

**A SECOND REVIEW OF
TECHNICAL PAINTS FOR
THE PROTECTON OF METAL
SURFACES, 1874-1904**

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A second review of technical paints for the protection of metal surfaces, 1874-1904 by Frank P. Cheesman

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FRANK P. CHEESMAN

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A Second Review of Technical Paints for the Protection of Metal Surfaces

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BY
FRANK P. CHEESMAN
OF THE

NATIONAL PAINT WORKS
Specialists in Paints for Metal Surfaces
WILLIAMSPORT, PA.

CHICAGO

NEW YORK



W. G. ELLIOT



F. P. CHEESMAN

1874-1904

This business was founded in 1874 by William G. Elliot. In 1882 he took in as partner William H. Loomis, who had been with him since 1878 as a salesman, and this partnership continued until 1903, when Frank P. Cheesman, who had been identified with two leading houses in the Paint trade for over twenty years, bought out the interest of Mr. Loomis, Norman Elliot, son of W. G. Elliot, still continuing in charge of the manufacturing department, which position he has filled for a number of years; and since the change in May, 1903, the capacity of the plant has been enlarged over 50 per cent., many improvements and new connections having been made, and a Purchasing and Sales Office opened in New York, as well as a Sales Office in Chicago.

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By
FRANK P. CHEESMAN

PREFACE.

The National Paint Works are unique in the position they occupy in the Paint Trade. For thirty years they have been the only Paint Manufacturers of any size who have confined their dealings to the large Consuming and Corporation trade. We claim that a Manufacturer cannot sell Dealer and Consumer and do justice to both. The Dealer, however, has no complaint against us, because we have not solicited his business, hence we have a right to sell the Consumer direct, but in doing this we are not injuring the Dealer, as the Consumers we sell are large ones, and must buy direct from the maker. But the Manufacturer who tries to sell Dealer and Consumer must protect the Dealer to a certain extent, hence he is not in a proper position to do the large Consuming buyer justice.

We are the Pioneer Manufacturers of "Special and Technical Paints for Metal Surfaces," and have supplied more Paint for Metal than all the other Paint Manufacturers combined, and yet we must confess we do not know it all, and if you know of anything better, send us your specifications and we will give you just what you ask for.

We use the best skill we can obtain to secure the proper production of our goods, but the best is but human and will at times make mistakes, and as we are not above making mistakes neither are we above correcting them. We do not allow knowingly a single gallon of paint to leave our works that is not up to its proper standard. If, however, the goods are not what you think they should be, notify us at once, and your complaint will be promptly investigated and the matter adjusted to your satisfaction.

We thank you for your past favors, and will do all in our power to warrant a continuance of your orders.

NATIONAL PAINT WORKS.

Williamsport, Pa.
March 1st, 1904.

CAUTION.

Several concerns have started in business within the past few years under the name of NATIONAL, and some of them have attempted to trade on our reputation. We desire to caution our readers, if they want the best goods from the Original Pioneer Manufacturers, to specify NATIONAL PAINT WORKS OF WILLIAMSPORT, PA.

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**SECOND REVIEW OF
TECHNICAL PAINTS FOR THE PROTECTION
OF METAL SURFACES.**

Three years have passed since our last Review was issued and during that time we have gleaned some new facts from experience. The Paint Market now, as then, continues to be flooded with new mysterious products under queer, fantastic names, but the old time standards have more than held their own, and as Louis E. Andés says (page 58, Iron Corrosion):

"The use of an oil paint, made from good material, properly laid on and renewed in good time, is still the best means available for painting iron structures. Moreover, the author is convinced that this will long continue to be the case, for he cannot conceive any other coating endowed with the same qualities, and so easy both to apply and renew."

While we propose to continue testing everything new that is offered as an improvement on the old, we will not advocate the use of a new pigment or vehicle until we have tested it under all possible conditions.

A working test is the only reliable test. Laboratory and short time tests are frequently very misleading, and we can give many instances to prove this.

The pigments which are recognized generally as being the standards for use on Metal Surfaces, either separately, or in combination, are as follows:

- Red Oxide of Iron.
- Brown Oxide of Iron.
- Carbon.
- Red Lead.
- Blue Lead.
- Graphite.
- Asphaltum.
- White Lead sublimed or corroded.

In vehicles, Linseed Oil, Turpentine, Varnishes and Driers, are the best used for grinding, thinning and drying purposes.

All of the above pigments and vehicles have their value and use, but it takes experience, care and skill to make a satisfactory protective coating out of them.

WHICH IS THE BEST PAINT?

In 1897 we painted a number of iron plates 10 x 12 with eight of the then leading paints on the market. Each plate was coated with three coats, and exposed continuously to the weather on the roof of our factory at Wilhamsport, from July, 1897, to July, 1903, and we now have them on exhibition at our New York City office. Their order of merit as regards durability is as follows:

- No. 1, National Paint Works, No. 31, English Red Oxide of Iron.
- No. 2, National Paint Works, No. 17, American Brown Oxide of Iron.
- No. 3, National Paint Works, No. 16, Carbon and Asphaltum Black.
- No. 4, National Paint Works, No. 400, Pure Carbon Black.
- No. 5, National Paint Works, No. 700, Red Lead and Graphite.
- No. 6, National Paint Works, No. 32, Graphite.
- No. 7, Manufacturer's name given on personal application—Coating.
- No. 8, Manufacturer's name given on personal application—Metal Protective.

