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SUPERSEDING
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MILITARY SPECIFICATION

LOADING WITH HBX COMPOSITIONS

1. SCOPE

1.1 This specification covers the loading of bursters, bombs, rocket heads, and warheads with HBX-1, HBX-3, or HBX-6.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, together with the Ordnance Corps Loading Drawing pertaining to the Burster, Bomb, Rocket Head, or Warhead under contract (see 6.1), of the issue in effect on date of invitation for bids, form a part of this specification.

SPECIFICATIONS

MILITARY

JAN-T-248 - Trinitrotoluene (TNT)
JAN-A-289 - Aluminum powder, flaked, grained and atomized (for use in ammunition)
JAN-C-401 - Composition B
MIL-G-2550 - General Specification for Ammunition except small arms ammunition
MIL-C-13573 - Calcium Chloride, Anhydrous (for Ordnance Use)
MIL-C-18164 - Comp osition D-2

(Copies of specifications, standards, drawings, and publications, 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 Materials.

3.1.1 Constituent material. - The constituent material used in the manufacture of HBX compositions shall comply with the following requirements:

Constituent	Conforming To
Composition B, Grade A	JAN-C-401
Trinitrotoluene, Grade 1	JAN-T-248
Aluminum Powder, Type C, Class D	JAN-A-289
Composition D-2 (Desen itizer)	MIL-C-18164
Calcium Chloride, Anhydrous	MIL-C-13573

3.1.2 Clean Scrap. - Clean scrap produced in regular operations may be re-used provided tha the scrap is free of grit. Clean scrap is defined as scrap formed in kettles, pails, risers, and loading machines used in the pouring and cooling operations. Grit is defined as any hard, sharp particles (metallic or non-metallic) foreign to the composition of the explosive. Scrap from floor sweepings, ventilators and suction apparatus shall not be used.

3.2 Composition. - The composition of HBX when stated to the nearest whole percent (except for the calcium chloride which shall be calculated to the nearest tenth of one percent) shall be as shown in table I:

TABLE I

INGREDIENT (see 6.2)	HBX-1 Percent	HBX-3 Percent	HBX-6 Percent
Composition B	67	52	74
Trinitrotoluene (TNT)	11	8	--
Aluminum Powder	17	35	21
D-2 Desensitizer	5	5	5
Calcium Chloride, Anhydrous (added)	0.5	0.5	0.5

3.3 Specific gravity. - Unless minimum (min.) weight or X-ray requirements are specified on the drawing or are in the detail specification for the item, the specific gravity of the loaded charge shall be not less than the value shown in table II. (See 6.3)

TABLE II

COMPOSITION	SPECIFIC GRAVITY (MIN.)
HBX-1	1.68
HBX-3	1.78
HBX-6	1.70

3.4 Interior surface. - The interior surface of the burster, bomb, rocket head, of warhead shall be dry when the high explosive is poured.

3.5 Coating (where applicable). - If examination shows the interior wall of any burster, bomb, rocket head, or warhead to be uncoated, imperfectly coated, or contaminated in any way, the item shall not be loaded.

3.6 Fuze well (applicable to bombs, rocket heads, and warheads only.)- After the fuze well is formed or drilled, the threads of the loaded bomb, rocket head, or warhead shall be thoroughly cleaned to remove all explosive and other foreign matter. If a chemical cleaner is required to clean the threads, no material other than acetone shall be used. Care shall be taken to prevent the acetone from coming into contact with the charge.

3.7 Workmanship. - All parts shall be free of chips, dirt, grease, rust and other foreign material. The cleaning method used shall not be injurious to any of the parts nor shall the parts be contaminated by the cleaning agents used.

4. QUALITY ASSURANCE PROVISIONS

4.1 Lot. - A lot shall consist of all bursters, bombs, rocket heads, or warheads of the same designation, loaded with cast HBX, by the same process in one loading plant. Each lot shall contain:

A. HBX-1, HBX-3 or HBX-6 only

B. Burster, bomb, rocket head, or warhead metal parts of one interfix lot number made by one manufacturer.

C. Loaded fuzes (where applicable) of one interfix lot number made by one manufacturer.

4.2 Sampling for specific gravity. - Four rounds shall be selected from each batch of HBX or 8 hours production (whichever is smaller) for test.

