

ARC FLASH PROTECTION

NFPA 70E / ASTM F 1506 Sixth Edition



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PROTECTION FROM ELECTRIC ARC EXPOSURE

The intense energy and very short duration of an electric arc flash represents a very unique exposure. Everyday work clothes made from regular cotton or poly/cotton fabrics, regardless of weight, can be readily ignited at some exposure level and will continue to burn adding to the extent of injury sustained from the arc alone. NFPA 70E now requires employees to wear flame resistant (FR) protective clothing that meets the requirements of ASTM F1506 wherever there is possible exposure to an electric arc flash. It requires employers to perform a flash hazard analysis to determine the flash protection boundary distance.

The standard is designed to protect employees working inside these flash protection boundaries by requiring protective clothing for the corresponding Hazard/Risk Category that has an ATPV of at least the value listed in the “Protective Clothing Characteristics” section of the standard (see below). OSHA has confirmed that garments which meet the requirements of ASTM F1506 are in compliance with OSHA 29 CFR 1910.269 Electrical Power Generation, Transmission and Distribution, with regard to garments not contributing to burn severity.

NFPA 70E REQUIREMENTS

The National Fire Protection Association (NFPA) published the latest edition of the NFPA 70E Standard (Standard for Electrical Safety Requirements for Employee Workplaces) in 2012. The revised version requires employees to wear flame resistant (FR) protective clothing that meets the requirements of ASTM F1506 wherever there is possible exposure to an electric arc flash. It requires employers to perform a flash hazard analysis to determine the flash protection boundary distance. The standard is designed to protect employees working inside these flash protection boundaries by requiring protective clothing for corresponding Hazard/Risk Category that has an arc thermal performance value (ATPV) of at least the value listed in the “Protective Clothing Characteristics” section of the standard (see table to the right). The vast majority of major companies in the U.S. have some employees who work on or near energized electrical conductors or circuit parts. In addition, the Department of Energy has required that federal and contractor employees comply with NFPA 70E and the 2002 National Electric Code (NEC) references the NFPA 70E standard. Finally, OSHA considers the NFPA 70E standard a “recognized industry practice.”

When incident energy exceeds 40 cal/cm² at the working distance, greater emphasis than normal should be placed on de-energizing before working on or near the exposed electrical conductors or circuit parts.

