

MIL-S-4461H

19 September 1974

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SUPERSEDING

MIL-S-4461G

26 August 1970

## MILITARY SPECIFICATION

## SEALING MACHINES, HEAT; HOT JAW AND CONTINUOUS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers two types of heat-sealing machines for sealing thermoplastic films (unsupported) and barrier (supported) material.

1.2 Classification. Sealing machines shall be of the following types, classes, styles and sizes as specified (see 6.2).

## Type I - Jaw sealing machines.

Class A - Foot operated, 8-inch long, 1/4-inch wide jaw for unsupported material. Both jaws heated (see 6.1.1).

Class B - Pneumatically operated for supported material. One jaw heated (see 6.1.2).

Size 6 - 6-inch long, 1/2-inch wide jaw.

Size 12 - 12-inch long, 1-inch wide jaw.

Size 24 - 24-inch long, 1-inch wide jaw.

Size 36 - 36-inch long, 1-inch wide jaw.

Class C - Motor operated, 12 to 14-inch long, 3/4-inch wide jaw for supported material. Both jaws heated (see 6.1.3).

## Type II - Continuous sealing machines (see 6.1.2).

## Class A - For supported material.

Style 1 - Bench mounted, 3/4-inch sealing bar.

Style 2 - Floor mounted, 3/4-inch sealing bar.

Style 3 - Portable, without motor, 1-inch sealing bar.

Style 4 - Portable with motor, 3/4-inch sealing bar.

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Class B - For unsupported material.

- Style 1 - Bench mounted, 1/2-inch sealing bar.
- Style 2 - Floor mounted, 1/2-inch sealing bar.
- Style 3 - Portable with motor, 3/16-inch sealing bar.

## 2. APPLICABLE DOCUMENTS

- \* 2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

### SPECIFICATIONS

#### FEDERAL

- J-C-580 - Cord, Flexible, and Wire, Fixture, (Electrical, 0 to 600 Volt Service).
- L-P-378 - Plastic Sheet and Strip Thin Gauge Polyolefin.
- W-C-596 - Connector, Plug, Electrical; Connector, Receptacle, Electrical.
- CC-M-636 - Motor, Alternating-Current (Fractional Horsepower).
- ZZ-H-496 - Hose, Pneumatic, Braided.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

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- MIL-P-116 - Preservation, Packaging, Methods Of.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
- MIL-B-131 - Barrier Material, Water Vaporproof, Flexible, Heat Sealable.
- MIL-C-3767 - Connector, Electrical (Power Blade type), General Specification For.
- MIL-C-4109 - Coupling Assembly, Low Pressure, Air Hose, Quick-Disconnect.
- MIL-C-5756 - Cable and Wire, Power, Electric, Portable.
- MIL-L-10547 - Liners, Case, and Sheet, Overwrap; Water-Vaporproof or Waterproof, Flexible.

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## STANDARDS

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-461 - Electromagnetic Interference Characteristics, Requirements for Equipment.
- MIL-STD-462 - Electromagnetic Interference Characteristics, Measurements Of.
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; with Appropriate Test Methods.

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

- \* 2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

Underwriters' Laboratories, Inc. (UL)

Electrical Construction Materials List

(Application for copies should be addressed to the Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.)

National Fire Protection Association (NFPA)

Standard No. 70 - The National Electrical Code.

(Application for copies should be addressed to the National Fire Protection Association, 60 Batterymarch Street, Boston, MA 02110.)

National Bureau of Standards (NBS)

Handbook H28 - Screw Thread Standards for Federal Services.

(Application for copies of Handbook H28 should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

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Uniform Classification Committee, Agent

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

**3. REQUIREMENTS**

**3.1 First article.** This specification contains provisions for first article test and approval (see 4.3, 6.2 and 6.3).

\* **3.2 Standard product.** Sealing machines under this specification shall be the manufacturer's commercial product except for any changes necessary to comply with the requirements of this specification. All like items furnished on any one contract including parts and subassemblies thereof shall be new and interchangeable.

\* **3.3 Codes and standards.** Each type of sealing machine shall comply with the following: (1) the electrical material and components shall conform to applicable UL Electrical Construction Materials List requirements, and (2) the installation of the electrical components shall conform to applicable requirements of NFPA Standard No. 70.

\* **3.3.1 Compliance.** Prior to the approval of the first article, if one is submitted, or prior to commencing production, the supplier shall submit to the contracting officer or his authorized representative satisfactory evidence that the sealing machine he proposes to furnish under this specification meets the applicable UL Electrical Construction Materials List standards and NFPA Standard No. 70.

\* **3.3.1.1 UL.** Acceptable evidence that the components and materials meet the requirements of Underwriters' Laboratories, Inc. shall be the UL label or Listing Mark, or a certified test report from a recognized independent testing laboratory acceptable to the Government, indicating that the electrical materials and components offered have been tested and conform to applicable UL standards.

\* **3.3.1.2 NFPA.** Acceptable evidence of meeting requirements of NFPA Standard, No. 70 shall be the manufacturer's certified statement that the sealing machines conform to the applicable requirements.

