

Personal Protective Equipment

Technical Specification

**Prepared For:
Allstar Fire -CASo**

**Prepared On:
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Prepared For:

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Scope

Yes | No

The purpose of the clothing is to provide protection during structural fire fighting operations where there is a threat of fire or when certain physical hazards are likely to be encountered, such as during non-fire-related rescue operations, emergency medical operations, and victim extrication.

Standard

Yes | No

All garments produced shall meet or exceed the criteria set forth in the current edition of NFPA 1971 PROTECTIVE CLOTHING FOR STRUCTURAL FIRE FIGHTING, FED-OSHA CFR 1910, Subpart L, OSHA 29 CFR Part 1910.1030 and/or the requirements of CAL-OSHA title 8, Article 10.1, Para. 3406.

All components and composites used in the construction of garments shall be third party tested, certified and listed for compliance to NFPA 1971. The label of the third party tester shall denote certification.

The manufacturer shall be registered to the ISO Standard 9001 to assure a satisfactory level of quality.

USER GUIDE INFORMATION

Yes | No

Each garment shall include a User Information Guide with information required by NFPA 1971.

This guide shall include:

- (a) Pre-use information:
 - Safety considerations.
 - Limitations of use.
 - Garment marking recommendations and restrictions.
 - A statement that most performance properties of the garment cannot be tested by the user in the field.
 - Warranty information.
- (b) Preparation for use:
 - Sizing/adjustment.
 - Recommended storage practices
- (c) Inspection:
 - Inspection frequency and details.
- (d) Don/Doff:
 - Donning and doffing procedures.
 - Sizing and adjustment procedures.
 - Interface issues.
- (e) Use:
 - Proper use consistent with NFPA 1500, Standard on Fire Department, Occupational Safety and Health Program, and 29 CFR 1910, 132.
- (f) Maintenance and Cleaning:
 - Cleaning instructions and precautions with a statement advising users not to use garments that are not thoroughly cleaned and dried.
 - Inspection details.
 - Maintenance criteria and methods of repair where applicable.
 - Decontamination procedures for both chemical and biological contamination.
- (g) Retirement and Disposal
 - Retirement and disposal criteria and considerations.

- (h) Drag Rescue Device (DRD)
 - Use, inspection, maintenance, cleaning and retirement of the DRD.

Tracking Label System

Yes | No

There shall be a PDF417, two dimensional bar code label permanently affixed to each garment for tracking purposes. The bar code shall contain a minimum of the following information:

- a. unique serial number
- b. item description (brand, model, material color)
- c. lot information (date of mfg., size, etc.)
- d. material description
- e. the standard to which the garment is compliant

The bar code shall be able to withstand customary wash and wear cycles. The PDF417 bar code must incorporate a minimum of a 30% "error correction" capability.

Sizes

Yes | No

Coats shall be made available in even chest sizes with corresponding sleeve lengths available in short, regular, and long. Pant sizes shall be made available in even waist sizes with inseam lengths available in extra short, short, regular and long. Male and female sizing available.

Warranty

Yes | No

Each garment shall have a limited lifetime warranty against defects in material and workmanship.

Composite Performance

Yes | No

The garment composite, consisting of the outer shell, moisture barrier and thermal liner, shall provide a Thermal Protective Performance (TPP) of not less than 39.9 when tested in accordance with NFPA 1971 standard.

The garment composite, consisting of the outer shell, moisture barrier and thermal liner, shall provide a Total Heat Loss (THL) of not less than 268.8 when tested in accordance with NFPA 1971 standard.

The Heat Transfer Index rating shall be 25 seconds for the shoulder when measured at 2 psi (pounds per square inch) and 25 seconds for the knee when measured at 8 psi.

Stress Points

Yes | No

All outer shell stress points, including top and bottom pocket corners, pocket flap corners, top and bottom of storm flap/fly shall be reinforced using a 42 stitch minimum bar tack.

Labeling

Yes | No

Each garment shall have a garment label(s) permanently and conspicuously attached stating at least the following language, as well as detailed warning instructions provided by the manufacturer.

Do Not Remove This Label

**THIS GARMENT MEETS THE GARMENT REQUIREMENTS OF NFPA 1971,
STANDARD ON PROTECTIVE ENSEMBLE FOR STRUCTURAL FIRE FIGHTING,
2007 EDITION**

MADE IN THE U.S.A.

