NATO STANDARD

AEP-7219

30MM x 113 AMMUNITION AND LINKS FOR AIRCRAFT GUNS

Edition A, Version 1

Date (to be filled by NSO only)
RATIFICATION DRAFT 2

NORTH ATLANTIC TREATY ORGANIZATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

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NATO LETTER OF PROMULGATION

[Date]

1. The enclosed Allied Engineering Publication AEP-7219, Edition A, Version 1, 30MM x 113 AMMUNITION AND LINKS FOR AIRCRAFT GUNS, which has been approved by the nations in the NATO AIR FORCE ARMAMENTS GROUP, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 7219.

2. AEP-7219, Edition A, Version 1, is effective upon receipt

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

Dimitrios SIGOULAKIS
Major General, GRC (A)
Director, NATO Standardization Office

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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.	

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]

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CHAPTER 1 INTRODUCTION

1. The ammunition and links shall comply with the following requirements:

   a. The principal characteristics of 30mm X 113 ammunition shall conform to those detailed in Annex A.

   b. The principal characteristics of the links shall conform to those detailed in Annex B.

   c. Until STANAG 4423 is promulgated, the ammunition shall be designed, tested and assessed in accordance with national requirements. (e.g., OB Pillar Proc P107). Pressure terms shall be in accordance with STANAG 4110.

   d. The ammunition containing fuzes shall be designed, tested and assessed in accordance with STANAGs 4187 and 4157.

   e. The ammunition shall be accepted as safe and suitable for service by the appropriate National Authority in accordance with AOP-15.

   f. The ammunition shall be tested and assessed in accordance with STANAG 4439 for slow and fast cook-off.

   g. The ammunition shall be manufactured in accordance with specifications prepared by national government agencies, which as a minimum should reflect the requirements of this agreement

   a. Stocks of ammunition shall be periodically inspected in accordance with surveillance criteria approved by national government agencies. Ammunition lots not meeting the performance or safety criteria prescribed in this standard shall be considered not suitable for use by NATO forces.

2. Ammunition that meets these requirements shall be marked with the NATO symbol of interchangeability in accordance with AOP-02.

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ANNEX A AMMUNITION CHARACTERISTICS

PHYSICAL CHARACTERISTICS

1. Dimensions. See page A-5.

2. Mass. (For currently fielded ammunition. To be used as a reference only for new design ammunition)

a.	Cartridge	TP 342g	HEDP 342g
b.	Propellant Charge	TP 50g	HEDP 50g

3. Initiation. Electrical.

   a. Primer Sensitivity.

      (1) All fire threshold is 50% of firing point plus three standard deviations and shall be less than 22 VDC.

4. Bullet Pull. The force required to extract the projectile from the cartridge shall be between 12.5kN and 4.9kN.

5. Projectile Torque. The projectile shall withstand a loosening torque of 6.1Nm minimum.

PERFORMANCE CHARACTERISTICS

6. General.

   a. Test Weapon. The nominated test weapon for this ammunition is the 30mm, M230 Automatic Gun or the DEFA 30/550 Aircraft Guns.

   b. Test Barrel. The performance measurements are to be taken using ADEN 30mm test barrel (U.S. part number 9390627) and the M230 30mm test barrel (U.S. part number 9390748) or an approved alternative with rifling and chamber as defined in pages A-6 and A-7 may be used**.**

   c. Temperatures. Performance measurements are to be taken with ammunition conditioned as follows:

Temperature		Time
Ambient:	21°C	2 hours minimum
Cold:	-54°C	12 hours +- 30 min
Hot:	71°C	12 hours +- 30 min

71ºC is the maximum temperature that can be reached by the effect of kinetic heating alone. On removal from the conditioning chambers the ammunition must be fired as soon as possible and the ammunition should not sit in the chamber of the test weapon for more than 30 seconds.

d. Operating Temperature Range. The temperature range over which this ammunition is expected to operate is -54°C to 71°C. This is in accordance with relevant Climatic Categories as defined in AECTP-200 and takes into account kinetic heating and gun firing effects.

7. Pressure. All pressure measurements shall be taking using piezo-electric transducers. All pressure terms shall be in accordance with STANAG 4110.

a. Chamber Pressure. The Extreme Service Condition Pressure (ESCP) + 3sd shall be less than 510 MPa piezo (the Maximum Operating Pressure (MOP)) which shall be less than the System Permissible Maximum Pressure. The standard chamber pressure measurement location shall be 46.0mm from the rear face of the test barrel.

b. Projectile Permissible Maximum Pressure. The Projectile Permissible Maximum Pressure shall be 510MPa piezo.

c. Muzzle Pressure. At all points within the operating temperature range, the mean muzzle pressure shall be less than 41MPa.