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3.4 Materials. All heat-sealing parts shall be made of brass, aluminum, or corrosion-resisting steel in accordance with the manufacturer's commercial practice. Materials not definitely specified shall be of the quality normally used for sealing machines by the manufacturer provided the completed items comply with all the provisions of this specification.

3.5 Design and construction. All type I and II sealing machines shall heat-seal supported or unsupported sealable material, as applicable (see 1.2) by the application of heat (sealing temperature) dwell time (see 6.4) and effective sealing pressure (see 6.1.1, 6.1.2 and 6.1.3). All sealing machines shall have the following:

- (1) Guides for accomplishing straight seals.
- (2) A separate switch for energizing the heating elements.
- (3) Accessibility of parts likely to require maintenance.
- (4) Means of lubrication.
- (5) All threads conforming to Handbook H-28.

3.5.1 Thermostat. Thermostats for sealing machines shall be capable of maintaining a selected sealing surface temperature between 225 Fahrenheit (F.) and 525 F. except that the type I, class A and type II, class B sealing machine temperature range shall be between 225 F. and 475 F. The sealing surface temperature on all machines shall not vary from the thermostat setting, by more than plus or minus 20 F. when tested as specified in 4.7.1.

3.5.2 Heat recovery. Sealing surfaces on all machines shall have a heat recovery capability of 50 F. within 80 seconds, in an ambient temperature between 68 F. and 72 F., with the thermostat set at 475 F. when tested as specified in 4.7.2.

\* 3.5.3 Insulation resistance. The insulation resistance of each sealing machine under a 60 Hz, 1000 rms (root mean square) voltage plus twice the rated machine voltage applied for one minute between the input terminal and the outer surface of the machine shall be no less than two (2) megohms when tested as specified in 4.7.3.

\* 3.5.4 Electrical characteristics. Sealing machines with heat sealing elements of less than 1650 watts shall operate on a nominal system voltage of 120-volts, 60 Hz, single phase. Machines with heat sealing elements of more than 1650 watts shall operate on a nominal system voltage of 208 volts, single or 3-phase, 60 Hz, as specified (see 6.2). Where 208 volts are required, the power supply for the heating elements only shall be connected directly to the sealing unit through a relay of adequate size. A 120-volt, single phase, 60 Hz power source shall be used for control and motor circuits (see 3.5.8.3).

\* 3.5.5 Electric cable. Sealing machines shall be suitable for connection to electric power sources by means of a 10 foot minimum length of flexible, oil-resistant, rubber-insulated electric cable with 3 or 4, No. 16 AWG copper wires or heavier, conforming to MIL-C-5756 or J-C-580. The ground wire of the

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cable shall be effectively grounded to the machine and shall be protected against possible mechanical injury. Unless otherwise specified (see 6.2), the free end of a 3-conductor cable for nominal system voltage of 120, single-phase shall terminate in a 15-ampere, 120-volt, polarized, 3-wire, ground receiving plug connector conforming to MIL-C-3767/13. Four-conductor cables for nominal system voltage of 208 volts, single or 3-phase shall terminate in a 250-volt, polarized, 4-wire, ground receiving male plug connector of ample current rating conforming to style N configuration of W-C-596.

- \* 3.5.6 Pressure controls. Sealing machines shall have adjustable pressure controls capable of rapidly adjusting sealing pressures for producing effective heat-seals (see 3.6).

3.5.7 Pneumatic hose. Type I and II sealing machines requiring air pressure shall have braided pneumatic hoses conforming to ZZ-H-496. The hose shall be 10-foot minimum length and shall terminate in a quick-operating air-hose connector conforming to class A of MIL-C-4109.

- \* 3.5.8 Type I. Type I sealing machines shall be of the jaw-closing type. All sealing jaws shall be removable. Tolerances for jaw lengths shall be plus or minus 1/4-inch and widths plus or minus 1/64 inch. Type I sealing machines shall have an indicator light to indicate that the heating elements are energized.
- \* 3.5.8.1 Class A. The type I, class A sealing machine shall have heating elements in both jaws. The machine shall have a foot pedal assembly with an adjustable compression spring, for the operation of the jaws and for the application of effective heat-sealing pressure and dwell time (see 6.4). The jaws shall have polytetrafluorethylene covers. A temperature gage to indicate the jaw temperature shall be provided and conveniently located in the machine. The indicator light specified in 3.5.8 may be omitted on this machine.
- \* 3.5.8.2 Class B. The type I, class B sealing machine shall have a remote control unit for control of heat-sealing operations and except for size 6 shall have a sealing head with handles, mounted on a base for bench operation and the head shall be readily demountable for portability and hand operation. Size 6 shall have a sealing head with one handle for portability and hand operation and no base. The jaws of the machine shall operate and heat-seal by pneumatic means. One jaw shall be heated and the other jaw shall be of resilient material construction. When specified (see 6.2) the unheated jaw shall have a polytetrafluorethylene impregnated fabric cover. In addition, the machine shall have an air regulator with external knob capable of regulating pressure elements.

