

# 70E PROTECTIVE APPAREL & FREQUENTLY ASKED QUESTIONS

VOLUME 5

Solutions for safety directors, maintenance electricians, electrical contractors, linemen, managers, supervisors and owners who work directly with 480 V or greater electrical equipment.

NFPA 70 COMPLIANT





» COOL TOUCH® 2 DRESS UNIFORM SHIRT



Gusset side seam for ease of movement + Banded topstitched collar + Two chest pockets with button flaps and sewn in pencil stall + Placket front with button closure + Tailored sleeve placket + Topstitched cuff + Straight back yoke + Women's style has darts for true women's look and fit

FABRIC: Flame-resistant, 7 oz. 48% Modacrylic/37% Lyocell/15% Para-Aramid  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating ATPV 8.4 calories/cm<sup>2</sup>

HRC 2	MEN'S STYLE	COLOR	SIZE RG	SIZE LN
	SMU2KH	KHAKI	S-3XL	M-2XL
	SMU2LB	LIGHT BLUE	S-3XL	M-2XL

HRC 2	WOMEN'S STYLE	COLOR	SIZE
	SMU3KHB	KHAKI	S-3XL
	SMU3LBB	LIGHT BLUE	S-3XL

WOMEN'S DELIVERY 4-6 WEEKS



FABRIC: Flame-resistant, 7 oz. 45% Modacrylic/35% Lyocell/15% Polyamide Imide/5% Para-Aramid  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating ATPV 10.1 calories/cm<sup>2</sup>

HRC 2	MEN'S STYLE	COLOR	SIZE RG	SIZE LN
	SMU2NV	NAVY	S-3XL	M-2XL

HRC 2	WOMEN'S STYLE	COLOR	SIZE
	SMU3NVB	NAVY	S-3XL

WOMEN'S DELIVERY 4-6 WEEKS

» 6 OZ. DRESS UNIFORM SHIRT



Banded, topstitched, button-down collar + Placket front with button closure + Tailored sleeve plackets + Topstitched cuff with button closure

FABRIC: EXCEL FR™ ComforTouch™ Flame-resistant, 6 oz. 88% Cotton/12% Nylon  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating ATPV 5.8 calories/cm<sup>2</sup>

HRC 1	STYLE	COLOR	SIZE RG	SIZE LN
	SLU6KH	KHAKI	M-3XL	L-2XL
	SLU6LD	LT. DENIM	M-3XL	L-2XL
	SLU6OR	ORANGE	M-3XL	L-2XL





» 7 OZ. DRESS UNIFORM SHIRT

Banded, topstitched, button-down collar + Placket front with button closure + Topstitched cuff with button closure + Tailored sleeve plackets + Women's style has darts for a true women's look and fit

FABRIC: EXCEL FR™ ComforTouch™ Flame-resistant, 7 oz. 88% Cotton/12% Nylon  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating ATPV 8.6 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE RG	SIZE LN
SLU2KH	KHAKI	S-3XL	M-2XL
SLU2LB	LT. BLUE	S-3XL	M-2XL
SLU2NV	NAVY	S-3XL	M-2XL
SLU2RB	ROYAL BLUE	S-3XL	M-2XL
SLU2SY	SILVER GREY	S-3XL	M-2XL

WOMEN'S STYLE	COLOR	SIZE
SLU3KHB	KHAKI	S-3XL
SLU3LBB	LT. BLUE	S-3XL
SLU3NVB	NAVY	S-3XL
SLU3RBB	ROYAL BLUE	S-3XL
SLU3SYB	SILVER GREY	S-3XL

WOMEN'S DELIVERY 4-6 WEEKS

» PLAID DRESS SHIRT

Banded, topstitched, button-down collar + Topstitched cuff with button closure + Placket front with button closure + Tailored sleeve placket + Women's style has darts for a true women's look and fit

