

Specification 5100-256c  
January 2007  
Superseding  
Specification 5100-256b  
August 1997

**UNITED STATES DEPARTMENT OF AGRICULTURE**  
**FOREST SERVICE**  
**SPECIFICATION FOR**  
**PUMP, FIRE, BACKPACK, HAND-OPERATED**

1. SCOPE.

1.1. Scope. The hand-operated trombone pump described in this specification is used with a fabric backpack water bag in wildland firefighting activities. The pump is a lightweight slide-action type. The trombone pump includes a hose with a male quick-connect fitting, a nozzle tip, and a D-ring for attachment to a backpack strap harness.

2. APPLICABLE DOCUMENTS.

2.1. Government Documents. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those in effect on the date of the invitation for bids or request for proposals (see 6.2).

USDA Forest Service Specifications

5100-103—Backpack Pump Bag

Federal Specification

A-A-59567—Hose and Hose Assemblies, Rubber (Wrapped or Braided) Water Service

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Beneficial comments, recommendations, additions, deletions and any pertinent data that may be used in improving this document should be addressed to: USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198 by using the Specification Comment Sheet at the end of this document or by letter.

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Copies of Federal specifications are available from General Services Administration, Federal Supply Service Bureau, Specification Section, Suite 8100, 470 East L'Enfant Plaza SW, Washington DC 20407.

Copies of USDA Forest Service Specifications and Standards are available from USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198.

2.2. Nongovernment Publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the invitation for bids or request for proposals.

American Society for Quality (ASQ)

ANSI/ASQ Z 1.4—Sampling Procedures and Tables for Inspection by Attributes

Address requests for copies to American Society for Quality, P.O. Box 3005, Milwaukee, WI 53201-3005

2.3. Order of Precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1. First Article. Unless otherwise specified, samples shall be subjected to first article inspection in accordance with 4.4.2. During the term of the contract the contractor shall be required to notify the contracting officer in writing when a component or the component supplier changes in any way, when a major manufacturing process changes in any way, or when a manufacturing location changes. The contracting officer may at any time require the contractor to submit a new first article sample when substantive changes occur during the term of the contract.

3.2. Construction.

3.2.1. Trombone Pump. The pump shall be hand operated, slide-action type with one tube sliding within another. The slide action produces positive pressure either in the pull direction only for single action or in both push-and-pull directions for double action. The pump shall be a single action, unless otherwise specified. The inlet end shall be fitted with a hose barb connection for a 3/8-inch inside diameter hose. The hose barb waterway shall be minimum 0.25-inch inner diameter. The outlet end of the pump shall be 1/4-inch 18 NPSM free-fitting American Standard straight pipe external threads and shall fit the nozzle described in 3.2.6. The pump shall include a lock feature, hand grip, D-ring, hose, nozzle tip, and a male quick-connect fitting. The pump shall be easily assembled and disassembled without special tools.

3.2.2. Lock Feature. The pump shall be provided with a lock or drag feature to prevent extension by gravity. This feature shall not restrict or hamper operation of the pump in any way.

3.2.3. Hand Grip. Hand grip areas shall be fitted into the forward and rear sections of the pump. One or both of the hand grips may be pistol grips. The grip areas shall be shaped and positioned for utmost safety and comfort in pumping operation.

3.2.4. D-Ring. A 0.5-inch to 1.5-inch inside radius D-ring shall be permanently attached to the outer pump cylinder, so that the center of the D-ring is 11 inches, +/- 1 inch from the end of the pump cylinder with the hose barb connection, as measured when the cylinder is assembled. The straight section of the D-ring shall be parallel to the centerline axis of the pump cylinder. The D-ring shall provide for a point of attachment for the pump attachment clip described in USDA Forest Service Specification 5100-103.

3.2.5. Hose. A hose shall be securely fastened onto the pump inlet hose barb. If a clamp is used, it shall be free of any protrusions or sharp edges that could cause discomfort or injury to the operator. The hose shall be 3/8-inch inside diameter and shall be 4.0-foot ± 1.0-inch long.

