

"Is It Safe to Paint My House Now?"

There is a very understandable tendency to feel that anything manufactured during the war-time period of scarcities must necessarily have been inferior to that same article manufactured pre-war. We are inclined to believe that anything made during the war must have been a "Victory" or a "War Emergency" model, which we patriotically accepted without complaint when our country was at war, but which we feel we should not have to put up with when raw material supplies improve.

Because we all are inclined to think this way about practically everything we buy or use today, it is not surprising that we are asked almost every day, "Is your house paint back to pre-war quality? Is it safe for me to paint my house now?" People always are a little surprised and often a little skeptical when we tell them that if they can get the paint it is perfectly safe to paint their house now - that the house paint we made during the war was better in quality and performance than the paint we made pre-war - and that we won't go back to pre-war quality, but will continue to make the kind of paint we made during the war, because it is better!

The real truth of the matter is that the necessity for conservation of our limited supplies of drying oils during the war forced the paint industry into a technological advance which it might otherwise have taken years to accomplish without this incentive. The move was toward the use of substantial quantities of bodied oils in house paints. This was by no means an entirely novel step, but it is true that this type of binder had not been used generally for high grade exterior paints prior to 1943.

The principal difference between the pre-war house paints and the current type is that we now use less total oil binder. We make up the binder using a substantial proportion of fairly heavy kettle bodied linseed oil blended with some raw, rather than practically straight raw linseed oil. The increase in the quality of the binder gives improved performance characteristics, even though the volume or weight of binder is smaller.

As oil gains viscosity through heat bodying its penetration properties are reduced. When the old pre-war, high raw linseed oil paints were applied on new wood, a considerable amount of the oil was lost by penetration into the wood. Even on repaint surfaces this loss was not inconsiderable. The use of substantial quantities of bodied oils permits control of penetration to the exact point desired. This may be seen very readily in the filter paper penetration test shown on Plate I.

In this simple test a can lid is filled with the paint to be tested and a filter paper pressed down lightly around the rim of the lid so that the paper is in complete contact with the paint. The oil bleeds away from the lid rim according to its penetrating tendencies and becomes visible as a translucent border, as shown in the photograph. A comparison of the two filter paper tests shows that the 1942 SWP Gloss White

exhibits about 2-1/2 times the penetration of the present formula. It is easy to see that the bodied oil in the present formula helps to control the penetration of the raw oil. In this way the total binder is held in the paint, where it does some good, and is not lost to the depths of the wood, where it is practically useless.

The use of bodied oils in the house paint vehicle contributes many other advantages, among which may be included better wetting of the pigments - which helps to give better grind and dispersion of the pigment and better gloss - better flow, better drying, and greater durability. The current house paints, with their considerable content of bodied oils, have slightly more feel under the brush than the pre-war paints, with their high content of raw oil, but they still are entirely satisfactory as to brushing. The somewhat greater feel under the brush results in a slightly reduced spreading rate. This would tend to counteract slightly the drop in film thickness due to the use of actually lower binder volume. Any decline in film thickness is further reduced by the considerable reduction of penetration into the substrate. Thus, the actual differences in film thickness between the old and the current paints are relatively unimportant and may vary, depending on the circumstances of application and the surface being painted. This point is emphasized because it is recognized that other things being equal and within practical limits, the durability of paint films is proportional to the film thickness.

One of the outstanding advantages of our current SWP is its increased flow. This results in improved smoothness of film, which not only gives us a more attractive finish, but has the further very practical advantage that the smoother film catches and holds less dirt than the pre-war paints, which had more prominent brush marks.

Plant II shows in a very simple way the greater flow of the current SWP compared with the pre-war formula. This is the simple flow plate test in which equal amounts of each paint are placed in the circular depressions shown, any excess scraped off, and the plate then tipped to start the paint flowing. In the picture shown the plate was tipped to an angle of 45° and the paints allowed to flow for 15 minutes. The current formula flowed about 3-1/2 times as far as the pre-war formula in that time.

Obviously this increased flow could go too far. We actually have controlled the flow at the point where we get a beautiful film with only low rounded brush marks, but with no danger of sags or curtains. House paints should not flow too much as they should obliterate incidental mars in the repaint surface, such as blistered areas or where the old paint has peeled or flaked off in spots. If the paint flows too much it follows the contours of these depressions and they are never covered up and hidden.

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Plate III shows the comparison in flow of SWP Gloss White pre-war and current formula as they were actually brushed on primed beveled siding. It is very apparent that there are still evidences of brush marks in our present formula, so that there is no danger of sagging, but the brush marks which remain are soft and rounded.

