**Monsanto**

FROM (NAME & LOCATION): T. C. Mathis - St. Louis Organic Research

DATE : December 22, 1967

SUBJECT : MEAD PACKAGING

REFERENCE : WORK REQUEST #67-161

TO : K. A. Wells, KWELL

Adhesives

cc: M. W. Farrar, Res. 1
J. R. Darby, Res. 2
A. W. M. Coaker, Res. 3
J. A. Cannon, Res. 3
N. W. Touchette, Res. 3
C. D. Bias, Res. 3
R. H. Mills, Res. 3
R. M. Parks, RPARK
W. F. Waychoff, WWAYC
E. C. Wilde, EWILD
J. S. Bagnall, JBAGN

Tests for water resistance, heat resistance, and wet tack did not show superiority of our plasticizers over the Mead control. Four out of five of the Monsanto plasticizer blends showed equivalence in these tests, and gave strong resistance to delamination under the test conditions. Perhaps the plasticizer performances are too similar for these tests to discriminate.

The blends showing equivalence to the control plasticizer in the AC-59 emulsion are these:

1) Santicizer 218A (S-160/S-141/DIBP 75/15/10)

2) S-218A/A-1254 (90/10)

3) S-218A/S-8 (90/10)

4) S-160/A-1254 (80/20)

S-160/S-8 (80/20) gave inferior performance as described in later discussion.

I have two unanswered questions:

1) Could we better discriminate between plasticizers by changing the test methods used by Mead?

2) Since Mead proposes to market an improved soda carrying case and since their wet tack is very slow, is it possible that they have gained resistance to delamination at too much sacrifice in wet tack?

In your call report dated November 7, 1967, I note that Santolite MHP, used as a tackifier, has been removed from their emulsion systems. Knowledge that they are altering their system, combined with lack of experience with adhesives, leaves me reluctant to make any recommendations other than that we try to get more information before we do more work.

DSW 586959

My experiences with the tests were briefly as follows:

Wet Tack -- fiber tear on kraft paper

I was unable to determine a time to tear due to slow tack. The method was the same as that used in Request No. 67-114 (a 2-inch, 3-mil film).

Heat Age Tests

This test was started at 140°F raising the temperature in 20° increments. S-160/S-8 (80/20) failed at 200°F. The test was terminated at 480°F because no other test specimens failed. In a repeat test the specimens were entered in an oven adjusted to 350°F. Only S-160/S-8 (80/20) failed during 32 hours at this temperature. This failure occurred at two hours.

Water Resistance Tests

These tests were carried out at 34°F and 90°F. The 34°F test was continued for 48 hours. Only S-160/S-8 (80/20) failed. This occurred during the last 8 hours of the 48-hour period.

The 90°F test was done twice. Results did not check but the average time to failure for each system was roughly 7 to 8 hours.

Ken, do you know or can you learn the conditions of time, pressure, and temperature under which the soda cartons are glued together, and do they actually use a 10-mil film as prescribed by the test method? Due to the very slow tack development, I had to be very careful to avoid having the top portion of the carton slide before tack developed between it and the lower portion of carton. I suppose the acrylic latex coating may have contributed to this problem. We would appreciate any information regarding how this operation is carried out.

In the progress of this work there was no instance of box fiber tear at failure. In the water resistance tests the separations appear to be primarily separation within the adhesive itself. I believe most of the adhesive stays on the white surface rather than on the brown (backside) surface.

Time: 24 hours

T. C. Mathis

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