

# **GENERAL SPECIFICATIONS PROTECTIVE JACKET AND PANTS FOR STRUCTURAL FIRE FIGHTING**

## **SCOPE**

This specification details design and materials criteria to afford protection to the upper and lower body, excluding head, hands, feet, against adverse environmental effects during structural fire fighting. All materials and construction will meet or exceed NFPA Standard #1971 2013 edition.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **SUBSTITUTES TO SPECIFICATIONS**

Any and all substitutes to the specifications (where allowed) must be clearly stated for each heading in the area provided. Fire and Emergency Services **CLEARLY RESERVES** the right to determine if another means of complying (substitute) with the requirements is acceptable.

Bidders shall clearly indicate in the bid, whether they are in compliance or a substitute is requested to the specifications by placing an **X** in the appropriate **Comply** or **Exception** box after each section. Each section where the bidder fails to indicate compliance or not will automatically be counted as a substitute is requested. The bidder, if making substitutes, shall respond with a full written explanation as to why he/she is making substitutes in each case along with the details of his/her proposed solution on a separate sheet of paper, failure to do this may result in the bid being null and void.

## **COMPLIANCE GUARANTEE**

The bidder may be required to submit a sample of the items being offered.

## OUTER SHELL MATERIAL - JACKETS AND PANTS

The outer shell shall be constructed of TENCATE "**DEFENDER™ 750**" Nomex® IIIA plain weave with an approximate weight of 7.5 oz. per square yard, shall be treated with Shelltite™ water repellent finish. Color of the garments shall be either black, yellow, red, tan, royal blue, natural (off white).

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## THERMAL INSULATING LINER - JACKET AND PANTS

The thermal liner shall be constructed of 7.2 oz. per square yard TENCATE "**ARALITE® NP**"; one layer of 3.8 oz. per square yard aramid blend non-woven needle-punch batt, quilt stitched to a 3.4 oz. per square yard spun meta-aramid face cloth, teal in color, with Wickwell™ Plus finish. A 7 inch by 9 inch pocket, constructed of self material and lined with moisture barrier material, shall be affixed to the inside of the jacket thermal liner on the left side by means of a lock stitch. The thermal liner shall be attached to the moisture barrier and bound together by bias-cut neoprene coated cotton/polyester around the perimeter. This provides superior abrasion resistance to the less expensive, less durable, "stitch and turn" method. Further mention of "Thermal Liner" in this specification shall refer to this section.

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## MOISTURE BARRIER - JACKETS AND PANTS

The moisture barrier material shall be W.L.GORE "**GORE™ RT7100 Type 3D**" moisture barrier which shall be GORE PTFE on a non-woven Nomex® substrate with an approximate weight of 4.6 oz. per square yard. The GORE PTFE Type 3D moisture barrier product incorporates GORE PTFE technology, with enhanced bicomponent technology and shall be laminated to a non-woven substrate. This alternative product is intended as a thermally stable alternate to NFPA compliant polyurethane-based moisture barriers. The moisture barrier shall be sewn to the thermal liner at the edges only and bound with bias-cut neoprene-coated cotton/polyester binding. Further mention of "Specified Moisture Barrier" in this specification shall refer to this section.

OR

The moisture barrier material shall be STEDFAST (**STEDAIR® 3000**) ePTFE moisture barrier is engineered using an E-89™ substrate and BHA Technologies ePTFE membrane, with an approximate weight of 5.5 oz. per square yard. The Stedair bi-component ePTFE membrane is a combination of microporous and monolithic technologies. The moisture barrier material shall meet all moisture barrier requirements of NFPA 1971-2007 edition, which includes water penetration resistance, viral penetration resistance and common chemical penetration resistance. The moisture barrier shall be sewn to the thermal liner at the edges only and bound with bias-cut neoprene-coated cotton/polyester binding. Further mention of "Specified Moisture Barrier" in this specification shall refer to this section.

