

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
REM

Peters
P

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Distribution: C.B. Workman

C.E. Ritchie

J.P. Linde

J.W. Brooks

R.J. Pohl

Petroleum Lab

Chambers Works

A.B. Hughes

ESD - Louviers

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331 - Supplement No. 2

Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M/700 and M/1100)

Prepared by: F.L. Supry

Date Prepared: 5/2/82

Proofread and Cleared By:

J.H. Hennings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

R.E. Nightingale 5-26-82
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

C.E. Ritchie 5/26/82
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331 - Supplement No. 2
REPORT TITLE: Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M700 and M1100)
MODEL(S): M/700 and M/1100
GAUGE OR CALIBER:
DATE: 5-2-82
WORK ORDER NO.:
PART NAME:
DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS. _____; TARGET: _____

RIM FIRE _____ CENTER FIRE _____

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

May 25, 1982

TO: J.H. Hennings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M/700 and M/1100)

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct Environment/Cold Tests on three spray lubricants.

1. Du Pont - Synthetic Diester
2. Sprayon - 711
3. CRC - 3-36

NOTE: Krylon Ten-4 and Houghton HLP were eliminated from further testing due to their poor performance in the M700 cock and fire simulation test.

SCOPE OF TEST

To compare the three lubricants in an environmental/cold test.

TEST RESULTS

In their order of finish, from the best performing to the poorest performing lubricant, the following results were obtained: Du Pont - Synthetic Diester

CRC - 3-36
Sprayon - 711

The following is a brief synopsis of each phase of the environmental/cold test.

1. Firearm function as removed from freezer after 3 hours at -20° F.

Du Pont	No failures to function occurred.
CRC	1 failure to function occurred.
711	2 failures to function occurred.

2. Rust inspection at completion of test.

Du Pont and CRC	Very little rust.
711	Greater amount of rust

TEST RESULTS - continued

3. Firearms function during firing of 100 rounds per day.

There were no malfunctions or failures during this phase of the test. All lubricants were equal.

4. Bolt Velocity Measurements

Measurements indicate that the lubricants all performed equal during this phase of the test.

5. Firearm function as removed from roof after 3 hours exposure to environment.

Lubricants all performed equal during this phase of the test.

6. Firearm function as removed from roof after 64 consecutive hours of exposure to environment.

Du Pont and CRC - No failures to function occurred.

711 Actions frozen.

REPORT TEXT

- A. Bolt velocity measurements were taken at the start of the test and each morning during the test. Refer to Data Sheet No. 1 in Appendix A for individual results.
- B. Trigger pull, firing pin indent, sear engagement, sear lift, safe on, safe off, and bolt lift measurements were taken at the start and completion of the test. Refer to Data Sheet 2 in Appendix A for individual results.
- C. Trigger pull and firing pin indents were taken each day after the guns had remained in the freezer at .20°F. for three hours. Refer to Data Sheet 3, Appendix A, for individual results.
- D. Weather conditions during test:

3/29	Sunny 45° F.	}	3 hours exposure each day.
3/30	Sunny 55° F.		
3/31	Rain 50° F.		
4/1	Flurries 30° F.		
4/2	Sunny, windy 35° F.	}	Week-end exposure
4/3	Rain, freezing rain 38° F. to 20° F.		
4/4	Snow 20° F. to 15° F.		

TEST PROCEDURE

- A. All rifles and shotguns selected to be used in the test were disassembled and degreased, using the solvent degreasing tanks located in our Heat Treat Department.

Each gun was lubricated with the assigned lubricant and reassembled.

1. At 8:00 A.M. each day bolt velocity measurements were taken by the Measurements Lab, utilizing the photo-diode transducer system.
2. 100 rounds were fired through each gun.
3. All guns were exposed to the environment by being placed on the roof for 3 hours each day.
4. They were then placed in a freezer at -20°F . for 3 hours. Trigger pull and firing pin indents were taken as guns were removed from the freezer.
5. The guns were placed in a stress coat oven at 120°F . overnight (16 hours).

The procedure was repeated each day for 5 consecutive days.

The guns were then placed on the roof over the week-end. At 8:00 A.M. Monday they were removed and bolt velocity measurements were taken.

