AlphaTec®

NFPA 1992

Breathable Chemical Protective Clothing Instructions for Use

AlphaTec® 66-600 Series

This manual may only be removed from the garment by the end user.

Ansell

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Safety Considerations

These Instructions for Use (IFU) are valid only for AlphaTec® 66-600 Series garments and provide important information regarding their use, care and maintenance. Do not remove the IFU from the garment prior to final delivery to the user.

The garment may only be used by specially trained personnel who are familiar with the contents of this manual.

Failure to comply with any of the recommendations given herein may result in serious injury or death.

The Instructions for Use are updated regularly and may be available in other languages.

Please check the website www.ansell.com to make sure you have the latest edition of the IFU in your preferred language.

Chemical Response

Choosing the appropriate chemical protective clothing, accessories and other necessary equipment to deal with a chemical exposure or chemical emergency is a decision that has to be made by qualified safety professionals.

Working with chemicals and responding to hazardous chemical emergencies can be very complex and may involve chemicals other than those listed in the NFPA 1992 Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies, or other published documentation.

Besides the specific chemical(s) encountered, other aspects such as the concentration, temperature of the chemical, mixtures of chemicals, flammability, toxicity etc. have to be considered.

Identify the chemicals before entering into the hazardous area in chemical protective clothing. Always minimize the exposure to and avoid direct contact with chemicals as much as possible.

Product Description

Breathable Chemical Protective Clothing

AlphaTec® 66-600 Series chemical splash protective garments provide liquid splash protection while maintaining all-day breathable comfort.

Features include:

- Meet & exceed NFPA 1992-2018 Edition as Level B garments.
- Lightweight, breathable fabric that allows body heat and moisture vapor to dissipate away from the body, minimizing risk of heat stress and providing outstanding comfort.
- Liquid chemical splash protection with penetration data for more than 70 chemicals.
- Highly durable garments that can be safely washed without compromising chemical protection (see Decontamination and Cleaning section).
- Fabric options to address different working environments and risks.

Garment Material

AlphaTec® 66-600 Series garments are constructed with Stedfast Stedair® protective barrier fabrics, available in two variations:

Red polyester garments:
White polyester inner / Stedair® membrane / red polyester outer.

Blue FR garments made with Nomex® fiber*:
White Nomex® inner / Stedair® membrane / Blue Nomex® outer.

* Material meets additional requirements according to NFPA 2012, Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire, 2018 Edition.

Seams

All seams are heat sealed with Stedfast sealing tape to protect against liquid penetration.

Compliance

All AlphaTec® 66-600 Series Liquid Splash Protective jackets, coats, bib overalls and coveralls meet and exceed the requirements of NFPA 1992, Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies, 2018 Edition.

Blue FR garments with Nomex® meet Hazard Category 2 as defined by NFPA 70E. They have been tested by an independent laboratory based on ASTM F1891-02 / ASTM 1959-05 Standard Test Method for Determining Arc Thermal Performance of Textile Materials for Clothing by Electric Arc Exposure Method Using Instrumented Sensor Panels.

Blue FR garments with Nomex® also meet the requirements according to NFPA 2112, Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire, 2018 Edition.

Proper Use

Red Polyester garments shall be used in accordance with applicable personal protective equipment regulations, which in the United States are 29 CFR 1910.132 and NFPA 1500.

Blue FR garments shall be used in accordance with 29 CFR 1910.132, NFPA 1500 and NFPA 2113.

Users in other countries are advised to consult national or other applicable personal protective equipment regulations.

It should be noted that most performance properties of the liquid splash–protective clothing item cannot be tested by the user in the field.

Limitations of Use

This clothing offers chemical liquid splash protection and is not appropriate for use where vapor protection is required. Any other use may result in serious injury or death. Consult the Stedfast protective barrier fabrics Technical Data in the Ansell published literature and on www.ansell.com for information on the protection offered against specific chemicals.

The garment may be used in temperature ranges from -40°F to 150°F (-40°C to 65°C).

Never use the garment near open flames or intense heat.

Only the blue Nomex® version is suitable for use where heat or arc flash might be anticipated.

WARNING! The respiratory equipment has not been evaluated for chemical permeation resistance consistent with the other ensemble elements.

The determination of the suitability of Ansell products for an application is the final responsibility of the user.

The manufacturer disclaims all responsibility for the improper use of Ansell products.

These Instructions for Use do not in any way comprise a guarantee or warranty on the part of Ansell, and Ansell expressly disclaims any implied warranty of merchantability or fitness. Ansell is not in any way nor under any conditions liable for compensation to the purchaser or commercial user of a protective garment for injury to (including death of) any person or loss of or damage to property of any kind or for costs, loss of profits or other damage or loss of any nature whatsoever.

