FORTY YEARS OF PROTECTION 1976-2016

Kappler®

APRIL 2016

Kappler®

Know What You're Getting Into.®

Table of Contents

The Sign Says Danger. The Suit Says Kappler.

Relax.

It takes a lot of confidence to put your brand on a gas-tight suit. It's a promise of protection we don't take lightly. But from chemical-flash garments to biohazard coveralls, we're the first to tell you:

It's not just the suit.

It's knowing it's the right suit, made from the right fabric, with the right seam. With test data that confirms all of the above. It's also knowing something about the people behind the technology that makes the protection possible in the first place.

For forty years Kappler has defined an entire industry with patented technology and proven garment designs. And we've built a reputation for quality, innovation and straightforward advice on what to wear. Today more than ever, the Kappler brand on your protective garment means you always know what you're getting into.

K40
FORTY YEARS
OF PROTECTION 1976-2016

Forty Years
Of Protective Technology

When George Kappler founded Kappler, Inc. on April 1, 1976, there were eight employees and six sewing machines. Today, the company is a respected global leader in chemical protective apparel. With George as Chairman of the Board and daughter Laura Kappler-Roberts serving as President and CEO, Kappler continues to grow as the industry's technology leader.

During a challenging period in the early days, company founder George Kappler wanted employees to guard against complacency. As a reminder to stay focused, he posted a sign that said "The Wolf Is Always At The Door." Over the years the wolf became an unofficial mascot for the company, appearing on Christmas cards and other company items. Much like the wolf itself, Kappler has overcome various threats to not only survive, but thrive. Known for its intelligence and survival instinct, the wolf also exhibits a nurturing side in taking care of the pack. For us, the pack is more than employees – it's also our customers, vendors, technical partners and many other friends. We look forward to the next forty years of working together to "keep bad stuff off people."

1976
Started April 1, 1976, in downtown Guntersville as contract manufacturer with eight employees and six sewing machines.

1980
Began making "Kappler" brand disposable garments.

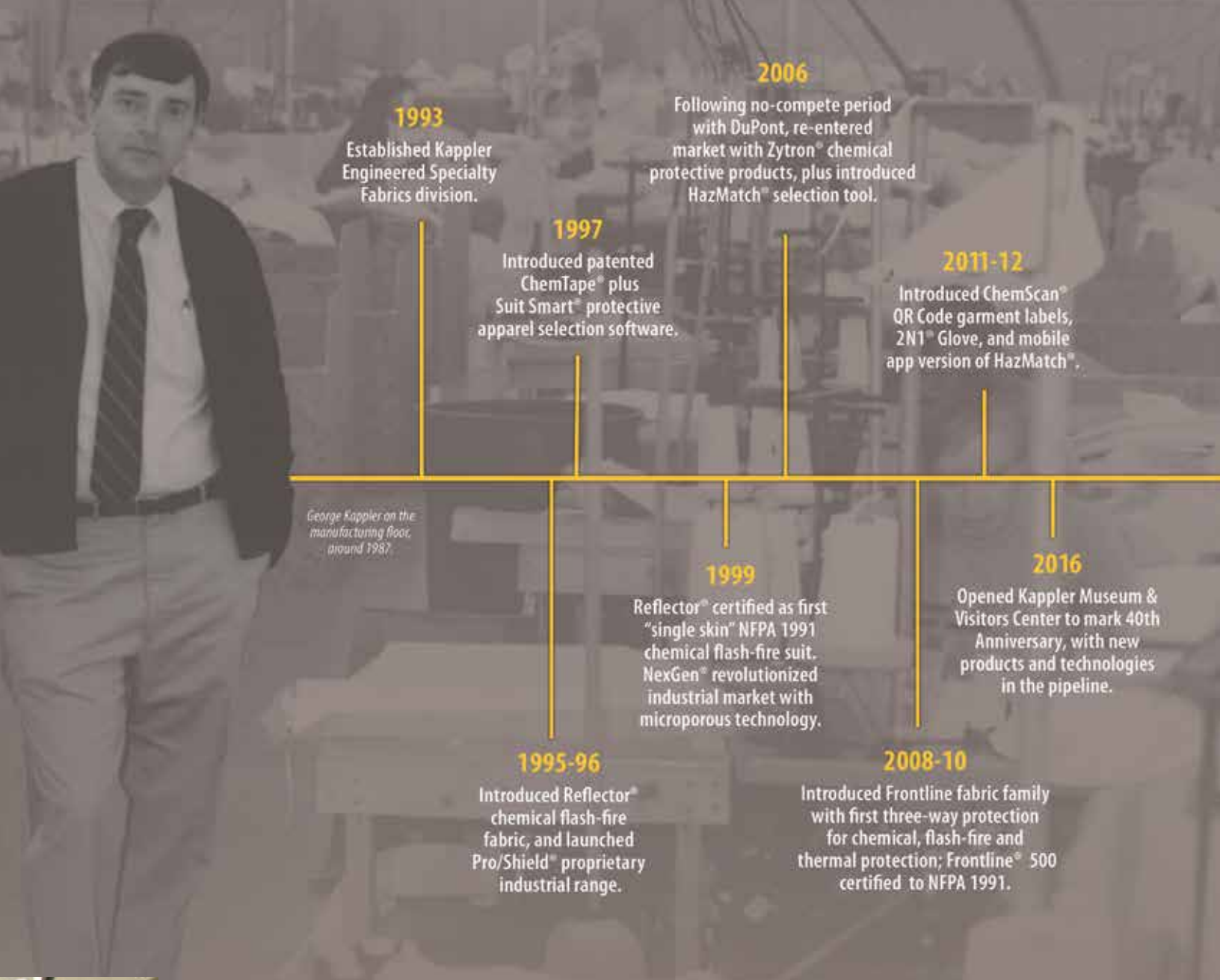
1984-85
Established Research & Development Department.