4.3 Inspection

4.3.1 General. - Inspection shall be as specified in specification MIL-G-2550 and as specified herein.

4.3.2 Components. - It shall be ascertained that prior to assembly all components of sub-assemblies of the bursters, bombs, rocket heads, or warheads procured under separate specifications or drawings have been inspected, tested, and accepted in accordance with their respective specifications or drawings.

4.3.3 Loading. - The preparation and loading of the HBX compositions shall be observed and inspected for conformance to this specification at the place of manufacture. (see 6.2)

4.3.4 Composition (see 6.1). - Certification shall be furnished to guarantee that the ingredient requirements specified in 3.2 have been complied with.

4.3.5 Packing and marking. - It shall be ascertained that the packing and marking of bursters, bombs, rocket heads, or warheads conform to this specification.

4.3.6 Classification of defects. - Inspection of bursters, bombs, rocket heads, or warheads shall be as follows:

	Categories and defects	Method of inspection
Minor		
41.	Specific gravity, min.	Approved test (see 4.4.1)

4.4. Test Procedure

4.4.1 Determination of specific gravity (when applicable). -

4.4.1.1 Procedure. - The representative bursters, bombs, rocket heads, or warheads shall be selected and identified and the specific gravity of the charge in each sample shall be determined as follows:

Each sample shall be weighed empty (without explosive). Each sample shall be filled with water (at approximately room temperature) and weighed. Each sample shall be emptied, thoroughly dried, placed at random in the loading line, and filled under conditions identical in all respects with those employed in filling regular bursters, bombs, or warheads. Each sample filled with explosive shall be weighed. The weight of water equivalent to the volume of the fuze well in bombs or warheads shall be calculated from the physical dimensions of the fuze well as they appear on the applicable loading drawing. This calculation shall be based on the lower tolerance limit of the fuze well dimensions and the density of water at room temperature. In the case of bursters the calculated weight of water equivalent to the volume of the fuze well shall be eliminated. The specific gravity shall be calculated as follows:

$$\text{Specific gravity} = \frac{Wt - We}{Ww - We - Wf}$$

Where:

We = Weight of empty burster, bomb, rocket head, or warhead.
Ww = Height of water-filled burster, bomb, rocket head, or warhead
Wt = Weight of loaded bomb, rocket head, or warhead with finished fuze well or weight of loaded burster
Wf = Calculated weight of water equivalent to the volume of fuze well (applicable to bombs, rocket heads, and warheads only)

4.4.1.2 Rejection. - If the average results of the samples fail to comply with the specific gravity requirement specified in 3.3, the lot shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Packing. - Packing shall be as specified on the applicable drawing.

Labeling and Marking.

5.2.1 Applicable to bombs and warheads.

5.2.1.1 For levels A or C in less than carload lots. - The marking for shipment shall be stenciled on the bomb or warhead as indicated on the drawing of the bomb or warhead being loaded.

5.2.1.2 For level C of carload lots (uncrated). - No marking shall be applied for bombs or warheads shipped uncrated in carload lots.

5.2.1.3 For levels A or C (crated). - Marking for shipment shall be stenciled on the crate as specified on the crate packing and marking drawing for the bomb or warhead being loaded.

5.2.2 Applicable to bursters and rocket heads. - Labeling and marking shall be as specified on the applicable drawing.

6. NOTES

6.1 Ordering data. - Procurement documents should specify the following:
(A) Title, number, and date of this specification
(B) Drawing required for burster, bomb, rocket head or warhead under contract (see 2.1)
(C) Level of protection required
(D) The certificates furnished to the Ordnance Inspector, prior to or at the time of delivery, showing tests conducted and results obtained must be signed by a responsible agent of the certifying organization and must bear evidence of the agents authority to bind his principal.

6.2 The ingredients should be mixed immediately prior to loading and for such a length of time as to insure thorough incorporation of the materials. While there is no strict requirement as to the sequence of addition of components, the aluminum should be added last. It is advisable that the temperature of the high explosive at the time of pouring be between 86° and 90° Centigrade (see 4.3.3)

6.3 If pellet loading is employed it is advisable that the pellets be free of cavities and meet the same minimum specific gravity requirements as the respective high explosive charge (see 3.3)

Custodian:
Army - Ordnance Corps