

# TECHNICAL DATA

## GARMENT REQUIREMENTS NFPA 1971, 2018 EDITION

New or Revised requirements are indicated by an \* and the revision text is bolded

| ITEM  | PERFORMANCE REQUIREMENT  |
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| TPP (thermal protective performance)  | Minimum 35   |
| Tear Resistance   | Shell – 100N (22 lbs.)<br>Thermal – 22N (5 lbs.)<br>Moisture barrier – 22N (5 lbs.)  |
| Zippers   | Crosswise breaking strength of chain and of separating unit; holding strength of stop, retainers and separating units; operating force and slider lock strength requirements as per A-A-55634A, <i>Commercial Item Description, Zippers (Fasteners, Slide, Interlocking)</i>   |
| Fastener Tape   | Breaking strength, shear strength, and peel strength requirements as per A-A 55126B, <i>Commercial Item Description, Fastener Tapes, Hook and Loop, Synthetic.</i>   |
| Seam Breaking Strength  | Major A = 667N (150 lbs.)<br>Major B = 334N (75 lbs.)<br>Minor = 180N (40 lbs.)<br>Knit wristlet seams = 181N (41 lbs)   |
| Heat and Thermal Shrinkage, excluding hook & pile fasteners when body contact not possible.   | Test is at 500°F for 5 minutes with no melting, separation, or ignition; Hardware to remain functional;<br>Maximum shrinkage 10% in any direction;<br>Moisture barrier seams shall not drip or ignite;<br>Outer shell shall not char;<br>Hardware to remain functional and not ignite  |
| Thread  | Thread Melting Test at 500F for 5 minutes  |
| Flame Test on all Textiles, excepting elastic, hook and pile fasteners, zippers, and seam seal materials when body contact is possible and labels on garment interior | 12 second direct flame exposure – item must self extinguish within 2 seconds. Maximum char length of 1”; afterflame of no more than 2 seconds and no melting or dripping; Harnesses, escape and ladder belts must meet requirement when they penetrate outer shell, are incorporated into closure system, or attached to garment |
| Metal Hardware  | 20 hr. test; no corrosion of base metal & must remain functional   |
| Labels  | Legibility after 5 wash/dry cycles; Must use brand names on labels (no generic fibers)   |
| *Outer Shell Water Absorption   | 15% or less ( <b>formerly 30% or less</b> )  |

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| Water Penetration Resistance                                       | Barrier layer minimum resistance of 25 psi  |
| *Liquid Penetration Resistance                                     | Barrier & seams tested against 6 common liquids for 1 hr: AAAF, battery acid, hydraulic fluid, fuel, Swimming pool chlorine, <b>antifreeze fluid</b>  |
| Viral Penetration Resistance                                       | Barrier and seams; 1 hr against Phi-X-174 Bacteriophage   |
| *Whole Garment Liquid Penetration Test                             | 3 complete garments for each closure; Tested as received; <b>10 min. test</b> ; Proximity tests one garment for each closure if design is same as structural. <b>1 of 3 specimens allowed to exhibit maximum leakage of 3.1 in<sup>2</sup></b> on absorptive garment (formerly 20 minute test, no leakage whatsoever) |
| Conductive, compressive, heat resistance                           | Shoulders tested at 2psi; knees at 9 psi; 25 seconds until 2 <sup>nd</sup> degree burn. Reported as pass/fail   |
| Light Degradation Resistance                                       | Barrier layer only tested; no surface water after exposure  |
| DRD Fabrics, Seams, Splices  | Minimum 1,573 lbs   |
| DRD Function Test  | Deployment time, mannequin distance drag, SCBA not ride up on mannequin   |
| <b>ADDITIONAL PERFORMANCE REQUIREMENTS FOR STRUCTURAL GARMENTS</b> |   |
| Outer shell break strength   | 140 lbs. structural; no requirement for proximity   |
| Cleaning Shrinkage   | Maximum 5%  |
| THL (Total Heat Loss)  | 205 W/M <sup>2</sup> for structural; no THL requirement on proximity gear   |
| Transmitted and Stored Thermal Energy Test                         | Enhancements sewn to coat sleeves tested for stored energy; minimum time to second degree burn 130 seconds; Proximity does not require stored energy testing  |
| Garment Trim   | Coefficient of retro-reflectivity minimum 100 cd/lux and fluorescent red, yellow-green or orange-red; Proximity specifically prohibits trim   |
| <b>ADDITIONAL PERFORMANCE REQUIREMENTS FOR PROXIMITY GARMENTS</b>  |   |
| Radiant Protective Performance                                     | Intersect time of not less than 20 seconds  |
| Wet Flex   | No requirement in structural; Proximity shells must show no sign of cracking or delamination to fabric face   |
| *Adhesion After Wet Flex   | No requirement in structural; Proximity shells must show no sign of separation of coating, cannot have laminated from base fabric or <b>show removal of surface coating</b>   |
| Flex at Low Temperatures   | No requirement in structural; Proximity shells must show no sign of breaking, shattering or cracking of coating, laminate or fabric   |
| Resistance to High Temperature Blocking                            | No requirement in structural; Proximity shells must show no sign of blocking  |
| <b>ITEM</b>  | <b>DESIGN REQUIREMENT</b>   |
| Garment Composite  | Outer shell, thermal liner, & moisture barrier; either single or multiple layers  |
| *Liner System  | Required to have thermal & moisture barrier & means to secure to shell. <b>Must have access opening</b>   |
| Liner Attachment   | Means of securing liner to shell; No more than 1" between liner system and coats sleeves or pant legs and no expandable attachments   |
| Liner Coverage   | Extend to neckline of coats, waistline of pants, within 1" of coat cuffs, and within 3" of hems on coats and pants.   |
| Garments & Closure Systems   | Must provide continuous moisture & thermal protection; Secured with positive fasteners (hooks & dees or zippers). Hook & loop is considered a non-positive closure and as such can only be used as supplemental to the positive closure.  |
| Collar   | Minimum 3" in height, consisting of shell, thermal and moisture barrier or materials meeting those requirements; must have closure system.  |