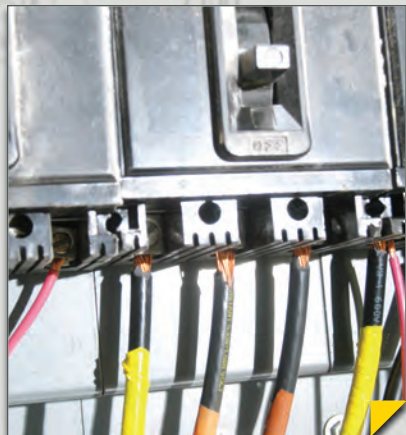


TABLE 130.7(C)(11) PROTECTIVE CLOTHING CHARACTERISTICS

Hazard/Risk Category	Protective Clothing and PPE	Hazard/Risk Category	Protective Clothing and PPE
0	Protective Clothing, Nonmelting or Untreated Natural Fiber (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a Fabric Weight of at Least 4.5 oz/yd ²	3	Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 25 cal/cm ² (See Note 3.)
	Shirt (long sleeve)		Arc-rated long-sleeve shirt (AR)
	Pants (long)		Arc-rated pants (AR)
	Protective Equipment		Arc-rated coverall (AR)
	Safety glasses or safety goggles (SR)		Arc-rated arc flash suit jacket (AR)
	Hearing protection (ear canal inserts)		Arc-rated arc flash suit pants (AR)
	Heavy duty leather gloves (AN) (See Note 1.)		Arc-rated arc flash suit hood
1	Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm ² (See Note 3.)		Arc-rated gloves (See Note 1.)
	Arc-rated long-sleeve shirt and pants or arc-rated coverall		Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Arc-rated face shield (see Note 2) or arc flash suit hood		Protective Equipment
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)		Hard hat
	Protective Equipment		Safety glasses or safety goggles (SR)
	Hard hat		Hearing protection (ear canal inserts)
	Safety glasses or safety goggles (SR)		Leather work shoes
	Hearing protection (ear canal inserts)	4	Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 40 cal/cm ² (See Note 3.)
	Heavy duty leather gloves (See Note 1.)		Arc-rated long-sleeve shirt (AR)
	Leather work shoes (AN)		Arc-rated pants (AR)
2	Arc-Rated Clothing, Minimum Arc Rating of 8 cal/cm ² (See Note 3.)		Arc-rated coverall (AR)
	Arc-rated long-sleeve shirt and pants or arc-rated coverall		Arc-rated arc flash suit jacket (AR)
	Arc-rated flash suit hood or arc-rated face shield (See Note 2) and arc-rated balaclava		Arc-rated arc flash suit pants (AR)
	Arc-rated jacket, parka, rainwear, or hard hat liner (AN)		Arc-rated arc flash suit hood
	Protective Equipment		Arc-rated gloves (See Note 1.)
	Hard hat		Arc-rated jacket, parka, rainwear, or hard hat liner (AN)
	Safety glasses or safety goggles (SR)		Protective Equipment
	Hearing protection (ear canal inserts)		Hard hat
	Heavy duty leather gloves (See Note 1.)		Safety glasses or safety goggles (SR)
	Leather work shoes		Hearing protection (ear canal inserts)
			Leather work shoes
			Hard hat
			Safety glasses or safety goggles (SR)
			Hearing protection (ear canal inserts)
			Heavy duty leather gloves (See Note 1.)
			Leather work shoes

AN: as needed (optional). AR: as required. SR: selection required.

Notes: (1) If rubber insulating gloves with leather protectors are required by Table 130.7(C)(9), additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement. (2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn. (3) Arc rating is defined in Article 100 and can be either the arc thermal performance value (ATPV) or energy of break open threshold (EBT). ATPV is defined in ASTM F 1959, Standard Test Method for Determining the Arc Thermal Performance Value of Materials for Clothing, as the incident energy on a material, or a multilayer system of materials, that results in a 50 percent probability that sufficient heat transfer through the tested specimen is predicted to cause the onset of a second-degree skin burn injury based on the Stoll curve, in cal/cm². EBT is defined in ASTM F 1959 as the incident energy on a material or material system that results in a 50 percent probability of breakopen. Arc rating is reported as either ATPV or EBT, whichever is the lower value.

ARC FLASH PROTECTION KITS



Clothing in our HRC2 kits is manufactured using single layers of Ultra Soft®.

Choose between 8, 12, and 20 cal/cm² kits.

Plug 8, 12, or 20 into below kit part numbers when ordering.



COVERALL KIT

Part # AG12-CV-(size) Components

Coverall (SW-605-12)
 Hard Cap (E2RW-SLT)
 Face Shield (WV-ARC-XL-CN)
 Chin Cup (SW-CN-G)
 Cap Bracket (HB-2-CAP)
 Knit Nomex Hood (KN-51-NFPA)
 Rubber Gloves (LRIG-0-11)
 Leather Protector Gloves (PG-0-ADJS)
 12" Glove Bag (GB-12)
 Gear Bag (909-ARC)
 Safety Glasses (SW-SG)
 Ear Plugs (SW-EAR)

JACKET & BIB KIT

Part # AG12-(size) Components

Jacket (SWJ-12)
 Bib Overall (SWB-12)
 Hard Cap (E2RW-SLT)
 Face Shield (WV-ARC-XL-CN)
 Chin Cup (SW-CN-G)
 Cap Bracket (HB-2-CAP)
 Knit Nomex Hood (KN-51-NFPA)
 Rubber Gloves (LRIG-0-11)
 Leather Protector Gloves (PG-0-ADJS)
 12" Glove Bag (GB-12)
 Gear Bag (909-ARC)
 Safety Glasses (SW-SG)
 Ear Plugs (SW-EAR)