1987
Sister company Life-Guard began producing high-end chemical suits.

1989
Patent issued for Responder® broad holdout chemical fabric.

1992
Introduced "fabric family" concept with CPF® chemical range, plus pioneered microporous technology with ProVent® blood and viral barrier fabric.

Made in the USA takes on special meaning when you don a Kappler garment. American-made quality provides an extra edge when it comes to the confidence factor.



1993
Established Kappler Engineered Specialty Fabrics division.

1995-96
Introduced Reflector® chemical flash-fire fabric, and launched Pro/Shield® proprietary industrial range.

1997
Introduced patented ChemTape® plus Suit Smart® protective apparel selection software.

1999
Reflector® certified as first "single skin" NFPA 1991 chemical flash-fire suit. NexGen® revolutionized industrial market with microporous technology.

2006
Following no-compete period with DuPont, re-entered market with Zytron® chemical protective products, plus introduced HazMatch® selection tool.

2008-10
Introduced Frontline fabric family with first three-way protection for chemical, flash-fire and thermal protection; Frontline® 500 certified to NFPA 1991.

2011-12
Introduced ChemScan® QR Code garment labels, 2N1® Glove, and mobile app version of HazMatch®.

2016
Opened Kappler Museum & Visitors Center to mark 40th Anniversary, with new products and technologies in the pipeline.

George Kappler on the manufacturing floor, around 1987.

Made In The USA – And Worn All Over The World.

From fabric development to packing the box, quality is an integral component to every Kappler garment. Registered to ISO 9001 since 1996, we document every detail when it comes to ensuring product quality. End-user safety is job one, and our integrated manufacturing process is geared to making sure every garment meets demanding specifications. Whether it's designing the most user-friendly suit possible or pressure-testing every gas-tight suit before it leaves the plant, Kappler quality comes through every time. From Berry-compliant products for DoD markets to NFPA-certifed apparel for the most challenging hazmat calls, you know what you're getting into with Kappler.

Suit Selection
Made Simple

3 steps to the right suit.

All Kappler garments are multi-use, single-exposure apparel. Follow these steps to ensure the right protection – or just use HazMatch,® Kappler's interactive Suit Selection Guide.

1

Select a fabric.

Find a fabric proven against your hazard – a complete list of chemicals tested can be found on the HazMatch app or online at hazmatch.com.

ProVent® see pages 6-7

Zytron® see page 8-17

2

Choose the seam.

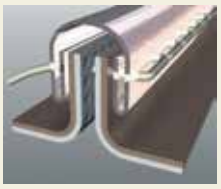
The right seam ensures your garment is constructed to match your specific hazard.

Serged

Produced when three threads are interlocked around the edges of two pieces of fabric. For particulates plus residual liquids to light splash where no skin hazard is involved.

Bound

Produced with two pieces of fabric joined by a piece of binding, then stitched through all layers. For particulates plus residual liquids to light splash where skin hazard is involved, and moderate splash for non skin hazards.

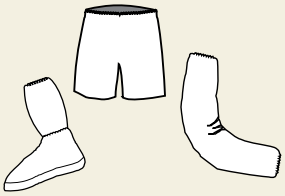


3

Pick your design.

Many styles are available in the garment types shown here. See a complete list at kappler.com.

Partial Body



Aprons/Labcoats

Coveralls

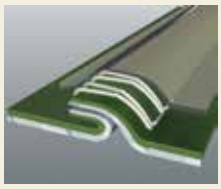
HazMatch®. The app is free, the data priceless.

HazMatch® is our easy-to-use selection tool that helps you make informed decisions about protective apparel. Search by chemical or by fabric, and save results to meet OSHA Hazard Assessment requirements. Download the free app or use it online at hazmatch.com – it's fast, easy, free, and only from Kappler.

Frontline® see page 18-21

Heat Sealed/Taped

A strong, gas-tight seam produced when a serged seam is covered with seam tape, then sealed with heat or adhesive. For particulates, moderate to heavy splash for skin hazards, and vapor hazards.



Ultrasonic

Two fabric pieces are ultrasonically welded to create a seam with no needle holes. An Ultrasonic/Taped seam is available for additional strength. For particulates and light to moderate liquid splash.

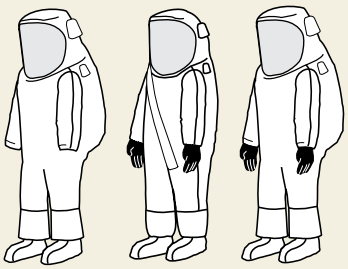
Kappler Custom

And Special Services

Kappler offers design options for any situation. *See page 28.*

Splash Suits

Splash/Vapor Encapsulating Suits



ProVent®

Biohazard And General Hazard Protection

ProVent 7000

ProVent 10,000

Proven Microporous Technology – From Biohazard Scenarios To General Hazards.

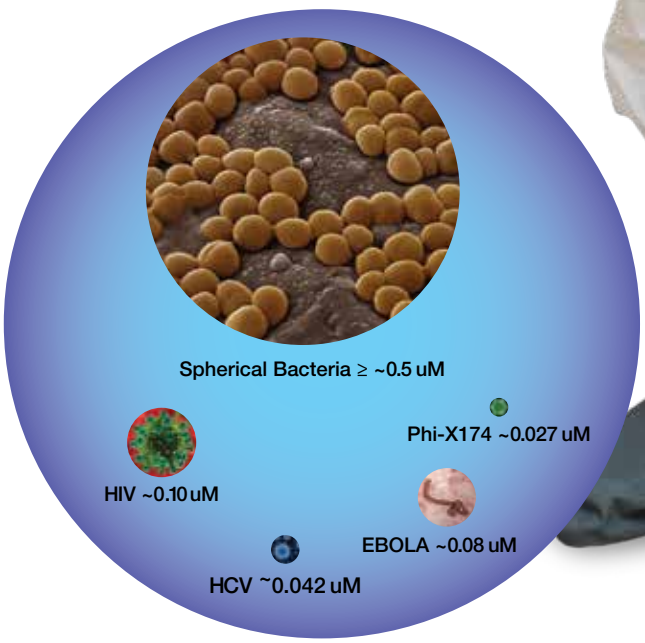
- Patented ProVent 10,000 fabric passes both ASTM F1670 blood penetration and ASTM F1671 viral penetration tests.
- ProVent 10,000 fabric protects against Ebola and other biohazards. It is a patented microporous fabric with a high moisture vapor transmission rate (MVTR) for greater comfort.
- ProVent 10,000 Applications: Patient care and other healthcare settings, lab and diagnostic services, pharmacy work, autopsies, mortuary services.
- ProVent 7000 passes ASTM F1670 blood penetration test and offers excellent general hazard protection in a breathable fabric. Applications: General healthcare, maintenance and custodial work, asbestos abatement, spray painting.

