COPY NO. 206

NORTH ATLANTIC TREATY ORGANIZATION

MILITARY AGENCY FOR STANDARDIZATION (MAS)

34-35 CHESHAM PLACE, LONDON, S.W.1.

ARMY BOARD

MAS(ARMY)(60)280

15 August, 1960

Telephone SLOane 0822
Ext.31

Memorandum : French/English ARMY/AIR/NAVY

For : All Members and Accredited Representatives, Army Board, Military Agency for Standardization.

Information : Remainder of List "B".

Subject : STANAG NO.4041 - SPECIFICATION FOR DNT (DINITROTOLUENE) FOR PROPELLANTS

Enclosure : STANAG NO.4041

1. Enclosed is a copy of STANAG No.4041 on the above subject which has been ratified by all NATO nations except German Federal Republic, and Luxembourg who do not oppose its promulgation.

2. This Agreement is for use by NATO Armed Forces.

3. Implementation. Reference MAS(ARMY)(56)102 of 13th July, 1956, and paragraph 207 of AAP-4(D), dated 1st January, 1960, you are requested to notify the Secretariat:-

a. at what date your National Authorities feel they will be able to implement this STANAG, and

b. as soon as possible after the event, on what date the STANAG has actually been implemented.

FOR THE MILITARY AGENCY FOR STANDARDIZATION:

J.P.E. BERNATCHEZ,
Major General, Canadian Army,
Chairman, MAS.

AJS.

STANAG No. 4041

COPY No.

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

MILITARY AGENCY FOR STANDARDISATION
BUREAU MILITAIRE DE STANDARDISATION

STANDARDISATION AGREEMENT
ACCORD DE STANDARDISATION

SUBJECT

OBJET

SPECIFICATION FOR DNT (DINITROTOLUENE) FOR PROPELLANTS

SPECIFICATION RELATIVE AU DINITROTOLUENE (DNT) POUR POUDRE

D 459 Wt. P79065 4/60 Gp. 807 (1252)

STANAG NO.4041

TERMS OF AGREEMENT

OBJECT

1. The purpose of this agreement is to standardize the minimum requirements for the propellant ingredient DNT (Dinitrotoluene) and thus make it acceptable to all NATO member countries.

The standard specification is divided into two parts:

(a) physical and chemical characteristics of DNT (Dinitrotoluene),

(b) testing methods for DNT (Dinitrotoluene).

The standard specification set out in the present agreement will engage individual countries to accept from other countries DNT (Dinitrotoluene) manufactured to this agreement, while keeping their own severer specifications for internal use if they so desire.

RELATED DOCUMENTS

2. NIL..

NATIONAL RATIFYING REFERENCES

3. Belgium	: SGA/002(58), 8th October, 1958.	: ARMY/NAVY/AIR
Canada	: E-1629, 12th September, 1958.	: ARMY/NAVY/AIR
Denmark	: 4 kt. 217-38, 7th March, 1959.	: ARMY/NAVY/AIR
France	: 1248/SP, 16th June, 1960	: ARMY/NAVY/AIR
German Federal Republic	:	:
Greece	: 1233/090/3, 14th March, 1959.	: ARMY/NAVY/AIR
Italy	: 5398, 15th October, 1958.	: ARMY/NAVY/AIR
Netherlands	: 1705, 4th February, 1959.	: ARMY/NAVY/AIR
Norway	: FDI No.6834/60/201.46,27 July 60	: ARMY/NAVY/AIR
Portugal	: 178, 10th November, 1958.	: ARMY/NAVY/AIR
Turkey	: 37/P-51, 23rd January, 1959.	: ARMY/NAVY/AIR
United Kingdom	: 2441/89/58, 11th December, 1958.	: ARMY/NAVY/AIR
United States	: LOG/E3-18673, 11th May, 1959.	: ARMY/NAVY/AIR

IMPLEMENTATION DETAILS

	Forecast Date	Actual Date
4. Belgium	:	
Canada	:	
Denmark	:	
France	:	
German Federal Republic	:	
Greece	:	
Italy	:	
Netherlands	:	
Norway	:	
Portugal	:	
Turkey	:	
United Kingdom	:	
United States	:	

SUPPLEMENTS

5. Supplements to this agreement may be proposed at any time by any of the participants and will be processed in the same manner as the basic agreement.

