

Ansell



GUIDE TO NFPA STANDARDS

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The National Fire Protection Association (NFPA) issues standards on chemical protective clothing (CPC) for hazmat teams, first responders etc. The NFPA series of standards for use by emergency responders during hazardous materials emergencies and CBRN terrorism incidents, has undergone a review and is now available as a “bundle standard”, namely the NFPA 1990 edition 2022 but the individual standards references NFPA 1991, 1992 and 1994 will still be used to designate and discriminate between the ensembles and the levels of protection they provide respectively. The standards may be linked to and used for the protection required by the EPA/OSHA levels A-D.

“OLD” NFPA HAZMAT STANDARDS SERIES



- **NFPA 1991 Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies and CBRN Terrorism Incidents, 2016 Edition**

This standard provides requirements for protection for emergency responders against adverse vapour environments during hazardous materials incidents, and from specified chemical, biological, or radiological terrorism agents during chemical and biological terrorism incidents



- **NFPA 1992 Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies, 2018 Edition**

This standard provides requirements for protection for emergency responders against adverse liquid- splash environments during hazardous materials emergency incidents



- **NFPA 1994 Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies and CBRN Terrorism Incidents, 2018 Edition**

This standard establishes requirements for protective ensembles and ensemble elements to safeguard emergency first responder personnel from chemicals, biological agents, and radiological particulates (CBRN) terrorism agents

NEW HAZMAT STANDARD



- **NFPA 1990 Standards for Protective Ensembles for Hazardous Materials and CBRN Operations**

- NFPA 1991, 1992 and 1994 compiled and re-structured into 1990
- Product certification will still be referencing 1991, 1992 and 1994 respectively on labels, so that users know what level of testing has been carried out

NFPA HAZMAT STANDARDS STATUS

NFPA 1990 Standards for Protective Ensembles for Hazardous Materials and CBRN Operations

NFPA 1991, 1992 and 1994 compiled and re-structured into 1990

Product certification will still be referencing 1991, 1992 and 1994 respectively on labels, so that users know what level of testing has been carried out


- NFPA 1990 edition 2022 is published online
- Entry into force since July 24th 2021*
*no more certificates to previous editions may be issued as of this date
- Transition period with a hard deadline January 24th 2023

NFPA FLAME-RESISTANT STANDARD

NFPA 2112 Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire.

- NFPA 2112 is the benchmark standard for FR clothing in North America and beyond and elevates AlphaTec® Breathable to a new level of recognition. End users concerned about flash fire hazards will value this certification.

STANDARDS & REQUIREMENTS FOR DIFFERENT LEVELS OF PROTECTION

Protection Level	Standard	Type of protection	Ansell Certified products
<p>Higher</p>  <p>Lower</p>	NFPA 1991	Hazmat + CBRN response Level A, vapour protective, liquids, particles	AlphaTec® EVO, FLASH
	NFPA 1994 class 1	Hazmat + CBRN response Vapour, liquids, particles	-
	NFPA 1994 class 2	Hazmat + CBRN response Vapour, liquids, particles	-
	NFPA 1994 class 3	Hazmat + CBRN response Vapour (below IDLH), liquids, particles	-
	NFPA 1994 class 4	Hazmat + CBRN response Particles (below IDLH)	-
	NFPA 1994 class 5 NEW	Liquid repellent FR garment	-
	NFPA 1992	Hazmat response Level B, liquid splash protection	AlphaTec® 4000 and AlphaTec® 66-6XX Breathable

Permeation barrier requirements	American Products Standard NFPA 1991	European Product Standard EN 943-2:2019
Permeation criteria based on	6 µg/cm ² cumulative (less for CWA)	1.0 µg/cm ² /min breakthrough (or 150 µg/cm ² cumulative)
Minimum time requirement	60 minutes	30 minutes (1 exception allowed)
Number of mandatory test chemicals	24 pcs incl CWA	15 pcs, no CWA
Test temperature	+32°C	23°C
Flexing + abrasion specimen pre-treatment	Yes	No
Others		
Option for chemical flash fire protection	Yes	No
Option for liquefied gas protection	Yes	No

	NFPA 1991	NFPA 1994 Class 1	NFPA 1994 Class 2	NFPA 1994:2018 Class 3
Scope	CBRN / Hazmat Response - vapour	CBRN / Hazmat Response - vapour	CBRN / Hazmat Response - vapour	CBRN / Hazmat Response - vapour
Design	Encapsulating	Encapsulating Non-encapsulating	Encapsulating Non-encapsulating	Encapsulating Non-encapsulating
Respirator	SCBA	SCBA	SCBA	CBRN PAPR or APR
Ensemble integrity criteria	Pressure Test MIST Inward leakage PPDF _i ≥ 1071 "Shower test" 60min	Pressure Test MIST Inward leakage PPDF _i ≥ 871 "Shower test" 20min	MIST Inward leakage PPDF _i ≥ 481 "Shower test" 20min	MIST Inward leakage PPDF _i ≥ 481 "Shower test" 8min
Options	Overall Flash fire Liquefied gas protection	Overall Flash fire	Overall Flash fire	Overall Flash fire

MIST = Man-in-Simulant Test
PPDF = Physiological Protective Dosage Factor

NFPA 1994 class 4 (particulate protection) and class 5 (liquid repellent FR ensemble) omitted here