New Guidelines from OSHA and the CDC

OSHA and the CDC have issued a comprehensive PPE guidance document for workers who may be exposed to potentially infected blood and body fluids. Details include:

- **The guidance is in a matrix format and identifies the type and level of PPE performance.**
- **It includes protective gowns and coveralls, described as *fluid resistant* or *impermeable*.**
- **Fluid resistant garments are specified where the risk of exposure to blood and body fluids is low. Fluid resistant garments are defined as those with fabrics and seams that meet certain industry standards for liquid repellency.**
- **Impermeable garments are specified for scenarios with high exposure risk. Impermeable garment definition references industry standards and test methods for blood and viral penetration resistance under pressure.**
- **Protection is achieved by a system of components. In addition to protective apparel, a proper system includes respiratory protection consistent with OSHA 29 CFR 1910.134, plus eye and face protection, examination gloves, boot/shoe covers and over aprons.**

For more details visit kappler.com.



Bloodborne pathogen size comparison.

ProVent®

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

ProVent 10,000 fabric is blue on one side, white on the other – garments may be ordered with either color on the outside (shown here in white).

Storm flap with pressure sensitive tape closure for additional protection.

Skid-resistant attached boots enhance worker safety.

Zytron®
Chemical Protection

Zytron 100

Zytron 100XP

Two Excellent Fabric Choices For Dry Particulates To Light Splash.

- Ideal where workers need to be protected against hazardous particles or light chemical exposure.
- Excellent holdout against a range of common chemical hazards.
- Zytron 100XP offers greater fabric strength when needed.
- Bound seam styles include storm flap with pressure sensitive closure.
- Applications: Acid handling, tank cleaning, petro-chemical operations, agrichemical mixing/applications.

Zytron 100 and 100XP
Specific Chemicals Tested*

Chemical	Minutes	
	100	100XP
1,2-Dihydroxyethane	>480	>480
Aqua Fortis	NT	>480
Battery Acid	>480	>480
Black Liquor	>480	>480
Caustic Soda	>480	>480
Chromic Acid	>480	>480
Ethylene Glycol	>480	>480
Formaldehyde	>480	NT
Glutaric Dialdehyde	>480	>480
Gluteraldehyde	>480	>480
Green Liquor	>480	NT
Hydrofluoric Acid 48%	>480	>480
Hydrogen Peroxide	>480	NT
Methylene Oxide	>480	NT
Nitric Acid	NT	>480
Orthophosphoric Acid	NT	>480
Phosphoric Acid	NT	>480
Potassium Cyanide	>480	NT
Sodium Chloride Oxide	>480	NT
Sodium Hydroxide	>480	>480
Sodium Hypochlorite	>480	NT
Sulfuric Acid	>480	>480
White Liquor	>480	NT

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. For detailed technical data and physical properties see page 26 or visit kappler.com.

Zytron® 100/100XP

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Hooded coverall styles feature extended neck design.

Zytron 100XP offers enhanced fabric strength.

ChemTape® is an essential accessory for most chemical scenarios – see page 22 for details.

Both Zytron 100 and 100XP hold out many common industrial hazards.

ChemScan® labels – quick, accurate and only from Kappler.
Scan the label with your phone's QR reader for a complete list of chemicals tested against your garment's protective fabric.

Zytron®
Chemical Protection

Zytron 200

When You Need More Strength And A Wider Range Of Protection.

- Offers protection from an expanded range of chemicals.
- Greater physical strength for more demanding work applications.
- Stronger fabric especially valuable where rip-out is a concern.
- Styles available with both bound and heat sealed/taped seams.
- Applications: Chemical handling, petrochemical operations, hazardous material clean-up and remediation.

Zytron 200
Specific Chemicals Tested*

Chemical	Minutes
Acetic Acid	>480
Acetonitrile	52
Acrylonitrile	65
Aniline	>480
Battery Acid	>480
Benzene	36
Caustic Soda	>480
Chlorobenzene	38
Crude Oil	>480
Dimethyl Sulfate	>480
Ethanol	>480
Fuel Oil LS	>480
Hydrofluoric Acid 48%	>480
Hydrogen Peroxide	>480
Jet Fuel A	>480
Methanol	>480
Methyl Acetate	330
Methyl Bromide	59
N,N-Dimethylformamide	77
Nitric Acid	>480
Nitrobenzene	97
Phenol @43 C	287
Potassium Hydroxide	>480
Sodium Hydroxide	>480
Sodium Hypochlorite	>480
Sulfuric Acid	>480
Trifluoroacetic Acid	>480

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. For detailed technical data and physical properties see page 26 or visit kappler.com.

Zytron® 200

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Extended neck design on hooded coverall styles adds protection.

Heat-sealed/taped garments (shown) come with a double storm flap, and bound seam garments come with a single storm flap.

Tingley HazProof® boots are available from Kappler as an authorized distributor.