HRC2 8,12&20 CAL/CM²



COAT & LEGGING KIT **Part # AG12-CL-(size) Components**

Coat (SWC-12)
Leggings (SW-401-12)
Hard Cap (E2RW-SLT)
Face Shield (WV-ARC-XL-CN)
Chin Cup (SW-CN-G)
Cap Bracket (HB-2-CAP)
Knit Nomex Hood (KN-51-NFPA)
Rubber Gloves (LRIG-0-11)
Leather Protector Gloves (PG-0-ADJS)
12" Glove Bag (GB-12)
Gear Bag (909-ARC)
Safety Glasses (SW-SG)
Ear Plugs (SW-EAR)

JACKET & PANT KIT **Part # AG12-JP-(size) Components**

Jacket (SWJ-12)
Pant (SWP-12)
Hard Cap (E2RW-SLT)
Face Shield (WV-ARC-XL-CN)
Chin Cup (SW-CN-G)
Cap Bracket (HB-2-CAP)
Knit Nomex Hood (KN-51-NFPA)
Rubber Gloves (LRIG-0-11)
Leather Protector Gloves (PG-0-ADJS)
12" Glove Bag (GB-12)
Gear Bag (909-ARC)
Safety Glasses (SW-SG)
Ear Plugs (SW-EAR)

ARC FLASH PROTECTION KITS



Clothing in these HRC3 & 4 kits is manufactured using multiple layers of Ultra Soft®.

Choose between 32 and 43 cal/cm² kits.

Plug 32 or 43 into below kit part numbers when ordering.



COVERALL KIT

Part # AG43-CV-(size) Components

Coverall (SW-605-43)

Hood (SWH-43)

Hard Cap (E2RW-SLT)

Rubber Gloves (LRIG-2-14)

Leather Protector Gloves (LLPG-12)

15" Glove Bag (GB-15)

Gear Bag (909-ARC)

Safety Glasses (SW-SG)

Ear Plugs (SW-EAR)



JACKET & PANT KIT

Part # AG43-JP-(size)

Jacket (SWJ-43)

Over Pant (SWP-43)

Hood (SWH-43)

Hard Cap (E2RW-SLT)

Rubber Gloves (LRIG-2-14)

Leather Protector Gloves (LLPG-12)

15" Glove Bag (GB-15)

Gear Bag (909-ARC)

Safety Glasses (SW-SG)

Ear Plugs (SW-EAR)

HRC 3 & 4: 32 & 43 CAL/CM²



JACKET & BIB KIT

Part # AG43-(size) Components

Jacket (SWJ-43)
 Bib Overall (SWB-43)
 Hood (SWH-43)
 Hard Cap (E2RW-SLT)
 Rubber Gloves (LRIG-2-14)
 Leather Protector Gloves (LLPG-12)
 15" Glove Bag (GB-15)
 Gear Bag (909-ARC)
 Safety Glasses (SW-SG)
 Ear Plugs (SW-EAR)



COAT & LEGGING KIT

Part # AG43-CL-(size) Components

Coat (SWC-43)
 Leggings (SW-401-43)
 Hood (SWH-43)
 Hard Cap (E2RW-SLT)
 Rubber Gloves (LRIG-2-14)
 Leather Protector Gloves (LLPG-12)
 15" Glove Bag (GB-15)
 Gear Bag (909-ARC)
 Safety Glasses (SW-SG)
 Ear Plugs (SW-EAR)

ARC FLASH PROTECTION KITS

44 and 74 cal/cm² kits are manufactured using inherently FR materials.

Choose between 44 and 74 cal/cm² kits and plug into below kit part numbers when ordering.

Lightweight options for HRC4.



