

# **PAINING DEFECTS: THEIR CAUSES AND PREVENTION**

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Painting Defects: Their Causes and Prevention by G. W. Thompson

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**G. W. THOMPSON**

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AND PREVENTION**



# **PAINTING DEFECTS**

## **Their Causes and Prevention**

An Address by

**G. W. THOMPSON**

*Chief Chemist, National Lead Co*

Delivered at the Eleventh Annual Convention Maintenance of Way Master Painters' Association of the United States and Canada, November 18th, 1914, and at the Semi-Annual Meeting of the American Institute of Chemical Engineers, December 3rd, 1914.

## PAINTING DEFECTS

### Their Causes and Prevention

**W**HEN a defect in painting occurs, there are two different attitudes in either of which a person may place his mind. One is to assume that the defect is inherent in the paint used, and the other is to assume that the defect is due to an improper use of the paint. This difference in attitude of mind is not imaginary; it is so real that it seems very desirable that this difference should be explained and amplified.

The principal cost of any painting job is labor, and yet, when in the attitude of mind first mentioned, if a paint goes wrong one will condemn the materials used, whereas in the other case he will be inclined to hold that the most costly factor is the one that is probably responsible. It is easier to blame paint materials than it is to blame workmanship. Materials are tangible; workmanship is intangible. To some extent materials can be examined even long after they have been applied, but there are few means of recording satisfactorily what the workman has done. Every manufacturer of paint feels more or less that if his paint were properly applied it would give perfect satisfaction. Every user of paint is inclined to feel that if he could only get the right materials he would be quite sure that he could always do good work.

It would appear that perhaps in most cases the manufacturer is inclined to take one of these two attitudes of mind and the consumer the other, but this is not necessarily the case. Some manufacturers are wedded to certain beliefs with regard to materials, which, judging from their advertisements, one would be inclined to think fool-proof, and some few consumers blame their workmen when things go wrong without thought that the materials used may be at fault.

Without attempting to judge of the relative value of either attitude of mind, as so much has been written connecting painting defects with materials used, the writer proposes in this paper to take the opposite attitude and to treat of paint defects, their causes and prevention, not with the idea of connecting these defects to any appreciable extent with the materials used, although he will have to diverge from this rule to a slight extent, but principally to give you the results of a great many years of study of this subject from this standpoint, and to show how paint defects may in many cases be corrected without radical change in the materials used.

In studying a paint defect from the attitude of mind which is adopted in this paper, one cannot, of course, ignore the materials used, but one can seek to find out to what extent such a defect may be the result of the condition of the surface painted, the proportioning of the materials, the application of these materials, the time allowed between coats, etc. From this attitude of mind, all of these factors, and others similar thereto, are included in the general term "application." In studying a paint defect along this line, one must use his reasoning powers conscientiously and scientifically. To obtain an intelligent conclusion, he must study many defects; he should furthermore be able to reproduce experimentally the defects being considered before he can reach a positive conclusion as to their causes and cure. It must not be assumed that the writer can explain all paint defects. He makes no such pretensions. But in so far as he is able to speak positively in any case, it will be because he has been able to reason out the cause of the defect, and in most cases he has been able to reproduce the defect experimentally.

A word must be said here in regard to the proper use of painting tests. Such painting tests, in so far as they are of a controversial nature, have not appealed to the writer. The real value of painting tests lies in the information they furnish—in the ability they give

the student to classify painting results, whether good or bad. The idea that paint materials can be tested out and their merits determined by a few panel painting tests is, in the opinion of the writer, generally unsound. But if such tests are to be conducted, they should be along lines entirely different from those which have heretofore been pursued, with one or two striking exceptions. The painting of panels indoors and then exposing them to the weather, and from such tests endeavoring to reach conclusions, favorable or unfavorable to certain paints, as the case may be, without prior thereto having determined that the method of testing is a fair representation of what actually occurs in practice, is an unsafe method to follow. To illustrate this by a parallel case, no chemist would dare to adopt a method of analysis or test that had not been checked up by analyzing or testing mixtures of known composition.

One of the exceptions to which reference should be made is the North Dakota tests. There Professor Ladd is not satisfied with painting panels and exposing them to the weather, but he also has had a number of houses painted following ordinary practice. In the case of the North Dakota tests, there are actual painting jobs done which serve as a check upon the panel tests conducted under his direction.

Another striking exception is the painting tests on the Havre de Grace Bridge, where the paints were applied both to the bridge proper and to the special panels erected along the side of the bridge. In all cases, if the panels do not confirm the actual service tests, they must be considered only as of secondary value. They have value—but only for the information they give.

This aspect of the subject has been driven home to the writer by the study of many thousands of tests which have been conducted under his direction. He has come to the conclusion that it is very difficult to make a panel test of paint materials which will give



results which correspond to the results obtained with those same materials in actual use. The writer did not believe this at one time and was inclined to take issue with the statement of experienced paint manufacturers who said that panel tests were of little value as showing the merits of materials when in actual use. A little consideration will, however, show the difficulty of preparing panel tests that will be conclusive as to the merits of paint materials. I refer now to paint materials used for exterior painting. The usual way of preparing such tests is to get nice specimens of wood, to paint them indoors, to place them on racks between the application of each coat, and when they are thought to be thoroughly dry, to place them out-of-doors for exposure.

The objection to this method of painting is that we never bring a house indoors to paint it, unless it be a toy house, and the drying action of the under coats of paint is never the same indoors as it is outdoors. Indoors there is not the same circulation and abundant supply of air that there is out-of-doors. A great quantity of air is needed to dry paint properly for outdoor exposure. Panels painted indoors will not dry so hard as they will when painted out-of-doors. Panels that are stacked fairly close together will not dry so hard as panels spread out and given a great deal of air. We must not think that this applies only to the outer coat, for that will finally dry when it is placed out-of-doors, but we must remember that for out-of-door work all coatings are exposed to more or less rapid currents of air which dry them to a proper condition for durability.

A number of different methods have suggested themselves to the writer whereby panels painted indoors can be brought to a condition corresponding to outdoor exposure before the actual exposure is made. The writer has thought that perhaps a short heating of the panels after each coat has been applied, at say 120° F., might produce results that correspond to outdoor



**Figure 1**  
**Test Board Drying Cabinet Supplied With Clean**  
**Out-of-Door Air.**