Janesville® V-Force™ Bi-Swing Coat

Coat Model / Design

Yes | No

COAT CONSTRUCTION: The coat is designed of a 3-panel construction in all layers of our innovative V-fit design. For optimum comfort and mobility an inverted pleat on each side where back front and back body panel pieces meet shall be incorporated. Each pleat shall begin at the back of each shoulder and shall extend vertically down the side of the coat. A combination moisture barrier/thermal liner shall include a corresponding 1" inward dynamic fold approximately 1.5" from each sleeve seam at the shoulder. This fold shall provide for coat expansion when extending arms forward and shall interface with the inverted pleats of the outer shell to maximize mobility and function of the outer shell and thermal liner. Sleeves shall be of raglan design in the front and set in design in back.

Coat Length

Yes | No

When measured at the center of the back from the collar seam to the hem bottom, the coat shall measure 32" or 35" long for male coats (29" or 32" for female coats).

Drag Rescue Device

Yes | No

The harness shall be constructed of a one and one-half inch (1 ½") wide KEVLAR® strap that shall be installed between the outer shell and the thermal liner. This harness shall have a hand loop (16" in circumference) that exits the outer shell through a 2" polymer coated aramid reinforced slot on the back of the coat just below the collar and is held in place by means of a piece of 1" x 1.5" hook on the strap and a piece of 1" x 2" loop attached to the outer shell. This strap is then secured under a 2.25" x 5.25" flap that is sewn in at the neck /collar area. 2 pieces of 1" x 2" hook shall be set vertically to the underside of the flap; 2 pieces 1" x 2" loop shall be set vertically on shell to align with hook on underside of flap. The harness is also held in proper alignment by means of a 2" x 2" piece of loop placed on the inside of the outer shell just above the chest trim that corresponds to a piece of 1.5"x 2" hook located on the harness. Two 1" x 3.5" self-fabric straps with 1" x 2" hook on one end and 1" x 2" loop shall be set to coat in the shoulder cap area. This keeps the straps in proper position for use.

PURPOSE OF THE HARNESS

Fire Fighter Recovery Harness (Harness) provides mechanical leverage for dragging a downed and incapacitated structural firefighter from a life-threatening environment. The design of the Harness enables the rescuer to drag the downed firefighter in line with the axis of the firefighter's skeletal frame, in order to decrease the risk of further injury. This product is only for structural firefighting operations.

Coat Outer Shell Material

Yes | No

The outer shell shall be constructed of +/- 7.25 oz./sq. yd. 40% PBI®/60% KEVLAR® highly constructed ripstop weave with extremely durable FPE water resistant Teflon® FPE alloy reinforced with a matrix of 600 denier filament Kevlar® cables. Color shall be black

Coat Liner & Moisture Barrier

Yes | No

THERMAL LINER: 3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to 1 layer E-89™ spunlace aramid 85%NOMEX®/15% KEVLAR® weighing approximately 2.3 oz./sq. yd. With a Teflon® finish. And 1 layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. With a Teflon® finish. (Total weight +/- 7.3 oz./sq. yd.)

MOISTURE BARRIER: NOMEX® substrate laminated to a lightweight breathable, CROSSTECH® (Type 2C), Teflon membrane; weighing 5.0 oz./sq. yd.

MOISTURE BARRIER/THERMAL LINER CONSTRUCTION: Design shall be compatible with the outer shell so that the liner does not buckle, pull, or otherwise restrict body motion. The left and right fronts of the moisture barrier/thermal liner shall be attached to the facings at the front closure of the outer shell. The neck of the moisture barrier/thermal liner shall be secured to the neck of the outer shell collar such that when donning the coat an arm may not be accidentally caught between the outer shell and its inner linings along the neck between the armholes. Liner shall have a 4" wide, CROSSTECH®/NOMEX® pajama check extension sewn the full length of the neck with FR loop 3/4" wide sewn along entire edge and on both sides at the end. There will also be a 4" wide, piece of Black NOMEX® with a 2" piece of self material extension sewn the full length of the neck with FR hook 3/4" wide sewn along the entire edge of the Black NOMEX® Five female snaps will be spaced along the edge of the self material for attachment to the outer collar.

The liner shall have one (1) 8.5" x 8.5" internal pocket which shall be made of black outer shell material. The liner pocket shall be located on the left side of coat liner.

