

## Why ARCSTAR?

An electric arc is a continuous or brief electrical discharge with very high current between two conductors at a distance. An electric arc is attended with a very bright light and intensive heat. An electric arc represents a very serious threat because of the risk of severe burns, with potentially fatal consequences, caused by intense heat. The electric arc also generates other potential dangers, for example intense light, a pressure wave, noise or toxic fumes.

People working in the electrical industry place themselves in the line of danger while repairing blown transformers, replacing downed power lines and handling other jobs where high voltage is a constant threat.

Traditional fabrics like cotton or polyester continue burning, melt or drip in case of an electric arc.

ARCSTAR Protective Clothing can protect workers under these and similar situations and can help to reduce the chance of long-term injury or death.

### **Application Areas**

- Electrical Utilities
- Power Distributions
- Power Plants
- Railways
- Engineering Projects
- Refineries
- Shipbuilding
- Automotive Industry

#### Requirements for protective clothing that protects against electric arcs

Naturally, there are requirements for the protection against the thermal effects of an electric arc. This can, according to the standard, be done in two ways. Depending on the needs of the user one or both of the methods should be applied. The open arc method described in EN 61482-1-1, while the box test falls in the EN 61482-1-2.

The open arc method determines, inter alia, the Arc Thermal Protection Value (ATPV). This must be at least 167,5 kJ/m² (4 cal/cm²). A higher value means better protection. The necessary ATPV value can be determined by a risk analysis.

At the box test, the class is determined depending on the test conditions and the measured thermal protection. Class 1 is the minimum, and thereby corresponds to an arc of 4 kA, for 500 ms and at a distance of 30 cm. The test for Class 2 makes use of a short-circuit current of 7 kA.





**ARCSTAR** 







ARCSTAR **BORIS** 

834227 - Jacket & Trousers

www.kivancgroup.com

## **BORIS** | Jacket & Trousers

### Model Details JACKET

- » Jacket is multi-layer
- » Lower welt pockets with zipper 1
- » Cuff adjustment by means of a Velcro tape and a buckle 1
- » Front flap closed by means of a zipper and Velcro tapes 2
- » 5 cm wide segmented silver and yellow-silver-yellow reflective tapes
- » Velcro tapes on right sleeve for logo and name tag 2
- » Hanger on the back of the jacket (3)
- » Chest pockets with zipper
- » Loop above the right chest pocket for radio, flashlight or gas detector
- » Armpit gussets for easy and comfortable arm movement
- » Reinforcement on shoulders and elbows

### **TROUSERS**

- » Trousers are single-layer
- » Wear resistant knee reinforcement with replaceable padding 4
- » Comfort-enhancing flexible knee system for easy and comfortable body movement 4
- » Belt loops for narrow and wide belts 6
- » Side bellow cargo pockets with flaps closed by Velcro tapes 6
- » Slash pockets and back pockets
- » 5 cm wide segmented yellow-silver-yellow reflective tapes on both legs
- » Reinforcements on the back of the trotters













**HENRY** 

834220 - Jacket & Trousers

www.kivancgroup.com

## **HENRY** | Jacket & Trousers

## Model Details

### **JACKET**

» Front flap closed by means of a zipper and Velcro tapes

» Chest pocket with flap closed by means of Velcro tapes

- » Name tag on chest pocket flap
- » 2 patch pockets at hem with flap closed by means of Velcro tapes
- » J-Style back bellow for easy movement
- Cuff adjustment with bellow and Velcro tapes
- Hem adjustment by means of Velcro tapes
- » Armpit gusstes for easy arm movement
- » 5 cm wide silver reflective tapes on chest, back and arms

#### **TROUSERS**

- » Slash pockets
- » Bellow cargo pockets on both sides of the legs (3)
- » Back pocket on right side with flap closed by means of Velcro tapes
- » Elastic waist and loops 4
- » Trotter adjustment with bellow and Velcro tapes 6
- » 5 cm wide silver reflective tapes on legs









### **Outershell Fabric**

Fire Blocker 220 g/m² 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic **Inner Lining** 

