

GENERAL SPECIFICATION
FOR
NON STANDARD SMALL CALIBER AMMUNITION

1. SCOPE

1.1 Scope. This general specification describes the requirements and verification procedures for Non Standard Small Caliber Ammunition as defined in 6.3.1.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in section 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in section 5 this specification, whether or not they are listed.

2.2 Government documents. Not Applicable

2.3 Non-Government publications.

United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air

International Maritime Organization (IMO) International Maritime Dangerous Goods Code (IMDG)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 Technical Requirements. Ammunition shall meet the requirements and verifications of this specification for the non-standard small caliber ammunition listed in ANNEXES A and B. The non-standard small caliber ammunition shall be accompanied with technical data as defined in 6.3.2 of this specification.

3.1.1 Compliance to technical requirements and storage history. Ammunition shall have evidence of compliance to the requirements of this specification and have documented storage history of ammunition.

3.1.2 Reduction or elimination of verification procedures. Sufficient evidence of compliance to technical requirements and acceptable storage history of ammunition as determined by SFAE-AMO-MAS-NSA may warrant reduction or elimination of verification procedures in TABLE I of this specification (see 6.2).

3.2 Conformance inspection. A sample of the ammunition presented for acceptance shall be subjected to conformance inspection in accordance with TABLE II and ANNEXES A and B.

3.3 Serviceability. Ammunition shall be serviceable and issuable without qualification. Ammunition shall be of good condition, without visible signs of degradation of ammunition.

3.3.1 Identification of defects. Defects inherent to the cartridge design and/or manufacturing processes shall be identified within the technical data and shall be classified as either a minor, major, or critical defect with a defined method for acceptance/rejection of ammunition.

3.3.2 Tip identification. The cartridge shall be permanently marked with tip identification.

3.3.3 Head stamp. The cartridge case head stamp shall be found on all rounds of ammunition (ie. identification code/name of the manufacturer, caliber and last two digits of the year of manufacture, etc.)

3.4 Interface and interoperability.

3.4.1 Weapon interface. The ammunition configuration shall conform to weapon interface as identified in ANNEX A or as otherwise specified in contract or purchase order.

3.5 Operating characteristics.

3.5.1 Operating temperatures. The cartridge shall demonstrate reliability throughout a temperature range which includes ambient and extreme temperatures.

3.5.2 Velocity. The ammunition shall meet velocity characteristics as specified in ANNEX B.

3.5.3 Chamber pressure. The ammunition shall meet chamber pressure characteristics as specified in ANNEX B.

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3.5.4 Accuracy/Dispersion. The ammunition shall meet accuracy and/or dispersion characteristics as specified in ANNEX B.

3.5.5 Function and casualty. The ammunition shall function without casualty or damage to weapon while maintaining metal parts security. Ammunition shall exhibit integrity during weapon usage and in ballistic flight (see ANNEX A).

3.5.6 Bullet integrity. The jacket of the bullet, or any part thereof, shall not strip from the slug when the cartridge is fired.

3.5.7 Tracer performance. The ammunition shall meet the trace performance characteristics as specified in the manufacturer's specifications.

3.6 Environmental requirements.

3.6.1 Sequential rough handling. Cartridges shall be capable of withstanding the rigors of the sequential rough handling and transportation throughout extreme temperatures and meet all performance and safety requirements.

3.7 Ownership and support requirements.

3.7.1 Packing. Packaging and packing shall be in accordance with section 5 of this specification.

3.7.2 Marking. Marking shall be in accordance with section 5 of this specification.

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4. VERIFICATION

TABLE I. Requirement/verification cross reference matrix

Section 3 Requirements		<u>Method of Verification</u> 1. Analysis 2. Demonstration 3. Examination 4. Test				<u>Classes of Verification</u> A – Basic Verification B – Verification Procedures		
Section 3	Requirements	Verification Methods				Verification Class		Section 4 Verification Procedures
		1	2	3	4	A	B	
3.1	Technical requirements	X				X		4.1
3.2	Compliance to technical requirements and storage history	X					X	4.2
3.2	Conformance verification	X	X	X	X	X	X	4.1.2, TABLE II
3.3	Serviceability			X	X		X	4.3
3.3.1	Identification of defects	X		X		X		4.3
3.3.2	Tip identification			X		X		4.3
3.3.3	Head stamp			X		X		4.3
3.4.1	Weapon interface		X				X	4.4.1
3.5.1	Operating temperatures		X		X		X	4.5.1
3.5.2	Velocity		X		X		X	4.5.2
3.5.3	Chamber pressure		X		X		X	4.5.3
3.5.4	Accuracy/Dispersion		X		X		X	4.5.4
3.5.5	Function and casualty		X		X		X	4.5.6
3.5.6	Bullet integrity		X		X		X	4.5.5
3.5.7	Tracer performance		X		X		X	4.5.7
3.6.1	Sequential rough handling		X	X	X		X	4.6.1
3.7.1	Packing			X		X		4.7.1
3.7.2	Marking			X		X		4.7.2