FABRIC: EXCEL FR™ Flame-resistant, 7 oz. 100% Cotton  
 CARE: Home wash  
 PROTECTION: Arc Rating ATPV 7.7 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE RG	SIZE LN
SEG2RN	RED/NAVY	S-3XL	M-2XL
SEG2ON	OLIVE/NAVY	S-3XL	M-2XL
SEG2KN	KHAKI/NAVY	S-3XL	M-2XL
SEG2NK	NAVY/KHAKI	S-3XL	M-2XL

WOMEN'S STYLE	COLOR	SIZE
SEG3RNB	RED/NAVY	S-2XL
SEG3ONB	OLIVE/NAVY	S-2XL
SEG3KNB	KHAKI/NAVY	S-2XL
SEG3NKB	NAVY/KHAKI	S-2XL

WOMEN'S DELIVERY 4-6 WEEKS



» WORK SHIRT

Two-piece, lined collar + Hemmed front with button closure + One-piece, lined cuff with button closure + Sleeve vents

FABRIC: EXCEL FR™ ComforTouch™ Flame-resistant, 7 oz. 88% Cotton/12% Nylon  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating is ATPV 8.6 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE RG	SIZE LN
SLW2LB	LT. BLUE	S-3XL	M-3XL
SLW2NV	NAVY	S-3XL	M-3XL
SLW2KH	KHAKI	S-3XL	M-3XL



» CONCEALED-GRIPPER POCKETLESS SHIRT

Two-piece, lined collar + One-piece lined cuff with concealed gripper + Hemmed front with concealed gripper closure + No pockets

FABRIC: EXCEL FR™ ComforTouch™ Flame-resistant, 7 oz. 88% Cotton /12% Nylon  
 CARE: Home and Industrial wash  
 PROTECTION: Arc Rating is ATPV 8.6 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE RG	SIZE LN
SLS2LB	LT. BLUE	S-3XL	M-2XL



## » FR BASE LAYER

Self-fabric crew neck collar + Tagless + Raglan sleeves + Side seam gusset + Heatseal Bulwark® triangle centered at neck to show undergarment compliance

FABRIC: EXCEL FR™ Flame-resistant, 4.5 oz. 100% Cotton

CARE: Home wash

PROTECTION: Arc Rating ATPV 4.0 calories/cm<sup>2</sup>

HRC 1	STYLE	COLOR	SIZE RG
	MPU2KH	KHAKI	S-5XL



## » SHORT SLEEVE TAGLESS T-SHIRT

Rib-knit crewneck collar + Hemmed sleeve + Single chest pocket

FABRIC: EXCEL FR™ Flame-resistant, 6.25 oz. Interlock FR 100% Cotton

CARE: Home wash

PROTECTION: Arc Rating ATPV 9.6 calories/cm<sup>2</sup>

HRC 2	STYLE	COLOR	SIZE RG	SIZE LN
	SET8GY	GREY	S-5XL	L-2XL
	SET8NV	NAVY	S-4XL	L-2XL
	SET8OR	ORANGE	S-4XL	L-2XL



## » LONG SLEEVE TAGLESS HENLEY SHIRT

Three button placket + Knit henley collar + Rib-knit cuff and collar + Single chest pocket

FABRIC: EXCEL FR™ Flame-resistant, 6.25 oz. Interlock FR 100% Cotton

CARE: Home wash

PROTECTION: Arc Rating ATPV 9.6 calories/cm<sup>2</sup>

HRC 2	STYLE	COLOR	SIZE RG	SIZE LN
	SEL2GY	GREY	S-4XL	L-2XL
	SEL2NV	NAVY	S-4XL	L-2XL
	SEL2OR	ORANGE	S-4XL	L-2XL



## » CLASSIC PRE-WASHED DENIM JEAN

One-piece waistband with button closure + Five jean style pockets + Two-needle felled seam construction + Soft pre-wash comfort and look + Women's style has updated fit + Classic fit is traditional, it sits at the natural waist and has a slimmer leg opening that will fit over boots

FABRIC: EXCEL FR™ Flame-resistant, 14.75 oz. 100% pre-washed cotton denim

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 20.7 calories/cm<sup>2</sup>

