

Memo To: R. L. Kalte

From: W. A. Costa

Subject: Sticking In the Bundles,
Martinez Production

Date: July 24, 1984

cc: R. C. Maloof
J. Jackson
R. Carlson

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Summary:

1. Inspection of top bundles of Firescreen shingle pallets exposed in the sun at Martinez revealed that most of them do not release during the heat of the day, but release in the cool of the morning. Bundle temperature of 123°F and 127°F were measured.
2. Wilmington Firescreens have not revealed this problem in recent yard inspections there.
3. We are not able to account for the differences in performance based on asphalt adhesive and soap quality control test data at both locations.
4. Martinez laboratory quality audit and a recent quality audit by D. Burks, F. Clark and myself failed to detect this problem, although we did detect dots sticking to the wrapper in release strip area.
5. During recent stock inspections at Martinez, we found bundles of shingles that appeared to be deficient in soap application by feel.

Recommendations & Conclusions:

1. We obtain roof top bundle temperatures in Sacramento & Phoenix to determine shingle release temperature requirements.
2. We should develop a laboratory test to verify release capability of shingles and wrapper release strip at expected product use temperatures. This would allow testing during quality audits and weekly spot checks.
3. Make certain soap applicator wheels are 1" wider than release tape, so soap application can be observed. This should be done in all Bird roofing plants.
4. Formulate a new effective adhesive that has a higher softening point so release is feasible at high bundle temperatures. (Adhesive has a tendency to string now), while not sacrificing sealing capability.

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Discussion:

Recently, we had a heat wave in Central California. The Central District received many sticking in the bundles complaints. When in Martinez on July 9th, a call from a complaining roofer from the Stockton area was given to me. Immediately upon completion of the call, John Dease was contacted and an inspection of the stock at Martinez was made.

This was done in mid-afternoon in the direct sunlight and most of the top bundles of the pallets exposed in the sun were stuck. The majority of these were stuck so shingles were difficult to separate. Some bundles were stuck to the extent that shingles could not be separated without pulling the dots out of the shingle, which exposed glass or otherwise damaging the product.

A review of the test data corresponding to bundle run codes showed that the dot adhesive was generally in the neighborhood of 158°F softening point, with the pens generally in the 14-16 category. The soap solution concentration was then increased from the 5½ to 9% indicated in the test data to 15-18%. Martinez's adhesive formulation at this time, the 9th of July, consisted of 500 lbs. adhesive asphalt, 4 lbs. Elvax and 5½ lbs. wax. This had been apparently changed on May 29th or May 30th from 500 lbs. asphalt, 9 lbs. Elvax and 22 lbs. wax.

The change in lowering the Elvax and wax was an effort to try and reduce the penetration values, as they had gotten up as high as 18 on the 29th. By the 31st of May, the penetration values had gone down to 15½ and on June 1st, a test of 12 was obtained. On June 4th, the result was 15 pen. During June and up through the 10th of July, FM remained on the 4 lb. Elvax, 5½ lb. wax, 500 lbs. asphalt formulation and during this period the penetration values varied from 11 up to as high as 17.

On July 9th, in addition to increasing the wax, instructions were given to also raise the Elvax to 8 lbs., keeping the wax the same (in order to keep the penetration from going higher). The penetration results during this period of 8 lb. Elvax and 5 lb. wax, was in the range of 13 to 15 penetration and on July 16, instructions were issued to raise the Elvax to 9 lbs. and the wax to 11. Since that time and to date, the penetration values have been ranging from 17 to 15. The last two penetration results were 16 and 15.

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Softening point penetration values of the adhesive asphalt plugs, (that is the raw asphalt with which we start to formulate), tested at 161°F softening point, 12 penetration value for plugs dated 5-25-84 and 160°F softening point, 12 penetration value for plugs dated 4-06-84. Apparently, we are getting a drop in softening point through formulation of 4-7 points and a raise in penetration value of 3-5 points.

Soap concentration tests during the period we've been discussing, have ranged from a low of 4.3 to a high of 11.7 from mid-March through July 10 and starting with and during the period of July 11th through July 20th, the soap tests ranged from a low of 9.1 to a high of 18½.

Bill Bradley at Wilmington has conducted several inspections of the yard during the heat of the day as a result of phone calls to him expressing concern at the sticking bundles at Martinez. He reported only a tackiness on the top shingles of the top bundles. From our discussions, it was apparent that the tackiness he encountered at Wilmington does not compare to the tackiness and sticking encountered at Martinez.

