

Eastman **OPTIFILM™**
enhancers

Reduce emulsion wall paint odor

Introduction

Eastman Texanol™ ester alcohol is an excellent coalescent in emulsion paint applications and imparts desirable properties such as scrub resistance, color development, and package stability in paints. In certain situations, the mild but characteristic odor of Texanol may not be ideal for some applications.

For these applications, the use of Eastman Optifilm™ enhancer 300 is highly recommended. It imparts similar desirable properties such as good scrub resistance and color development but with very low odor.

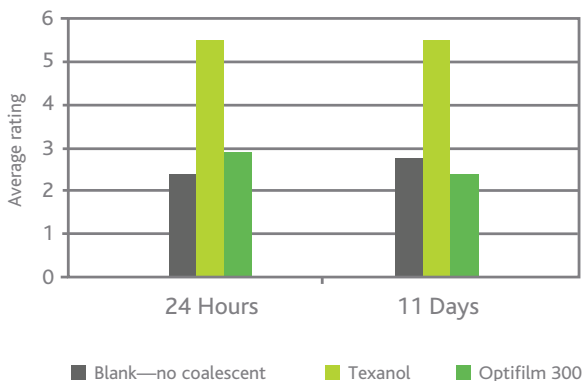
This technical tip compares the odor characteristics of three commercial architectural flat emulsion wall paints; one containing no coalescent—one containing Texanol—one containing Optifilm 300.

The comparison shows that the paint incorporating Optifilm 300 has a very low odor comparable to paint containing no coalescent and lower than the paint containing Texanol.

Procedure

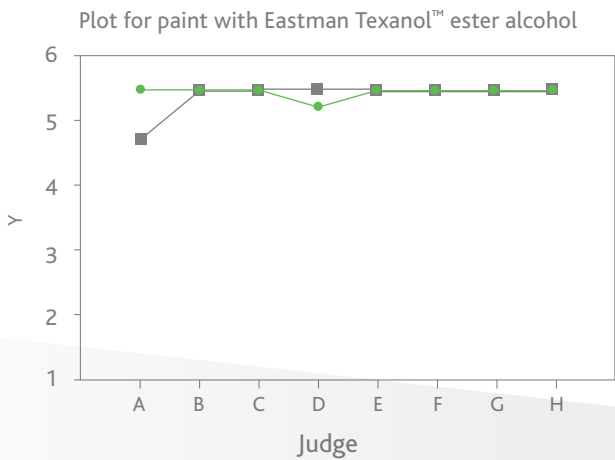
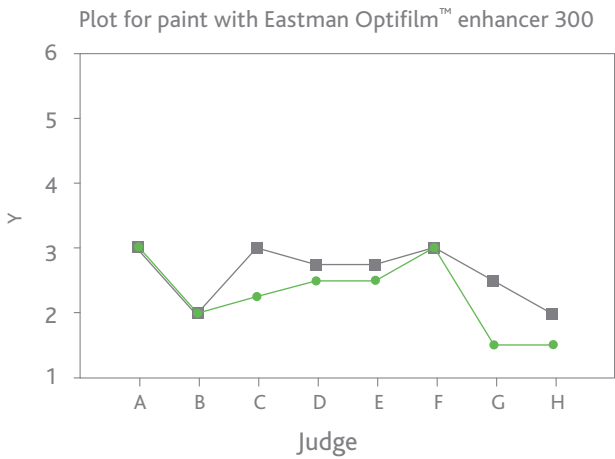
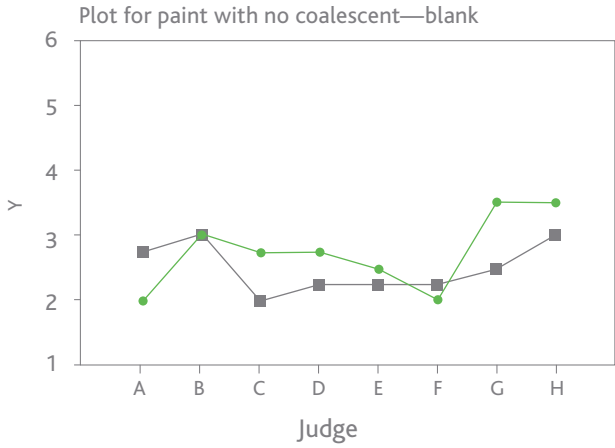
1. A standard flat wall paint was diluted by 20% with deionized water and split into 6 samples.
2. Texanol and Optifilm 300 were each added to two samples at 0.5% parts by weight based on the original undiluted weight of paint.
3. Two samples were not coalesced and were used as "blanks." After 24 hours, the inside of 5-liter lacquer-lined tins were coated with 5 g of paint using a sponge. A new sponge was used for each application, which prevented cross contamination of the samples.
4. The paints were allowed to dry for approximately 1 hour at ambient and then sealed with lids. The tins were stored at 23°C throughout the experiment.
5. Twenty-four hours after application, 10 judges, not connected with the coatings laboratory and unfamiliar with the coalescents and their odors, were asked to evaluate the paints' odor, ranking the 6 samples from least odor to most odor. This was repeated after 11 days using 8 of the original 10 judges.
6. A statistical analysis called a Friedman's test was carried out. This test calculates a Chi-square statistic based on the rankings by each judge. A low p value indicates the Chi-square value is statistically significant.