3.2.6. Nozzle Tip. The nozzle shall be a dual-nozzle tip or adjustable single-nozzle tip. The nozzle shall generate a straight stream pattern in accordance with 3.8.8, and a spray pattern in accordance with 3.8.9. The nozzle shall attach to the pump discharge end by at least four full internal threads of 1/4-inch 18 NPSM free-fitting American standard straight pipe threads. A gasket shall be installed to prevent leakage. Deflector plates or other external devices to produce a spray shall not be allowed. The nozzle tip shall be removable for cleaning. A bead chain may be provided as a component part of the pump, permanently connecting the nozzle tip to the pump in order to prevent loss of the tip. Tip changeover shall not require any tools. With an adjustable nozzle, water pattern change shall be accomplished without the use of special tools.

3.2.7. Quick-Connect Fitting. A 90-degree male (nipple) quick-connect fitting with a 3/8-inch diameter hose barb connection shall be provided on the hose inlet. This fitting shall mate with the female quick-connect coupling on the fabric bag described in USDA Forest Service Specification 5100-103. The nipple section shall have a minimum waterway of 0.25 inch. The male quick connect fitting shall be as listed in table 1 or equivalent and shall be fully interchangeable between products.

Table 1. Quick-Connect Couplings - External Threads

Product	Manufacturer
Amflo Part Number CP5-44-90	Amflo Products, Inc. 1430 S. Anaheim Blvd Anaheim, CA 92805
D.B. Smith Part Number 175875	D.B. Smith and Company 414 Main Street Utica, NY 13501
H.D. Hudson Part Number 144-955	H.D. Hudson Manufacturing Company 1130 17th Street NW, Suite 300 Washington DC 20036
Parker Hannifin Part Number 14 10 Coupler, 3/8-inch 18 NPT	Quick-Coupling Division, Parker Hannifin 8145 Lewis Road Minneapolis, MN 55427

3.3. Materials. Where more than one type of material is used in various components, there shall be no incompatibility between materials which may cause corrosion.

3.3.1. Pump Body, Tip, and Component Material. Pump body material, inner and outer tube sections, nozzle tip, and end material shall be made of bronze, brass, or stainless steel. In addition, pump body and component material shall be corrosion resistant in an air-water atmosphere.

3.3.2. Hand-Grip Material. Hand-grip material shall be made of the same material as the pump: bronze, brass, stainless steel; or of galvanized steel. In addition, the hand grip shall be coated with an elastomer coating or plastic coating. If the hand-grip material is galvanized steel, no coating is required. The elastomer coating or plastic coating shall be resistant to ultraviolet degradation and ozone.

3.3.3. Seal and Gasket Material. All pump seal and gasket material shall be oil and ozone resistant. Seal lubrication shall be of a type that will not dry out or otherwise make the pump unsuitable for use after storage for up to 2 years.

3.3.4. Hose Material. Hose material shall conform to the requirements of Federal Specification A-A-59567, grade 3, or shall consist of a polyvinyl chloride seamless core encased in a flexible nylon braid with a reinforced polyvinyl chloride cover, chemically inert, resistant to solvents, and to abrasion.

3.3.5. Hose Fitting and Quick Connect Material. Hose fitting and 90-degree male quick-connect fitting material shall be bronze, zinc-plated steel, or stainless steel and shall be noncorrosive in an air-water atmosphere.

3.3.6. Recoverable Materials. The contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR), provided all performance requirements of this specification are met.

3.4. Dimensions and Weights.

3.4.1. Dimensions. The overall length of the pump in the contracted position, including nozzle tip, shall not be more than 20 inches. The outside cylinder shall be between 0.87 inch and 1.25 inches in diameter.

3.4.2. Weights. The dry weight of the pump with the nozzle but without the hose shall not exceed 2 pounds 8 ounces. The 4.0-foot length of hose shall not weigh more than 12 ounces. The nozzle tip assembly shall not weigh more than 3 ounces.

3.4.3. Dimensional Tolerance. Unless otherwise noted, the following tolerances apply: one place  $\pm 0.1$  inch; two places (x.xx)  $\pm 0.03$  inch and three places (x.xxx)  $\pm 0.010$  inch.

3.5. Workmanship. Workmanship shall be equal to the best commercial practices consistent with the highest engineering standards in the industry and shall be free from any nonconformance which may impair serviceability or detract from the product's appearance.