Fire Blocker 220 g/m<sup>2</sup> 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic

























ARCSTAR MARCO

837270 - Jacket & Trousers

## MARCO | Jacket & Trousers

#### **Model Details**

#### **JACKET**

- » Comfort-enhancing back bellows 1
- » 5 cm wide yellow-silver-yellow reflective tapes on sleeves
- » Cuff adjustment by means of a Velcro tape and buckle 2a 2b 2c
- » 5 cm wide yellow-silver-yellow reflective tapes on sleeves
- » Silver segmented reflective tape on the back of jacket
- » Hem adjustment by means of a Velcro tape and buckle
- » Chest pockets with flaps closed by means of Velcro tapes
- » Lower welt pockets with flaps (8)
- » Front flap closed by means of a zipper and Velcro tapes
- » Interior design with red lines

#### **TROUSERS**

- » Semi bellow cargo pockets with flaps closed by Velcro tape
- » Ergonomic cut of trousers waist 5
- » 5 cm wide yellow-silver-yellow reflective tapes 6
- » Elastic belt system 6
- » Slash pockets
- » Semi bellow cargo pockets on the back with flaps closed by Velcro tape 6
- » Trotter adjustment by means of Velcro tapes and buckle









































**ADAM** 

837275 - Jacket & Trousers

www.kivancgroup.com

## **ADAM I Jacket & Trousers**

# Model Details JACKET

Comfort-enhancing J-type back bellows ①a

- » Additional piece of fabric on armpit for comfortable movement
- » Cuff adjustment by means of a Velcro tape and buckle 2
- 5 cm wide silver reflective tapes on chest and back
   3 cm wide silver reflective tapes on sleeves
- » Lower welt pockets
- » Hem adjustment by means of a Velcro tape and buckle
- » Front flap closed by means of a zipper and Velcro tapes
- » Interior design with orange lines





#### **TROUSERS**

» Semi bellow side cargo pockets with silver reflective piping 6

» Back pocket on the right with flaps and silver reflective

piping 4

» Slash pockets

» Elastic belt system 6

» Trotter adjustment by means of Velcro tape and buckle

» Trousers front closed by means of a zipper and button

» 3 cm wide silver reflective tapes



























LUCAS

829257 - Waterproof Jacket

www.kivancgroup.com

## **LUCAS** I Waterproof Jacket

### **Model Details**

- Water and windproof hood with drawcord, detachable by means of a zipper
- » Jacket has a moisture barrier, all seams are seam-sealed to prevent water leakage
- » Front flap closure by means of a zipper and Velcro tapes
- » Chest patch pockets with flaps closed by means of Velcro tapes
- » Velcro tapes to fix name and blood type tags 2
- » Radio, flashlight and gas detector loops above the chest pockets 2
- » Lower patch pockets with flaps
- » 2.5 cm wide segmented silver reflective tapes on chest 2
- » Cuff adjustment by means of Velcro tape 3
- » Pen pockets on both sleeves 4
- » Velcro tape on right sleeve for logo
- » Comfort-enhancing back bellows
- » Inner pocket
- 5 cm wide yellow-silver-yellow reflective tapes on sleeves,chest and hem
- » Adjustable jacket hem by means of Velcro tapes





















LUIS

816158 - Vest

#### LUIS Vest

#### **Model Details**

- » Mobile phone pocket with velcro tape and drag rope for easy removal
- » Hem adjustment by means of a Velcro tape and a buckle 2
- » Front part closed by means of zipper and hidden snap buttons
- » Chest patch pockets with flaps closed by means of Velcro tapes
- » 2,5 cm wide segmented silver reflective tapes on chest and back
- » 5 cm wide yellow-silver-yellow reflective tapes on the back
- » Velcro tape above the right chest pocket for name tag
- » 2 Lower pockets with snap buttons and silver reflective piping
- » Cargo pocket on lower left side closed by a snap button





