3.5.8.2.1 Handles. The type I, class B sealing machines shall have one handle for size 6, one or 2 handles for size 12, and 2 handles for each of size 24 and 36. The handle temperature shall not exceed 110 F. during the operation of the sealing machine at 525 F. when tested as specified in 4.7.5.

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3.5.8.2.2 Weight. The weights of type I, class B machines, exclusive of the base, wire, hose, and couplings shall be as follows:

Size 6 - 4 pounds,  $\pm 1/2$  pound.  
 Size 12 - 11-1/2 pounds,  $\pm 1$  pound.  
 Size 24 - 24 pounds,  $\pm 1$  pound.  
 Size 36 - 36 pounds,  $\pm 1$  pound.

- \* 3.5.8.2.3 Remote control unit. The remote control unit of the type I, class B machines shall have: (1) pressure control valve with pressure gage calibrated in 2-psi (pound per square inch) intervals from 0 to 80 psi pressure for control and application of effective sealing pressure; (2) a dwell timer for application of heat sealing cycle dwell time (see 6.4); (3) electrical cables for power source and heating elements (see 3.5.5); and (4) pneumatic hoses (see 3.5.7) for connection of the control unit between the applicable sources of supply and the heat-sealing unit. All applicable components shall be securely encased in a cabinet with a carrying handle and all controls securely attached in the face of the cabinet. The control unit shall operate on a 120-volt, 60 Hz system.
- \* 3.5.8.2.4 Dwell timer. The dwell timer of type I, class B sealing machines shall have a dial calibrated in seconds of dwell time from 0 to 15 seconds at 1/4 second intervals. The timer shall be capable of applying heat sealing dwell time (see 6.4) within plus or minus 1/4 second of indicated dwell time when tested as specified in 4.7.6. The timer shall function so that once the heat sealing cycle is started, the cycling period cannot be altered or interrupted until the full cycle is completed and upon completion of the cycle, the timer shall reposition itself in readiness for the next cycle.
- \* 3.5.8.3 Class C. The type I, class C sealing machine shall have heating elements in both jaws. Unless otherwise specified (see 6.2), the machine shall be driven by a motor, from a 120-volt, 60 Hz, single-phase, power source conforming to CC-M-636. Sealing pressure shall be applied by a spring action in the machine, and heat sealing dwell time (see 6.4) shall be dependent upon motor speed. The sealing temperature thermostatic control shall be conveniently located on the machine. The machine shall have a foot operated switch for either single or continuous operation of heat sealing cycles.
- \* 3.5.9 Type II. Type II sealing machines shall produce a continuous heat-seal as the sealable material is conveyed through the machine. The machines shall have adjustable means for; (1) the adjustment of the gap between heating bars to obtain effective heat seals with material of various thicknesses, and (2) slack take up of conveying bands or chains, as applicable. The conveyors carrying the sealable material through the machines, except class A, style 3, shall be either motor driven continuous bands or chains. Class A, style 3, sealing machine shall have no motor and no material conveyors. Width of seals made by type II machines shall be considered equal to the width of sealing surfaces of sealing bars. The tolerances for the width of sealing bar surfaces shall be plus or minus 1/16 inch.

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- \* 3.5.9.1 Class A, style 1 and 2. The type II, class A, styles 1 and 2 sealing machines shall have a bench or floor mount as required (see 1.2). The mount shall consist of one or two columns with a sturdy base. The mount shall have means for a minimum range adjustment of the machine height from 10 inches to 15 inches above the bench for the bench mount and no less than 46 inches above the floor for the floor mount with means for the rotation of the machine about its longitudinal axis and for locking the machine in any required position. The machines shall have sealing bars 3/4 inch wide for 3/4-inch width of seal and a pair of flat rollers for the application of effective sealing pressure. The rollers, in the application of sealing pressure shall operate by adjustable pneumatic, hydraulic, or spring pressure means at the option of the supplier unless a pneumatic, hydraulic, or spring pressure source is specified (see 6.2). The machines shall have controls for temperature (see 3.5.1), pressure (see 3.5.6) and speed (dwell time) of the material conveyors. The controls shall be conveniently located on the machine. The speed of travel of the material conveyor to produce a heat sealing dwell time of 4 seconds shall be not less than 13 feet per minute when tested as specified in 4.7.7. In addition, the machines shall have a means for the adjustment of conveyor tension and spacing between sealing bars for obtaining effective heat-seals (see 3.6) with sealable material of various thicknesses, a separate switch for conveyor operation, and guards on heated and moving machine components for the safety of the operator.
- \* 3.5.9.1.1 Speed controller. The speed controller on the type II, class A, style 1 and 2 sealing machine shall be capable of rapid adjustment of operating speeds to attain the equivalent of 2 to 15 seconds variation in dwell time during the heat-sealing travel of the material conveyors. Dwell time shall be indicated on a dial. Actual dwell time shall be within 10 percent of dwell time setting when tested in 4.7.7. Means shall be provided for locking the dwell time setting.
- \* 3.5.9.2 Class A, style 3. The type II, class A, style 3 sealing machine shall have a cast aluminum body with carrying handle for portability and hand operation. The carrying handle temperature shall not exceed 110 F. during operation of the machine at 525 F. when tested as specified in 4.7.5. The body shall be in the form of a channel with 2-inch minimum depth of throat and sides that shall provide the means for the mounting of heat sealing bars and sealing pressure rollers. The sealing bars shall be 1-inch wide for 1-inch width of seal. The rollers shall have ball bearings and shall be mounted opposite each other in the body of the machine at the outlet end. The rollers shall be loaded under spring pressure capable of being adjusted for the application of effective sealing pressure. The sealing roller surfaces shall be flat or grooved as specified (see 6.2), and the in-feed end of the machine shall be flared to facilitate the insertion of the sealable material.
- 3.5.9.2.1 Accessories. The type II, class A, style 3 sealing machine shall have provisions for the attachment of a side handle for horizontal hand operations and brackets for bench operation. When specified (see 6.2) the machine shall have a side handle, a bag-making bracket, a bag-closing bracket or any combination of these accessories.