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## SEALED MOISTURE BARRIER SEAMS

All moisture barrier seams shall be sealed with a minimum 1 inch wide sealing tape. One side of the tape shall be coated with a heat activated glue adhesive. The adhesive side of the tape shall be oriented toward the moisture barrier seam. The adhesive shall be activated by heat and the sealing tape shall be applied to the moisture barrier seams by means of pressure exerted by rollers for that purpose.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## METHOD OF THERMAL LINER/MOISTURE BARRIER ATTACHMENT FOR JACKETS AND PANTS

The thermal liner and moisture barrier shall be completely removable from the jacket shell. Two strips of 5/8 inch wide FR Velcro<sup>®</sup> fastener tape shall secure the thermal liner/moisture barrier to the outer shell along the length of the neck line under the collar. **OR** using (6) dome fastener closures (snaps) built into reinforcing material panels, and spaced evenly along each side of the collar. The remainder of the thermal liner/moisture barrier shall be secured with snap fasteners appropriately spaced on each jacket facing and Ara-Shield<sup>®</sup> snap fasteners at each sleeve end. One of the Ara-shield<sup>®</sup> snap tabs shall be a different color in the liner to correspond with color coded snap tabs for ease of matching the liner system to the outer shell after inspection or cleaning is completed.

The thermal liner and moisture barrier shall be completely removable from the pant shell. Nine snap fasteners shall be spaced along the waistband to secure the thermal liner to the shell. The legs of the thermal liner/moisture barrier shall be secured to the shell by means of Ara-Shield<sup>®</sup> snap fasteners per leg. The Ara-shield<sup>®</sup> snap tabs shall be color coded to a corresponding snap tab in the liner for ease of matching the liner system to the outer shell after inspection or cleaning is completed.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## THERMAL PROTECTIVE PERFORMANCE

The assembled garment, consisting of an outer shell, moisture barrier, and thermal liner, shall exhibit a TPP (Thermal Protective Performance) rating of not less than 35.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## STITCHING

The outer shell shall be assembled using stitch type #301, #401, #514 and #516. The thermal liners and moisture barriers shall be assembled using stitch type #301, #401, #504, #514, and #516. Stitching in all seams shall be continuous. Major A outer shell structural seams, major B structural liner seams and shall have a minimum of 8 to 10 stitches per inch.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## **JACKET CONSTRUCTION**

### **BODY**

The body of the shell and liner system shall be constructed of three separate panels consisting of two front panels and one back panel. The body panels shall be shaped so as to provide a tailored fit thereby enhancing body movement and shall be joined together by double stitching with Nomex® thread.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### **DRAG RESCUE DEVICE (DRD)**

A Firefighter Drag Rescue Device shall be installed in each jacket. The ends of a 1½ inch wide strap, constructed of Kevlar®, will be sewn together to form a continuous loop. The strap will be installed in the jacket between the liner system and outer shell such that when properly installed will loop around each arm. The strap will be accessed through a portal between the shoulders on the upper back where it is secured in place by a FR Velcro® strap. The access port will be covered by an outside flap of shell material, with beveled corners designed to fit between the shoulder straps of an SCBA. The flap will have a NFPA-compliant 3M Scotchlite™ reflective logo patch sewn to the outside to clearly identify the feature as the DRD (Drag Rescue Device). The DRD shall not extend beyond the outside flap. This device provides a quickly deployed means of rescuing a downed firefighter. Flimsy, rope-style DRD straps will not be considered.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### **LINER ACCESS OPENING - JACKET**

The thermal liner and moisture barrier shall be completely removable from the jacket shell. Two strips of ½ inch wide FR Velcro® hook and loop fastener tape shall secure the thermal liner/moisture barrier to the outer shell along the length of the neckline under the collar. This opening shall run the full length of the collar for the purpose of inspecting the inner surfaces of the jacket liner system. The remainder of the thermal liner/moisture barrier shall be secured with a minimum of four snap fasteners appropriately spaced on each jacket facing and four Ara-Shield® snap fasteners at each sleeve end. The outside perimeter of the liner moisture barrier and thermal liner layers shall be bound together along the side and bottom edges with a bias-cut Neoprene coated cotton/polyester binding for a finished appearance that prevents fraying and wicking of contaminants. Stitching used to secure the thermal liner and moisture barrier in place of the Neoprene shall not be considered since stitching is not able to provide the same level of abrasion resistance.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## SIZING

The jacket length shall be measured from the juncture of the collar and back panel to the hem of the jacket and shall measure 32 inches long.

The jacket shall be available in even size chest measurements of two-inch increments, and shall range from a small size of 30 to a large size of 68. Generalized sizing, such as small, medium, large, etc., will not be considered acceptable. Sizing specifically for women shall also be available.