3.5.1. Symmetry. All metal part sections shall be symmetrical and concentric to 0.030 inch.

3.5.2. Extruded and Forged Components. Extruded and forged sections shall be free from laps, sharp die marks, cracks, and other nonconformities.

3.5.3. Cast Components. Cast parts shall be fine-grained, free from blowholes, pinholes, pits, porosity, hard spots, shrinkage, cracks, or other nonconformities.

3.6. Marking. The outer tube section of the pump body shall be permanently and legibly marked, on the outside surface, with the manufacturer's name or trademark, nozzle thread of 1/4-inch 18 NPSM, the letters "FSS" and the month and year of manufacture in numeric form (example—04/07 for April 2007). The minimum letter height shall be 0.12 inch.

3.7. Surface Finish. The finish shall be equal to the best commercial practices consistent with the highest engineering standards in the industry and shall be free from any finish nonconformance which may impair serviceability or detract from the appearance of the item.

3.7.1. Cast Surface Finish. Exterior surfaces shall be smooth and cleaned by sandblasting, tumbling, or other accepted standard commercial process.

3.7.2. Forged and Extruded Surface Finish. Die-formed and machined surfaces, except threads, shall be smooth and have a roughness of not more than 125 microinches.

3.7.3. Plastic Coating Surface Finish. Excessive material on edges shall not be allowed. All surfaces shall be free from laps, sharp die marks, cracks, flash, burrs, and sharp edges. The surface of the finished product shall be smooth and tack free.

### 3.8. Performance.

3.8.1. Lock Feature Resistance Testing. When tested in accordance with 4.6.2, the lock or drag feature of the pump shall prevent extension by gravity with 3 pound  $\pm$  1 ounce weight attached and with the pump in the fully contracted position.

3.8.2. D-Ring Tension Test. When tested in accordance with 4.6.3, the D-ring attached to the pump shall withstand a 50-pound tension force with no permanent deformation, mechanical damage, or structural failure.

3.8.3. Hose Pressure Test. When tested in accordance with 4.6.4, the hose shall withstand 25-  
psig hydrostatic pressure with no leaks, permanent deformation, mechanical damage, or structural failure.

3.8.4. Hose Vacuum Test. When tested in accordance with 4.6.5, the hose shall withstand 26 inches Hg vacuum, without collapsing or structural failure.

3.8.5. Hose Kink Test. When tested in accordance with 4.6.6, the hose shall not kink when coiled with a diameter of 5.0 inches  $\pm$  0.5 inch.

3.8.6. Hose Connection Tension Test. When tested in accordance with 4.6.7, the hose shall not separate from the barb when a tension force of 50 pounds  $\pm$  1 pound is applied.

3.8.7. Bead Chain Tension Test. If a bead chain is attached, when tested in accordance with 4.6.8, the bead chain shall withstand a tension force of 30 pounds between the pump and nozzle tip.

3.8.8. Nozzle Tip Straight Stream Test. When tested in accordance with 4.6.9, the nozzle tip shall project a solid stream of water vertically to a height of 17.0 feet  $\pm$  6 inches above the nozzle tip. The dispersal shall not exceed 2.0 feet in diameter. The nozzle flow rate shall be greater than 0.75 gallons per minute and less than 1.25 gallons per minute.

3.8.9. Nozzle Tip Spray Pattern Test. When tested in accordance with 4.6.10, the nozzle tip shall produce an evenly distributed 30 degree  $\pm$  10 degree spray pattern. The nozzle flow rate shall be greater than 0.75 gallons per minute and less than 1.25 gallons per minute.

3.8.10. Pump Side Load Support. When tested in accordance with 4.6.11, the pump shall support a side load of 55 pounds with no permanent deformation, mechanical damage, or structural failure.

3.8.11. Antisiphoning Action. When tested in accordance with 4.6.12, the antisiphoning mechanism of the pump shall prevent any discharge or leakage at the nozzle tip.

3.8.12. Pump Priming. When tested in accordance with 4.6.13, the pump shall be able to prime within five pumping cycles at a 4.0-foot-draft height.

