



# **DOEL**

ARC FLASH SAFETY CLOTHING



## ARC FLASH *wear*

PUTTING ELECTRICAL SAFETY FIRST

FULL RANGE OF ELECTRIC PROTECTIVE CLOTHING

## Protecting The American Worker



**NFPA 70E Requirements** 2



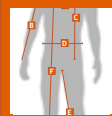
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### A comprehensive line of convenient Arc Flash protective clothing!

OSHA 29 CFR 1910.269 (1)(6)(iii) requires employers to ensure that their employee's clothing does not increase the extent of injuries sustained when exposed to flames or electric arcs.

Clothing worn for a particular application must have a Breakeven Threshold Energy (EBT) or Arc Thermal Performance Value (ATPV) higher than the potential hazard to prevent the onset of second degree burns. The NFPA 70E -2004 standard addresses electrical-safety work practices and procedures. The standard is applicable to employees working on or near exposed energized electrical conductors or circuit parts.

Although not formally adopted by OSHA, NFPA 70E is often the defacto standard referenced in its citations. It requires employees to wear flame resistant (FR) clothing that meets the performance requirements of ASTM F1506 when exposure to electric arc flash is possible.

Our flame resistant (FR) protective clothing meets or exceeds ASTM F1506 performance requirements. Always perform a careful hazard assessment. Determine the minimum PPE cal/cm<sup>2</sup> rating based on the severity of the arc hazard. Refer to the table below as your guide.



**Protection Bib Overalls** 9



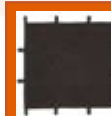
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**Protective Clothing Characteristics**  
**Table 130.7 (C) (11) NFPA 70E**

Color	Hazard Risk Category (HRC)	Description	Min ATPV or EBT Rating of PPE
Navy Blue	1	FR Shirt and Pants/ Coverall (1)	4 cal/cm <sup>2</sup> (16.74 J/cm <sup>2</sup> )
Navy Blue	2	Cotton Underwear Plus FR Shirt and FR Pants/ Coverall (1 or 2)	8 cal/cm <sup>2</sup> (33.47 J/cm <sup>2</sup> )
Royal Blue	3	Cotton Underwear Plus FR Shirt and FR Pants Plus FR Coverall (2 or 3)	25 cal/cm <sup>2</sup> (104.6 J/cm <sup>2</sup> )
Gray	4	Cotton Underwear Plus FR Shirt and FR Pants Plus Double Layer Switching Coat and Pants (Minimum 3)	40 cal/cm <sup>2</sup> (167.36 J/cm <sup>2</sup> )

## 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 2004. 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 above). 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/cm<sup>2</sup> 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.**



From Clothing to Insulated Tools to ARC Suppression Blankets we have everything you need to meet the NFPA 70E Standard and OSHA 29 1910.269 Regulations. The NFPA 70E Standard and OSHA Regulations have been established to protect workers from electrical shock and arc flash hazards. For example, the NFPA 70E Standard specifies areas in which arc flash protection is required for workers. All personnel within the defined boundaries must wear specified protective equipment, even on circuits as low as 50 volts. The NFPA 70E Standard and OSHA Regulations **MUST** be met, and OEL has made it easy and affordable for you to meet and exceed them.

**OEL is Protecting the American Worker**

### OEL's ARC Flash Wear High Performance Shield Kits

10 cal/cm2

Meets NFPA 70E - 2004, ANSI Z87.1 - Special Application  
 7.5" x 20" viewing area  
 Resistant to fogging  
 Light enhancing green lens with 50% light transmission  
 Product weight at 12.5 oz  
 Made from proprietary plastic/chemical alloy



Cat. No.	Description
AFW 032	10 cal/cm2 High Performance Shield Kit Kits include Head Gear, Hard Hat, Chin Guard, Shield and Hardware
AFW 033	10 cal/cm2 High Performance Shield Kit Kits include Head Gear, Chin Guard, Shield and Hardware
AFW 034	10 cal/cm2 Hard Hat
AFW 029	Shield Bag - Cotton flannel with drawstring



### OEL's ARC Flash Wear Hoods



Offers 360 degree° head and neck protection from arc flash dangers, when used with a High Performance Shield Kit.  
 Each Arc Flash Hood is made from two layers of rib knit material and has an elastic face opening that maintains its shape and size.

Cat. No.	Description
AFW 021	11 cal/cm2, 20% Nomex®, 80% Lensing, White
AFW 022	15 cal/cm2, 100% Nomex®, White
AFW 023	20 cal/cm2, 40% P84®, Navy Blue

**Important :** The maximum Arc Flash Protection of a kit is equal to the lowest cal/cm2 rating of any component in the selected safety kit.

