

# DuPont™ Tychem® ThermoPro

A SINGLE-LAYER TRIPLE THREAT PROTECTIVE GARMENT THAT RESISTS CHEMICALS WHILE ALSO PROVIDING FLASH FIRE ESCAPE AND ELECTRIC ARC PROTECTION



**Emergency responders and industrial workers deserve the latest innovation in proven protection.**

To protect others, emergency responders need the best protection for themselves. Whether responding to a traffic accident or containing an industrial emergency, responders need a garment that will protect them from many hazards. Industrial workers facing the possible hazards of a flash fire, electrical arc flash, and chemical exposure need a single garment with multiple types of protection. Choosing the best garment also means considering many other factors, like comfort, durability, cost effectiveness and safety. For these reasons, and others, DuPont has taken 40 years of industrial chemical and firefighting technology experience and innovation and created a single-layer suit—DuPont™ Tychem® ThermoPro.



*The miracles of science™*

### Triple hazard protection in a single garment.

Tychem® ThermoPro provides triple hazard protection from chemicals, flash fire, and electric arc, combining the trusted chemical protection of DuPont™ Tychem® with the flame and arc flash protection of DuPont™ Nomex® into a single garment.

### Protecting your team from a range of hazardous chemicals.

From industrial chemical handling and remediation to first responder and secondary emergency response in industrial settings, we offer a complete range of chemical protective fabrics and garments. It's this knowledge and experience that's made us a leader in chemical protective garments. We've put this knowledge to work for at-risk personnel by creating Tychem® ThermoPro. This fabric delivers permeation protection against a broad range of toxic industrial chemicals and even chemical warfare agents.

Because protection matters most, Tychem® ThermoPro has been tested against 177 chemical challenges of which 134 chemicals have exhibited no observed breakthrough after 480 minutes. This testing also demonstrates that Tychem® ThermoPro provides at least 8 hours barrier to 20 of the 21 chemicals found in ASTM F1001. *Note: Physical Properties and Permeation Data tables can be found on the following page.*



Tychem® ThermoPro garments are also available in low-visibility gray for law enforcement and clandestine applications.

### Every garment is certified to NFPA standards.

The Safety Equipment Institute certifies that Tychem® ThermoPro garments meet the requirements of NFPA 1992 *Standard on Liquid-Splash Protective Ensembles and Clothing for Hazardous Materials Emergencies (2005 Edition)* and NFPA 2112, *Standard on Flame Resistant Garments for Protection of Industrial Personnel against Flash Fire (2007 Edition)*. In addition, Tychem® ThermoPro exceeds the Hazard Risk Category 2 requirement of 8 cal/cm<sup>2</sup> outlined in NFPA 70E, *Standard for Electrical Safety in the Workplace (2009 Edition)* with a 15.2 cal/cm<sup>2</sup> Ebt arc rating determined using ASTM F1959 and following special test requirements outlined in ASTM F1891.

And although Tychem® ThermoPro is constructed for heavy use, it's also lightweight and easy to wear.



Flash fire, electric arc and chemical protection in a single-layer protective garment.

**TP198T**  
Respirator fit  
hooded coverall

**TP199T**  
Respirator fit  
hooded coverall  
with attached socks  
and outer boot flaps

Please specify  
orange or gray.

### The first name in flash-fire and electric arc protection.

Nomex®, the name firefighters have valued for years, is integral to Tychem® ThermoPro garments. So Tychem® ThermoPro garments are flame resistant, increasing escape time from flash fire conditions.

Tychem® ThermoPro garments also offer protection for those who may face electric arc hazards associated with energized systems. If a high-energy electric arc event was to occur, Tychem® ThermoPro has been tested to provide burn injury protection with an arc rating of 15.2 cal/cm<sup>2</sup> Ebt.

NFPA 2112 Performance Tests	NFPA 2112 Criteria	Tychem® ThermoPro*
Vertical Flammability		
Char length (MD/CD) [inches]	≤4	2.6/2.7 Pass
After flame (MD/CD) [seconds]	≤2	0/0 Pass
Oven Shrinkage (MD/CD) [%]	≤10	4.5/6.7 Pass
Thermal Protective Performance (TPP)		
Contact [cal/cm <sup>2</sup> ]	≥3	12.6 Pass
Spaced [cal/cm <sup>2</sup> ]	≥6	15.7 Pass
Thermal Manikin		
Predicted Body Burn 3 sec. @ 2 cal/cm <sup>2</sup> -sec.	≤50%	14% Pass

\*Specimens conditioned and tested as specified in NFPA 2112. Also passes heat stability and thread stability tests.

**Typical physical properties of Tychem® ThermoPro**

Property	Value	Method
Basis Weight [oz./yd. <sup>2</sup> ]	8.4	ASTM D3776
Thickness [mils]	34	ASTM D1777
Grab Tensile (MD/CD) [lbf]	243/231	ASTM D5034
Trapezoidal Tear (MD/CD) [lbf]	51/34	ASTM D5733
Puncture-Propagation, Tear (MD/CD) [lbf]	28.7/31.8	ASTM D2582
Ball Burst [lbf]	167	ASTM D751

**A team dedicated to innovation and safety.**

Like the people who select, wear and value our garments, we're constantly looking for new ways to improve safety and protect lives. As conditions change, we're dedicated to developing the materials that can help you protect your team even under the most hazardous conditions.