ChemScan® labels – quick, accurate and only from Kappler.
Scan the label with your phone's QR reader for a complete list of chemicals tested against your garment's protective fabric.

Zytron®
Chemical Protection

Zytron 300

From Petro Hazards To Warfare Agents, Zytron 300 Is A True Performance Fabric.

- Ideal for demanding applications with potential for chemical splash.
- Increased physical strength and broad chemical holdout take the protection level up a serious notch.
- Available in seven NFPA certified styles.
- Excellent for petrochemical operations including chemical handling and maintenance work – a favorite for military operations.
- A real workhorse of the Zytron family, available in a wide range of garment types and styles.

Zytron 300
ASTM F1001 Chemical Test Battery*

Chemical	Minutes**
Acetone	>480
Acetonitrile	87
Carbon Disulfide	>480
Dichloromethane	70
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	55
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480
Gases	
Ammonia Gas	39
1,3 Butadiene Gas	>480
Chlorine Gas	>480
Ethylene Oxide Gas	81
Hydrogen Chloride Gas	>480
Methyl Chloride Gas	>480

Chemical Warfare Agent Data**

Chemical Agent	Minutes	Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480	4.0 ug/cm2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480	1.25 ug/cm2
Chlorovinyl arsinedichloride (Lewisite:L)	>240	4.0 ug/cm2
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480	1.25 ug/cm2

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. **Chemical Warfare Agent testing was conducted in accordance with MIL-STD-282 and/or NFPA 1994-2001 with breakthrough times reported based on total cumulative permeation. For detailed technical data and physical properties see page 26 or visit kappler.com.

Zytron® 300

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Large face shield on encapsulating suits for better field of vision.

Attached gloves are available on any heat sealed/ taped suit style.

Rear entry style shown provides protection in front-splash scenarios.

Attached sock boots with boot flaps are standard.

Zytron®
Chemical Protection

Zytron 400

A Real Tough Guy With Great Physical Properties, Plus Broad Chemical Holdout.

- ASTM F1001 chemical holdout performance similar to Zytron 500 at an economical price.
- Excellent physical properties give Zytron 400 an advantage in garment strength.
- Styles include a variety of coveralls plus total encapsulating suits and hood/jacket/trouser combos.
- Applications: Chemical handling, petrochemical operations, hazmat response and clean-up.

Zytron 400
ASTM F1001 Chemical Test Battery*

Chemical	Minutes
Acetone	>480
Acetonitrile	>480
Carbon Disulfide	>480
Dichloromethane	88
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	>480
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480
Gases	
Ammonia Gas	NT
1,3 Butadiene Gas	NT
Chlorine Gas	NT
Ethylene Oxide Gas	305
Hydrogen Chloride Gas	NT
Methyl Chloride Gas	NT

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. For detailed technical data and physical properties see page 26 or visit kappler.com.

ChemScan® labels – quick, accurate and only from Kappler.

Scan the label with your phone's QR reader for a complete list of chemicals tested against your garment's protective fabric.

Zytron® 400

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Tough fabric with excellent physical properties for demanding work applications.

Attached gloves are an available custom option.

Double storm flap includes hook-and-loop closure.

Attached sock boots with boot flaps available on both coverall and encapsulating suit styles.

Zytron®
Chemical Protection

Zytron 500

Top Level Protection For Demanding Hazmat Response.

- Greater than 8-hour holdout against hundreds of chemicals, with proven holdout against Chemical Warfare Agents (CWA).
- NFPA 1994 Class 2 - 2012 Edition style available.
- Many features and options in a wide variety of encapsulating suits and coverall styles.
- Available in hi-viz orange and charcoal gray.
- Applications: Hazmat response, chemical handling, refueling operations, petrochemical operations, hazardous material clean-up and remediation, CWA incineration, remediation and disposal.

Zytron 500
ASTM F1001 Chemical Test Battery*

Chemical	Minutes
Acetone	>480
Acetonitrile	>480
Carbon Disulfide	>480
Dichloromethane	>480
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	>480
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480
Gases	
Ammonia Gas	>480
1,3 Butadiene Gas	>480
Chlorine Gas	>480
Ethylene Oxide Gas	>480
Hydrogen Chloride Gas	>480
Methyl Chloride Gas	>480

Chemical Warfare Agent Data

Chemical Agent	Minutes	Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480	4.0 ug/cm2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480	1.25 ug/cm2
Chlorovinyl arsinedichloride (Lewisite:L)	>480	4.0 ug/cm2
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480	1.25 ug/cm2

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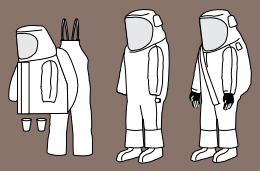
Zytron® 500



Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Large-view face shield allows better field of vision.

All Hazmat styles include 2N1® Glove System with barrier liner gloves.

HazMat styles include seams that are sewn then double heat sealed/taped.

Softer, pliable fabric enhances comfort for extended wear applications.

Frontline®
Chemical/FR Protection

Splash-And-Flash Protection For Petrochemical Environments.

- Three-way protection for chemical, flash-fire and radiant heat.
- Ideal for petrochemical line break operations – developed with input from petrochemical safety officers.
- Proven with demanding Pyroman Thermal Manikin testing.
- Multi-use, single-exposure garment provides economical alternative to expensive reusable FR apparel.
- Coverall and ensemble styles offer flexibility for a wide variety of work situations.
- Applications: Line maintenance, tank cleaning, refueling situations.

Frontline 300
ASTM F1001 Chemical Test Battery*

Chemical	Minutes
Acetone	>480
Acetonitrile	>480
Carbon Disulfide	>480
Dichloromethane	10
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	>480
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480
Gases	
Ammonia Gas	>480
1,3 Butadiene Gas	>480
Chlorine Gas	>480
Ethylene Oxide Gas	>480
Other Chemicals Tested	
Benzene	>480
Diesel Fuel	>480
Diethylethanolamine	>480
Gasoline	>480
Hydrofluoric acid (48%)	>480
Kerosene	>480
Methanol	>480

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. For detailed technical data and physical properties see page 26 or visit kappler.com.

