NORTH ATLANTIC TREATY ORGANIZATION
ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD

MILITARY AGENCY FOR STANDARDIZATION (MAS)
BUREAU MILITAIRE DE STANDARDISATION (BMS)
1110 BRUSSELS

MAS/176-MMS/4172
5 May 1993

To : See MAS Distribution List No. 2

Subject : STANAG 4172 MMS (EDITION 2) - 5.56 mm AMMUNITION (LINKED OR OTHERWISE)

References : a. MAS/24-MMS/4172 dated 1 February 1982 (Edition 1)
b. AC/225-D/1231 dated 3 December 1991

Enclosure : STANAG 4172 (Edition 2)

1. The enclosed NATO Standardization Agreement which has been ratified by nations as reflected in page iii is promulgated herewith.

2. The references listed above are to be destroyed in accordance with local document destruction procedures.

3. AAP-4 should be amended to reflect the latest status of the STANAG.

ACTION BY NATIONAL STAFFS

4. National staffs are requested to examine page iii of the STANAG and if they have not already done so, to advise the Defence Support Division, IS, through their national delegation as appropriate of their intention regarding its ratification and implementation.

E./STAI
Major-General, NOAF
Chairman, MAS

92mv
MAS176A

STANAG 4172
(Edition 2)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)

MILITARY AGENCY FOR STANDARDIZATION
(MAS)

STANDARDIZATION AGREEMENT

SUBJECT : 5.56 mm AMMUNITION (LINKED OR OTHERWISE)

Promulgated on 5 May 1993

R. STAI
Major-General, NOAF
Chairman, MAS

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature
2		10/07/01	D. [illegible]

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Chairman MAS under the authority vested in him by the NATO Military Committee.

2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "The declaration by which a nation formally accepts the content of this Standardization Agreement".

5. Implementation is "The fulfilment by a nation of its obligations under this Standardization Agreement".

6. Reservation is "The stated qualification by a nation which describes that part of this Standardization Agreement which it cannot implement or can implement only with limitations".

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page iii gives the details of ratification and implementation of this agreement. If no details are shown, it signifies that the nation has not yet notified the tasking authority of its intentions. Page iv (and subsequent) gives details of reservations and proprietary rights that have been stated.

Agreed English/French texts - 1 - STANAG 4172 (Edition 2)

NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT (STANAG)

5.56 mm AMMUNITION (LINKED OR OTHERWISE)

ANNEXES : A. Standardization Drawing, 5.56 mm Cartridge

B. Standardization Drawing, 5.56 mm Proof Barrel

C. Technical Performance Specification Providing for the Interchangeability of Ammunition linked or otherwise.

RELATED DOCUMENTS :

AC/259-DS/26 paragraph VII(a)(10 - National Armaments Directors Decisions

AC/225(Panel III/SP.1)D/200 - Manual of Proof of Inspection Procedures for NATO 5.56 mm Ammunition

STANAG 2316 - Marking of Ammunition (and its packaging) of a calibre below 20 mm.

AIM

1. The aim of this agreement is to standardize, for the use of the NATO Armed Forces, the essential characteristics of 5.56 mm ammunition types, linked or otherwise, capable of use in both individual and light support weapons, used by the Armed Forces of NATO, to ensure interchangeability on the battlefield.

AGREEMENT

2. The NATO nations agree that only 5.56 mm ammunition which is in accord with this STANAG will be adopted for use in 5.56 mm individual and light support weapons which are or may be in the future adopted or deployed within their armed forces.

APPLICATION

3. To achieve the purpose of this STANAG the NATO nations agree ;

(a) to comply with the Technical Performance Specification attached to this STANAG as Annex C;

(b) to comply with the implementation procedures outlined below;

(c) to adhere to the rules laid down governing the use of the NATO Symbol of Interchangeability.

4. Implementation of this STANAG shall be managed by a NATO body, currently AC/225(Panel III/SP.1), which will assess the compliance with the Technical Performance Specification of this STANAG, of Candidate Ammunition Designs and authorize the use of the NATO Symbol of Interchangeability.

5. This assessment will consist of tests of interchangeability conducted periodically at NATO Test Centres.

6. The nature and frequency of the tests, the test procedures and details of reference cartridges and test equipment, will be codified into a Manual of Proof and Inspection Procedures for NATO 5.56 mm Ammunition, which will become a part of this STANAG by reference as a Related Document (AC/225(Panel III/SP.1)D/200).