Quilt Thermal Liner Construction: The moisture barrier shall be sewn to the thermal liner at its perimeter with the breathable membrane oriented inward toward the thermal liner and away from the outer shell. All moisture barrier seams shall be sealed as required by NFPA 1971. The moisture barrier/thermal liner shall finish no more than 1" from the cuffs and 2" from the hem.

MOISTURE BARRIER/THERMAL LINER ATTACHMENT:

Completely Removable: The moisture barrier/thermal liner shall be completely detachable from the outer shell for ease of cleaning by the use of hook and loop, zippers, and snaps. There shall be a brass zipper and two snaps down each front facing, hook and loop shall also be located around the entire neck opening. In addition, there will be a snap for alignment along the bottom of the liner, and one snap and hook and loop at each sleeve end.

Reflective Trim

Yes | No

Reflective Trim set vertical down flap of fallen man harness, 4 rows lockstitch.

Trim shall be of 3" Ventilated Scotchlite II (triple trim) of red/orange

Ventilated Trim shall be of 3" Scotchlite II (triple trim) of red/orange perforated with 0.08 mm holes (114 per square inch) to provide a conduit for the release of vapor that can occur when moisture is heated and the trim compressed.

Reflective Trim

Yes | No

Trim shall be of 3" Ventilated Scotchlite II (triple trim) of lime/yellow, set with 4 rows lockstitch. Ventilated Trim shall be of 3" Scotchlite II (triple trim) of lime/yellow perforated with 0.08 mm holes (114 per square inch) to provide a conduit for the release of vapor that can occur when moisture is heated and the trim compressed.

- (1) 3" strip shall be set full circumference at the chest
- (1) 3" strip shall be set around each sleeve approximately 2" from bottom of sleeve cuff
- (1) 3" strip shall be set full circumference at the bottom sweep of the outer shell
- (2) 3" V shaped vertical strips shall be set at an angle from hem trim to back chest trim of the coat
- (1) 3" strip shall be set vertically down flap of fallen man harness.

Coat Collar

Yes | No

The collar shall be of three piece contoured 4-layer configuration such that when the collar is raised it shall remain standing while providing continuous thermal and moisture protection around the neck and face. To ensure this protection, the two layers of outer shell collar shall be fully lined with one layer of Gore RT7100™ PTFE moisture barrier material and two layers of 1.5 oz. apertured E-89™ thermal liner. The collar shall provide proper interface with liner to insure no moisture penetration through the collar seam to inside of coat.

The collar shall be contoured and shall completely cover the neck and throat area when in the raised position. Raised height shall be approximately three inches, with a contoured overlap at the front of the coat. Collar closure shall be provided by FR hook and loop 1.5" x 4", with hook portion sewn on right side of collar, and loop portion sewn on left, set horizontal. Collar shall be of such design so as not to interfere with SCBA facemasks, nor helmet.

When examined prior to donning, the turned-up collar shall completely wrap around the front of the neck opening such that left and right collars touch or overlap to maximize facial protection.

The three piece contoured 4-layer collar shall be sewn with a pleat on the innermost layer. Pleat shall have 3/4" FR hook sewn on the underside to engage the moisture barrier extension on the liner.

Hanger Loop

Yes | No

An external hanger loop constructed of a double layer of outer shell material and reinforced with two 42-stitch bartacks shall be provided on the outside of the coat at the collar seam. It shall be designed to provide long service and shall not tear or separate from the coat when the coat is hung by the hanger loop, loaded evenly with a weight of 80 lbs. and allowed to hang for one minute.

Coat Inner Yoke Reinforcement

Yes | No

A layer of Semper Dri™ (3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to one layer E-89™ spunlace aramid 85%/NOMEX®/15% KEVLAR® weighing

approximately 2.3 oz./sq. yd. With a Teflon® finish. And one layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. With a Teflon® finish. (Total weight +/- 7.3 oz./sq. yd.) (1377-059)) shall be positioned between the moisture barrier and thermal liner for extra thermal protection in a high heat and compression area of the coat. It shall be sewn to the inside of the upper back portion and raglan sleeve of the thermal liner across the upper back and shoulder for approximately 7".

