

# FENTANYL AND OTHER OPIOIDS

## Technical Bulletin



### What Is the Opioid Crisis?

Opioids are an important class of drugs prescribed to help patients manage chronic pain due to surgery, cancer treatment and many other medical conditions. Unfortunately, they are also highly addictive and subject to abuse; consequently, the U.S. Drug Enforcement Administration (DEA) regulates opioids as Schedule II Controlled Substances.

When legally prescribed and taken as directed, opioids are very effective at pain management. However, when abused or unknowingly overexposed, these drugs can cause respiratory depression and death.

In the last several years, one opioid, fentanyl, has received a tremendous amount of media attention. Fentanyl and several of its derivatives are synthetic opioids that have newfound use in the illicit drug market. Fentanyl is approximately 100 times more potent than morphine and 50 times more potent than heroin. Unfortunately, drug dealers, in their greed and disregard for life, lace heroin with these cheap synthetic opioids and unsuspecting addicts often are subject to overdoses.

According to the Centers for Disease Control and Prevention (CDC), the years 2001 to 2014 saw a six-fold increase in the total number of deaths due to overdoses. Additionally, overdose deaths involving synthetic opioids, including fentanyl, increased by 80% from 2013 to 2014.<sup>1</sup>

### Unintended Consequences

An unfortunate consequence of the opioid crisis is the exposure risk these extremely hazardous synthetic opioids pose to law enforcement and first responders, as well as prison and emergency medical personnel who may have to deal with this public health

epidemic. Synthetic opioids are highly toxic organic solids that may be encountered as powders, liquids, nasal sprays, dermal patches and pills. The particle size of synthetic opioid powders typically ranges from 0.2 to 2.0 microns, and the powders are easily aerosolized, presenting primarily a respiratory hazard. A secondary dermal hazard exists if there is direct skin contact with large bulk amounts of concentrated threat materials.<sup>2</sup>

### Protecting Workers at Risk

As with any hazard, the risk level from synthetic opioids, such as fentanyl, depends on the exposure potential, which must be determined by conducting a thorough hazard risk assessment.

Law enforcement and other public safety workers may have to contend with a variety of potential exposure scenarios that present varying levels of risk to responders. Those at the highest risk of potential exposure include special operation squads raiding active clandestine labs and “pill mills” and investigative personnel collecting evidence. Moderate risk may be associated with routine law enforcement or emergency medical actions where visible suspect powder material is present. Low risk may be related to law enforcement or medical response scenarios with suspected illicit drug activity where no visible powders are present.

Fentanyl and its derivatives, as well as laced illicit drugs, typically are encountered in powder form that presents both inhalation and dermal exposure risks. Due to the high bioavailability of these opioid particles, the greatest exposure risk is attributable to inhalation or mucous membrane exposures. Fentanyl, for example, exhibits a 30-fold greater absorption rate across mucous membranes versus intact skin.<sup>3</sup> Nevertheless, dermal contact poses a serious secondary exposure risk that must be protected against.

## Procedural Guidelines

Since the advent of the opioid crisis, several groups have developed guidelines for assessing risk and providing responders with appropriate exposure control options, including personal protective equipment (PPE). Because many of the exposure scenarios are uncontrolled situations, it is difficult to use engineering controls, such as ventilation, to capture aerosolized powders; consequently, responders rely heavily on PPE.

The National Institute for Occupational Safety and Health (NIOSH), in its recommendations for preventing occupational exposure to fentanyl and other opioids, outlines safe operating procedures, risk assessment, training, decontamination and PPE guidelines for potentially exposed emergency responders. For its PPE recommendations, the agency has defined three levels of exposure risk: Minimal, Moderate and High. Based on the exposure risk and the task being performed, a PPE matrix is offered specifying respiratory protection; face and eye protection; hand protection; and dermal protection.<sup>1</sup>

The InterAgency Board (IAB) has published recommendations for selecting and using PPE to protect emergency responders potentially exposed to fentanyl and other synthetic opioids. In its guidelines, the agency expands the levels of exposure risk to include Minimal, Moderate (small volume), Moderate (large volume), High (particulates—milling operations) and High (chemicals—production lab). A matrix establishes levels of PPE based on exposure risk and operational response function. Subsequently, a table defines the skin, eye, face and respiratory protection associated with each level of PPE.<sup>2</sup>

The DEA guide, “Fentanyl: A Briefing Guide for First Responders”,<sup>3</sup> outlines details of the threats and PPE recommendations and other safety considerations for first responders.

## What Protective Apparel is Available?

Whether responders are following the NIOSH, IAB and/or DEA recommendations, DuPont offers protective garment options for all levels of exposure risk to fentanyl and other synthetic opioids. Garments made of DuPont™ Tyvek® and Tychem® fabrics designed

with taped seams and sealable flaps covering the zipper can limit dry particle contamination of the skin, hair and underclothing and should be considered for situations involving synthetic opioids in powder form.