## OEL's ARC Flash Hat and Hood Kit

10 cal/cm<sup>2</sup>

The AFW 040 -Hat and Hood Kit make your Personal Protective Equipment purchasing even easier. This convenient kit contains an AFW 032 High Performance Shield Kit, a 11 cal/cm<sup>2</sup> ATPV rated AFW 021 Hood, safety glasses and an AFW 029 Bag.

The AFW 032 High Performance Shield Kit has an ATPV rating of 10 cal/cm<sup>2</sup>. The lens provides a 7.5" x 20" viewing area with an extra light tint.

The AFW 040 is an ideal kit to use with a HRC 2 uniform program or with 8 cal/cm<sup>2</sup> to 11 cal/cm<sup>2</sup> ATPV rated coveralls and jackets.

Cat. No.	Description
AFW 040	<p>10 cal/cm<sup>2</sup></p> <p>Kits include High Performance Shield Kit (Head Gear, Hard Hat, Chin Guard, Shield and Hardware) as well as the AFW 021 11cal/cm<sup>2</sup> Hood, Safety Glasses and Shield bag</p> <p>(Higher rating hoods can be substituted)</p>



## IMPORTANT SAFETY INFORMATION FOR PPE

### ARC PROTECTION CLOTHING REQUIREMENTS

OSHA 29 CFR 1910.269 (l)(6)(iii) "The employer shall ensure that each employee who is exposed to the hazards of flames or electric arcs does not wear clothing that, when exposed to flames or electric arcs, could increase the extent of injury that would be sustained by the employee."

Clothing made from acetate, nylon, polyester and rayon either pure or blended should not be worn when working in hazardous environments. (see videos showing this hazard at [www.oelsales.com](http://www.oelsales.com))

Clothing made from 100% cotton or wool must be determined acceptable for the conditions the worker will be exposed to. Clothing made from flame-resistant materials, that meet current ASTM F1506, is acceptable.

ASTM F1506 details the specifications of a textile to be used by an electrical worker as a means of electrical arc protection. A garment must include a label, which states the following information: Tracking I.D. Code, Meets ASTM F1506, Manufacturer's name, Care Instructions & Fiber Content, Size, and "Arc Rating" - ATPV or EBT.

ASTM F2178 is the test method used to measure arc rated products intended to protect the face of workers exposed to electrical arcs.

### DANGERS OF ARC FLASH

Even relatively low voltages can be fatal. For example, electrical shocks produced from common 60 hz AC power passing from hand to foot for a duration of one second can have the following effects:

#### Effects of Electrical Shock

Current	Effects
1-3Milliamps	Tingling Sensation
3+Milliamps	Shock (pain)
10+Milliamps	Muscular Contractions (can't let go)
30+Milliamps	Respiratory Paralysis (may be fatal)
60+Milliamps	Ventricular Fibrillation (usually fatal)
4+Amps	Heart Paralysis (fatal)
5+Amps	Tissue Burning (fatal, vital organs destroyed)

### ALWAYS PERFORM A HAZZARD ASSESSMENT

The NFPA 70E Standard for Electrical Safety in the Workplace requires employers to perform an Electrical Arc Hazard Assessment. Each situation is unique and needs to be evaluated on its own merits. ASTM F1959 details the standardized test that must be used to determine the thermal protective value of textiles in an electric arc application.

Clothing selected for a particular application shall have an arc thermal performance value of (EBT or ATPV) higher than the potential hazard to prevent the onset of 2nd degree burns.

### VISIT OUR WEBSITE FOR:

- Reviewing our up to date Tool Catalog
- Reviewing our new ARC Flash Clothing Catalog
- Witnessing our stunning ARC Flash Videos
- Reading up on the latest OSHA rules and regulations

[www.oelsales.com](http://www.oelsales.com)



OEL ARCWEAR ARC FLASH PROTECTION HOODS ARE SIZED ONE SIZE FITS ALL.

## Sizing Chart

PRODUCT: COAT 8 cal/cm<sup>2</sup> - 20 cal/cm<sup>2</sup> 50"

Measurements in inches/cm (minimum allowed)			
SIZE	A	B	C
Small	42/107	26/66	32/81
Medium	46/117	26/66	32/81
Large	50/127	28/71	32/81
xlarge	54/137	28/71	32/81
2xLarge	58/147	28/71	32/81
3xLarge	62/158	28/71	32/81
4xLarge	66/168	28/71	32/81
5xLarge	70/178	28.5/72	32/81
6xLarge	74/188	29/74	32/81

PRODUCT: COAT 31 cal/cm<sup>2</sup> - 55 cal/cm<sup>2</sup> 50"

Measurements in inches/cm (minimum allowed)			
SIZE	A	B	C
Small	42/107	26/66	32/81
Medium	46/117	26/66	32/81
Large	50/127	28/71	32/81
xlarge	54/137	28/71	32/81
2xLarge	58/147	29/74	32/81
3xLarge	62/158	29/74	32/81
4xLarge	66/168	29/74	32/81
5xLarge	70/178	29/74	32/81
6xLarge	74/188	30/76	32/81

