

INCH-POUND

A-A-59764

1 February 2005

## COMMERCIAL ITEM DESCRIPTION

## ENSEMBLE, STEAM SUIT, SUBMARINE

The General Services Administration has authorized the use of this commercial item description, for all federal agencies.

1. **SCOPE.** The submarine steam suit ensemble is designed to allow safe entry into a steam filled compartment on Navy submarines for emergency repair or personnel rescue. The submarine steam suit ensemble is comprised of four integral components: an insulated hood, a steam vapor protective suit, a pair of steam mittens and a pair of steam boots. In conjunction with the ensemble, a fire protective garment (FPG), size X-large, and a Self-Contained Breathing Apparatus (SCBA); 30-minute 4500-psi cylinder is worn under the submarine steam suit ensemble.

## 2. SALIENT CHARACTERISTICS.

2.1 **Insulated hood.** The insulated hood shall be a head/bib design, shoulder length, round at the top and flared at the bottom (see Figures 1 and 2). The circular face opening of the head shall have elastic webbing completely encircling the perimeter of the opening and covered by the outer material, secured with at least two rows of stitching. The bib shall be notched at the shoulders allowing it to lay flat when worn. The bib shall be bound at the bottom with binding fabricated from the outer material. The head and bib shall have two layers of material.

2.1.1 **Size.** The hood shall be a universal size, one size fits all.

2.1.2 **Dimension.** With the hood folded in half, using the back seam as a reference, the overall hood length shall measure 21 inches from top of head to bottom of apron and 15 inches from top of head to bottom of notched shoulder. The head shall measure 13 inches from the top of head to neck, 9 inches from the back seam to top of face, and 11 inches from the back seam to bottom of head. The face opening, top to bottom shall measure 5 inches relaxed and 15 inches stretched. The bib shall measure 8 inches at the front and the back.

2.1.3 **Outer layer.** The outer fabric shall be a 1-by-1 circular knit, 20%/80% Nomex/Rayon. The fabric shall be a minimum 7.2-oz/sq yd when tested in accordance with ASTM D3776 and a minimum burst strength of 80 lbs in accordance with ASTM D3787.

2.1.4 **Inner layer.** The inner fabric shall be a three-dimensional Rachel knit, Kevlar/Nomex. The fabric shall be a minimum 8.5-oz/sq yd when tested in accordance with ASTM D3776; a minimum burst strength of 60 lbs in accordance with ASTM D3787, and a minimum thickness of 0.155 inch when tested in accordance with ASTM D1777.

2.1.5 **Seams.** All seams shall be merrow stitched, then top and bottom covered with a 5-thread cover-stitch for extended durability. The thread shall be Nomex.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: Commander, Naval Sea Systems Command, ATTN: SEA 05Q, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to [commandstandards@navsea.navy.mil](mailto:commandstandards@navsea.navy.mil), with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil/>.

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2.2 Steam vapor protective suit. The steam vapor protective suit shall be a one-piece, totally encapsulating coverall constructed from a single layer of composite material. The composite material shall be lime-yellow in color, consisting of multiple films applied to a tough substrate. The material shall resist steam vapor penetration. The coverall shall be front entry, with a zipper closure and flap from the hood diagonally down to the leg. The flap shall have a hook and loop tape. The suit construction shall contain heat sealed seams. It shall have a wide face-piece sealed into the head section to provide the wearer with good visibility. The suit shall have sock-like booties of the same material and integral with the suit (see Figure 3). The suit shall have an expanded back for use with an SCBA and two-covered vent exhaust valves built into the suit to prevent inflation of the suit (see Figure 4). The sleeves shall have hook and pile fastener tape to provide adjustment at the wrists.

2.2.1 Size. The suit shall be a size 2X-large.

2.2.2 Performance. The steam vapor protective suit shall meet the requirements of NFPA 1991, Vapor Protective Suits for Hazardous Chemical Emergencies, with design exceptions as follows: the suit shall have no attached gloves and the sleeves shall have hook and pile adjustable fastener tape.