Frontline® 300

Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Coverall styles feature special hood design for better fit against respirator.

Frontline 300 offers true "splash-and-flash" protection, plus excellent radiant heat protection.

Reinforced knee area for added confidence and work flexibility.

Frontline garments are designed for chemical flash-fire protection FOR ESCAPE ONLY in the event of a chemical flash fire.

ChemScan® labels – quick, accurate and only from Kappler.
Scan the label with your phone's QR reader for a complete list of chemicals tested against your garment's protective fabric.

Frontline®
Chemical/FR Protection

NFPA 1991 Certified Apparel For Chemical Flash-Fire Protection.

- Single suit provides three-way protection – chemical, flash-fire and radiant heat protection.
- Single garment eliminates need for two-suit NFPA 1991 configuration.
- Provides excellent "survivability" performance – 0% body burn in Pyroman Thermal Manikin testing.
- NFPA-certified multi-use, single-exposure garment provides economical alternative to expensive FR reusables.
- Applications: Hazmat response and chemical handling with potential for chemical flash-fire.

Frontline 500
ASTM F1001 Chemical Test Battery*

Chemical	Minutes
Acetone	>480
Acetonitrile	>480
Carbon Disulfide	>480
Dichloromethane	253
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	>480
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480
Gases	
Ammonia Gas	>480
1,3 Butadiene Gas	>480
Chlorine Gas	>480
Ethylene Oxide Gas	>480
Hydrogen Chloride Gas	>480
Methyl Chloride Gas	>480

Chemical Warfare Agent Data**

Chemical Agent	Minutes	Criteria
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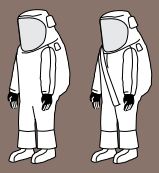
Isopropyl methylfluorophosphonate (Sarin:GB)	>480	1.25 ug/cm2
Chlorovinyl arsinedichloride (Lewisite:L)	>240	4.0 ug/cm2
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480	1.25 ug/cm2

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. **Chemical Warfare Agent testing was conducted in accordance with MIL-STD-282 and/or NFPA 1994-2001 with breakthrough times reported based on total cumulative permeation. For detailed technical data and physical properties see page 26 or visit kappler.com.

Frontline® 500



Shown above are typical garment types for this fabric. View standard styles at kappler.com and see page 28 for custom options.

Wide-view face shield allows expanded field of vision.

Removable Kevlar outer glove, plus field-replaceable 2N1® Glove System which prevents inner glove inversion when removing hands.

48" gas-tight PVC zipper facilitates easier donning and doffing.

Frontline garments are designed for chemical flash-fire protection FOR ESCAPE ONLY in the event of a chemical flash fire.

Accessories
And Specialty Products

ChemTape®

ChemTape is Kappler's patented chemical-resistant tape designed specifically for protective apparel. Provides added assurance for taping around gloves, boots, respirators and storm flaps, plus shelter-in-place applications. Rolls are 2" X 60 yd (48 mm wide and 55 meters long); 24 rolls per case. Style 99402 YW.

ChemTape® Responder ID Kit

Large, easy-to-read identification numbers enhance safety where worker identities are obscured. Self-adhesive, easy to apply, complete set includes numbers 0-9. 24 sets per case. Style 99415.

ChemTape
ASTM F1001 Chemical Test Battery*

Chemical	Minutes
Acetone	>480
Acetonitrile	>480
Carbon Disulfide	>480
Dichloromethane	160
Diethylamine	>480
Dimethylformamide	>480
Ethyl Acetate	>480
n - Hexane	>480
Methyl Alcohol	>480
Nitrobenzene	>480
Sodium Hydroxide	>480
Sulfuric Acid	>480
Tetrachloroethylene	>480
Tetrahydrofuran	>480
Toluene	>480

Chemical Warfare Agent Data

Chemical Agent	Minutes	Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480	4.0 ug/cm2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480	1.25 ug/cm2
Chlorovinyl arsinedichloride (Lewisite:L)	NT	NT
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480	1.25 ug/cm2

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes. **Chemical Warfare Agent testing was conducted in accordance with MIL-STD-282 and/or NFPA 1994-2001 with breakthrough times reported based on total cumulative permeation.

Accessory and specialty products continue through page 24. For a complete list of Kappler accessories or additional details call customer service at 1-800-600-4019.

USB port allows easy connection to a data storage device.

Large, easy-to-read touch-screen for selecting test criteria and data input.

Kappler's Digital Pressure Test Kit Is Flexible, Easy To Use And Extremely Accurate.

Kappler's automated Digital Pressure Test Kit improves the efficiency and accuracy of gas-tight garment tests for both ASTM and CE methods. Our unique design features a digital readout for more accurate testing, while a large LCD touchscreen allows easy test criteria selection and data input. All fittings and hoses are included – the user simply provides a Grade D air supply with a 1/4 inch NPT fitting. Press START and the test is performed automatically, allowing the user to handle other duties while the test is in process. For easy and accurate record-keeping, test data can be copied to the provided USB stick via the built-in USB port. Style AKMOC.

A video of the test procedure and data formatting program can be found online at kappler.com/resources under "Training Videos."

2N1® Glove System Prevents Inner Glove Inversion.

Kappler's 2N1® Glove System – a true innovation that prevents the fingers of the inner liner glove from being pulled inside-out when the user removes a hand from the double-glove configuration common to gas-tight garments. This allows the user to easily remove or reinsert the hands into the glove without the annoying inversion. This is especially helpful when a user needs to free the hands while inside the suit to adjust the respirator face piece or other equipment and clothing. The 2N1 Glove System also provides improved comfort and manual dexterity with a double-glove configuration. Contact Customer Service for style options.