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- \* **3.5.9.3 Class A, style 4.** The type II, class A, style 4 sealing machine shall be similar to style 3 specified in 3.5.9.2 except that style 4 shall have a motor with a pair of chains or steel bands as conveyors for the sealable material. The heat-sealing bars shall be 3/4 inch wide for a 3/4-inch width of seal. Sealing pressure shall be provided by a pair of spring-loaded steel rollers with adjustable pressure means located at the outlet end of the machine. The chain or band conveyors shall move between a fixed guide on one side and a spring loaded guide on the opposite side to provide contact between the conveyors. Unless otherwise specified (see 6.2), the conveyors shall have a fixed speed of travel of 200 inches per minute plus or minus 10 inches when tested as specified in 4.7.8. The machine shall have a separate switch for operation of the chain conveyors. The carrying handle temperature shall not exceed 110 F. during operation of the machine at 525 F. when tested as specified in 4.7.5. When specified (see 6.2), the sealing machine shall have means for controlling effective sealing pressure and dwell time (see 6.4).
- \* **3.5.9.3.1 Pressure controller.** The pressure controller shall adjust sealing pressures ranging from 0 to 75 psi and shall be calibrated in intervals of 5 psi minimum.
- \* **3.5.9.3.2 Speed controller.** The speed controller shall provide variable machine speeds indicated in seconds of dwell time ranging from 2 to 15 seconds. The speed controller shall indicate dwell time within 10 percent of dwell time setting, when tested as specified in 4.7.7.
- \* **3.5.9.4 Class B, style 1 and 2.** The type II, class B, styles 1 and 2 sealing machines shall be similar to type II, class A, styles 1 and 2 except that the machine shall have sealing bars 1/2-inch wide for 1/2 inch width of seal, a cooling unit for cooling the heat-seal, and no pressure controller and sealing pressure rollers. The machine shall have a speed of travel of the material conveyor to produce an effective dwell time of 2 seconds at a speed of not less than 13 feet per minute when tested as specified in 4.7.7. The speed controller shall control speed to produce dwell time in seconds within 10 percent accuracy of indicated dwell time setting when tested as specified in 4.7.7. The mount shall be either a bench or floor mount as required (see 1.2). In addition the machine shall have means for the adjustment of band tension and material gap for producing effective heat-seals with sealable material of various thicknesses.
- \* **3.5.9.5 Class B, style 3.** The type II, class B, style 3 sealing machine shall be similar to type II, class A, style 4 except that the machine shall have a pair of continuous steel bands, a cooling unit for cooling of heat-seal and no sealing pressure rollers. The sealing bars shall have a ridge 3/16 inch wide for 3/16-inch wide seal. The machine shall have a fixed 200 inches per minute plus or minus 10 inches, conveyor speed of travel when tested as specified in 4.7.8. The handle temperature shall not exceed the 110 F. temperature during operation of the machine at 475 F., when tested as specified in 4.7.5. In addition the machine shall have means for the adjustment of band tension and material gap for producing effective heat-seals with sealable material of various thicknesses.

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- ★ 3.6 Performance. Sealing machines shall produce effective heat-seals on applicable supported or unsupported, sealable material as specified herein by the application of heat at the effective sealing temperature, pressure, and dwell time. Heat-seals shall be made in accordance with the material manufacturer's recommended sealing cycle. Effective heat-seals when tested as specified in 4.7.9 (1), (2), and (3) respectively: (1) shall exhibit a continuous fusion of sealable material at the interfaces of the sealable material; (2) shall be watertight, and (3) shall be capable of withstanding a 2-pound separation pull for 5 minutes. The sealing machines shall produce effective heat-seals on sealable material, as follows:

(a) Type I, class B and type II, class A sealing machines shall heat-seal heavy duty supported material conforming to MIL-B-131.

(b) Type I, class B machines shall heat-seal light duty supported material conforming to MIL-B-121.

(c) Type I, class A and type II, class B sealing machines shall heat-seal unsupported material 0.003 inch minimum thickness conforming to L-P-378.