4.1 Technical verification. The Government or an identified Government representative may subject ammunition to verification of any or all requirements of applicable technical data in addition to verification in accordance with TABLE II of this specification. Noncompliance to any requirements shall be cause to withhold acceptance of the lot or batch in which the noncompliance was found.

4.1.1. Lot formation. The ammunition shall be assembled into identifiable lots, sublots, or batches, or in such other manner as may be prescribed. Each lot or batch shall, as far as practicable, consist of units of product of a single type, grade, class, size, and composition, manufactured under essentially the same conditions, and at essentially the same time. The lots or batches shall be identified by the contractor and shall be kept intact in adequate and suitable storage space. The formation of lots or batches is desirable for reasons of homogeneity.

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4.1.2 Conformance verification. The ammunition shall be subjected to verification by analysis, demonstration, examination and tests in accordance with TABLE II.

4.1.3 Conformance acceptance. Acceptance of ammunition shall be based on compliance with verification in accordance with TABLE II of this specification. Failure to meet requirements of TABLE II shall be cause to withhold acceptance of lot or batch for which verification was performed.

TABLE II. Conformance verification

Examination or Test	Requirement Paragraph	Verification Method	Sample Size
Compliance to technical requirements and storage history	3.2	4.2	1
Serviceability	3.3	4.3	See Note 1
Identification of defects	3.3.1	4.3	See Note 1
Tip identification	3.3.2	4.3	See Note 1
Head stamp	3.3.3	4.3	See Note 1
Weapon interface	3.4.1	4.4.1	Annex A
Operating temperatures	3.5.1	4.5.1	Annex A
Velocity	3.5.2	4.5.2	Annex A
Chamber pressure	3.5.3	4.5.3	Annex A
Accuracy/Dispersion	3.5.4	4.5.4	Annex A
Function and casualty	3.5.5	4.5.5	Annex A
Bullet integrity	3.5.6	4.5.6	Annex A
Tracer performance	3.5.7	4.5.7	Annex A
Sequential rough handling	3.6.1	4.6.1	Annex A
Packing	3.7.1	4.7.1	2 (See Note 2)
Marking	3.7.2	4.7.2	Annex A
Notes:			
1 – To be performed using a defined sampling method for inspection determined on the ammunition lot/batch size			
2 – 2 Units of Pallets, Packaging and unit pack will be inspected			

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4.2 Verification of evidence of compliance. Evidence shall include, but is not limited to, the following.

4.2.1 Identification of technical requirements to which ammunition is/was produced.

4.2.2 Producer, date of manufacture and original acceptance documentation.

4.2.3 Initial acceptance reports, including type, lot or batch identification, quantity and method of acceptance (e.g. sample size, verification method, acceptance criteria, and results).

4.2.4 Surveillance reports, including lot or batch identification, quantity and method of surveillance (e.g. sample size, verification method, criteria for action to be taken on lot or batch, results).

4.2.5 Storage history, including duration and storage condition (e.g. controlled, uncontrolled).

4.3 Serviceability verification. A random sample shall be selected from the lot of ammunition using a defined sampling procedure for inspection. The ammunition shall be visually inspected for signs of degradation, tip identification, head stamp and the defects that are identified in the producer's technical data.

4.4 Interface and interoperability verification.

4.4.1 Weapon interface. A random sample shall be selected from the lot of ammunition to be delivered and inserted into a weapon chamber or chamber gage that conforms to the identified weapon system to check for profile and alignment. Inability to interface properly with the weapon system shall be considered a failure to show compliance and constitute a single reliability failure.

4.5 Operational verification.

4.5.1 Operating temperatures. Ammunition shall show evidence of performance when conditioned and fired throughout a temperature range which includes hot, cold and ambient temperatures.

4.5.2 Velocity. Velocity tests shall be conducted in accordance with producer's test procedure to verify that a sample representative of the lot meets the specified velocity requirements of Annex B.