8. Action Time.

		Each Cartridge	Test Sample
Temperature		**Action Time**	**Mean Action Time Plus 4 Standard Deviation**
Hot:	71°C ± 5°C	< 4.0ms	<4.0ms
Ambient:	21°C ± 5°C	< 4.0ms	<4.0ms
Cold:	-54°C ± 5°C	< 4.0ms	<4.0ms

9. Accuracy.

a. Dispersion. At 21°C ± 2°C when fired through the test barrel at a range of 61m ± 2m the standard deviation of the impact points about the mean impact point shall not exceed 1.35 mil.

b. Time of Flight. At 21°C ± 2°C when fired through the test barrel at a range of 1000m the time of flight shall be approximately 2 seconds.

10. Stability. The projectile when fired in the operating temperature range from a barrel near to the wear limits (4th quarter of its life) must meet the dispersion requirement out to a range of 1500m.

11. Early Burst. An early burst is considered to have occurred if the projectile functions prior to impact.

12. Normal Impact Function. When fired against 1.6mm (nominal thickness) 2024T3 aluminum alloy sheet the cartridge shall function high order.

13. System Function. The functionality of the rounds shall be evaluated using the highest rate of fire anticipated at any point in the life cycle of the ammunition.

    a. Linkless. The ammunition, when fired in the nominated test weapon with a linkless ammunition handling system, must enable the gun to operate at a rate of fire of 625 ± 25 shots per minute and within the performance specifications of the test weapon across the operational temperature range.

    b. Ground Support Equipment. Ammunition shall be capable of undergoing at least two upload and download cycles into an aircraft gun system at nominal loading rates without compromising the ammunition environmental seal or the ammunition performance in any way.

14. Cook off. Cook-off is the initiation of a round by heat transfer from its surrounding environment. Testing shall be in accordance with STANAG 4439. The nominated test weapon shall be equipped with a positive cook-off safety (open bolt clearing) and double ram prevention.

OPERATIONAL ENVIRONMENT

15. Climate. The ammunition shall be capable of being:
    a. Stored in climatic categories as defined in AECTP-200 for 20 years.
    b. Used in climatic categories as defined in AECTP-200 for 3 months.

16. Packaged Ammunition Environment. Packaged ammunition shall not allow ingress of:

    a. Water in conditions of driving rain as defined in STANAG 4370.

    b. Dust or sand as defined in STANAG 4370.

17. Packaged Ammunition Handling. Packaged ammunition shall be safe to use the following:

    a. Logistic transport vibration and bounce as defined in STANAG 4370.

    b. Dropping from a height of 12m as defined in STANAG 4370.

18. Unpackaged Ammunition. Unpackaged ammunition shall continue to function within specification after:

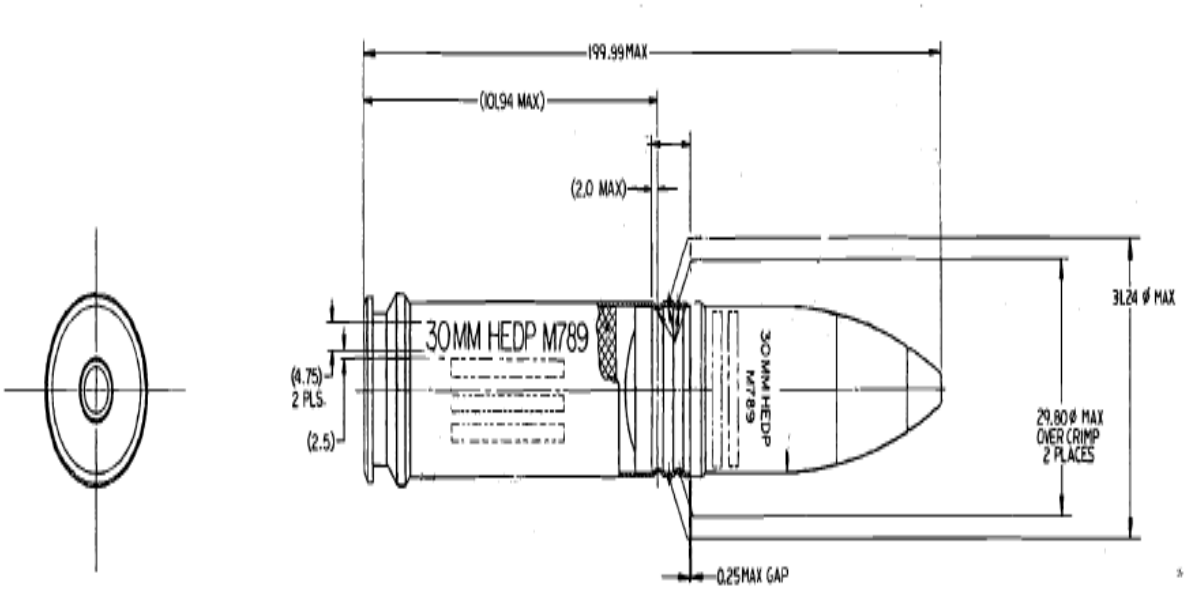
a. Exposure to salt mist for 24 hours as defined in STANAG 4370.

