



Taking care of my FR/AR clothing – Can I mess it up?



YOUR PRESENTER



DEREK SANG

Technical Training Manager

Derek Sang has 25+ years in the Flame-Resistant clothing industry in a variety of roles, In his position as the Technical Training Manager for Bulwark Protection, Derek has developed over 40 hours of training curriculum for Bulwark Institute covering all aspects of Flame Resistant and Arc Rated clothing. He has conducted 250+ educational and informational seminars on the hazards of arc flash and flash fire across a variety of platforms including live events, webinars and seminars for organizations all over North America, the Middle East and Europe. Derek is a recognized as a Subject Matter Expert on the proper selection, use care and maintenance of flame resistant and arc rated clothing as secondary PPE.



THIS PRESENTATION IS FOR INFORMATIONAL PURPOSES ONLY

Customers of Bulwark Protection are solely responsible for conducting their own Hazard Risk Assessment to identify safety hazards in their work environment.

Customers of Bulwark Protection are solely responsible for selecting appropriate garments and protective gear for their employees and ensuring wearers use the garments and protective gear properly and in conjunction with appropriate gloves and footwear. Because working conditions and other factors may vary, Bulwark Protection does not make any representation that these garments and protective gear will protect wearers from injury.



WELCOME TO OUR WEBINAR

Premise – we receive a lot of questions around Flame Resistant/Arc Rated clothing and how to properly care for and maintain our FR/AR clothing.

What you will take away....

- Who is responsible for Care & Maintenance
- Top laundry tips
- What about mosquitos and ticks?
- When should I use an Industrial Laundry vs home laundering?
- Its pretty hard to mess up good FR/AR



A FEW DEFINITIONS...

Fire retardant - is a chemical additive that suppresses fire by interrupting the fire flow (fire tetrahedron).

Flame resistant – self extinguishes does not support combustion, does not melt, drip or add to the injury

Old terms; inherent fiber does not support combustion; **and treated** – fiber needs additional finishing in order to not support combustion

FR Engineering – molecular level, fiber level, fabric level – must be durable for life of the garment.

Arc Rated – tested to the electric arc flash hazard

FR/AR – flame resistant/arc rated garments



CAN I MESS IT UP?

The FR/AR properties of today's proven suppliers are for the life of the garment and are therefore durable to not just laundering but also wear and tear.

It is key to understand what you can and cannot do as a wearer and what you need to be aware of as an employer.

Today's FR/AR is not the PPE of 25 years ago when 4-5 fabrics dominated the market space and performance apparel was not even in our vocabulary.



RESPONSIBILITY: WHO IS RESPONSIBLE FOR WHAT?

When determining who is responsible for worker and workplace safety, it's important to note that most laws and regulations point to employers.

Includes the Proper Selection, Use, Care and Maintenance of PPE



REGULATIONS SAY ...

1910.132 The employer shall assess the workplace to determine **if hazards are present**, or are likely to be present, which **necessitate the use of personal protective equipment (PPE)**.

SELECTION: CHOOSING THE RIGHT PPE FOR THE JOB

Employers choosing FR/AR clothing are required by OSHA to –

“Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment.”

As with hazard assessment, industry consensus standards may be used to guide selection decisions. (NFPA® 70E/2112/2113, ASTM 1506, ANSI/ISEA 107)



WHERE TO START – Understanding Labels

NFPA® and ASTM labeling requirements are strict; ASTM F1506 6.3 requires that:

Garments shall be labeled with the following information:

6.3.1 Tracking identification code system,

6.3.2 Meets requirements of Performance Specification F1506,

6.3.3 Manufacturer's name,

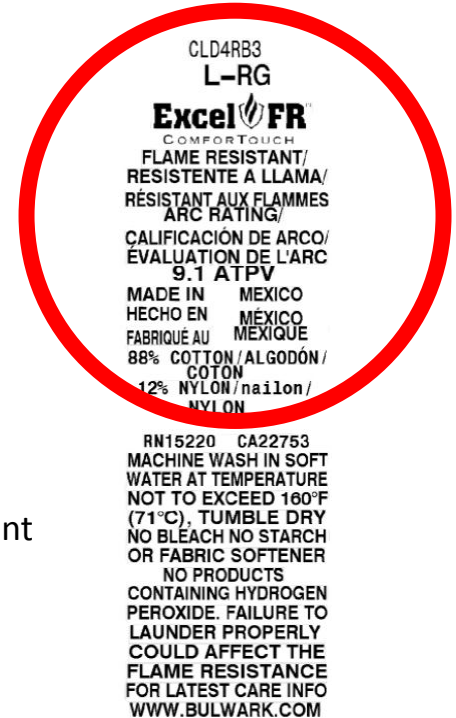
6.3.4 Size and other associated standard labeling,