3.7 Interchangeability. All parts on any one contract having the same manufacturer's part number shall be functionally and physically interchangeable for the same type, class, style, and size of sealing machines.

3.8 Electromagnetic compatibility. When specified (see 6.2), type I, class C and type II, class A, styles 1, 2, and 4 and type II, class B sealing machines shall be designed and equipped for electromagnetic compatibility in accordance with class 11B of MIL-STD-461 (see 4.7.10).

3.9 Finishes. All painted external surfaces of the machine shall be in accordance with the manufacturers standard practice. All metal surfaces other than stainless steel, brass, aluminum alloy, or where painting is not feasible shall be cadmium plated in accordance with commercial practice. All aluminum parts shall be anodized in accordance with the manufacturer's standard practice. Coated, plated, or treated finished surfaces shall be smooth, adherent, and free of areas of no finish and imbedded foreign material.

3.10 Operating instructions. Operating and maintenance instructions and a parts list shall be provided with each sealing machine. Instructions for air operated sealing machines shall include information relating to reduced air pressure, if used, to average effective sealing pressure.

3.11 Identification. A corrosion-resistant metal nameplate, permanently and legibly marked in accordance with the manufacturer's standard practice shall be securely attached to the sealing machine.

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3.12 Workmanship. Workmanship on all machines and accessories shall exhibit in particular the following:

- (a) Freedom from blemishes, slivers, burrs, dents and sharp edges
- (b) Accuracy of marking of parts and assemblies
- (c) Thoroughness of soldering, welding, brazing, plating, painting, wiring, and riveting
- (d) Soundness alignment and operable capability of components and tightness of screws, nuts, and bolts

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his 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 set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

\* 4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

- 1. First article inspection (see 4.3).
- 2. Quality conformance inspection (see 4.4).

\* 4.3 First article. When a first article is required, the sealing machine shall be examined as specified in 4.4.2.1 and 4.4.2.2 and tested as specified in 4.7.1 thru 4.7.10, as applicable. Any nonconformance shall be cause for rejection of the first article.

\* 4.4 Quality conformance inspection. Except as otherwise specified herein, sampling for inspection shall be performed in accordance with the provisions set forth in MIL-STD-105.

\* 4.4.1 Component and material inspection. The supplier shall insure that all components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards unless excluded, amended, modified or qualified in this specification or applicable purchase document.

\* 4.4.2 End item inspection. The inspection lot shall be all sealing machines of one type, class, style, and size as applicable offered for inspection at one time.

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4.4.2.1 Visual examination. The sealing machine shall be examined for defects in table I. The inspection level shall be II and the acceptable quality level (AQL) shall be 2.5 for major defects and 6.5 for total defects expressed in terms of defects per hundred units.

TABLE I. Classification of defects

Examine	Defect	Classification	
		Major	Minor
Material	Not as specified (Applicable where visual determination can be made)	X	
Finish	Not as specified		X
	Not smooth and adherent	X	
	Not free of areas of no finish and embedded foreign material		X
Workmanship and construction, general	Elements or burrs		X
	Slivers or splinters	X	
	Part fractured, broken, or punctured	X	
	Deteriorated, bowed, malformed, missing, or misplaced	X	
	Loose		X
	Part or assembly inaccurately marked		X
	Belts, steel bands, chains, sprockets, gears, pulleys, or heated surfaces not guarded	X	
	Lubrication means missing	X	
	Any component not accessible for maintenance	X	
	Any component not as specified	X	
	Any component not in alignment	X	
	Any component out of adjustment		X
Welding, brazing and soldering when used	Not continuous, burn holes, or fractured	X	
	Not adherent	X	
	Slag inclusion or not smooth		X
	Scale or flux deposit not removed		X
Threaded fasteners	Missing, broken, stripped, or fractured	X	
	Loose		X

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TABLE I. Classification of defects (cont'd)

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		Major	Minor
Electrical components	Insulation cut, stripped, or abraded	X	
	Wiring not properly joined or loose at terminal		X
Gauges and instruments	Not properly mounted	X	
Marking identification and instructions	Missing, incomplete, not legible, or not as specified		X

- \* 4.4.2.2 Dimensional examination. The sealing machines shall be examined for compliance with dimensions and weight specified. Any dimension or weight not within this specification tolerance shall be a defect. The inspection level shall be 6.5 with an AQL of 2.5 defects, expressed in terms of defects per hundred units.

- \* 4.4.2.3 End item testing. When a first article is not required, the first produced sealing machine shall be examined as specified in 4.4.2.1 and 4.4.2.2 and tested as specified in 4.7.1 thru 4.7.10, as applicable. Each sample sealing machine shall be tested as specified in 4.7.1 thru 4.7.10, as applicable. Failure to pass any test shall be a defect. The inspection level shall be II with an AQL of 4.0 defects, expressed as defects per hundred units.

