NATO STANDARD

AOP-4090

TECHNICAL PERFORMANCE SPECIFICATION PROVIDING FOR THE INTERCHANGEABILITY OF 9 mm x 19 AMMUNITION

Edition A Version 1

JUNE 2020

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED ORDNANCE PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

INTENTIONALLY BLANK

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

30 June 2020

1. The enclosed Allied Ordnance Publication AOP-4090, Edition A, Version 1, TECHNICAL PERFORMANCE SPECIFICATION PROVIDING FOR THE INTERCHANGEABILITY OF 9 mm x 19 AMMUNITION, which has been approved by the nations in the NATO ARMY ARMAMENTS GRUOP (NAAG – AC/225), is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 4090.

2. AOP-4090, Edition A, Version 1, is effective upon receipt.

3. This NATO standardization document is issued by NATO. In case of reproduction, NATO is to be acknowledged. NATO does not charge any fee for its standardization documents at any stage, which are not intended to be sold. They can be retrieved from the NATO Standardization Document Database (https://nso.nato.int/nso/) or through your national standardization authorities.

4. This publication shall be handled in accordance with C-M(2002)60.

Dieter Schmaglowski
Deputy Director NSO
Branch Head P&C

Zoltán GULYÁS
Brigadier General, HUNAF
Director, NATO Standardization Office

INTENTIONALLY BLANK

RESERVED FOR NATIONAL LETTER OF PROMULGATION

INTENTIONALLY BLANK

RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

INTENTIONALLY BLANK

RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

INTENTIONALLY BLANK

TABLE OF CONTENTS

INTENTIONALLY BLANK

CHAPTER 1
AMMUNITION INTERCHANGEABILITY PRINCIPLES

1. The aim of this standard is to standardize 9 mm x 19 Ammunition designs to ensure functional interchangeability between NATO Forces on the battlefield.

2. STANAG 4090 covers 9 mm x 19 combat ammunition. Ammunition natures other than these natures such as, blank or training cartridges, are outside the scope of STANAG / AOP 4090.

3. The following paragraphs in Chapter 2 amplify and interpret the essential NATO military characteristics and specify the technical performance requirements for designs of 9 mm x 19 ammunition submitted for NATO Qualification to ensure functional interchangeability.

4. Under the scope of this standard, interchangeability is understood if the ammunition is in conformance with the performance, functioning and safety criteria as detailed in AEP-97, the Multi-Calibre Manual of Proof and Inspection (MC-MOPI) procedures for 9 mm x 19 ammunition.

5. The ammunition shall function safely and with the specified performance out of all 9 mm x 19 NATO Nominated Weapons to provide direct evidence testing of battlefield interchangeability.

6. The ammunition shall comply with the specifications prepared by national government agencies, which as a minimum should be in accordance with AOP-4090 for the performance requirements (Chapter 2 & Annex B) and the referenced dimensions (Annex A).

7. Where appropriate, the ballistic levels cited in Chapter 2 are to be obtained from the standard proof barrels described in AEP-97, Multi-Calibre Manual of Proof and Inspection after correction using the NATO Reference Ammunition.

8. NATO Reference Ammunition shall be used to verify barrel ballistics characteristics and test equipment as defined in Volume 8 of AEP-97.

9. It should be noted that this standard by itself should not be used for acquisition purposes.

INTENTIONALLY BLANK

CHAPTER 2
TECHNICAL PERFORMANCE REQUIREMENTS FOR 9 mm x 19 AMMUNITION

1. PRESSURE

(*AEP-97, Volumes 12 & 13*)

1a. For ammunition conditioned at + 21 °C, the corrected mean case mouth pressure plus 3 standard deviations shall not exceed 265 MPa when tested with the Kistler Model 6203 pressure transducer or shall not exceed 285 MPa when tested with the Kistler Model 6215 or HPI GP6 pressure transducer. (*AEP-97, Volume 12*)

1b. For ammunition conditioned at + 52 °C or - 54 °C, the corrected mean case mouth pressure shall not vary from the corrected mean case mouth pressure of ammunition conditioned at + 21 °C by more than ± 65 MPa. (*AEP-97, Volume 12*)