3.8.13. Flow Rate and Pumping Force. When tested in accordance with 4.6.14, the pump without nozzle tip, shall deliver a minimum of 0.75 gallons per minute of water, with pumping

force not to exceed 35 pounds.

3.8.14. Static Pumping Force. When tested in accordance with, 4.6.15, the pump shall withstand a static pumping force of 100 pounds for 5 seconds with no permanent deformation, mechanical damage, or structural failure.

3.8.15. Maximum Pumping Rate. When tested in accordance with 4.6.16, the pump flow rate curve shall be linear to 45 degrees when plotted on the flow-versus-cycles chart.

3.8.16. Pumping Endurance. When tested in accordance with 4.6.17, the pump shall be tested for pumping endurance. The pump shall not leak, have any permanent deformation, mechanical damage, or structural failure after completing 50,000 cycles of pumping.

3.8.17. Post Endurance Flow Rate and Pumping Force. When tested in accordance with 4.6.18, the pump shall be retested for flow rate and pumping force in accordance with 4.6.14 to determine if performance has been reduced. The pump without nozzle tip shall deliver a minimum of 0.75 gallons per minute of water with pumping force not to exceed 35 pounds.

#### 4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his/her own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections or tests set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1. Testing With Referenced Documents. The contractor is responsible for insuring that components and materials used were manufactured, examined, and tested in accordance with referenced specifications and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.2. Responsibility for Compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known nonconforming material, either indicated or actual, nor does it commit the Government to accept nonconforming material.

4.3 Classification of Inspection. The inspection requirements specified herein are classified as follows:

- a. First Article Inspection (paragraph 4.3.2)
- b. Lot Acceptance Inspection (paragraph 4.3.3)

4.3.1. Lot. All pumps of the same type presented together in one delivery shall be considered a lot for the purpose of inspection. A sample unit shall be one pump.

4.3.2 Sampling for First Article Inspection. The contractor shall make available to the Government items from which a first article may be selected.

4.3.3 Sampling for Lot Acceptance Inspections and Tests. When inspection and testing is performed, sampling shall be in accordance with ANSI/ASQ Z 1.4. Sampling for inspection shall be performed on pumps ready for delivery. The sample size shall be in accordance with special inspection level S-3.

#### 4.4. Inspection and Tests.

4.4.1. Lot Inspection. When selected in accordance with paragraph 4.3.3, each sample item shall be inspected in accordance with table 2 to determine conformance with this specification. If the sample is found to have any major nonconformities, as identified in table 2, the lot shall not be accepted. Additionally, if the number of minor nonconformities (per table 2) in the sample exceeds an AQL of 2.5-percent nonconforming, the lot shall not be accepted.

Table 2. Lot Acceptance Inspection and Testing.

Nonconformance	Paragraph	Classification	
		Major	Minor
1. Configuration not as specified (includes 3.2.1 through 3.2.7).	3.2	X	
2. Visible indication of material incompatibility or corrosion.	3.3	X	
3. Materials not as specified (includes 3.3.1 through 3.3.5).	3.3	X	
4. Dimensions not as specified.	3.4.1	X	
5. Weight not as specified.	3.4.2		X
6. Workmanship not as specified (includes 3.5.1 through 3.5.3).	3.5	X	
7. Marking not as specified.	3.6		X
8. Surface finish not as specified (includes 3.7.1 through 3.7.3).	3.7	X	

4.4.2. First Article Inspection. Unless otherwise specified in paragraph 6.3, the first articles submitted in accordance with paragraph 3.1 shall be inspected as specified in paragraph 4.4.1 (table 2) and in accordance with table 3. The presence of any nonconformity or failure to pass any test shall be cause for rejection of the first article submission.

4.4.2.1 First Article Inspection Package. The contractor shall submit to the Government along with the selected first articles, copies of:

- a. All certificates of conformance, paragraph 4.5.
- b. Company inspection records, paragraph 4.1.
- c. All test results for the first article samples, paragraph 4.7.
- d. All other information necessary to perform the inspections identified in tables 2 and 3.

Table 3 – First Article Inspection.