Bill reported that the softening point of the adhesive at Wilmington has been in the 155-160° softening point range, with penetration values ranging from 14-20 and most of them being in the 15-17 range. Soap test values range from 9-11½ with most of them above 9½. The adhesive asphalt used to formulate the adhesive has been mostly Trumbull, Los Angeles with a smaller amount formulated with APOC asphalt.

The data does not indicate any substantial difference between Martinez and Wilmington in regard to the adhesive except that Wilmington adhesive tends to be of higher penetration value which means that it is further out of specification on the soft side than Martinez's.

The soap test values although higher at Wilmington during the earlier periods than Martinez's are now lower than Martinez's. Bradley also reported that during his recent inspection of the stock at Wilmington, the temperatures ranged in the 90's with little wind. This is not substantially different from the temperatures encountered during the last inspections at Martinez.

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From the information above, it seems that the only likely differences that could account for sticking at Martinez and no sticking at Wilmington would be inconsistent or deficient soap application at Martinez and/or differences in the Trumbull asphalt at Martinez versus the Trumbull asphalt at Wilmington. In my judgment, soap application is the most likely culprit.

In a conversation with John Dease, Friday, July 20th, he reported that the lab people have been watching and feeling the product for soap application much more aggressively than has been done in the period prior to becoming aware of sticking in the bundles.

Martinez has been conducting internal monthly stock inspections. The sticking in the bundles were not picked up in the monthly stock inspections. Neither were they detected in the quality audit conducted by Messrs. Burks, Clark and myself. This indicates need for a change in procedures. When quality audits are conducted in the summertime, as part of that audit, bundles exposed to direct sunlight should be inspected for shingle release capability on site.

This approach would only work on hot days in the summertime. It would not protect us against substandard performance of product manufactured in winter and used in the summertime. Therefore, we need to invent a new test for evaluating release capabilities of both the shingles and the release strip on the wrapper at expected elevated bundle temperatures.

In that regard, we have obtained recently, 2 tests on bundle temperatures. These were on bundles on which the wrapper had been torn exposing the top shingle of the bundle and in which a thermometer had been placed underneath the top shingle for a period of approximately 10-15 minutes and then the temperature read.

On the 17th of July at approximately 4:15 in the afternoon, a reading of 123° bundle temperature was obtained. On the 19th, John Dease reported a reading of 127°. These readings were obtained after the heat wave. Higher bundle temperatures could therefore be expected during the period of the heat wave. The temperature could have been even higher on bundles loaded on rooftops.

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Based on this information, it should be part of the requirements to have release capabilities at 140°. We will attempt to obtain data of rooftop temperatures to confirm whether the 140° temperature figure is indeed a realistic one.

Martinez has had wider soap wheels on order for some time. They have been instructed to have new and wider soap wheels installed prior to the next Firescreen run. The lack of ability to easily and clearly see the soap application on the shingle because of the tape, has resulted in reducing ability of knowing how well the soap is applied. I wrote memos addressing this problem and asked for responses. While verbal responses were received from two locations, aggressive action was not taken to obtain the visual appearance of soap application that is required to assure good release compliance. Soon enough to avoid this problem.


WAC:mes



Aemo To: W. A. COSTA

From: J. JACKSON

Subject: STICKING IN THE BUNDLES,
MARTINEZ PRODUCTION

Date: JULY 30, 1984

CC: R.L. KALTE
R.C. MALOOF
R. CARLSON

C O N F I D E N T I A L

Bill, I believe your difficulty at Martinez is due to the adhesive formulation not containing enough wax. The purpose of the wax in the Wind Seal Adhesive is to give you good release characteristics. I spoke with Bill Bradley on 7/27 and determined that Wilmington is using 4.2% wax in the adhesive formulation. The Martinez adhesive formulation at the time of the sticking problems only contained 1.1%. On July 16th, you raised the wax content to 2.1% at Martinez. This is in the right direction, but every attempt should be made to get the wax content over 3.5%.

I believe that it may be necessary for us to obtain Underwriter's approval to go to an 18 penetration on our Wind Seal Adhesive. This increase in penetration will affect the performance of the system far less than the lack of wax. When Forrest and Bob return from their trip to the West Coast, I will discuss what steps need to be taken to raise the 77° penetration spec as far as Underwriters is concerned. In the meantime, please keep me informed as to the effect of increased wax on the Martinez adhesive.

JJ:jmsw