

## **CARNA BUNKER GEAR**

- Carna Bunker Gear aims to shift the precarious, long-standing culture of outfitting firefighters in structural firefighting gear when training in atmospheres that are not immediately dangerous to life and health (IDLH)
  1. “70% of firefighters will eventually die from cancer.”
  2. For every 1 in 100,000 firefighters, 350 firefighters can develop cancers from clothing contaminated with PAHs via dermal absorption.
- Carna Bunker Gear primary role is a cancer risk reduction strategy with a secondary strategy to extend the performance life of firefighter’s front-line gear utilizing a low-cost alternative non certified model.
- Some of the carcinogens expected to increase cancer in firefighters is due to elevated exposure rates of SVOCs, PHAs, PFAS, PBDEs/ PBB, and DEHP, and heavy metals.
- These chemicals are found on emergency scenes from a wide variety of fires such as residential, commercial and vehicle fires (PHA, PFAS, PBDEs, DEHP, heavy metals) and even in basic fires with organic fuel sources such as wood (PAHs).
- Some of these chemicals are even found in brand new unused bunker gear such as fluid repellents, flame retardants and microplastics. (PFAS, PBDEs, DEHP).
- Current laundering techniques do not appear to effectively remove PAHs, OPFRs and PBDEs and there is no such thing as “clean” bunker gear once it’s used in a fire.
- Laundering SFG is not ‘iron clad’ and its ineffectiveness in removing PFAS, DHEPs, or PBDEs or other flame retardants and plastics chemicals found in bunker gear is unanimously consistent
- “Several important protective properties of turnout gear are significantly changed after repeated (between 0 cycles and 40 cycles) simulated fireground exposures followed by cleaning (laundering, decon) or laundering alone.” Performance reductions are seen with as little as 10 washes. Training and washing are negatively affecting the performance of bunker gear and safety of firefighters.
- Benefits to Utilizing Carna Bunker Gear
  1. Help reduce cancer rates in the fire service. Miami Dade County had 33% of FF diagnosed with or die from cancer from 2008-2010. Carna will help reduce hidden cost of sick firefighters due to OT, insurance, workman’s comp, light duty etc. and hopefully help save lives.

2. Improve health and safety of FF by keeping performance of front-line bunker gear as high as possible due to less usage and washes.
  3. Reduce cost of replacing and repairing expensive front line bunker gear. Typically, high use bunker gear lasts 3-5 years before needing to be replaced. This will extend the useful life of front-line gear and literally save FD money buying Carma Gear to train in.
  4. Using non certified training gear that mimics structural firefighter bunker gear in design, bulk, weight, and heat retention is essential for proper job specific training and thermal adaptation.
- Only Carma Bunker Gear provides all of the benefits of training in gear with NONE of the risks. "Risk a lot to save a lot. Risk a little to save a little. Risk nothing for what is already lost." Chief Brunacini. This is foundational concept to the fire service and Carma Bunker Gear exemplifies that.
  - Applications
    1. Drill Yard Training- Hose line training, ladders, hitting hydrants and water supply, man down, search & rescue, forcible entry, training with tools, VES, RIT, etc. 95% of our training and skill development.
    2. Physical Fitness – Wear during PT especially when desiring heat acclimation.
    3. Fire Academies/ Recruits/ Probie's/ Rookies – These firefighters are at the highest risk to dermal absorption due to typically getting the oldest, dirtiest gear. Start them off in the healthiest way possible by wearing Carma, not the worst by using the oldest gear available.
    4. Competitions – Physical fitness competitions, RIT competitions, etc.
    5. Public Education – Wear during public educational events such as speaking at schools with children or any interaction with the public. The public can wear the gear if desired with no risk and FF can display bunker gear without worry of unnecessarily spreading carcinogens to other people or members of the public.