4.5.3 Chamber pressure. Chamber pressure tests shall be conducted in accordance with the producer's test procedure (crusher, transducer, etc.) to verify that a sample representative of the lot meets the specified chamber pressure requirements of Annex B.

4.5.4 Accuracy/dispersion. Accuracy/dispersion tests shall be conducted in accordance with producer's test procedure (mean radii, R50, etc.) to verify that a sample representative of the lot meets the specified accuracy/dispersion requirements Annex B.

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4.5.5 Function and casualty. A random sample shall be selected from the lot of ammunition to be delivered and functioned from the identified weapon system to check for function, casualty and metal parts security. Inability to function without casualty or damage to weapon while maintaining metal parts security shall be considered a failure and constitute a single reliability failure.

4.5.6 Bullet integrity. Bullet integrity tests shall be conducted in accordance with producer's test procedure to verify the sample meets the specified bullet integrity requirement.

4.5.7 Tracer performance. Tracer testing shall be conducted in accordance with producer's test procedure to verify the sample meets the specified tracer requirement.

4.6 Environmental requirements.

4.6.1 Sequential rough handling. The sequential rough handling tests shall be performed in accordance with producer's test procedures to verify ammunition and packaging will maintain performance and safety when exposed to the rough handling and temperatures consistent with transportation.

4.7 Support and ownership verification.

4.7.1 Packing. A random sample of packaging and packing shall be selected from ammunition to be delivered and visually inspected for defects and compliance to requirements of section 5 of this specification.

4.7.2 Marking. A random sample of ammunition shall be selected from ammunition to be delivered and visually inspected for marking defects. Marking that is not visible, clear or correct shall be considered a failure and constitute a single reliability failure.

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5. PACKAGING

5.1 Preservation, packaging, packing, unitization, and marking shall provide protection for multiple handling, redistribution, and shipment by any transportation mode and meet or exceed the following requirements.

5.1.1 Packaging containers for hazardous materials, ammunition and explosives shall meet or exceed the requirements found in part 6 of the "United Nations Recommendations on the Transport of Dangerous Goods Model Regulations" and in a manner acceptable to the competent authority of the nation of origin and in accordance with the regulations of all applicable carriers.

5.1.2 Cleanliness - items and packaging shall be free of dirt and other contaminants which would contribute to the deterioration of the item or which would require cleaning by the customer prior to use. Coatings and preservatives applied to the item for protection are not considered contaminants.

5.1.3 Preservation - items susceptible to corrosion or deterioration shall be provided protection against external environmental effects.

5.1.4 Cushioning - items requiring protection from physical and mechanical damage (e.g. fragile, sensitive, critical material) or which could cause physical damage to other items, shall be protected by wrapping, cushioning, pack compartmentalization, or other means to mitigate shock and vibration and prevent damage during handling and shipment.

5.2. Unit Package

5.2.1 Unit package shall be so designed and constructed that it will contain the contents with no damage to the item(s), and with minimal damage to the unit pack during shipment and storage in the shipping container, and will allow subsequent handling. The outermost component of the unit package shall be a container such as a sealed bag, carton, or box.

5.3. Packing

5.3.1 Unit packages must be packed in shipping containers. All shipping containers shall be the most cost effective and shall be of the minimum cube to contain and protect the items.

5.3.2 Shipping Containers - the shipping container (including any necessary blocking, bracing, cushioning, or waterproofing) shall comply with the regulations of the carrier used and shall provide safe delivery to the destination at the lowest tariff cost. The shipping container shall be capable of multiple handling, stacking at least ten feet high, and storage under favorable conditions and meet the requirements of the "United Nations Recommendations on the Transport of Dangerous Goods".

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5.4. Unitization

5.4.1 Shipments of identical items going to the same destination shall be palletized if they have a total cubic displacement of 20 cubic feet or more unless skids or other forklift handling features are included on the containers. Pallet loads must be stable, and to the greatest extent possible, provide a level top for ease of stacking. The weight capacity of the pallet must be adequate for the load. A pallet load shall not exceed 4,000 pounds and should not exceed 52 inches in length or width, or 54 inches in height. The load shall be contained in a manner that will permit safe handling during shipment and storage. 5.4.2 Banding - metal banding shall be used to secure load. Straps shall be applied to each column or layer of boxes. Tie down straps shall be applied to each column of boxes at 90 degrees to the load straps. Edge protectors shall be used when securing fiberboard boxes.