HRC 2	MEN'S STYLE	COLOR	SIZE
	PEJ4DW	BLUE DENIM	28-50

HRC 2	WOMEN'S STYLE	COLOR	SIZE
	PEJ3DW	BLUE DENIM	4-24



» LOOSE FIT STONE-WASHED DENIM JEAN

Two-needle contrast stitch styling with felled out seams and seat seam + Five jean style pockets + One-piece waistband with metal button closure (metal is not exposed to the skin) + Traditional jean style back yoke + New stone-washed fabric with soft pre-washed comfort and look + Loose fit sits slightly below the natural waist and has a loose seat and thigh with a wider leg opening than classic fit

FABRIC: EXCEL FR™ Flame-resistant, 14.75 oz.

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 20.7 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE
PEJ6SW	STONE WASH	28-50



» PRE-WASHED DENIM DUNGAREE

One-piece waistband with concealed button closure + Five jean style pockets + Two deep scoop pockets + Two oversized reinforced hip pockets + Rule pocket on right leg with wrap-around cell phone pocket + Hammer loop on left leg + Utility loop on back under waistband + Triple-needle felled outseam + Soft pre-wash comfort and look + Loose fit sits at the natural waist and has a loose seat and thigh with a wider leg opening

FABRIC: EXCEL FR™ Flame-resistant, 14.75 oz. 100% Cotton Denim

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 20.7 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE
PEJ8DW	BLUE DENIM	28-50
PEJ8SW	STONE-WASH	28-50



BLUE DENIM

STONE-WASH

» COOL TOUCH® 2 CARGO POCKET WORK PANT

Innerlined waistband with hook and eye closure for Men's and button closure for Women's + Two slack style front pockets + Two set in hip pockets, left hip pocket with button closure + Left leg cargo pocket and right leg cell phone pocket

FABRIC: Flame-resistant, 7 oz. 45% Modacrylic/35% Lyocell/15% Polyamide Imide/5% Para-Aramid

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 10.1 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE
PMU2NV	NAVY	28-50

WOMEN'S STYLE	COLOR	SIZE
PMU3NVB	NAVY	4-24

WOMEN'S DELIVERY 4-6 WEEKS



» WORK PANT

Innerlined waistband with button closure + Topstitched outseams and front pockets + Permanent crease + Women's style has updated fit

FABRIC: Flame-resistant, 7.5 oz. Twill, 93% Nomex® Aramid/5% Kevlar® Aramid/2% Other Fiber

CARE: Home and Light soil wash

PROTECTION: Arc Rating ATPV 6.7 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE
PNW8NV	NAVY	28-50

WOMEN'S STYLE	COLOR	SIZE
PNW9NV	NAVY	4-24





» WORK PANT

Innerlined waistband with button closure + Two slack style front pockets + Two set-in hip pockets, left hip pocket with button closure

FABRIC: EXCEL FR™ ComforTouch™ Flame-resistant, 9 oz. Twill 88% Cotton/12% Nylon

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 12.2 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE
PLW2NV	NAVY	28-50

WOMEN'S STYLE	COLOR	SIZE
PLW3NVB	NAVY	4-24

WOMEN'S DELIVERY 4-6 WEEKS

» WORK PANT

Innerlined waistband with button closure + Two slack style front pockets + Two set-in hip pockets, left hip pocket with button closure

FABRIC: EXCEL FR™ Flame-resistant, 9 oz. Twill 100% Cotton

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 11.2 calories/cm<sup>2</sup>