ARCSTAR DEAN

834244 - Jacket & Trousers

#### **DEAN Jacket & Trousers**

### **Model Details JACKET**

- » Front flap closed by means of a zipper and Velcro tapes
- » Back bellow for easy movement
- » Cuff adjustment with Velcro tapes
- » Knitted cuff for additional protection ①

#### **TROUSERS**

- » Bib trousers with elastic suspenders 2
- » Buckles for suspender height adjustment 2
- » Waist adjustment with buttons and Velcro
- » Trotter adjustment by means of Velcro tapes











### **Outershell Fabric**

Fire-Blocker 220 g/m<sup>2</sup> 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic

#### **Heat Barrier**

Two layers of Aramid non-woven quilted to Aramid/Viscose FR inner lining 305 g/m<sup>2</sup>

















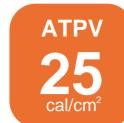
**DUSTIN** 

835108 - Overjacket

#### Overjacket DUSTIN

### **Model Details**

- » Right and left flap for better protection in front
- » Front flaps closed by means of a zipper and Velcro tape
- » High collar for better protection
- » Long overjacket will knee
- » Cuff adjustment with Velcro tapes





#### **Outershell Fabric**

Fire Blocker 220 g/m<sup>2</sup> 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic **Inner Lining**Fire Blocker 220 g/m² 2/2 Twill

93% Meta aramid, 5% Para aramid, 2% Antistatic

















**ALEX** 

838282 - Coverall

#### **ALEX** Coverall

#### **Model Details**

- » Front flap closed by means of a zipper and Velcro tapes
- 5 cm wide yellow-silver-yellow reflective tapes on sleeves, back and legs
- » 2,5 cm wide segmented reflective tapes on chest and back
- 2 Chest pockets with flaps closed by means of Velcro
- Radio, flashlight and gas detector loops on the chest pockets
- » Pen pocket on right sleeve and velcro tape on left sleeve for logo
- » Comfort-enhancing flexible waist system for easy and comfortable body movement 1
- » Comfort-enhancing J-type back bellows
- Elastic tape and tunnel for J-type bellow
- » Cuff adjustment by means of snap buttons 4
- » Slash pockets
- » Semi bellow cargo pocket on right side with flap closed by means of Velcro tape

» Semi bellow pockets on the back with flaps closed by















Fire-Blocker 200 g/m<sup>2</sup> 2/1 Twill









93% Meta-aramid, 5% Para-aramid, 2% Antistatic











Body-Guard 250 g/m<sup>2</sup> 2/1 Twill 55% Viscose FR, 44% Meta-aramid, 1% Antistatic



















**JASPER** 

844117 - Trousers

#### **JASPER Trousers**

#### **Model Details**

- » Slash pockets
- » Patch pockets on both sides of legs with flaps closed by means of Velcro tape1
- » 2 Patch pockets on back with flaps closed by means of Velcro tapes
- » Elastic waist with loops 2
- » Front closure with a zipper and a button
- » 5 cm wide yellow-silver-yellow reflective tapes on legs





















Fire-Blocker 200 g/m<sup>2</sup> 93% Meta-aramid, 5 %Para-aramid, 2% Antistatic

















SIMON

839116 - Shirt

## SIMON | Shirt

#### **Model Details**

- » Cellulosic sweat absorbing lining on collar
- » Velcro tapes for name and blood tags on the patch pockets flaps
- » Pen pocket on both sleeves 1
- » 5 cm yellow-silver-yellow reflective tapes on back and sleeves
- » Chest patch pockets with flaps closed by snap buttons
- » Velcro tape on left sleeve for logo
- » Cuff adjustment by means of Velcro tape (8)
- » Radio, flashlight and gas detector loops above the chest pockets
- » Front part closed by means of hidden snap buttons
- » Back yokes for easy and comfortable body movement