PRODUCT: JACKET 32"

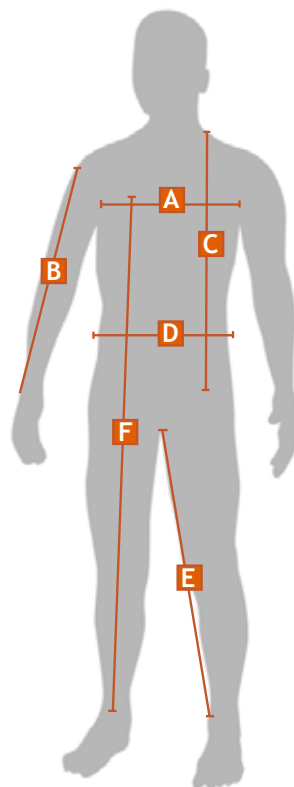
Measurements in inches/cm (minimum allowed)			
SIZE	A	B	C
Small	48/122	27.5/70	46/117
Medium	52/132	28/71	46/117
Large	54/137	28/71	46/117
xlarge	58/147	28.5/72	48/122
2xLarge	62/158	29/74	48/122
3xLarge	66/168	29/74	48/122
4xLarge	70/178	29.5/75	48/122
5xLarge	74/188	30/76	48/122
6xLarge	78/198	30/76	48/122

PRODUCT: BIB OVERALL

Measurements in inches/cm (minimum allowed)			
SIZE	D	E	F
Small	30/76	28/71	56/142
Medium	34/86	29/74	56/142
Large	38/96	30/76	56/142
xlarge	42/107	30/76	56/142
2xLarge	46/117	30/76	56/142
3xLarge	50/127	30/76	56/142
4xLarge	54/137	30/76	56/142
5xLarge	58/147	30/76	56/142
6xLarge	62/158	30/76	56/142

PRODUCT: COVERALL

Measurements in inches/cm (minimum allowed)				
SIZE	A	B	D	E
Small	40/102	34/86	36/91	29/24
Medium	44/112	34/86	40/102	30/76
Large	48/122	36/91	44/112	31/79
xlarge	52/132	36/91	48/122	31/79
2xLarge	56/142	37/94	52/132	31/79
3xLarge	60/152	37/94	56/142	31/79
4xLarge	64/163	40/102	60/152	31/79
5xLarge	68/173	40/102	64/163	31/79
6xLarge	72/183	40/102	68/173	31/79



- A Chest - Measure across front from underarm to underarm
- B Sleeve - Measure from top shoulder seam out to end of cuff
- C Length - Measure from back of neck down to hem

- D Waist - Measure from waist side seam to side seam (flares open)
- E Inseam - Measure from mid crotch down to leg hem
- F Length - Measure from top of bib down to pant hem

## Protection Clothing

### Quality Guaranteed

OEL uses INDURA® Ultra Soft® and INDURA® brand flame resistant (FR) protective clothing fabrics which are guaranteed flame resistant for the life of the garment. The advanced INDURA® Ultra Soft® provides excellent protection from electric arc flash (for NFPA 70E, ASTM F1506 and OSHA 1910.269 compliance), flash fire (for NFPA 2112 and CGSB 155.20 compliance), molten ferrous metal splash and welding exposures.

This excellent protection is coupled with the soft breathable comfort of cotton and by engineering 12% high tenacity nylon in the face of the fabric, INDURA® Ultra Soft® is designed to wear at least 75% longer than all cotton, which leads to an excellent value equation. This superior balance of protection, comfort and value offers end-users with an excellent option to FR synthetic fabric such as Nomex IIIA.

### Material Weights

#### MATERIAL WEIGHT FOR ATPV RATINGS

ATPV Rating cal/cm <sup>2</sup>	Material Weight oz./yd <sup>2</sup>
8	7 oz./yd <sup>2</sup> (237 g/m <sup>2</sup> )
11	9 oz./yd <sup>2</sup> (305 g/m <sup>2</sup> )
20	13 oz./yd <sup>2</sup> (441 g/m <sup>2</sup> )
31	2 layers - 9 oz./yd <sup>2</sup> (305 g/m <sup>2</sup> ) & 7oz./yd <sup>2</sup> (237 g/m <sup>2</sup> )
40	2 layers - 13 oz./yd <sup>2</sup> (441 g/m <sup>2</sup> ) & 5.5 oz./yd <sup>2</sup> (186 g/m <sup>2</sup> )
55	2 layers - 13 oz./yd <sup>2</sup> (441 g/m <sup>2</sup> ) & 13 oz./yd <sup>2</sup>

