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AUTHORITY

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SPRINGFIELD ARMORY

RESEARCH AND DEVELOPMENT



MEMORANDUM REPORT

PROJECT TITLE NONE

PROJECT NO. NONE

REPORT TITLE ROUND-ROBIN COMPARISON

TEST ON LIGHT RIFLE CARTRIDGES.

SPRINGFIELD, MASSACHUSETTS

ITEM .30 AMM. DATE 13 FEB. 1950

SA-MR 20-2117

ORD. RES. & DEV. DIV.

DOWNGRADED AT 5 YEAR INTERVALS
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107


SPRINGFIELD ARMORY

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RESEARCH AND DEVELOPMENT DIVISION

MEMORANDUM REPORT SA-MR20-2117

LOSpaulding/shp/632

13 February 1950

SUBJECT:

Round-Robin Comparison Test on Light Rifle Cartridges.

OBJECT:

To obtain a record of the pressure and velocity of the subject ammunition to be used to determine the testing level of this station.

NOTE: This is the fourth in a series of Round-Robin comparison tests on Light Rifle ammunition.

REFERENCE:

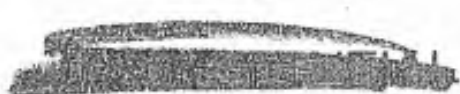
F.A. 471.4/7075
S.A. 471.41/113

SUMMARY:

Ten rounds each of the subject ammunition were fired for velocity and pressure. Instrumental velocity at 78 feet was recorded as 2736 fps and chamber pressure was recorded as 45141 psi. Detailed information is shown on Tables I and II.

MATERIAL:

1. Ammunition
 - a. Test sample, Caliber .30, T65E2 Ball (no lot number given) submitted by Frankford Arsenal.


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b. Reference rounds loaded as follows:

Cartridge Case - Lot FAX30-1336
Bullet - Lot FA-Y-30-256
Powder Type - IMR 3031
Lot - 97
Charge - 42.3 gr.

Assessment

Velocity ft/sec - 2720
Pressure psi - 47200

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2. M2 Universal Receiver with 22-inch long velocity barrel, No. 24, previously fired 23 rounds and 22-inch long pressure barrel, No. 23, previously fired 45 rounds. Both of these barrels were chambered in accordance with drawing SK-FSA-5212.

3. Copper pressure cylinders - metal of 1943
Mean length uncompressed .4004 inch
Mean diameter uncompressed .2262 inch
For use with 1/30 sq. in. dia. piston
F.A. drawing F.D. 12951 dated October 30, 1943
S.O. 419 Lot 4
E.D. Memo 112 F.Y. 43

4. Potter chronograph in conjunction with lumiline screens.
Muzzle to first screen 28 ft. Distance between screens 100 ft.
Instrumental velocity at 78 ft.

5. Friez thermograph ML77

6. Fixture for drilling cases

DATE OF TEST:

Due to a breakage of the M2 Universal Receiver while obtaining pressures at -70° F., the date of the test as stated in reference file 8 February 1950 was advanced to 14 February 1950.

PROCEDURE:

1. Using the M2 Universal Receiver and velocity barrel, three rounds of the test sample were fired for warming and fouling. This was followed by firing ten rounds of the test

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sample for velocity. Instrumental velocities were recorded at 78 feet. Immediately after firing the test rounds, the barrel was cleaned and two rounds of reference ammunition fired for fouling. This was followed by the firing of ten reference rounds for velocity.

2. Following the same procedure as above, ten rounds each of the test ammunition and reference ammunition were fired for pressure in the M2 Universal Receiver and pressure barrel. All cases were drilled. Check velocities were recorded at the same time pressures were taken.

3. Method of conducting test was done in accordance with procedure outlined in ORD-M608-PM. Section 7-13.

RESULTS:

1. The corrected velocity for an average of ten rounds was 2738 fps.

2. The corrected pressure for an average of ten rounds was 4514.1 psi. Average check velocity as taken with pressures was 2680 fps.

3. Detailed pressure and velocity information is shown on Tables I and II.

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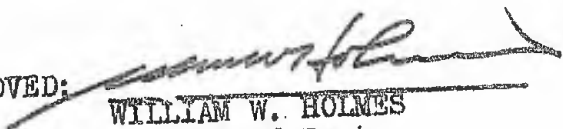
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REPORT
NO. SA-MR20-2117

SUBMITTED:


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Ordnance Engineer

APPROVED:


WILLIAM W. HOLMES
Major, Ord Dept

-4-

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TABLE I

INSTRUMENTAL VELOCITY AT 78 FTET OF CAL..30 LIGHT RIFLE AMMUNITION

<u>TEST ROUNDS</u> <u>VELOCITY FT/SEC</u>	<u>REFERENCE ROUNDS</u> <u>VELOCITY FT/SEC</u>
2743 -	2794 +
2775	2752
2766	2729
2779	2727 -
2748	2743
2780	2762
2755	2746
2784 +	2728
2750	2736
2763	2740

AVE.	2764.3	AVE.	2745.7
Vel. Cor.	-25.7	EX. Var	67
Cor. Vel.	2738.6	S. D.	19.27
S. D.	14.07		

Ammunition temp. 70° F.
M2 Universal Receiver - Accuracy and velocity barrel #24

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TABLE II

CHAMBER PRESSURE CHECK ON CAL..30 LIGHT RIFLE AMMUNITION

TEST ROUNDS Lbs/Sq. In.	CHECK VELOCITY Ft/Sec.	REFERENCE ROUNDS Lbs/Sq. In.	CHECK VELOCITY Ft/Sec.
45600 +	2720 +	46000	2688
43400		44400	2652 -
43550		45150	2655
39300 -	2652	45000	2664
44050	2706	46600	2678
45150	2706	46800 +	2689 +
40450	2639 -	43333 -	2679
43266	2647	44050	2659
42733	2688	44400	2670
42300	2682	44650	2664
<hr/>			
Avg. 42979.9	Avg. 2680	Avg. 45038.3	Avg. 2669.8
Press. Cor. +2161.7	E.V. 81	E.V. 3467	E.V. 37
Cor. Press. 45141.6	S.D. 28.67	S.D. 1064.51	S.D. 12.57
S.D. 1837.61			

Ammunition temp. 70° F.
M2 Universal Receiver - Pressure barrel #23

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REPORT
NO. SA-MR20-2117

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