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RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 880181
MARCH 21, 1988

MODEL 700 SYNTHETIC LONG STOCK EVALUATION

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ABSTRACT:

The Test and Measurement Laboratory evaluated Model 700 long stocks made of Arylon, Rynite, and Fiberglas. The testing consisted of 100 yard accuracy, proof strength and drop testing. The accuracy consisted of three, five shot groups; at ambient, after 24 hours of -40 degrees and after 12 hours of +250 degrees Fahrenheit with each rifle. The proof strength consisted of firing 25 standard factory rounds and 75 high pressure proof rounds with each rifle. The drop test was conducted per SAAMI specifications and then each rifle used was dropped at heights above the SAAMI specifications.

The Arylon and Rynite stocks were as good as or better than the Fiberglas stocks in every phase of the test. The Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. However, the accuracy results were not adversely affected.

Prepared by: F.L. Supry
Date Prepared: March 21, 1987

MODEL 700 SYNTHETIC LONG STOCK EVALUATION

To: F.H. Smith
From: F.L. Supry

INTRODUCTION:

A request was received from F.H. Smith on January 18, 1988 to evaluate Arylon, Rynite and Fiberglas synthetic long stocks assembled on the Model 700 30-06 caliber rifles. The testing consisted of 100 yard accuracy, proof strength and drop testing. The accuracy consisted of three, five shot groups; at ambient, after 24 hours of -40 degrees and after 12 hours of +250 degrees Fahrenheit with each rifle. The proof strength consisted of assembling Model 700 338 Win. Mag. caliber actions into two stocks of each material and firing 25 standard factory rounds and 75 high pressure proof rounds. The drop test was conducted, per SAAMI specifications, on three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions and then each was dropped at heights above the SAAMI specifications for additional information.

SCOPE OF TEST:

To determine if the Model 700 rifles assembled in the experimental stocks would meet the Remington specifications for 100 yard accuracy and SAAMI drop testing. Also, to compare the affects of extreme heat and cold on 100 yard accuracy and to compare the strength of the internal bearing surfaces of each stock material.

TEST RESULTS:

There was no deformation of the internal bearing surfaces on any of the stocks tested.

All the rifles tested passed the SAAMI and extended drop test.

The Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. However, all the rifles tested were within Remington specifications of 3.5 inches for the 100 yard accuracy in each phase of the accuracy test. The following average group sizes were established:

STOCK TYPE	ACCURACY RESULTS			(in.)
	AMBIENT (in.)	+250 degrees F.	-40 degrees F. (in.)	
RYNITE	1.77	2.23	2.00	
Arylon	2.38	2.03	1.98	
FIBERGLAS	1.98	1.83	2.22	

REPORT TEXT:

ACCURACY:

Eleven rifles were shot (two with Rynite stocks, six with Arylon stocks and 3 with Fiberglas stocks) with three, five shot groups fired for each rifle.

Remington 180 grain bronze point ammunition (R30066 code H20 MC2825) was used throughout the test.

The three Fiberglas stocks swelled and cracked during the +250 degree Fahrenheit phase of the accuracy test. The cracks were covered with Duct-tape and the accuracy test continued.

Individual accuracy results are listed in the appendix of this report.

PROOF STRENGTH:

Two stocks of each material were used to test the deformation of internal bearing surfaces, when the rifle was subjected to the loading and firing of 338 Win. Mag. (25 standard and 75 proof rounds) ammunition. There was no deformation on the bearing surfaces of any of the stocks tested.

DROP TEST:

The drop test was conducted, per SAAMI specifications, on three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions. Then each was rifle was dropped at heights above the SAAMI specifications for additional information. All the rifles tested passed the SAAMI and extended drop test.

TEST PROCEDURE:

ACCURACY:

The accuracy was shot by D.R. Thomas and J.E. Selan in the R&D 100 yard range located in building 52-1.

Standard long action Leupold bases and Leupold rings were used, in conjunction with a 20X All-American scope.

