INCH-POUND

MIL-P-60397B (AR)
AMENDMENT 1
18 May 1993

MILITARY SPECIFICATION

PROPELLANT M1
FOR USE IN CHARGE, PROPELLING, 155MM, M4A2

This Amendment forms a part of Military Specification MIL-P-60397B (AR) dated 09 July 1980 and is approved for use by the US Army Armament, Munitions and Chemical Command and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 2

2.1 Add the following to para. 2.1, DRAWINGS:

"12914019 - Collar and Rail Assembly, Dynagun Beta
12914000 - Dynagun Charge Weight Procedure"

3.2 Delete in its entirety and substitute the following new paragraph:

"3.2 Ballistic assessment requirements. The propellant, when fired in the M1 cannon with the M107 projectile, or in the Dynagun system, shall be capable of assessment to the velocities and pressures at 70 degrees F as specified in TABLE I. Propellant shall be aged for 90 calendar days minimum after packout prior to Dynagun testing. Sample drums designed for assessment tests shall not be unsealed for use in the tests until the 90 day time frame is met. In the event of war emergency, this requirement does not apply."

3.3 Delete in its entirety and substitute the following new paragraph:

"3.3 Ballistic uniformity requirements. The propellant, when fired in the M1 cannon with the M107 projectile, or in the Dynagun system, shall comply with the following requirements when tested as specified in 4.5.1.2 or 4.5.2.2 respectively. All charges shall be manufactured in accordance with MIL-C-60395 except with the Dynagun firing. All charges fired in the Dynagun system shall be manufactured in accordance with the applicable Unit Operating Procedure."

Add the following new paragraphs:

"4.5.2 Dynagun assessments. This alternative test method may be used for substitution of proving ground assessments (see 4.5.1). However, proving ground assessment for the acceptance of the propellant lot shall be used for every fifth lot accepted by the dynagun assessment. The dynagun assessment shall be performed at the propellant production facility in accordance with the applicable facility unit operating procedure for the beta dynagun firing system and with Drawings 12914019 and 12914000. All charges shall be conditioned to the required temperature for a minimum of 24 hours and assurance will be made that, when fired, the charges are at the conditioning temperature. The following tolerances shall apply to all temperature conditionings: -50 degrees F, +5 degrees F; 70 degrees F, plus or minus 2 degrees F; 145 degrees F, plus 5 degrees F. The facility unit operation procedure shall be submitted to SMCAR-QAR-R and SMCAR-QAH-T for review and approval.

4.5.2.1 Charge establishment. Ten charges (five calibration and five test) each loaded with charge weights of propellant for zone 3, 5, 6, and 7, and four (test) for 7+ shall be conditioned and fired at 70 degrees F. From the data, charge weights shall be calculated which will yield the prescribed service velocity (see 3.2). This calculated charge weight shall then be loaded into charges for the uniformity series (see 4.5.2.2).

The difference between the corrected velocity obtained during the uniformity series and the service velocity shall be compensated for by a final adjustment in charge weight using the slope of the velocity charge weight curve previously established. The result will be the recommended charge weight.

4.5.2.2 Charge uniformity.

4.5.2.2.1 Initial production. Thirty (30) charges shall be assembled with the calculated charge weight (see 4.5.2.1) of propellant at zone 7. Ten charges each shall be conditioned to -50 degrees F, 70 degrees F, and 145 degrees F. Charges fired at 70 degrees F shall be fired alternately with calibration charges. Firing results at all temperatures shall be corrected to recommended charge weight conditions

(i.e., the difference between calculated (as fired) charge weight and recommended charge weight). The means and standard deviations of the velocities and pressures at all firing temperatures shall be calculated using corrected results. The initial production lots represent the first three consecutive lots from each manufacturer which have been produced and met the acceptance criteria of this specification.

4.5.2.2.2 Subsequent production. Sixteen (16) charges shall be assembled with the established charge weight (see 4.5.2.1) of propellant. Nine rounds each shall be conditioned to 70 degrees F, and seven to 145 degrees F. Charges fired at 70 degrees F shall be fired alternately with calibration charges and shall be corrected to firing conditions. Firing results at both temperatures shall be corrected to recommended charge weight conditions (i.e., the difference between as fired charge weight and recommended charge weight). The means and standard deviations of the velocities and pressures at all firing temperatures shall be calculated using corrected results. Throughout production, if 3 consecutive lots fail on first test, testing shall revert back to the initial production plan (see 4.5.2.2.1).

4.5.2.3 Retest criteria. A lot shall be retested whenever any of the following conditions exist or whenever the facility deems it necessary.

a. The final adjustment in charge weight exceeds 2.0 ozs of charge weight used in uniformity firings, retest for uniformity in accordance with 4.5.2.2.

b. If for any reason, the facility considers that test conditions have detrimentally affected the test results, additional charges as required shall be tested.

4.5.2.4 Referral criteria. A test lot shall be referred to the procuring activity for disposition whenever any of the following conditions exist or whenever the facility deems it necessary.

a. Calibration rounds fired in any test phase fail to comply with Section 3 of this specification (The velocity standard deviation shall be multiplied by a factor of 3.5).

b. Calibration correction applied exceeds two percent of the expected muzzle velocity.

c. Number of test or calibration results utilized in calculations is less than specified.

d. Any unusual occurrences during testing, such as excessive delays between firings, drift of pressure and velocity sensors, etc. Each such event shall be reported in detail on the applicable firing record.

e. One low outlier is permitted for each calibration or test firing set according to the outlier criteria of 4.5.1.4f. The critical value (Tc) shall be 0.482 for a sample size of 6, 0.434 for 7 and 0.409 for 10, at a significance level of 0.1."

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 1376-A460)