We have also on exhibition, plates finished with both Red Lead and Blue Lead, showing their relative merits for first coating, and the Blue Lead seems to stand as well, if not better than the Red Lead, while there is an economy as regards labor and material in the use of Blue Lead, as compared with Red Lead for first coating.

In 1898 The Osborne Co., civil engineers, Cleveland, Ohio, made a most careful test of some twenty-five different kinds of paints, pigments, vehicles, varnishes, etc. They painted some 250 different metal plates, and made five different exposures that lasted from three to sixteen months viz.: Brine, Acid Fumes, Weather (with plates placed flat and upright), Depot (that is, hung in the Union Depot train shed over where the locomotives stand, and in such manner that the plates would receive their great blasts when they start). A careful inspection of the Osborne blue print report shows that the oxide pigments are the best, as an oxide of iron is marked perfect on four exposures, and good on the fifth or acid exposure. All tests were two and three coats of paints.

In November, 1897, Mr. Ira O. Baker, Professor of Civil Engineering, University of Illinois, in conjunction with one of his students, Mr. F. W. Von Oven, made tests of twelve different kinds or makes of paints. Mr. Von Oven presented his thesis the following June, with a table of tests that had been rushed through the laboratory, consisting of the following: Heat, salt water, sulphurous acid gas and relative elasticity. This was published in the "Railroad Gazette" of March 10, 1899.

His table of short time tests, as published at that time, shows conclusively that the Asphalt paint was much the best, as proven by five laboratory tests, as in four of them it stood No. 1, and in the fifth (the salt water test), No. 2. He also made a long time weather test of the twelve paints received. After a weather exposure of two years and eleven months, they were examined on November 20th, 1900. The Red Lead and National Paint Works, No. 17, Brown Oxide of Iron showed no rust spots on either the first or second coats, while all the others showed rust badly, and especially the Asphalt paint.

This proves conclusively that the long time weather tests are the only tests of any value, and that the laboratory and other short time severe tests are very misleading.

Mr. Hunter MacDonald, Chief Engineer of the Nashville, Chattanooga and St. Louis R. R. in a paper which he read in 1899 before the Engineering Association of the South, entitled "Painting Railroad Bridges" states as follows: "As painting is the only remedy so far in use against oxidation of bridges, the question of what paint to use is an ever-recurring one to the officer in charge of construction and maintenance."

The writer recently undertook a laboratory test of twenty different

kinds of paint, which will be briefly described, but he is free to confess that the laboratory test is a short cut, and is not entirely conclusive on account of the impossibility of bringing to bear all the destroying agencies which are to be encountered in practice.

Twenty discs of No. 22 sheet iron, six inches in diameter, were placed on a concave wooden block and hammered with a round-faced hammer until each became a saucer about half an inch deep. The inner surface of each saucer was divided by radial lines into three equal sectors. After being thoroughly cleaned one-third of each saucer received one, two, and three coats, respectively.

Each saucer had about a tablespoonful of locomotive sparks placed in it and water poured over them until about three-quarters full. They were then set away. This was done on June 1st, 1899. The saucers were watched, and as each became dry it was refilled. On November 1st, 1899 the saucers were submitted to one of our members for classification with regard to the rust-resisting qualities of the paints. After careful examination he arranged them in a row in the order of their superiority, and then called in another member, who, on looking over them, approved his classification. Neither one knew the name or kind of paint used. These saucers are presented for inspection.

The writer, equally ignorant, also made a classification, marking each third of each saucer whatever percentage of 100 his best judgment dictated.

A comparison of the two results is given below.

COMPARISON OF CLASSIFICATION.

No. of Samp.	Rank by member.	Rank by Writer.	Kind of Paint.
1	9th	6th	Dixon's Silica Graphite Ground in Oil
2	11th	10th	**
3	7th	8th	**
4	17th	8th	Allen's Antirust Japan.
5	2nd	2nd	Penn. Standard Rubber Paint.
6	3rd	3rd	Red Lead and Oil.
7	14th	9th	Lampblack.
8	5th	4th	National Paint Works, No. 500-B.
9	15th	10th	Mexlean Graphite.
10	13th	11th	Ferrubron.
11	18th	12th	**
12	4th	5th	**
13	10th	10th	** [Protector.
14	1st	1st	National Paint Works, No. 500 Metal
15	16th	9th	Princes Mineral Brown.
16	20th	13th	Princes Red Oxide.
17	8th	6th	National Paint Works, No. 31, Special
18	6th	7th	Nat. Paint Works, No. 32, Graphite.
19	18th	9th	National Paint Works, No. 700-B.
20	12th	10th	American Lucol Co. Durax.

**Proprietors do not desire publication of tests.

The importance of selecting a good paint is emphasized by the fact that the cost of its application is from three to five times the cost of the paint, depending upon the character of the structure to be painted and the condition the iron happens to be in when the application is made. The cost of the paint is a small item, compared to the labor of its application."

Of course we are pleased that our No. 500 Metal Protector was selected unanimously as being the best paint tested, and the test proves conclusively what we have always claimed for it, that for the under side of bridges, and for all hydraulic and underground construction, No. 500 is an ideal paint, but it will not stand as well as our No. 16 or No. 400 on the upper part of bridges where it also has sun exposure.