1c. For ammunition subjected to the climatic conditioning of Exposed Desert, Continuous Heating or Continuous Arctic, the corrected mean case mouth pressure plus 3 standard deviations shall not exceed 305 MPa when tested with the Kistler Models 6203, 6215* or the HPI GP6 pressure transducers. (*AEP-97, Volume 13*)

1d. For ammunition subjected to the climatic conditioning of Exposed Desert, Continuous Heating or Continuous Arctic, the mean case mouth pressure of the conditioned ammunition shall not vary from the mean case mouth pressure of the unconditioned ammunition by more than ± 50 MPa. (*AEP-97, Volume 13*)

Note*: *For 9 mm, designs that were NATO Qualified using the Kistler Model 6203 transducer will continue to be Production Tested using the Kistler Model 6203 transducer. New 9mm designs submitted for Qualification Approval Testing will be tested using either the Kistler Model 6215 transducer or HPI Model GP6 transducer. All 9mm designs that were NATO Qualified with either the Kistler Model 6215 transducer or HPI Model GP6 transducer will subsequently be NATO Production Tested using either the Kistler Model 6215 transducer or HPI Model GP6 transducer (see AEP-97, Volume 12, para. 12.2.1b.).*

2. VELOCITY

(*AEP-97, Volumes 12 & 13*)

2a. For ammunition conditioned at + 52 °C or - 54 °C, the corrected mean velocity shall not vary from the corrected mean velocity of ammunition conditioned at + 21 °C by more than ± 30 m/s. (*AEP-97, Volume 12*)

2b. For ammunition subjected to the climatic conditioning of Exposed Desert, Continuous Heating or Continuous Arctic, the mean velocity of the treated ammunition shall not vary from the mean velocity of the untreated ammunition by more than ± 20 m/s. (*AEP-97, Volume 13*)

3. ACTION TIME

(*AEP-97, Volumes 12 & 13*)

3a. For ammunition conditioned at +21oC, the maximum individual action time shall not exceed 3 ms. (*AEP-97, Volume 12*)

3b. For ammunition subjected to the climatic conditioning of Exposed Desert, Continuous Heating or Continuous Arctic and then conditioned at - 54 °C, the mean action time plus 5 standard deviations shall not exceed 3 ms. (*AEP-97, Volume 13*)

4. FUNCTION AND CASUALTY

(*AEP-97, Volumes 11 & 14*)

The ammunition shall perform satisfactorily in the NATO Nominated Weapons listed in AEP-97, Volume 10 when fired in accordance with the test requirements defined in AEP-97, Volume 11 at temperatures (+21 °C, -54 °C and +52 °C). The Function and Casualty firing defects shall not exceed the permitted number defined in the relevant table in AEP-97, Volume 14 for any NATO Nominated Weapon type.

5. ENVIRONMENTAL REQUIREMENTS

(*AEP-97, Volumes 12, 13 & 14)*

5a. Compliance with the requirements for performance after temporary heating or cooling will be tested by conditioning the ammunition to + 52 °C and - 54 °C and firing the ammunition at those temperatures. (*AEP-97, Volumes 12 & 14*)

5b. Compliance with the requirements for performance after prolonged climatic storage will be tested by exposure of the ammunition to appropriate intensified storage cycles and subsequent firing of the ammunition at + 21 °C (- 54 °C for action time). (*AEP-97, Volume 13*)

6. FOULING

(*AEP-97, Volumes 14 & 16*)

The ammunition shall be designed to avoid excessive fouling. Satisfactory functioning in the Barrel Erosion Test on prolonged firing and in the Function and Casualty Test in the NATO Nominated Weapons shall be used as a criterion. If fouling is considered excessive, it will be investigated and recorded by the Test Centre in its report for consideration by appropriate NATO authorities.

7. SMOKE AND FLASH

(*AEP-97, Volumes 17*)

The ammunition shall be designed to avoid excessive smoke and flash. Observation of these features will be performed during the Barrel Erosion Test and the Function and Casualty Test in the NATO Nominated Weapons. If a standard of comparison is required, this will be provided by the performance of the reference ammunition. If either smoke or flash is considered excessive, the Test Centre will record this in its report for consideration by appropriate NATO authorities.

