

# User Information for DuraChem® 200

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Certified Models NFPA 1990 (1992) - 2022 Edition  
NFPA 2112 • D2H632-9212 • D2H634-9212  
D2H440-9212 • D2H443-9212



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User Information for  
DuraChem 200 Protective Ensemble

Certified Models  
NFPA 1990 (1992) - 2022 Edition  
NFPA 2112

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## SAFETY CONSIDERATIONS

Be sure to read, understand and follow the information in this manual and all applicable federal, state and local occupational safety and health statutes. For users outside the United States, please consult national or other applicable personal protective equipment regulations for proper use, consistent with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and 29 CFR 1910.132.

The Authority Having Jurisdiction (AHJ) responsible for approving equipment must comply with the requirements of NFPA 1891 for the selection, care, and maintenance of protective ensembles and elements.

## SAFETY SYMBOLS USED IN THIS MANUAL



### WARNING

*Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*



### CAUTION

*Indicates a potentially hazardous situation which, if not avoided, could result in physical injury or damage to the product. It may also be used to alert against unsafe practices.*



## NOTICE

*Indicates additional information on how to use the garment.*

## WARNINGS AND LIMITATIONS



### WARNING

*There are uses, environments and chemicals for which these garments are unsuitable. **THIS GARMENT DOES NOT PROVIDE PROTECTION AGAINST CHEMICAL VAPORS OF ANY KIND.** It is the responsibility of the end user to review available data and verify that the garment is appropriate for the intended use and meets all applicable standards.*



### CAUTION

*This garment must be used in combination with additional PPE, which include the following:*

*Separate full-face respiratory protection such as a positive pressure self-contained breathing apparatus (SCBA), an external breathing air supply (airline system) with escape bottle or a re-breather system certified by NIOSH.*

*Separate foot and lower leg protection such as chemical protective boots.*

## Additional Equipment

Additional personal protective equipment that might also be considered includes:

- Head protection.
- Hearing protection may be required due to high levels of external noise or high noise levels generated by supplied air systems.
- Other protective equipment that may be warranted based on the situation.



### CAUTION

#### Wearers Must be Physically Fit

*Garments should only be worn by persons who are in good physical condition. In an emergency situation or hot environment, the wearer may experience heat stress. Persons who show symptoms of heat stress such as nausea, dizziness, or excessive heat build-up should leave the work area immediately and get out of the garment as quickly as possible. Persons in doubt about their physical condition should check with a physician before wearing garments.*

*If any of the following symptoms develop during use of this garment, immediately leave the hot zone, undergo field decontamination (if exposed), and doff the garment;*

- Fever
- Difficulty breathing
- Nausea

*continued*

- Excessive tiredness
- Dizziness
- Numbness
- Any unusual odor or taste
- Eye or skin irritation
- Narrowing or dimming of vision
- Claustrophobia
- Loss of balance or orientation

### ***Always Use the Buddy System***

Never work in this garment alone. A minimum of two people should enter contaminated areas together. It is important to have someone available to assist in the event of an emergency. That person will require the same level of protection as the person needing emergency assistance.

### ***Manage and Prevent Heat Stress***

This garment interferes with the natural regulation of body temperature. This can lead to a rise in core body temperature and heat stress. The wearer should be aware of the symptoms and treatment of heat stress. The wearer can take several steps to limit and/or prevent heat stress, such as use of a cooling system, and working in accordance with a conservative work/rest schedule. The maximum time the garment can be worn depends on such variables as the air supply, ambient condition, climate inside the ensemble, physical and psychological condition of the wearer, work rate and work load.

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## ***Chemical Penetration Resistance***

Before using a garment in a chemical situation, consult the chemical resistance data appropriate to the garment material. This information is to be used as a guide only. The performance of any material depends on a number of factors including chemical concentration, temperature, time and amount of exposure, etc. This garment will not protect against chemical vapors/gases.

Chemical penetration test are performed under laboratory conditions not actual workplace conditions. They address chemical breakthrough characteristics and do not take into consideration physical performance characteristics that effect barrier or degraded performance due to previous contamination.