## 0 - 20 cal/cm2

### OEL's ARC Flash Protection Coveralls

4 cal/cm2 to 20 cal/cm2 ATPV ratings  
 Made from arc flash resistant, Indura Ultra Soft®  
 Sewn with Nomex® thread  
 Full cut with set in sleeves  
 FR hook and pile front closure  
 30" inseam, Expansion back  
 2-ply Nomex® wristlets  
 Hook and pile cuff opening  
 Meet current ASTM F1506 and NFPA 70E standards.  
 Sizes S, M, L, XL, 2XL, and 3XL available from stock  
 Other sizes available by special order  
 Colors: Royal Blue (97), Tan (93), Orange (94), Navy (96)

**4.5 oz. NOMEX® Coverall**  
 4 ATPV  
 AFW 79-82-(color)-13-(size)  
 Category 1

**6 oz. NOMEX® Coverall**  
 5.5 ATPV  
 AFW 79-81-(color)-13-(size)  
 Category 1

**9 oz. Indura® Ultra Soft® Coverall**  
 12.4 ATPV  
 AFW 79-79-(color)-13-(size)  
 Category 2

**Indura® Ultra Soft® Navy Blue Coverall**  
 8.7 ATPV  
 AFW 79-79-96-1120-(size)  
 Category 2  
 11 cal/cm2

**Indura® Ultra Soft® Navy Blue Coverall**  
 8.7 ATPV  
 AFW 79-78B-96-1120-(size)  
 Category 2  
 20 cal/cm2





### 11 - 55 cal/cm<sup>2</sup>

### OEL's ARC Flash Protection Hoods

All OEL's hoods are made from arc flash resistant Indura Ultra Soft® material sewn with Nomex® thread.

All lenses are replaceable and made from Arc rated 10" x 20" material with anti-fogging coatings.

Hoods are designed to accommodate belt-mounted compact air systems.

One size fits all.

Hard hat is included.



Cat. No.	Description
AFW 017	11 cal/cm <sup>2</sup> , navy blue, Indura Ultra Soft VLT = 50%
AFW 018	20 cal/cm <sup>2</sup> , navy blue, Indura Ultra Soft VLT = 35%
AFW 020	31 cal/cm <sup>2</sup> , royal blue, Indura Ultra Soft VLT = 35%
AFW 019	40 cal/cm <sup>2</sup> , gray, Indura Ultra Soft VLT = 35%
AFW 016	55 cal/cm <sup>2</sup> , gray, Indura Ultra Soft VLT = 26%

ARC Flash Wear Protection Hoods are specifically designed to meet NFPA 70E HRC2\* standards, in the industry!



**\*IMPORTANT:** NFPA 70E does not have a Hazard Risk Category above 40 cal/cm<sup>2</sup>. Working on levels above 40 cal/cm<sup>2</sup> should be avoided because of the blast hazards caused by arc flash.

### OEL's ARC Flash Protection Bib Overalls

11 - 55 cal/cm2

11 cal/cm2 to 55 cal/cm2\* ATPV ratings  
 11 cal/cm2 to 55 cal/cm2\* bib overalls are made from arc flash resistant, Indura Ultra Soft®  
 Sewn with Nomex® thread  
 Integrated heavy duty suspenders  
 Relaxed cut for greater mobility  
 30" inseam  
 Adjustable hook and pile waist straps  
 Bib front for added protection  
 Adjustable gussets on pant cuffs.  
 Meets current ASTM F1506 and NFPA 70E standards.

Sizes S, M, L, XL, 2XL, and 3XL available from stock  
 Other sizes available by special order



Cat. No.	Description
AFW 77-79-96-20-30-(size)	11 cal/cm2, navy blue, Indura Ultra Soft
AFW 77-78B-96-20-30-(size)	20 cal/cm2, navy blue, Indura Ultra Soft
AFW 77-79B-97-20-30-(size)	31 cal/cm2, royal blue, Indura Ultra Soft
AFW 77-79X-8796-20-30-(size)	40 cal/cm2, gray, Indura Ultra Soft
AFW 77-793-87-20-30-(size)	55 cal/cm2, gray, Indura Ultra Soft



### OEL's ARC Flash Protection Jackets

11 cal/cm<sup>2</sup> and 55 cal/cm<sup>2</sup> ATPV ratings  
 Made from arc flash resistant, Indura Ultra Soft®  
 Sewn with Nomex® thread  
 Jackets and overpants meet current ASTM F1506 and  
 NFPA 70E standards.  
 Sizes S, M, L, XL, 2XL, and 3XL available from stock  
 Other sizes available by special order

Jackets are 32" long and have Nomex® wristlets.  
 Jackets have hook & pile front closure  
 Jackets with hoods are intended to be used with OEL's High  
 Performance Shield Kit