**BRICE** 

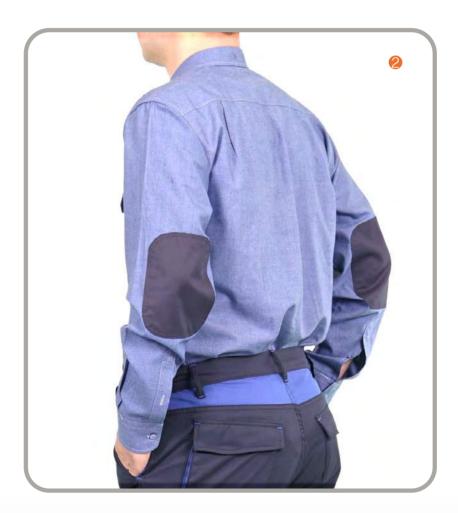
839114 - Shirt

## **BRICE** | Shirt

#### **Model Details**

- » Front closure by means of hidden buttons
- 2 chest pockets with flaps closed by means of Velcro tapes
- » Cuff adjustment by means of buttons
- » Elbow reinforcements with contrast color













**HAWKINS** 

839199 - Shirt

#### HAWKINS | **Shirt**

### **Model Details**

- » Front closure by means of hidden buttons
- » 2 chest pockets with flaps closed by means of Velcro tapes 1
- » Cuff adjustment by means of buttons 2
- » Segmented silver reflective tapes on chest and back (8)









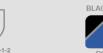


Fire-Blocker 155 g/m² 1/1 Plain 93% Meta-aramid, 5% Para-aramid, 2% Antistatic













Body Guard 160 g/m² 1/1 Plain 55% Viscose FR, 44% Meta-aramid, 1% Antistatic















**RYAN** 

839197 - Shirt



**Body Guard 160** g/m² 1/1 Plain 55% Viscose FR, 44% Meta-aramid, 1% Antistatic EN ISO 11612 EN 1149-3 A1 A2 B1 C1 F1 EN 1149-5







**SERGIO** 

839198 - Shirt

#### **Shirt** SERGIO |

#### **Model Details**

- » Front closure by means of buttons
- » 2 chest pockets with flaps closed by means of Velcro tapes
- » Cuff adjustment by means of buttons
- » 2,5 cm wide segmented silver reflective tapes on chest and back
- » Velcro tape above right chest pocket for name tag 2
- » 5 cm wide yellow-silver-yellow reflective tapes on the back











Fire-Blocker 155 g/m<sup>2</sup> 1/1 Plain 93% Meta-aramid, 5% Para-aramid, 2% Antistatic

























ARCSTAR DANNY

822131 - Round Collar Sweatshirt

www.kivancgroup.com

#### DANNY I **Round Collar Sweatshirt**

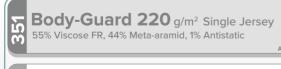
#### **Model Details**

- » Collar made from main fabric •
- Cuffs made from main fabric 2
- Stitched hem
- 100% Aramid sewing thread





















**Fire-Blocker 190** g/m² Single Jersey 93% Meta-aramid, 5% Para-aramid, 2% Antistatic













**Para Vis 180** g/m<sup>2</sup> Single Jersey 78% Viscose FR, 20% Para-Aramid, 2% Antistatic









**Para Vis** 

230 g/m<sup>2</sup> Single Jersey













78% Viscose FR, 20% Para-Aramid, 2% Antistatic







**LARRY** 

822128 - Polo-Shirt

## LARRY | Polo-Shirt

#### **Model Details**

- » Hidden buttons 🗐
- » Knitted Polo collar 2
- » Rib knitted cuffs (3)
- » Stitched hem
- » Chest pocket with flap closed by means of Velcro tape
- » 100% Aramid sewing thread











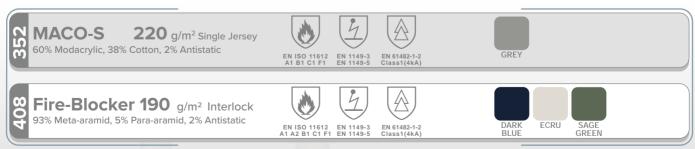


# **ERIC** I Underwear

## **Model Details**

- » Underwear designed to wear inside non-flammable clothing in a cold environment
- » Round collar
- » Long sleeves, long johns
- » Skin-friendly, breathable technical knit
- » 100% Aramid sewing thread









