

PetroWear™ Chemical Splash Outerwear

FLAME RESISTANT RAINWEAR FOR PROTECTION AGAINST VAPORS FROM HAZARDOUS MATERIAL EMERGENCIES

Summary of relevant information contained in the NFPA 1991 *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies* 2005 Edition

Scope: This standard specifies the minimum design, performance, certification, documentation requirements, and test methods for vapor-protective ensembles and individual elements for chemical vapor protection. This standard also provides additional optional criteria for chemical flash fire escape protection and liquefied gas protection. This standard also specifies additional optional criteria for vapor-protective ensembles and individual elements that will provide protection from chemical and biological warfare agents and chemical and biological terrorism incidents. The standard does not cover respiratory protection that is to be worn with the ensemble. Respirator guidelines are provided by NIOSH.

Purpose: This standard is intended to assist emergency response organizations in specifying appropriate protective ensembles for the growing number of hazardous materials emergency responders who reach the scene of a spill or terrorist attack in the early stages while a vapor hazard may still be present. Initially, NFPA 1991 was intended to correspond to EPA Level A designation, but the NFPA 1991 scope has been expanded. NFPA 1991 provides the end user organization with performance and testing requirements for an ensemble with both gas-tight and liquid tight integrity more comprehensively than the EPA Level A designation.

Key Definitions:

CRRN: Abbreviation for Chemical, Biological, Radiological, Nuclear

Certification Organization: An independent, third-party organization that determines product compliance with the requirements of this standard with a labeling/listing/follow-up program.

Chemical and Biological Terrorism Incidents: Situations involving the release of chemical or biological warfare agents in civilian areas by terrorists.

Chemical Flash Fires: The ignition of a flammable and ignitable vapor or gas that produces an outward expanding flame front as those vapors or gases burn. This burning and expanding flame front, a fireball, will release both thermal and kinetic energy to the environment.

Chemical Warfare Agent: A chemical substance intended to kill, seriously injure, or incapacitate humans through physiological effects.

Emergency Response Personnel: Personnel assigned to organizations that have the responsibility for responding to hazardous materials emergencies.

Hazardous Materials: A substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property.

Vapor-Protective Ensemble: Multiple protective elements of compliant protective clothing and equipment that when worn together provide protection from some risks, but not all risks, of vapor, liquid-splash, and particulate environments during hazardous materials incidents and from chemical and biological terrorism agents in vapor, gas liquid, or particulate forms.

Vapor Protective Ensemble with Optional Chemical Flash Fire Escape and Liquefied Gas Protection: A compliant vapor-protective ensemble that is also certified as compliant with the optional requirements for both *limited* protection against chemical flash fire *for escape only* and for protection against liquefied gases.

Performance Requirements:

- Gas-tight integrity (inflation test) and liquid-tight integrity (shower test) and inward leakage resistance for vapor-protective ensemble
- Chemical permeation resistance after flexing and abrasion of all ensemble elements, seams and closures against 21 chemicals to demonstrate resistance against a broad range of industrial chemicals for the gas-tight ensemble and all elements
- Warfare agent and chemical permeation resistance including 4 additional chemicals for all CBRN ensemble elements and seams
- Burst strength, puncture propagation tear resistance, cold temperature performance, abrasion resistance, flex fatigue resistance for suit, glove, and footwear materials
- Puncture resistance, cut resistance, impact and compression resistance, bending resistance, abrasion resistance and slip resistance for footwear
- Breaking strength testing for seams and closures
- Leak resistance and mounting strength testing of exhaust valves
- Flammability resistance of ensemble and all elements
- Testing to evaluate functional use of ensembles and dexterity of gloves
- Optional requirements for chemical flash fire escape protection and liquefied gas protection

Labeling Requirements:

- **Manufacturer Label:** States manufacturer's name, address, country of manufacture, suit model, style, or serial number, date of compliance pressure testing, size, material "Do Not Remove" statement
- **Compliance Statement:** Ensemble meets the requirements of NFPA 1991
- **Certification:** The certification organization's label or symbol
- **Additional Information:** Specific indication of a technical data package that must be read before use of the ensemble. Additional information on warnings and instructions for use
- **Label Print Legibility:** Required font size