

**MIL-G-45653**

30 DECEMBER 1959

**MILITARY SPECIFICATION****GAGES, CYLINDRICAL PLUG AND RING, PLAIN**

*This specification has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy, and the Air Force.*

**1. SCOPE**

1.1 This specification covers manufacture, inspection, and preparation for delivery requirements for plain cylindrical, plug and plain ring gages listed in Military Standards 110, 111, 112, 113, 116, 117, 133, and 134 and for plain cylindrical plug gages and plain ring gages made to American Gage Design Standard (AGD) specifications of sizes not listed in a Military Standard (Prototypes of the Mil-Stds).

**2. APPLICABLE DOCUMENTS**

2.1 The following documents, of the issue in effect on date of invitation for bids, form a part of this specification.

**SPECIFICATIONS****FEDERAL**

- NN-P-515 —Plywood, Container Grade.
- PPP-T-76 —Tape, Pressure-Sensitive Adhesive Paper, Water Resistant.
- PPP-B-585 —Boxes; Wood, Wire-bound.

- PPP-B-591 —Boxes, Fiber-board, Wood-Cleated.
- PPP-B-601 —Boxes, Wood, Cleated Plywood.
- PPP-B-621 —Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 —Boxes, Fiber.
- UU-P-268 —Paper, Kraft, Wrapping.

**MILITARY**

- MIL-P-116 —Preservation, Methods of.
- MIL-B-121 —Barrier Material, Greaseproofed, Flexible (waterproofed).
- MIL-I-45177 —Instruments, Tracer, Surface Roughness.

**STANDARDS****MILITARY**

- MIL-STD-10 —Surface Roughness, Waviness and Lay.

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**MIL-STD-110** —Gages, Plug, Plain Cylindrical, Go.

**MIL-STD-111** —Gages, Plug, Plain Cylindrical, Not Go.

**MIL-STD-112** —Gages, Ring, Plain, Go.

**MIL-STD-113** —Gages, Ring, Plain, Not Go.

**MIL-STD-116** —Gages, Ring, Thread, Go (Class X) and Related Thread Setting Plug Gages, Go and Not Go Plain Plug Minor Diameter Acceptance Check Gages for Unified and American National Standard External Threads.

**MIL-STD-117** —Gages, Ring, Thread, Not Go and Related Thread Setting Plug Gages, Go and Not Go Plain Plug Minor Diameter Acceptance Check Gages for Unified and American National Standard External Threads.

**MIL-STD-120** —Gage Inspection.

**MIL-STD-129** —Marking for Shipment and Storage.

**MIL-STD-133** —Gages, Plug, Plain Cylindrical, Go for Minor Diameters of Standard Classes of Internal Threads.

**MIL-STD-134** —Gages, Plug, Plain Cylindrical, Not Go for Minor Diameters of Standard Classes of Internal Threads.

(Copies of documents required by contractors 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. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

U. S. DEPARTMENT OF COMMERCE  
Commercial Standard CS8, Gage Blanks  
Supplement to Commercial Standard CS8.

(Application for copies should be addressed to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

CONSOLIDATED CLASSIFICATION  
COMMITTEE

Uniform Freight Classification Rules.

(Application for copies of these freight classification rules should be addressed to the Consolidated Classification Committee, 202 Chicago Union Station, Chicago 6, Ill.)

AMERICAN TRUCKING ASSOCIATION, INC.  
National Motor Freight Classification  
No. A-8 and No. 18.

(Application for copies of the above publication should be addressed to the American Trucking Associations, Inc. Traffic Department, 1424 Sixteenth Street, N. W. Washington 6, D. C.)

U. S. POST OFFICE DEPARTMENT  
Parcel Post Regulations.

(Application for copies should be obtained from any first class U. S. Post Office.)

### **3. REQUIREMENTS**

#### **3.1 Gaging members.**

**3.1.1** Gaging members shall be of American Gage Design Standard (AGD) as specified in Commercial Standard CS8 and the Supplement to Commercial Standard CS8.

**3.1.1.1** Go and not go plain plug gaging members up to and including .510 inch in diameter shall be finished from AGD plain plug gage blanks of the wire type design. Go plain plug gaging members above .510 inch up to and including 1.510 inches in diameter shall be finished from AGD go plain plug gage blanks of the taperlock design with precision centers. Not go plain plug gaging members above .510 inch up to and including

1.510 inches in diameter shall be finished from AGD not go plain plug gage blanks of the taperlock design with precision centers. Go and not go plain plug gaging members above 1.510 inches to and including 8.010 inches in diameter shall be finished from AGD not go plain plug gage blanks of the trilock design. Gaging members above 8.010 inches in diameter shall be finished from AGD not go plain plug gage blanks of the annular design.