MEN'S STYLE	COLOR	SIZE
PEW2CH	CHARCOAL	28-50
PEW2KH	KHAKI	28-50
PEW2NV	NAVY	28-50
PEW2VG	VISUAL GREEN	28-50

WOMEN'S STYLE	COLOR	SIZE
*PEW3KHB	KHAKI	4-24
PEW3NV	NAVY	4-24

\*WOMEN'S DELIVERY 4-6 WEEKS



» COOL TOUCH® 2 DELUXE CONTRACTOR COVERALL

One-piece, topstitched, lay-flat collar + One-piece bi-swing action back + Two-way concealed Nomex® taped brass breakaway zipper, concealed snap at top of zipper at neck + Two two-needle topstitched patch chest pockets with flaps and concealed snap closure + Two inset lower front pockets are topstitched and lined + Concealed snap closure on sleeve cuffs + Two patch hip pockets have single concealed snap closure + One sleeve pocket sewn to left bicep with pencil stall + One piece rule pocket on right leg + Elastic-waist inserts in back

FABRIC: Flame-resistant 7 oz. 48% Modacrylic/37% Lyocell/15% Para-Aramid

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 8.4 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE RG	SIZE LN
CMD6KH	KHAKI	38-58	42-58

FABRIC: Flame-resistant 7 oz. 45% Modacrylic/35% Lyocell/15% Polyamide Imide/5% Para-Aramid

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 10.1 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE RG	SIZE LN
CMD6NV	NAVY	38-58	42-58



» 9 OZ. DELUXE COVERALL

Two-way concealed Nomex® taped brass breakaway zipper, concealed snap at top of zipper and at neck + Stand-up, two-way safety collar + Concealed snap closure on sleeve cuff + Elastic-waist inserts + Two front swing pockets + Two patch chest pockets with flaps and concealed snap closure + Two patch hip pockets + Left sleeve pocket + Deep-pleated action back + Side vent openings with snap closure + Rule pocket on right leg

FABRIC: EXCEL FR™ Flame-resistant, 9 oz. Twill 100% Cotton

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 11.2 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE RG	SIZE LN
CEB2KH	KHAKI	38-54	42-52
CEB2GY	MEDIUM GREY	38-54	42-52
CEB2NV	NAVY	38-58	42-52
CEB2OR	ORANGE	38-54	42-52
CEB2RD	RED	38-54	42-52
CEB2RB	ROYAL BLUE	38-58	42-52
CEB2SG	SPRUCE GREEN	38-58	42-58



» PARKA

Two-way, separating, heavy-duty Nomex®, taped brass zipper, fully covered with insulated storm flap, concealed snap closure + Fully insulated stand-up collar + Knit storm cuff with hook and loop suppression tabs + Three large patch pockets with concealed snaps (lower pocket with handwarmers) + One inside chest pocket + Sleeve pocket + Deep-pleated action back + Elastic inserts at waist across back + Internal snow belt + Accommodates snap-on hoods HLH2NV and HLH2RB, sold separately

FABRIC: EXCEL FR™ ComforTouch™

**Outershell** - Flame-resistant, 7 oz. Twill  
88% Cotton/12% Nylon, Water Repellent

**Insulation** - Flame-resistant, 12 oz. Two-layer  
Quilted Modacrylic

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 43.3 calories/cm<sup>2</sup>

HRC 4	STYLE	COLOR	SIZE RG	SIZE LN
	JLP8NV	NAVY	S-3XL	L-2XL
	JLP8RB	ROYAL BLUE	S-3XL	L-2XL



NAVY

ROYAL BLUE



NAVY

ROYAL BLUE

» LINED BOMBER JACKET

Separating, heavy-duty, Nomex® taped brass zipper, fully covered with two-layer storm flap, concealed snap closure + Two-layer stand-up collar + Concealed snap closure on cuff + Two large external patch pockets with concealed snap closure, with hand warmer + One inside chest pocket + Deep-pleated action back + Fully-tunneled elasticized waistband + Inside zipper guards on all zippers + Accommodates snap-on hoods HLH2NV and HLH2RB, sold separately + Accommodates liners LNL2, LNL6, LNS2 and LNS6, sold separately