Tyvek® 600 and Tyvek® 800 J coveralls can be considered for use in low-exposure scenarios where the chance of dermal contact is minimal, such as handling an overdose victim.

For high-risk exposure incidents, such as raids of production and milling labs where a self-controlled breathing apparatus (SCBA) may be required, an encapsulating suit may be needed to protect both the responder and the respirator equipment. In these high-exposure situations, the IAB recommends the use of garments certified to National Fire Protection Association (NFPA) 1994 or NFPA 1991. Tychem® 10000 and Tychem® 10000 FR, respectively, meet these requirements.

In all cases, the results of the hazard risk assessment for the task and environment at hand should determine the necessary PPE ensemble, including the appropriate protective garment.

Note: It is up to each organization or authority having jurisdiction (AHJ) to conduct its own hazard risk assessment to determine appropriate PPE, standard operating procedures and training for its individual members in specific scenarios involving fentanyl or other synthetic opioids.

See the next page for a list of DuPont PPE suitable for protecting your workers against fentanyl and other opioid risks.

## Visit SafeSPEC.DuPont.com for More Product Details

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. When responding to a fentanyl incident, no skin should be exposed.

Refer to the DuPont™ Tychem® User Manuals, available via DuPont™ SafeSPEC™, for more information on donning and doffing coveralls, encapsulated suits and decontamination.

## References:

- (1) Centers for Disease Control and Prevention (CDC), NIOSH Workplace Safety and Health Topics <https://www.cdc.gov/niosh/topics/fentanyl/default.html>
- (2) The InterAgency Board, Recommendations on Selection and Use of Personal Protective Equipment and Decontamination Products for First Responders Against Exposure Hazards to Synthetic Opioids, Including Fentanyl and Fentanyl Analogues, August 2017.
- (3) The American College of Medical Toxicology (ACMT) and American Academy of Clinical Toxicology (AACT), ACMT and AACT Position Statement: Preventing Occupational Fentanyl and Fentanyl Analog Exposure to Emergency Responders, July 12, 2017.
- (4) Drug Enforcement Administration (DEA), Fentanyl: A Briefing Guide for First Responders, June 2017 [https://www.dea.gov/druginfo/Fentanyl\\_BriefingGuideforFirstResponders\\_June2017.pdf](https://www.dea.gov/druginfo/Fentanyl_BriefingGuideforFirstResponders_June2017.pdf)

**Garments Designated With These Icons Are Recommended for Consideration for These Applications:**

-  **Emergency Medical Care**
-  **Routine Law Enforcement**
-  **Investigations/ Evidence Collection**
-  **Special Operations**

**Encapsulated Level A and Level B Suits—Featured Options\***

 TK 554T  	<p><b>Tychem® 10000</b>                      Encapsulated Level A suit                      Provides protection for both wearer and respiratory equipment                      Durable puncture- and tear-resistant fabric                      High-visibility lime yellow                      NAFTA/TAA compliant</p>	 C3 528T  	<p><b>Tychem® 5000</b>                      Encapsulated Level B suit                      Provides protection for both the wearer and respiratory equipment                      High-level protection for hazmat and domestic preparedness situations                      Tan for a discreet appearance</p>
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**Non-Encapsulating Level B Suits—Featured Options\***

 TF 611T  	<p><b>Tychem® 6000</b>                      Trusted Tychem® 6000 protection with an enhanced face-seal design                      Rubber seal on the hood provides a tight fit around respirator                      Back entry for improved wearer protection</p>	 TF 145T  	<p><b>Tychem® 6000</b>                      Provides complete coverage of neck area, good fit around a respirator and storm flap to prevent intrusion at zipper                      Strong, durable and lightweight multi-threat protection from a range of chemicals</p>
 QC 127T  	<p><b>Tychem® 2000</b>                      Flexible, durable and lightweight protection against light liquid splash                      At least 30 minutes of protection against &gt;40 chemical challenges                      Available with attached hood and attached socks                      Manufactured in high-visibility yellow</p>	 TY 198T  	<p><b>Tyvek® 600</b>                      Comfortable, all-day protection against a range of low-concentration, water-based inorganic chemicals                      Features include taped seams, storm flap, attached respirator-fit hood and elastic at the wrists and ankles</p>

**If Chemical- and Flame-Resistant Suits Are Needed—Featured Options\***

 TP 198T  	<p><b>Tychem® 6000 FR</b>                      CR/Primary FR                      Triple hazard protection from chemicals, flash fire and electric arc                      Certified to NFPA 1992 and NFPA 2112                      Available in high-visibility orange or gray for a discreet appearance</p>	 QS 127T  	<p><b>New! Tychem® 2000 SFR</b>                      CR/Secondary FR                      Chemical and secondary flame protection in a lightweight garment                      May be suitable for tactical entry                      Must be worn over primary flame-resistant garments</p>
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\*Other garment styles available.

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