5.5. Marking

5.5.1 Packaging marking shall be visible, clear, and remain legible during normal life cycle handling.

5.5.2 All unit packages, intermediate packs, exterior shipping containers, and, as applicable, unitized loads shall be marked with item description, quantity, lot number, or serial number. The outer shipping container and unitized load shall indicate load weight, UN dangerous goods proper shipping name, and UN number.

5.5.3 Each package shipping container shall show the United Nations packaging symbol and applicable codes in accordance with the construction requirements and testing of packaging as expressed in part 6 of the "United Nations Recommendations on the Transport of Dangerous Goods".

5.6. Additional Requirements for Hazardous Materials

5.6.1 The shipment shall be prepared in accordance with the "United Nations Recommendations on the Transport of Dangerous Goods" and other applicable regulations effective at the time of shipment in a manner acceptable to the competent authority of the nation of origin and in accordance with the regulations of all applicable carriers.

5.6.2 Packaging and marking for hazardous material shall comply with the requirements for the mode of transport and the applicable performance packaging contained in the following documents:

a. International air transport: International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air

b. International vessel transport: International Maritime Organization (IMO) International Maritime Dangerous Goods Code (IMDG)

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Acquisition requirements. Acquisition documents must specify the following:

- a. Title and date of this specification
- b. Requirements for certificates of conformance for each lot or shipment of product.
- c. Requirements for age of ammunition.
- d. Requirements and provisions for submission of data as required.
- e. Requirements for acceptance criteria if different than those stated in specification.
- f. Requirements for reduction or elimination of verification procedures.
- g. Requirements and provisions for contractor and Government verification.
- h. Requirements and provisions for packaging of ammunition.
- i. Requirements and provisions for transportation of ammunition.

6.2 Reduction or elimination of verification procedures. The contract or purchase order will state the minimum requirements for reduction or elimination of verification procedures. Ammunition produced within five (5) years of delivery with evidence of continuous controlled storage, evidence of conformance to and in accordance with provided technical data that satisfy requirements of production verification of TABLE II of this specification may be reason to reduce or eliminate verification procedures of TABLE II of this specification.

6.3 Definitions.

6.3.1 Non standard small caliber ammunition. Non standard small caliber munitions are those munitions that have not been safety tested and type classified for Army use, cannot be procured through the Army supply. Munitions and explosives that are not managed by National Inventory Control Points, have not been safety tested nor type classified for Army use, do not have a national stock number (NSN) and cannot be procured or requisitioned through the Army or other Department of Defense supply system.

6.3.2 Technical data. Technical data is the specific technical drawing and Quality Assurance (QA) requirements to which ammunition and associated packaging is produced and accepted for each applicable Contract Line Item Number (CLIN). For the purpose of this specification Technical data, as a minimum, must contain the following: top assembly drawings with revision number, revision date, interface dimensions, and list of component assemblies and drawings with revision dates and key assembly dimensions; packaging and marking drawings with revision number, revision date, and markings; product specification with acceptance test methods, including in-process testing, with sample size, and accept/reject criteria.

6.3.3 Degradation. Ammunition with gross nonconformance to identified technical requirements, corrosion, cracks, deformation, and spillage.

6.3.4 Deterioration. Packaging that is ripped, broken, perforated, water damaged, or crushed.

Preparing activity:
Army-AR

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ANNEX A – Weapon interface

TABLE III. Small Caliber Ammunition Reliability/Confidence Requirements

Item	Weapon Interface	Sample Size ¹
5.45 x 39mm Ball	AK-74 Assault Rifle	99/90 (e.g. 230-0-1)
7.62 x 25mm Ball	Tokarev Pistol	99/90 (e.g. 230-0-1)
7.62 x 39mm Ball	AK-47 Assault Rifle / RPK Light Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 39mm Tracer	AK-47 Assault Rifle / RPK Light Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 39mm Blank	AK-47 Assault Rifle / RPK Light Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R Ball	PKM Machine Gun / PKT Tank Machine Gun / SVD Dragunov Sniper Rifle	99/90 (e.g. 230-0-1)
7.62 x 54mm R Tracer	PKM Machine Gun / PKT Tank Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R Armor Piercing	PKM Machine Gun / PKT Tank Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R Armor Piercing Incendiary	PKM Machine Gun / PKT Tank Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R Armor Piercing Tracer	PKM Machine Gun / PKT Tank Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R Blank	PKM Machine Gun / PKT Tank Machine Gun	99/90 (e.g. 230-0-1)
7.62 x 54mm R 7N1 Sniper	SVD Dragunov Sniper/PSL Rifle	99/90 (e.g. 230-0-1)
9 x 18mm Ball	Makarov Pistol	99/90 (e.g. 230-0-1)
12.7 x 108mm Ball	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12.7 x 108mm Tracer	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12.7 x 108mm Armor Piercing	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12.7 x 108mm Armor Piercing Incendiary	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12.7 x 108mm Armor Piercing Tracer	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12.7 x 108mm Armor Piercing Incendiary Tracer	YaKB Machine Gun / DshKM Machine Gun	99/90 (e.g. 230-0-1)
12 Gauge Slug	Shotgun M590 A1/M1014	99/90 (e.g. 230-0-1)