FABRIC: EXCEL FR™ ComforTouch™

**Outershell** - Flame-resistant, 7 oz. Twill  
88% Cotton/2% Nylon, Water Repellent

**Insulation** - Flame-resistant, 7 oz. 100% Cotton

CARE: Home and Industrial wash

PROTECTION: Arc Rating ATPV 30.4 calories/cm<sup>2</sup>

HRC 3	STYLE	COLOR	SIZE RG	SIZE LN
	JLJ8NV	NAVY	S-3XL	M-2XL
	JLJ8RB	ROYAL BLUE	S-3XL	L-2XL

» 1/4 ZIP-FRONT FLEECE SWEATSHIRT

1/4 zip front + Inset chest pocket with zipper closure + Kangaroo pouch pockets + Hemmed sleeve and bottom opening

FABRIC: EXCEL FR™ Flame-resistant, 13 oz.  
100% Cotton Brushed Fleece

CARE: Home wash

PROTECTION: Arc Rating ATPV 18 calories/cm<sup>2</sup>

HRC 2	STYLE	COLOR	SIZE RG	SIZE LN
	SEZ6NV	NAVY	S-5XL	L-XL



» ZIPPER FRONT SWEATSHIRT

Hood with drawstring closure + Zipper front + Hemmed sleeve with elastic + Elastic waist + Two patch pockets

FABRIC: EXCEL FR™ Flame-resistant, 13 oz. 100% Cotton  
Brushed Fleece

CARE: Home wash

PROTECTION: Arc Rating ATPV 18 calories/cm<sup>2</sup>

HRC 2	STYLE	COLOR	SIZE RG	SIZE LN
	SEH6NV	NAVY	S-5XL	M-5XL
	SEH6OR	ORANGE	S-5XL	M-5XL

FABRIC: Flame-resistant, 13 oz. 94% Cotton/6% Polyester  
Brushed Fleece

CARE: Home wash

PROTECTION: Arc Rating ATPV 20 calories/cm<sup>2</sup>

HRC 2	STYLE	COLOR	SIZE RG	SIZE LN
	SEH6GY	GREY	S-5XL	M-5XL



NAVY

ORANGE

GREY





» 40 CAL/CM<sup>2</sup> HOOD WITH PROTECTIVE SHIELD

Includes ANSI 287-1 Faceshield + Shoulder notches for stability + 15" front bib + Fits standard hard hat + Does not include hard hat and safety glasses

FABRIC: **Outershell** - Flame-resistant 12 oz. Twill, 88% Cotton/12% Nylon  
**Liner** - 9 oz. Twill, 88% Cotton/12% Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: Arc Rating ATPV 40 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE
HRC4 HTC4RBB	ROYAL BLUE	ONE SIZE

» 40 CAL/CM<sup>2</sup> BIB

Quick disconnect straps + Hook and loop fly closure + Covered leg zippers with gussets + Generous bib pocket + Two large rear pockets + Two slash pockets with pass throughs for access to pant pocket

FABRIC: **Outershell** - Flame-resistant 12 oz. Twill, 88% Cotton/12% Nylon  
**Liner** - 9 oz. Twill, 88% Cotton/12% Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: Arc Rating ATPV 40 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE
HRC4 BTC4RBB	ROYAL BLUE	M-3XL



» 40 CAL/CM<sup>2</sup> SHORT COAT

Thigh length + FR hook and loop closure + Two-piece raglan sleeves + Knit cuff + Double layer stand-up collar

FABRIC: **Outershell** - Flame-resistant 12 oz. Twill, 88% Cotton/12% Nylon  
**Liner** - 9 oz. Twill, 88% Cotton/12% Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: Arc Rating ATPV 40 calories/cm<sup>2</sup>

STYLE	COLOR	SIZE
HRC4 CTC4RBB	ROYAL BLUE	M-3XL

Please allow 10-12 weeks for delivery for items on this page

» 40 CAL/CM<sup>2</sup> KIT

40 CAL/CM<sup>2</sup> Kit Includes:  
 + **HTC4RBB** - 40 CAL/CM<sup>2</sup> Hood with Protective Shield and Hard Hat and Safety Glasses  
 + **BTC4RBB** - 40 CAL/CM<sup>2</sup> Bib  
 + **CTC4RBB** - 40 CAL/CM<sup>2</sup> Short Coat  
 + **DUF4RBB** - Duffle Bag