6.3.5 Care instructions and fiber content, and

6.3.6 Arc rating (ATPV) or arc rating (EBT).

6.3.6.1 When garments are made with a different number of fabric layers in different areas

of the garment, the arc rating for each area shall be designated. Pockets, trim, closures, seams, labels, and heraldry shall not be considered as extra layers⁹





Required Labeling for NFPA 2112 Compliance

REQUIRED LABELING

These two examples correctly list and briefly describe the

..... but not everyone follows the rules.

and labeling requirements for the relevant standards and regulations, or they indicate that the garment has been certified by a third-party, in this case Underwriters Laboratories.



THIS GARMENT IS FLAME RESISTANT

This Bulwark flame resistant garment is constructed from flame-resistant fabrics and components, for prevention of clothing ignition during short duration exposure to flame or electric arc, when free from contamination with flammable substances, and for the protection from inadvertent splash of medium to high surface tension and high polarity liquid chemicals (see www.bulwark.com/frtech for more information). The secondary splash protection is for exposures to small amounts of liquid chemicals and/or solvents at atmospheric pressure. The fabric resists penetration and wicking by shedding small amounts of liquid chemicals either dropped or splashed on the fabric (excluding knit cuffs). This garment meets all the requirements of ASTM F1506 and is categorized to NFPA 70E (2024 Edition). It also meets the requirements of ASTM F2302 and is acceptable for use in occupations covered by OSHA Final Rule 1910.269.

WARNING

You or your employer must conduct a hazard assessment to determine the suitability of this garment for your workplace. This garment is NOT intended for fire entry, structural, wildland fire fighting, or activities requiring primary chemical protection or chemical exposures other than described above. Do NOT use for personal protection against continuous thermal loads, radiant heat, hot liquids, steam or primary chemical or biohazard protection. Do NOT use and remove at once, if contaminated with flammable or other chemical substances. To prevent generation of potentially hazardous static electricity, do NOT dry or remove in a hazardous area. The user assumes all risks associated with the use of this product. Failure to comply with this warning may result in serious INJURY or DEATH.

For more information go to www.bulwark.com
DO NOT REMOVE THIS LABEL
 Bulwark Protection, E9427CA in the US call
 1-800-223-3372 in Canada call 1-800-667-0700

CLASSIFIED

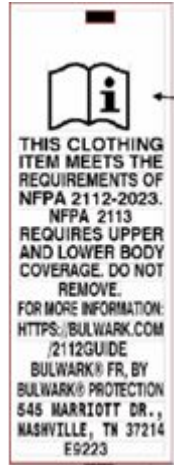
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THIS GARMENT MEETS THE REQUIREMENTS OF NFPA 2112, STANDARD ON FLAME-RESISTANT GARMENTS FOR PROTECTION OF INDUSTRIAL PERSONNEL AGAINST FLASH FIRE, 2012 EDITION, NFPA 2113 REQUIRES UPPER AND LOWER BODY COVERAGE. PROTECTIVE CLOTHING FOR PROTECTION OF INDUSTRIAL PERSONNEL AGAINST FLASH FIRE IN ACCORDANCE WITH NFPA 2112-2012