The guns were then placed in a dry cabinet for 24 hours.

The guns were removed from the dry cabinet and bolt velocity measurements were taken.

At the completion of the test all the guns were disassembled and examined for rust.

... FLJ
... 5-0:1

5-11

[illegible]

[illegible]

TRIGGER PULLS AND FINE TUNING PIN INDENT AS GUNS ARE REMOVED FROM FREEZER AFTER 3 Hours @ -20°F											
L	LUBRICANT USED	3/29/82		3/30/82		3/31/82		4/1/82		4/2/82	
		F.P.	TRIGGER	F.P.	TRIGGER	F.P.	TRIGGER	F.P.	TRIGGER	F.P.	TRIGGER
		INDENT	PULL	INDENT	PULL	INDENT	PULL	INDENT	PULL	INDENT	PULL
1	100BOL/86382317	0.07	6.15	0.07	6.15	0.08	5.75	0.07	6.15	0.07	6.15
2	DUPONT	0.065	6.00	0.065	6.15	0.08	6.00	0.07	6.00	0.07	6.00
3	700BOL/86383491	0.07	5.75	0.075	5.50	0.07	5.05	0.06	5.15	0.07	5.00
4	CRC 3-36	0.115	5.50	0.115	5.15	0.07	5.0	0.075	5.15	0.075	5.15
5	100BOL/86378743	0.05	4.75	0.06	4.75	0.055	4.50	0.06	4.50	0.06	4.15
6	CRC 5-56	0.055	4.00	0.06	4.75	0.06	4.75	0.055	4.00	0.055	5.15
7	100BOL/86382335	0.075	5.00	0.075	5.15	0.075	5.05	0.075	5.00	0.075	5.00
8	711	0.06	5.00	0.06	5.15	0.06	5.15	0.06	5.15	0.06	5.15
9	700BOL/86030805	0.035	4.75	0.035	5.25	0.035	4.75	0.035	4.25	0.035	4.75
10	MOLY KOTE GUN PARTS	0.035	4.75	0.035	4.75	0.035	5.00	0.035	4.25	0.035	4.75
11	100BOL/86814399	0.020	5.25	0.02	5.00	0.02	4.75	0.02	4.75	0.02	4.75
12	ROSTEC 345L	0.020	5.00	0.02	4.75	0.02	4.50	0.02	4.75	0.02	4.50
13	100BOL/86331003	0.03	4.50	0.035	4.50	0.035	5.00	0.035	4.75	0.035	4.75
14	WD-40	0.035	4.50	0.035	4.25	0.035	5.00	0.035	4.50	0.035	5.25
15	1100 LT-20/8604914K	0.03	4.25	0.03	4.00	0.03	4.00	0.03	4.35	0.03	4.25
16	CRC 3-36	0.03	4.10	0.03	4.25	0.03	4.00	0.03	4.25	0.03	4.25
17	1100 LT-20/8681762K	0.01	4.50	0.015	4.25	0.02	5.00	0.02	4.00	0.03	4.25
18	ROSTEC 345L	0.03	4.25	0.02	4.50	0.02	4.25	0.02	4.25	0.03	4.25
19	1100 LT-20/8597359K	0.04	4.25	0.03	4.75	0.03	4.25	0.03	4.25	0.02	4.25
20	DUPONT	0.035	4.00	0.03	4.50	0.03	4.25	0.03	4.25	0.02	4.25
21	1100 LT-20/8622763K	0.035	4.75	0.04	5.00	0.035	4.75	0.04	4.25	0.03	4.75
22	WD-40	0.04	4.50	0.03	4.50	0.04	4.50	0.035	4.50	0.04	4.50
23	1100 LT-20/8636533K	0.02	3.75	0.025	3.25	0.025	3.00	0.02	4.50	0.02	3.25
24	CRC 5-56	0.02	3.25	0.025	3.00	0.02	3.25	0.02	3.25	0.02	3.25
25	1100 LT-20/860210K	0.03	4.00	0.03	4.00	0.025	3.75	0.02	3.75	0.02	3.75
26	711	0.035	4.25	0.03	4.25	0.035	4.25	0.03	3.75	0.03	3.75