7. Ratifying nations agree to submit ammunition samples for test as specified in the Manual of Proof and Inspection Procedures for NATO 5.56 mm Ammunition (AC/225(Panel III/SP.1)D/200).

8. Ratifying nations agree to observe the rules laid down by the NATO body regarding changes to ammunition designs for which the use of the NATO Symbol of Interchangeability has already been authorized.

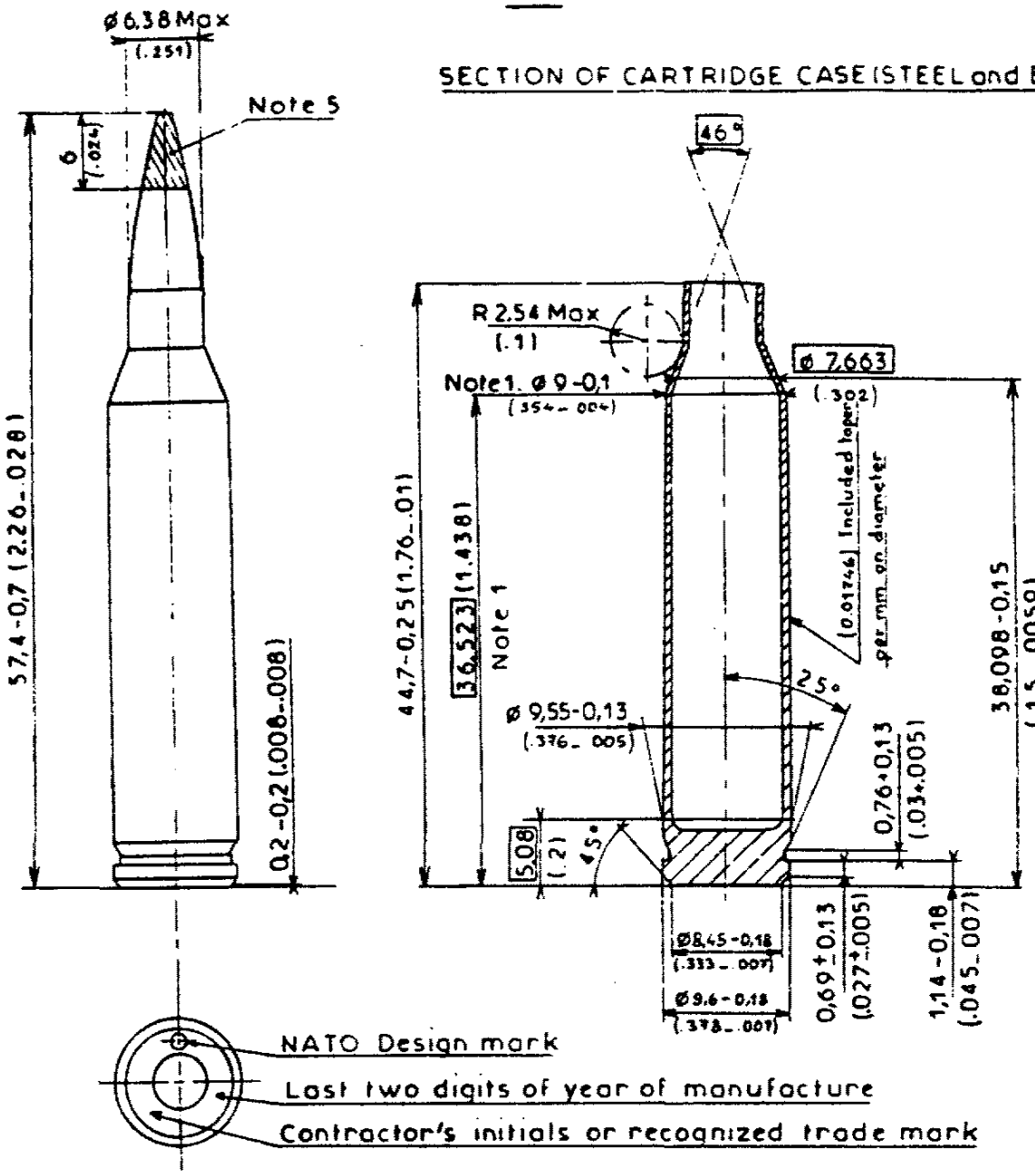
IMPLEMENTATION OF THE AGREEMENT

9. This STANAG will be considered to have been implemented when the ratifying nations have introduced in their forces ammunition which has met the requirements of the Manual of Proof and Inspection Procedures for NATO 5.56 mm Ammunition (AC/225(Panel III/SP.1)D/200).