8. PRECISION

(AEP-97, Volume 18)

When fired from a precision barrel at a range of 46 metres, the pooled mean of the vertical standard deviations and the pooled mean of the horizontal standard deviations from all targets shall be 50 mm or less for all metal bullets.

9. TERMINAL EFFECTS

(AEP-97, Volumes 12 & 19)

Ammunition which satisfies the requirement for Muzzle Energy shall be considered to have met AOP 4090 requirements for terminal effects.

9a. Muzzle Energy - For ammunition conditioned at + 21 °C, the muzzle energy calculated from the muzzle shall be between 542 joules and 814 joules (≥ 482 joules and ≤ 704 joules when calculated 16 metres from the muzzle) using the Kistler Model 6203 pressure transducer. When using the Kistler Model 6215 or HPI GP6 pressure transducer, the muzzle energy calculated from the muzzle shall be between 551 joules and 823 joules (≥ 491 joules and ≤ 713 joules when calculated 16 metres from the muzzle). This calculation is performed after conducting the EPVAT Test (*AEP-97, Volumes 12).*

9b. Bullet Mass – The mass of the bullets shall be between 7.0 and 8.3 grams.

10. RESIDUAL STRESS

(*AEP-97, Volume 22*)

No brass cartridge case shall display either splits or cracks when subjected to the Residual Stress Test, except as permitted in "I" area of the case in accordance with the technical parameters of AEP-97. A split is defined as a separation of the metal entirely through the wall of the case. A crack is a surface condition and represents a separation of the metal not entirely through the case wall.

11. PRIMER SENSITIVITY

(*AEP-97, Volume 23*)

When tested by a run-down method, using a ball of 55 g, the mean height of fire (H) and standard deviation (sd) shall meet the following requirements:

11a. H + 5 standard deviations shall be less than or equal to 350 mm.

11b. H - 2 standard deviations shall be greater than or equal to 75 mm.

12. BULLET EXTRACTION

(*AEP-97, Volume 24*)

The force required to extract the bullet from the cartridge shall not be less than 200 newtons.

13. PROPELLANT AND PRIMER MIX COMPOSITION

(*AEP-97, Volume 25*)

NATO does not specify the chemical composition for propellant or primer composition contained in ammunition submitted for NATO qualification. However, once acceptability of an ammunition design is established and the design is qualified, then all subsequent production of that ammunition design, which bears the NATO Symbol of Interchangeability on the basis of that qualification, must contain the same propellant and primer composition as were identified in the Qualification Approval sample.

14. WATERPROOF

(*AEP-97, Volume 26*)

The ammunition shall be considered to have met the waterproof requirement if no more than fifteen percent (15%) of the cartridges tested display leaks in accordance with the technical parameters of AEP-97.

15. PACKAGING AND STORAGE – CAPABILITY OF WITHSTANDING TRANSPORTATION

15a. NATO ammunition shall be produced from materials and using processes which assure a long shelf life. Ammunition shall be packaged in waterproof containers sufficiently rugged to withstand service use.

15b. Ammunition will not be specifically tested to assess these features. However, when NATO ammunition is assessed for compliance with transportation and rough-handling requirements, the assessment shall be of ammunition in its complete tactical pack.

16. MARKING

NATO ammunition and its packaging shall be marked in accordance with AOP-2.

17. QUALIFICATION OF OTHER DESIGNS

This standard is structured to ascertain an ammunition's design in order for it to be interchanged on the battlefield among NATO and Partner Member Forces. While this standard is only structured for conventional cartridges, however, other designs may also be submitted for NATO Qualification Approval. These designs will only be assessed to the requirements described within the standard but upon successful qualification will allow the NATO Member Forces to apply the NATO Symbol of Interchangeability to these other ammunition designs thereby increasing the logistical stockpile available in theater. However, should it be determined by higher NATO authority that an additional requirement should be pursued, the NATO body implementing this standard will formulate appropriate requirements and tests to assess suitability of the design to those new requirements.