DO NOT REMOVE 15UR E9297CA

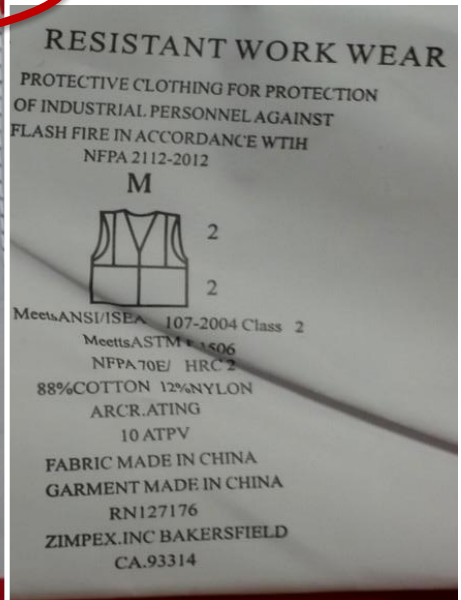
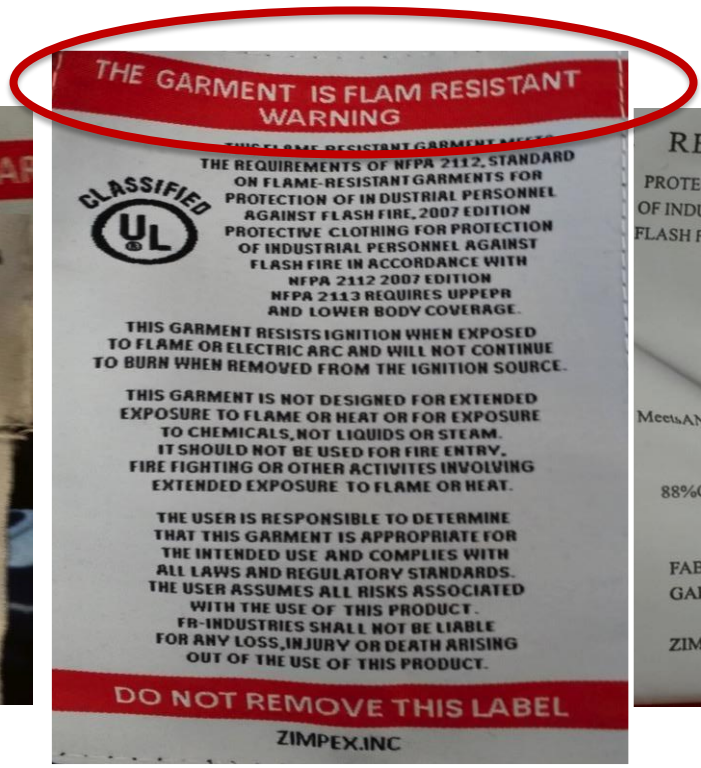
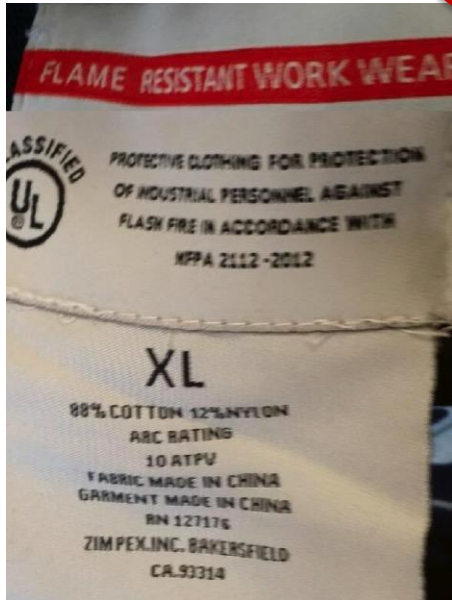
ALPHA SIZES	XS	S	M	L	XL	2XL
CHEST	34	36-38	40-42	44-46	48-50	52-54
SHORT=27" INSEAM	REGULAR=30" INSEAM		LONG=32" INSEAM			

Bulwark Protective Apparel, a brand of VF Imagewear Inc.
 545 Marriott Drive, Nashville TN 37214





Labels that are misleading or omit critical information.





TRAINING, WHEN IT IS NECESSARY, WHAT EXACTLY IS NECESSARY...

Employers implementing a PPE program are required by OSHA 1910.132(f)(1) and all industry consensus standards to provide training to each employee.

According to OSHA, each employee who is required to wear PPE should at least know when it is necessary, what exactly is necessary, how to don and doff and adjust it, what its limitations are, and **how to properly care for it.**

In addition to the requirement that employees be trained to use PPE properly, OSHA points to other specific industry consensus standards that provide even more specific details, such as NFPA®2113 A.5.1.1.