Pre-use

Make sure that the garment has not passed its recommended shelf life (see "Storage Life/Shelf Life") and that the garment is free from damage before it is taken into service.

Also make sure that the garment is decontaminated and inspected before it is returned into service or storage. If the garment is damaged, take it out of service and replace.

Sizes

AlphaTec® 66-600 series garments are available in different sizes for the wearer's safety and comfort.

The following table serves as a guideline to standard sizing, custom sizes can be considered upon request.

Available size range:

GARMENT SIZE	HEIGHT (in/cm)	WEIGHT (lb/kg)
S	62-64/157-163	90-130/41-59
M	64-66/163-168	130-170/59-77
L	66-69/168-175	170-210/77-95
XL	69-71/175-180	210-235/95-107
2XL	71-74/180-188	235-260/107-118
3XL	74-76/188-193	260-290/118-132

Recommended Undergarments

Undergarment selection will depend on the task at hand, and on the prevailing climatic conditions.

If the employer's safety assessment has identified extreme temperature hazards, such as a high or low temperature environment or the potential for workers to come into contact with hot or cold surfaces or liquids, then additional undergarments or thermal undergarments may be required to provide further protection and comfort for the worker.

This is particularly relevant to users of AlphaTec® blue FR clothing with Nomex® fiber, where arc flash and/or fire hazards have been identified in the safety assessment.

Donning and Doffing

- A routine should be established and practiced periodically for donning and doffing AlphaTec® Breathable clothing.
- Assistance should be provided if required by the user (particularly for doffing of contaminated clothing).
- Clothing fit should be evaluated. If the clothing is too small, it will restrict movement, increase the likelihood of accidental damage to the clothing and will accelerate wearer fatigue. If the clothing is too large, it may decrease user dexterity and coordination.

Donning Procedure

- Inspect clothing for damage and expiry date before donning.
- For **coveralls and bib overalls**, step into the legs, pull over feet and gather the garment around the waist.
- Put on chemical-resistant safety boots, pull the garment legs down over the boots and secure the hook-and-loop closures on the legs of the garment.
- For **bib-overalls**, secure shoulder straps. Adjust buckles for a comfortable fit and don jacket.
- For **coveralls, jackets and coats**, put arms into sleeves, close zipper and secure zipper storm flap and collar using hook-and-loop closures. Don protective gloves and pull sleeves down over the glove cuffs and secure using hook-and-loop closures.
- **Hoods**, if used, should be fixed to the coverall, jacket or coat before donning, or afterwards with assistance from a co-worker. Ensure hood is securely fixed to the garment using the hook-and-loop closure. Adjust hood around face using pull-cord (ensuring vision is not impeded).
- Lastly, ensure all closures and zipper are closed and secure before proceeding to work area.

Gloves and boots should interface securely with the sleeves and pant legs. NFPA 1992 does not allow the use of tape as a means for creating interfaces between ensemble elements.

Doffing Procedure

- If contamination has occurred, decontaminate the garment/worker using a procedure appropriate to the working environment and the chemical hazards encountered. This must be developed by the employer.
- Remove any extraneous or disposable clothing if used (e.g. boot covers, outer gloves).
- Remove, or have assistant loosen and remove the wearer's safety footwear.
- Open all hook-and-loop closures and the zipper and remove arms from coverall, jacket or coat, one at a time. Once arms are free, have assistant hold or lift the garment away from the wearer, avoiding any contact between the outside surface of the suit and the wearer's or assistant's body. For coveralls and bib-overalls, remove legs from the legs of the garment. Sit if possible to do this. Leave internal gloves on, if any.
- Lay discarded garments out flat, away from the wearer.
- After clothing is removed, remove internal gloves by rolling them off the hand, inside out.
- Remove undergarments and thoroughly cleanse the body.

Storage

Make sure that the garment is decontaminated and inspected before it is returned into storage. If the garment is damaged, take it out of service and replace.

Storage Conditions

- Always make sure the garment is clean and dry prior to storage.
- Store in a dry environment, out of direct sunlight.
- Keep away from ozone-generating sources, for example electrical engines, fluorescent lamps and air-conditioners.

Storage Methods

- Garments can be folded as received upon delivery or hung on a hanger or hanger loop.
- The garments should not be hung on a hook that can damage the fabric.

Storage Life/Shelf Life

Five years under recommended storage conditions.