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| Sleeves                                   | Liner 1" from cuff, Must have close fitting wristlet  |
| Hardware                                  | Free of rough spots, burrs, or sharp edges; Inward facing hooks w/3 attachment points; Cannot penetrate through all three layers unless covered   |
| Sewing Thread                             | Inherently flame resistant  |
| Cargo Pockets                             | Means of drainage and flaps with closure  |
| Metallic Closure Systems/Metal Components | Shall not contact body; unless covered by closure flap  |
| Harnesses, ladder belts and escape belts  | When these penetrate shell, are part of closure system, or are attached to garment, must meet NFPA 1983 and optional flame resistance requirements of that standard   |
| Sizing                                    | <ul style="list-style-type: none"> <li>• Male &amp; female patterns</li> <li>• Chest Men 34-60; Female 28-50 in 2" increments or to order</li> <li>• Sleeves M: 32-38; F: 28-34 in 1: increments or to order</li> <li>• Waist M: 30-60; F: 28-50 in 2" increments or to order</li> <li>• Lengths M: 26-36; F: 24-34 in 2" increments or to order</li> </ul> |
| Drag Rescue Device Required in Coats      | Accessible from exterior of coat; able to be deployed with gloved hand while wearing SCBA; designed to prevent accidental deployment and such that incapacitated fire fighter is secured by the upper torso so DRD pulls on body and not only garment.  |
| Coats Required to Have Wristlet           | Permanently attached and designed so as not to allow any gap in thermal protection. Wristlet fabric tested for flame, heat resistance, and for cleaning and thermal shrinkage. Additionally, wristlets must have a TPP value of 20, and knit wristlets must have a burst strength of not less than 51 lbs.  |
| Reinforcements                            | Must meet all flame and heat requirements of standard; Proximity specifically prohibits non reflective reinforcements, with the exception of 1" cuffs at coat and pant hems.  |

**ADDITIONAL DESIGN REQUIREMENTS FOR STRUCTURAL GARMENTS**

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| Trim | Retroreflective & fluorescent trim in stated placements and must appear to be continuous; must be minimum 2" wide; retroreflective surface at least 5/8" wide with a minimum fluorescent surface of 50 mm <sup>2</sup> . Gaps not to exceed 1" allowed on coat inner sleeve and pant inseams or wherever there is a zipper. No vertical stripes on coat fronts. Proximity specifically prohibits trim |
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**ADDITIONAL DESIGN REQUIREMENTS FOR PROXIMITY GARMENTS**

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| Collar         | Same as structural except that collar lining shall not be reflective.  |
| Reinforcements | Must meet all flame and heat requirements of standard; Proximity specifically prohibits non reflective reinforcements, with the exception of 1" cuffs at coat and pant hems. |

**OPTIONAL PERFORMANCE REQUIREMENTS FOR PROTECTION FROM LIQUID AND PARTICULATE CONTAMINANTS**

The entire protective ensemble (helmet, hood, SCBA, coat, glove, pant, and footwear shall be tested for overall particulate inward leakage and show no visual particulate inward leakage. Label must state brand names of all elements used for certification.

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