4.4.3 Inspection of preparation for delivery. An examination shall be made of preservation, packaging, packing, and marking for compliance with section 5 of this specification. Defects shall be as specified in table II. The lot shall be all the containers offered for inspection. The sample unit shall be one container prepared for delivery except that it shall not be sealed. The inspection level shall be S-4 and the AQL shall be 6.5 defects expressed in terms of defects per hundred units.

TABLE II. Examination of preparation for delivery

<u>Examination</u>	<u>Defect</u>
Markings	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application
Materials	Component missing, damaged, or otherwise defective

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TABLE II. Examination of preparation for delivery (cont'd)

Examination	Defect
Workmanship	Inadequate application of components such as incomplete closure of container flaps; loose strapping; inadequate stapling; bulging or distortion of containers
Preservation	Preservative improperly applied or missing
Content	Contents per container is more or less than required

- \* 4.5 Code and standard examination. Certificate of compliance, certified test reports, approval labels or listing marks for codes and standards, as applicable, that are submitted as proof of compliance with specification requirements shall be examined and validated.
- \* 4.6 Test methods. Test shall be conducted in accordance with the schedule of table III.

TABLE III. Test schedule

Test sequence	First article	Quality conformance	Test	Test paragraph	Requirement paragraph
1	2	3	4	5	6
1	X	X	Temperature	4.7.1	3.5.1
2	X	X	Heat Recovery	4.7.2	3.5.2
3	X	X	Insulation Resistance	4.7.3	3.5.3
4	X	X	Ground	4.7.4	3.5.3
5	X	X	Handle Temperature	4.7.5	3.5.8.2.1 3.5.9.2 3.5.9.3 3.5.9.5
6	X	X	Dwell Timer	4.7.6	3.5.8.2.4
7	X	X	Speed Control (Dwell Time)	4.7.7	3.5.9.1 3.5.9.3.2 3.5.9.4
8	X	X	Speed	4.7.8	3.5.9.3 3.5.9.5
9	X	X	Performance	4.7.9	3.6
9.1	X	X	Seal	4.7.9(1)	3.6
9.2	X	X	Leak	4.7.9(2)	3.6
9.3	X	X	Seam Strength	4.7.9(3)	3.6
1.0	X	X	Electromagnetic Compatibility	4.7.10	3.8

#### 4.7 Tests.

4.7.1 Temperature test. The machine shall be turned "on". Temperature of sealing bars of the sealing machine shall be measured as close as possible to the sealing surfaces. The temperature shall be measured at 3 points (one at the mid point and one at each end) except that for the type I, class B, size 36 sealing machine, the temperatures shall be measured at each end and at two intermediate points, equally spaced on the sealing bar. Temperature readings shall be made for thermostat settings of 225, 300, 400, and 525 F., except that for type I, class A and type II, class B sealing machines a maximum temperature reading of 475 F. instead of 525 F. shall be made. On type II machines this test may be made with the conveyor bands or chains removed and temperatures shall be taken at 3 points bridging the gap between the parallel sealing bars (one at mid point and one at no more than 1-1/2 inches from each end of the bar). Any deviation from the uniform temperature requirements of 3.5.1 shall constitute failure of this test.

4.7.2 Heat recovery test. The sealing machine shall be turned "on" for operation, with the thermostat set at 475 F. The ambient temperature shall be between 68 F. and 72 F. for this test. When temperature equilibrium is reached, the heating surfaces shall be cooled 50 degrees. Without changing temperature setting of the thermostat, the cooling medium shall be removed and the time required to return to temperature equilibrium of the heat sealing surfaces at 475 F. shall be checked. Any deviation from the heat recovery requirements of 3.5.2 shall constitute failure of this test.

- \* 4.7.3 Insulation resistance test. One thousand rms volts plus twice the rated machine voltage at 60 Hz shall be applied for one minute between the current carrying elements of the machine and ground. Voltage between machine surface and ground shall be checked. Any noncompliance with the insulation requirements of 3.5.3 shall constitute failure of this test.

4.7.4 Ground test. Electrical continuity shall be checked between a minimum of 5 different points on the surface of the machine and the ground terminal of the electrical cable. Any noncompliance with the electrical ground requirements of 3.5.3 shall constitute failure of this test.

4.7.5 Handle temperature test. Type I, class B, and type II, class A, styles 3 and 4 and type II, class B, style 3 sealing machines shall be turned "on" with thermostat set at maximum temperature. The machines shall be heated for one hour and the handle temperature then checked. Any nonconformance with the handle temperature requirements of 3.5.8.2.1, 3.5.9.2, 3.5.9.3 and 3.5.9.5, as applicable shall constitute failure of this test.

- \* 4.7.6 Dwell timer test. On type I, class B sealing machines, the dwell time or time required to complete sealing cycles shall be checked against a 4, 8, and a 12-second dwell timer setting. Any deviation from the dwell time accuracy and heat sealing cycle requirements of 3.5.8.2.4 shall constitute failure of this test.