b. Immersion in water for 2 hours as defined in STANAG 4370.

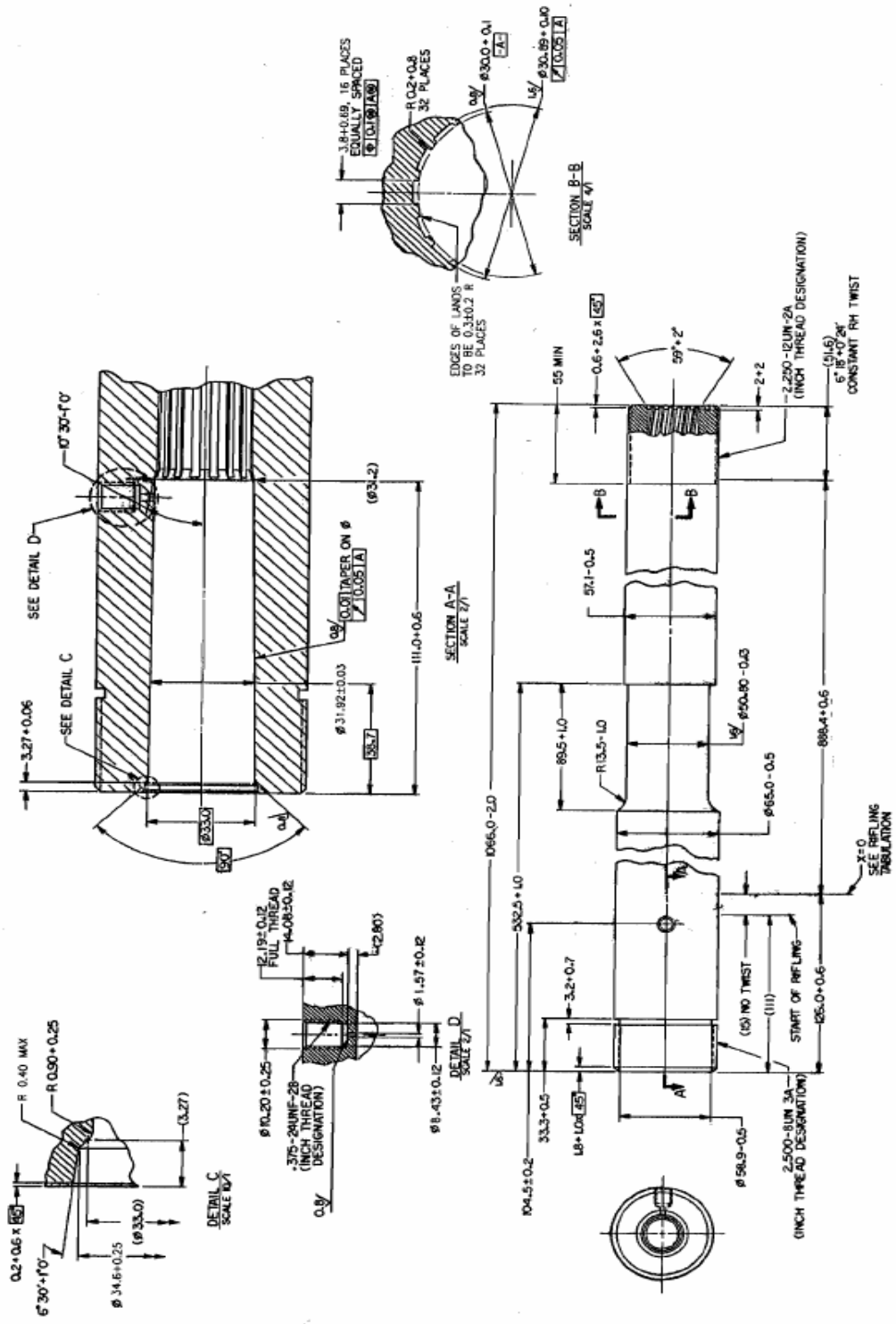
c. Dropping from a height of 1.5m as defined in STANAG 4370.

