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MIL-PRF-18949A(OS)
5 January 1976

SUPERSEDING
MIL-P-18949(NOrd)
12 August 1955
(See section 6)

PERFORMANCE SPECIFICATION

PROJECTILES, ILLUMINATING, LOCALIZED HEAT TREATMENT OF

*This specification is approved for use by all
departments and agencies of the Department of Defense*

1. SCOPE

1.1 Scope. This specification covers the localized heat treatment requirements of an inner annulus of the body under the band seat on illuminating projectiles and supplements the requirements of the projectile specification.

1.2 Classification. Induction heat treatment of the inner annulus is the only type of localized heat treatment that shall be permitted.

2. APPLICABLE DOCUMENTS

*2.1 The following documents of the issues in effect on date of invitation for bids or request for proposals form a part of this specification to the extent specified herein. In the event of conflict between this specification and any document referenced herein, the requirements of this specification shall apply.

SPECIFICATIONS

Military

MIL-P-18950

Projectiles, High Capacity, Anti-Aircraft and Illuminating

FSC 1355

MIL-P-18949A(OS)

STANDARDS

Military

MIL-STD-105

Sampling Procedures and Tables for
Inspection by Attributes

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

3. REQUIREMENTS

*3.1 General. In addition to those requirements set forth herein and in MIL-P-18950, illuminating projectiles shall, at the time of localized heat treatment, be in that stage of manufacture where the rotating bands have been assembled to the body of the projectile but prior to the finish machining of those surfaces subject to warping due to this localized heat treatment.

3.1.1 Preproduction lot. Unless otherwise specified, the submission of a preproduction lot and the satisfactory compliance of this lot with the requirements of this specification shall be required before general production on the contract is approved. These projectiles shall be made by the same processes the contractor intends to use in the fulfillment of the contract. The marking for such projectiles shall be as for production lots except the letters "PL" shall be substituted for the lot number.

3.2 Material. Materials shall comply with the requirements specified herein and the specifications referred to on the applicable drawings or list of drawings, unless specific approval, in writing, covering a departure therefrom has been obtained from the procuring activity prior to manufacture or use.

3.3 Chemical composition. Illuminating projectiles purchased under this specification shall be restricted to the analysis shown in table I. Upon written request by the contractor, other compositions may be approved by the procuring activity.

Table I

CHEMICAL COMPOSITION

Element	Percent
Carbon	0.45 - 0.55
Manganese	1.35 - 1.60
Phosphorous	0.05, max.
Sulfur	0.05, max.
Silicon	¹
Copper	0.25, max.
Nickel	0.25, max.
Chromium	0.15, max.
Molybdenum	0.10, max.

¹ Full silicon killed.

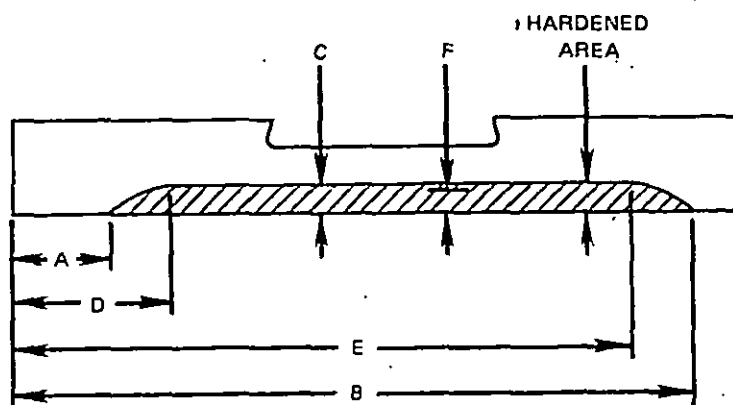
3.4 Physical properties. The inner annulus shall be heattreated so that its minimum cross section is in accordance with table II for the applicable caliber and mark. That portion of the cavity between D and E (see figure 1) shall be heattreated to a minimum hardness of Rockwell C52 for a total minimum depth of C minus F.