\_\_\_\_\_ Comply      \_\_\_\_\_ Exception

## RETROREFLECTIVE FLUORESCENT TRIM

The retro reflective fluorescent trim shall be lime/yellow 3M Scotchlite™ Triple Trim (L/Y borders with silver center). OR red/orange 3M Scotchlite™ Triple Trim (R/O borders with silver center).

Each jacket shall have an adequate amount of retro reflective fluorescent trim affixed to the outside of the outer shell to meet the requirements of NFPA #1971 and OSHA. The trim shall be in the following widths and shall be **NFPA Basic 3 style**; 3 inch wide stripes - around each sleeve below the elbow, around the bottom of the jacket within approximately 1 inch of the hem, and around the back and chest area approximately 3 inches below the armpit.

NOTE: Any trim installed must comply with the NFPA 2013 Stored Energy Test

\_\_\_\_\_ Comply      \_\_\_\_\_ Exception

## COLLAR & FREE HANGING THROAT TAB

The collar shall consist of a four-layer construction and be of two-piece design. The outer layers shall consist of outer shell material on the outside and on the inside. There shall be a layer of specified moisture barrier and a layer of Nomex® pajama check material sandwiched in between (see Moisture Barrier section). The rear inside ply of Nomex® pajama check shall be sewn to the collar's back layer of outer shell at the edges only. The forward inside ply of moisture barrier shall be sewn to the inside of the collar at the edges only. The multi-layered configuration shall provide protection from water and other hazardous elements. The collar shall be a minimum of 3 inches high and graded to size. The leading edges of the collar shall extend up evenly from the leading edges of the jacket front body panels so that no gap occurs at the throat area. The collar's back layers of outer shell and moisture barrier shall be joined to the body panels with two rows of stitching. Inside the collar, above the rear seam where it is joined to the shell shall be a strip of 5/8 inch wide FR Velcro® loop fastener tape running the full length of the collar. The collar's front layers of moisture barrier and outer shell shall have an additional strip of 5/8 inch wide FR Velcro® hook fastener tape stitched to the inside lower edge and running the full length of the collar. These two inside strips of 5/8 inch wide FR Velcro® fastener tape sewn to the underside of the collar shall engage corresponding pieces of FR Velcro® fastener tape on the neck extension of the liner system.

A self material fabric hanger loop shall be sewn at the top of collar.

The throat tab shall be a scoop type design and constructed of two plies of outer shell material with two center plies of moisture barrier material. The throat tab shall measure not less than 2½ inches wide at the center tapering to 2 inches at each end with a total length of approximately 7½ inches. The throat tab will be attached to the right side of the collar by a 1 inch wide by 1½ inch long piece of Nomex®. The throat tab shall be secured in the closed and stowed position with FR Velcro® hook and loop fastener tape. The FR Velcro® hook and loop fastener tape shall be oriented to prevent exposure to the environment when the throat tab is in the closed position. A 1½ inch by 3 inch piece of FR Velcro® loop fastener tape shall be sewn horizontally to the inside leading end of the throat tab and a 1½ inch by 3 inch piece of FR Velcro® hook fastener tape shall be sewn horizontally to the opposite end of the throat tab. A corresponding piece of FR Velcro® hook fastener tape measuring 1½ inches by 3 inches shall be sewn horizontally to the leading outside edge of the collar on the left side, for attachment and adjustment when in the closed position and wearing a breathing apparatus mask. The collar closure strap shall fold in half for storage with the FR Velcro® loop fastener tape engaging the FR Velcro® hook fastener tape.

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## **JACKET FRONT**

The jacket shall incorporate separate facings to ensure there is no interruption in thermal or moisture protection in the front closure area. The facings shall measure approximately 3 inches wide, extend from collar to hem, and be double stitched to the underside of the outer shell at the leading edges of the front body panels. A breathable moisture barrier material shall be sewn to the jacket facings and configured such that it is sandwiched between the jacket facing and the inside of the respective body panel. The breathable film side shall face inward to protect it. There shall be wicking barrier constructed of previously specified moisture barrier material installed on the front closure system on the left and right side directly below the front facings to ensure continuous protection and overlap. The thermal liner and moisture barrier assembly shall be attached to the jacket facings by means of snap fasteners.

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## **STORM FLAP**

A rectangular storm flap measuring approximately 3 inches (6 inches for hook and dee inside/FR Velcro® outside closure; aka #7C) wide and a minimum of 23 inches long (based on a 32" jacket) shall be centered over the left and right body panels to ensure there is no interruption in thermal or moisture protection in the front of the jacket. The outside storm flap shall be constructed of two plies of outer shell material with a center ply of breathable moisture barrier material. The outside storm flap shall be double stitched to the right side body panel and shall be reinforced at the top and bottom with bartacks.