d. Cycling through the weapon system 2 times.

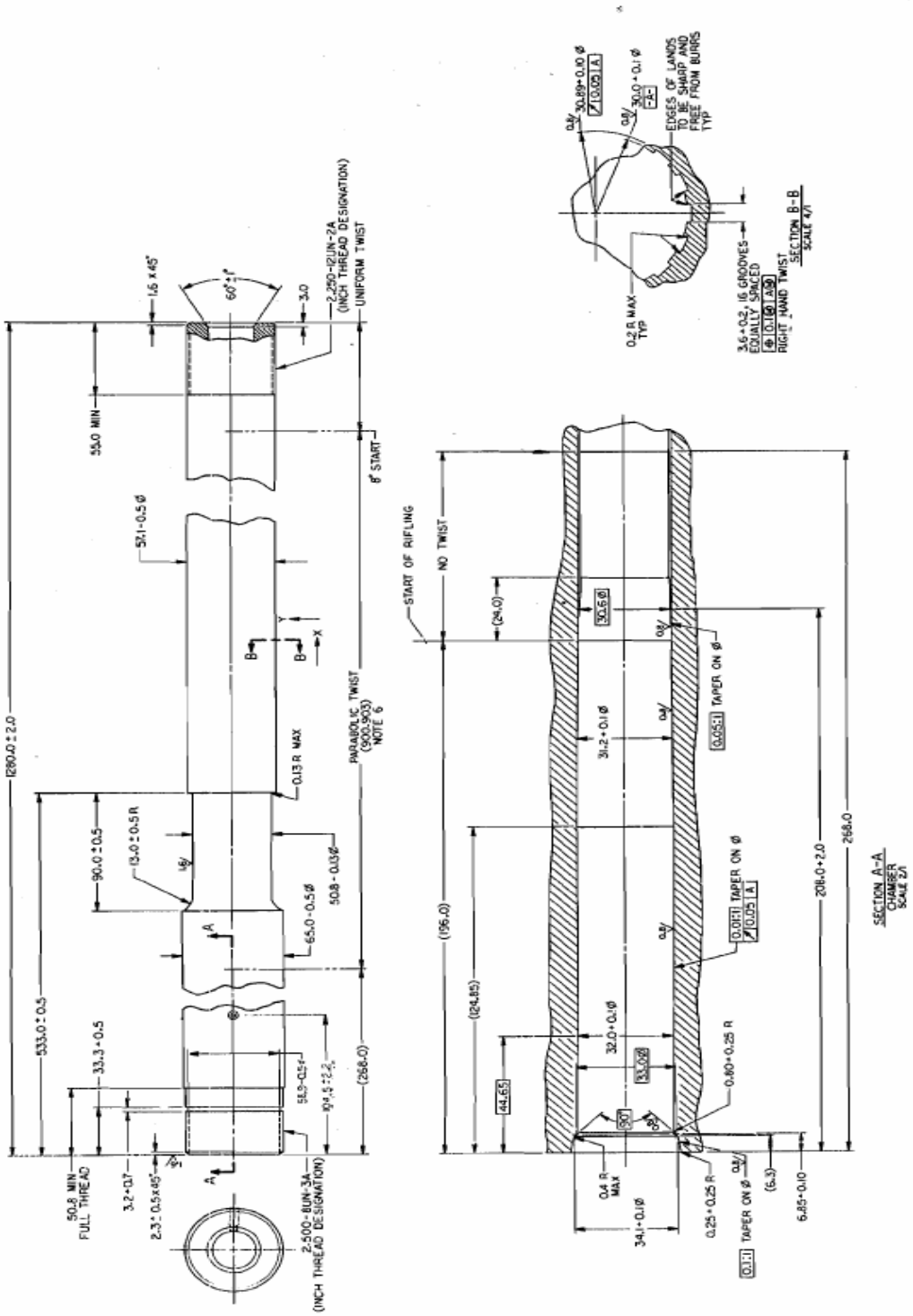
19. Electrical Environment. Packaged and unpackaged ammunition shall not react to the electrical environments specified in AECTP 500 and 250.