Coat Shoulder Reinforcement

Yes | No

A 6" wide area at the top of the shoulders extending from the shoulder seam to a width of 4" at the collar shall be capped with outershell material for abrasion resistance and thermal protection. For additional thermal protection and cushioning, 1-layer of 1/8" thick, fire retardant closed-cell foam shall be oriented between the outer shell and the shoulder cap reinforcement.

Coat Elbow Reinforcement

Yes | No

The sleeve shall have an insert throughout all layers that shall provide a natural bend in the sleeve. This elbow shall include cut outs, shaped pieces, and darts to create free movement with few restrictions. The insert shall consist of black polymer coated aramid for abrasion resistance and thermal protection.

In addition to reinforcement, elbows shall be padded using one layer of uninterrupted 1/8" thick, fire retardant closed-cell foam. The reinforcement material shall be oriented between the outer shell and elbow insert reinforcement.

Coat Cuff Reinforcement

Yes | No

The extended cuff of the sleeve shall be reinforced with a binding of black polymer coated aramid not less than 3" in total width for abrasion resistance and thermal protection. One leather tab with female snap fastener shall be set in the cuff to attach outer shell to liner.

Coat Wristlets

Yes | No

An internal wristlet shall consist of a 2-ply KEVLAR® / NOMEX® / Spandex® construction knitted not less than 8" extending completely over the palm with a thumbhole preventing the wristlet from sliding back. Wristlets shall be double stitched and bound to the moisture barrier/thermal liner providing extended thermal and slash protection.

Waterwells - Ever-Dri

Yes | No

A combination of Semper Dri™ (3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to 1 layer E-89™ spunlace aramid 85%NOMEX®/15% KEVLAR® weighing approximately 2.3 oz./sq. yd. With a Teflon® finish. And 1 layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. With a Teflon® finish. (Total weight +/- 7.3 oz./sq. yd.)

(1377-059)/breathable CROSSTECH® (Type 2C) moisture barrier leader shall be sewn no more than 1" back from the combination liner sleeve end to form a sleeve well. One male snap and one .75" wide strip of FR loop fastener shall be sewn full circumference to the end of the thermal liner/CROSSTECH® (Type 2C) moisture barrier leader to help secure the combination liner to the outer shell. This leader shall be approximately 4" in length and end with a gathering of 1/2" elastic. This sleeve well shall prevent water and hazardous materials from entering the sleeve when arms are in a raised position.

The combination liner sleeve ends shall be inserted into the outer shell sleeve ends by means of lining up the male snap then attaching the FR loop fastener of the combination liner sleeve end with the female snap and FR hook fastener of the outer shell cuff. This method of combination liner attachment shall prevent any gaps from occurring between the combination liner and sleeve well during a full range of motion. The combination liner shall extend to within 1" of the sleeve end.

Coat Closure System

Yes | No

THERMAL FRONT PANEL CONSTRUCTION: There shall be continuous thermal and moisture protection around the entire torso including the storm flap. To ensure this protection, as well as reduce potential for wicking moisture to inside of liner, both right and left inside front facings of the coat outer shell shall incorporate outer shell fabric extending from collar to hem.

COAT FRONT CLOSURE DESIGN: The complete outer shell coat front closure design shall consist of a FRONT CLOSURE SYSTEM completely protected by an OUTSIDE STORM FLAP which shall have its own, independent STORM FLAP CLOSURE SYSTEM.

STORM FLAP: A storm flap measuring not less than 2.5" wide, nor less than 22" in length shall be set on the outside of the right side of the coat opening for maximum thermal protection and clear drainage. The inner lining of the storm flap shall be Gore RT7100™ PTFE moisture barrier meeting all requirements for moisture barriers sandwiched between two layers of outer shell fabric.

FRONT/STORM FLAP CLOSURES: The front closure shall consist of a #9 brass zipper with a 1 3/4" polymer coated aramid tab added to left bottom for fast closure and exit. The bottom 3" of the zipper closure shall angle towards the center of the closure. The storm flap closure shall consist of 1.5" wide FR hook and loop attachment with FR hook fastener sewn on the left front of the coat, and corresponding FR loop fastener sewn on the inner side of the outer storm flap. The hook and loop closure shall extend the full length of the outer storm flap eliminating all exposed frontal hardware.

Turn-Out Pockets

Yes | No

Two 9" x 9" Semi-bellow and handwarmer pocket combination that expands by means of side and bottom gussets to a thickness of 2" in back only and 0" in front. The pockets shall be set at the bottom left and right front panel of the coat hem and reflective trim shall be set on each pocket.

