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Highlights of the

**NFPA 2007-Edition
SCBA and PASS Standards**

HIGHLIGHTS



The NFPA 1981-2007 Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services and the NFPA 1982-2007 Standard on Personal Alert Safety Systems were issued on December 20, 2006.

Although these new 2007-edition standards are already in effect, the NFPA does permit SCBA and PASS manufacturers to continue shipping NFPA 1981-2002-edition SCBA and NFPA 1982-1998-edition PASS devices through August 31, 2007. After August 31, 2007, the NFPA will no longer permit the use of previous-edition approval labels on newly manufactured products.

The following key changes are now part of the new standards; some background and product implications associated with each are also included.

- **CBRN** was proposed and removed from the Standard during the voting of the technical committee, but was reinstated by the NFPA Technical Correlating Committee to keep the standard consistent with the new NFPA 1500 Standard on Fire Department Occupational Safety and Health Program, which requires all newly purchased SCBA to be CBRN-compliant. With most brands of SCBA, including MSA, the additional cost for CBRN protection is inexpensive, and the differences related to non-CBRN SCBA are virtually transparent.

Because this was not the case with all brands of SCBA (some having differences more noticeable to the end-user), this issue underwent lengthy debate. Ultimately, however, CBRN protection was believed to be valuable protection for all first responders in all locations, due to the unpredictable and random nature of terrorist attacks, and it is now part of the Standard.

- **Mechanical voice diaphragm** performance changed from a minimum score of 72% to 80% at a distance of 5 ft. An additional requirement for voice communications systems, which may call for an electronic amplifier, has been set at an 85% minimum score at a 10-ft. distance. The purpose of this requirement is to provide firefighters with a greater ability to communicate in a noise-filled emergency scene. It was anticipated that an electronic amplifier would be required to meet the 85% level. To ensure that firefighters have effective communications in the event their electronics fail, the 80% requirement is specific to a mechanical system.

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- More rigorous **water-immersion testing** has been added to both 1981 and 1982 standards. All electronic devices must function properly and remain watertight following six cycles of heat at 350° F for 15 minutes and water submersion to 1 ½ meters deep. Previously, PASS devices had to undergo temperature stress tests from -4° F to 160° F; then, after being conditioned to a nominal 113° F, they had to remain watertight after water immersion for 2 hours at a 1-meter depth. HUD devices on SCBA underwent a liquid splash test and had no immersion requirements.

This requirement will help ensure that electronics function properly in the field after repeated exposure to heat and water. PASS device failures, like those reported by MSNBC, have been associated with water ingress as a contributing cause. For MSA's product, this change means permanently sealed electronics enclosures by hermetic sonic welds, and radial-sealed threaded caps on battery compartments.

- A challenging 3-hour **tumble test** has been added to PASS devices only. The primary reason for this change is to ensure that electronic circuitry can endure long-term rough handling and transportation. The test is based upon an apparatus that MSA has used for years in the development of products, to ensure durability during rough handling. It consists of a 4-ft-diameter "squirrel cage" that rotates and tumbles its contents. Circuitry modifications will likely be required to most products on the market to better protect them from the impact and vibration. Early screening tests revealed that some products had difficulty enduring only minutes of testing.
- A new **muffle test** has been added to PASS devices. In this test, the device must emit 95dBA of sound at 3 meters while the wearer is positioned in each of 5 orientations (face down, supine right and left, and fetal right and left). The test helps to protect against the accidental muffling of a PASS device in various orientations. It appears that air cylinders are effective in elevating the user enough to prevent muffling; therefore, a potential solution is to place sound emitters behind the SCBA cylinder.

- The high-temperature performance of PASS devices has been raised from 200° F for 15 minutes to 500° F for 5 minutes, after which the PASS must emit 95dBA of sound at 3 meters. This will require design modifications to all products on the market, and is probably considered the most challenging aspect of the new standard. MSA has developed a unique horn to meet this requirement. The horn has consistent performance (sound output and power use) over a complete range of temperatures and is one of the most innovative features of the new product.

It may be possible to overdrive conventional piezo sound emitters to meet this test. However, their performance will likely be compromised by being too loud at typical temperatures, consuming excessive battery power, and possibly shortening their service life.

- **Data-logging**, similar to MSA's ICM® Tx, will be a new requirement for all PASS devices. Most brands on the market do not have this feature. An independent pressure gauge (mechanical or electronic) that is not affected by the failure of the HUD will be required on all SCBA, and will likely result in a chest-mounted mechanical gauge. Also, the tightness of the CGA cylinder valve handwheel will be tested to prevent it from loosening during use.



SUMMARY

In summary, these changes represent the most significant differences between the new and previous-edition standards. Several additional changes were included, but are relatively minor by comparison. Most SCBA will need to undergo a redesign of their electronics; however, pneumatic air-delivery systems will probably not be affected. Please stay tuned to **MSAFire.com** – your source of information and updates.

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

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The logo for MSA The Safety Company. It features the letters 'MSA' in a large, bold, white font inside a green rectangular box. Below the box, the text 'The Safety Company' is written in a smaller, black, sans-serif font.

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