Nonconformance	Paragraph	Classification	
		Major	Minor
1. Certificates of conformance missing or incomplete.	4.5	X	
2. Lock feature not as specified.	3.8.1	X	
3. D-ring does not pass tension test.	3.8.2		X
4. Hose does not pass pressure test.	3.8.3	X	
5. Hose does not pass vacuum test.	3.8.4	X	
6. Hose does not pass kink test.	3.8.5	X	
7. Hose does not pass connection tension test.	3.8.6	X	
8. Bead chain does not pass tension test.	3.8.7		X
9. Straight stream nozzle height, diameter, and flow rate not as specified.	3.8.8	X	
10. Spray nozzle pattern and flow rate not as specified.	3.8.9	X	
11. Pump does not meet side load requirements.	3.8.10	X	
12. Antisiphoning mechanism not as specified.	3.8.11	X	
13. Pump priming not as specified.	3.8.12	X	
14. Pump flow rate and pumping force not as required.	3.8.13	X	
15. Pump does not withstand static pumping force without permanent deformation, mechanical damage, or structural failure.	3.8.14	X	
16. Pump flow rate curve not as specified.	3.8.15	X	
17. Pump leaks, has permanent deformation, mechanical damage, or structural failure after 50,000-cycle endurance test.	3.8.16	X	
18. Pump flow rate and pumping force not as required after 50,000-cycle endurance test.	3.8.17	X	

4.5. Certificate of Conformance. A Certificate of Conformance (COC) shall meet the requirements of USDA Forest Service Standard 5100-190. Where COCs are required, the Government reserves the right to determine the validity of certification. These COCs shall be based on the testing of component materials and may be performed by the component material supplier. The date on the COCs for all textile, natural rubber, and synthetic compounds shall not exceed 2 years prior to the current date. The contractor shall provide certificates of conformance for 3.2.7, 3.3.1, 3.3.2, 3.3.4, and 3.3.5.

4.6. Performance Testing. Samples shall be subjected to the following tests to determine if the samples meet the requirements of the specification. The pump with nozzle tip and the hose shall be measured and weighed before performance testing.

4.6.1. Fluid Medium. All testing requiring the use of a fluid medium shall be performed using municipally supplied potable water; this shall include, but is not limited to pump performance testing. If the contractor does not have access to a municipal water supply, the testing shall be performed using any clear fresh water normally available for firefighting. Testing performed by the Government will be conducted using municipally supplied potable water.

4.6.2. Lock Feature Resistance Test. As required by 3.8.1, the pump shall be tested for lock or drag feature resistance. With a 3-pound  $\pm$  1-ounce weight attached to the nozzle tip end of the pump, and the pump fully contracted and held pointing perpendicular to the test room floor, the pump shall be raised until the weight hangs freely. The pump shall be observed to determine if the lock or drag feature keeps the pump in its contracted position.

4.6.3. D-Ring Tension Test. As required by 3.8.2, the D-ring attachment shall be tested for tensile strength. Testing shall be conducted using a tension machine or by the dead-weight test method. A tension force of 50 pounds shall be applied to the D-ring, with the pulling direction perpendicular to the pump axis. If a tension machine is used, the tension force shall be applied at a rate not to exceed 0.2 inches per minute. The D-ring shall not separate from the pump, and there shall be no sign of damage to the attachments or the D-ring.

4.6.4. Hose Pressure Test. As required by 3.8.3, one end of the hose shall be connected to a water pressure source and the other end capped. Water pressure shall be increased up to 25 psig in 1 minute and the hose examined for deformation, leakage, or bursting.

4.6.5. Hose Vacuum Test. As required by 3.8.4, the hose shall be vacuum tested. Connect one end of the hose to a vacuum-pumping source at 26 inches Hg vacuum. The hose shall be examined for collapse and structural failure. Release the vacuum and examine the hose. There shall be no collapse or structural failure.

4.6.6. Hose Kink Test. As required by 3.8.5, the hose shall be coiled with a diameter of 5.0 inches  $\pm$  1 inch. The hose shall be visually examined for any kinks.