## ***Static Electricity***

Under certain conditions, such as cold and dry weather, it is possible for garments to build and discharge static electricity. Discharges are not normally dangerous except in situations where generation of an electrical spark could ignite a flammable atmosphere. When operating around flammable chemicals, steps to eliminate potential static discharges should be used. In these situations, recommended precautionary steps include the use of an over-cover, raising humidity level of the work area, and/or using a commercial, anti-static application.

## ***Avoid Continuous Exposure***

This garment should not be immersed in chemicals. This garment should not be exposed to continuous hazardous liquid chemical splash or deluge. Do not wade through liquid pools of hazardous chemicals if not necessary. Direct chemical exposure to the garment should be as limited as possible. If exposed to direct splash or deluge of hazardous chemicals, leave the area immediately and decontaminate.

## *Provide Hearing Protection*

If noise levels inside the garment exceed regulatory noise levels, hearing protection must be provided. Use hearing protection recommended by a safety professional and which does not interfere with the operation or use of the garment.



### **NOTICE**

#### **Marking Recommendations and Restrictions**

*Additions of lettering, trim, emblems or other markings to this garment must be made in accordance with NFPA 2112. Failure to meet these requirements will revoke Kappler's warranty.*

## *Proper Use*

Refer to NFPA 2113 for proper use information. The user is responsible to determine that this garment is appropriate for the intended use and complies with all laws and regulatory standards. The user assumes all risk associated with the end use of this product.

## *Recommended Undergarments*

The wearer should consider wearing inherently flame resistant, woven clothing, with full length sleeves and trousers under this garment.



## INSPECTION OF THE GARMENT



### CAUTION

The garment should undergo a full visual inspection at the following times:

- *Upon receipt to ensure no damage has occurred during shipment.*
- *After a garment is worn and before the garment is made available for reuse.*
- *Annually.*

*Most performance properties of a liquid-splash clothing item or ensemble cannot be tested by the user in the field.*

### *Full Visual Inspection*

To perform a full visual inspection:

- Choose a clean, dry area that is free of potential sources of snags, tears and punctures.
- Visually check the outside of the garment for visible defects such as tears, holes, cuts and discolorations.
- Visually inspect the seams and material inside of the ensemble for tape lift, tears, holes, and delamination.
- Visually inspect for surface damage or discoloration on material.
- All zippers should work smoothly and all fasteners should hold tightly prior to use. If the zipper or fasteners do not function properly, the suit should be replaced.

- The visual inspection should be noted in the Inspection Log, found at the end of this manual.

Garments with visible holes, tears, rips, punctures, serious discoloration or abrasions should not be used. If the garment is deemed unsuitable for use by visual inspection, the garment may be retired and designated for training use after being permanently labeled “For Training Use Only,” or disposed of properly.

## RETURNING THE GARMENT

If a garment fails a visual inspection, the ensemble may be returned for inspection and possible replacement. Contact Kappler, Inc. to authorize the return. No contaminated garments will be accepted for return. Discoloration or odors are evidence of unsatisfactory decontamination. Garments being returned must be accompanied by the inspection log and with a letter stating that the garment has not been contaminated. *Note: Charges may be incurred. See warranty information.*

## STORAGE LIFE AND STORAGE CONDITIONS

### *Storage Life*

Kappler’s DuraChem® 200 garments have a predicted *storage life* of 5 years from the date of manufacture when stored properly (see Storage Conditions), based on accelerated aging studies. *Storage Life* is defined as the period in which the garment or element has undergone proper care and maintenance in accordance with this instruction manual, but has not been used in either training or in response to actual incidents. The useable *service life* of the garment is dependent on the chemicals exposed to the garment, the concentration of those chemicals, the work environment, frequency of use and the maintenance program. It is the responsibility of the employer or purchaser to determine when the garment should be taken out of service. It is recommended that garments be labeled and retired to “Training Use Only” if they do not pass the visual test inspections.