The 2N1 Glove System is available on Kappler Zytron® 500 Hazmat styles and NFPA Certified styles in both Zytron® 500 and Frontline® 500 fabrics.

Unique installation technique using rigid glove ring makes it easier to insert or withdraw hands.

Fingers of inner glove stay in place when hands are removed.

Accessories
And Specialty Products

Zytron® 300 Half C Jacket

Kappler's Zytron 300 Half C Jacket is ideal for supplied-air work applications. The flat back design includes hood with PVC faceshield, double storm flap with hook and loop closure and attached CP Cuff Option for easy glove taping. Loops for air system attached inside the hood. Style Z3H763 (Z3H763-30 includes tubes and Nupro valve), 6 garments per case.

Male Glove Insert Cones

Kappler's insert cones interface glove to suit and provide smooth taping surface. 1 pair per case, style AG0AR.

CP Cuff Option For Any Suit

Taping gloves with ChemTape® has become standard procedure for good protection. Our CP Cuff Option, available on any Kappler taped seam chemical garment, makes the job faster, easier and more effective. Eliminate chemical burns on hands and wrists – ask Customer Service about adding the CP Cuff Option to your next apparel order.

Attached CP Cuff Option makes taping fast and easy.

Cooling Vest

The Kappler Cooling Vest with patented Phase Change Material is lightweight and provides hours of cooling. Available in two cooling-capacity sizes, in mesh or FR Cotton. Contact Customer Service for style numbers.

Decon Shower

Kappler's patented Decontamination Shower is made with Zytron 500 fabric to ensure hazardous material run-off is safely contained. The removable spray wand with adjustable shut-off valve and ergo-grip handle allow better water control during decon. Simple design and snap-lock components mean easy setup and take-down. Catch Basin w/ frame and shower wand, Style Z5HD0. Shower curtain and frame, Style Z5HD1.

For a complete list of Kappler accessories or additional details call customer service at 1-800-600-4019.

NFPA
Standards Overview

A Handy Reference Guide To NFPA Apparel Standards.

The National Fire Protection Association (NFPA) develops, publishes and disseminates consensus codes and performance standards intended to minimize the possibility and effects of fire and other risks. Below is an overview of the NFPA standards that apply specifically to protective apparel, along with a list of our products certified to these standards. For additional information on NFPA or other technical issues, please contact Customer Service at 1-800-600-4019 or email customerservice@kappler.com.

NFPA Chemical Standards Overview*

	NFPA 1991	NFPA 1992	NFPA 1994 Class 2	NFPA 1994 Class 3	NFPA 1994 Class 4
Scope	Hazmat Response Vapor	Hazmat Response Liquid	Chem/Bio Terrorism Incident Response Vapor	Chem/Bio Terrorism Incident Response Liquid	Chem/Bio Terrorism Incident Response Particle
Chemical vs Garment Fabric, Seams, Visors, Gloves, Boots	Permeation resistance 1 hr vs 21 industrial chemicals, 4 toxic industrial chemicals and warfare agents soman and mustard	Penetration resistance 1 hr vs 7 industrial chemicals	Permeation resistance 1 hr vs 5 toxic industrial chemical and mustard and soman	Permeation resistance 1 hr vs 5 toxic industrial chemicals and mustard and soman	Not Required
Challenge Level	100 % concentration and full contact 100 g/m2 agents	100 % concentration and full contact	Liquids 10 g/m2 Gases 350 ppm Closed Top Cell	Liquids 10 g/m2 Gases 40 ppm Open Top Cell	Not Required
Breakthrough Criteria	ASTM F 739 Cumulative 6.0 TICs, 4.0 mustard, 1.25 soman	ASTM F 903 Visual liquid	ASTM F739 Cumulative 6.0 TICs, 4.0 mustard, 1.25 soman	ASTM F 739 Cumulative 6.0 TICs, 4.0 mustard, 1.25 soman	Not Required
Whole Garment	ASTM F 1052 Pressure Test MIST inward leakage ASTM F 1359 Shower Test > 60 min Flashfire Option 7 second flash propane	ASTM F 1359 Shower Test > 20 min	MIST PDDF >360 ASTM F 1359 Shower Test > 20 min	MIST PDDF >120 ASTM F 1359 Shower Test >4 min	Particle Inward Leakage Test < 5%
Flame Resistance ASTM F 1358	Pass	Not Required	Not Required	Not Required	Not Required
COMFORT ASTM F 1868 Total Heat Loss	Not Required	Not Required	Not Required	Pass	Pass
Viral Resistance ASTM F 1671 FABRIC/ SEAMS	Not Required	Not Required	Pass	Pass	Pass
Components	Boots/SCBA	Boots/Respirator	Boots/SCBA	Boots/Specify Respirator	Boots/Specify Respirator
Kappler Products	*Frontline® 500* - F5H580-91, F5H580-9C, F5H580-9Z	*Zytron® 300* - Z3H426-92, Z3H427-92, Z3H428-92 Z3H437-92, Z3H576-92 Z3H577-92, Z3H579-92	*Zytron® 500* - Z5HTN-C2		

* Changes are in the process for NFPA standards 1991, 1992 and 1994. New edition NFPA 1991 has been issued effective January 2016. Standards 1992 and 1994 are currently in revision cycle and are scheduled for issue in January 2018.