There shall be a 6" opening on the rear side of the bellow of the pocket. Semi Bellow pocket shall be lined with KEVLAR® twill. Handwarmer pocket shall be lined inside with Semper Dri™ thermal liner material and have a KEVLAR® twill backer.

Pocket and flap shall be set with stitch 301, seam Ssb-2 with each corner of pocket opening and top corners of flap reinforced with bar tacks for additional strength. Drainage of moisture to be provided by brass eyelets.

Each pocket flap shall measure 10" wide by 3" high in front and 5" high in rear. Each flap shall incorporate a 1" by 2" polymer coated aramid pull tab for easy opening. The corner under this tab shall be reinforced with two layers of Lite-N-Dri™ for stability.

A hook and loop closure system shall be set with two pieces of 1.5" x 3" loop fastener set horizontally on the outside edge of the pocket opening with corresponding 1.5" x 3" hook fastener set vertically on the underside of the flap.

Turn-Out Pockets

Yes | No

One 3.5" wide x 9" deep full bellows radio pocket that expands by means of side and front gussets to a thickness of 2" in front and back shall be located on the left side of the chest.

Pocket and flap shall be set with stitch 301, seam Ssb-2 with the top and bottom pocket corners and top corners of flap reinforced with a minimum 42-stitch bar tack. A brass eyelet shall provide drainage of moisture. Pocket flaps shall be 4.5"x 5". Pocket shall be fully lined all 3 sides inside pocket with polycotton lining. Pocket flap shall close to the pocket top using 1 piece of 1"x 2" loop on pocket horizontally and 1 piece of 1"x 2" hook on flap vertically. Pocket flap shall include a notch on the left flap to accommodate an antenna.

Coat Outer Yoke Reinforcement

Yes | No

SHELL YOKE REINFORCEMENT: A layer of Semper Dri (3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to 1 layer E-89™ spunlace aramid 85%NOMEX®/15% KEVLAR® weighing approximately 2.3 oz./sq. yd. with a Teflon® finish, and 1 layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. with a Teflon® finish (total weight +/- 7.3 oz./sq. yd.) shall be sewn to the inside of the outer shell upper back portion and sleeve 13" in length and 12" across the sleeve.

MISC. Fasteners

Yes | No

Three gold leather zipper pulls shall be threaded through end of zipper, one on stormflap zipper, one on each end of the facemask pocket zipper.

Mic Tab

Yes | No

There shall be three 3/4" x 3" self-fabric mic tabs with hard leather inside bartack each end. The mic tabs shall be located as follows:
 One on right chest on Facemask Pocket set even with mic tab on left chest
 One on left chest, 2" down from shoulder cap, above radio pocket
 One on left side of collar, 8.5" from collar edge

Mic Tab

Yes | No

There shall be a 1x1.5" self-fabric mic tab bartacked at each end located on the left chest between the radio pocket and stormflap even with radio pkt. The 1" x 12" self-fabric strap shall be 3" below.

Flashlight Strap

Yes | No

There shall be a 2x13" self fabric flashlite strap with 1 piece 2x3.5" hook on one end, 1 piece 2x3.5" loop on opposite end, strap to be X-stitched & tack all 4 corners of X-stitch. The strap shall be located on left handwarmer pocket, 4" from the front end and 2" above the trim.

Flashlight Strap

Yes | No

There shall be a 1" x 10" two layer self fabric flashlight strap X-stitched to shell with 1 piece 1x4" hook on one end and 1 piece 1x4" loop on other end. This strap shall be located Left chest 3" below 1" x 1.5" mic tab, as close to stormflap buckle as possible.

Flashlight Strap

Yes | No

There shall be a 1"x5.5" self fabric strap folded over 2" and then end folded up 1.25" with 1" dee hanging from loop, bartacked to shell shall be located on left handwarmer pocket, 4" from the front end and 2" above the trim.

Turn-Out Pockets

Yes | No

One 7.5" wide x 9" high x 6" deep SCBA facemask pocket shall be constructed of outer shell material and attached to the right chest, with the top of pocket next to the shoulder seam. The pocket closure shall consist of a 17" heavy duty brass zipper set on the left side of the pocket. Drainage of moisture shall be provided by brass eyelets.

