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MONSANTO RESEARCH CORPORATION

From LOCATION : Mound Laboratory, Miamisburg, Ohio

cc :

DATE : August 7, 1963

MOUND LABORATORY-MONSANTO
Central File No. 63-8-119

SUBJECT : Notes from Detonator Development Meeting, LRL, July 16, 17, 1963

REFERENCE :

TO : Dr. L. V. Jones

THIS DOCUMENT CONSIST OF 4 PAGES
THIS IS COPY 1 OF 47

Attendees:

J. R. Stroud, LRL
R. C. Myers, LRL
R. E. Varosh, LRL
E. James, LRL
W. H. Meyers, LASL
L. A. Carlson, LASL
G. E. Seay, SCA
J. J. Marron, SCA
L. B. Gnagey, MD
G. W. Leadingham, MD
J. R. Brinkman, MD

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The meeting held on July 16, 17, 1963 was the second of this type. The meeting was very informal and there was no prepared agenda. Due to the small size of the group and the informality, many interesting topics were freely discussed.

Change In Transmission Time Due To 30 Hour/190°F Environment (Δt_m)

LRL has become concerned with the "Δt_m problem" due to the Navy requirements of storage, i.e., storage at 135°F, 4 months per year for 4 years. W. Meyers had not heard of this and was going to determine if it is actually required.

The history of the 30 hour/190°F test was discussed. On the average the 30 hour/190°F test is more severe than the Desert Cycle but not necessarily always.

LASL had not worried about storage due to some original temperature work with detonators. 1E26 detonator Lot 3 was tested as shown below and essentially no shift in transmission time was observed when the detonators were subjected to 135°F for one year. As it turned out however, these data were misleading since data from all other lots tested showed a significant shift. The moral of this discussion was to indicate that you can't always rely on first information remaining true.

MOUND DECLASSIFICATION REVIEW
1ST REVIEW-DATE 8/8/63 DETERMINATION (CIRCLE NUMBER(S))
AUTHORITY: DOE DADD
NAME: [illegible]
2ND REVIEW-DATE 11/11/97
AUTHORITY: DADD
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1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO
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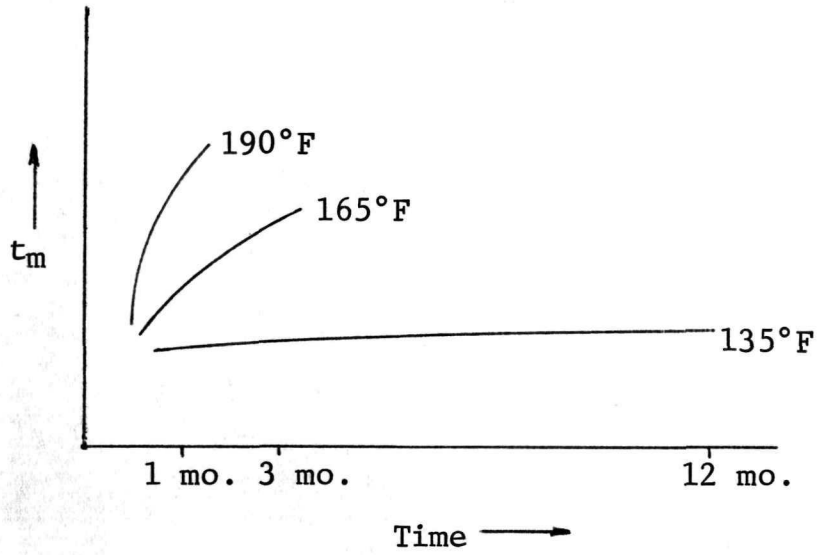
Notes from Detonator Development Meeting (Continued)



Addition of triPEON to standard PETN seems to reduce the "Δt_m problem" even for high specific surface PETN, see table below. This is very encouraging.

	Specific Surface-cm^2/g Drying Conditions for 24 hours		
% TriPEON	Vacuum	60°C	88°C
0	9138	7567	3896
0.25	10212	9090	6053
0.50	10610	9826	7537
1.00	10831	10335	8370
2.00	11318	11108	10560

Data not available for transmission time

The change in transmission time is probably due to mechanical and/or physical effects and not chemical effects since transmission time seems to be a function of specific surface regardless of type of crystal or method of obtaining crystal.

Also the change in transmission time is due to a change in the pick-up time and not due to a change in the detonation velocity through the powder. Data presented show that, as expected, RDX detonators exhibit less effect of temperature.

Plastic Bonded PETN

Plastic bonded PETN, containing 2% Exon, was developed by LASL specifically for loading boosters volumetrically. The material handles well and exhibits good timing. Standard PETN was utilized.

9407 PBX Problem

Mound has experienced considerable difficulty in pressing pellets with several recent Holston lots of 9407 PBX (powder sticks to punches). Ed James and Bob Myers had 3 batches that were unable to be pressed by Mound. Ed could find nothing significantly different chemically and Bob was able to press them satisfactorily. Ed felt that with a marginal quality batch of PBX, a certain combination of finish on tooling and clearances may be required.

High Temperature Detonators

Ed James recommended investigation of HMX for a replacement of PETN in preference to RDX. Its main advantage would be higher temperature stability.

The sensitivity concern of the various polymorphs of HMX is somewhat exaggerated. Apparently some of the early sensitivity data was in error. Ed James and Walt Meyers are investigating this problem further. It is felt that someone should be evaluating this material.

Miscellaneous

LRL has successfully loaded several detonators at one time using an isostatic pressure technique with satisfactory results.

Sandia is preparing to make a series of tests to determine accurately the effect of firing temperatures on the current threshold of detonators.

Ed James has approximately 6 grams of C^{14} labeled PETN. If anyone can justify a need for a small quantity, they might be able to obtain some.

Notes from Detonator Development Meeting (Continued)

There is more evidence that something odd happens to the transmission time of detonators at 0.110 inch diameter well.

The next meeting of this type will be held in April, 1964 at LASL. It was recommended that a general Mound Development meeting be held in October, 1963 at Mound. –

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