3.1.1.2 Go and not go plain ring gages shall be finished from AGD plain ring gage blanks. Gages above 1.510 inches to and including 12.260 inches in diameter shall be finished from AGD inspection or working type plain ring gage blanks.

3.1.2 Unless otherwise specified, the gaging members shall be of a high quality, electric furnace alloy steel, alloy tool steel, or carbon tool steel and shall be heat treated to provide hardness specified on applicable documents or drawings.

3.1.3 *Finish of gaging surface.* Gaging surface shall be precision lapped to remove amorphous or smear metal left after finish grinding and shall be free of any detrimental defects.

3.1.3.1 Numerical values denoted on documents or drawings for gaging and other surfaces of the gages are Roughness Height Ratings as described in Standard MIL-STD-10.

3.1.4 *Stability.* The material selected and the appropriate artificial seasoning employed shall insure that the distortion or dimensional growth is held to a minimum and shall remain within the limits of the size specified.

3.1.5 Variation from a true cylindrical form for plain plug gaging members such as taper and out of roundness over the entire gaging surface of the gaging member shall not exceed one-half of the gagemaker's tolerance. The permissible taper on not go taperlock plug gages shall be restricted to back

taper, i.e. the front end shall be the largest dimension.

3.1.6 Variation from a true cylindrical form for plain ring gages such as bellmouth, taper, and out of roundness shall not exceed one-half of the gagemaker's tolerance. In the case of ring gages below .250 inch gaging diameter (where internal measurements are not practical) the ring gage shall be a snug fit on a acceptance check gage when the surfaces are free of oil or any lubricant.

3.1.6.1 *Plain plug acceptance check gages.* Plain plug acceptance check gages shall be provided, when specified, for plain ring gages below .250 inch gaging diameter. Variation from a true cylindrical form such as taper or out of roundness over the entire length of the gaging member shall not exceed .00002 inch.

3.1.7 When specified, go plain plug gaging members shall be provided with an air groove for blind hole applications.

### 3.2 Handles for plain plug gages.

3.2.1 Handles shall be of of American Gage Design Standard (AGD) in accordance with Commercial Standard CS8 and the Supplement to Commercial Standard CS8.

3.2.1.1 All gage handles shall be single end type.

3.2.2 Unless otherwise specified, gage handles shall be made of aluminum alloy.

3.2.3 Taperlock design gage handles may be tapered on one end only and the drift hole or slot may be omitted.

3.2.4 Trilock design gage handles shall be provided with steel screws of type No. 2 as illustrated in the 1955 Supplement to Commercial Standard CS8.

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3.2.4.1 The steel screws shall be free from burrs and torn threads.

3.2.5 The external surfaces of go plain plug gage handles shall be anodized with a permanent green color having a bright finish. The external surfaces of not go plain plug gage handles shall be anodized with a permanent red color having a bright finish. Wire type gage handles may be finished having the identifying color applied only to the gage nut while the handle may be either rough anodized or highly polished (not anodized) maintaining the natural aluminum color.

3.2.5.1 Gage handles for go and not go plain plug minor diameter acceptance check gages for go and not go thread ring gages, as specified in Specification MIL-G-45654 shall be processed in accordance with the above stipulations for go and not go plain plug gage handles respectively.

3.2.5.2 The annular groove for not go plain plug gage handles as shown in Commercial Standard CS8 is not required.

3.2.5.3 Gage handles for plain plug acceptance check gages for plain ring gages shall be either rough anodized or highly polished (not anodized) maintaining the natural aluminum color.

3.2.6 When specified, plain plug and acceptance check gaging members may be procured without handles. Gaging members shall be marked with the required identifying data specified in related applicable documents as follows:

Wire Type	—The gaging member shall be identified with a tag or label having the required pertinent data printed thereon. The tag or label shall be such
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that it can be removed without damage to the gaging member.

**Taperlock Type** —Marked by a steel stamp or electric etching on the front end of the gaging member or if space does not permit, marked on the taper portion of the gaging member.

*Note.* Marking shall not impede assembly of gaging member and handle.

**Trilock Type** —Marked by a steel stamp or electric etching on either side of the gaging member.

3.2.7 *Marking.* All marking shall be permanent and legible and of suitable height commensurate with the size of the gaging member or handle.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 **Contractor inspection.** Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for Government inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order.