ANNEX A - 9 mm x 19 STANADARDIZATION DRAWINGS

A.1. SHEET 1 – 9 mm x 19 CARTRIDGE & CASE DIMENSIONS
A.2. SHEET 2 – 9 mm x 19 PROOF WEAPON CHAMBER & BARREL

Please note the following:

Note 1: The drawings are for reference only and are NOT to be used for manufacture, dimensions are for guidance only. Please refer to the drawings published in AEP-97, Volume 6 – NATO Test Equipment and Visual Standards.

Note 2: Deviations are allowed if all other requirements of AEP-97 (incl. functioning in the NATO Nominated Weapons) are met.

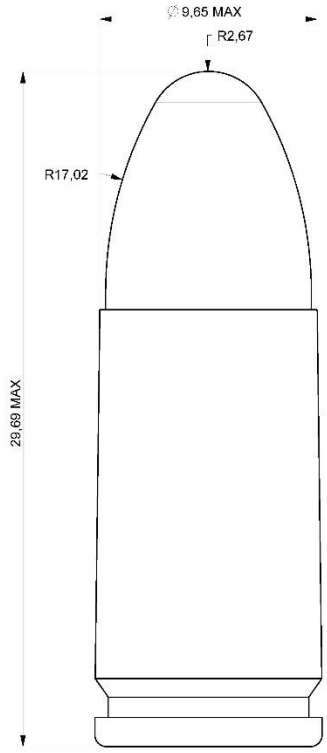
A.1. SHEET 1 – 9 mm x 19 CARTRIDGE

DO NOT SCALE DRAWING

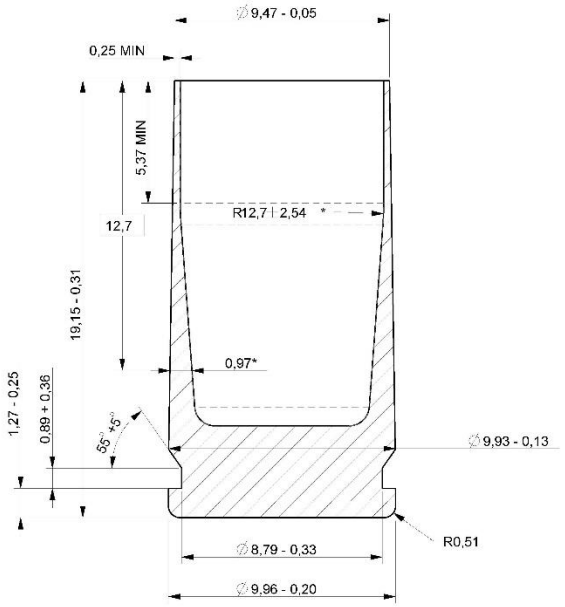
AOP 4090 - SHEET 1
STANDARDISATION DRAWING
9 mm x 19 CARTRIDGE

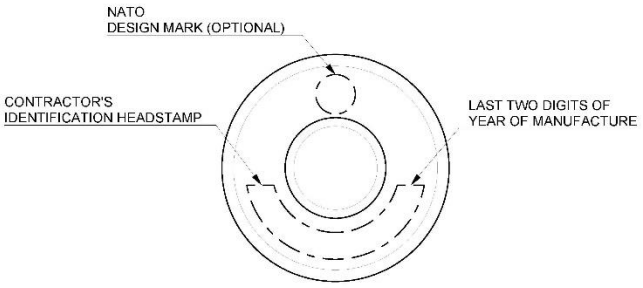
ALL DIMENSIONS ARE IN MILLIMETERS

CARTRIDGE



SECTION OF CARTRIDGE CASE





NOTES:
1. THE LACK OF PRIMER POCKET DETAILS ON THE CARTRIDGE AND CASE DRAWING IS INTENTIONAL. THIS DETAIL IS NOT PRESENTED HERE DUE TO THE DIFFERENCE IN PRIMER TYPES (I.E. BOXER / BERDAN) THAT MAY BE UTILIZED.
2. THE TOLERANCE ON ANY ANGLE SHOWN UNTOLERANCED IS DERIVED FROM THE ASSOCIATED LINEAR DIMENSIONS.
3. MINIMUM HARDNESS FOR BRASS RIM AND ALONG WALLS OF PRIMER (CAP) CHAMBER: 140 DPM VICKERS.
4. RADII ARE CONSTRUCTIONAL AND CONTROL MAXIMUM ROUND PROFILE ONLY.
5. *DIMENSIONS ARE FOR GUIDANCE ONLY.