A - 1

STANDARDIZATION DRAWING 5,56 mm CARTRIDGE

Scale : 2



NOTES

.1. dimensions are in millimetres (between brackets: in inches)

.2. extractive effort of bullet minimum: 20 daN

.3. measurement given to the theoretical interaction of surfaces (maximum material condition (M)).

.4. an included taper (due to variable expansion of material) not exceeding 0,05 is allowed at the mouth.

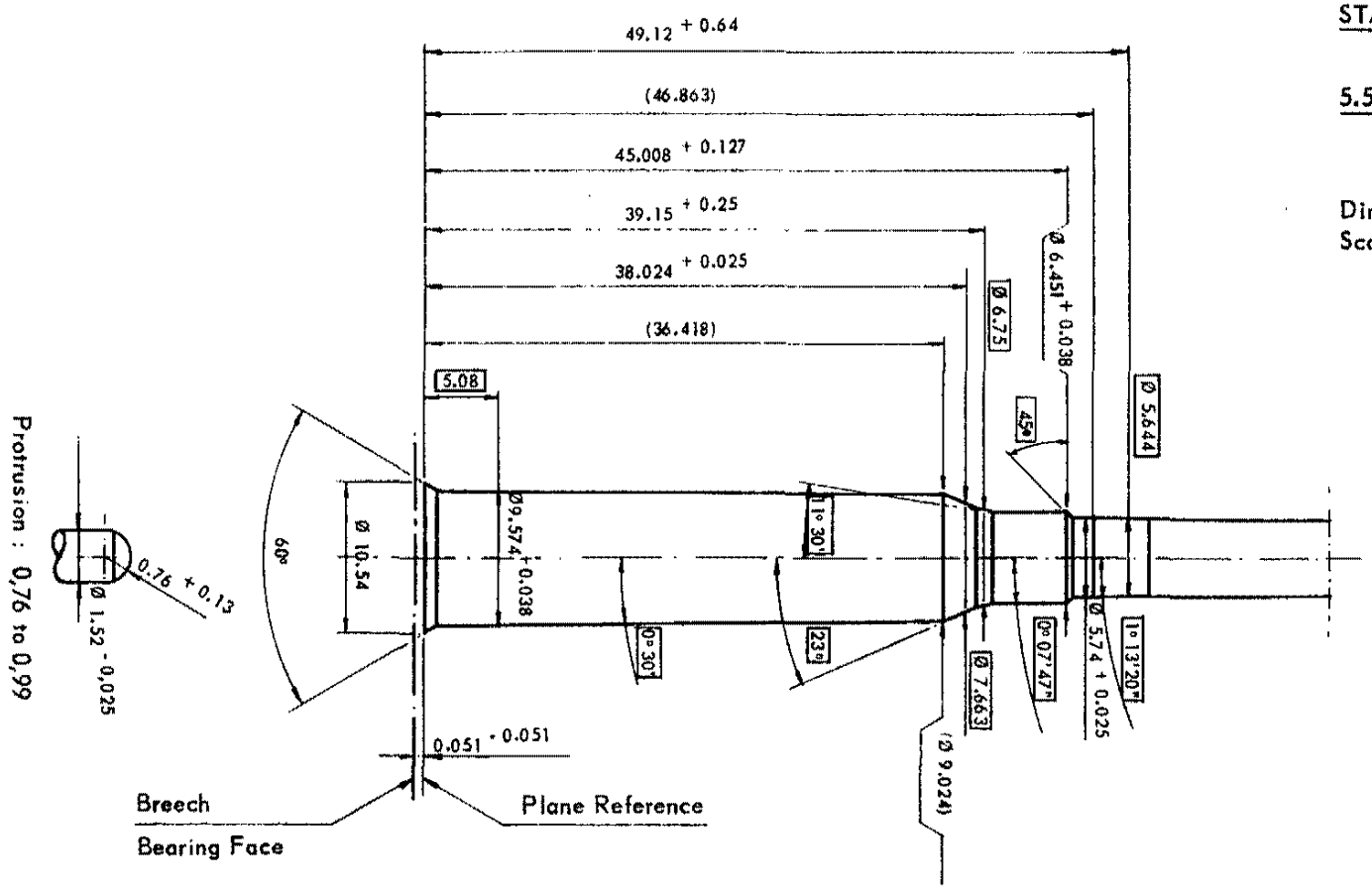
.5. Tip identification in accordance with STANAG 2316