CARE & MAINTENANCE: Protecting the PPE Investment

Proper care and maintenance of FR/AR is essential to its effectiveness. While most industry standards recommend following the instructions provided by compliant garment manufacturers, some standards offer specific guidance, and there are a few basic rules that apply across all relevant standards.



ASTM F2757, Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing

ASTM F1440, Standard Guide for Industrial Laundering of Flame, Thermal



ASTM F1506 APPENDIX XI.3^{††††}

XI.3.1 The garment manufacturer in conjunction with the fiber and fabric supplier should provide instructions for the care and maintenance of protective wearing apparel. See Guide ASTM F2757, Standard Guide for Home Laundering of Flame, Thermal, and Arc Resistant Clothing or See Guide ASTM F1449 Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing concerning care and maintenance of protective wearing apparel.

ASTM 2757 – Home Laundering
ASTM 1449
Industrial Laundering

Washed at least once prior to initial use

NFPA® 2113 GUIDELINES[†]

- 6.1.1* Flame-resistant garments shall be kept clean.
- 6.1.2* New flame-resistant garments shall be washed or dry-cleaned at least once prior to their initial use.
- 6.1.3* Flame-resistant garments shall be cleaned in accordance with manufacturer instructions, or if cleaning instructions are not provided, in accordance with the recommendations provided in ASTM F2757-09, Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing, or ASTM F1449, Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing.
- 6.1.4 Flame-resistant garments shall be laundered or dry-cleaned with such frequency so as to prevent buildup of contaminants that reduce flame resistance.

NFPA 70E® GUIDELINES[†]

(13) Care and Maintenance of Arc-Rated Clothing and Arc-Rated Arc Flash Suits.

- (a) Inspection. Arc-rated apparel shall be inspected before each use. Work clothing or arc flash suits that are contaminated or damaged to the extent that their protective qualities are impaired shall not be used. Protective items that become contaminated with grease, oil, or flammable liquids or combustible materials shall not be used.
- (b) Manufacturer's Instructions. The garment manufacturer's instructions for care and maintenance of arc-rated apparel shall be followed.

Laundered or dry cleaned with frequency so as to prevent build up of contaminants



- Important to read the manufacturer's laundry instructions on the label
- Written care instructions are available for all employees
- They can also be accessed at:
<http://www.Bulwark.com/Safety-Care>

CLD4RB3
L-RG
Excel[®] FR
COMFORTOUCH
FLAME RESISTANT/
RESISTENTE A LLAMA/
RESISTANT AUX FLAMMES
ARC RATING/
CALIFICACIÓN DE ARCO/
EVALUATION DE L'ARC
9.1 ATPV
MADE IN MEXICO
HECHO EN MEXICO
FABRIQUÉ AU MEXIQUE
88% COTTON / ALGODÓN /

2% NYLON / nailon
NYLON
RN15220 CA22753
MACHINE WASH IN SOFT
WATER AT TEMPERATURE
NOT TO EXCEED 160°F
(71°C), TUMBLE DRY
NO BLEACH NO STARCH
OR FABRIC SOFTENER
NO PRODUCTS
CONTAINING HYDROGEN
PEROXIDE. FAILURE TO
LAUNDER PROPERLY
COULD AFFECT THE
FLAME RESISTANCE
FOR LATEST CARE INFO
WWW.BULWARK.COM

F1600

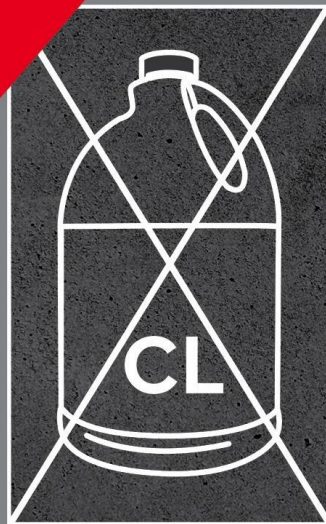


THE BASICS



RECOMMENDED

Only use liquid detergents without any special additives.



AVOID

Insect repellent with DEET, spray starch, liquid fabric softener, detergents with peroxide, chlorine bleach, and dryer sheets should not be used on any FR garments.



WHAT CAN YOU USE?