Technical Data
And Testing Details

ASTM F1001 Chemical Test Battery*

CHEMICAL	Zytron®						Frontline®		ChemTape®
	100	100XP	200	300	400	500	300	500	
Acetone	NT	NT	17	>480	>480	>480	>480	>480	>480
Acetonitrile	NT	NT	52	87	>480	>480	>480	>480	>480
Carbon Disulfide	NT	NT	2	>480	>480	>480	>480	>480	>480
Dichloromethane	NT	NT	2	70	88	>480	10	253	>480
Diethylamine	NT	NT	21	>480	>480	>480	>480	>480	160
Dimethylformamide	NT	NT	77	>480	>480	>480	>480	>480	>480
Ethyl Acetate	NT	NT	14	>480	>480	>480	>480	>480	>480
n-Hexane	NT	NT	7	>480	>480	>480	>480	>480	>480
Methyl Alcohol	NT	NT	>480	55	>480	>480	>480	>480	>480
Nitrobenzene	NT	NT	97	>480	>480	>480	>480	>480	>480
Sodium Hydroxide	>480	>480	>480	>480	>480	>480	>480	>480	>480
Sulfuric Acid	>480	>480	>480	>480	>480	>480	>480	>480	>480
Tetrachloroethylene	NT	NT	21	>480	>480	>480	>480	>480	>480
Tetrahydrofuran	NT	NT	3	>480	>480	>480	>480	>480	>480
Toluene	NT	NT	6	>480	>480	>480	>480	>480	>480
GASES									
Ammonia Gas	NT	NT	NT	39	NT	>480	>480	>480	NT
1,3 Butadiene	NT	NT	NT	>480	NT	>480	>480	>480	NT
Chlorine Gas	NT	NT	NT	>480	NT	>480	>480	>480	NT
Ethylene Oxide Gas	NT	NT	NT	81	305	>480	>480	>480	NT
Hydrogen Chloride Gas	NT	NT	NT	>480	NT	>480	NT	>480	NT
Methyl Chloride Gas	NT	NT	NT	>480	NT	>480	NT	>480	NT

Chemical Warfare Agent Data**

CHEMICAL AGENT	Zytron®300		Zytron®500		Frontline®500		ChemTape®	
	Breakthrough		Breakthrough		Breakthrough		Breakthrough	
	Time	Criteria	Time	Criteria	Time	Criteria	Time	Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480	4.0 ug/cm^2	>480	4.0 ug/cm^2	>480	4.0 ug/cm^2	>480	4.0 ug/cm^2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2
Chlorovinyl arsinedichloride (Lewisite:L)	>240	4.0 ug/cm^2	>480	4.0 ug/cm^2	>240	4.0 ug/cm^2	NT	NT
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2	>480	1.25 ug/cm^2

* Industrial chemical testing was conducted in accordance with ASTM F 739 with normalized breakthrough times reported in minutes.

** Chemical Warfare Agent testing was conducted in accordance with MIL-STD-282 and/or NFPA 1994-2001 with breakthrough times reported based on total cumulative permeation.

Note: Sources for all chemical test data are independent laboratories. All tests were performed under laboratory conditions and not under actual use conditions. Tests were performed on material samples, not actual garments.

Typical Physical Properties	Zytron®						Frontline®	
TEST METHOD	**100**	**100XP**	**200**	**300**	**400**	**500**	**300**	**500**
Grab Tensile Strength MD* ASTM D751(lbs/N)	32 / 142	49 / 217	52 / 231	78 / 347	155 / 689	120/ 534	134 / 596	137 / 609.38
Grab Tensile Strength CD* ASTM D751(lbs/N)	24 / 106	38 / 169	39 / 173	69 / 307	152 / 676	121 / 538	125 / 556	166 / 738.37
Tear Resistance Trapezoid MD*(lbs/N) *method details below***	11.5 / 51	17.4 / 77	22.9 / 101.8	16.6 / 74	42.2 / 188	35 / 156	13.7 / 60.94	13.5 / 60.05
Tear Resistance Trapezoid CD*(lbs/N) *method details below***	7.4 / 32	10.3 / 45	9.6 / 42.7	22.1 / 98	50.6 / 225	37 / 168	10.7 / 44.79	14 / 62.27
Ball Burst ASTM D3787 (lbs/N)	28 / 124	46 / 204	43 / 191	58 / 258	153 / 681	128 / 569	123 / 547.10	134 / 596.03
Flammability Resistance ASTM F1358	N/A	N/A	N/A	N/A	N/A	N/A	PASS	PASS

**MD - Machine Direction, CD - Cross Direction*
***ASTM D1117 (Zytron 100, 200) ASTM D5587 (Zytron 300, 400, 500) ASTM D571 (Frontline 300, 500)*

Frontline Pyroman Testing – The Inside Story On Survivability.

Because of Kappler's commitment to user survivability, Frontline garments designed to protect against a chemical flash-fire are subjected to intense testing in order to simulate real-world exposure. Chemical flash-fires are known to generate heat up to 1900º F. The Pyroman Thermal Manikin test at North Carolina State University produces this environment for 6 seconds in order to predict a percentage of body burn a wearer might experience. Sensors on the manikin indicate not only the area of the body affected, but also predict severity of the burn. The Frontline 500 encapsulating suit performed exceptionally well in both measurements, with 0% body burn indicated. The Frontline 300 ensemble garment indicated less than 1% body burn. For more details contact Customer Service at 1-800-600-4019 or email customerservice@kappler.com.

Scan to see video.

Additional Frontline® Testing Information – Frontline 300 and 500 Heat, Flame and Thermal Data

Frontline 300 and Frontline 500 have been tested for thermal protective performance (TPP) in accordance with ISO 17492, Clothing for Protection Against Heat and Flame. Frontline 300 showed a TPP value of 16, and Frontline 500 showed a TPP value of 32.

Both Frontline 300 and 500 meet the requirements for flame resistance in accordance with ASTM F1358.

Frontline 500 meets requirements of NFPA 1991, including base requirements plus optional Flash-Fire and Liquified Gas requirements.

Both Frontline 300 and 500 have been tested in accordance with ASTM F 1930-00 Standard Test Method for Evaluation of Flame Resistant Clothing for Protection Against Flash Fire Simulations Using an Instrumented Manikin. The Frontline 300 ensemble garment indicated less than 1% body burn after a three-second burn test, and the Frontline 500 indicated 0% body burn after a six-second test.