Figure 1. Odor ratings



Judges odor ratings and statistical analysis

Figure 2. Graphical comparison of judges' odor rating @ 24 hours and @ 11 days



—■— Odor rating 11 days —●— Odor rating 24 hours

Statistical analysis*

- Each data point is the average (mean) of the odor rating each judge gave two tins of each paint.
- The graphs show the judges have rated the tins consistently, within themselves, on each occasion.
- The difference between the odor rating at 24 hours and at 11 days was calculated for each judge, and each paint; i.e., the difference between each pair of points on the graphs. The average (mean) of these differences was 0.01042. A Students T-Test was carried out which concluded this mean difference was not statistically significantly different from 0 (Prob> [t] = 0.9163).

* There is acceptable agreement between the odor rating given by each judge, to each paint, after 24 hours and after 11 days. The data is therefore valid for further statistical analysis.

Figure 3. Odor rating by paint after 24 hours

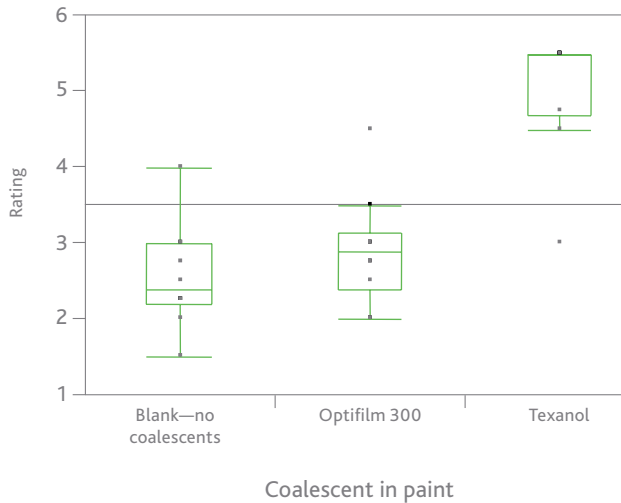
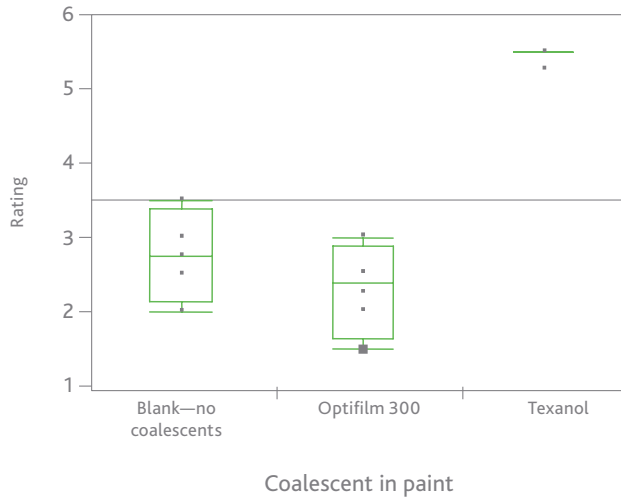


Figure 4. Odor rating by paint after 11 days



Statistical analysis

- Figures 3 and 4 are “box and whisker” plots. The central line of each box denotes the median odor rating for each paint. The “box” contains 50% of the data. The “whiskers” denote the spread of the data, and single points indicate possible outliers (relative to that paint only).
- These plots show at both 24 hours and at 11 days that Eastman Texanol™ ester alcohol measures higher in odor than Eastman Optifilm™ enhancer 300 and the blank sample with no coalescent added.
- The overlap between the boxes for the Optifilm 300 and the blank sample indicates they are not significantly different from each other.
- Further statistical analysis was performed via Friedman's test. This test models the ratings of n judges on k treatment: (paints). The test parameter calculated was statistically significant, indicating the paints are different and the judges' odor ratings are correlated.

Conclusion

These statistical analyses confirm the paint incorporating Optifilm 300 has an odor comparable with the “blank” sample containing no coalescent and lower than the paint containing Texanol.



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