3.5 Workmanship. All workmanship shall be high grade, suitable for the purpose intended and uniform for all projectiles in each lot. Projectile bodies shall be free from all surface conditions that interfere with satisfactory heat treatment.

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.

MIL-P-18949A(OS)



- A Distance from base to beginning of hardened area.
 B Distance from base to end of hardened area.
 C Total hardened depth.
 D Maximum distance from base to beginning of hardened area having hardened depth C.
 E Minimum distance from base to end of hardened area having hardened depth C.
 F Maximum width of transition area.

FIGURE 1. LOCATION OF HARDENED PATTERN

Table II

LIMITING DIMENSIONS (INCHES) OF HARDENED AREAS¹

Caliber	Mk	A	B	C	D	E	F
3"/50	25	0.350 - 0.450	2.80 + 0.500 - 0.000	0.100 - 0.110	0.750	2.25	0.010
4"/50	14	0.350 - 0.470	5.00 + 0.500 - 0.000	0.130 - 0.140	0.875	4.60	0.015
5"/25	45	0.500 - 0.725	5.00 + 0.500 - 0.000	0.125 - 0.140	1.30	4.50	0.025
5"/38	44	0.500 - 0.725	5.00 + 0.500 - 0.000	0.125 - 0.140	1.30	4.50	0.025
5"/54	48	0.800 - 1.000	5.40 + 0.500 - 0.000	0.125 - 0.140	1.30	5.10	0.025
6"	38	0.580 - 0.780	5.00 + 0.500 - 0.000	0.140 - 0.160	1.20	4.70	0.025
6"	41	0.580 - 0.780	5.00 + 0.500 - 0.000	0.140 - 0.160	1.20	4.70	0.025

¹Letter are as defined in figure 1.

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

- a. Preproduction inspection (see 4.3)
- b. Quality conformance inspection (see 4.4).

*4.3 Preproduction inspection. Projectiles in the preproduction lot shall be subjected to all tests considered necessary by the procuring activity to determine conformance to the requirements of this specification. The results of these tests will determine whether the supplier shall proceed under the contract.

*4.4 Quality conformance inspection.

*4.4.1 Sampling. Unless otherwise specified, and when applicable, the sampling plans and procedures used in the determination of the acceptability of products submitted by a supplier for Government inspection shall be in accordance with MIL-STD-105.

*4.4.1.1 Inspection lot. As applied to the Government inspection of units of product, the term "lot" shall mean "inspection lot," i.e., a collection of units of the product used as a basis for Government inspection. Unless otherwise specified, the number of units of product in inspection lots shall be as determined by the procuring activity and may differ from the quantity designated in the contract or order as a lot for production, shipment, or other purposes.

*4.4.2 Examination of preparation for delivery. The preservation, packing, and marking of the projectiles shall be examined for conformance to the requirements of section 5.

*4.4.3 Physical properties test. Every second projectile shall, after localized heat treatment, be tested in a Rockwell testing device to determine that the hardness meets the minimum requirements of 3.4. In addition, one projectile from each lot shall be sectioned through the locally hardened area and parallel to its longitudinal axis. Hardness check readings shall be taken on such sectioned projectiles as required by the procuring activity. Each sectioned projectile shall then be suitably etched to bring out the hardened pattern. The pattern shall be examined for conformance to the requirements of 3.4.

MIL-P-18949A(OS)

4.4.4 Ballistic tests. Ballistic tests shall be conducted in accordance with MIL-P-18950.

5. PREPARATION FOR DELIVERY

*5.1 Preservation, packaging, packing, and marking. The projectiles shall be preserved, packaged, packed, and marked in accordance with MIL-P-18950.

6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification
- *b. Preproduction lot, if required (see 3.1.1)
- *c. Sampling, if other than specified in 4.4.1.

*6.2 Supersession data. This specification includes the requirements of NAVORD OS-1690 dated 1 March 1946.

*6.3. The margins of this specification are marked with an asterick 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 contractors 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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