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**4.7.7 Speed control (dwell time) test.** One type II, class A, styles 1 and 2, and class B, styles 1 and 2 sealing machines, speed control or conveyor speed of travel in terms of dwell time (time required for the conveyor to travel the distance from beginning to end of sealing bars) shall be checked as follows:

(1) Speed of travel of 13 feet per minute of the material conveyor shall be checked against the dwell time of 4 and 2 seconds of 3.5.9.1 or 3.5.9.4, respectively. Any deviation from the dwell time requirements shall constitute failure of this test.

(2) Dwell time settings of 4, 8 and 12 seconds shall be checked against the actual time required for material conveyor to travel the distance from beginning to end of sealing bars of the sealing machine. Any deviation from the dwell time accuracy requirements of 3.5.9.1, 3.5.9.3.2 when applicable, and 3.5.9.4 shall constitute failure of this test.

**4.7.8 Speed test.** Type II, class A, style 4 and type II, class B, style 3 sealing machines shall be turned on at maximum speed and the speed of travel of the material conveyor then checked. Any deviation from the maximum conveyor speed requirements of 3.5.9.3 and 3.5.9.5, as applicable shall constitute failure of this test.

**4.7.9 Performance test.** Heat-seals with supported and unsupported sealable material as applicable shall be subjected to the following tests:

(1) **Seal test.** A test specimen consisting of two pieces of sealable material 3 inches wide joined by a heat-seal shall be made on the applicable sealing machine. On type I sealing machines the seal shall be made using the entire length of the jaw. On type II sealing machines the seal shall be made on a test specimen 8 inches minimum length. The specimen shall be pulled apart at the seal and examined. Noncompliance with the effective heat-seal requirements of 3.6 shall constitute failure of this test.

(2) **Leak test.** A test pouch, 7 by 7 inches of sealable material applicable to the sealing machine (see 3.6) shall be made by heat sealing 3 sides with seams equal in width to the sealing surfaces of the machine (see 1.2) except that the pouch made on type I, class B and type II, class A machines shall include an overlapping joint crosswise to the bottom seal. The heat-seals shall be cooled to an ambient temperature between 68 and 72 F. The pouch shall be filled to a level of approximately 2 inches above the bottom seal with a water solution containing one percent aerosol OT or equivalent and sufficient dye to produce a distinct color. The filled pouch shall be suspended for 1 hour, at ambient temperature between 68 F. and 72 F. and then checked for leaks by wiping the seal with a piece of absorbent paper. Any deviation from the watertight requirements of 3.6 shall constitute failure of this test.



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(3) Strength test. A test heat-seal shall be made using the entire length of the jaw on type I machine and sealable material 7-inch minimum length on type II machines. The test heat-seal shall be made with 2 strips 3 inches wide, of sealable material, as applicable for the sealing machine (see 3.6) except that the test seal made on type I, class B, and type II, class A sealing machines shall include an overlapping joint crosswise to the seal. One inch wide specimens including one with the overlapping joint, when applicable, shall be cut crosswise to the seal at intervals of 2 inches throughout the entire length of the seal. The specimens shall be cooled and at an ambient temperature between 68 F. and 72 F. shall be subjected to a separation pull specified in 3.6. Any deviation from the seal strength requirements of 3.6 shall constitute failure of this test.

- \* 4.7.10 Electromagnetic compatibility tests. When electromagnetic compatibility is required, the first article or initial production unit, as applicable, shall be tested by the supplier in accordance with test method CEO3 and REO2 of MIL-STD-462. The Government reserves the right to witness tests performed by the supplier or an independent testing agency. The supplier shall furnish the contracting officer written certification that the Interference Control Plan, the EMI/EMC Test Plan, the electromagnetic test report and the requirements meet MIL-STD-461.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).

### 5.1.1 Level A.

5.1.1.1 Disassembly. Each sealing machine shall be disassembled to reduce cube and prevent damage while in transit. Disassembly shall be such as not to require special skills or tools during assembly. Disassembled parts shall be match marked.

5.1.1.2 Preservation. Each sealing machine having open electrical components shall be preserved in accordance with method II of MIL-P-116. Alternatively, machines disassembled and having electrical components shall be preserved by method II of MIL-P-116 and all other components not requiring preservation shall be preserved by method III.

- \* 5.1.2 Level C (commercial package). Each sealing machine shall be preserved and packaged to afford adequate protection against corrosion, deterioration, and damage during known favorable conditions of shipment, handling, and storage, from the supply source to receiving activity. The package shall be the same as that normally used by the supplier for retail distribution.

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5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).

5.2.1 Level A. Sealing machines or disassembled sealing machines, preserved and packaged as specified in 5.1, shall be packed, unless otherwise specified in a snug-fitting shipping container conforming to class 2, styles 2 or 4 of PPP-B-621 or overseas type of PPP-B-601. When specified (see 6.2) sealing machines shall be packed in snug-fitting shipping containers conforming to style RSC, V2s of PPP-B-636. Contents of each shipping container shall be cushioned, blocked, and braced in accordance with MIL-STD-1186. Each fiberboard shipping container shall be waterproofed by means of tape in accordance with the appendix of the container specification. Wood and cleated plywood container shall be provided with a type I or II, grade B or C case liner conforming to MIL-L-10547. Each shipping container shall be closed, reinforced with strapping or tape banding in accordance with the appendix of the applicable container specification. The weight of contents for fiberboard shipping container shall not exceed 65 pounds; wood and cleated plywood shall not exceed the weight limitations of PPP-B-621 or PPP-B-601, as applicable.