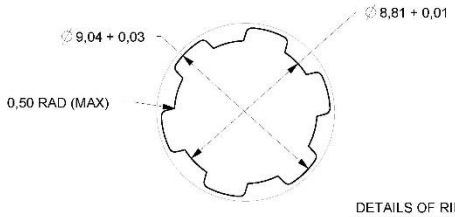
THIS DRAWING IS FOR REFERENCE ONLY AND NOT TO BE USED FOR MANUFACTURE
UPDATED 11-06-20

A.2. SHEET 2 – 9 mm x 19 PROOF WEAPON CHAMBER & BARREL

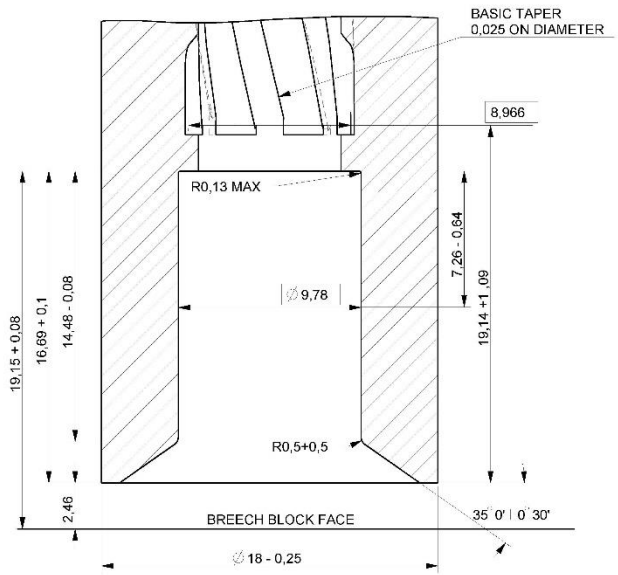
DO NOT SCALE DRAWING

AOP 4090 - SHEET 2
STANDARDISATION DRAWING
9 mm x 19 PROOF WEAPON
CHAMBER & BARREL

ALL DIMENSIONS IN MILLIMETERS



DETAILS OF RIFILING:
6 GROOVES RIGHT HAND TWIST
1 TURN IN 250 MM
BARREL LENGTH 199 MM



NOTE:
1. THE TOLERANCE ON ANY ANGLE SHOWN UNTOLERANCED IS DERIVED FROM THE ASSOCIATED LINEAR DIMENSION.

THIS DRAWING IS FOR REFERENCE ONLY AND NOT TO BE USED FOR MANUFACTURE
UPDATED 11-06-20

INTENTIONALLY BLANK

ANNEX B – 9 mm x 19 REQUIREMENTS TABLE

B.1. SHEET 1 – 9 mm x 19 REQUIREMENTS TABLE
B.2. SHEET 2 – 9 mm x 19 REQUIREMENTS TABLE (cont.)
B.3. SHEET 3 – 9 mm x 19 REQUIREMENTS TABLE (cont.)