## 11 - 55 cal/cm<sup>2</sup>



#### Jackets with Hood

Cat. No.	Description
AFW 20-79-96-1120-32-(size)	11 cal/cm <sup>2</sup> , jacket, navy blue, Indura Ultra Soft
AFW 20-78B-96-1120-32-(size)	20 cal/cm <sup>2</sup> , jacket, navy blue, Indura Ultra Soft

#### Jackets without Hood

Cat. No.	Description
AFW 20-79-96-1120-32-(size)	11 cal/cm <sup>2</sup> , jacket, navy blue, Indura Ultra Soft
AFW 20-78B-96-1120-32-(size)	20 cal/cm <sup>2</sup> , jacket, navy blue, Indura Ultra Soft
AFW 20-79X-97-20-32-(size)	31 cal/cm <sup>2</sup> , jacket, royal blue, Indura Ultra Soft
AFW 30-79X-8796-32-(size)	40 cal/cm <sup>2</sup> , jacket, gray, Indura Ultra Soft
AFW 20-793-87-20-32-(size)	55 cal/cm <sup>2</sup> , jacket, gray, Indura Ultra Soft



### OEL's ARC Flash Protection Coats

### 11 - 40 cal/cm<sup>2</sup>

11 cal/cm<sup>2</sup> to 40 cal/cm<sup>2</sup>\* ATPV ratings  
 11 cal/cm<sup>2</sup> to 40 cal/cm<sup>2</sup>\* coats are made from arc flash resistant, Indura Ultra Soft®  
 Sewn with Nomex® thread  
 32" long  
 Nomex® wristlets.  
 Expansion back for added comfort  
 Dual stage front closure with high temperature plastic zipper on the 31 - 55 cal/cm<sup>2</sup>\* coats  
 FR hook & pile storm flap  
 Coats are intended to be used with ARC FLASH Wear Hoods  
 Meets current AFWSTM F1506 and NFPA 70E standards.  
 Sizes S, M, L, xL, 2xL, and 3xL available from stock Other sizes available by special order



Cat. No.	Description
AFW 20-79-96-1120-50-(size)	11 cal/cm <sup>2</sup> , navy blue, Indura Ultra Soft
AFW 20-78B-96-1120-50-(size)	20 cal/cm <sup>2</sup> , navy blue, Indura Ultra Soft
AFW 20-79X-97-20-50-(size)	31 cal/cm <sup>2</sup> , royal blue, Indura Ultra Soft
AFW 20-79X-8796-20-50-(size)	40 cal/cm <sup>2</sup> , coat, gray, Indura Ultra Soft



#### EXCLUSIVE FEATURE



Dual stage front closure with high temperature plastic zipper and FR hook & pile storm flap on 31-100 cal/cm<sup>2</sup> coat designs.

**\*IMPORTANT:** NFPA 70E does not have a Hazard Risk Category above 40 cal/cm<sup>2</sup>. Working on levels above 40 cal/cm<sup>2</sup> should be avoided because of the blast hazards caused by arc flash.

## OEL'S INSULATED RUBBER GLOVES

OEL's Insulated Rubber Gloves are available in sizes 7 through 12, including half sizes. Proper fit is important to minimize chafing and fatigue. To determine glove size, measure the circumference around the palm. Allow for additional room if fabric glove liners are to be worn, especially with thermal liners.

Class 00 are available in red and black, Type I Natural Rubber or blue and contrasting blue/orange Type II Salcor® ozone resistant rubber. Class 0 gloves are available in red, yellow and black, Type I Natural Rubber or blue Type II Salcor® ozone resistant rubber. The contrast between the thin outer orange color against the inner blue color makes inspecting for cuts and tears easier when the glove is inflated or stretched.

Class 2 glove are available in Type I Natural Rubber only. All insulating rubber gloves are extremely flexible and make working with small parts easy. The gloves meet or exceed ASTM D120 and IEC EN60903 Standards.



## Insulating Rubber Gloves Maximum Usage

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

### Insulated Rubber Gloves

	11" Length	14" Length	16" Length	18" Length
Class 00	AFW IRG-00-11-(size)	AFW IRG-00-14-(size)	n/a	n/a
Class 0	AFW IRG-0-11-(size)	AFW IRG-0-14-(size)	n/a	n/a
Class 1	n/a	AFW IRG-1-14-(size)	AFW IRG-1-16-(size)	AFW IRG-1-18-(size)
Class 2	n/a	AFW IRG-2-14-(size)	AFW IRG-2-16-(size)	AFW IRG-2-18-(size)
Class 3	n/a	AFW IRG-3-14-(size)	AFW IRG-3-16-(size)	AFW IRG-3-18-(size)
Class 4	n/a	n/a	n/a	AFW IRG-4-18-(size)

Sizes: 7/7.5, 8/8.5, 9/9.5, 10/10.5, 11/11.5, 12

## OEL'S LEATHER PROTECTOR GLOVES

OEL's Leather Protector Gloves should always be worn over Insulating Rubber Gloves to provide the needed mechanical protection against cuts, abrasions and punctures. Our leather protector gloves are manufactured from top grain cowhide or goatskin. Cowhide cuffs are tough leather on palm side and orange vinyl on the back, while the goatskin cuffs are green leather on palm side and orange vinyl on back. Protectors for Class 00 and 0 are available with non-metallic buckle and pull strap or elastic wrist.