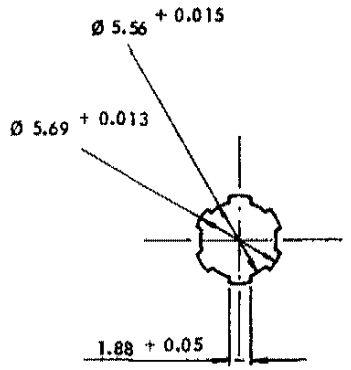
Drawing according to standards ISO 1101/1 (1969) and 1101/2 (1974)

STANDARDIZATION DRAWING

5.56 mm PROOF BARREL

Dimensions in mm
Scale : 5/1 - 2/1





DETAIL OF RIFLING
6 grooves right hand twist
1 turn in 177.8 mm

B-1

NOTES

Length of barrel : 508

Pressure bleed position in relation to the reference plane : CHAMBER : 46,5
PORT : 280 (located in the bottom of a groove)

TECHNICAL PERFORMANCE SPECIFICATION PROVIDING FOR THE INTERCHANGEABILITY OF AMMUNITION LINKED OR OTHERWISE

GENERAL

1. The NATO 5.56 mm cartridge designs will be required to comply with the essential characteristics of the cartridge selected for standardization by the National Armaments Directors as recorded in paragraph VII(a)(1) to AC/259-DS/26 and as amplified and interpreted in the following paragraphs.

2. Where appropriate the ballistic levels cited below are to be obtained from the standard proof barrel described in Annex B and in the Manual of Proof and Inspection Procedures and corrected by the NATO reference cartridge. (Belgian ball cartridge SS109).

PRECISION

3. When fired from a standard proof barrel at a range of 600 m, all shots shall be in a group whose horizontal and vertical standard deviations are 225 mm or less for all metal bullets and 340 mm or less for tracer and other pyrotechnic bullets.

TRAJECTORY

4. The mean point of impact of all types of ammunition at 600 m must not deviate above or below the mean point of impact of the referenced cartridge, in a vertical direction, by more than 300 mm.

5. The maximum ordinate of a trajectory to 300 m range must not be greater than 250 mm.

TERMINAL EFFECTS

6. Bullets, except tracers. shall completely perforate at 21 degrees C the mild steel plate of 3.5 mm nominal (10 gauge) thickness defined in SAE1010 or SAE1020 minimum hardness Rockwell B55 Maximum B70 placed at 570 m from the muzzle at 0 degrees obliquity (normal to the line of fire) according to test requirements specified in the Manual of Proof and Inspection Procedures.

MUZZLE ENERGY

7. Each NATO cartridge design shall produce a muzzle energy in the standard NATO proof barrel of not less than 1,500 joules.

VELOCITY

8. Each NATO design shall be designed to obtain an appropriate velocity level which together with the nominal mass selected for the bullet used is to comply with the relevant requirements of this STANAG.

9. Velocity shall be subsequently monitored as detailed in the Manual of Proof and Inspection Procedures to ensure continuing compliance with requirements, and in particular trajectory matching with the reference round.

CHAMBER PRESSURE AND PORT PRESSURE

10. When measured at 21 degrees C, the average chamber pressure shall not exceed 380 MPa and the average pressure plus three standard deviations shall not exceed 420 MPa.

11. The average pressure at the gas port minus three standard deviations shall not be less than 88 MPa when measured at 21 degrees C.

12. The values apply only with electronic apparatus defined by NATO for use with 5.56 mm ammunition. However, these values may be amended by Sub-Panel 1 or by the NATO body established to replace it, to take account of differences of measurement levels resulting from the use of measuring apparatus other than that used by the NATO Small Arms Test Control Commission to evaluate the reference cartridge.

ACTION TIME

13. The average action time (defined as the sum of the primer ignition time, propellant burning time and the time taken by the bullet to reach the gas port) of each design, plus five standard deviations, shall not exceed 3 milliseconds when fired at -54 degrees C as described in the Manual.

PRIMER SENSITIVITY

14. When tested by a run-down procedure as described in the Manual of Proof and Inspection Procedures, using a ball of 111,7 q to determine the mean height of fire and standard deviation (H and s).

H + 5s shall be equal to or less than 450 mm

H - 2s shall be equal to or greater than 75 mm

TRACER PERFORMANCE

15. Tracer bullets shall produce a continuous trace visible by day throughout its burning range from points in the vicinity of the gun.

16. The trace shall be invisible or dim for a least 13 m from the muzzle, it shall reach acceptable brilliance by at most 140 m and maintain that brilliance to a range of at least 600 m from the muzzle.

