

The Dutch Boy Digest

A page of discussion and comment of interest to users of National Lead Company products, digested chiefly from The Dutch Boy Painter and The Dutch Boy Quarterly

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Manufacturers of Lead Products

Red-Lead Not Impaired By Acid Vapors

It Forms Insoluble Sulphate When Attacked

An oil refining company was having trouble with the paint on its tanks and metal work in general, because of the presence of sulphurous gases in the air. In answer to an inquiry from the company, Professor A. H. Sabin, consulting chemist of National Lead Company, wrote in part as follows (Professor Sabin speaks from an experience of thirty years in dealing with paint and painting problems):

"Sulphurous gases in the atmosphere are almost always present in the form of sulphurous or sulphuric acid (generally both) either in actual solution in the air (along with more or less watery vapor) or more rarely as a sort of mist.

"These acids are extremely dilute; and while this condition causes prompt and continuous rusting of unprotected iron or steel, these acids do not naturally attack linseed oil or any other oil, nor tar, nor asphaltum, unless the acids are in concentrated form. Should the blinder go rapidly to pieces, it is probably due to other and more common causes, such as prevailing temperature and sun exposure, alternating wetness and dryness and so on.

"The other part of the paint is the pigment. Some pigments may be easily attacked by these acid vapors and be converted into soluble sulphates which will not only wash off, but may corrode iron if they touch it.

Lead Changes Into Sulphate

"Lead is also subject to attack, but the lead sulphate is insoluble and if the paint contains red-lead the effect will be to change the pigment in the very thin outer layer, probably only one five-thousandth of an inch in depth, into sulphate. This will cause the surface to whiten, but when you rub it off you will find the red color beneath. The whitened skin is only a white paint instead of a red paint. If it were soluble it would constantly wash off and the paint would stay red as long as there was any left.

"About this time you want to know why it is that paint does not last in such places, if what I have said is true. There are two fundamental reasons.

Moisture Causes Chemical Action

"We all know, in the first place, that moisture tends to soften oil film and then sets up chemical action within it. You may think that in a dry climate there is not likely to be much moisture; but if there is acid and moisture (there is always moisture where there is acid), which settles on the painted surface, the acid will hold some of the water there no matter how dry the surface may seem to be to the touch.

"You therefore have the water always at work softening the oil part of the film and helping the atmosphere and the sunlight to destroy it. The chemical rays of sunlight are destructive to all oils. In this secondary way no doubt the acid does help to destroy the life of the paint, but it acts on all alike.

"The second cause, which is probably the more important, is that the acid, being always there, attacks the iron or steel wherever it can get at it.

"A paint film is not sure to be perfect everywhere, and if the air, carrying these corrosive acids, gets in even through microscopic pores or holes in the film (perhaps because of imperfect brushing, perhaps accidental puncture or scratches), the acid goes at work at once and the rust spreads. Rust always swells and breaks up

Tests Prove Paint Is Foe of Germs

Infected Surfaces Are Made Sterile By Painting

Germs have killed a vastly greater number of people than have fallen in all the wars ever fought. No wonder so many brilliant minds have been devoted entirely to the wiping out of these enemies of man. One of their most practical discoveries is that paint is a foe to germs.

A test of paint's sterilizing power was carried out in the Institute of Industrial Research at Washington, D. C. On a laboratory wall one coat of paint was applied to a small area. After drying, the painted surface and the unpainted area next to it were lightly rubbed with a different swab which had been moistened with sterile water. The moisture in each swab was then squeezed out into plates of agar sugar, a jelly-like mixture in which germs easily multiply. Examination showed that the plate made from the unpainted area contained a positive bacterial growth. The one made from the painted area showed a negligible growth.

Then a culture of three species of germs, each of a death-dealing type, were mixed with a dry powder and blown upon the two surfaces—painted and unpainted. Similarly the germs in a sterile liquid were sprayed on other portions of the same surface. One hour later plates were made in the agar the same as before and the growths were positive the not so pronounced from the painted area.

Results of Test

Next the two surfaces were washed with soap and sterile water. Plates in agar were made an hour later. The agar containing the culture from the unpainted area showed abundant growth while the culture from the painted area showed very little.

These tests conclusively prove that if a painted surface becomes contaminated the source of danger may be removed by washing and also that infected surfaces may be made sterile by painting. These results are probably not so much due to any germicidal properties which paint may possess, but to the fact that the old surface is covered with a clean washable film of paint.