PARA. #	PERFORMANCE REQUIREMENTS	TEMP	VALUES	VALUES	UNITS	AEP-97 VOL. #
	Piezoelectric Transducer Type *(if applicable)*		***Kistler 6203***	***HPI GP6*** *or* ***Kistler 6215***		
	CASE MOUTH PRESSURE					
--	Maximum Corrected Mean Case Mouth Pressure	+21 °C	No Requirement	No Requirement	MPa	12
1a	Maximum Corrected Mean Case Mouth Pressure + 3 Std Dev	+21 °C	265	285	MPa	12
1b & 5a	Maximum Mean Case Mouth Pressure Δ from +21° C sample	+52 °C	+65 to -65	+65 to -65	MPa	12
1b & 5a	Maximum Mean Case Mouth Pressure Δ from +21° C sample	-54 °C	+65 to -65	+65 to -65	MPa	12
--	Maximum Corrected Mean Case Mouth Pressure	+52 °C	No Requirement	No Requirement	MPa	12
--	Maximum Corrected Mean Case Mouth Pressure	-54 °C	No Requirement	No Requirement	MPa	12
--	Maximum Corrected Mean Case Mouth Pressure + 3 Std Dev	+52 °C	No Requirement	No Requirement	MPa	12
--	Maximum Corrected Mean Case Mouth Pressure + 3 Std Dev	-54 °C	No Requirement	No Requirement	MPa	12
--	Maximum Corrected Individual Case Mouth Pressure	+52 °C	No Requirement	No Requirement	MPa	12
--	Maximum Corrected Individual Case Mouth Pressure	-54 °C	No Requirement	No Requirement	MPa	12
1c & 5b	Maximum Corrected Mean Case Mouth Pressure + 3 Std Dev	AEP-97	305	305	MPa	13
1d & 5b	Maximum Δ between Mean of Treated & Untreated Samples	AEP-97	+50 to -50	+50 to -50	MPa	13
	PORT PRESSURE					
--	Minimum Corrected Mean Port Pressure – 3 Std Dev	+21 °C	No Requirement	No Requirement	MPa	12
--	Maximum Mean Port Pressure Δ from +21° C sample	+52 °C	No Requirement	No Requirement	MPa	12
--	Maximum Mean Port Pressure Δ from +21° C sample	-54 °C	No Requirement	No Requirement	MPa	12
--	Minimum Corrected Mean Port Pressure – 3 Std Dev	+52 °C	No Requirement	No Requirement	MPa	12
--	Minimum Corrected Mean Port Pressure	-54 °C	No Requirement	No Requirement	MPa	12
	VELOCITY					
2a & 5a	Maximum Mean Velocity Δ from +21° C sample	+52 °C	+30 to -30	+30 to -30	m/s	12
2a & 5a	Maximum Mean Velocity Δ from +21° C sample	-54 °C	+30 to -30	+30 to -30	m/s	12
2b & 5b	Maximum Δ between Mean of Treated & Untreated Samples	AEP-97	+20 to -20	+20 to -20	m/s	13
	ACTION TIME					
3a	Maximum Individual Action Time	+21 °C	3	3	ms	12
--	Maximum Mean Action Time + 5 Standard Deviation	-54 °C	No Requirement	No Requirement	ms	12
3b & 5b	Maximum Mean Action Time + 5 Standard Deviation	-54 °C	3	3	ms	13
	FUNCTION & CASUALTY					
4 & 5a	The ammunition shall perform satisfactorily in the NATO Nominated Weapons when fired the Function and Casualty firing defects shall not exceed the permitted number defined in the relevant table in AEP-97, Volume 14 for any NATO Nominated Weapon type.	+21 °C 54 °C +52 °C	per AEP-97	per AEP-97	--	11 & 14
	LINKED AMMUNITION					
--	NATO Chute [1]	--	No Requirement	No Requirement	--	15
--	Free Hanging [1]	AEP-97	No Requirement	No Requirement	--	14
--	Free Helical Flexibility	+21 °C	No Requirement	No Requirement	--	15
--	Free Fanwise Flexibility	+21 °C	No Requirement	No Requirement	--	15
--	Belt Strength (and Firing)	+21 °C	No Requirement	No Requirement	--	15
--	Free Hinging	+21 °C	No Requirement	No Requirement	--	15
--	Cartridge and Link Extractor Pull	--	No Requirement	No Requirement	--	15
--	Cartridge Stripping	--	No Requirement	No Requirement	--	15
--	Dimensional Characteristics	--	No Requirement	No Requirement	--	15
--	Visual Inspection	--	No Requirement	No Requirement	--	15
--	Salt Corrosion Test	--	No Requirement	No Requirement	--	15
	Note [1] Test is conducted and sentenced as part of the Function and Casualty Test					

B.1. SHEET 1 – 9 mm x 19 REQUIREMENTS TABLE

B.2. SHEET 2 – 9 mm x 19 REQUIREMENTS TABLE (cont.)

