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Purpose

This document provides technical specifications that describe the safest available arc-rated arc flash suit products on the market. True Colour Grey (TCG) hood windows allow workers to see all wire colours proving that grey is safer than green. Workers using a grey lens can perform work without lifting the front of their hood to properly see darker colours. Hoods with an effective ventilation system allow workers to breathe fresh air while remaining stationary without needing to lift the front of their hood. Any time a worker needs to lift the front of their hood can create a potentially unsafe situation while unprotected. Oberon Customers can use this specification when updating their Electrical Safety Program or creating an invitation for suppliers to bid (quote or proposal) on new Arc Flash PPE.
Construction & Materials

- All product components must be Arc-Rated with a minimum Arc Rating per each;
  - ARC40 >40 cal/cm²
  - ARC65 >65 cal/cm²
  - ARC100 >100 cal/cm²
- ATPV (arc thermal performance rating) arc rating only. ATPV is the reported result at 50% probability of onset of a second degree burn based upon the Stoll Curve per ASTM F1959. EBT (breakopen threshold energy) arc ratings not acceptable.
- Product components must be manufactured to comply with and labeled to CSA Z462-2015, NFPA 70E-2015, ASTM F1506-10a, ASTM F2178-12 (Hoods and faceshields) and ASTM F1959-14 standards. Products stating or implying compliance with earlier versions of these standards is not acceptable.
- Product must be rated as if no additional protective layer/devise worn underneath.
- Fabric must be inherently/permanently flame resistant.
- Fabric must be constructed of 100% aramid fibers and threads for optimal weight and protection. Products constructed of Flame Retardant Chemically Treated fabrics, such as Cotton/Nylon blends, are not acceptable.
- Total Fabric weight (of the Fabric used in the garment) must be less than;
  - ARC40 <11 oz/yd²
  - ARC65 <14 oz/yd²
  - ARC100 <18 oz/yd²
- Fabric color must be distinctly different from other rated Arc Flash garments from the same manufacturer to avoid confusion by the user.
- Product model clearly identified on the outer surface of the garment. Identification must be permanent to the garment in the form of Embroidery using aramid thread.
- All embroidery must be through only the outer layer of the fabric system to maintain thermal protection offered by the construction. Embroidery or patches stitched through the multilayered system are not acceptable.
- Patches on the garments using flammable materials such as fabrics, threads or inks are not acceptable.
- Product label (see Figure 1 example) must be permanently attached using heat transfer adhesion to the inside of the garment. Sewn in labels are not acceptable.
- Product label must carry a bar coded serial number which is unique to each individual item for tracking and identification purposes.
- Product label must include manufacturer name, “Meets F1506-10a”, washing/care instructions & Arc Rating (F1959-14 for garments or ASTM F2178-12 in the case of hoods & faceshields).
• No flammable components may be incorporated into the construction of the product (i.e., Velcro®, adhesive, threads and embroidery).
• Product must be arc-rated to the weakest area of the garment (i.e., if the front is double layered fabric and the back or sleeves are single layered, the garment must be rated to the weakest (least protective) point, in this case the back panel or the sleeves).
• Seams are safety stitched for strength and durability, then top stitched for additional protection.

Hood Design
• Design Configuration;

• Window must be constructed of grey (neutral density) tinted Infrared absorbing material to allow for optimal visibility and colour identification. Green Tinted Infrared absorbing materials are not permitted because they can cause shifts in the appearance of colours, particularly darker colours such as blue and purple.
• Window must provide a minimum of 40% visible light transmission when measured per ANSI/ISEA Z87.1-2010.
• Window must block (per ANSI/ISEA Z87.1-2010 methods);
  o >99% of the ultraviolet light
  o >90% of the infrared energy
• Window must meet ANSI/ISEA Z87.1-2010 and marked as Z87+ to indicate compliance with ANSI Z87.1’s High Mass-High Velocity (+) level.
• Window must be manufactured of polycarbonate for impact strength and temperature stability.
• Window must be injection molded, not thermoformed and a single layer for optical correctness.
- Window must be scratch resistant with a coated outer surface and anti-fog coated on the inner surface.
- Velcro® is not acceptable for effectively sealing the window to the hood fabric.
- Window requires snap buttons for easy installation and removal.
- Replacement shields must be available.
- Windows must be easily removed and replaced by the user without damage to the hood.
- Hood ventilation system shall be available and the design shall not create holes or vents in the hood allowing super-heated gas to enter the hood.
- Hood ventilation system shall deliver external air (considered fresh air) inside of the hood directly to the worker’s breathing zone and along the inside of the hood window.
- All external hood ventilation system components shall be manufactured with flame resistant materials only.
- Manufacturer must document that its ventilation system has been subjected to arc testing and evaluated for ignition probability, melting and dripping. Designs that exhibit ignition, melting or dripping at the intended exposure value shall not be used.
- Hood shall allow for the use of a hard hat.
- Hood adapters must be available to accept both Type I and Type II version CSA Z94.1 certified hard hats. The Type II version uses foam to provide lateral protection from flying debris and projectiles.
- Hood shall allow for an LED lamp to be used.