2.2.3 Material. The material shall be equivalent to Dupont, Tychem-TK. It shall have a minimum weight of 10.5 oz/sq yd when tested in accordance with ASTM D3776, minimum thickness of 26 mils when tested in accordance with ASTM D1777, minimum ball burst strength of 187 lbs when tested in accordance with ASTM D3787 and minimum tear strength of 188 by 180 when tested in accordance with ASTM D5597.

2.2.4 Face shield. The face shield shall have a minimum viewing area of 15 by 15 inches. It shall be 5 mil Dupont Teflon FEP film sandwiched between 2 layers of pressed/polished PVC: inner layer 20 mil and outer layer 40 mil.

2.2.5 Seams. The seams shall be double reinforced butt seams with polyester/cotton thread and heat sealed with chemical barrier film.

2.2.6 Exhaust valves. The suit shall have two exhaust valves, which shall perform in accordance with NFPA 1991.

2.3 Steam mittens. The mittens shall consist of a four-finger compartment and a separate articulated thumb design attached to long gauntlet (see Figure 5). They shall be fabricated in a four-layer steam vapor impermeable assembly, including a waterproof outer shell, a vapor impermeable barrier, and an insulated liner. The palm and thumb shall be reinforced with leather. The gauntlet shall be at least 7 inches long and also be fully lined/insulated using the four-layer assembly. The mittens shall be secured at the top with an elasticized nylon cord and a cord-lock device.

2.3.1 Size. The mittens shall be size large.

2.3.2 Outer material. The shell material shall be a minimum 1.9-oz/sq yd nylon rip-stop nylon fabric coated on the back with a minimum of 0.1-oz/sq yd of urethane, when tested in accordance with ASTM D3776. The color of the outer material shall be yellow.

2.3.3 Vapor barrier. The vapor barrier shall be urethane foam, coated on both sides with a urethane film, at a minimum weight of 1.9-oz/sq yd when tested in accordance with ASTM D3776.

2.3.4 Insulation liner. The insulation liner shall be a minimum 9.6-oz/sq yd batting of silicone treated 6 denier, continuous filament polyester when tested in accordance with ASTM D3776.

2.3.5 Lining. The lining shall be a 70-denier nylon taffeta at a minimum weight of 2.0-oz/sq yd, when tested in accordance with ASTM D3776. The color of the lining shall be black.

2.3.6 Cord-lock device. The securing device shall be a cord-lock device.

2.4 Steam boot. The steam boot shall be a driver's style fireman's boot constructed from standard vulcanized rubber construction. The rubber compounds shall be natural, synthetic, or a combination of both. The upper part of the boot shall be black with a yellow toecap and foxing. The outsole shall be white, high-abrasion, traction tread and the insole shall be cushioned. The heel shall be molded rubber. The boot shall be fully lined and contain pull-on leg loops. The boot shall have a steel toe, mid-sole, and shank (see Figure 6).

2.4.1 Size. The boots shall be men's size 13 wide.

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2.4.2 OSHA compliance. The boots shall comply with OSHA 1988 CFR 1910.36, 1910.156, Appendix E, and CAL-OSHA Title 8 GISO, Article 10.1.

2.4.3 Insulation. The vamp and quarter areas shall be insulated with closed cell polyurethane insulation.

2.4.4 Lining. The leg and top lining shall be wool or a flame-resistant material.

2.4.5 Steel toe. The steel toe shall meet ANSI Z41.

2.4.6 Steel shank. The shank shall be triple ribbed .05 x 1 x 4 inches.

2.4.7 Heel reinforcement. The heel reinforcement shall be cotton/nylon.

2.4.8 Insole. The insole shall be a laminated, low friction, rubberized foam.

2.5 Labeling. There shall be a label that indicates the garment name, manufacturer, NSN and Navy certification number on each piece of the steam protective ensemble.

3. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

4. PRODUCT CONFORMANCE. The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES.

6.1 Source of documents.

6.1.1 ANSI. ANSI standards are available from the American National Standards Institute, 25 W. 43rd St, 4th Floor, New York, NY 10036 or online at <http://webstore.ansi.org/>.

6.1.2 ASTM. ASTM standards are available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or online at [www.astm.org](http://www.astm.org).