\_\_\_\_\_ Comply                      \_\_\_\_\_ Exception

## **STORM FLAP AND JACKET FRONT CLOSURE SYSTEM**

The jacket shall be closed by means of a 22 inch size #10 heavy duty brass zipper on the jacket fronts and FR Velcro® hook and loop fastener tape on the storm flap. The teeth of the zipper shall be mounted on black Nomex® tape and shall be sewn into the respective jacket facings. The storm flap shall close over the left and right jacket body panels and shall be secured with FR Velcro® hook and loop fastener tape. A 1½ inch by 24 inch piece of FR Velcro® loop fastener tape shall be installed along the leading edge of the storm flap on the underside with four rows of stitching. A corresponding 1½ inch by 23 inch piece of FR Velcro® hook fastener tape shall be sewn with four rows of stitching to the front body panel and positioned to engage the loop fastener tape when the storm flap is closed over the front of the jacket.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## **OR**

FR Velcro® hook and loop fastener tape on the jacket fronts and inward facing hook and dee rings on the storm flap. A 1½ inch by 23 inch piece of FR Velcro® hook fastener tape shall be sewn to the leading edge of the right jacket front body panel on the outside with four rows of stitching. A corresponding 1½ inch by 23 inch piece of FR Velcro® loop fastener tape shall be sewn with four rows of stitching to the leading edge of the left jacket facing on the underside and shall be positioned to engage the hook fastener tape when the jacket is closed. The storm flap shall close over the left and right jacket halves and shall be secured by means of four non-ferrous inward facing hook and dee rings. The dee rings shall be secured to the leading edge of the storm flap with two rivets. The rivets shall be reinforced on the underside of the storm flap with leather. Four inward facing hooks shall be attached to the left front body panel with three rivets per hook. The rivets shall be reinforced on the inside of the body panel with a single circular piece of leather on each hook. The inward facing hooks shall be positioned in such a manner that they engage the dee rings when the storm flap is closed over the front of the jacket.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## **DUAL ACTION POCKETS**

Each jacket will be equipped with two pockets: one on the left side and one on the right side. The pockets shall be located at the bottom of the jacket near the storm flap and be double stitched to the respective body panels. The lower pocket corners shall be stitched in such a way that a small diagonal opening is left for complete water drainage. The lower half of the pocket shall be reinforced with an additional layer of safety material on the inside. The pockets shall measure 9 inches wide by 9 inches high and be accessed from the top. Each pocket will be constructed with a two pleats installed vertically for the full height of the pocket to provide expansion capability. The pocket flaps shall be rectangular in shape, constructed of two layers of outer shell material, and shall measure 3 inches deep and ½ inch wider than the pocket. A piece of 1½ inch by 3-inch FR Velcro® hook and loop fastener tape shall secure each flap in the closed position. The upper pocket corners and pocket flaps shall be reinforced with bartacks.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## SLEEVES

The sleeves shall be of two-panel construction, contoured, and of set in design. The outer and under sleeve panels shall be double stitched together with Nomex<sup>®</sup> thread. The sleeves shall be contoured (curved) to follow the natural shape of the human arm unlike straight, tubular sleeve configurations. An underarm gusset shall be incorporated between the underside of the sleeve and the body of the jacket, and shall be used in all layers of the garment (shell, moisture barrier, and thermal liner). The underarm gusset shall measure approximately 5 inches wide by 17 inches long (all layers) and graded to size, beginning at the front of the armpit and terminating approximately three inches from the top of the back of the shoulder, and shall provide for a high degree of uninhibited arm and shoulder movement.

\_\_\_\_\_ Comply          \_\_\_\_\_ Exception

## SLEEVE CUFF REINFORCEMENTS

The sleeve cuffs shall be reinforced with gray suede leather.

The cuff reinforcements shall not be less than 2 inch in width and folded in half, approximately one half inside and one half outside the sleeve end for greater strength and abrasion resistance. The cuff reinforcement shall be double stitched to the sleeve end; a single row of stitching shall be considered unacceptable. This independent cuff provides an additional layer of protection as compared to a turned and stitched cuff. Jackets finished with a turned and stitched cuff do not provide the same level of abrasion resistance and will be considered unacceptable.

