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R. A. Brown)Turn
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October 15th, 1946

TO: H. J. Heckman

FROM: R. H. Grace

SUBJECT: POWDERED METAL - M/721 GEAR

The preliminary investigation of the use of Powdered Iron, supplied by the Bassick Company, as an engineering material has been completed. Results indicate that the Bassick product shows considerable promise and warrants further investigation of heat treatment so that a combination of wear resistance and strength as required for use in gun parts can be developed.

Results of testing on three sample pieces of powdered iron supplied by the Bassick Company and compared with earlier work on conventional powdered product is as follows:

Shear Test - lbs. to Break -

Powder Metal Products Corp. Pilot Lot	Powder Metal Products Corp. Home, N.Y.	Powder Metal Products Corp. Original Sample	Bassick Co. Special Samples
a. 23 lbs. 7 oz.	a. 29 lbs. 8 oz.	a. 49 lbs. 14 oz.	a. 44 lbs. 12 oz.
b. 29 lbs. 9 oz.	b. 24 lbs. 4 oz.		b. 47 lbs. 2 oz.
c. 24 lbs. 8 oz.			c. 51 lbs. 4 oz.

Heat Treatment of the Bassick samples was done in the Technical Laboratory and was performed as follows:

Sample A - Pack carburize 1-1/2 hours at heat; cool in pack; harden from 1550°F. (30 min. at heat) controlled atmosphere; oil quench. Parts were then soft scleare reheated to 1550°F. (15 min. at heat) controlled atmosphere; water quench; temper 30 min. at 350°F; Rc 50; 15N 90 - 91.5.

Sample B - Pack carburize 1-1/2 hours at heat, cool in pack; harden in controlled atmosphere from 1550°F. (30 min. at heat); water quench; temper 30 min. at 350°F.; Rc 55; 15N 90-91.

Sample C - Pack carburize 1-1/2 hours at heat; cool in pack; harden in controlled atmosphere from 1440°F. (30 min. at heat); water quench; temper 30 min. at 375°F; Rc 50/51; 15N 88.5 - 89.

It is assumed that results obtained justify further work with the Bassick material to improve the properties through heat treatment. Unless advised otherwise, Bassick will be contacted through Purchasing to supply twenty to fifty more sample pieces. If charges are involved, they will be applied against P.O. #71332, Powder Metal Development.

Eng. Section, Technical Dept.
By _____ C. P. Benner