

GGG-E-950A  
 February 29, 1988  
 (SUPERSEDING)  
 GGG-E-950  
 August 19, 1957

## FEDERAL SPECIFICATION

### EXTRACTOR, STUFFING BOX AND PUMP PACKING (AND TAMPER); AND EXTRACTOR, LANTERN GLAND

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers extractors and tampers for stuffing box and pump packing and lantern gland extractors. Packing extractors remove semihard packing held fast in stuffing boxes because of pressure, heat, or long use. Two packing extractors are usually employed to engage the packing at diametrically opposite points; this also applies to lantern gland extractors which are designed to engage previously tapped holes in the glands or rings. Flexible shaft tools are used in stuffing boxes wherever obstructions prevent the use of rigid shaft tools. Tampers are used to seat packing firmly in medium and deep stuffing boxes to provide a more efficient seal during long service.

#### 1.2 Classification

1.2.1 Types and classes. Extractors and tampers shall be of the following types and classes, as specified (see 6.2).

##### Type I. Extractor, stuffing box and pump packing.

- Class 1. - Screw and flexible shaft
- Class 2. - Screw and rigid shaft
- Class 3. - Hook and rigid shaft
- Class 4. - Double end, rigid shaft

##### Type II. Extractor, lantern gland.

##### Type III. Tamper, stuffing box and pump packing.

#### 2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

##### Federal Specification:

PPP-P-40 - Packaging and Packing of Hand Tools

##### Federal Standard:

Federal Standard No. 102 - Preservation, Packaging and Packing Levels

Federal Standard No. 123 - Marking for Shipment (Civil Agencies)

Federal Standard H28 - Screw-Thread Standards for Federal Services

FSC 5120

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(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

#### Military Specifications:

MIL-P-116 - Preservation-Packaging, Methods of

#### Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129 - Marking for Shipment and Storage

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

### 3. REQUIREMENTS

3.1 Illustrations. The illustrations shown herein are descriptive and not restrictive and are included for the convenience of identification by requisitioning and purchasing officers, and are not intended to preclude the purchase of tools which are otherwise in accordance with this specification.

3.2 Material. The materials shall be as specified herein.

3.3 Construction. Extractors and tampers shall be of durable construction and capable to maintain life under service conditions.

3.4 Test loads. Extractors and tampers shall withstand the loads specified in the applicable tables of this specification without damage or noticeable permanent deformation (set) which may adversely affect their durability or serviceability (see 4.3.2).

3.5 Identification marking. Each tool shall be etched or stamped in a permanent and legible manner with the manufacturer's name or identifying symbol of such known character that the source may be readily identifiable, part number and country of origin.

3.6 Type I, Extractors, stuffing box and pump packing.

3.6.1 Class 1, screw and flexible shaft. Type I, class 1 extractors shall consist of a flexible shaft with a "T" type handle at one end and a screw bit of the corkscrew type at the other end geared for extracting semihard packing from stuffing boxes.

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3.6.1.1 Flexible shaft. The shaft shall be of a flexibility and resiliency to allow the bit to be turned from a fixed point or center while the shaft is bent at an angle of 45 degrees and at the same time transmit the thrust applied at the handle to the screw.

3.6.1.2 Handle. The "T" type handle shall be provided and be securely attached to or integral with the ferrule opposite the screw-bit end.

3.6.1.3 Screw bit. The bit shall have at least two, and no more than three, turns and shall be properly hardened and tempered to prevent breaking or deforming. The bit shall have a smooth finish and shall be tapered to a fine point in such a manner that it may be inserted into semihard packing.

3.6.1.4 Type 1, class 1 extractors shall conform to table I for the size specified (see 6.2) and shall be similar to figure 1.