AGREEMENT

6. The provisions stated on the following pages (3 in number) have been approved in accordance with the terms stated above by the countries listed and no departure will be made from this agreement without prior consultation with the Military Agency for Standardization and the Production and Logistics Division.

7. It is further agreed that when National implementation action in this STANAG is taken, reference will be made to the STANAG number whenever practicable, for identification purposes.

FOR THE MILITARY AGENCY FOR STANDARDIZATION:

J.P.E. BERNATCHEZ,
Major General, Canadian Army,
Chairman, MAS.

Date of promulgation 15th August, 1960.

DETAILS OF AGREEMENT

GENERAL

1. The North Atlantic Treaty Organization countries shown in paragraph 3 of the Terms of Agreement have agreed to adopt standardized specifications for DNT (Dinitrotoluene). Technical details are given in the following paragraphs 3 to 8.

SCOPE OF THE AGREEMENT

2. All DNT (Dinitrotoluene) manufactured in NATO countries to be delivered to another NATO country shall comply with the following minimum requirements.

PART I: PHYSICAL AND CHEMICAL CHARACTERISTICS

COMPOSITION

3. The DNT (Dinitrotoluene) shall consist essentially of 2.4 dinitrotoluene according to the formula:

APPEARANCE AND GRANULATION

4. The material shall be pale yellow and shall satisfy the granulation conditions specified by the receiving country. If desired for certain purposes, a flake form may be used.

CHEMICAL DATA

(a) Setting point:	min. 65.5°C.
(b) Moisture and volatile matter:	max. 0.25%
(c) Acidity (as sulphuric acid):	max. 0.005%
(d) Alkalinity:	nil
(e) Insoluble matter (in benzene):	max. 0.1%
(f) Tetranitromethane:	traces

PART II: TESTING METHODS

GENERAL

6. When the description of the apparatus to be used is not completely given, the characteristics of the material will be determined by the normal laboratory procedure.

PHYSICAL TESTS

7. Visual Examination

The material will be examined during sieving and, in the molten state, during the determination of the solidification point, it shall not have ary apparent traces of impurities.

CHEMICAL TESTS

8. (a) Setting point

Dry a 40 to 50 g. sample for 4 hours at 40°C. Introduce the sample into the inner tube of the apparatus to determine setting point and melt

(see sketch of the apparatus attached at Annex).

Place the tube in the apparatus and adjust the standard thermometer until the bulb is in the middle of the liquid. Place in position the side thermometer employed for the emergent column correction.

Stir ther molten mass vigorously with the hand stirrer until the solidification starts and the temperature rises. Carefully read the temperature at this moment and then every 15 seconds until the maximum reading is obtained.

Apply the emergent column correction by adding the value calculated from the formula:

$$N(T-t) \times 0.000159$$

where: N = number of degrees exposed of emergent mercury column

T = uncorrected setting point

t = mean temperature of emergent mercury column. This is determined by the side thermometer which shall be placed with its bulb in the centre of the emergent column of the standard thermometer.

0.000159 = apparent coefficient of expansion of mercury in glass.

The setting point is the corrected reading.

(b) Moisture and volatile matter

Weigh an approximately 5 g. sample on a tared watch glass and spread carefully.

Dry for one hour in a desiccator over calcium chloride (pressure reduced to (380 ± 2)mm. mercury).

The desiccator shall be maintained at a temperature of (25 ± 5)°C.

Express the loss of weight as percentage moisture and volatile matter.

(c) Acidity and alkalinity

Melt a sample of about 10 g. shake with 100 ml. of neutral boiling water and leave to cool. Decant the supernatent liquid.

Remelt the sample and extract again with 50 ml. of neutral boiling water. Unite the aqueous extracts, cool and add bromothymol blue.

If the solution is acid, titrate with 0.01 N sodium hydroxide.

Carry out a blank test, apply the resulting correction and express acidity as sulphuric acid.

During the above test an alkaline reaction with bromothymol blue indicates excessive alkalinity.