## ***Storage Conditions***

Garments should be stored away from direct sunlight, in a clean and dry location that is not subjected to extreme hot or cold conditions (between 40°-90° F). Garments should be stored in their original boxes, in bags or on hangers.

## **CLOSURE LUBRICANTS**

There are no lubricants recommended for the closure system.

## **DONNING THE GARMENT**

1. Conduct a brief visual inspection of the ensemble before beginning donning procedure.
  - Garment should be free of discoloration, or physical damage.
2. An assistant should help the wearer don the ensemble.
3. Remove all jewelry and personal items (pens, key rings, badges, pagers, knife cases, etc.) that might damage the garment.
4. Check function of respirator and place nearby donning location.
5. Visually check size and condition of boots and place nearby donning location.
6. Open jacket or coverall closure completely.
7. Read garment size label to assure proper fit.
8. Remove shoes.
9. While sitting, insert feet into bib trouser or coverall legs. Stretch legs out to maximum extension while pulling garment up around hips.
10. Put on boot and pull ankle openings over the boots.

11. Pull bibs or coverall up. For bib, secure shoulder straps on each side.
12. Put on jacket or insert arms into coverall. Slowly close the zipper closure. After checking that the closure is completely closed, the storm flap should be closed and sealed over the closure.
13. Put on respirator face piece and pull garment hood back over the top of the face piece.

## DOFFING THE GARMENT

1. If the garment has been contaminated or suspected of being contaminated, the wearer should continue to use his respirator until the garment has been doffed and removed.
2. An assistant should help the wearer doff the garment after field decontamination. If the garment has been contaminated, the assistant should wear protective clothing and respiratory equipment.
3. While the wearer stands, the assistant should open the closure and peel the jacket or coverall down and away from the wearer's shoulders. The assistant should help the wearer remove his arms from the sleeves. External airlines should be disconnected from the garment and from the wearer's respirator, while the wearer switches to his escape bottle.
4. Lower garment below the hips and sit down. Have the assistant remove the boots, pull the garment off the legs and remove the garment to a remote location.
5. Once the ensemble has been removed, the wearer can doff the respiratory face piece.

## INTERFACE ISSUES

The user should insure respirators, boots and gloves, as applicable, are properly interfaced. Adhesive tape is not an appropriate means for creating an interface between ensemble elements.

## DECONTAMINATION AND CLEANING OF CHEMICAL AND BIOLOGICAL CONTAMINATION

### *Decontamination before Reuse*

This garment is designed for multiple uses, single exposure. This garment is not designed for multiple exposures and multiple decontaminations. Contaminated garments should be discarded. Contaminated garments are not suitable for training.

### *Field Decontamination*

The purpose of field decontamination is to allow the wearer to doff the garment without being harmed by contaminants on the garment surface. Garments that have been exposed or suspected to have been exposed to chemical or biological contamination should be field decontaminated before doffing. Additional cleaning, decontamination and a full visual inspection are required before a garment may be reused.

1. Leave the hot zone with adequate air supply for decontamination and removal of the garment. The wearer should continue to wear the respirator until the garment has been completely doffed and removed from the area.
2. If the garment has been exposed or is suspected to have been exposed, thoroughly scrub the garment using household dishwashing liquid and soft scrub brush, followed by a thorough rinsing in water.

3. If possible, the excess rinse water should be removed from the garment by individuals wearing gloves, liquid-splash protective clothing and respirator protection. At a minimum, the excess rinse water on and near the closure assembly should be removed with a dry cloth to ensure wearer is not exposed to chemical.

## ***Maintenance and Cleaning***

Only garments that have been thoroughly cleaned and dried may be considered for use.

- Wash separately from non-flame-resistant garments.
- Fasten all zippers, buckles, and closures prior to washing.
- Wash in a front-loading or other non-agitator machine to lessen mechanical damage during washing. If a top-loading machine is used, select the gentlest cycle available.
- Wash in cold water (less than 105 degrees F) with a low-sudsing detergent.
- Do not use fabric softeners, bleaches, or other stain treatments.
- Do not scrape or scrub fabric as this may compromise chemical resistance.
- Air-dry only. Do not use hot air or a tumbling air dryer to dry this garment.
- Do not dry-clean this ensemble.
- Document cleaning in Inspection Log.