Size No.	Diameter of screw bit $\pm \frac{1}{16}$	Diameter of shaft A $\pm \frac{1}{16}$	Length of screw bit B $\pm \frac{1}{16}$	Overall length C $\pm 1$	Diameter of ferrule D $-\frac{1}{16}$ $-\frac{1}{32}$	Length of ferrule E $\pm \frac{1}{16}$	Recommended for packing spacer sizes	Tension load (minimum) Pounds	Torsion load (minimum) Inch-pounds
	Inch	Inch	Inches	Inches	Inch	Inches	Inch (incl.)		
1.....	$\frac{1}{16}$	$\frac{3}{16}$	$1\frac{1}{16}$	7	$\frac{3}{16}$	$\frac{3}{8}$	$\frac{3}{8}$ to $\frac{1}{2}$	150	10
2.....	$\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{8}$	11	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	300	43
3.....	$\frac{1}{4}$	$\frac{3}{8}$	$1\frac{1}{4}$	$14\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{1}{2}$ to $\frac{3}{4}$	400	70
4.....	$\frac{3}{8}$	$\frac{1}{2}$	$1\frac{3}{8}$	18	$\frac{3}{8}$	$1\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{2}$	400	70
5.....	$\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{2}$	22	$\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{2}$ to 1	400	70
6.....	1	$\frac{1}{2}$	$3\frac{1}{2}$	30	$\frac{3}{4}$	$1\frac{1}{2}$	Over 1	400	70

TABLE I. Type 1, Class 1 stuffing box and pump packing extractors, screw and flexible shaft.

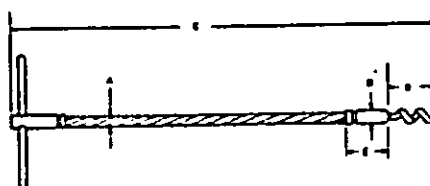


Figure 1. Type 1, Class 1 stuffing box and pump packing extractor, screw and flexible shaft.

3.6.2 Class 2, screw and rigid shaft. Type 1, class 2 extractors shall consist of a steel rod, one end of which is formed into a circular handle and the opposite end of which is tapered and formed into a corkscrew bit geared for extracting semihard packing from stuffing boxes.

3.6.2.1 Screw bit. The bit shall have at least two, and no more than four, turns and shall be properly hardened and tempered to prevent breaking or deforming. The bit shall have a smooth finish and be tapered to a fine point in such a manner that it may be inserted into semihard packing.

3.6.2.2 Type 1, class 2 extractors shall conform to table II for the size specified (see 6.2), and shall be similar to figure 2.

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Size No.	Diameter of screw bit $\pm \frac{1}{16}$	Diameter of rod A $\pm \frac{1}{16}$	Length of screw bit B $\pm \frac{1}{4}$	Overall length C $\pm 2$	Torsion load (minimum)
	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inches</i>	<i>Inch-pounds</i>
1.....	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{4}$	6	10
2.....	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{4}$	10	45
3.....	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{13}{16}$	14	70
4.....	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	18	70

TABLE II. Type I, class 2 stuffing box and pump packing extractor, screw and rigid shaft.

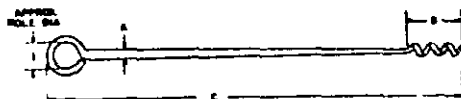


Figure 2. Type I, Class 2 stuffing box and pump packing extractor, screw and rigid shaft.

3.6.3 Class 3, hook and rigid shaft. Type I, class 3 extractors shall consist of a steel rod, one end of which is formed into a circular handle and the opposite end of which has a well formed hook.

3.6.3.1 Hook. The hook shall be properly hardened and tempered and have a radius on the outer edge similar to that shown on figure 3, and shall be entirely geared for engaging packing incident to its removal from a stuffing box.

3.6.3.2 Type I, class 3 extractors shall conform to table III for the size specified (see 6.2), and shall be similar to figure 3.