	NFPA 1991	NFPA 1994 Class 1	NFPA 1994 Class 2	NFPA 1994 Class 3
Barrier type test	Permeation	Permeation	Permeation	Permeation
Pre-treatment	Flexing and abrasion	Flexing and abrasion	Flexing and abrasion	Flexing and abrasion
Min. duration	1 hour	1 hour	1 hour	1 hour
Requirement	≤ 6.0 µg/cm ² cumulative (4.0 and 1.25 µg/cm ² for CWAs)	≤ 6.0 µg/cm ² cumulative (4.0 and 1.25 µg/cm ² for CWAs)	≤ 6.0 µg/cm ² cumulative (4.0 and 1.25 µg/cm ² for CWAs)	≤ 6.0 µg/cm ² cumulative (4.0 and 1.25 µg/cm ² for CWAs)
Challenge	100g/m ² 100%	20g/m ² 1%	10g/m ² 350ppm	10g/m ² open top 40ppm
Challenge chemicals	23 industrial/TICs 2 CWA (HD, GD)	9 industrial/TICs CWA (HD, GD)	4 industrial/TICs CWA (HD, GD)	4 industrial/TICs CWA (HD, GD)
Biological criteria	-	-	Viral penetration	Viral penetration

TIC's = Toxic Industrial Chemicals
CWA = Chemical Warfare Agents

NFPA 1994 class 4 (particulate protection) and class 5 (liquid repellent FR ensemble) omitted here

MAJOR CHANGES RELEVANT TO NFPA 1991

No outer cover suits allowed to fulfil any NFPA 1991 requirements

ASTM F 1930 / NFPA 2112 flash fire manikin ("Pyroman" test) to replace "propane booth" flash fire test

New "flame break open" material test, mandatory requirement

MAJOR CHANGES RELEVANT TO NFPA 1992

- Breathability requirements of a garment – if claimed to be breathable must pass:

Evaporative resistance, ISO 11092: < 30 Pa m²/W

Total heat loss (THL), ASTM F 1868: > 200 W/m²

NEW CHEMICAL FLASH FIRE MANIKIN TEST

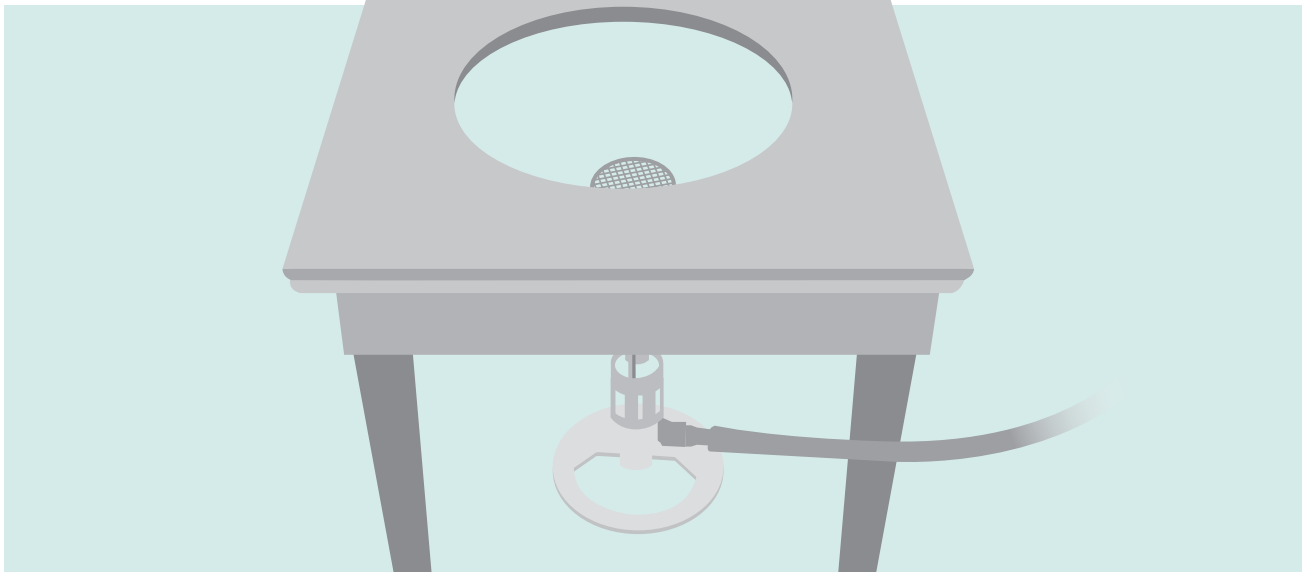


Test conditions

- 84 kW/m² (2.02 cal/cm²/sec)
- Exposure time of 3 seconds
- T shirt and briefs worn underneath

Requirements

- Afterflame ≤ 5s
- Material or seam break opening ≤ 51 mm
- No dripping
- Through visor visual acuity 20/100



NEW FLAME-BREAK-OPEN TEST

Test conditions

- Meeker burner from Method 5905.1 of Federal Test Method Standard 191A, Textile Test Methods
- Horizontal sample position 50 mm above burner top
- Flame height 75 mm
- Flame exposure time of 3 seconds

Requirements

- No hole formation
- Sample to remain airtight (EN 14325 “pressure pot”)

➤ **For more information, visit www.ansell.com**

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