4.1.1 Unless otherwise specified, the supplier will make such inspections as are necessary of each gage by use of one hundred percent inspection in conjunction with the

methods and procedures described in Standard MIL-STD-120 to determine that the gages are in accordance with the requirements of this specification and applicable documents.

**4.2 Hardness test.** Hardness tests shall be made on standard type hardness testers and shall be made as near to the actual gage wear surface as practicable.

**4.3 Surface roughness of gaging surfaces.** Surface roughness of gaging surfaces shall be determined by an instrument conforming to the requirements of Specification MIL-I-45177.

**4.3.1** Gaging surfaces shall be inspected for seams, cracks, nicks, scratches, rust spots, and other defects which may materially affect the use, durability, or stability of the gage.

**4.4** Taperlock gaging members and handles shall be inspected to insure correct taper and size.

**4.5 Stability test.** When deemed necessary, gages will be subjected to a deep freeze treatment to determine whether or not they have been properly stabilized. Gages shall remain in tolerance after treatment.

**4.6** The preservation, packaging of the gages shall be in accordance with the requirements of section 5.

## 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 Cleaning.** The gages shall be cleaned in accordance with process C-1 of Specification MIL-P-116.

**5.1.1.2 Drying.** The gages shall be dried in accordance with any applicable drying procedure specified in Specification MIL-P-116.

**5.1.1.3 Preservative application.** The gages shall be preserved with type P-10 preservative as specified in Specification MIL-P-116.

**5.1.1.4 Unit packaging.** Each gage shall be packaged by method IA-15 as specified in Specification MIL-P-116 and herein. The gage shall be wrapped with type II, grade A, class 2, barrier material conforming to Specification MIL-B-121 and secured with tape conforming to Specification PPP-T-76. The MIL-B-121 barrier material shall be overwrapped with Kraft paper conforming to Specification UU-P-268.

**5.1.2 Level C.** The gages shall be preserved and packaged in accordance with the manufacturer's commercial practice.

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

**5.2.1 Level A.** The gages (gages of the same Federal stock No.) shall be packed in a close-fitting wire bound wood box, wood cleated fiber board box, wood cleated-plywood box, nail wood box, or a fiberboard box conforming to Specification PPP-B-585, class 3, PPP-B-591, (overseas type), PPP-B-601, style A or B using plywood conforming to Specification NN-P-515, type II or III, class 2, PPP-B-621, class 2, and PPP-B-636, class 2 or 3, respectively. Closure and strapping requirements shall be in accordance with the applicable box specification or appendix thereto. The gross weight for wood or wood-cleated boxes shall be approximately 200 pounds. The gross weight of fiberboard boxes shall not exceed the weight limitations of the applicable box specifications.

**5.2.2 Level B.** The gages (gages of the same Federal stock No.) shall be packed in a close-fitting wire bound wood box, wood-

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cleated fiberboard box, wood cleated-plywood box, nail wood box or a fiberboard box conforming to Specification PPP-B-585, class 1, PPP-B-591, (Domestic type), PPP-B-601, (Domestic type), PPP-B-621, class 1, and PPP-B-636, class 1, respectively. Closure shall be as specified in the applicable box specification or appendix thereto. The gross weight of wood or wood-cleated boxes shall be approximately 200 pounds. The gross weight of fiberboard boxes shall not exceed the weight limitations of the applicable box specification.

5.2.3 *Levl C.* The gages shall be packed to afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Containers shall comply with Uniform Freight Classifications, Motor Freight Regulations or Parcel Post Regulations, whichever is applicable.

5.3 **Marking.** Unit packages and shipping containers shall be marked in accordance with the requirements of Standard MIL-STD-129.

**6. NOTES**

6.1 **Intended use.** Gages described herein are to be used for acceptance inspection by Government facilities.

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

- (a) Title, number, and date of this specification

- (b) Number of gages required and federal stock number or gage drawing number
- (c) Place of delivery for acceptance inspection
- (d) Any required acceptance check gages (see 3.1.6.1)
- (e) Level of preservation, packaging, and packing required
- (f) Any required air groove (see 3.1.7)
- (g) Material if different from 3.1.2 or 8.2.2
- (h) Procurement of gaging members only (see 3.2.6)

**Notice.** When Government drawings, specifications, 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 nor any obligation whatsoever; and the fact that the Government may have formulated, furnished or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any invention that may in any way be related thereto.

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**Preparing activity:**

Army—Ordnance Corps