Size No.	Diameter of rod A nominal	Length of hook projection B $\pm \frac{1}{16}$	Overall length C $\pm 1$	Ten: load or hook (minimum)
	<i>Inch</i>	<i>Inch</i>	<i>Inches</i>	<i>Pounds</i>
1.....	$\frac{3}{8}$	$\frac{3}{8}$	8	60
2.....	$\frac{1}{2}$	$\frac{1}{2}$	12	100
3.....	$\frac{5}{8}$	$\frac{3}{4}$	16	150

TABLE III. Type I, class 3 stuffing box and pump packing extractors, hook and rigid shaft.

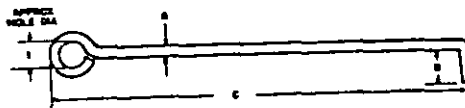


Figure 3. Type I, class 3 stuffing box and pump packing extractor, hook and rigid shaft.

**3.6.4 Class 4, double end, rigid shaft.** The type I, class 4 extractors shall consist of a steel rod with a right angle hook on one end and a curved, tapered point on the other end. The ends of the tools shall be properly hardened and tempered to prevent fracture or deformation.

**3.6.4.1** Type I, class 4 extractors shall conform to table IV for the size specified (see 6.2) and shall be similar to figure 4.

Size No	Shape	A ± 1/8	B ± 1/32	C ± 1/32	D ± 1/64	E ± 1/32	F ± 1	G +1 -3/4	H ± 1/16	Test load on hook (minimum)
1.....	OCT	4	3/8	1/2	3/4	2	—	No twist	3/8	100
2.....	OCT	6	3/8	1/2	3/4	2	—	No twist	3/8	100
3.....	OCT	8	3/8	1/2	3/4	2	—	No twist	3/8	100
4.....	SQ	10	3/8	1/2	3/4	2	4	1	3/8	125
5.....	SQ	12	3/8	1/2	3/4	2	6	1	3/8	125
6.....	SQ	14	3/8	1/2	3/4	2	8	1	3/8	125

Dimension tolerance shall be ± 1/4 inch.

TABLE IV. Type I, class 4 stuffing box and pump packing extractor, double end, rigid shaft.

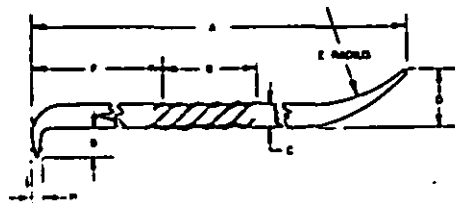


Figure 4. Type I, class 4 stuffing box and pump packing extractor, double end, rigid shaft.

**3.7 Type II, extractor, lantern gland.** Type II extractors shall consist of a flexible shaft with a "T" type handle at one end and a thread on the other end.

**3.7.1 Flexible shaft.** The shaft shall be in accordance with 3.6.1.1.

**3.7.2 Handle.** The handle shall be in accordance with paragraph 3.6.1.2

**3.7.3 Thread.** The thread shall be of the coarse series in accordance with Federal Standard H-28. The end of the thread shall be chamfered to a dull point so as to facilitate engaging the threads with previously tapped holes in lantern glands.

**3.7.4 Thread Identification marking.** In addition to the marking specified in 3.5, the thread data shall be marked on the ferrule of each extractor.

**3.7.5** Type II lantern gland extractors shall conform to table V for the size specified (see 6.2) and shall be similar to figure 5.

Size set No. (two tools)	Screw-thread data	Length <sup>1</sup> of thread $\pm \frac{1}{16}$	Nominal diameter of shaft A	Nominal length of ferrule B	Overall length C $\pm 1$	Diameter of ferrule D $\pm \frac{1}{16}$	Tension load (minimum)
1	No. 10--24 NC Class 2 fit	$\frac{1}{4}$ Inch	$\frac{1}{4}$ Inch	$\frac{1}{4}$ Inch	7 Inches	$\frac{1}{2}$ Inch	150 Pounds
2	$\frac{1}{4}$ --20 NC Class 2 fit	$\frac{3}{8}$ Inch	$\frac{3}{8}$ Inch	$\frac{1}{2}$ Inch	10 $\frac{1}{2}$ Inches	$\frac{3}{8}$ Inch	250
3	$\frac{3}{8}$ --18 NC Class 2 fit	$\frac{1}{2}$ Inch	$\frac{1}{2}$ Inch	$\frac{3}{8}$ Inch	13 $\frac{1}{2}$ Inches	$\frac{1}{2}$ Inch	400

<sup>1</sup> Length of thread includes point.