A total of three, five shot groups, were shot for each rifle. The rifles were cooled and cleaned between each group, and one fouling shot fired before the next group was shot. The procedure was repeated after the rifles were placed in an industrial oven at +250 degrees Fahrenheit

TEST PROCEDURE: (continued)**ACCURACY: (continued)**

for 12 hours and then allowed to return to ambient, and again after the rifles were placed in an industrial freezer at -40 degrees Fahrenheit for 24 hours and then allowed to return to ambient.

The targets were analyzed for group size, using the HP 9000 computer and digitizing tablet.

PROOF STRENGTH:

The proof strength test was conducted by C.J. Stephens in the R&D shooting room located in building 52-1A.

Two stocks of each material were randomly selected, the 30-06 actions removed and the internal bearing surfaces examined. Then the 338 Win Mag. actions were assembled to the stocks. Each of the rifles was placed in a shooting jack and 25 standard factory rounds were fired; then, using a lanyard and the portable shield, 75 proof rounds were fired. Next the actions were removed and the internal bearing surfaces re-examined.

DROP TEST:

The drop test was conducted by R.W. Howe and J.E. Selan in the R&D drop test area located in building 52-1A.

The following SAAMI specifications were used:

All drops were on an one inch 85 Durometer Shore A rubber mat backed by concrete.

POSITIONS OF DROP:

- | | | | |
|---------------|---------------|---------------|-----------------|
| 1. Vertical | - muzzle up | 4. Horizontal | - bottom down |
| 2. Vertical | - muzzle down | 5. Horizontal | - left side up |
| 3. Horizontal | - bottom up | 6. Horizontal | - right side up |

JAR OFF:

SAAMI specification - 12 inch drop in all six positions with the safety in the off position.

HEIGHTS USED: 12, 18, and 24 inches.

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TEST PROCEDURE: (continued)

DROP TEST: (continued)

DROP:

SAAMI specification - 48 inch drop in all six positions with safety in the on position.

HEIGHTS USED: 48 and 54 inches.

Three Arylon, two Rynite and two Fiberglas stocks, assembled with the 30-06 caliber actions were used in the drop test. Then, for additional information, each was rifle was dropped at heights above the SAAMI specifications. All the rifles tested passed the SAAMI and extended drop test.

APPENDIX

MODEL 700 SYNTHETIC LONG STOCK EVALUATION
INDIVIDUAL RIFLE ACCURACY RESULTS

SERIAL NUMBER	TYPE OF STOCK	TEMP. (°F)	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)
B6893419	F	A	2.477	2.248	1.983	2.236
		+250	1.689	2.037	2.387	2.038
		-40	2.093	1.892	2.147	2.044
B6892908	F	A	1.324	1.814	1.784	1.640
		+250	1.964	1.589	1.981	1.845
		-40	2.541	2.429	2.850	2.607
B6893598	F	A	1.891	1.898	2.438	2.075
		+250	1.805	1.446	1.604	1.618
		-40	1.374	2.391	2.274	2.012
C6203696	R	A	1.092	1.615	1.662	1.456
		+250	2.307	2.624	2.229	2.387
		-40	2.352	1.410	1.184	1.649
B6862427	R	A	1.651	2.358	2.258	2.089
		+250	2.124	2.120	1.968	2.071
		-40	1.557	2.788	2.689	2.345
C6213564	A	A	2.114	1.970	2.659	2.248
		+250	2.294	1.353	2.175	1.941
		-40	0.668	2.766	1.760	1.731
B6887194	A	A	3.079	2.773	3.200	3.017
		+250	1.008	2.342	1.921	1.757
		-40	1.417	2.283	2.147	1.949
C6200125	A	A	2.107	3.778	1.550	2.478
		+250	1.674	1.994	2.003	1.890
		-40	2.165	1.904	2.067	2.045
B6829937	A	A	2.522	3.026	1.115	2.221
		+250	2.672	1.162	1.443	1.259
		-40	2.639	2.472	1.748	2.286
B6835137	A	A	1.995	1.182	1.980	1.719
		+250	3.204	2.704	1.097	2.335
		-40	1.511	1.988	1.982	1.827
B6829419	A	A	2.624	2.350	2.777	2.584
		+250	3.015	1.897	2.561	2.491
		-40	1.345	3.046	1.641	2.011