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4/2/93

To: T.C. Douglas

From: J.H. Coyle *JHC*

Subject: Monthly Report

LEADLESS BULLET (Copper):

30 Cal. 165 gr. - more bullets have been made from C110 and C145 utilizing different bearing area designs. One utilizes a long driving band and the other utilizes double driving bands - one at the base where the boattail begins, and one up front near the beginning of the ogive. Both bullets were made using the Extended Range profile. These changes were done to try and lower pressure and raise velocity since the first bullets were approximately 180 fps too slow at max. pressure. Testing produced the following results:

Bullet	Velocity (fps)	Pressure (psi x 100)	Accuracy - 3/5's (100 yds)
165 gr. X	2757	591	1.0"
165 gr. (C145)			
1 Driving Band	2802	565	1.0"
2 Driving Bands	2791	530	0.9"
165 gr. (C110)			
1 Driving Band	2812	581	0.8"
2 Driving Bands	2811	554	0.8"

Accuracy on the copper bullets was tested with unsplit noses.

Mush was shot through 18" of gelatin at 200 yds using bullets with one driving band since both designs use same profile. Results of the mush tests are listed below:

Bullet	Retained wt.	% wt. ret.
X-bullet	164.5 gr.	99.7
	164.5 gr.	99.7
C145 - no split	142.9 gr.	85
.100 split	139.5 gr.	85
.100 split	141.0 gr.	85
C110 - no split	164.7 gr.	99.8
no split	164.9 gr.	99.9
.100 split	154.2 gr.	93
.100 split	157.1 gr.	93

Testing on C145 material will be terminated at this time since the bullets do not perform well in the mush test. Other material has been

ordered to test for performance and machineability. This should be completed by 4/26.

An ex-product drawing has been sent out for quotes to have the bullets made. To date, one vendor has responded but there are tolerance concerns. He has agreed to make some bullet samples for testing to see if there are any adverse effects on bullet performance.

Another vendor said he would have to buy machines to produce the bullets and no quote has been received yet.

30 Cal. 190 gr. - bullet samples are in the process of being machined at this time. Two bullet weights are being made - 180 gr. and 190 gr. Samples are being made from C110 only and using both designs as mentioned for the 165 gr. Testing on these bullets should be completed the week of 4/5.

270 Win 140 gr. - bullet samples have been made from C110 using a single driving band and 2 driving bands as used with the 165 gr. bullet. Testing on these bullets should be completed the week of 4/5.

LEAD FREE P&R TRAINING AMMO:

Purchasing is in the process of trying to find a machine, either new or used, at this time. The machine will have to be modified to accept a disc feeder.

A project write-up should be completed and sent to H. Cast by 4/15.

Tool drawings to produce a blanked disc should be completed by 4/23 and sent out to have tools made. These discs will be made in-house utilizing the present gas check machine in the cupping area. Once some discs are made, some bullets can be made by hand and tested. This should be done by 6/15. Some discs will also be sent out for a feeder design.

MISCELLANEOUS:

Some time has been spent assisting in the machining of slugs and sabots for the 20 ga.

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