Notes:

1. Acceptance based on demonstration of reliability / confidence (example sampling plan provided in parenthesis sample size – accept – reject)

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ANNEX B – Technical Requirements¹

TABLE IV. 5.45 x 39mm Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Δ Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Individual max chamber pressure (kgf/cm ²)	Individual min chamber pressure (kgf/cm ²)	Accuracy at 200 m Mean Radius (Unless Specified)
5.45 x 39mm Ball	5.45 x 39mm CIP	≥ 820	≤ 10	≤ 3000	≤ 3200	≥ 2250	≤ 7 cm

TABLE V. 7.62 x 25mm Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Individual max chamber pressure (kgf/cm ²)	Individual min chamber pressure (kgf/cm ²)	Accuracy at 100 m Mean Radius (Unless Specified)
7.62 x 25mm Ball	7.62 x 25mm CIP	≥ 475	≤ 2400	N/A	N/A	≤ 7 cm

TABLE VI. 7.62 x 39mm Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Δ Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Individual max chamber pressure (kgf/cm ²)	Individual min chamber pressure (kgf/cm ²)	Accuracy at 100 m Mean Radius (Unless Specified)
7.62 x 39mm Ball	7.62 x 39mm CIP	≥ 710	≤ 35	≤ 3200	≤ 3650	≥ 2250	≤ 20 cm ≤ 50 cm (R50)
7.62 x 39mm Tracer	7.62 x 39mm CIP	≥ 710	≤ 35	≤ 2800	≤ 3050	≥ 2250	≤ 20 cm ≤ 50 cm (R50)

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TABLE VII. 7.62 x 54mm R Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Δ Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Individual max chamber pressure (kgf/cm ²)	Accuracy at 100m Mean Radius (Unless Specified)
7.62 x 54mm R Ball	7.62 x 54mm R CIP	≥ 780	≤ 40	≤ 2900	≤ 3200	≤ 15 cm
7.62 x 54mm R Tracer	7.62 x 54mm R CIP	≥ 780	≤ 40	≤ 2900	≤ 3200	≤ 15 cm
7.62 x 54mm R Armor Piercing	7.62 x 54mm R CIP	≥ 780	≤ 40	≤ 2900	≤ 3200	≤ 15 cm
7.62 x 54mm R Armor Piercing Tracer	7.62 x 54mm R CIP	≥ 780	≤ 40	≤ 2900	≤ 3200	≤ 15 cm
7.62 x 54mm R 7N1 Sniper	7.62 x 54mm R CIP	≥ 775	N/A	≤ 2900	≤ 3200	≤ 2 cm

TABLE VIII. 9 x 18mm Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Accuracy at 25 m Mean Radius (Unless Specified)
9 x 18mm Ball	9 x 18mm CIP	≥ 310	≤ 1700	≤ 5 cm

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TABLE IX. 12.7 x 108mm Technical Requirements.

Item	Dimensional inspection	Velocity (m/s)	Δ Velocity (m/s)	Average chamber pressure (kgf/cm ²)	Individual max chamber pressure (kgf/cm ²)	Accuracy @ 300m Mean Radius (Unless Specified)
12.7 x 108mm Ball	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm
12.7 x 108mm Tracer	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm
12.7 x 108mm Armor Piercing	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm
12.7 x 108mm Armor Piercing Tracer	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm
12.7 x 108mm Armor Piercing Incendiary	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm
12.7 x 108mm Armor Piercing Incendiary Tracer	As provided in Contractor submitted TDP	≥ 810	≤ 40	≤ 3100	≤ 3400	≤ 30 cm

Notes:

1. For ammunition not meeting the technical requirements, requests for use must be submitted to SFAE-AMO-MAS-NSA for technical evaluation.