MASTER SERIES JACKET & PANT KIT Part # AG44-JP-(size) Components

Jacket [SWJ-MS44]
Over Pant [SWP-MS44]
Hood [SWH-44]
Hard Cap [E2RW-SLT]
Rubber Gloves [LRIG-2-14]
Leather Protector Gloves [LLPG-12]
15" Glove Bag [GB-15]
Gear Bag [909-ARC]
Safety Glasses [SW-SG]
Ear Plugs [SW-EAR]



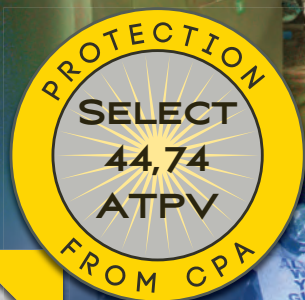
COAT & LEGGING KIT Part # AG44-CL-(size) Components

Coat [SWC-44]
Leggings [SW-401-44]
Hood [SWH-44]
Hard Cap [E2RW-SLT]
Rubber Gloves [LRIG-2-14]
Leather Protector Gloves [LLPG-12]
15" Glove Bag [GB-15]
Gear Bag [909-ARC]
Safety Glasses [SW-SG]
Ear Plugs [SW-EAR]

HRC4: 44 & 74 CAL/CM²

Refresh™

AIR FLOW SYSTEM



Increase your comfort and productivity with CPA's Refresh™ air flow system.



JACKET & BIB KIT

Part # AG44-(size) Components

Jacket (SWJ-44)

Bib Overall (SWB-44)

Hood (SWH-44)

Hard Cap (E2RW-SLT)

Rubber Gloves (LRIG-2-14)

Leather Protector Gloves (LLPG-12)

15" Glove Bag (GB-15)

Gear Bag (909-ARC)

Safety Glasses (SW-SG)

Ear Plugs (SW-EAR)

Full Kit part # RF-KIT

Rechargeable battery part # RF-BATT

Bag of 3 filters part # FR-FLTR

CPA's waist belt unit minimizes stagnant air in your hood by delivering a steady stream of ambient air flow.

- ◆ Our **Refresh™** system can be used with any CPA Arc hood as well as with any of our HRC2 face shields.
- ◆ **Refresh™** fans are not NIOSH approved and do not provide breathable air filtration. They are a means to provide ambient air flow only.
- ◆ **Refresh™** full kit includes: Fan belt unit with FR cover, hose with FR cover, hard cap with diffuser, rechargeable battery, AC power adapter and two filters.

HRC2 DAILY WEAR



ULTRA SOFT® Medium Blue Work Shirt

7 oz Ultra Soft®
Medium Blue, 8.7 ATPV
Part #625-USB-(size)

Category 2



ULTRA SOFT® Khaki Work Shirt

7 oz Ultra Soft®
Khaki, 8.7 ATPV
Part #625-USK-(size)

Category 2



ULTRA SOFT® Navy Work Pant

9 oz Navy Ultra Soft®,
12.4 ATPV
Part # 606-USN-(waist x inseam)

Category 2

COVERALLS, SHIRTS, PANTS

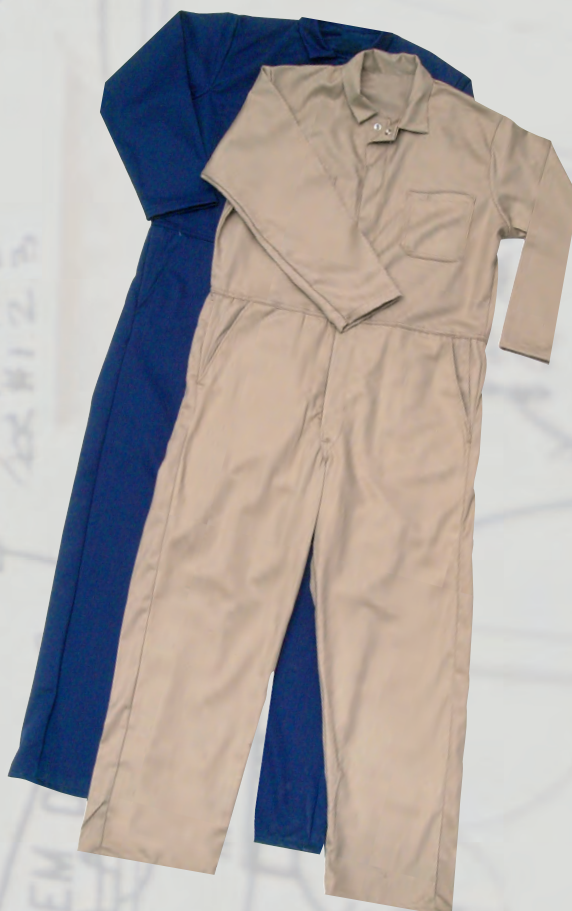


INDURA® Navy Coverall

9 oz Navy Indura®
10 ATPV

Part # 605-IND-N-(size)

