TECHNICAL SPECIFICATION

PRINCIPAL TECHNICAL PARAMETERS OF PERSONAL PROTECTIVE EQUIPMENT FOR ARC FLASH:

Sr No	ITEM	SPECIFICATION
1	**PERSONAL PROTECTIVE EQUIPMENT FOR ARC FLASH**	**1. GENERAL TECHNICAL PARAMETERS** 1. Arc flash PPE is designed to give protection against thermal hazards of an electric arc. 2. Arc flash suits, all layers of are made of inherently flame resistance materials and should not be Flame Retardant treated(FRT) cotton or cotton/nylon blend. 3. Garments used for FR suit must be sewn with inherently flame resistance threads. 4. When garments have a higher rating of arc protection on front than the back, the torso, sleeves and legs must be in the same arc rated material, the back can have a lower arc rating, **however minimum ATPV shall be 10cal/Cm2**." 5. Garments must have no exposed external or internal metal or melting parts. 6. The FR garment label has to show the lowest ATPV or Class if different panels on the garment are used. More detailed information about areas of the garment with higher protection may be given as well on the label or in the manufacturer's instructions of use. 7. The FR garment should be of flame retardant, antistatic, rip stop fabric. 8. The FR suit should be machine/ home washable as per Indian condition. 9. The protective clothing material must be lifelong flame resistance. 10. The FR suit offered should be compatible to wear with hood, gloves etc. 11. The FR suit should confirm EN/IEC 61482-2 when tested

		according to EN/IEC 61482-1, EN/IEC 61482-1-1 and EN/IEC 61482-1-2 As mentioned in Section II clause no.2. 12. Arc flash Resistance PPE includes: (A) A FR Coverall : Torso & Sleeves Protection : Legs Protection (B) A FR hood : Face protection (C) A Face shield with chin cup : Face Protection (D) Insulating hand gloves & leather over glove : Hand Protection (E) Hard Hat : Head protection (F) Safety glasses with safety pouch : Eyes Protection (G) A carrying bag : For Kit 13. A FR Coverall: a. It should have high collar, an elasticated waist, covered main zip, Stretch cuffs and zip fastening to leg bottoms. There is no metallic zip through out. b. ATPV rating is 10 cal/cm^2 or Better. c. Should have facility to provide GETCO logo on coverall. 14. A FR protective hood: a. ATPV value is 10 cal/cm^2 or Better. b. Protection Rating is 360^o c. It should have facility for sufficient air flow for breathing. d. It should have holes for eye exposure only. e. The hood is designed for the arc Goggle to be worn in combination.

		15. A FR face shield with Chin cup & hard hat a. ATPV value is 10 cal/cm^2 or Better. b. It is with slotted hard hat & chin guard. c. VLT (Visible light transmission) is 70%. d. It should be anti-fog. 16. A FR Goggle: a. Goggle should have anti-fog lens. b. A proper elastic strap comfortably secures the goggle to the head and hard hat. c. Special strap adjuster allows the strap tension to be adjustable while wearing gloves. 17. A Insulting Hand Gloves: a. Insulating hand gloves conform to IEC 60903/IS 13774 standard. b. They are subjected to dielectric, mechanical resistance and ageing tests as per standard. c. Working Voltage is 11000 Volt d. Gloves are made of latex material. e. They are individually tested and delivered in plastic bag. f. Size: XL 18. A leather Over Gloves: a. Used as other gloves to protect insulating gloves in dry environment. b. Silicon grain leather, Flexible. c. Should have large protective cuff. d. Size: XL 19. Expected wear life of FR suit is 36 Months, worn daily and industrial laundered once per week as per Indian condition. 20. Operation Condition: a. Ambient Temperature (Max)-45 Degree C b. Humidity – 95%

2. PRINCIPAL TECHNICAL PARAMETERS

1. Fabric Specification:

ATPV Rating (Min)	:	10 Cal/ CM^2 or Better.
Heat Attenuation factor (Min)	:	80%
Breaking Strength, min, N	:	223
Tearing Strength, min, N	:	22

2. Over gloves Specification:

Test/Properties			Performance Level
Resistance to abrasion, Cycle	:	500	2
Blade Cut Resistance, Factor	:	1.2	1
Tear Resistance, N	:	25	2
Puncture Resistance, N	:	20	1

3. All the claimed parameter should be type tested at NABL accredited laboratory in India or foreign laboratory having national accreditation certificate of that country."

4. Type test report should be submitted with bid instead of declaration of conformity only.

3. <u>STANDARDS</u>

Unless, otherwise specified elsewhere, in this specification, the rating, performance and testing of test set, shall confirm to the latest revisions, available at the time of placement of order of the relevant standards as below.

STANDARD NO.	**STANDARD TITLE**
ASTM F1959 / F1959M	Standard Test Method for Determining the Arc Rating of Materials for Clothing.
ASTM F1506 - 10a	Standard Performance Specification for Flame Resistant and Arc Rated Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards.
ASTM F2621 / F2621M - 19	Standard Practice for Determining Response Characteristics and Design Integrity of Arc Rated Finished Products and Evaluating other Products in an Electric Arc Exposure.
NFPA 70E	Standard for Electrical Safety in the Workplace.
NFPA 2112	Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire.
ISO 11612:2015	Protective clothing — Clothing to protect against heat and flame — Minimum performance requirements.
ISO 6330:2012(en)	Textiles — Domestic washing and drying procedures for textile testing.
EN 1149-5	Protective clothing with electrostatic properties.
ISO 11611:2015	Protective clothing for use in welding and allied processes.
ASTM F2178 / F2178M - 20	Standard Specification for Arc Rated Eye or Face Protective Products.
ANSI/ISEA Z89.1-2014	standard provides performance and testing requirements for industrial helmets, commonly known as hard hats.
BS EN 397:2012+A1:2012	Industrial Safety Helmets.
EN166 EN167 & EN168	Personal Eye Protection Standard
EN 170:2002	Personal Eye Protection - ultraviolet filters – Transmittance requirements and recommended use

EN/IEC 61482-1-1:2019	Protective clothing against the thermal hazards of an electric arc.
IS-13774:2014/IEC 60903:2002	Applicable to electrical insulating gloves and mitts that provide protection of the worker against electric shock.
EN 420 & EN 388	General requirement for over gloves & tests for over Gloves.