+ **HTC4RBB** - 40 CAL/CM<sup>2</sup> Hood with Protective Shield  
 + **BTC4RBB** - 40 CAL/CM<sup>2</sup> Bib  
 + **CTC4RBB** - 40 CAL/CM<sup>2</sup> Short Coat  
 FABRIC: **Outershell** - Flame-resistant 12 oz. Twill, 88% Cotton/12% Nylon.  
**Liner** - 9 oz. Twill, 88% Cotton/12% Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: Arc Rating ATPV 40 calories/cm<sup>2</sup>

+ **DUF4RBB** - Duffel Bag  
 FABRIC: 100% Waterproof Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: N/A

STYLE	COLOR	SIZE
KIT4RBB	ROYAL BLUE	N/A



» REPLACEABLE FACE SHIELD

Hook and loop tabs are placed on inside of the detachable face shield for easy removal + Replaces face shield of HTC4RBB

FABRIC: N/A  
 CARE: N/A  
 PROTECTION: ANSI 287-1

STYLE	COLOR	SIZE
FAC4BNB	N/A	ONE SIZE

Please allow 10-12 weeks for delivery for items on this page



» DUFFLE BAG

A large bag to carry the Electrical Switching Gear + Not flame resistant

FABRIC: 100% Waterproof Nylon  
 CARE: Home and Light soil wash  
 PROTECTION: N/A

STYLE	COLOR	SIZE
DUF4RBB	ROYAL BLUE	ONE SIZE



## NFPA 70E STANDARD & FREQUENTLY ASKED QUESTIONS

“Flame Resistant protective apparel can mean the difference between minor survivable burns and major life threatening injuries.”



### NFPA 70E - STANDARD FOR ELECTRICAL SAFETY REQUIREMENTS FOR EMPLOYEE WORKPLACES

National Fire Protection Association (NFPA) Standard 70E, 2009 Edition, became effective September 5, 2008. This American National Standard addresses electrical safety requirements for activities such as operation, repair or demolition of exposed energized electrical conductors or circuit parts. This standard covers virtually all aspects of workplace electrical safety, recognizing hazards associated with the use of electrical energy, and taking precautions so that hazards do not cause injury or death.

The 2009 Edition eliminated Chapter 4 on Installation Safety Requirements because it was a duplicate of National Electrical Code installation requirements. Other changes addressed host employer/contract employer responsibilities. The host employer is responsible for advising the contractor of known hazards and other information about the work site. The contractor employer is responsible for instructing his/her employees in the hazards communicated by the host employer and for ensuring that the contract employees follow required rules and work practices.

The employer must implement and document an overall electrical safety program that directs activity appropriate for the voltage, energy level and circuit conditions. This includes hazard/risk evaluation and job briefing procedures and must be audited annually. Employees must be qualified to do the work and trained to understand the specific hazards and potential injury associated with electrical energy. Employees exposed to shock hazards must be retrained annually in cardiopulmonary resuscitation.

FOR MORE INFORMATION ON 70E VISIT: [WWW.NFPA.ORG](http://WWW.NFPA.ORG)

### » WHAT EMPLOYERS NEED TO KNOW

NFPA is a national consensus standard that establishes “best practices” for protection from electric arcs.

Employers must conduct both shock and flash hazard analysis to establish a flash protection boundary.

If energized electrical conductor or circuit parts operating at 50 volts or more are not placed in an electrically safe work condition within the Limited Approach Boundary, written authorization by work permit is required. In addition to a description of the circuit and equipment, other requirements must be implemented including Lockout/Tagout devices, a shock hazard analysis and a flash hazard analysis. An exception for the work permit requirement was added for tasks involving “visual inspection”.

When work will be performed within the Flash Protection Boundary, the employer must document the incident energy exposure in calories per square centimeter. Arc rated clothing and PPE must be worn either based on the incident energy determined for the specific task or by using Table 130(C)(9) to determine the hazard/risk category. Job briefing procedures and must be audited annually.