LAUNDRY TIPS – best practices

Although there are no special processes or equipment needed for cleaning FR/AR clothing, there are a few basic laundry guidelines:

1. Do not use any kind of bleach or peroxide
2. Do not use any additive that could build up and impede FR performance
3. Wash FR/AR garments separately
4. Turn FR/AR garments inside out to help color retention and preserve appearance
5. Use liquid detergent for best results
6. Avoid the hottest temperature to reduce the impact of shrinkage
7. For tough stains, soak garments in liquid detergent or non-bleach, non-peroxide pre-wash stain removers
8. For even tougher stains, Bulwark® FR/AR garments may be dry cleaned
9. Tumble dry on low setting and do not over dry
10. Rewash garments with lingering odor





IMPORTANT TO READ THE LABEL





HOW MUCH IS TOO MUCH???





SOILED GARMENTS

- Discoloration/stains alone are not an indicator of reduced protection
- Monitor the accumulation of secondary accelerants on your garments throughout the day.
- After laundering make sure accelerants are removed. **SMELL!!**
- Rewash the garment until the odor is gone.



FR/AR CARE & MAINTENANCE

Soiled Garments:

- Monitor the accumulation of secondary accelerants on your garments through out the day.
- After laundering make sure accelerants are removed. If your garments still have a hydrocarbon/petroleum odor, a flammable contaminant may still be present. Rewash the garment until the odor is gone. If combustible soils are not completely removed, the protective qualities of the garment may be compromised.



**Discoloration/stains alone are not an indicator of reduced protection.*



REPAIRING OR REPLACING

Beyond proper cleaning, the efficient and safe care and maintenance of FR/AR depends on regular and thorough inspection along with appropriate repair and/or replacement.

Regular inspections should look for:

1. Correct fit - shrinkage can cause a garment to fit too tightly
2. Garment integrity - this means tears, rips, loose seams, holes, etc.
3. Stains - particularly the oily, sticky, or smelly ones

Repairs must be made with fabric and findings that match the protection level of the original garment.

Garments that cannot be safely repaired must be removed from service.



TIPS

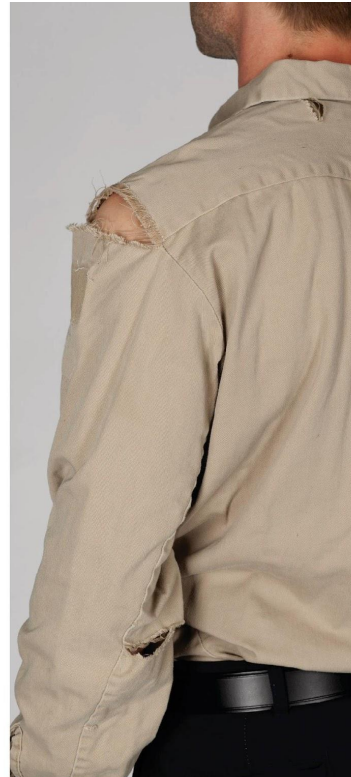


Using the viable fabric from retired FR garments for patches and repairs is a safe and economical way to extend the life of FR clothing.



REPAIRING OR REPLACING

Garments that cannot be safely repaired must be removed from service.





REPAIRING OR REPLACING

Garments that cannot



**3 inches and a Nickle -
One of Each!**

from service.





WHEN SHOULD A GARMENT BE RETIRED?

- Garments are ill-fitting
- Closures no longer engage
- Aesthetically unpleasing
- Threadbare
- Worn/Abraded
- Excessively ripped or torn
- Heavily soiled or stained





WHEN SHOULD I CONSIDER AN INDUSTRIAL LAUNDRY

- ✓ High soil environment – higher water temps/stronger chemistry
- ✓ Contain contaminants – prevent from going home with employees
- ✓ Logistics make sense – proximity to facility/service area
- ✓ Repairs and upgrades – single source
- ✓ High turnover – can manage bulk programs
- ✓ Simplified product line – coveralls a few S/P's few colors and options



WHEN SHOULD I CONSIDER HOME LAUNDERING?

