

6889  
Memorandum M-1369

Page 1 of 3

Digital Computer Laboratory  
211 Massachusetts Avenue  
Cambridge, Massachusetts

SUBJECT: TRIP TO GENERAL CERAMICS, JANUARY 9, 1952

To: J. W. Forrester

From: D. R. Brown

Date: January 10, 1952

ABSTRACT: The development of ferrite cores suitable for use in a high-speed memory and other computer circuits was discussed with the Vice President and Research Staff of General Ceramics and Steatite Corporation. Considerable progress has been made in development of "square-loop" ferrites for use in the memory. The company is interested in the computer field as a potential market for ferrites, and is willing to develop materials for our application. We will set up equipment for making pulse tests on new materials at their laboratory early in February.

On January 9, 1952, Messrs. Brown, Papian, and Taylor visited the offices and plant of the General Ceramics and Steatite Corporation, Keasbey, New Jersey. Most of the morning was spent in discussion with Mr. C. L. Snyder (brother of R. L. Snyder, Jr.), Vice President of General Ceramics. The company has been making ferrites since 1948. Most of the production has been for the television industry. During the television boom, they were making over 100 tons of ferrite per month, or more than 1,000,000 cores per month. Their customers in the television industry have never rejected a core for electrical or magnetic defects, although some cores have been rejected because of mechanical defects. They receive requests for ferrites with many different characteristics. At present, besides square-loop material for computer use, they are working on materials for permeability tuning and microwave switching. Eckert-Mauchly and IBM are interested in square-loop material. Mr. Snyder believes that the potential market in the computer field is large and justifies their participation in the development of materials for us.

6889  
Memorandum M-1369

Page 2

General Ceramics now has a \$25,000 per year contract with the Signal Corps (Contract No DA-36-039-sc-5449, supervised by the Components and Materials Branch, SSL, SCEL). This contract is quite general and has supported some work on square-loop materials. General Ceramics would like to spend \$200,000 per year on ferrite development, including \$25,000 to \$35,000 per year on development of materials for our use. They have the equipment and ceramicists, but need an additional electrical engineer for measurement work. Their research staff includes: Dr. Ernst Albers-Schoenberg, an eminent ceramicist and author of the book Hochfrequenzkeramik, Steinkopff, Dresden, 1939; Mr. Harry F. Remde, a physicist from MIT; Dr. Wetzel, a ceramicist; and Mr. Frank Gelbard, an electrical engineer from Rutgers University. A \$25,000 contract would permit approximately one and one-half staff members to work specifically on material for us. This would include at least 25 per cent of Dr. Schoenberg's time. (Dr. Schoenberg told us that during the last month, he spent approximately 80 per cent of his time on our work.)

Mr. Snyder welcomed the suggestion that we set up equipment in their research laboratory for additional measurements on material for our use. This equipment will be very similar to our present single-core pulse tester. Mr. Snyder is requisitioning a Tecktronix 514-D oscilloscope; delivery is expected in 30 days. We will lend them the additional equipment required for the pulse tests, and will obtain a suitable power supply, probably a small Burroughs unit, for them. One of us will set up this equipment at their laboratory early in February.

We emphasized our desire and intention to back up the development work at General Ceramics by more thorough and basic investigations at MIT. Mr. Snyder stated that General Ceramics will cooperate in this effort, and has discussed with Prof. von Hippel a method of handling certain details of the art normally treated as secret.

After lunch, and a tour through the plant, technical developments were discussed with the research staff. A new body, MF1118A #1, had been developed. The B-H loop of this material has very sharp corners; the B<sub>r</sub> is larger than in MF666 and the H<sub>c</sub> about the same. Several new bodies appear very promising for driver cores, MF1128 and MF1131. Some driver cores of MF1131 are being ordered.

6889  
Memorandum M-1369

Page 3

Dr. Schoenberg is confident that production tolerances can be maintained provided that we do not specify electrical or magnetic tolerances less than about  $\pm 5$  per cent. Mechanical tolerances of  $\pm 1$  per cent are normal.

Greater progress will be made if the research staff at General Ceramics understand what we are working for in the magnetic-core memory and are able to make complete measurements on new materials which will give a truer indication of performance in the final application.

*David R. Brown*  
David R. Brown

DRB:kst

cc: A. G. Blachman  
D. A. Buck  
D. J. Epstein  
R. R. Everett  
H. Fahnestock  
H. B. Frost  
H. B. Morley  
K. H. Olsen  
W. N. Papian  
N. H. Taylor  
A. R. von Hippel  
P. Youtz