



THE DO'S AND DON'TS OF FR LAYERING

Layered FR systems are a great way to keep your team safe and compliant—especially as the weather turns cold. But FR layering can get tricky, and when gear is layered improperly it can undercut the protection it is designed to provide. Recent updates to FR layering standards have added greater confusion to an already complicated topic. That's why our FR experts have compiled a list of their top five layering tips, complete with the cited standards, so you can easily find the information that's relevant to your business.

1 BASE LAYER BASICS

According to NFPA® 70E section 130.7 (C) (12) (a), non-melting flammable garments (i.e., non-FR) are permitted to be worn under FR garments for added protection. In fact, an extra layer of non-melting fabric can provide an added level of protection—even if the garment is not FR. However, that layer will **not** count toward achieving your required arc rating. Any additional protection it provides is considered above and beyond the ATPV already met by the FR garments. To keep it simple, we recommend specifying an FR base layer—you'll get the benefits of an undershirt plus the protection of Bulwark.

2 OUTERMOST FR/AR

Layering rules can be confusing, but there's one rule that is crystal clear across all industry consensus standards: no matter how many layers you wear, or how you achieve your total system arc rating, your outermost layer must always be FR/AR. The reason all outerwear must be FR/AR is that flammable outerwear can easily ignite and continue to burn, eliminating the protection afforded by the FR/AR clothing worn underneath. During winter weather, an FR/AR outer layer can also provide added warmth and insulation against the cold.

3 LET IT BREATHE

FR systems often come at the expense of comfort—especially in the summer. And that discomfort poses a threat to both compliance and safety. If the FR is uncomfortably hot, wearers are more likely to disregard the rules in favor of comfort, or stay compliant and run the risk of heat stress. That's why it's important to select FR fabrics that are designed to wick moisture away from the body and allow air to flow through. Bulwark's iQ Series® uses dual elemental technology to provide exceptional FR protection in a thin, open weave fabric that mimics performance wear—to keep workers cool, dry and compliant all day.

4 HELP WITH HI-VIS

Rainwear and vests provide yet another layer of confusion when it comes to FR layering. ANSI/ISEA 107-2015 is your go-to standard for hi-vis safety apparel. Per the 2015 revision, hi-vis safety apparel labeled as FR must meet at least one of these recognized standards: ASTM F1506 or ASTM F1891 for electric arc protection, ASTM F2733 for flash fire protection or NFPA® 2112 or NFPA® 1977. Be on the lookout for misleading references to documents that do not measure FR performance, including ASTM D6413, which is a test method not a performance standard, and NFPA® 701, which is a performance standard for draperies and linens.

5 ATPV ARITHMETIC

A layered system is a great way to achieve your required ATPV, but it's not as simple as adding up the arc ratings of each layer. For instance, the Bulwark Long Sleeve FR Two-Tone Base Layer on its own carries an ATPV of **6.4 calories/cm²**. And the Deluxe Coverall carries an ATPV of **9.0 calories/cm²**. However, when combined, they have a layered arc rating of **21 calories/cm²**—significantly higher than the total ATPV if you simply combined the two garments' arc ratings. Many factors contribute to this, including the additional layer of air between the layers that creates added insulation. To make this process easier, Bulwark created an Arc Rating Calculator—an online tool that allows you to quickly and simply determine the total system arc rating for over 400 combinations of Bulwark FR garments.

Try the Arc Rating Calculator for yourself at bulwark.com/calculator

MORE PEOPLE ARM THEMSELVES WITH BULWARK THAN ANY OTHER FR BRAND.

Because only Bulwark brings over 45 years of frontline experience to the realities you face every day. Subscribe to our monthly newsletter for more information on safety standards, industry insights, product news and safety tips.

bulwark.com/newsletter