- ✓ Low to medium soil – little or no concern of contaminants going home
- ✓ Logistics are a challenge – employees do not return to a central location
- ✓ Low turnover – tenured employees minimize cost of outfitting
- ✓ Flexibility – not locked into terms and or technology
- ✓ Choice – can rapidly adapt to changes in technology/style

**The ability to mix and match programs within facilities/locations - NOG*



CHECKLIST:

FOR THE PROPER SELECTION, USE, CARE & MAINTENANCE OF FR/AR CLOTHING

- ✓ Ask for the manufacturers guarantee in writing on letterhead and signed
- ✓ Ask for the test data for the hazard (fabric suppliers can readily supply these results)
- ✓ Ask to see the garments certification(s) (has every garment been tested to your hazard?)
- ✓ Specify that only certified compliant garments are allowed on site
- ✓ Work with a proven supply chain partners
- ✓ Periodically police your program for compliance



IT'S PRETTY HARD TO MESS UP GOOD FR/AR

Asterisk ...this pertains to market proven suppliers and manufacturers**

FR/AR today regardless of the FR engineering or combination of FR engineering is that the FR/AR properties are for the life of the garment and are therefore durable to not just laundering but also wear and tear.

Thanks to regulations, standards and you the market:

- Extensive testing and development around protection, comfort and durability
- 25+ years of fiber and fabric innovation and development
- Market driving manufacturers to improve around comfort and durability - light weight, moisture wicking, high air permeability and moisture vapor transfer to create performance FR/AR workwear.



FR/AR DURING THE CORONAVIRUS PANDEMIC:



1 Big Don't



3 Do's



ONE BIG DON'T – DON'T SHARE YOUR PPE



- Different surfaces need to be disinfected/sanitized differently (you can have a lot of different surfaces – rubber, leather, poly carbonate, HD plastics etc.)
- Virtually impossible to decontaminate in the field
- Arc Flash Kits are a huge concern



HANDLING YOUR FR CLOTHING IN A COVID WORLD

DO #1

If you have **NO** concern regarding possible contamination:

- Follow manufacturers laundering guidelines for FR/AR home laundering procedures
- Do **not** use chemical additives such as sanitizers, bleach, Lysol
- No need to isolate clothing beyond manufacturers guidelines
- No need for special handling





HANDLING YOUR FR CLOTHING IN A COVID WORLD

DO #2 – IMPORTANT!

If you have a contamination concern, DO NOT shake the clothing:

The CDC recommends anyone handling potentially exposed FR clothing wear disposable gloves. If gloves are not available, be sure to wash your hands thoroughly with soap and water, for at least 20 seconds, after handling. If soap and water is not readily available, use an alcohol-based hand sanitizer that contains at least 60% alcohol.

- Isolate clothing, remove away from living areas and other clothing if possible
- Remove with gloves or wash hands prior and again after
- Follow manufacturers laundering guidelines for FR/AR home laundering procedures
- Do not use chemical additives such as sanitizers, bleach, Lysol
- Special handling – NOTE: The heat of the water, the agitation in the wash cycle, as well as the chemicals in the detergent work well to render the virus inactive

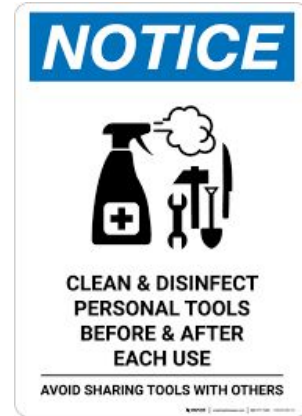


HANDLING YOUR FR CLOTHING IN A COVID WORLD

DO #3

Sanitize your tools and equipment.

- Wear disposable gloves to clean and disinfect.
- Clean surfaces using soap and water, then use disinfectant.
- Cleaning with soap and water reduces number of germs, dirt and impurities on the surface. Disinfecting kills germs on surfaces.
- Practice routine cleaning of frequently touched surfaces.
 - More frequent cleaning and disinfection may be required based on level of use.



CDC recommends a chlorine bleach/water disinfectant

- 1/3 cup for every gallon of water
- Do not use/wear your FR clothing when cleaning
- When cleaning, protect your FR clothing – Use a disposable coverall
- Wear an old coverall over your FR coverall



QUESTIONS/ COMMENTS

Derek Sang, QSSP, IASHEP (CSHEP)
Senior Technical Training Manager
Bulwark Protection
480-540-5350
derek.sang@bulwark.com