Annex H provides a simplified approach to select appropriate arc rated clothing and PPE based on whether the task requires “everyday work clothing” or “electrical switching clothing”.

#### THREE STEPS TO COMPLIANCE WITH NFPA 70E:

- + Implement and document an overall electrical safety program, including hazard/risk evaluation and job briefing procedures. Audit the program annually.
- + Determine PPE based either on the incident energy determined for the specific task or by using Table 130(C)(9).
- + Select PPE matching the hazard to the arc rating of the garments.

### » THREE STEPS TO COMPLIANCE WITH NFPA 70E

#### IMPLEMENT AND DOCUMENT AN OVERALL ELECTRICAL SAFETY PROGRAM

The employer must implement and document an overall electrical safety program that directs activity appropriate for the voltage, energy level and circuit conditions. This includes hazard/risk evaluation and job briefing procedures and must be audited annually. Employees must be qualified to do the work and trained to understand the specific hazards and potential injury associated with electrical energy. Employees exposed to shock hazards must be retrained annually in cardiopulmonary resuscitation.

#### DETERMINE PPE BASED INCIDENT ENERGY TASK, OR FROM TABLE 130.7(C)(11)

HAZARD/ RISK CATEGORY	CLOTHING DESCRIPTION	REQUIRED MINIMUM Arc Rating of PPE cal/cm <sup>2</sup>
<b>HRC 1</b>	Arc-rated FR shirt and FR pants or FR coverall	4
<b>HRC 2</b>	Arc-rated FR shirt and FR pants or FR coverall	8
<b>HRC 3</b>	Arc-rated FR shirt and pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum	25
<b>HRC 4</b>	Arc-rated FR shirt and pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum	40

NOTE: Arc Rating can be either ATPV or E<sub>BT</sub>.

### » CUSTOMIZATION OPTIONS FOR EXTERIOR HRC RATINGS

Bulwark offers the option to embroider HRC ratings on the exterior of your garment. Placement and size are your choice but must be communicated at time of order.

CODE:	EL#A956	EL#A889	EL#A955	EL#A957
DESCRIPTION:	<b>HRC1</b>	<b>HRC2</b>	<b>HRC3</b>	<b>HRC4</b>
COLOR:	Blue	Yellow	Orange	Red



## » SELECT PPE

Employees must wear arc rated clothing wherever there is a possible exposure to an electric arc flash above the threshold incident-energy level for a second-degree burn (1.2 cal/cm<sup>2</sup>). Conductive items such as jewelry, necklaces, etc. may not be worn where they present a contact hazard. Clothing made from synthetic materials that melt such as nylon, polyester, polypropylene

and Spandex may not be used unless such blends meet the requirements of ASTM F 1506 and do not exhibit melting and sticking during arc testing.

Be aware that other PPE may be required for specific tasks including hearing protection, voltage-rated tools and gloves, etc.

## » FREQUENTLY ASKED QUESTIONS

## + WHO IS COVERED?

Employees during activities such as operation, maintenance and demolition of exposed energized electrical conductors or circuit parts. Research shows that approximately 10% of the employees in any operation work as electricians, maintenance, or other categories of work covered by this standard.

## + DOES OSHA ENFORCE NFPA 70E?

OSHA believes that the NFPA 70E standard offers useful guidance for employers and employees attempting to control electrical hazards, but OSHA has not conducted a rulemaking and therefore does not "enforce" NFPA 70E. OSHA does use consensus standards, such as NFPA 70E as evidence of hazard recognition in evaluating General Duty Clause violations.

## + WHERE CAN I GET A COPY?

NFPA 70E is available from NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9109; phone: 1-800-344-3555; on-line at: <http://catalog.nfpa.org>.

+ WHAT IS ATPV; E<sub>BT</sub>?