Category 2



ULTRA SOFT® Khaki or Navy Coverall

7 oz Khaki Ultra Soft®, 8.7 ATPV

Part # 605-USK-(size)

9 oz Navy Ultra Soft®, 12 ATPV

Part # 605-USN-(size)

Category 2



DENIM RUGGED TWILL Relaxed Jean

12 oz Denim Inherently FR

14.2 ATPV

Part # 606-DFR-(waist x inseam)

Category 2

SWEATSHIRTS/T-SHIRTS



ULTRA SOFT® Fleece Full Zip Hooded Sweatshirt

Ultra Soft® Fleece. Sewn with
Nomex® Thread. Navy, 21.8 EBT
Part # 615-USFN-(size)

Category 2



ULTRA SOFT® Fleece Hooded Sweatshirt

Ultra Soft® Fleece. Sewn with
Nomex® Thread. Navy, 21.8 EBT
Part # 617-USFN-(size)

Category 2



ULTRA SOFT® Fleece Crewneck Sweatshirt

Ultra Soft® Fleece. Sewn with
Nomex® Thread. Navy, 21.8 EBT
Part # 620-USFN-(size)

Category 2



FR TREATED COTTON Interlock Short Sleeve Shirt

Sizes: S-5XL Colors: Navy, Orange, Gray
10.9 ATPV

Part # 610-FRC-SS-(color)-(size)