It is the responsibility of the purchaser to specify the overall length of the protector gloves.

**WARNING:** Do not use leather protectors alone for protection against electric shock. Serious injury or death will result. Always use proper insulating rubber gloves. Proper care of leather protectors is essential to user safety. Inspect the leather protectors when inspecting rubber gloves. Metal particles, imbedded wire, abrasive materials or any substance that could physically damage the rubber gloves must be removed from the protector before use.



### Leather Protector Gloves

	10" Length	12" Length	14" Length	16" Length
Low Voltage	AFW LVPG-10-(size)	n/a	n/a	n/a
High Voltage	AFW-HVPG-10-(size)	AFW-HVPG-12-(size)	AFW-HVPG-14-(size)	AFW-HVPG-16-(size)

Sizes: 7/7.5, 8/8.5, 9/9.5, 10/10.5, 11/11.5, 12

## Quick reference charts

### QUICK REFERENCE PRODUCT NUMBERING CHART FOR ALL KITS

	ATPV Rating cal/cm <sup>2</sup>	Glove** Color (choose one below)	Class of Gloves (choose one below)	Size of Gloves (choose one below)	Size of Garments (choose one below)	HRC
AFW	10	R, L, B, Y	00 or 0	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	2
AFW	11	R, L, B, Y	00 or 0	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	2
AFW	20	R, L, B, Y	00 or 0	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	2
AFW	31	R, L, B, Y	00,0 or 2	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	3
AFW	40	B	2	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	4
AFW	55	B	2	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	4

Example:

AFW	55	B	2	8, 9, 10,11, or 12	S, M, L, XL, 2XL or 3XL	4
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### HOW TO WRITE THE ORDER:

Example: AFW 55-B-2-10-2XL is a clothing kit with a rating of 55 cal/cm<sup>2</sup> that contains, Blue Class 2 gloves size 10 and 2XL coat and bib overalls. The appropriate hood, glove bag, leather protectors, hard hat, safety glasses and storage bags are also included.

\*\*Class 00 Gloves in R, B, or L Only, Class 0 Gloves in R, B, Y, or L

Type I Natural Rubber available in: R=Red, Y=Yellow, B=Black Type II Rubber available in: L=Blue

### QUICK REFERENCE PRODUCT NUMBERING CHART FOR KITS WITHOUT GLOVES

	ATPV Rating cal/cm <sup>2</sup>	Size of Garments (choose one below)	HRC
AFW	10	S, M, L, XL, 2XL or 3XL	2
AFW	11	S, M, L, XL, 2XL or 3XL	2
AFW	20	S, M, L, XL, 2XL or 3XL	2
AFW	31	S, M, L, XL, 2XL or 3XL	3
AFW	40	S, M, L, XL, 2XL or 3XL	4
AFW	55	S, M, L, XL, 2XL or 3XL	4

Example:

AFW	31	XL	3
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### HOW TO WRITE THE ORDER:

Example: AFW 31-XL is a clothing kit with a rating of 31 cal/cm<sup>2</sup> that contains coat and bib overalls size extra large, hard hat, hood, safety glasses and storage bags.

## 10 cal/cm<sup>2</sup> hrc 3

### THIS PERSONAL PROTECTION EQUIPMENT KIT IS AVAILABLE IN ATPV RATING OF 10 CAL/CM<sup>2</sup>

This kit contains an arc flash coverall, OEL's High Performance Shield Kit, hard hat, electrical insulating rubber gloves, leather protector gloves, glove bag, safety glasses and ARC Flash Storage bag.

This kit has the option of either Class 00 or Class 0, 11" insulating rubber gloves. For this kit, Class 00 gloves are available in red or black, Natural Rubber. Class 0 gloves are available in red, yellow, or black Type I Natural Rubber or blue.

Sizes S, M, L, XL, 2XL, and 3XL available from stock. Other sizes available by special order.

**This kit meets NFPA 70E-2004 Hazard Risk Category 2.**



### 10 Cal Coverall Kit

9 oz. Indura® Ultra Soft® Navy Coverall	AFW 79-79-(color)-13-(size)
The AFW 040 -Hat and Hood Kit	AFW 040
Kits include High Performance Shield Kit (Head Gear, Hard Hat, Chin Guard, Shield and Hardware) as well as the AFW 021 10cal/cm <sup>2</sup> Hood, Safety Glasses and Shield bag	
Class 0 Rubber Gloves	AFW IRG-0-11-(size)
Leather Protector Gloves	AFW LVPG-10-(size)
Gear Bag	AFW 030
Glove Bag	
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart



**Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 2**



## THE FOLLOWING PERSONAL PROTECTION EQUIPMENT KITS ARE AVAILABLE IN ATPV RATINGS OF 11 - 55 CAL/CM2

These kits contain an arc flash jacket, bib overalls, arc flash protection hood, hard hat, electrical insulating rubber gloves, leather protector gloves, glove bag and gear bag.