6.1.3 CFR. The Code of Federal Regulations (CFR) may be obtained from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20401 or online at [www.gpoaccess.gov/index.html](http://www.gpoaccess.gov/index.html).

6.1.4 FAR. The Federal Acquisition Regulations (FAR) may be obtained from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20401 or online at [www.gpoaccess.gov/index.html](http://www.gpoaccess.gov/index.html).

6.1.5 NFPA. National Fire Protection Association (NFPA) standards are available from NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471 or online at [www.nfpa.org](http://www.nfpa.org).

6.2 Ordering data. The contract or order should specify the following:

- a. CID document number and revision.
- b. National stock numbers (NSNs).
- c. Product conformance provisions.
- d. Packaging requirements.
- e. Quantity required.

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6.3 National stock numbers (NSNs). The following are the NSNs that are assigned that correspond to this CID. This list may not be indicative of all possible NSNs associated with the CID.

NSNs	Item
4220-01-502-1039	Insulated Hood
4220-01-502-1033	Steam Vapor Protective Suit
4220-01-502-1036	Steam Mitten
4220-01-502-1041	Steam Boot

6.4 Key words.

Steam Protective Suit

Submarine

Vapor Suit

MILITARY INTERESTS

Custodians:

Navy – SH

Air Force – 03

Review Activities:

Navy – AS

Air Force – 11, 84, 99

DLA – IS

CIVIL AGENCY COORDINATING ACTIVITY:  
GSA – FSS

Preparing Activity:

Navy – SH

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FIGURE 1. Insulated hood, front view.

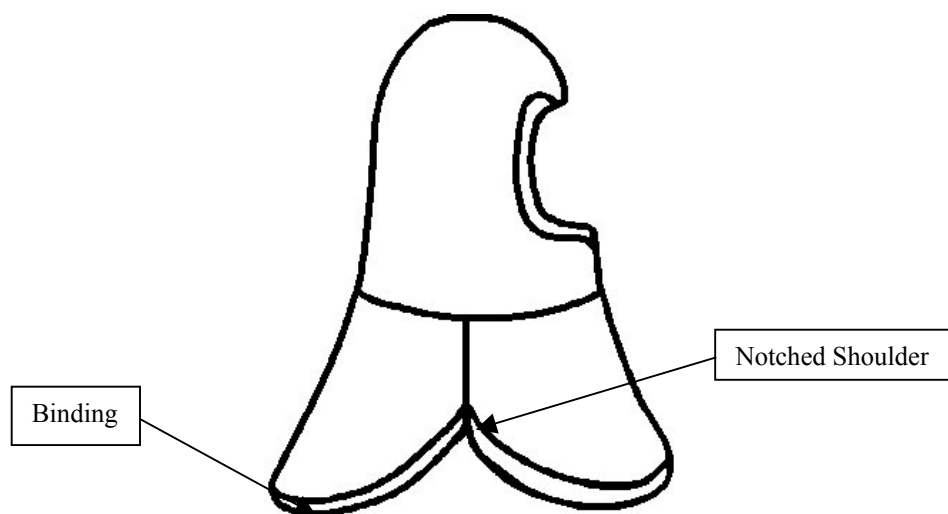


FIGURE 2. Insulated hood, side view.