17. The performance shall be evaluated under conditions laid down in the Manual of Proof and Inspection Procedures.

BARREL EROSION

18. Ammunition with all metal bullets shall be free from design features which render barrels unserviceable due to erosion in less than 5,000 rounds.

19. Compliance with this requirement shall be tested in an appropriate weapon, as laid down in the Manual of Proof and Inspection Procedures, and according to the firing cycles and requirements specified in the Manual.

FUNCTION AND CASUALTY TEST - SPECIFICATION OF NOMINATED WEAPONS

20. The ammunition, linked or not, is to function in, and cause to function satisfactorily, the Nominated Weapons established as primary tests of interchangeability, at 21 degrees C, and under the temperature conditions specified in paragraph 26 below. For linked ammunition, functional firing shall be done using weapon configurations which represent actual conditions of utilization. Linked ammunition shall be subjected to the test described in paragraph 29 and shall function correctly in specified weapon configurations.

NB: Function testing of linked ammunition reflects on the correct functioning of an ammunition/link combination and shall not result in the NATO standardization of the link alone.

21. Ratifying nations are invited to nominate service weapons and special weapon configurations for use as primary tests of interchangeability of ammunition, linked or not. Nations nominating weapons or special weapon configurations for this rôle agree to freeze the essential features of the design of sufficient weapons or special weapon configurations and spares to support function test requirements of ammunition, linked or not.

22. In addition, ratifying nations who submit weapons or special weapon configurations for nomination agree to supply, at manufacturing cost, to nations who wish to develop ammunition, linked or not, to meet the requirements of this STANAG, weapons or weapon configurations of the type concerned as necessary for the ammunition development by those nations.

SMOKE AND FLASH

23. 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 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 their report for consideration by appropriate NATO authorities.

FOULING

24. The Ammunition shall be designed to avoid excessive fouling. Satisfactory functioning in the Erosion Test on prolonged firing, and in the Function and Casualty Test in Nominated Weapons, shall be used as a criterion that fouling is not excessive. If malfunctioning occurs, the degree of fouling will be investigated, and if it is considered excessive, the Test Centre will record this in their report for consideration by appropriate NATO authorities.

ENVIRONMENTAL REQUIREMENTS - TEMPERATURE - CLIMATIC STORAGE

25. Ammunition shall remain safe and be capable of satisfactory performance when temporarily heated to a high temperature or cooled to a low temperature and after storage under service climatic conditions, Tropical, Arctic and Desert for an appropriate period.

26. Compliance with the requirements for performance after temporary heating or cooling will be tested by conditioning the ammunition, linked or not, to specified high and low temperatures and firing at these temperatures, i.e. at +52 degrees C and -54 degrees C.

27. 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 trials at 21 degrees C.

28. Details of the test requirements and maximum permitted ballistic changes appear in the Manual.

CORROSION RESISTANCE - STEEL CASED AMMUNITION - LINKS

29. Ammunition with steel cases and links shall be protected against corrosion. Compliance will be tested by a Salt Spray Test as specified in the Manual of Proof and Inspection Procedures.

RESIDUAL STRESS - BRASS CASED AMMUNITION

30. The cases of brass cased ammunition shall be free from harmful residual stress. Compliance will be tested by a Mercurous Nitrate Test as specified in the Manual of Proof and Inspection Procedures.

BULLET PULL

31. The force required to extract the bullet from the cartridge case shall be tested by a technique and to requirements specified in the Manual of Proof and Inspection Procedures.

WATERPROOFING

32. Ammunition shall be waterproof. Compliance will be tested by a technique and to requirements specified in the Manual of Proof and Inspection Procedures

PACKAGING AND STORAGE - CAPABILITY OF WITHSTANDING TRANSPORTATION

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

34. 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.

MARKING

35. NATO ammunition and its packaging shall be marked in accordance with STANAG 2316.

UNCONVENTIONAL DESIGNS - REQUIREMENTS

36. This STANAG is structured for conventional brass and steel cased cartridges with conventional propellants, cap and tracer compositions as, for example, standardized in 7.62 mm. The STANAG is not intended to exclude other types of cartridge, but should a country wish to submit for NATO Qualification Approval a cartridge embodying unconventional design features or materials, the NATO body implementing this STANAG will formulate other appropriate requirements and tests to assess suitability of the design. Such tests will include assessment of safety risks, e.g. cook-off. This evaluation shall be made by comparison with the reference cartridge.