## RETIREMENT CONSIDERATIONS

It is recommended this garment be retired from service if any of the following criteria are met:

- Garment is abraded, cut, torn, punctured, or otherwise and in any way breached.
- Garment has received an exposure to a toxic chemical.

Retired garments that are not contaminated may be labeled and used “For Training Use Only.” The labeling should be done with a permanent marker.

## DISPOSAL

This garment may be safely disposed of in a facility capable of handling plastic items containing polyolefin, polyester and vinyl plastics. Severely contaminated garments may need to be treated as and disposed of as hazardous wastes.

## WARRANTY INFORMATION

It is the responsibility of the user to select garments which are appropriate for each intended use and which meet all specified government and/or industry standards.

Kappler DuraChem® 200 garments are designed for multiple use / single exposure. It is the responsibility of the wearer to inspect garments periodically to ensure that all components including fabric, zippers and seams are in good working condition and provide adequate protection for the operation and chemicals to be encountered. Failure to fully inspect garments may result in serious injury or death to the wearer. Never wear garments that have not been fully inspected prior to use. Any garment which does not pass the visual inspection should be removed from service immediately.

Kappler warrants for a period of 90 days after the delivery of a DuraChem® 200 garment that the garment is free from defects in materials and workmanship when used in accordance with the instructions contained in this care and use manual. NO OTHER EXPRESSED OR IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE IS MADE. Purchaser and all garment users shall promptly notify Kappler of any claim, whether based on contract, negligence, strict liability, or otherwise.

The sole and exclusive remedy of the purchaser and all end users and the limit of liability of Kappler for any and all losses, injuries or damages shall be the refund of the purchase price or the replacement or repair of any product found to be defective within 90 days after the product is delivered. In no event shall Kappler be liable for any special, incidental or consequential damages, whether in contract or in tort, arising out of any warranties, representations, instructions or defects from any cause in connection with the DuraChem® 200 series garments or the sale thereof.

Purchaser and all users are responsible for the inspection and proper care of this product as described in this care and use manual and are responsible for all loss or damages from use or handling which results from conditions beyond the control of the manufacturer.

DuraChem® 200 is a Kappler registered trademark.

## APPENDIX A – TECHNICAL DATA PACKAGE

### NFPA 1992 PERFORMANCE DATA

Available on request from Kappler.

### SIZING INFORMATION

Sizes available: SM/MD, LG/XL, 2X/3X, 4X.

See attached chart (Appendix B).

### GARMENT MATERIAL

The primary garment material is Kappler DuraChem® 200 chemical and thermal barrier fabric.

### ZIPPER/CLOSURE TYPE AND MATERIAL

#### *D2H632 and D2H634*

The materials for construction for the zipper closure include brass chain, brass pull and slide, and an inherently flame resistant cloth tape. The completed closure assembly is located on the garment, oriented along the center of the torso from crotch to neck opening, with a 26” length for all sizes.

## ***D2H440 and D2H443***

The materials for construction for the zipper closure include brass chain, brass pull and slide, and an inherently flame resistant cloth tape. The completed closure assembly is located on the garment, oriented vertically on the center of the torso from crotch to neck opening, with a 26” zipper for sizes SM/MD and L/XL and 30” zipper for sizes 2X/3X and 4X.