**ARCSTAR** 

**ERIC** 

854106 - Underwear

#### NICK Hood

### **Model Details**

- » Double Layer Hood
- Ergonomic design in the form of head and neck
- Ergonomic face opening
- » Special stitching preventing thickness on sewing area for comfortable skin-friendly wearing
- » 100% Aramid sewing thread



# **Outershell Material**

Fire-Blocker 250 g/m<sup>2</sup> Interlock 93% Meta-aramid, %5 Para-aramid, 2% Antistatic

**Inner Lining** 

Fire-Blocker 250 g/m<sup>2</sup> Interlock 93% Meta-aramid, 5% Para-aramid, 2% Antistatic Interlock















# **Outershell Material**

PBI 170 g/m² 40% PBI, 58% Para-aramid, 2% Antistatic

**Inner Lining** 

Aramid/Viscose FR 220g/m<sup>2</sup> 50% Aramid, 50% Viscose FR











NICK

825105 - Hood







ARCSTAR

**LUKE** 

827119 - Hood

# LUKE | Hood

## **Model Details**

- » Replaceable Visor by means of Velcro tapes
- » Cap connected to the hood by means of Velcro tapes
- » Long front part for better protection
- » Visor could be protected when not in use by folding the front part and fixing with Velcro tape
- This hood is certified according to EN 166, EN 170 and GS-ET-29 Class 2
- » Visor ATPV 25 cal/cm²
- » Fabric ATPV 34 cal/cm<sup>2</sup>







## **Outershell Fabric**

Fire Blocker 220 g/m² 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic **Inner Lining** 

Fire Blocker 220 g/m<sup>2</sup> 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic











I ISO 11612 EN 1

EN 61482-1-2 EN 61482-1-1ATPV







ARCSTAR

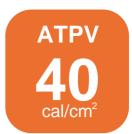
LEO

827110 - Hood

#### LEO Hood

# **Model Details**

- Replaceable Visor by means of Velcro tapes
- 3M H700 helmet connected to the hood by means of Velcro tapes
- » Long front part for better protection
- Ergonomic design covering the head, throat and shoulder area
- » This hood is certified according to EN 166, EN 170 and GS-ET-29 Class 2
- » Visor ATPV 40 cal/cm<sup>2</sup>
- » Fabric ATPV 43.4 cal/cm<sup>2</sup>





Outershell Fabric Fire-Blocker 220 g/m² 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic

# **Heat Barrier**

Two layers of Aramid non-woven quilted to Aramid/Viscose FR inner lining 305 g/m<sup>2</sup>











EN ISO 11612 EN 1149-3 EN 61482-1-2 EN 61482-14ATPV A1 B1 C1 F1 EN 1149-5 Class2 (7kA) 43.4 cal/cm²



Outershell Fabric Fire-Blocker 220 g/m² 2/2 Twill 93% Meta aramid, 5% Para aramid, 2% Antistatic

# **Heat Barrier**

Two layer of Aramid non-woven quilted to Aramid/Viscose FR inner lining 305 g/m<sup>2</sup>















**ARCSTAR RONALD** 805101 - Gloves



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Fire-Blocker 220 g/m $^2$  2/2 Twill Double Layer 93% Meta aramid, 5% Para aramid, 2% Antistatic

100% Leather













ARCSTAR
RUSSELL
805106 - Gloves

# HARVIK 9726 | Boots

## **Model Details**

- » Harvik 9726 Dielectric Safety Boots
- » Vulcanized Rubber Upper and Sole
- » For working environment with high voltage hazards







Certification: CE 0321 EN ISO 20345:2011 SB E FO HRO SRA







ARCSTAR
HARVIK 9726
Boots

# **ARC GOGGLES**

### **Model Details**

- » High Performance Arc Goggle with nose shield for electricians designed to specifically address the requirements of Arc Flash Protection
- » Black frame, blue bezel, green lens
- » Weight of 205 g
- » Two options available
  - o ATPV 12 cal/cm² (Silicone frame and strap, Polycarbonate lens, Polymer alloy components)
  - o ATPV 38 cal/cm² (Silicone frame and strap, Polycarbonate outer lens and propionate inner lens, Polymer alloy components)