Coat Design
- Design Configuration;

- Coat shall include a dual stage front closure for ease of use and effective closure.
  - Primary closure zipper must be manufactured of a high temperature plastic, including pull tab, and zipper-tape must be constructed of Inherently FR material.
  - Secondary closure must be designed with inner and/or outer flaps to cover the zipper from arc blast.
• Coat’s front flap must be additionally closed by an inherently FR hook & loop material across full length of the placard.
• Coat must not incorporate any exposed metal snaps or buttons which could become the source of an arc flash or conductor of heat into the garment.
• No pockets or pass-through slits.
• Coat arms shall seal at the wrist using inherently flame resistant knit cuffs.
• Coat arm design shall telescope down in size from the elbow to the wrist for workers to easily wear rubber insulating gloves with leather glove protectors.
• Available in a variety of sizes including Small through 5XL, Short, Tall and Extra Tall. Sizing based on CEN 13402 standard.
• Garment shall be designed to easily fit over dailywear or every day garments worn under the suit.
• Available with a harness port to allow workers to wear fall protection equipment under the suit.
• Available with high visibility stripping as per CSA Z96 High Visibility Safety Apparel Standard.

Bib-Overalls Design
• Design Configuration;

• Bib-Overalls shall be designed to provide protection above the workers waist to cover vital organs.
• Bib-Overalls shall include suspenders constructed of FR elastic straps and high temperature plastic closures for easy donning/doffing.
• Garment must not incorporate any exposed metal snaps or buttons.
• No pockets or pass-through slits.
• Bib-Overalls must feature a wide pant leg to allow it to be pulled on over shoes or work boots as large as men’s size 13.
• Bib-Overall designs with openings that do not include a pleat shall not be used. The pleat shall be constructed of the same material as the suit shall be used from the top of the opening to the hemmed pant leg bottom.
• Available in a variety of sizes including Small through 5XL, Short, Tall and Extra Tall. Sizing based on CEN 13402 standard.
• Garment shall be designed to easily fit over dailywear or every day garments worn under the suit.
• Available with high visibility stripping as per CSA Z96 High Visibility Safety Apparel Standard.

Required Documentation
• ASTM F1959 test report for the fabric of the garments detailing the Arc Rating.
• ASTM F2178 test report for the Hood detailing the Arc Rating. ASTM F2178 report must be certified by the manufacturer as having been conducted by the manufacturer on the hood as sold to market. Licensing or borrowing of test reports in not permitted. If Company A is the manufacturer of the hood, Company A must certify that it has tested its hood AS SOLD to market, not use test results from a fabric or visor supplier.
• Manufacturer must provide documentation that a garment (hood, coat & bib-overall combination) rated to the calorie level of these specifications or higher has been tested to ASTM F2621-12
• Test report for the Hood detailing the ANSI/ISEA Z87.1-2010 Visible Light Transmission of the Window. A VLT rating at a single wavelength is not acceptable. The VLT rating shall be provided across the entire visible spectrum, incorporating the “Relative Luminous Efficiency” or the eyes’ sensitivity at each wavelength as detailed in the ANSI Z87.1-2010 Table C2.
• Statement from the hood manufacturer that the hood window is;
  o Constructed of polycarbonate material
  o Has been tested and labeled to comply with ANSI Z87 High Mass & High Velocity Criteria (Z87+)
  o Complies with ANSI Z87.1 for optical correctness (including haze and prism) as worn by user.
  o Incorporates a silicone based abrasion resistant coating that will prolong the useful life of the product.