Emblem

Yes | No

There shall be a 3.75"x2.25" American Flag patch sewn on the radio pocket flap

Letter Patch Attachment

Yes | No

There shall be two male snaps set on top edge of letter patch. One snap to be set 6" left of center of patch and one to be set 6" right of center of patch.

Sewn On Lettering

Yes | No

There shall be 3" lime yellow Scotchlite letters, NLVFD. sewn-on in an arch on the back yoke.

Lettering Patches

Yes | No

There shall be one 5"x18" contoured 2-layer self-fabric one-line Letter Patch attached to hang from back hem. There shall be 3" lime yellow Scotchlite letters, sewn-on for the 1st initial and last name (2" letters will be used for longer names).

LETTER PATCH ATTACHMENT: There shall be one male snap at each top corner of hanging letter patch (total of two male snaps) and two female logo snaps on the inside

of the shell to align with the male snaps. 1.5" x 18" Hook & loop shall be used to attach patch to coat.

Janesville® V-Force™ Pant w/ Belt

Pant Model / Design

Yes | No

PANT CONSTRUCTION: The pant shall have a low rise waist V-Fit™ design.

WAISTBAND: The waist of the pants shall be reinforced on the inside with 1-ply of outer shell fabric material not less than 1.5" in width. The pant waist shall be contour shaped for better comfort and hemmed to provide strength with the independent waistband, which shall then be double stitched to the outer shell.

Belts and Harnesses

Yes | No

A two inch wide KEVLAR® belt with 2" self-locking thermoplastic buckle with quick-release mechanism. There shall be three belt loops of two-layers of self fabric, 4" wide by 3.5" high shall be double stitched to pant shell and bartacked at all four corners. One loop at center back and one loop on each side.

Pant Outer Shell Material

Yes | No

The outer shell shall be constructed of +/- 7.25 oz./sq. yd. 40% PBI®/60% KEVLAR® highly constructed ripstop weave with extremely durable FPE water resistant Teflon® FPE alloy reinforced with a matrix of 600 denier filament Kevlar® cables. Color shall be black

Pant Liner & Moisture Barrier

Yes | No

THERMAL LINER: 3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to 1 layer E-89™ spunlace aramid 85%NOMEX®/15% KEVLAR® weighing approximately 2.3 oz./sq. yd. With a Teflon® finish. And 1 layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. With a Teflon® finish. (Total weight +/- 7.3 oz./sq. yd.)

MOISTURE BARRIER: NOMEX® substrate laminated to a lightweight breathable, CROSSTECH® (Type 2C), Teflon membrane; weighing 5.0 oz./sq. yd.

MOISTURE BARRIER/THERMAL LINER CONSTRUCTION: Design shall be compatible with the outer shell so that the liner does not buckle, pull, or otherwise restrict body motion. The bottom nine inches of each thermal leg shall be constructed of treated chambray facecloth with two layers of apertured (11-13 apertures/sq. inch) E-89™ spunlaced aramid to deter the wicking of moisture up the thermal liner leg. The waist of the moisture barrier/thermal liner shall be secured to the waist of the outer shell such that when donning the pant a leg may not be accidentally caught between the outer shell and its inner linings along the waist and between the legs of the pant.

Quilt Thermal Liner Construction: The moisture barrier shall be completely sewn to a Teflon® treated NOMEX® facecloth at its perimeter. The moisture barrier substrate/facecloth combination will be sewn to the quilted thermal liner at its perimeter with the breathable membrane oriented inward toward the thermal liner and away from

the outer shell. The quilted thermal liner will be oriented toward the wearer. All moisture barrier seams shall be sealed as required by NFPA 1971. The moisture barrier/thermal liner shall finish no more than 3" from the pant cuffs.

Completely Removable: The moisture barrier/thermal liner shall be completely detachable from the outer shell for ease of cleaning by using snaps and hook and loop. Eight (8) evenly spaced snaps shall secure the liner to the integral waistband; (2) snaps shall be set in leather leg tabs at each leg end and hook and loop on each side of fly facing.

Reflective Trim

Yes | No

All trim shall be sewn with four (4) rows lockstitch 301, minimum (6) stitches/inch for most secure trim attachment. Ventilated Trim shall be of 3" Scotchlite II (triple trim) of lime/yellow perforated with 0.08 mm holes (114 per square inch) to provide a conduit for the release of vapor that can occur when moisture is heated and the trim compressed. Pant trim shall be applied as follows: (1) strip set full circumference around the bottom of the cuff 3" from the bottom cuff.