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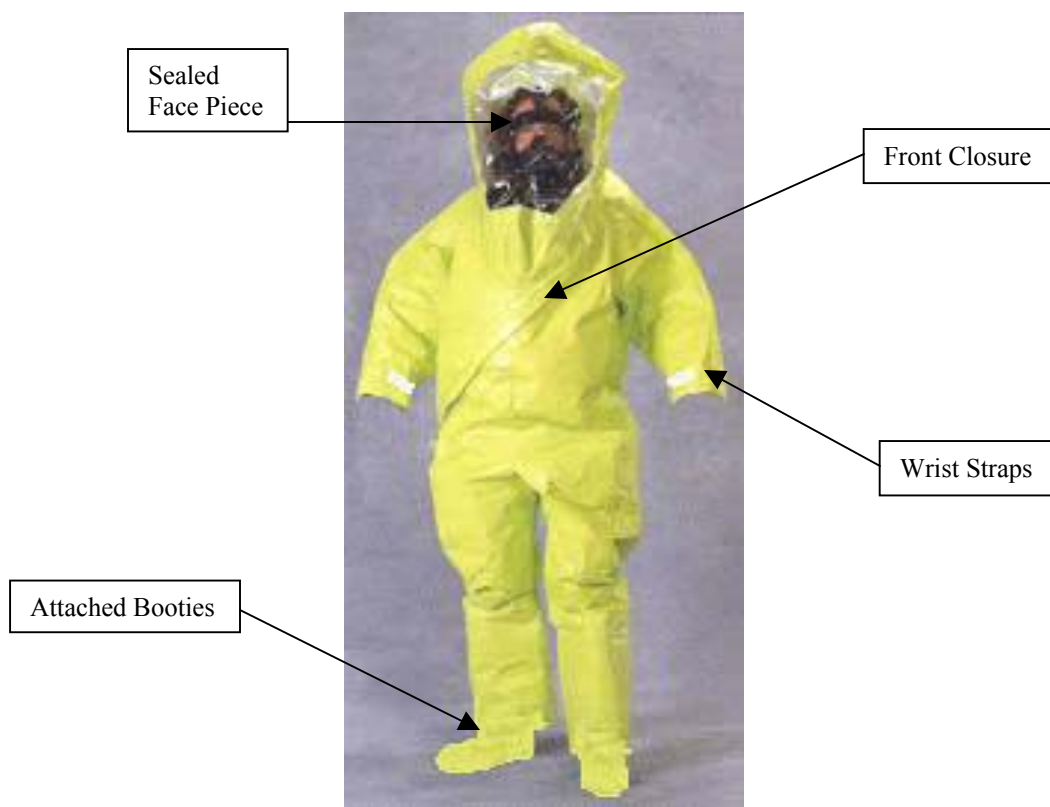


FIGURE 3. Steam vapor protective suit, front view.

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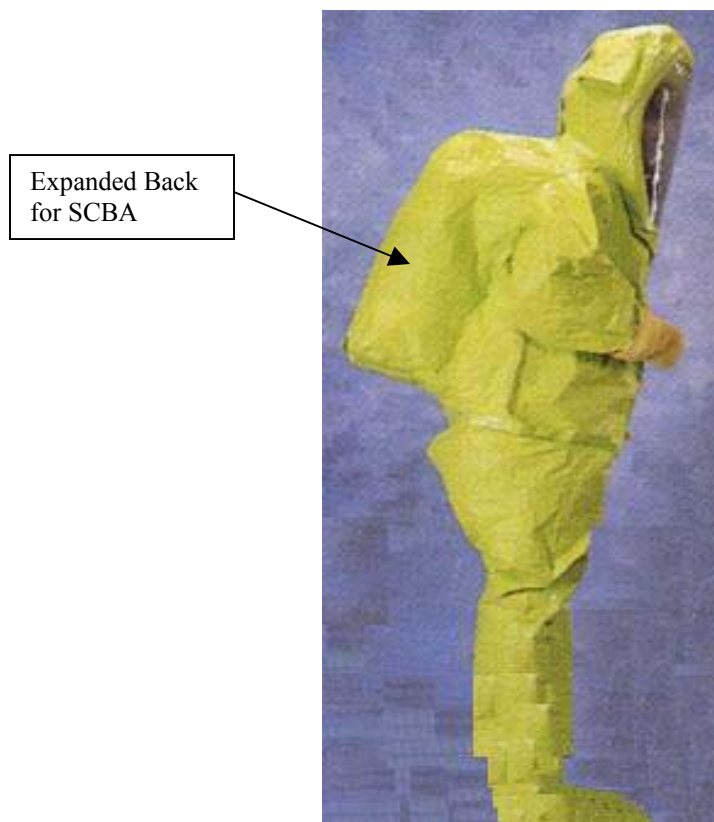


FIGURE 4. Steam vapor protective suit, side view.



FIGURE 5. Steam mitten, front and back view.