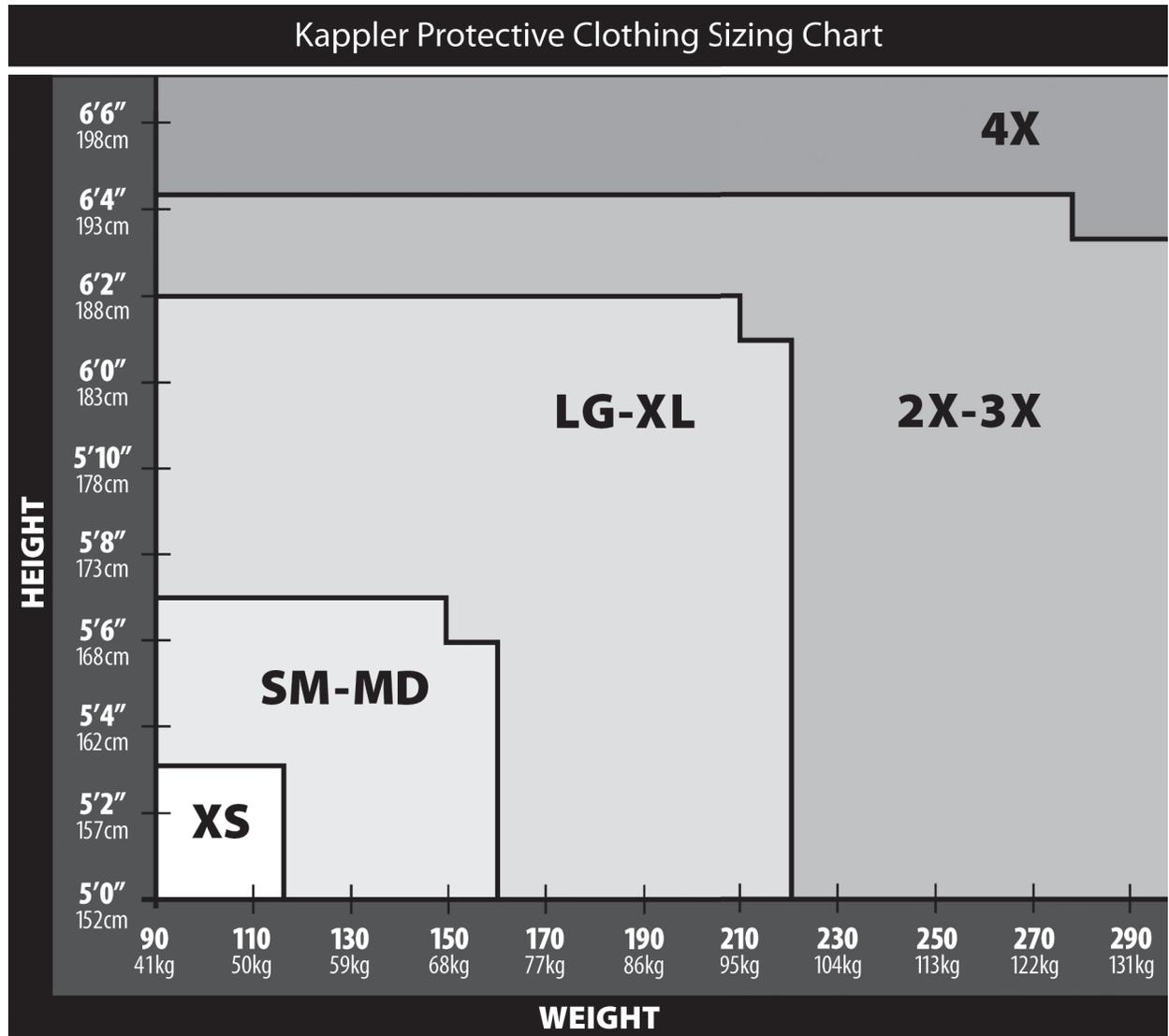
## **MATERIAL SEAM TYPES AND COMPOSITION**

Garment material seams are single needle lock stitch to the inside. The sewing thread is 100% meta-aramid. The inner seam tape is a composite structure composed of meta-aramid and a chemical barrier film. The garment closure is connected to the garment by sewing then heat sealing over the seam to the inside of the closure.

## **TYPE AND STYLE OF HEAD PROTECTION ACCOMMODATED WITH THIS GARMENT**

The DuraChem® 200 garment will accommodate Type 1 Class G helmets of ANSI Z89.1.

## APPENDIX B – GARMENT SIZING CHART



**Please Note:** This chart is based on individuals wearing S.C.B.A., safety helmet and suggested underclothing (see recommended undergarments). Proper fit varies with individual body shape.