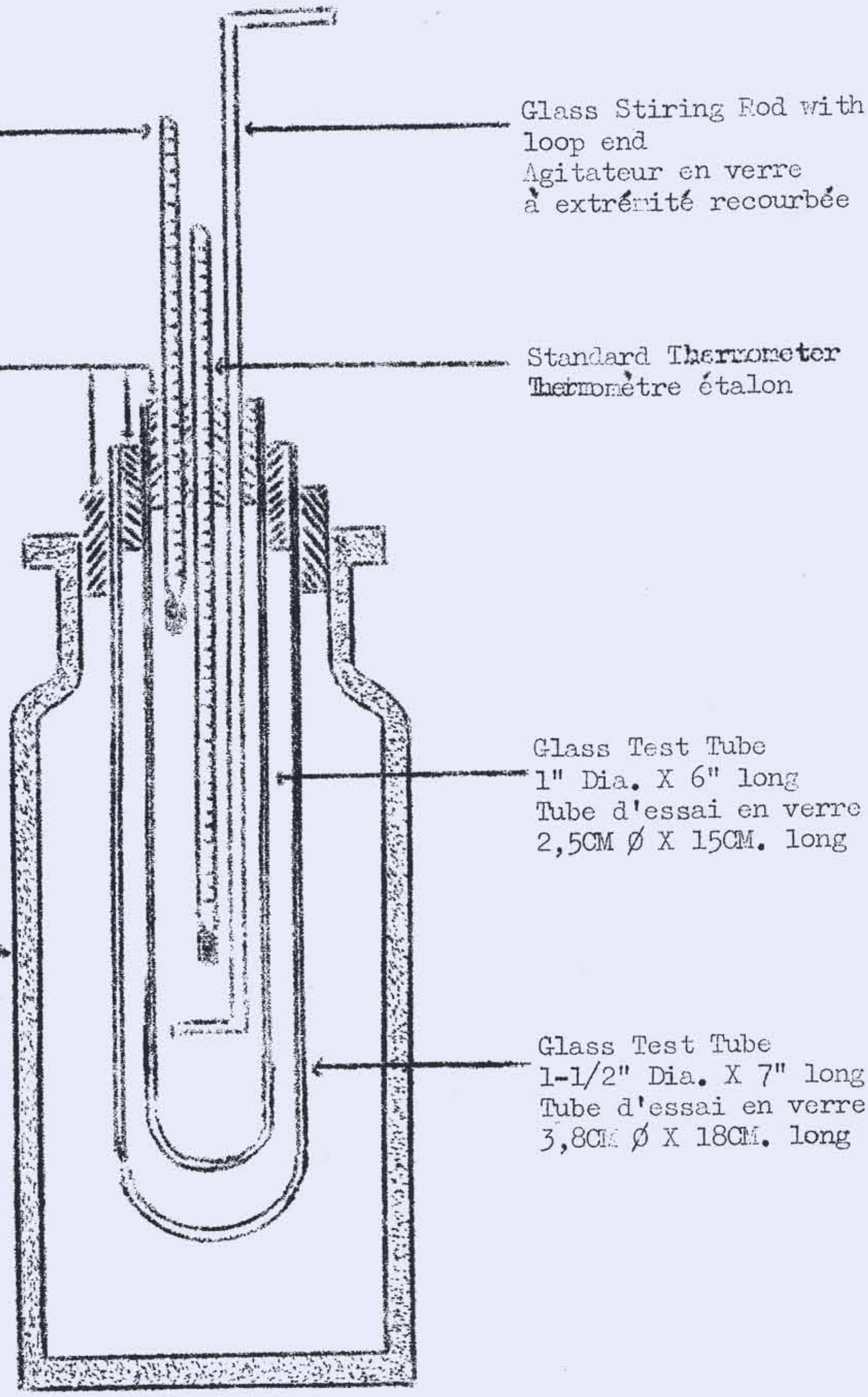
(d) Insoluble matter (in benzene)

Dissolve about 10 g. of the DNT in 150 ml. of boiling benzene. Filter the hot solution through a tared Gooch crucible.

Wash the residue with hot benzene, dry the crucible and contents for one hour at 75°C.

Cool in a desiccator and weigh. Express increase in weight as percentage insoluble matter.

(e) Tetranitromethane



SOLIDIFICATION - POINT APPARATUS

APPAREIL POUR POINT DE SOLIDIFICATION