Check HazMatch® For Complete Chemical Test Results.

The details shown here represent only a fraction of the chemicals tested against Kappler fabrics – a list that's constantly being expanded. The latest list of chemicals in the Kappler database is always available via HazMatch – get the mobile app or use it online at kappler.com. If you don't see your specific chemical, see page 28 for details on Kappler's free testing program.

WARNING: This information is based on technical data that Kappler believes to be reliable. It is subject to revision as additional knowledge and experience are gained. The website will contain Kappler's most up-to-date product information, and customers who receive pamphlets, brochures or other literature should be aware that such "hard copy" information may not be as current as the information on Kappler's website. Customers also should recognize that there are uses, environments and chemicals for which Kappler products, garments and/or fabrics are unsuitable. It is the responsibility of the user to review available data and verify that the product, garment and/or fabric is appropriate for the intended use and meets all specified government and/or industry standards. Also, the customer should review all available information on the website to understand the uses – and limitations – on ALL products, garments and fabrics which Kappler makes available. **CAUTION:** Do not use for fire protection. Avoid open flame or intense heat.

Kappler Custom
And Special Services

Don't See The Style You Need?

If you need something not shown in our standard styles, ask about Kappler's custom solutions. We offer many options to make your favorite style a perfect fit. Popular items include:

- Glove options, a Kappler specialty, can be added to any heat sealed/taped suit style; they include the 2N1® Glove System and permanently attached gloves *(shown)*. (**A**)
- Fall protection harness pass-throughs for gas-tight suits. (**B**)
- Special pass-throughs and tool/equipment loops. (**C**)
- Air-fed hood. (**D**)
- CP Cuff Option. (**E**)

Whatever your application or hazard scenario calls for, Kappler can configure the apparel to meet your needs. Just contact customer service at 1-800-600-4019 or email customer service@kappler.com.

Need A Specific Chemical Tested? Ask About Our Free Testing Program.

If you need to document a Kappler fabric against a specific hazard not already in our database, we make it easy. We'll conduct third-party testing on your chemical, and if the fabric meets your requirements you agree to purchase a standard minimum number of garments. For details contact Customer Service at 1-800-600-4019 or email customerservice@kappler.com.

Precision Decision

Choose With Confidence

When there's no room for guesswork, Kappler delivers the data and support you need.

Whether you're responding to a hazmat call or specifying apparel for a routine bid, Kappler helps you choose with confidence. We sell you the suit, but we give you the data to ensure a safe decision.

Our HazMatch® selection guide lets you search by chemical or by fabric and easily match a garment that's safe for your scenario. Use it online or get the free app for a quick, accurate recommendation.

ChemScan QR code garment label.

Got a suit but not sure if it's right for the hazard? Just scan the innovative ChemScan® QR code label for the latest test results for that specific fabric.

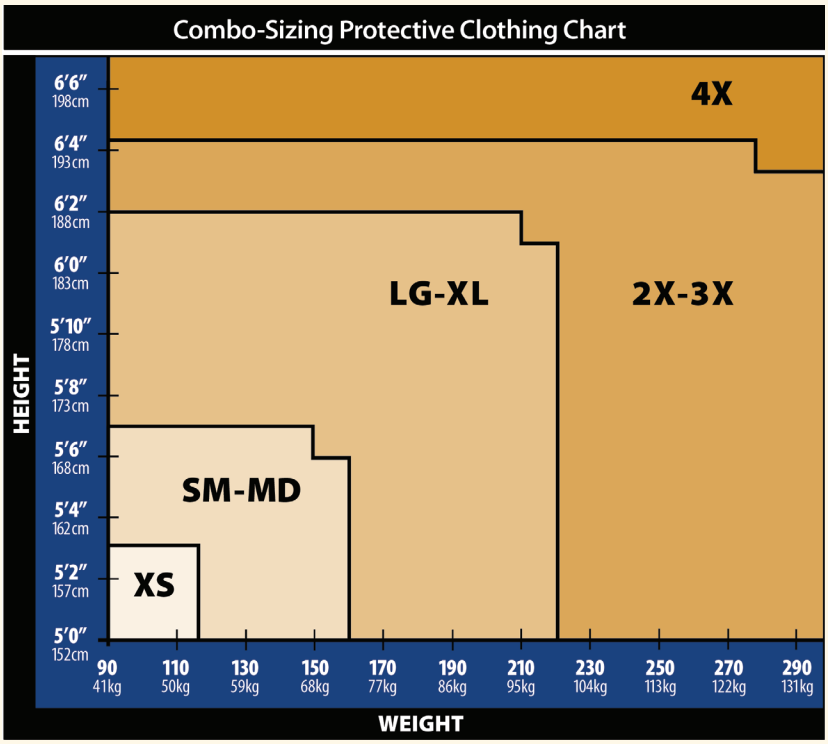
Our website is an excellent resource for everything from how-to videos to NFPA details. The Kappler University Road Show and Workshops offer user education unmatched in the industry. And our no-nonsense tech support is just a phone call away at 1-800-600-4019.

At Kappler, the suit is just the beginning. The data – and how to use it – always lets you know what you're getting into.

Use HazMatch online at kappler.com or get the free app.

Our Sizing System Reduces Inventory And Simplifies Your Selection Process.

Our garments are designed and constructed with the wearer in mind, and that includes sizing that simplifies the decision process. Typically worn over other clothing, Kappler's garments are designed so that "combination sizes" comfortably fit the vast majority of users. Plus, with only five size options (versus the normal eight), you simplify ordering logistics and reduce inventory requirements.



NOTE: *Zytron 500 style Z5HTN C2 and certain Medical styles use specific sizing (XS, SM, MD, LG, XL, 2X ,3X, 4X and 5X). Please contact customer service for details.*

Kappler®

Know What You're Getting Into.®

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