\* 5.2.2 Level B. Sealing machines or disassembled sealing machines, preserved and packaged as specified in 5.1, shall be packed in a snug-fitting shipping container conforming to style RSC, type CF, variety optional or type SF, class domestic of PPP-B-636; class 1, style 2 or 4 of PPP-B-621; class 2 style optional of PPP-B-640; or domestic type, style A or B of PPP-B-601. Contents of each shipping container shall be cushioned, blocked, and braced in accordance with MIL-STD-1186. Closure of fiberboard shipping containers shall be in accordance with method II of the appendix of PPP-B-636. The weight of contents for fiberboard shipping containers shall not exceed 65 pounds; nailed wood and cleated plywood shall not exceed the weight limitations of the applicable specification.

5.2.2.1 When specified (see 6.2), the shipping container shall be grade V3c, V3s or V4s fiberboard boxes fabricated in accordance with PPP-B-636 and closed in accordance with the appendix of PPP-B-636.

5.2.3 Level C (Commercial pack). Each sealing machine, preserved and packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at lowest transportation rate for such supplies. Containers shall be in accordance with Uniform Freight Classification Rules or National Motor Freight Classification Rules.

5.3 Marking. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

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## 6. NOTES

**6.1 Intended use.** The sealing machines covered by this specification are intended for use in heat-sealing supported and unsupported heat-sealable materials for preservation and storage of supply and maintenance components.

**6.1.1** Type I, class A and type II, class B, styles 1, 2, and 3 sealing machines are intended for use with unsupported material conforming with L-P-378 providing sealing cycle controls as follows:

a. Type I, class A sealing machine provides precise temperature with variable dwell time and pressure controls.

b. Type II, class B, styles 1 and 2 sealing machine provides precise temperature and dwell time with instant pressure controls.

c. Type II, class B, style 3 sealing machines provides precise temperature with constant dwell time and pressure controls.

**6.1.2** Type I, class B and type II, class A, styles 1, 2, 3, and 4 sealing machines are intended for use with supported material conforming to MIL-B-131 providing sealing cycle controls as follows:

a. Type I, class B and type II, class A, styles 1 and 2 sealing machines provide precise temperature, dwell time, and pressure control.

b. Type II, class A, style 3 sealing machine provides precise temperature with variable dwell time and constant pressure controls.

**6.1.3** Type I, class C sealing machine is intended for use with supported material conforming to MIL-B-121 providing precise temperature with constant dwell time and pressure controls.

\* **6.2 Ordering data.** Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type, class, style and size required (see 1.2).
- (c) First article (see 3.1, 4.3 and 6.3).
- (d) Whether single or three-phase, is required for 208 volt heat-sealing units (see 3.5.4).
- (e) Ground attachment plug if other than specified (see 3.5.5).
- (f) When an impregnated fabric cover is required for unheated jaw of type I, class B machines (see 3.5.8.2).
- (g) Voltage and phase of motor for type I, class C if other than specified (see 3.5.8.3).
- (h) Whether effective sealing pressure is to be provided by a hydraulic, pneumatic, or spring pressure source for type II, class A, styles 1 and 2, (see 3.5.9.1).

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- (i) Whether flat or grooved sealing pressure rollers are required (see 3.5.9.2).
- (j) When a side handle, a bag-marking bracket, a bag-closing bracket or any combination of these accessories is required for type II, class A, style 3 (see 3.5.9.2.1).
- (k) Conveyor speed for type II, class A, style 4, if other than specified (see 3.5.9.3).
- (l) When pressure and dwell time controllers are required for type II, class A, style 4 machine (see 3.5.9.3).
- (m) When electromagnetic compatibility is required (see 3.8).
- (n) Selection of applicable levels of preservation, packaging, and packing (see 5.1 and 5.2).
- (o) When V2s fiberboard is required for level A shipments (see 5.2.1).
- (p) When weather-resistant grade fiberboard is required for level B shipments (see 5.2.2.1).

**6.3 First article.** The first article covered by this specification requires first article test and approval under the appropriate provisions of paragraph 7-104.55 of the Armed Services Procurement Regulations. The first article should be a preproduction sample or initial unit of production described under the definition of a first article in the ASPR. The first article shall consist of one complete sealing machine. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for examination, test and approval of the first article.

**6.4 Definition.** For the purpose of this specification dwell time is the time during which the sealing material is subjected to heat.

**6.5** The margins of this specification have been marked with an asterisk (\*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and suppliers are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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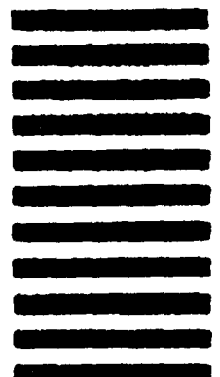
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