubber latex, which may cause allergic reactions in some sensitized individuals. Anyone who begins to exhibit an allergic response during the use of DuPont products should immediately cease using these products and should report it to DuPont at +1 (888) 439-2988 so that an investigation can be initiated.

Silicone statement: All DuPont Personal Protection products are manufactured under specifications that do not contain silicone, with some exceptions. Tyvek® friction-coated shoe covers or Tyvek® garments with friction-coated shoe covers might contain silicone. This includes styles TY122, TY121, FC450 and FC454. Tychem® 6000 AL styles TF630 and TF640T contain a silicone valve diaphragm. End users who are consuming these styles and who have concerns about silicone contamination should conduct their own testing to ensure they are suitable for their application(s).

Garments should have slip-resistant or anti-slip materials on the outer surface of boots, shoe covers or other garment surfaces in conditions where slipping could occur. Some Tychem® garments have attached socks made of the garment material. These attached socks must be worn inside protective outer footwear and are not suitable as outer footwear. These attached socks do not have adequate durability or slip resistance to be worn as the outer foot covering.

DuPont protective apparel must be worn with other appropriate PPE, such as, but not limited to, respirators, face and eye protection, gloves and protective footwear, as indicated during the hazard risk assessment to minimize inhalation, prevent skin contact and avoid contamination of clothing worn under the protective garment.

REFERENCES:

[1]How the industry is performing and where it's headed – 2025 Marijuana Industry Statistics & Data Insights. https://flowhub.com/cannabis-industry-statistics#:~:text=There%20are%20440%2C445%20full%2Dtime,to%20the%20economy%20in%202024.

[2]National Institute for Occupational Safety and Health (NIOSH), Cannabis - Workplace Safety and Health Hazards. https://www.cdc.gov/niosh/cannabis/about/index.html#:~:text=Chemical%20exposures,View%20Larger

[3]Colorado Department of Public Health and Environment, Guide to Worker Safety and Health in the Marijuana Industry, January 2017.

This information is based upon technical data that DuPont believes to be reliable. It is subject to revision as additional knowledge and experience become available. It is the user's responsibility to determine the level of toxicity and the proper personal protective equipment needed. The information set forth herein reflects laboratory performance of fabrics, not complete garments, under controlled conditions. This information is intended for use by persons having the technical expertise to undertake evaluation under their own specific end-use conditions, at their own discretion and risk. Anyone intending to use this information should first check that the garment selected is suitable for the intended use. The end-user should discontinue use of garment if fabric becomes torn, worn or punctured, to avoid potential chemical exposure. Since conditions of use are beyond our control, DUPONT DE NEMOURS, INC. AND ITS AFFILIATES MAKE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ASSUME NO LIABILITY IN CONNECTION WITH ANY USE OF THESE PRODUCTS AND INFORMATION. This information is not intended as a license to operate under or a recommendation to infringe any trademark, patent or technical information of DuPont or other persons covering any material or its use.

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