Category 2

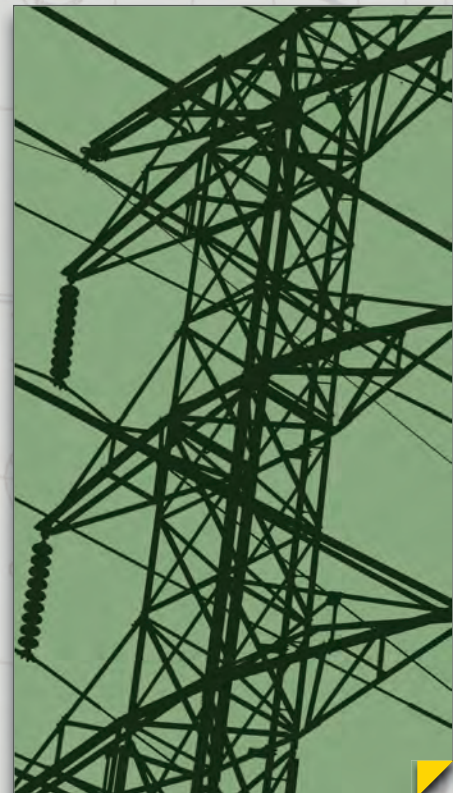


FR TREATED COTTON Interlock Long Sleeve Shirt

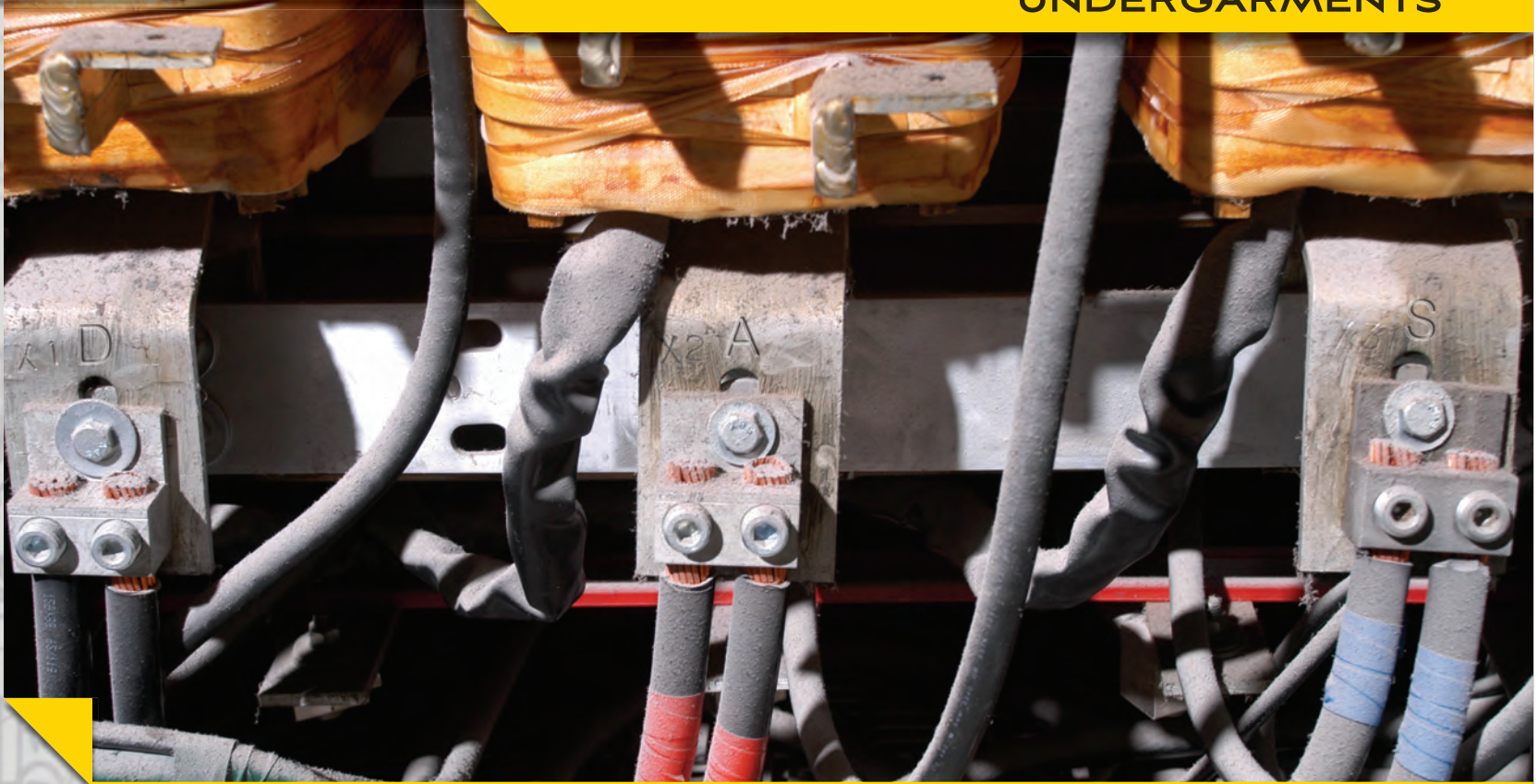
Sizes: S-5XL Colors: Navy, Orange, Gray
10.9 ATPV

Part # 610-FRC-LS-(color)-(size)

Category 2



UNDERGARMENTS



UNDERGARMENT STYLES

Short Top/Short Pant * Long Top/Long Pant

UNDERGARMENTS

Undergarments are made of a single layer of 7.7 oz interlock knit. The fabric has a TPP rating of 14.7 and an ATPV of 11 cal/cm². Tops and bottoms are available in sizes S-4XL. Socks are one size only.

Long sleeve top	CX-54-(size)
Short sleeve top	CX-64-(size)
Long pant	CX-55-(size)
Short Pant	CX-65-(size)
Socks 22"	CX-56-22



GLOVES



CLASS 0 GLOVE KIT

Class 0 Rubber Glove

LRIG-0-11-{size}

Leather Protector

PG-0-ADJS-{size}

Glove Bag

GB-12

COMPLETE KIT

GK-0-11-{size}

CLASS 2 GLOVE KIT

Class 2 Rubber Glove

LRIG-2-14-{size}

Leather Protector

LLPG-12-{size}

Glove Bag

GB-15

COMPLETE KIT

GK-2-14-{size}

GLOVE TALC

An accessory for gloves, the 5 oz squirt bottle talc helps absorb moisture and perspiration. Facilitates donning and doffing of gloves.