ATPV
12
cal/cm²

ATPV
38
cal/cm²



STANDARD: ANSI Z87.1, ASTM F2178







ARCSTAR PAULSON

Arc Goggles

# **VISOR**

### **Model Details**

Face shield kit options with green color, made of polycarbonate, with 18,4 x 50,8 x 0,15 cm window size and complying with EN 166, ANSI Z87.1, GS-ET-29 (Class 2),□ASTM F2178, NFPA 70E standards



AMP1-E12-PCT

Face Shield kit with large transparent, ergonomically shaped chin protector. Includes cap bracket with EURO clips.



ARC-E-25-S2K2

Face Shield kit with large transparent chin protector. Includes helmet bracket with elastomeric band.



ARC-PCE-12-S2K2

Face Shield kit with large transparent chin protector. Includes helmet bracket with elastomeric band.



ARC-E-25-S2K1-PCT

Face Shield kit with large chin protector. Includes helmet bracket with EURO clips.



ARC-PCE-12-S2K1-PCT

Face Shield kit with large chin protector. Includes cap bracket with EURO clips.





ARCSTAR PAULSON

Visor

# **VISOR**

# **Model Details**

Face shield kit options with clear color, made of polycarbonate, with 20 x 39 cm window size and complying with EN 166, ANSI Z87.1, GS-ET-29 (Class 1) standards



ARC-E-1-SK1-PCT

Face Shield kit with includes cap bracket with EURO clips.



ARC-E-1-SK2

Face Shield kit with large includes cap bracket with elastomeric band.



ARC-E-1-SK7

Face Shield kit includes large headgear.





ARCSTAR
PAULSON
Visor

# **HELMET WITH VISOR**



SECRA-1

### **Model Details**

- » Electrically Insulating Safety Helmet With Integrated Face Shield Class 1
- » Available in two versions, made of polyamide or ABS
- » Additionally equipped with a face shield with visor made of polycarbonate with a thickness of 1.5 mm
- » Available with transparent visor and white, yellow, red or green shell
- EN 397:2012+A1:2012,
   EN 50365:2002, EN 166:2001,
   GS-ET-29:2011,
   ANSI/ISEA Z89.1:2014



SECRA-2

### **Model Details**

- » Electrically Insulating Safety Helmet With Integrated Face Shield Class 2
- » Helmet available in two versions, made of polyamide or ABS.
  - additionally equipped with a face shield with visor made of polycarbonate with a thickness of 1.7 mm
- » Available with transparent green visor and white, yellow, red or green shell
- EN 397:2012+A1:2012,
   EN 50365:2002,
   EN 166:2001,
   GS-ET-29:2011,
   ANSI/ISEA Z89.1:2014





ARCSTAR SECRA







**TED** 

890123 - Aramid Belt

# STANDARDS FOR INDUSTRIAL SOLUTIONS

protective clothing

- EN ISO 11612 Heat, Flame & Molten Metal Splash
- EN ISO 11611 Welding Protection
- EN ISO 14116 Heat & Flame Protection, Limited Flame Spread
- EN 1149-5 Electrostatic Properties
- EN 61482-1-2 Electric Arc Protection (Box Test)
- EN 61482-1-1 Electric Arc Protection (Open Arc)
- EN 20471 High Visibility
- EN 343 Protection against Rain

Check the label of your garment in order to learn the protection level.