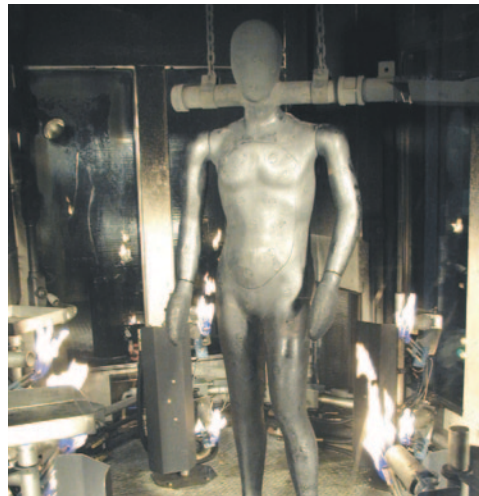
**Permeation Data (ASTM F1001)**

Chemical	Breakthrough Time (minutes)
Acetone	>480
Acetonitrile	>480
Ammonia Gas	>480
1,3-Butadiene Gas	>480
Chlorine Gas	>480
Dichloromethane	imm.
Carbon Disulfide	>480
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
Ethylene Oxide Gas	>480
n-Hexane	>480
Hydrogen Chloride Gas	>480
Methanol	>480
Methyl Chloride Gas	>480
Nitrobenzene	>480
Sodium Hydroxide, 50%	>480
Sulfuric Acid, 98%	>480
1,1,2,2-Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480

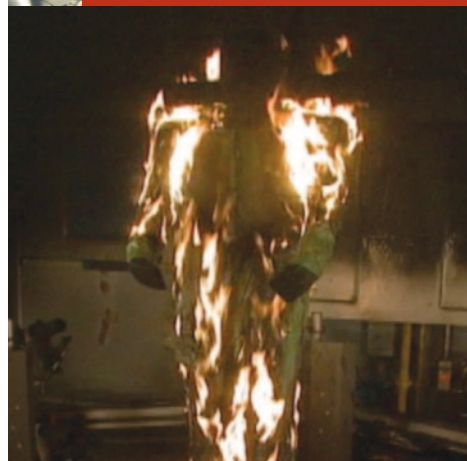
*Tested per ASTM F739.  
For more permeation data for Tychem® ThermoPro,  
please visit [www.personalprotection.dupont.com](http://www.personalprotection.dupont.com).*

**DuPont™ THERMO-MAN®—pushing protection to the limit.**

The increased thermal protection that DuPont™ Tychem® ThermoPro garments offer is clearly demonstrated in simulated fire testing using instrumented thermal manikins such as the DuPont™ THERMO-MAN® system.



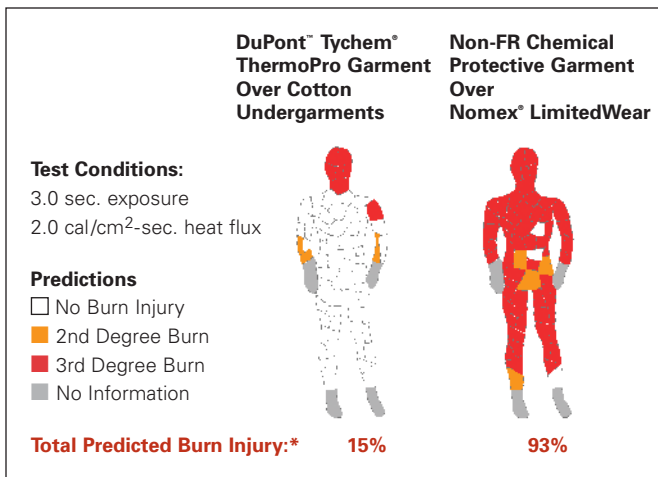
THERMO-MAN® testing helps DuPont scientists and engineers design more protective garments.



This standard (non-flame resistant) chemical protective garment ignites and melts onto the manikin during a similar flame exposure resulting in significantly higher levels of predicted burn injury. (Image 3 seconds after flame source removed.)



The Tychem® ThermoPro garment does not continue to burn after the flame exposure—maintaining a protective barrier to minimize burn injuries. (Image 3 seconds after flame source removed.)



\*Total body results—images for front.

Note: The head was uncovered in these tests and contributed to 7% of the predicted body burn injury reported.

The sophisticated DuPont™ THERMO-MAN® system consists of a life-size manikin with 122 thermal sensors used to predict level, extent, and location of potential burns of garments in simulated flame exposures. THERMO-MAN® tests are performed in accordance with the ASTM F1930 standard.

DuPont™ Tychem® ThermoPro has been certified to NFPA 2112, *Standard on Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire*.

To purchase Tychem® ThermoPro garments or for more information, please call 800.931.3456 or visit [www.PersonalProtection.DuPont.com](http://www.PersonalProtection.DuPont.com).

DuPont Personal Protection

Customer Service:

United States 1.800.931.3456

Canada 1.800.387.9326

Mexico (52) 55 57 22 1222

[www.PersonalProtection.DuPont.com](http://www.PersonalProtection.DuPont.com)

Tychem® ThermoPro garments are intended for flash-fire escape, electric arc and liquid splash protection only. Tychem® ThermoPro garments do not provide protection for any firefighting, hot liquid, molten-metal or long-duration thermal exposures.

All manikin tests are laboratory simulations of fire exposures. These laboratory simulations are severe and tax the performance properties of materials from which the clothing is made. The results of these tests are laboratory predictions of relative burn injury based upon several factors, including fabric type, fabric weight, garment styling and fit, number of launderings, exposure energy and exposure time. The results should not be used to predict garment performance in actual fire situations.

Product safety information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own determinations. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. It is the user's responsibility to determine the level of risk and the proper protective equipment needed for the user's particular purposes. This information may be subject to revision as new knowledge and experience becomes available. Since we cannot anticipate all variations in actual end-use conditions, DUPONT MAKES NO WARRANTIES AND ASSUMES NO LIABILITY IN CONNECTION WITH ANY USE OF THIS INFORMATION. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any trademark or patent right.

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