These kits come with the option of Class 00 or Class 0, 11" insulating rubber gloves, or 14" Class 2 insulating rubber gloves. For these kits, Class 00 gloves are available in red or black, Type I Natural Rubber or blue Type II, ozone resistant rubber. Class 0 gloves are available in red, yellow, or black Type I Natural Rubber or blue Type II, ozone resistant rubber. Class 2 gloves are available in black Type I Natural Rubber.

Sizes S, M, L, XL, 2XL, and 3XL available from stock. Other sizes available by special order.



## OEL'S PERSONAL PROTECTION EQUIPMENT KITS

# 11 cal/cm2 hrc 3

### 11 Cal PPE Kit

Jacket, Indura® Ultra Soft® Navy	AFW 20-79-96-1120-32
Bib Overall Indura® Ultra Soft®	AFW 77-79-96-20-30
ARC Flash Protection Hood	AFW 017
Hard hat	
Class 0 Rubber Gloves	AFW IRG-0-11-(size)
Leather Protector Gloves	AFW LVPG-10-(size)
Glove Bag	
Gear Bag	AFW 030
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart

Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 2

**OEL'S PERSONAL PROTECTION EQUIPMENT KITS**

**20 cal/cm2 hrc 3**

**20 Cal PPE Kit**

Jacket, Indura® Ultra Soft® Navy	AFW 20-78B-96-1120-32
Bib Overall Indura® Ultra Soft®	AFW 77-78B-96-20-30
ARC Flash Protection Hood	AFW 018
Hard hat	
Class 0 Rubber Gloves	AFW IRG-0-11-(size)
Leather Protector Gloves	AFW LVPG-10-(size)
Glove Bag	
Gear Bag	AFW 030
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart

**Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 2**



**OEL'S PERSONAL PROTECTION EQUIPMENT KITS**

**31 cal/cm2 hrc 3**

**31 Cal PPE Kit**

Jacket, Indura® Ultra Soft® Navy	AFW 20-79X-97-20-32
Bib Overall Indura® Ultra Soft®	AFW 77-79X-97-20-30
ARC Flash Protection Hood	AFW 020
Hard hat	
Class 2 Rubber Gloves	AFW IRG-2-14-(size)
Leather Protector Gloves	AFW HVPG-12-(size)
Glove Bag	
Gear Bag	AFW 030
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart

**Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 3**

## OEL'S PERSONAL PROTECTION EQUIPMENT KITS

### 40 cal/cm<sup>2</sup> hrc 4

### 40 Cal PPE Kit

Jacket, Indura® Ultra Soft® Navy	AFW 30-79X-8796-20-32
Bib Overall Indura® Ultra Soft®	AFW 77-79X-8796-20-30
ARC Flash Protection Hood	AFW 019
Hard hat	
Class 2 Rubber Gloves	AFW IRG-2-14-(size)
Leather Protector Gloves	AFW HVPG-12-(size)
Glove Bag	
Gear Bag	AFW 030
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart

Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 4

## OEL'S PERSONAL PROTECTION EQUIPMENT KITS

### 55 cal/cm<sup>2</sup> hrc 4

### 55 Cal PPE Kit

Jacket, Indura® Ultra Soft® Navy	AFW 20-793-87-20-99
Bib Overall Indura® Ultra Soft®	AFW 77-793-87-20-30
ARC Flash Protection Hood	AFW 019
Hard hat	
Class 2 Rubber Gloves	AFW IRG-2-16-(size)
Leather Protector Gloves	AFW HVPG-14-(size)
Glove Bag	
Gear Bag	AFW 030
COMPLETE KIT with gloves	see pg.14 chart
COMPLETE KIT	see pg.14 chart

Meets NFPA 70E/ASTM F 1506 - Hazard Risk Category 4



**OEL'S ARC SUPPRESSION BLANKETS**

OEL's Arc Suppression Blankets are used as a barrier for protection from the explosive and incendiary effects of electrical arcs and flashes. They can be used for worker protection in underground vaults, switchyards and other locations where there is a potential of exposure to explosive electrical discharges

CAUTION: Because of the unpredictability of electrical discharges, the Arc Suppression Blanket may not totally contain arcs and flashes, but only reduce or limit exposure and incendiary effects. In such cases, injuries may still occur, even when the blanket is properly used.