4.6.7. Hose Connection Tension Test. As required by 3.8.6, the hose connection shall be tested for tensile strength. Testing shall be conducted using a tension machine or by the dead-weight test method. The hose shall be properly installed on the barbed pump fitting. A tension force of 50 pounds shall be applied on the hose, with the pulling direction perpendicular to the pump axis. If a tension machine is used, the tension force shall be applied at a rate not to exceed 0.2 inches per minute. The hose shall not separate from the pump, move more than 0.25 inch, or have any sign of damage to the attachments or the hose.

4.6.8. Bead Chain Tension Test. As required by 3.8.7, if a bead chain is included in the test sample, the bead chain and points of attachment shall be tested for tensile strength. Testing shall be conducted by using a tension machine or by the dead-weight test method. With one end of the bead chain attached to the pump, a tension force of 30 pounds shall be applied to the nozzle tip with the pulling direction perpendicular to the pump axis. If a tension machine is used, the tension force shall be applied at a rate not to exceed 0.2 inches per minute. There shall be no separation or any sign of damage to the attachments or the chain.

4.6.9. Nozzle Tip Straight Stream Testing. As required by 3.8.8, the nozzle tip shall be tested for straight-stream performance. The nozzle tip shall be connected to a water pressure source including a flowmeter. The nozzle tip shall be mounted on a fixture with the discharge end pointing vertically upward. A pressure of 35 psig  $\pm$  1 psig shall be applied. The height of the water stream and the dispersal diameter shall be measured at the extreme points.

4.6.9.1. Flow Rate Test. Measure the flow rate using a calibrated flowmeter device. The nozzle tip connection, to include gasket, shall not leak during performance testing.

4.6.10. Nozzle Tip Spray Pattern Testing. As required by 3.8.9, the nozzle tip shall be tested for spray performance. The nozzle tip shall be connected to a water pressure source and mounted on a fixture with the discharge end pointing horizontally. A pressure of 35 psig  $\pm$  1 psig shall be applied. The angle of the spray pattern shall be measured.

4.6.10.1. Flow Rate Test. Measure the flow rate using a calibrated flowmeter device. The nozzle tip connection, to include gasket, shall not leak during performance testing.

4.6.11. Pump Side Load Support Test. As required by 3.8.10, the pump shall be tested for side load support. Testing shall be conducted using a tension machine or by the dead-weight test method. The pump shall be fully extended and mounted on a compression testing machine with supports at 16 inches  $\pm$  0.25 inch, center-to-center spacing, and with the pump centrally located. A compression load shall be applied on the pump at the midpoint between the supports. If a tension machine is used, the rate for applying the load shall be not more than 0.2 inches per minute, up to 55 pounds  $\pm$  1.0 pounds. The pump support shall be 1-inch wide and the upper compression force bar shall be 0.25-inch wide.

4.6.12. Antisiphoning Action Test. As required by 3.8.11, the pump shall be connected to a backpack bag, as specified in USDA Forest Service Specification 5100-103. Fill the backpack bag with water, prime the pump, contract the pump, and lock into place. The bag shall be positioned at a height to produce 3.0 psig  $\pm$  0.2 psig water pressure at the pump inlet with the pump directly below the fabric bag. The pump shall be manually rotated in various positions to determine if any leakage occurs at the nozzle tip.

4.6.13. Priming Test. As required by 3.8.12, the pump shall be connected to the water-filled bag as in 4.6.12, except that the connecting point of the hose to the fabric bag shall be positioned 4.0-foot below the connecting point of the hose to the pump. With the pump positioned horizontally, pumping action shall be started manually until the pump is primed and discharging water. The number of pumping cycles shall be counted.

4.6.14. Flow Rate and Pumping Force Test. As required by 3.8.13, the pump shall be connected to a water-filled bag, as in 4.6.12 and mounted on the backpack pump test machine as shown in figure 1. Pumping action shall be adjusted to 90 percent  $\pm$  2 percent of full stroke and the machine speed set to produce 30 cycles per minute pumping action at peak discharge pressure of 35 psig by throttling the test machine discharge valve. After completing adjustments, the flow rate and the pumping force shall be measured.

4.6.15. Static Pumping Force. As required by 3.8.14, after completing the flow rate and pumping force test as described in 4.6.14, the pump and testing apparatus shall remain connected and the pump positioned at its 90-percent  $\pm$  2-percent extended length. A force gauge shall be placed at the rear of the pump, the test machine discharge valve closed, and a 100-pound force shall be applied manually and held for 5 seconds. Repeat 4.6.14.