PARA. #	PERFORMANCE REQUIREMENTS	TEMP	VALUES	VALUES	UNITS	AEP-97 VOL. #
	Piezoelectric Transducer Type *(if applicable)*		***Kistler 6203***	***HPI GP6*** *or* ***Kistler 6215***		
	BARREL EROSION					
	No Requirement					
	FOULING					
6	The ammunition shall be designed to avoid excessive fouling. Satisfactory functioning in the Barrel Erosion Test on prolonged firing and in the Function and Casualty Test in the NATO Nominated Weapons shall be used as a criterion.	per AEP-97	--	--	--	14 & 16
	SMOKE AND FLASH					
7	The ammunition shall be designed to avoid excessive smoke and flash. Observation of these features will be performed during the Barrel Erosion Test and the Function and Casualty Test in the NATO Nominated Weapons.	per AEP-97	--	--	--	17
	PRECISION					
	9 mm All Metal bullets @ 46m					
8	Horizontal Standard Deviation	+21 °C	≤ 50	≤ 50	mm	18
8	Vertical Standard Deviation	+21 °C	≤ 50	≤ 50	mm	18
	TERMINAL EFFECTS					
9	Ammunition which satisfies the 9 mm x 19 requirement for Muzzle Energy shall be considered to have met the requirement for terminal effects.	--	--	--	--	19
9a	Muzzle Energy @ the muzzle	+21 °C	Min: 542 Max: 814	Min: 551 Max: 823	J	12
9a	Muzzle Energy @ 16m from the muzzle	+21 °C	Min: 482 Max: 704	Min: 491 Max: 713	J	12
9b	Bullet Mass	--	Min: 7.0 Max: 8.3	Min: 7.0 Max: 8.3	g	12
	TRAJECTORY MATCH					
	No Requirement					
	TRACER PERFORMANCE					
	No Requirement					
	RESIDUAL STRESS					
10	Brass cased ammunition shall be free from harmful residual stress.	+21 °C	0 Splits 0 Cracks	0 Splits 0 Cracks	--	22
	PRIMER SENSITIVITY (with 55 g ball)					
11a	Mean Height (H) + 5 Standard Deviation	+21 °C	≤ 350	≤ 350	mm	23
11b	Mean Height (H) - 2 Standard Deviation	+21 °C	≥ 75	≥ 75	mm	23
	BULLET EXTRACTION					
12	The force required to extract the bullet from the cartridge	+21 °C	≥ 200	≥ 200	N	24
	PROPELLANT AND PRIMER MIX COMPOSITION					
13	NATO does not specify the chemical composition for propellant or primer composition contained in ammunition submitted for NATO qualification. Once acceptability of an ammunition design is established and the design is qualified, then all subsequent production of that ammunition design, which bears the NATO Symbol of Interchangeability on the basis of that qualification, must contain the same propellant and primer composition as were identified in the Qualification Approval sample.	--	National Requirement	National Requirement	--	25
	WATERPROOF					
14	The ammunition shall be considered to have met the waterproof requirement if not more than 15 % of the cartridges tested display leaks.	+21 °C	≤ 15%	≤ 15%	--	26
5b & 14	After the ammunition has been subjected to Climatic Conditioning the maximum permitted percentage of the treated sample displaying leaks of any type.	+21 °C	≤ 15%	≤ 15%	--	26

B.3. SHEET 3 – 9 mm x 19 REQUIREMENTS TABLE (cont.)

PARA. #	PERFORMANCE REQUIREMENTS	TEMP	VALUES	VALUES	UNITS	AEP-97 VOL. #
	Piezoelectric Transducer Type *(if applicable)*		***Kistler 6203***	***HPI GP6*** *or* ***Kistler 6215***		
	PACKAGING AND STORAGE – CAPABILITY OF WITHSTANDING TRANSPORTATION					
15a	NATO ammunition shall be produced from materials and using processes which assure a long shelf life. Ammunition shall be packaged in waterproof containers sufficiently rugged to withstand service use.	--	National Requirement	National Requirement	--	--
15b	Ammunition will not be specifically tested to assess these features. However, when NATO ammunition is assessed for compliance with transportation and rough-handling requirements, the assessment shall be of ammunition in its complete tactical pack.	--	National Requirement	National Requirement	--	--
	MARKING					
16	NATO ammunition and its packaging shall be marked in accordance with AOP-2.	--	National Requirement	National Requirement	--	--

AOP-4090(A)(1)