Painted Walls Are Sanitary

The danger of an unpainted dingy or rough wall is that it will retain moisture a long time and that its porous nature makes it easy for floating organic matter to collect. This kind of wall cannot be effectively washed, so that the two factors necessary for quick bacteria growth—moisture and organic matter—cannot be removed. If a wall is covered with a good waterproof coat of paint such as produced with white-lead-and-oil, its smooth surface is easily washed and need never afford a resting place for germs. That is why every inch of surface in a hospital is painted.

The lesson learned by the modern hospital can well be put into practice in the home. In the kitchen where food is prepared, washable painted surfaces are unquestionably needed; sleeping and living rooms and particularly nurseries require the same protection. The ideal feature about paint

Why a Paint Film Will Not Last Forever

It Fights the Elements to "Save the Surface"

The length of time that a given film of paint will afford protection to a surface depends to a large extent upon the exposure.

Moisture is the active element which enters into the process of decay or disintegration of all paint films. Indoors where the air is more or less freed from moisture the process is extremely slow, and in deserts and other dry countries no perceptible decay has taken place in a thousand years. But out-of-doors, as a general thing, there is an entirely different story to tell, especially in the rain belts, which after all are the parts of the earth inhabited by man.

Here we are confronted with certain natural influences which tend to hasten the decay and disintegration of the paint film. Among these influences may be mentioned the sun's light and heat, wind, rain, hail, snow, ice, fog, salt spray, dust, dirt, and surface soil acids. There are a number of other influences more or less artificially produced in cities and other centers of industrial activity that have a marked effect on the life of paint. Under such influences may be mentioned brine dripping, acid fumes, smoke, and other deleterious gases.

Pigment Does Not Decay

Paint, of course, is subject to decay, as is all other structural material. It is the vehicle (oil or vegetable part) of the paint that decays. The pigment or mineral part of the paint does not decay. It simply falls off when the oil is gone, as there is then nothing left to hold it in place. Decay, as has already been stated, always takes place in the presence of moisture, and is greatly accelerated by the action of heat.

With all these influences trying to destroy the film, we should not expect paint to last forever. Nothing which is exposed to the elements does. The remedy for this condition is frequent renewal. Paint is cheaper than metal or wood. One or the other is bound to go sooner or later. A coat of red-lead or white-lead paint from time to time will maintain the surface in an excellent state of preservation, and when you "save the surface," you save it.

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How Boiled Linseed Oil Affects Drying

Dries in About Same Time as Raw Oil

Many painters say that boiled linseed oil dries from the top, while raw dries all the way from the bottom, that is, from the surface of the material painted, outward to the air. This is an error, due to the observation that a boiled oil film is often dry to the touch while still soft underneath, while raw oil when dry to the touch, is dry clear down to the wood.

Surface Dries First

Any coat of paint dries first on the surface, whether it contains boiled oil or raw oil. The process of drying requires oxygen—and this is most plentiful on the surface exposed to air. Boiled oil, due to its process of manufacture, is already in a state of partial oxidation. As a result of these two facts, the surface of a paint film containing boiled oil will dry very quickly. The drying process does not cease here, however, it still continues down thru the film, tho at a slower rate, because the oxygen must pass thru the outer surface, which is already dry to the touch.

Raw oil requires the addition of a drier, usually made of lead and manganese oxides to hasten its drying action. This drier makes easier the passage of oxygen from air to oil. A paint film containing such an oil will dry more quickly on the outer surface—the same as a boiled oil film—but this outer layer does not dry as quickly as that of boiled oil, which fact gives the deeper portions of the film a chance to get oxygen before the surface is sealed. When the raw oil film is dry to the touch it is just as dry thruout.

Drying Time the Same

The important point is this—the time necessary for each film to become thoroughly dry is practically the same. In other words, the boiled oil, apparently dries first, the process is still going on underneath and is completed at about the same time the raw oil with drier is actually dry.

Properly handled by one who understands its action, boiled oil will give excellent results. The same may be said of raw oil combined with drier. Which shall be used is, in most cases, simply a matter of personal preference, but the quick drying of boiled oil at the top often misleads those who are not familiar with it and causes them to think it is thoroughly dry when it is not. This may lead to trouble.