#### **EN ISO 11612 Heat& Flame Protection**

The purpose of this standard is to provide minimum performance requirements for clothing to protect



against heat and flame. Within many of the hazards listed in this standard there are three performance levels, Level 1 to indicate exposure to perceived low risk, Level 2 to indicate exposure to perceived medium risk and Level 3 to indicate exposure to perceived high risk. For protection against radiant heat, there is a fourth performance level, to take into account high performance materials such as aluminized and similar materials. The level of personal protection to be provided should be based on the outcome of the risk assessment. For complete protection against exposure to heat and/or flame, it is probable that it will be necessary to protect the head, face, hands and/ or feet with suitable PPE and in some cases, appropriate respiratory protection may also be considered as necessity.

- Code A: Limited Flame Spread (A1 or A2)
- Code B: Protection against Convective Heat (B1, B2 or B3)
- Code C: Protection against Radiant Heat (C1, C2, C3 or C4)
- Code D: Protection against Molten Aluminium
- (D1, D2 or D3) Code E: Protection against Molten Iron Splash
- Code F: Protection against Contact Heat (F1, F2 or F3)

### **EN ISO 11611 Welding Protection**

(E1, E2 or E3)



EN ISO 11611 specifies minimum basic safety requirements and test methods for protective

clothing including hoods, aprons, sleeves and gaiters that are designed to protect the wearer's body including head (hoods) and feet (gaiters) and that are to be worn during welding and allied processes with comparable risks. For the protection of the wearer's head and feet, EN ISO 11611 is only applicable for hoods and gaiters. ENISO 11611 does not cover requirements for hand protection. This type of protective clothing is intended to protect the wearer against spatter (small splashes of molten metal), short contact time with flame, radiant heat from the arc, and minimizes the possibility of electrical shock by short term, accidental contact with live electrical conductors at voltages up to approximately 100 V d.c. in normal conditions of welding. Sweat, soiling or other contaminants can affect the level of protection provided against short term accidental contact with live electric conductors at these voltages.EN ISO11611 specifies two classes with specific performance requirements, i.e. Class 1; the lower level and Class 2; the higher level.

There are several standards regarding personal Class 1 is protection against less hazardous wel- IEC 61482 ding techniques and situations, causing lower levels of spatter and radiant heat.

> Class 2 is protection against more hazardous welding techniques and situations, causing higher levels of spatter and radiant heat.

For adequate overall protection against the risks to which welders are likely to be exposed, personal protective equipment (PPE) covered by other standards should additionally be worn to protect the head, face, hands and feet.

### **EN ISO 14116 Heat& Flame Protection, Limited** Flame Spread



ISO 14116 specifies the performance EN ISO 14116 requirements for the limited flame

spread properties of materials, material assemblies and protective clothing in order to reduce the possibility of the clothing burning and there by itself constituting a hazard. Additional requirements for clothing are also specified.

Protective clothing complying with this International Standard is intended to protect workers against occasional and brief contact with small igniting flames, in circumstances where there is no significant heat hazard and without the presence of another type of heat. When protection against heat hazards is necessary in addition to protection against limited spread flammability, then standards, such as EN ISO 11612, are more appropriate. A classification system (index 1, index 2, index 3) is given for materials, material assemblies and garments which are tested according to EN ISO 15025, Procedure

### EN 1149-5 **Electrostatic Properties**

This European Standard specifies material and design requirements for electrostatic dissipative protective

clothing, used as part of a total earthed system, to avoid incendiary discharges. The requirements may not be sufficient in oxygen enriched flammable atmospheres. This European Standard is not applicable for protection against mains voltages

- The standard specifies 3 areas: 1- Material performance requirements
- 2- Design requirements
- 3- Marking & guidance

Ad 1)Performance tests should be made after pretreatment for protective clothing produced from woven fabrics

#### Electrostatic requirements

Materials with conduction threads in stripe or grid pattern, the maximum space shall not exceed 10 mm in one

Surface Resistance & Induction Charging

 $\geq 2.5 \times 10^9 \Omega$ EN 1149-1 EN 1149-3 - 2 Half decay time > 4 s Shielding factor > 0.2

# **Electric Arc Protection**

This standard regulates heat and flame resistant clothing for workers exposed to electric arcs. A direct and constrained



electric arc in a low voltage circuit is used to classify material / garments in defined arc protection classes.