TABLE V. Type II extractor, lantern gland.

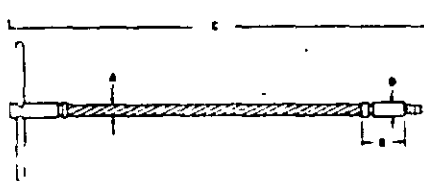


Figure 5. Type II lantern gland extractor.

3.8 Type III tamper, stuffing box and pump packing. The tamper shall consist of a flexible shaft with a straight handle grip at one end, a thread on the other end, and an attachable head.

3.8.1 Flexible shaft. The shaft shall be in accordance with 3.6.1.1.

3.8.2 Handle grip. The grip shall be of a size to afford a comfortable grip and shall be integral with or securely attached to the flexible shaft.

3.8.3 Thread. The thread shall be in accordance with 3.7.3, except that the extent of the chamfer shall be for removing the sharp edge only.

3.8.4 Head. The head shall be of bronze or other alloy which will not score steel shafting and shall be threaded to accommodate the applicable threaded shaft. The head shall have a smooth finish throughout and shall be designed to fit the shaft sizes and packing spaces in table VI.

3.8.4.1 Head Identification marking. Each head shall be marked in a permanently legible manner with the size number and the shaft size for which it is intended.

3.8.5 Type III tamper shall conform to table VI, and shall be similar to figure 6.

Size No.	For packing spaces	Shaft sizes of tamper heads available	Nominal diameter of shaft A	Ferrule diameter B $\pm 1/16$	Overall length C $\pm 1$	Thread length D $\pm 1/16$	Screw-thread data	Tension load (minimum)
1 .....	<i>Inch</i> 3/8 to 3/4	<i>Inches</i> 3/4, 3/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4	<i>Inch</i> 3/4	<i>Inch</i> 3/8	<i>Inches</i> 7	<i>Inch</i> 1 1/4	No. 6-32 NC Class 2 fit	<i>Pounds</i> 100
2 .....	3/4 to 1	1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4, 1 7/8, 2	3/4	3/8	10 1/4	1 1/4	No. 10-24 NC Class 2 fit	150
3 .....	3/4 to 1 1/4	2, 2 1/4, 2 1/2, 2 3/4, 3, 3 1/4	3/4	3/8	13 1/4	3/4	3/4-20 NC Class 2 fit	200
4 .....	3/4 to 1 1/2	3, 3 1/4, 3 1/2, 4, 4 1/4, 5, 5 1/4, 6	3/4	3/4	17 1/4	3/4	3/4-18 NC Class 2 fit	300
5 .....	3/4 to 1	6, 7, 8, 9, 10, 11, 12	3/4	3/8	21 1/4	3/4	3/4-16 NC Class 2 fit	400
6 .....	(Over 1)	12, 13, 14, 15, 16, 17, 18	3/4	3/4	25 1/4	3/2	3/2-13 NC Class 2 fit	500

*Note.*—The "shaft sizes of tamper heads available" are equal to approximately twice the inner radius of the applicable tamper head segment.

TABLE VI. Type III tamper stuffing box and pump packing.

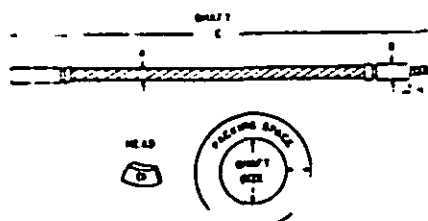


Figure 6. Type III stuffing box and pump packing tamper.