Style # TALC-5-OZ



INSULATED RUBBER GLOVES

	11" Length	14" Length	16" Length	18" Length
Class 00	LRIG-00-11-{size}	LRIG-00-14-{size}	n/a	n/a
Class 0	LRIG-0-11-{size}	LRIG-0-14-{size}	n/a	n/a
Class 1	n/a	LRIG-1-14-{size}	LRIG-1-16-{size}	LRIG-1-18-{size}
Class 2	n/a	LRIG-2-14-{size}	LRIG-2-16-{size}	LRIG-2-18-{size}
Class 3	n/a	LRIG-3-14-{size}	LRIG-3-16-{size}	LRIG-3-18-{size}
Class 4	n/a	n/a	n/a	LRIG-4-18-{size}

LEATHER PROTECTOR GLOVES

	10" Length	12" Length	14" Length	16" Length
Low Voltage	PG-0-ADJS	n/a	n/a	n/a
High Voltage	LLPG-10-{size}	LLPG-12-{size}	LLPG-14-{size}	LLPG-16-{size}

14" SWITCHING GLOVES

Not Electrically Insulated

SW-234-12	12 Cal/cm ² Gloves
SW-234-20	20 Cal/cm ² Gloves
SW-234-32	32 Cal/cm ² Gloves
SW-234-43	43 Cal/cm ² Gloves
SW-234-74	74 Cal/cm ² Gloves

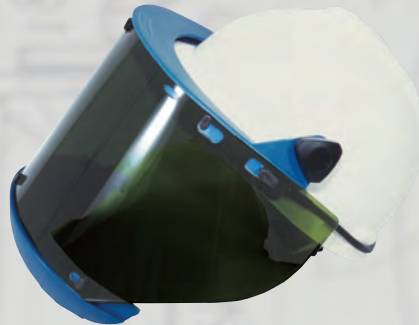
Class	Proof-test [A_C]	Max. use Voltage [A_C]
00	2,500	500
0	5,000	1,000
1	10,000	7,500
2	20,000	17,000
3	30,000	26,500
4	40,000	36,000

FACE SHIELDS/LENSES



10 CAL FACE SHIELD UNIT

Face Shield	WV-ARC-XL
Cap Bracket	HB-2-CAP
Hard Cap	E2RW-(Color)
COMPLETE KIT	SW-WVK-(Color)



12 CAL CHIN FACE SHIELD UNIT

Face Shield	WV-ARC-XL-CN
Chin Cup	SW-CN-G
Cap Bracket	HB-2-CAP
Hard Cap	E2RW-(Color)
COMPLETE KIT	SW-WVCK-(Color)



BRACKETS

Description	Part Number
Universal Cap Bracket	HB-2-CAP
Slotted Cap Bracket	HB-2-SLT
Universal Hat Bracket	HB-2-UNV

ACCESSORIES

Chin Guard	SW-CN-G
Hard Cap	E2RW-(Color)
Hard Hat	E1RW-(Color)
Safety Glasses	SW-SG



STORAGE BAG

Fleece lined storage bag with drawstring. Sized to accommodate face shield with hard cap.

Style # SW-SB



CARBONX[®] ULTIMATE HOOD

The CarbonX[®] Ultimate flared style hood provides maximum coverage. Our hood features flat stitching and seamless chin area for better fit and comfort. The 2-Ply version has an ATPV of 23 cal/cm² square. Our 3-ply version has an ATPV of 53 cal/cm².

Style # KCF-51 2 Ply

Style # KC3-51 3 Ply



NOMEX[®] BLEND

Our Nomex[®] blend hood offers economy and 10 cal/cm² protection. One size.

Style # KN-51-NFPA



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