The standard requires that arc rated garments have a minimum Arc Thermal Performance Value (ATPV) based on the hazard/risk analysis for the task being performed. The ATPV is expressed in calories per square centimeter and represents the protection from electric arcs provided by the garment. If the ATPV cannot be calculated because the fabric breaks open, the energy causing the break open is expressed as the Breakopen Threshold Energy (E<sub>BT</sub>).

## + WHERE DO I FIND ARC RATINGS?

Arc ratings are included on Bulwark garment labels and in the Bulwark catalog and Wholesale Product Guide. This information is also available on line at [www.bulwark.com](http://www.bulwark.com).

## + MY CUSTOMER HAS DONE THEIR CALCULATIONS AND SOME TASKS REQUIRE A HIGHER LEVEL OF PROTECTION THAN IS AVAILABLE FROM SINGLE LAYER GARMENTS. WHAT DO I OFFER THEM?

The total system arc rating of layered ensembles must be determined by a multilayer arc test on the combination of all layers assembled as

they would be worn, rather than adding the arc ratings of the individual layers. Arc ratings of individual layers cannot simply be added together. Any garment worn as the outer layer, including rainwear, must be FR. Electrical switching clothing (flash suits) is available for those needing HRC 3 (25 minimum ATPV) or HRC 4 (40 minimum ATPV). Many insulated outerwear garments also have ATPVs greater than 25. These can be used for specific applications where higher arc ratings are needed. Keep in mind that hearing, head, face and neck protection are also required for these higher exposure levels.

## + THERE ARE SOME REALLY COMPLEX CALCULATIONS IN 70E. DO I HAVE TO BECOME AN ELECTRICAL ENGINEER TO UNDERSTAND THE STANDARD?

Arc rated clothing and PPE must be worn either based on the calculated incident energy determined for the specific task or by using Table 130(C)(9) to determine the hazard/risk category (HRC). HRC is specified based on specific job tasks. These range from HRC 0 that allows non-melting flammable materials up to HRC 4 that requires an arc rated FR shirt and pants or FR overall, and arc flash suit with a minimum system arc rating of 40.

Annex H provides a simplified approach to select appropriate arc rated clothing and PPE based on whether the task requires "everyday work clothing" or "electrical switching clothing".

## + CAN'T THOSE COVERED BY THIS STANDARD JUST WEAR HEAVYWEIGHT NON-MELTING FLAMMABLE GARMENTS SUCH AS DENIM JEANS?

Probably not. Non-melting flammable garments are only allowed for HRC 0 exposures. Employees must wear FR clothing wherever there is a possible exposure to an electric arc flash above the threshold incident-energy level for a second-degree burn (1.2 cal/cm<sup>2</sup>).

## + CAN WORKERS CONTINUE TO WEAR FLAMMABLE T-SHIRTS UNDER THEIR ARC RATED GARMENTS?

Layering of non-melting flammable garments is permitted to be worn under FR garments for added protection. However, if Table 130.7(C)(9) is used to determine the HRC category, only FR layers within the layered system are used to determine system arc rating.

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Bulwark® Protective Apparel markets 7.0 oz. TenCate TECASAFE™ PLUS fabric under the brand name "Cool Touch®2".

This overview was developed by Bulwark Protective Apparel. It is not a publication of the National Fire Protection Association. Please refer to NFPA 70E Standard for Electrical Safety in the Workplace, 2009 Edition, available from NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101 for all questions and interpretations.

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Bulwark® garments are designed for continuous wear. They meet the flame resistance requirements specified in ASTM International Standard F2302-08 for labeling protective clothing as heat and flame-resistant. They also meet the performance requirements of National Fire Protection Association (NFPA) Standard 70E, *Electrical Safety Requirements for Employee Workplaces*, 2009 Edition, ASTM Standard F1506-08, *Flame-Resistant Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards*. Because these fabrics are flame-resistant, they are acceptable under the Occupational Safety & Health Administration (OSHA) Final Rule 1910.269, *Final Rule on Electrical Protective Equipment*. For complete information on these products, as well as laundering instructions, please visit [bulwark.com](http://bulwark.com).

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