Pant Liner Option

Yes | No

A piece of 1" elastic shall be sewn to thermal liner on batting side of thermal liner 2" up from bottom.

Pant Fly Closure

Yes | No

STORM FLY/CLOSURE: The outer shell shall have a sewn on overlapping fly front running the full length of the fly on the left side. The flap shall not be less than 5" wide at the waistband. The bottom of the fly shall be reinforced with one 42 stitch bartack.

The storm fly shall be held closed along its length by means of a hook and loop fastener closure 2" minimum width, along the leading edge for a distance of not less than 6" from the bottom of the fly closure to the waist area for proper alignment and secure closure. Additionally, (1) snap shall be positioned at the inside top of the fly.

The storm fly shall be outer shell material, lined with a 4" strip of CROSSTECH® (Type 2C) moisture barrier material and Semper Dri™ (3.5 oz./sq. yd. Glide™ (NOMEX® filament/spun) face cloth quilted to 1 layer E-89™ spunlace aramid 85%NOMEX®/15% KEVLAR® weighing approximately 2.3 oz./sq. yd. With a Teflon® finish. And 1 layer of apertured (11-13 apertures/sq. inch) E-89™ spunlace aramid 85% NOMEX®/15% KEVLAR® weighing approximately 1.5 oz./sq. yd. With a Teflon® finish. (Total weight +/- 7.3 oz./sq. yd.) (1377-059)) to prevent wicking.

Take Up Straps

Yes | No

There shall be a hook and dee ring shall be used for a quick one-motion closure. The hook shall be 2.5" in length, made of a zinc non-ferrous metal alloy and weigh 1.2 oz. +5%. It shall be securely fastened to the pant by means of a 5/8" wide, treated leather take-up strap looped through the rear of the buckle and triple riveted to the pant shell. The dee shall be made of a non-ferrous metal alloy 2" long x 1 1/16" wide and riveted to the fly flap with two rivets.

Take Up Straps

Yes | No

There shall be 1 pair self fabric take-ups w/ long strap 1" x 9" and short strap 1" x 3" long. Short straps have 2 each nickel loops (total 4), long strap has hook & loop.

Pant Knee Reinforcement

Yes | No

V-FIT™ KNEE: The knee shall have an insert throughout all layers that shall provide a natural bend in the leg. This knee shall include cut outs, shaped pieces, and darts to create free movement with few restrictions. The insert shall consist of black poly-coated aramid for abrasion resistance and thermal protection. For added thermal protection, an additional layer of uninterrupted 1/8" thick, fire retardant closed-cell foam shall be positioned between the moisture barrier and thermal liner. For additional extended thermal protection, two layers of uninterrupted 1/8" thick, fire retardant closed-cell foam shall be also be positioned between the reinforcement layer and outershell.

Pant Cuff Reinforcement

Yes | No

The cuff area of the pant shall be reinforced with a binding of black polymer coated aramid not less than 2" in total width for greater strength, abrasion resistance, and thermal protection. The back portion of the cuff will gradually curve upward from each side seam to a maximum of 2" at the center back of the pant leg to prevent wear on the back of the cuff

Leg Tabs

Yes | No

Two grey leather leg tabs 3/4" wide x 1 3/4" long with female snaps shall be bartacked 2" up from bottom edge on inside (1 on inseam 1 on outseam).

Turn-Out Pockets

Yes | No

Two 10" wide x 10" deep outside full bellows pockets that expand by means of side and bottom gussets to a thickness of 2" in front and back shall be located one on each thigh. Pocket shall be split 6" front and 4" back inside pocket with a Kevlar® twill divider. Pockets shall be fully lined all 4 sides inside pocket with KEVLAR® twill.

Pockets and flaps shall be set with stitch 301, seam Ssb-2 with the top and bottom pocket corners and top corners of flap reinforced with bar tacks for additional strength. Drainage of moisture to be provided by brass eyelets. Pocket flaps shall be 11"x 5". A hook and loop fastener closure system shall be set with 1"x10" loop fastener horizontally on the pocket and (3) pieces of 1"x 3" hook fastener set vertically on the underside of the flap.
