

Facepiece inspections prevent injury, death

The Department of Homeland Security, Science & Technology Directorate, Acquisition Support & Operations Analysis, Office of Standards identified a critical flaw in first responder Self-Contained Breathing Apparatus (SCBA) facemask facepiece lenses. S&T funded “live burn” studies and laboratory tests conducted by the National Institute of Standards and Technology (NIST). Studies found that firefighter’s SCBA facepiece lenses may melt when exposed to intense heat.

The identification of this flaw resulted in the National Fire Protection Association (NFPA) issuing a safety alert to 1.25 million U.S. firefighters in July 2012, recommending all SCBA facepiece lenses be inspected before and after each use. As a result, NFPA’s safety alerts based on S&T studies protect frontline responders from critical injury or death.



A Self-Contained Breathing Apparatus (SCBA) is a critical component in the personal protective equipment (PPE) used by today’s firefighters. This equipment is essential for allowing firefighters to operate in hostile fire ground environments. However, in recent decades there have been significant shifts with the environments encountered by structural firefighters and how they operate in those

Self-contained breathing apparatus facemask

environments. For example, the modern fire burns hotter. While suits, helmets and respiratory gear allow firefighters to work in hotter environments, they also make them less aware of the heat. Most vulnerable are the lenses in this piece of firefighter PPE.

NFPA recommendations

As a result of the study findings, NFPA made recommendations to identify and remove degraded facepieces from service and to raise awareness of threatening conditions for firefighters. Specifically, these recommendations include:

- NFPA 1852, *Selection Care and Maintenance of Open-Circuit Self-Contained Breathing Apparatus*, fire departments, academies, and emergency service organizations should ensure that all SCBA facepiece lenses are inspected before and after each use. Remove from service and replace SCBA facepiece lens found to have cracks, crazing, bubbling, deformation, discoloring, gaps or holes.
- In addition to complying with the provisions of NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, fire departments, training academies and emergency service organizations should review their training programs to ensure they cover the limitations of respiratory protection devices; awareness that delayed recognition of intense thermal environments can occur while wearing a firefighter protective ensemble; and how to respond to problems encountered when using SCBA in high temperature environments.
- When evaluating fire conditions and determining fire attack tactics and strategies, incident commanders, company officers, and firefighters should take into account the thermal performance limitations of SCBA facepiece lenses and the problem of delayed recognition of heat intensity due to the thermal insulation/protection provided by the PPE ensemble.
- Maintain constant situational awareness for deteriorating conditions indicative of extreme thermal temperatures/flashover conditions. Personnel must initiate self-evacuation or be directed to retreat to a safe area when confronted with these conditions.
- Fire departments, academies, and emergency service organizations that utilize SCBA should begin planning for the upgrade or replacement with products compliant with the upcoming 2013 edition of NFPA 1981.

“Your funding of our SCBA work was critical in addressing this problem. Without your support, it would not have happened. You are responsible for improving the SCBA lens for each of the 1.25 million firefighters in the United States. Eventually, I believe that the impact will go global as well.”

- Nelson Bryner, Group Leader, NIST, Engineering Laboratory, Fire Research Division