EXTERNAL DIMENSIONS, 30 MM X 113 CARTRIDGE
(Typical values, for reference only)



30 MM TEST BARREL
(Typical values, for reference only)



ADEN 30 MM TEST BARREL
(Typical values, for reference only)

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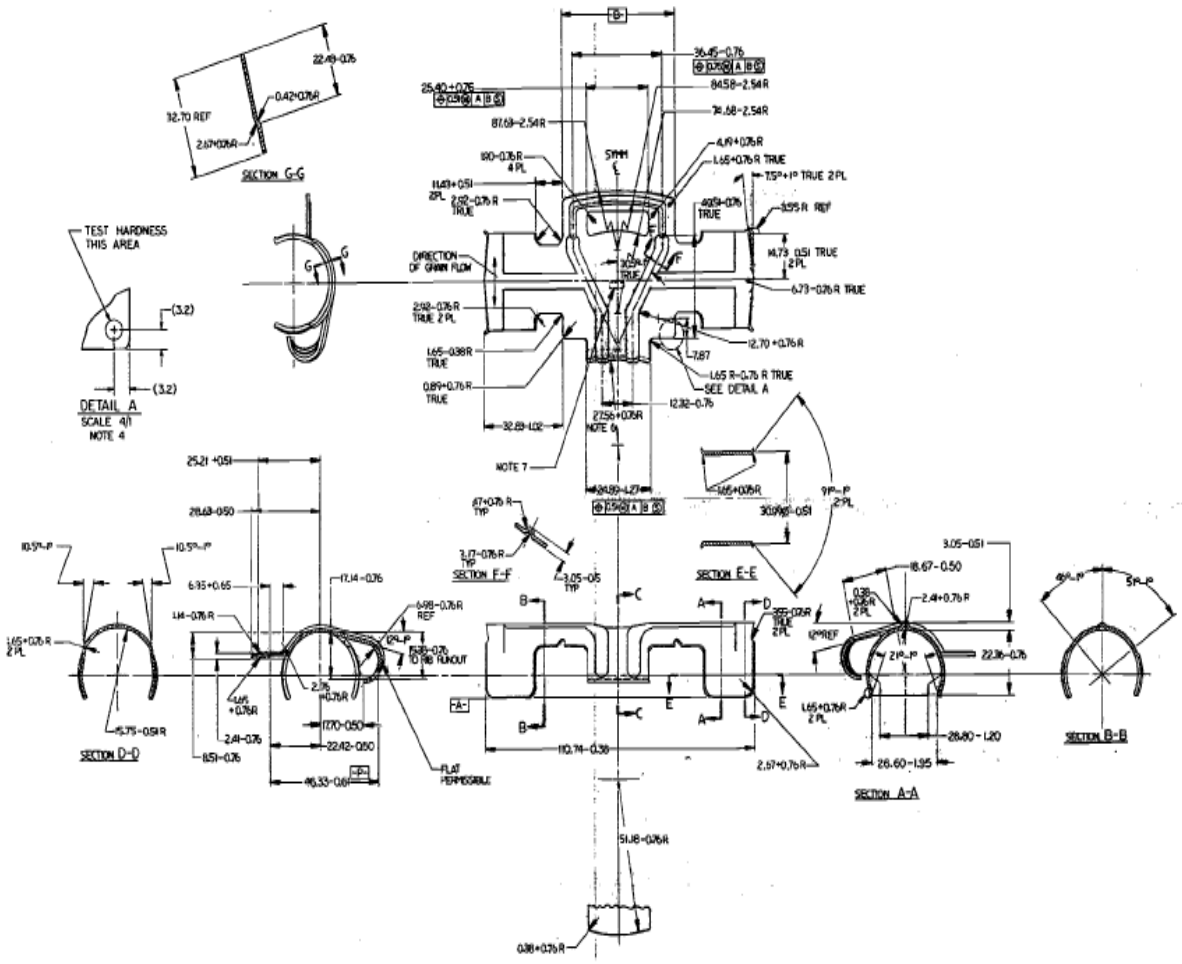
ANNEX B LINK CHARACTERISTICS



EXERNAL DIMENSIONS 30 MM LINK

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