Maintenance

Inspection

Garments must be inspected upon delivery and before and after each use. Use the following guidelines when inspecting:

- Visually inspect the garments both inside and outside.
- Look for surface damage or tears on material and seams.
- Check the function of the zipper.

If the garment has been subjected to contaminants, it should be decontaminated prior to laundering, re-use or storage. If any damage/malfunction is found, the garment must be taken out of service. Do not attempt to repair.

Decontamination and Cleaning

AlphaTec® chemical protective garments require proper care to ensure performance.

Do not use clothing items that are not thoroughly cleaned and dried.

After contact with chemicals the garment should be decontaminated with a suitable decontamination solution prior to laundering.

Cleaning and laundering recommendations are as follows:

- Machine wash using powdered laundry detergent in warm water (<105°F), rinse thoroughly.
- For best results, hang to dry. However, garments can be tumbled dried using cotton setting. High temperatures can separate the seam tape.
- DO NOT use liquid bleach, starch or fabric softener.
- DO NOT dry clean.
- DO NOT press or iron.
- DO NOT scrape or scrub the fabric, which could compromise its chemical resistance.
- If the garment is stained by grease or oil, a spray pre-wash can be used on the stains prior to laundering.
- If the hook and loop fasteners become contaminated with lint, brush the hooks carefully with a suitable small brush to remove.

Marking

Marking on the garment can be made by a “permanent marker” type of pen, however the ink may bleed.

Retirement and Disposal

- Make sure the recommended shelf life of the garment is not exceeded.
- If any damage/malfunction is found during inspection, the garment must be taken out of service.
- Garments that are not completely decontaminated must be disposed of in a safe manner, taking local regulations for the specific chemical into account.
- Garments showing indications of chemical degradation (such as brittleness, stiffness, swelling, stickiness or other changes in the material) must be disposed of.

NFPA 1992-2018 Approval Data

Ensemble or Element	Performance Requirement	Test Method	Requirement	Result
Base Requirements				
Nonencapsulating Garment	Liquidtight integrity	ASTM F1359/ F1359M with modifications (Section 8.2)	No liquid penetration	Pass
	Overall garment function and integrity	ASTM F1154 (Section 8.3)	Complete all tasks within 15 minutes	Pass
			No liquid penetration	Pass
			Accommodates head protection devices meeting ANSI/ISEA Z89.1 (Type 1, Class G)	N/A
			Test subject has visual acuity of 20/35 or better through visor and facepiece lens	N/A
			Protective flap remains closed over closure system	Pass
			Test subject properly identifies 3 out of 4 numbers on NFPA 704 placard at each angle	N/A

GARMENT MATERIAL TESTED: AlphaTec® Breathable Polyester (Red)				
Ensemble or Element	**Performance Requirement**	**Test Method**	**Requirement**	**Result**
Garment material	Chemical penetration resistance	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	See separate table
	Burst strength	ASTM D751 (Section 8.8)	Strength ≥ 135 N	1280 N
	Puncture propagation tear resistance	ASTM D2582 (Section 8.6)	Tear resistance ≥ 25 N	MD: 341 N XD: 1104 N
	Cold temperature performance	ASTM D747 (Section 8.7)	Bending moment ≤ 0.057 Nm	MD: 0.001 Nm XD: 0.000 Nm
Garment seam	Chemical penetration resistance	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	See separate table
	Seam breaking strength	ASTM D751 (Section 8.8)	Strength ≥ 33 N/25 mm	175 N/25 mm
Garment closure	Chemical penetration resistance	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	N/A
	Closure breaking strength	ASTM D751 (Section 8.8)	Strength ≥ 33 N/25 mm	152 N/25 mm
Garment material	Total heat loss	ASTM F 1868, Method C (section 8.20)	Total heat loss (report only)	589.6 W/m^2
			Apparent intrinsic evaporative resistance (report only)	0.0064 kPa $*m^2/W$
			Intrinsic thermal resistance (report only)	0.0038 K $*m^2/W$
	Evaporative resistance	ISO 11092 (section 8.23)	Evaporative resistance (report only)	17.48 Pa $*m^2/W$

