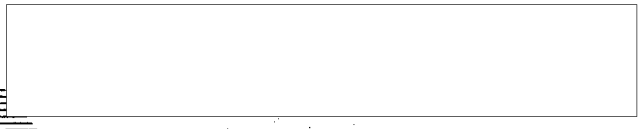
Project No. A-100

THICKNESS MEASUREMENT OF NON-METALLIC MATERIALS

Progress Report No. 4



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for

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Copy No. 2

May 13, 1957

THICKNESS MEASUREMENT OF NON-METALLIC MATERIALS

I. INTRODUCTION

This is a report of the work done on [redacted] Project No. A-100 during the period of April 1 to April 30, 1957. The purpose of this project is the development of an ultrasonic method for measuring thickness in non-metallic materials. The material which has been the chief concern to date is concrete, and the method most considered has been the echo method, although a small amount of time during the last month has been used to investigate the possibility of using the barium titanate discs recently obtained as transducers in a resonance type thickness measurement.

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II. PRESENT WORK

Whatever method is used, it is important to have a transducer which, in its mounting, is highly damped. This will allow the production of short bursts of ultrasound for the echo technique or, alternately, will insure the absence of a spurious reading in the resonance method. Much of the time spent during the last month has been given to the investigation of methods for obtaining this damping. Some of the more promising seem to involve the use of a second ceramic transducer, similar to the actual transmitter, which is placed on top of the transmitter, the boundary between the two transducers being a common electrical contact. In one experiment the top transducer had its two faces shorted or connected through a resistance while the bottom transducer was pulsed. In another experiment the top and bottom faces of the transducer "sandwich" were connected together to ground while the common faces received the pulse from the generator. The best results were obtained when the polarities

of the two transducers in the sandwich were opposite in direction. The reason for this result is not obvious since, inasmuch as the fields on the two transducers are also opposite in direction, the transducers should oscillate in phase with each other.

III. FUTURE WORK

This last effect will be investigated during the next month as a part of a continued investigation of damping. A new supplier of barium titanate ceramics has been contacted and has promised to send several samples for our investigation.

IV. NOTEBOOKS

The work reported here is being recorded in [redacted] Notebook No. C-6529. 25X1

V. CONTRIBUTING PERSONNEL

The project is under the supervision of [redacted] 25X1

The work on the transducers is being done by [redacted] and [redacted] 25X1 25X1

Respectfully submitted,

[redacted] 25X1