4.6.16. Maximum Pumping Rate Test. As required by 3.8.15, the pump shall be tested for maximum pumping rate. The machine speed shall be adjusted to the lowest speed possible (30 cycles per minute) and the pump peak discharge pressure set at 35 psig  $\pm$  2 psig. The machine speed will be increased by 5 cycles per minute, up to 70 cycles per minute at 35 psig  $\pm$  2 psig pressure, with flow recorded at each cycle change. The cycles and flow data shall be plotted to determine linearity at 45 degrees.



4.7. Test Results. The contractor shall maintain complete records, including test results. At the request of the Government, the contractor shall provide test results and other records, as described in the certificates of conformance, for all materials used in the manufacture of an item.

## 5. PACKAGING, PACKING, AND MARKING.

5.1. Packaging, Packing, and Marking. The pump shall be supplied completely assembled - pump, nozzle, hose, and male quick connect fitting shall all be connected together so that no further assembly is necessary for use. Packaging shall not kink the hose. Additional requirements regarding packaging, packing, and marking shall be as specified in the contract or order.

## 6. NOTES.

6.1. Intended Use. The hand-operated trombone pump described in this specification is used with a fabric backpack water bag in wildland firefighting activities. The pump is a lightweight slide-action type. The trombone pump includes a hose with a male quick-connect fitting, a nozzle tip, and a D-ring for attachment to a backpack-strap harness.

6.2. Acquisition Requirements. Acquisition documents, such as Invitation For Bids and Request For Proposals should specify the following:

- a. Title, number, and date of this specification.
- b. If double-action pump required (see 3.2.1).
- c. If adjustable nozzle tip is required.
- d. When first article samples are not required (see 3.1, 4.4.2, and 6.3).
- e. If certificates of conformance are acceptable in lieu of lot by lot testing.
- f. Packaging, packing and marking (see 5.1).
- g. Date of the invitation for bids or request for proposals (see 2.1).

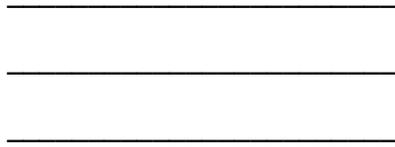
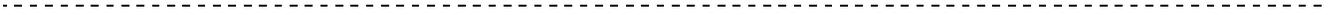
6.3. First Article. When first article samples are required, they shall be inspected and approved under the appropriate provisions of Federal Acquisition Regulation 52.209. The contracting officer should include specific instructions regarding arrangements for selection, inspection, and approval of the first article.

6.4. Notice. When Government drawings, documents, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility or any obligation whatsoever.

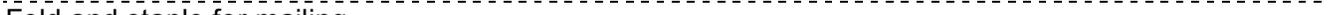
6.5. Preparing Activity. USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198

United States Department of Agriculture, Forest Service  
Standardization Document Improvement Proposal

<p>Instructions: This form is provided to solicit beneficial comments that may improve this document and enhance its use. Contractors, government activities, manufacturers, vendors, or other prospective users of this document are invited to submit comments to the USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, California 91773-3198. Attach any pertinent data that may be of use in improving this document. If there is additional documentation, attach it to the form and place both in an envelope addressed to the preparing activity. A response will be provided when a name and address are included. Note: This form shall not be used to submit request for waivers, deviation, or for clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.</p>	
<p>Standard Number and Title: <b>Specification 5100-256c, Pump, Fire, Backpack, Hand-Operated</b></p>	
<p>Name of Organization and Address:</p> <p>_____ Vendor    _____ User    _____ Manufacturer</p>	
<p>1. _____ Has any part of this document created problems or required interpretation in procurement use? _____ Is any part of this document too rigid, restrictive, loose, or ambiguous? Please explain below.</p> <p>Give paragraph number and wording:</p> <p>Recommended change (s):</p> <p>Reason for recommended change (s):</p>	
<p>Remarks:</p>	
<p>Submitted by: (Print or type name and address - Optional)</p>	<p>Telephone number: (Optional)</p>
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