**3.9 Workmanship.** Extractors and tampers shall be free from imperfections of any nature which may adversely affect their durability and serviceability.

**3.10 Regulatory requirements.** The offerer/contractor is encouraged to use recovered materials in accordance with Public Law 94-580, as amended, to the maximum extent practicable.

#### 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 as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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.

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4.2 Sampling for Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105. The lot size shall consist of all tools of the same type and class offered for acceptance at one time. The sample unit is one tool.

#### 4.3 Inspection of the end item.

4.3.1. Examination for visual and dimensional defects. The inspection level shall be Level I and the AQL shall be 4.0, expressed in terms of defects per hundred units. Any tool in the sample containing one or more visual or dimensional defects shall be rejected.

4.3.2. Testing of the end item. The end item shall be tested in accordance with the following paragraphs. The inspection level shall be S-2 with an AQL of 2.5, expressed in terms of defects per hundred units.

4.3.2.1 Tension load for type I, class 1, type II, and type III. Secure the corkscrew bit end in soft wood or other suitable material and the tools with standard thread ends in tapped metal. The load specified in the applicable table for the type, class and size shall then be applied at the handle end for a period of 1 minute by means of dead weights or a testing machine.

4.3.2.2 Torque load for type I, classes 1 and 2. Hold the corkscrew bit near its end in a securely clamped block of soft metal or other suitable material, then attach an adapter to the handle of the tool and with a torque machine, standard torque wrench or other suitable torque recording mechanism, twist the extracting tool until the minimum load specified in the applicable table for the type, class, and size is attained.

4.3.2.3 Test load on hook for type I, classes 3 and 4. Securely clamp the rod in a bench vise with the hook in a horizontal position, the load specified in the applicable table for the type, class and size shall then be suspended from the tip end of the hook for a period of 1 minute.

4.4 Examination of preparation for delivery. An examination shall be made to determine compliance with the requirements of section 5 and the contract. The sample unit shall be one container fully prepared for delivery. The inspection level shall be S-2 with an AQL of 4.0 percent defective.

### 5. PREPARATION FOR DELIVERY

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

5.1.1 Level A. Level A preservation and packaging shall be in accordance with level A of PPP-P-40.

5.1.2 Commercial. The extractor and tampers shall be preserved and packaged to afford adequate protection against corrosion, deterioration, and damage during shipment from the supply source.

5.2 Packing. Packing shall be level A or Commercial as specified (see 6.2).

5.2.1 Level A. Level A packing shall be in accordance with level A of PPP-P-40.

5.2.2 Commercial. Extractors and tampers shall be packed in fiberboard boxes to insure delivery at destination, to provide for redistribution by the initial receiving activity, and shall be acceptable by common carrier under the National Motor Freight Classification and the Uniform Freight Classification Rules.

5.3 MARKING. Marking shall be as specified in the contract or order.



**6. NOTES****6.1 Intended use.**

**6.1.1 Type I, stuffing box and pump packing extractors.** Type I extractors are intended for use in removing worn and leaky packing from stuffing boxes in various equipment.

**6.1.2 Type II, lantern gland extractors.** Type II extractors are intended to engage previously tapped holes in the lantern glands for their removal.

**6.1.3 Type III, stuffing box and pump packing tampers.** Type III tampers are intended to tamp and seat packing sufficiently to effect a seal without having to retighten the packing several times after operation of the pump or machinery has begun.

**6.2 Ordering data.** Purchasers should select the preferred options permitted herein, and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Type, class (if applicable), and size required, see 1.2.1 and applicable table).
- (c) Level of packing required (see 5.2).
- (d) Marking required (see 5.3).

**MILITARY INTERESTS:****Military Coordinating Activity**

Army - GL

**Custodians**

Army - GL

Air Force - 99

**Review Activity**

Air Force - 84

**Preparing Activity:**

GSA-FSS