Cat. No.	Description
AFW 025	48" x 60" Blanket
AFW 028	48" x 96" Blanket

NOTE: Not an insulating blanket



**OEL ARC Flash Storage Bag**

Large storage bag for storing OEL's Arc Flash Wear Clothing, gloves and other accessories. Comes standard in most OEL kits. Bag is 24" long x 15" high x 12" deep.

Cat. No.	Description
AFW 030	24" x 15" x 12" Bag





# OEL

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**Arc Flash:** An arcing fault is the flow of current through the air between phase conductors or phase conductors and neutral or ground. An arcing fault can release tremendous amounts of concentrated radiant energy at the point of the arcing in a small fraction of a second resulting in extremely high temperatures, a tremendous pressure blast, and shrapnel hurling at high velocity.

**ASTM:** American Society for Testing and Materials

**Arc Thermal Performance Value (ATPV):** This value is presented in calories per square centimeter and represents the maximum capability for arc flash protection of a particular garment. This rating also applies to fabrics, however, a garment made from more than one layer of arc flash rated fabric will have a calorie per square centimeter rating greater than the sum of the ATPV ratings of the original fabrics.

The calories per square centimeter rating of most arc flash protection suits, coveralls, and coats is commonly sewn into the fabric in large letters on the outside of the garment.

**Calories per Centimeter Squared (cal/cm<sup>2</sup>):** This is a number identifying the amount of energy that can be delivered to a point at a particular distance from an arc flash. Once this value is known, the ATPV rating of the flash clothing required for work at that distance from the potential flash hazard is also known. See ATPV.

**Calorie:** A calorie is the energy required to raise one gram of water one degree Celsius at one atmosphere. The onset of second-degree burns may occur at 1.2 calories per centimeter squared per second. One calorie per centimeter squared per second can be equal to holding your finger over the tip of the flame of a cigarette lighter for one second.

**De-energized:** Free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth.

**Electrical Hazard:** A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast.

**Electrical Safety:** Recognizing hazards associated with the use of electrical energy and taking precautions so that hazards do not cause injury or death.

**Electrically Safe Work Condition:** A state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

**Flame-Resistant (FR):** The property of a material whereby combustion is prevented, terminated, or inhibited following the application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source.

**Flash Hazard:** A dangerous condition associated with the release of energy caused by an electric arc.

**Flash Hazard Analysis:** A study investigating a worker's potential exposure to arc-flash energy, conducted for the purpose of injury prevention, the determination of safe work practices, and the appropriate levels of PPE.

**Flash Protection Boundary:** An approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur.

**Flash Suit:** A complete FR clothing and equipment system that covers the entire body, except for the hands and feet. This includes pants, jacket, and bee-keeper-type hood fitted with a face shield.

**Hazard Risk Category (HRC):** Categories defined by NFPA 70E-2004 to explain protection levels needed when performing tasks. The values range from -1 to 4. ATPV rated PPE is required for categories 1 through 4 as follows:

• Category 1: 4 cal/cm<sup>2</sup> • Category 2: 8 cal/cm<sup>2</sup> • Category 3: 25 cal/cm<sup>2</sup> • Category 4: 40 cal/cm<sup>2</sup>

**IEEE:** The Institute of Electronics and Electrical Engineers (IEEE) (Note: IEEE1584 - 2002 Guide to Performing Arc-Flash Hazard Calculations).

**Incident Energy:** The amount of energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. One of the units used to measure incident energy is calories per centimeter squared (cal/cm<sup>2</sup>).

**Limited Approach Boundary:** An approach limit at a distance from an exposed live part within which a shock hazard exists.

**NEC The National Electrical Code:** The NFPA Standard 70-2005 "The National Electrical Code" (NEC) (Note: paragraph 110.16 contains requirements for warning labels).

**NFPA:** The National Fire Protection Association.

**NFPA 70E Standard:** Standard that provides guidance on implementing appropriate work practices that are required to safeguard workers from injury while working on or near exposed electrical conductors or circuit parts that could become energized.

**OSHA:** Occupational Safety and Health Administration.

**OSHA 29 CFR 1910, Subpart S-Electrical:** Occupational Safety and Health Standards. Section 1910 Subpart S-Electrical Standard number 1910.333 specifically addresses Standards for Work Practices.

**Prohibited Approach Boundary:** An approach limit at a distance from an exposed live part within which work is considered the same as making contact with the live part.

**Restricted Approach Boundary:** An approach limit at a distance from an exposed live part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the live part.

**Shock Hazard:** A dangerous electrical condition associated with the possible release of energy caused by contact or approach to energized parts.

**Voltage, Nominal:** A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class. The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

**Working Near (live parts):** Any activity inside a limited approach boundary.

**Working On (live parts):** Coming in contact with live parts with the hands, feet, or other body parts, with tools, probes, or with test equipment, regardless of the personal protective equipment a person is wearing.