\_\_\_\_\_ Comply          \_\_\_\_\_ Exception

## WRISTLETS / SLEEVE WELLS

Each jacket shall be equipped with **Nomex<sup>®</sup> hand and wrist guards** (over the hand) not less than 7 inches in length and of double thickness. A separate thumbhole with an approximate diameter of 2 inches shall be recessed approximately 1 inch from the leading edge. Nomex<sup>®</sup> knit is constructed of 96% Nomex<sup>®</sup> and 4% Spandex for shape retention. The color of the wristlets shall be white, grey.

The wristlets shall be sewn to flame resistant neoprene coated cotton/polyester impermeable barrier material, which in turn shall be sewn to the inside of the sleeve shell approximately five inches from the sleeve cuff. This sleeve well configuration serves to prevent water and other hazardous elements from entering the sleeves when the arms are raised. The neoprene barrier material shall also line the inside of the sleeve shell from the cuff to a point approximately five inches up, where it joins the sleeve well and is double stitched to the shell. Four Ara-shield<sup>®</sup> snap tabs will be sewn into the juncture of the sleeve well and wristlet. The tabs will be spaced equidistant from each other and shall be fitted with female snap fasteners to accommodate corresponding male snaps in the liner sleeves. One of the Ara-shield<sup>®</sup> snap tabs shall be a different color in the liner to correspond with color coded snap tabs for ease of matching the liner system to the outer shell after inspection or cleaning is completed. This configuration will ensure there is no interruption in protection between the sleeve liner and wristlet.

\_\_\_\_\_ Comply          \_\_\_\_\_ Exception



## **LINER SHOULDER THERMAL ENHANCEMENT**

A minimum of one additional layer of thermal liner material shall be used to increase thermal insulation in the shoulder area of the liner system. This thermal enhancement layer shall drape over the top of each shoulder extending from the collar to the sleeve/shoulder seam, down the front approximately 2 inches from the juncture of the collar down the back to a depth of 2 inches to provide greater CCHR protection in this high compression area. The upper back, front and shoulder thermal enhancement layers shall be sandwiched between the thermal liner and moisture barrier layers of the liner system and shall be stitched to the thermal liner layer only. The thermal enhancement layer shall have finished edges by means of overedging. Raw or unfinished edges shall be considered unacceptable. Thermal scraps shall not be substituted for full-cut fabric padding. Smaller CCHR reinforcements shall not be considered acceptable since they provide far less area of coverage.

\_\_\_\_\_Comply      \_\_\_\_\_Exception

## **RADIO POCKET**

Each jacket shall have a pocket designed for the storage of a portable radio. This pocket shall be of box type construction, double stitched to the jacket and shall have one drainage eyelet in the bottom of the pocket. The pocket flap shall be constructed of two layers of outer shell material measuring approximately 5 inches deep and ¼ inch wider than the pocket. The pocket flap shall be closed by means of FR Velcro® fastener tape. A 1½ inch by 3 inch piece of FR Velcro® hook fastener tape shall be installed vertically on the inside of the pocket flap beginning at the center of the bottom of the flap. A 1½ inch by 3 inch piece of FR Velcro® loop fastener tape shall be installed horizontally on the outside of the pocket near the top center and positioned to engage the hook fastener tape. In addition, the entire inside of the pocket shall be lined with neoprene coated cotton/polyester impermeable barrier material to ensure that the radio is protected from the elements. The impermeable barrier material shall also be sandwiched between the two layers of outer shell material in the pocket flap for added protection. The radio pocket shall measure approximately 3 inches deep by 3.5 inches wide by 9 inches high and shall be installed on the left chest. OR it can be custom sized for the purchasing fire departments radio.

\_\_\_\_\_Comply      \_\_\_\_\_Exception

## **MICROPHONE STRAP**

A strap shall be constructed to hold a microphone for a portable radio. It shall be sewn to the jacket at the ends only. The size of the microphone strap shall be 1 inch x 3 inches.

The microphone strap shall be mounted above the radio pocket and shall be constructed of double layer outer shell material.

\_\_\_\_\_Comply      \_\_\_\_\_Exception

#### **FLASHLIGHT CLIP & VELCRO STRAP:**

There will be an inverted snap-hook that is built into the right side of the chest. It will be held by a piece of reinforcement material measuring approximately 3 ½" long by 1" wide (88 mm x 25 mm), folded in two with the snap hook in the middle, and held in place with rivets and bar tacks. The ring of the flashlight connects to the snap hook.

