



FireHawk[®] M7XT Air Mask

(2216 and 4500 psig air masks)

Product Specification

Prepared for:

Prepared by

I. Approvals:

1. The apparatus shall be approved by the National Institute for Occupational Safety and Health (NIOSH), under 42 CFR, Part 84 for chemical, biological, radiological, and nuclear protection (CBRN) with a 30-, 45- or 60-minute-rated service life and compliant with all requirements of the National Fire Protection Association's 2013 Edition of NFPA-1981 Standard on Open-Circuit Self-Contained Breathing Apparatus.
2. Units equipped with an integrated PASS device must meet requirements of NFPA 1982, 2013 edition.
3. Units equipped with an emergency egress system shall also comply with the NFPA 1983 Standard on Fire Service Life Safety Rope and System Components, 2012 Edition; Type: Escape.
4. Units equipped with an accountability system must meet minimum requirements for FCC part 15 and part 90.

II. Specific Requirements:

Facepiece

- A. The facepiece shall be available in three sizes in Hycar™ Rubber (small, medium and large).
- B. Two sizes of removable nose cup; nose cup shall contain a voice collector system that enhances unamplified speech transmission.
- C. The facepiece shall have an inhalation check valve and exhalation valve to prevent exhaled air from entering and contaminating the mask-mounted regulator.
- D. The facepiece shall have a speaking diaphragm with aluminum-coated membrane suitably protected and located centrally on the facepiece for optimal voice projection.
- E. The lens shall be field-replaceable and of a non-shatter type and shall fit all three sizes of the facepiece.
- F. The facepiece head harness shall be a flame- and heat-resistant Kevlar assembly featuring a suspension with five points of attachment and four points of adjustment.
- G. The facepiece shall be I-HUD-ready.
- H. An optional flame- and heat-resistant PBI neck strap shall be offered to carry the facepiece in a ready position for quick donning.

Internal HUD System

- A. The Heads-Up-Display, I-HUD System shall be wireless to eliminate snag hazards and provide modularity for easy maintenance.
- B. The I-HUD System shall prevent the ability to cross-talk among firefighters.
- C. The I-HUD System shall be immune to radio frequency interference (RFI) and must function properly in close proximity of fire service hand-held radios.
- D. The I-HUD shall provide the user with the remaining volume of air in his/her cylinder in 25% increments through a series of 3 colored LEDs.
 - o Three green lights 76 to 100% cylinder volume
 - o Two green lights 51 to 75% cylinder volume
 - o Two flashing amber lights 36 to 50% cylinder volume
 - o Flashing red light 0 to 35% cylinder volume
- E. Internal HUD shall be contoured to fit securely within facepiece to reduce snag hazards.
- F. The I-HUD receiver shall display remaining air pressure, battery life warning and PASS device pre-alarm and EVACUATE indicators.
- G. The I-HUD system shall allow the user to select between two modes of operation, 1) continuous lights on mode or 2) an intermittent lights on mode for power conservation.
- H. The I-HUD shall incorporate a photoelectric sensor that senses ambient light conditions, automatically adjusting the display to one of 16 pre-programmed light intensities.
- I. The I-HUD shall be field removable and replaceable without use of tools.
- J. Three buddy lights shall be visible from the outside of a firefighter's facepiece.
- K. The I-HUD receiver shall have a green test button.
- L. The I-HUD battery should last four to eight months using a single CR2 battery.

Universal Rescue Connection

- A. The system shall be capable of:
 - 1. Refill in immediately dangerous to life or health (IDLH) atmospheres.
 - 2. Transfilling between two SCBA wearers (connection allows for donation and receipt of air), providing an emergency breathing system (EBS) while maintaining NIOSH approvals.
 - 3. Quickly refilling (approximately one minute) an SCBA cylinder from a mobile compressor, cascade system or RIT Pack.
 - 4. Extending the wearer's air supply over longer duration when a remote cascade system or other compressed gas source is located in a remote area.

First-Stage Regulator

- A. Reduces the cylinder pressure to an outlet pressure not to exceed 100 psi. Regulator outlet pressure must be adjustable.
- B. The pressure reducer shall incorporate a downstream flow to ensure fail-safe in an open position.
- C. Regulator redundancy shall be achieved by two inter-nested long-life springs.
- D. The regulator body shall be constructed of a high-strength heat-treated aluminum alloy, and plated with a Teflon hard coat anodize to minimize corrosion and wear of internal components.
- E. There shall not be more than 14 individual replacement parts on the regulator.
- F. The regulator shall be mounted on a slide bracket to facilitate easy cylinder attachment and to prevent binding of high-pressure hose.
- G. The regulator must not require any special tools for disassembly.

Mask-Mounted Regulator: (Push-to-Connect)

- A. The second-stage regulator shall not obstruct or reduce the field of vision of the wearer when installed on the facepiece.
- B. The second-stage regulator must be equipped with Positive Protection Tetraplex Shield membrane that covers the diaphragm, preventing against permeation of CBRN agents.
- C. When doffing the regulator, the disengagement of the regulator from the facepiece must simultaneously stop the flow of air and release the regulator.
- D. The regulator must be equipped with a variable flow bypass.
- E. The second-stage regulator must be labeled with a CBRN notation.
- F. An over-the-shoulder air-supply hose shall be routed through a shoulder strap tunnel from the first- stage regulator.
- G. As an option, the detachable regulator must have a push-to-connect attachment to the facepiece. This option of the regulator shall feature a non-indexing design, capable of mounting to the facepiece in any orientation. In this configuration, the regulator must rotate freely when connected to the facepiece, maximizing the user's freedom of head movement.

