U.S. Department of Labor
Mine Safety and Health Administration
Protecting Miners' Safety and Health Since 1978

EXAMINATION OF MINESHIELD REFUGE ALTERNATIVES

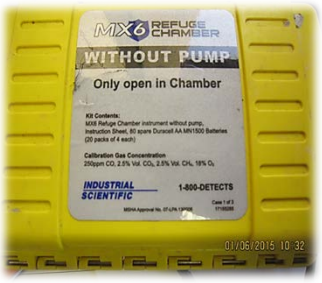
MSHA has become aware of several issues affecting MineShield refuge alternatives that may require action by mine operators who use these units. Refuge alternatives with components and equipment identified in this Alert have been manufactured in a manner that is inconsistent with their MSHA 30 C.F.R. part 7 approvals and prompt action is necessary to assure the safety of miners who may need to seek shelter in an emergency.

Air Monitoring Component

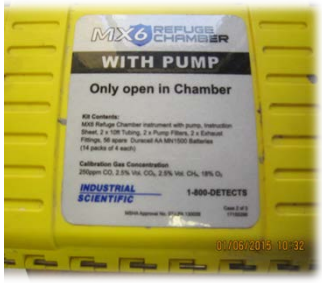
The exterior housing on certain MineShield refuge alternatives is not large enough to store the MSHA approved cases containing the air monitors and related parts. Consequently, MineShield provided some customers with smaller cases that do not have MSHA approval. The smaller storage cases are not large enough to contain the specified number of batteries and/or related parts in a manner consistent with the air monitoring component approval.

The MSHA approved Industrial Scientific Corporation (ISC) MX6 Refuge Chamber Multigas Monitor kit contains three Underwater Kinetics Ultrabox 408 cases measuring 9.1" x 5.9" x 4.3". The contents of each case, as specified in the ISC MX6 Refuge Chamber Multigas Monitor approval, are as follows:

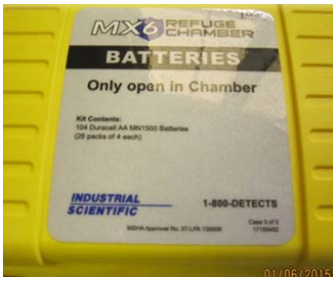
- Case #1 – The ISC MX6 "without pump" with a total of 83 alkaline batteries (3 installed and 80 spare) and the ISC MX6 Quick Start Guide. Only Duracell MN 1500 (AA) alkaline batteries are approved for use in the ISC MX6 multigas monitor.
- Case #2 – The ISC MX6 "with pump" with a total of 59 Duracell MN 1500 (AA) alkaline batteries (3 installed and 56 spare), two 10' pieces of urethane tubing, three pump inlet filers (1 installed and 2 spare), ISC MX6 Quick Start Guide and two exhaust fittings.
- Case #3 – 104 Duracell MN 1500 (AA) alkaline batteries.



Case #1



Case #2



Case #3

The approved component contains a total of 246 Duracell MN 1500 (AA) alkaline batteries (6 installed in the monitors and 240 spare) to assure a monitoring capability of 96 hours.

The approval for the MineShield Air Monitoring component specifies that Cases #1 and #2, containing the monitors and associated parts, are to be stored in an exterior housing on the front of the refuge alternatives where they are accessible for examination, calibration, and use in an emergency. Case #3, with spare batteries, is to be stored inside the airlock for use following deployment.

Carbon Dioxide (CO_2) Scrubbing Curtains & Storage

A 16-gauge steel storage container is specified in the MineShield harmful gas removal component approval to provide air tight, water tight and rodent proof protection for the CO_2 scrubbing curtains. Some MineShield refuge alternatives have been found without these approved steel containers, which help to assure the integrity of the harmful gas removal system. The number of scrubbing curtains will depend on the rated occupancy of the refuge alternative. This quantity is provided in the model specific MineShield User Manual.

Approved User Manuals

Applicable use and maintenance instructions and other related documentation must be provided at the location of approved refuge alternative components. Manuals must be the latest revision that is on file with MSHA's Approval and Certification Center and reflect the correct refuge alternative and component model in use. Some MineShield refuge alternatives have been found without the latest revision of the user manual stored with the approved component.

Stored Equipment

Stored equipment, such as mine phones and fire extinguishers, are not adequately secured to prevent movement during re-location of the refuge alternative. Parts and supplies inside the refuge alternative should be configured, arranged, and stored to minimize shifting, movement, or damage during handling and routine transport. Some MineShield refuge alternatives have been found with equipment that had been thrown about the interior during transport, exposing it to potential damage.

ACTION ITEMS

To assure compliance with 30 C.F.R. § 75.1506, mine operators using MineShield refuge alternatives should conduct examinations to determine if any of the above deficiencies exist. Refuge alternatives need to be taken out of service during these examinations; thus, affected miners must be withdrawn until the units are returned to service. When conducting these examinations, mine operators should:

- Examine the air monitoring component to assure that all required monitors, batteries (installed and spare), and related parts are located at the refuge alternative in the approved locations and are ready for use.

- Examine the air monitoring component to determine if it is stored as specified in the MSHA approval. If it is *NOT* stored appropriately but contains all of the necessary parts, miners must be trained as to the actual storage location(s) and MineShield should be notified so retro-fits can be completed.
- Examine the CO_2 scrubbing curtains for the appropriate number of curtains and make sure they match the rated occupancy.
- Assure CO_2 scrubbing curtains are stored in approved steel storage containers. If no storage container is provided:
  - Examine the CO_2 scrubbing curtains to assure that the curtains are not damaged.
  - Examine the CO_2 scrubbing curtains after the refuge alternative is moved to assure that the curtains have not been damaged.
- Assure that the latest version of the MineShield user manual is stored inside each refuge alternative.
- Assure that equipment has not shifted from its' properly stored location after a refuge alternative has been re-located.
- Report any deficiencies found during the examinations and retrofit plan to the MSHA District Office.
- After completing examinations, appropriate tamper evident seals must be in place prior to the refuge alternative being placed back into service. Follow the refuge alternative tamper evident seal procedure in effect at the mine.