Underneath the snap-hook is a strap built from outer shell and reinforcement material. The strap wraps around the flashlight and utilises hook and pile closures to keep the flashlight flush against the coat and prevent it from moving. It measures approximately 8 ½" finished (213 mm), and is sewn at its centre point to the outer shell.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

#### **EMBROIDERED CANADIAN FLAG**

Each jacket shall have a Nomex<sup>®</sup> embroidered Canadian flag that measures approximately 2½ inches high by 3½ inches wide installed on the left sleeve. Flags made of fabric other than Nomex<sup>®</sup> shall be considered unacceptable.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### ***PANT CONSTRUCTION***

#### **BODY**

The body of the shell shall be constructed of four separate body panels consisting of two front panels and two back panels. The body panels shall be shaped so as to provide a tailored fit, thereby enhancing body movement, and shall be joined together by double stitching with Nomex<sup>®</sup> thread. The body panels and seam lengths shall be graded to size to assure accurate fit in a broad range of sizes.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **LINER ACCESS OPENING (PANT)**

The combined moisture barrier and the thermal liner shall be completely removable for the pant. The thermal liner and moisture barrier layers of the liner system shall be stitched together and bound around the cuffs, but each layer will be individually bound at the top of the waist. The binding shall be of Bias-Cut neoprene coated cotton/polyester material for a finished appearance that prevents fraying and wicking of contaminants. The thermal liner and moisture barrier layers are attached at the waist band with a snap one either side and one center snap. Additionally, there shall be four independent snap tabs that secure the moisture barrier layer to the shell to prevent any gapping. The bottom of the liner fly opening shall have a reinforcement of black Nomex<sup>®</sup> Twill which serves to prevent the liner from tearing in this area which is highly stressed as a result of the constant donning and doffing of the pants.

The liner system of the pant shall incorporate a full length opening along the entire waistline for ease in inspecting the inner layers as well as performing the complete Liner Inspection. The thermal liner and moisture barrier shall be individually bound with a neoprene coated bias cut tape, and joined together with a snap at the center back. There shall be a minimum of 4 snap tabs sewn to the underside of the waistband, with corresponding snaps in the moisture barrier layer to secure the barrier to the shell. As described previously, the pant thermal layer snaps directly to the independent waistband by means of nine snap fasteners.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## **SIZING**

The pants shall be available in even size waist measurements of two inch increments and shall be available in a range of sizes from 24 to 68. The pant inseam measurement shall be available in two inch increments. Generalized sizing, such as small, medium, large, etc., will not be considered acceptable. Sizing specifically for women shall also be available.

\_\_\_\_\_Comply          \_\_\_\_\_Exception

## **RETROREFLECTIVE FLUORESCENT TRIM**

The pants shall have a stripe of retroreflective fluorescent trim encircling each leg below the knee to comply with the requirements of NFPA #1971 in 3 inch lime/yellow 3M Scotchlite<sup>™</sup> Triple Trim (L/Y borders with silver center). OR 3 inch red/orange 3M Scotchlite<sup>™</sup> Triple Trim (R/O borders with silver center). Bottom of trim band shall be located approximately 3" above cuff.

\_\_\_\_\_Comply          \_\_\_\_\_Exception\

## WAISTBAND

The waist area of the pants shall be reinforced on the inside with a separate piece of black aramid outer shell material not less than two inches in width. Neoprene coated cotton/polyester impermeable barrier shall be sewn to the back of the waistband as a reinforcement. The top edge of the waistband reinforcement shall be double stitched to the outer shell at the top of the pants. The lower edge of the waistband shall be serged and unattached to the shell to accept the thermal liner and moisture barrier. The top of the thermal liner and moisture barrier shall be secured to the underside of the waistband reinforcement so as to be sandwiched between the waistband reinforcement and outer shell to reduce the possibility of liner detachment while donning and to avoid pass through of snaps from the outer shell to the inner liner.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## TAKE UP STRAPS

The pants shall be equipped with two take up straps. The straps shall be constructed of 1 inch wide black Aramid twill and be positioned in the waist area on the outside of the garment; one on each side. Each take up strap shall be comprised of two sub-component straps. The rear strap component shall be constructed of black twill Nomex®. The rear strap shall measure 1 inch wide and 4 inches long, folded back to form a loop, and shall be bartacked to the pants. The loop shall hold a high temp thermoplastic buckle. The buckle shall point toward the front. The front strap component shall measure 1 inch wide by approximately 9 inches long (finished dimension). One end shall be folded back on itself to form a loop. A high temp thermoplastic slide fastener shall be captured within the loop. The front strap component shall be inserted through the buckle on the rear strap component, back through the slide fastener, and the end shall be bartacked to the pants. A pull-tab of 1 inch black Aramid twill shall be affixed to the slide fastener. The take up strap pull-tabs shall pull toward the front to tighten. This shall allow for approximately 4 inches of adjustment per strap (8 inches overall).