Primary Low Pressure Warning Device

- A. An audible bell alarm shall be an air-actuated, self-cocking, continuous ringing audible warning bell automatically operating when air pressure in the supply cylinder reaches approximately 35% of the rated service life.
- B. An audible bell alarm must cover multiple levels of frequencies to cover all hearing levels.

Cylinders

- A. Cylinders with 2216 psig operating pressure must be rated for 30 minutes. Cylinders with 4500 psig operating pressure must be available in 30-, 45- and 60-minute durations.
- B. Cylinders must be available in two operating pressures, 2216 and 4500 psig.
- C. The cylinder shall be constructed of a deep-drawn, seamless aluminum liner that is fully wound over its entire surface (except for the thick neck area) with high-strength carbon fiber filaments impregnated with epoxy resin.
- D. The cylinder shall contain a closing valve that shall incorporate a pressure gauge to indicate the pressure in the cylinder at all times. The pressure gauge face shall be luminescent. The hand wheel shall be at a 90° angle from the longitudinal plane of the cylinder.
- E. The valve shall incorporate a flow control insert to limit the airflow over the first half-rotation of the hand wheel, minimizing propulsion thrust in the event that the cylinder is mishandled.
- F. The cylinder shall have a minimum two-inch wide luminescent band to enhance visibility of the wearer.

Emergency Egress Rescue Belt (Optional)

- A. In addition to meeting the NFPA 1983 standard, the rescue belt must be NIOSH-certified and NFPA 1981-2012 edition-compliant as a component of the SCBA.
- B. Complete system to include Ara-shield pouch, carabiner or Crosby hook with sewn-in connection and F4 Sterling auto-locking descender.
- C. Shall be available with 50-ft. FireTech 32 rope or an aramid/nylon blend.
- D. As a safety feature, the rope shall be detachable under load by the user, with a pull-to-release knot at the end of the rescue rope.
- E. As a safety feature, the rope assembly shall have two end-of-rope flags, one at 15 feet and the second at 10 feet.
- F. Shall be available with double-action waist belt buckle.
- G. Rescue system shall have web management system for reduced snag hazards.
- H. The rope assembly shall be available as a replacement part.

PASS Device

- A. The PASS device is a combination integrated PASS device and HUD Transmitter that shall be contained in a single enclosure and shall be easily replaced in the event of fire ground damage.
- B. The PASS device unit must be immune to radio frequency interference (RFI) and must function properly in the close proximity of fire service hand-held radios.
- C. The unit shall be capable of storing up to 25 hours of use information in the form of sessions that are generated each time the SCBA is pressurized. The sessions must indicate the day, time, user's name, cylinder pressure, duration of use, and time of alarm (PASS and thermal) for each pressurization of the SCBA stored on a minute-by-minute basis.
- D. The sessions must provide the option of downloading to a personal computer for addition to maintenance records, or for use in incident investigations.
- E. The PASS device must utilize a perimeter seal (sonic weld) to provide the highest level of protection against water ingress.
- F. The PASS device must be equipped with buddy lights on the front and back of the firefighter. The purpose of the buddy lights is to easily identify firefighters that are in immediate need of assistance. Buddy lights are positioned to face one towards the firefighter and one away from the firefighter.
- G. The power module shall be equipped with dual sound emitters. The sound emitters shall perform at a minimum of 95 dBa after heat emersion of five minutes at 500° Fahrenheit.
- H. The PASS device must be equipped with time remaining display and an optional thermal sensor. The time remaining function must update calculations every 30 seconds based on the user's previous three minutes of air consumption. The initial calculation will appear after three minutes.
- I. The PASS device and power module shall be powered by four C-cell batteries.
- J. The expected service life of the batteries shall be six to eight months on average for units without telemetry, and four to six months on average with telemetry.
- K. If equipped with telemetry, the unit shall have the capability of electronically storing the user's name into memory through an ID tag.

Emergency Escape Breathing Support System

- A. As an option, an emergency escape breathing support system must be accommodated by the SCBA.
- B. The system must be available with a common SCBA quick-disconnect fitting.
- C. The system shall connect to the intermediate pressure side of the SCBA, downstream of the first-stage regulator.
- D. The system shall have both male and female connections.

Weight

- A. The weight of a basic SCBA (less cylinder) shall not exceed 13 lbs., 4 oz.
- B. The weight of the cylinder and valve assemblies (empty) shall not exceed:

Cylinder Type	Weight
Carbon-wrapped L30	8 lbs., 0 oz.
Carbon-wrapped H30-SL	7 lbs., 4 oz.
Carbon-wrapped H45	9 lbs., 7 oz.
Carbon-wrapped H45-SL	9 lbs., 10 oz.
Carbon-wrapped H60-SL	11 lbs., 12 oz.