GARMENT MATERIAL TESTED: AlphaTec® Breathable FR (Blue)				
Ensemble or Element	**Performance Requirement**	**Test Method**	**Requirement**	**Result**
Garment material	Chemical penetration resistance	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	See separate table
	Burst strength	ASTM D751 (Section 8.8)	Strength ≥ 135 N	952 N
	Puncture propagation tear resistance	ASTM D2582 (Section 8.6)	Tear resistance ≥ 25 N	MD: 1360 N XD: 848 N
	Cold temperature performance	ASTM FD747 (Section 8.7)	Bending moment ≤ 0.057 Nm	MD: 0.000 Nm XD: 0.000 Nm
Garment seam	Chemical penetration resistance test	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	See separate table
	Seam breaking strength	ASTM D751 (Section 8.8)	Strength ≥ 33 N/25 mm	241 N/25 mm
Garment closure	Chemical penetration resistance	ASTM F903 (Section 8.4)	No penetration for at least 1 hour for each of the specified chemicals	N/A
	Closure breaking strength	ASTM D751 (Section 8.8)	Strength ≥ 33 N/25 mm	173 N/25 mm
Garment material	Total heat loss	ASTM F 1868, Method C (section 8.20)	Total heat loss (report only)	455.7 W/m^2
			Apparent intrinsic evaporative resistance (report only)	0.0088 kPa *m^2/W
			Intrinsic thermal resistance (report only)	0.0209 K *m^2/W
	Evaporative resistance	ISO 11092 (section 8.23)	Evaporative resistance (report only)	13.276 Pa *m^2/W

Chemical Penetration Test Data

It should be noted that all chemical testing was performed on swatches of garment material under laboratory conditions, not under actual workplace environments. The user must determine the applicability of the results obtained under laboratory conditions to the actual conditions of use. Information presented is subject to change without notice.

		Red Polyester		Blue Nomex®	
Chemical and Concentration	**Minimum Requirement***	**Garment Material**	**Garment Seam**	**Garment Material**	**Garment Seam**
Butyl acetate, CAS No. 123-86-4, > 95%	Pass	Pass		Pass	
Dimethylformamide, CAS No. 68-12-2, > 95%	Pass	Pass		Pass	
Fuel H (42.5% toluene, 42.5% isooctane, 15% ethanol mixture, v/v)	Pass	Pass	Pass	Pass	Pass
Isopropyl alcohol, CAS No. 67-63-0, > 91%	Pass	Pass		Pass	
Methyl isobutyl ketone, CAS No. 108-10-1, > 95%	Pass	Pass	Pass	Pass	Pass
Nitrobenzene, CAS No. 98-95-3, > 95%	Pass	Pass		Pass	
Sodium hydroxide, CAS No. 1310-73-2, 50%	Pass	Pass		Pass	
Sodium hypochlorite, 10%	Pass	Pass		Pass	
Sulfuric acid, CAS No. 7664-93-9, 93.1%	Pass	Pass	Pass	Pass	Pass
Tetrachloroethylene, CAS No. 127-18-4, > 95%	Pass	Pass		Pass	

Note: Shaded areas indicate no requirement for testing.
*A pass result indicates no liquid penetration through the tested specimens after a 1-hour exposure with 1-minute of the exposure at 7.8 kPa hydrostatic pressure.

NFPA 2112-2018 Approval Data

GARMENT MATERIAL TESTED: AlphaTec® Breathable FR (Blue)				
Ensemble or Element	**Performance Requirement**	**Test Method**	**Requirement**	**Result**
Garment material	Heat Transfer Performance Test (HTP)	Section 8.2	Spaced, > 6.0 cal cm^{-2}	As received/after 3 launderings 20.5/20.7
			Contact, > 3.0 cal cm^{-2}	As received/after 3 launderings 11.4/12.8
	Flame resistance	Section 8.3 (ASTM D6413 apparatus)	After flame: max 2 sec Char length: max 4 inches	After flame: average 0.6 Char length: average 1.96
	Heat and thermal shrinkage resistance	Section 8.4 (ASTM F2894 apparatus)	Max -10%	Average -1.7%
	Manikin test predicted % total body burn	Section 8.5	≤ 50	10.4%

Optional Testing - Molten Metal Splash (ASTM F955-15)

GARMENT MATERIAL TESTED: AlphaTec® Breathable FR (Blue)				
Ensemble or Element	**Performance Requirement**	**Test Method**	**Requirement**	**Result**
Garment material	Time to second degree burn (s)	Molten Aluminum at 760 °C	-	12.3 s
	Temp Increase (°C) top/bottom calorimeter		-	44.8/35.2 °C
	Time to second degree burn (s)	Molten Iron at 1538 °C	-	6.0 s
	Temp Increase (°C) top/bottom calorimeter		-	35.9/14.6 °C
	Time to second degree burn (s)	Molten Sulfur at 150 °C	-	No burn
	Temp Increase (°C) top/bottom calorimeter		-	13.9/11.9 °C

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