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## PANT CLOSURE SYSTEM

The exterior primary positive locking closure shall be an inward facing metal safety hook and dee ring. The safety hook shall be attached to a leather strap that is triple riveted to the right front body panel in the waist area. A leather backed dee ring shall be riveted to the leading edge of the fly flap near the top. The snap hook shall engage the dee ring located on the fly flap when in the closed position.

The internal fly flap closure shall consist of 1½ inch wide by full-length FR Velcro® hook and loop fastener tape. The FR Velcro® loop portion shall be sewn with four rows of stitching to the inside of the leading edge of the external fly flap. The corresponding portion of FR Velcro® hook fastener tape shall be sewn with four rows of stitching to the right front body panel positioned to engage the loop portion when the external fly flap is in the closed position.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **EXTERNAL / INTERNAL FLY FLAP**

The fly flap shall be constructed of two pieces of outer shell material. A center ply of specified moisture barrier shall be sandwiched between the two outer shell pieces. The fly flap shall be double stitched to the left front body panel beginning at the waist and extending down to a depth of approximately 11 inches. The fly flap shall be approximately 6 inches wide at the top, tapering to approximately 1 inch in width at the crotch where it will be further reinforced with a bartack. A leather backed dee ring shall be riveted to the leading edge of the fly flap at the top and shall be positioned to engage the safety hook on the take-up strap when the fly flap is in the closed position.

An internal fly flap constructed of one ply of outer shell material, thermal liner and specified moisture barrier, measuring approximately 2 inches wide by 11 inches long, shall be sewn to the leading edge of the right front body panel in the fly area. The thermal liner and moisture barrier of the internal fly shall extend approximately 7 inches horizontally from the leading edge of the fly flap and will follow the shape of the outside large fly flap. The action of the external fly flap overlapping the internal fly flap lined with thermal liner and moisture barrier will ensure there is no interruption in protection.

Appropriate male and female snap fastener halves shall be installed at the leading edge of the waistband for the purpose of further securing the pants in the closed position.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **LINER KNEE THERMAL ENHANCEMENT**

A minimum of one additional layer of specified thermal liner and one additional layer of moisture barrier material, measuring a minimum of 7 inches by 10 inches, will be sewn to the knee area of the liner system for added CCHR protection and increased thermal insulation in this high compression area. The knee thermal enhancement layers shall be sandwiched between the thermal liner and moisture barrier layers of the liner system and shall be stitched to the thermal liner layer only. The thermal enhancement layer shall have finished edges by means of overedging. Raw or unfinished edges shall be considered unacceptable. Thermal scraps shall not be substituted for full-cut fabric padding. Smaller CCHR reinforcements shall not be considered acceptable since they provide far less area of coverage.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **KNEE REINFORCEMENTS**

The knee area shall be reinforced with gray Ara-Shield® material.

The knee reinforcement shall be centered on the leg to insure proper coverage when bending, kneeling and crawling. The knee reinforcements shall measure 9 inches wide by 12 inches high and shall be double stitched to the outside of the outer shell in the knee area for greater strength and abrasion resistance. Knee reinforcements of a smaller size do not provide the same protective coverage and shall be considered unacceptable.