#### EN 61482-1-2 **Box Test**

- APC 1: Fabrics that pass 4kA current, burning time less than 5 seconds.
- APC 2: Fabrics that pass 7kA current, burning time less than 5 seconds.

Garment test must be done along with material tests. Both tests are necessary for certification. Garment class will be defined according to the results of tests. Garment protection level should be clearly written on

If a garment consists of different layers this should be written on the user manual. Never use synthetic and flammable fabrics inside these garments. You can wear these garments with the other fire retardant suits to increase the safety performance.

### EN 61482-1-1 **Open Arc Test**

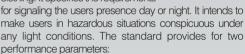
**ATPV:** Arc Thermal Performance Value (cal/cm<sup>2</sup>)

**EBT**: Energy to Break Open Value **HAF:** Heat Attenuation Factor

EN 61482-1-1 specifies test methods to measure the arc thermal performance value of materials intended for use in heat- and flame-resistant clothing for workers exposed to the thermal effects of electric arcs and the function of garments using these materials.

### EN 20471 **High Visibility**

EN ISO 20471 is the harmonized European standard for high visibility clothing. It specifies the requirements



X: Surface of fluorescent and retroreflective material (3 levels)

Y: Quality of the retro-reflecting materials (2 levels)

### **EN 343 Protection Against Rain**

EN 343 is the harmonised European standard that applies to garments worn in adverse weather

conditions. It specifies the characteristics of protective clothing against the influence of foul weather, wind and cool above -5°C. The standard provides for two performance parameters:

X: Waterproofness (3 levels) Y: Breathability properties (3 levels)









Established in 1980, Kovanç Group continues its activities in 4 divisions; Safety, Engineering, Mining and Technical Textile.

**In Safety Division,** personal protective clothing against heat and flame, static discharges, arc flashes, molten metals, welding spatters is produced.

Our company has established the first heat laboratory for personal protective garments in Turkey. Following the second investment that we have made, our physical test laboratory has commenced to provide services. In our heat and physical test laboratory, raw materials (fabrics, accessories etc.,) and finished products (protective garments) are tested in accordance with EN and ISO standards. In our laboratory, which serves for R&D purposes also, new products are developed and all controls are performed before CE certification. These controls enhance product reliability and expedite required processes.

Thanks to the barcode system which have been integrated to our ERP (Enterprise Resource Planning) software that we have been using since 2009, the traceability has been made available and all product processes can be monitored. Depending upon work order number on the label of garments produced by our company, date of production; materials used in that production; date, lot number and supplier of the raw materials could be traced back. We also offer Product Liability Insurance for protective garments we produce. The cost of damages that may arise from the incidents to be encountered by the people using our garments due to material and faulty workmanship have been guaranteed within this insurance.

**In Engineering Division,** thermal insulation applications to reduce the heat loss are done by using high temperatureresistant glass fiber based materials. We manufacture removable insulation pads for turbines, plastic injection molding machines, textile dying machines, exhaust parts of vehicles, valves etc. Correct materials are used by calculating the heat loss, minimum thickness of insulation, surface temperature etc. Thermal imaging cameras are used to find the heat loss areas.

In Mining Division, Silica (Quartz) Sand and Musselstone are extracted.

- Silica (Quartz) Sand is used in potable and waste water filtration, in construction chemicals, in railroads as a skid preventing sand, in hippodromes, in pitch and sports fields and in many other fieds.
- Musselstone is a compact stone that consists of limestone, silica and fossil sediment (such as clams and mussels). It is in light beige color, highly or partly porous with fossil according to its formation. Musselstone has been used frequently in artistic works that require aesthetic, elegance and art such as interior spaces, coves, columns, jambs, exedras, wall copings, fire places, landscaping, reliefs, crown gates, portal, altars, minibars, birdhouses, benevolence stones. Nowadays, it is used for restoration of historical buildings, and in new buildings, kiosks, villas waterfront residences, garden walls, walking trails, and in similar places.

In Technical Textile Division, we start from fiber and produce our own technical yarns and fabrics.