The lower edge of the Ara-Shield® knee reinforcement shall be turned under so that the lower row of stitching is covered and protected from abrasion.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **EXPANSION POCKETS**

An expansion pocket, measuring approximately 2 inches deep by 10 inches wide by 10 inches high shall be double stitched to the side of each leg straddling the out-seam above the knee and positioned to provide accessibility. The lower half of each expansion pocket shall be reinforced with a layer of outer shell material on the inside. Two rust resistant metal drain eyelets shall be installed on the underside of each expansion pocket to facilitate drainage of water. The pocket flaps shall be rectangular in shape, constructed of two layers of outer shell material and shall measure 3 inches deeper than the pocket expansion and ½ inch wider than the pocket. The pocket flaps shall be closed by means of FR Velcro® hook and loop fastener tape. Two pieces of 1½ inch by 3 inch FR Velcro® hook fastener tape shall be installed vertically on the inside of each pocket flap (one piece on each end). Two corresponding pieces of 1½ inch by 3 inch FR Velcro® loop fastener tape shall be installed horizontally on the outside of each pocket near the top (one piece on each end) and positioned to engage the hook fastener tape.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **EXPANSION POCKET REINFORCEMENTS**

The lower half of the expansion pockets shall be reinforced on the outside with gray suede leather.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **PANT CUFF REINFORCEMENTS**

The cuff area of the pants shall be reinforced with gray suede leather.

The cuff reinforcement shall not be less than 1 inch in width and folded in half, approximately one half inside and one half outside the end of the legs for greater strength and abrasion resistance. The cuff reinforcement shall be double stitched to the outer shell for a minimum of two rows of stitching. This independent cuff provides an additional layer of protection over a hemmed cuff. Pants that are turned and stitched at the cuff, as opposed to independent cuff reinforcement, do not provide the same level of abrasion resistance and shall be considered unacceptable.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **PADDED RIP-CORD SUSPENDERS & ATTACHMENT**

On the inside waistband shall be attachments for the standard "H" style "Padded Rip-Cord" suspenders. There will be four attachments total – 2 front, 2 back. The suspender attachments shall be constructed of a double layer of black aramid measuring approximately ½ inch wide by 3-inches long. They shall be sewn in a horizontal position on the ends only to form a loop. The appearance will be much like a horizontal belt loop to capture the suspender ends.

A pair of "H" style "Padded Rip-Cord" suspenders shall be specially configured for use with the pants. The main body of the suspenders shall be constructed of 2 inch wide black webbing straps. The suspenders shall run over each shoulder to a point approximately shoulder blade high on the back, where they shall be joined by a 2 inch wide horizontal piece of webbing measuring approximately 8-inches long, forming the "H". This shall prevent the suspenders from slipping off the shoulders. The shoulder area of the suspenders will be padded for comfort by fully encasing the webbing with aramid batting and wrap-around black aramid.

The rear ends of the suspenders will be sewn to 2-inch wide elasticized webbing extensions measuring approximately 8-inches in length and terminating with thermoplastic loops. The forward ends of the suspender straps shall be equipped with specially configured black powder coat non-slip metal slides with teeth. Through the metal slides will be the 9 inch lengths of strap webbing "Rip-Cords" terminating with thermoplastic loops on each end. Pulling on the "Rip-Cords" shall allow for quick adjustment of the suspenders.

Threaded through and attached to the thermoplastic loops on the forward and rear ends of the suspenders will be black aramid suspender attachments incorporating two snap fasteners. The aramid suspender attachments are to be threaded through the suspender attachment loops on the inside waistband of the pants. The aramid suspender attachments will then fold over and attach to themselves securing the suspender to the pants.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

## **REVERSE BOOT CUT**

The outer shell pant leg cuffs will be constructed such that the back of the leg is approximately 1 inch shorter than the front. The liner will also have a reverse boot cut at the rear of the cuff and a concave cut at the front to keep the liner from hanging below the shell. This construction feature will minimize the chance of premature wear of the cuffs and injuries due to falls as a result of "walking" on the pant cuffs. Pants that have "cut-outs" in the back panel rather than a contoured boot cut shall be considered unacceptable.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### **THIRD PARTY TESTING AND LISTING PROGRAM**

All components used in the construction of these garments shall be tested for compliance to NFPA Standard #1971 by Underwriters Laboratories (UL). Underwriters Laboratories shall certify and list compliance to that standard. Such certification shall be denoted by the Underwriters Laboratories certification label.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### **LABELS**

Appropriate warning label(s) shall be permanently affixed to each garment. Additionally, the label(s) shall include the following information.

Compliance to NFPA Standard #1971  
Underwriters Laboratories classified mark  
Manufacturer's name  
Manufacturer's address  
Manufacturer's garment identification number  
Date of manufacture  
Size

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

### **WARRANTY:**

The manufacturer shall warrant these jackets and pants to be free from defects in materials and workmanship for their serviceable life when properly used and cared for.

\_\_\_\_\_Comply                      \_\_\_\_\_Exception

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