Another outstanding advantage of the present formula is its faster dry and better through drying. The pre-war oil-rich house paints had a tendency to skin dry and wrinkle when applied in heavy films, and the drying was quite slow at lower temperatures. The current SWP has proportionately more pigment and less oil, and almost one-half of the oil has already been processed to a comparatively advanced state of polymerization. The net result is that the film gels rapidly, sets out of dust quickly and dries through much more thoroughly than the old oil-rich paints. Actually, this means that our present house paints are much more fool-proof from the standpoint of drying of accidental heavy spots and unfavorable drying conditions. Plate IV shows these differences in drying quite graphically.

The average SWP film will probably be spread at about 500 square feet per gallon, one coat application, or even higher. In the exhibit in Plate IV the paints have been applied on plate glass by doctor blade at excessively low spreading rates of 300 and 150 square feet per gallon, respectively. The photograph shows the condition of the films after over night drying at room temperature. In the areas marked "1" on the two films at the left (at spreading rates of 300 square feet per gallon) it may be seen that the pre-war film was easily gouged with the finger nail, showing soft top drying. The current SWP has dried through very firmly, showing considerable resistance to gouging.

In the areas marked "2" a lead pencil was drawn on the paint surface until the films ruptured or showed up the pencil mark. It is obvious that on the pre-war paint film the pencil cut right through the top dried film. The current SWP has dried through hard enough so that the pencil marked the paint without cutting through unless considerable pressure was exerted.

In the area "3" the very heavy bead at the bottom edge of the film wrinkled in both cases. However, when the bead of the pre-war paint was punctured liquid paint flowed out, showing that only a skin had formed and that the paint remained wet underneath. When the heavy bead of the current paint was punctured no liquid paint appeared. The whole bead had thickened to a consistency about that of tooth paste. This illustrates the capacity of the current formula to dry through in rather considerable depths of film.

When the two paints were applied at the extremely low spreading rate of 150 square feet per gallon the entire surface of the pre-war paint top dried and wrinkled. The current SWP dried through without wrinkling.

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Whenever possible, house paints should be applied so that they will enjoy the most favorable drying conditions. Keeping this in mind, painters usually avoid starting work too early in the morning, when there is dew on the surface being painted, and they also try to stop work early enough in the afternoon so that if there are dews in the early evening they do not flatten the drying paint film. Since low temperatures retard the drying of paint, it has been necessary to wait late enough in the spring to get reasonably good drying conditions and not to delay painting until too late in the fall for the same reasons. It should be obvious that the better drying of the current formula extends the permissible painting hours during the day and the painting season for the year. Of course, it is possible to take too great an advantage of the better drying of our present production on house paints. One should never start painting so early in the morning that the sun has not had an opportunity to dry the dew off of the surface to be painted, and in all cases painting should be suspended early enough so that the film has a chance to set before the evening dews strike the surface.

We have already remarked upon the better flow of the current formula, stating that bodied oils produce smoother films which catch and hold less dirt. There is another reason why the present SWP catches and holds less dirt. Due to the faster and more thorough through drying there is less liquid oil in the dried film which may appear at the film surface and make the paint tacky or sticky. The freshly dried binder consists of some liquid material held in a gel of solidified oil. There is a tendency for this liquid to squeeze out. Since the amount of liquid component in the newly dried film of our current production is less than that of the old oil-rich formula, this tendency to squeeze out liquid components has been sharply reduced.

The better appearance of the bodied oil type of house paints in the first year or two of exposure has definite appeal to the public. General appearance is improved because of the smoother film and cleaner appearance due to less dirt retention. Naturally, after paints are well exposed they usually chalk fast enough to shed dirt so that dirt retention differences may disappear in the later years, before the house must again be repainted.

Plant V shows the difference in dirt retention between the pre-war and the current SWP house paints after six months' exposure at our Chicago Exposure Farm. The cleaner, smoother surface of the present house paint is quite obvious.

Plate VI shows a typical siding exposure fence at the Chicago Exposure Farm. In this case we show the south vertical exposure, although some of the paints are also exposed north, and a smaller number east and west. The overlapping of the beveled siding and the general construction of the fence have been designed to approach as closely as possible actual exposure conditions on the average frame house.

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We have three principal points of exposure - the Chicago Exposure Farm, which is located 13 miles southwest of Chicago, Coffeyville, Kansas and Miami, Florida. Besides this, a large number of exposures are conducted at Cleveland, Ohio and other of our factory locations, as well as complete house painting tests distributed nationally.

Gloss retention is at least as good on the current SWP as on the pre-war, oil-rich formula and in some cases may be better. Obviously no conventional oil paint retains its gloss for more than a few months when exposed directly to the weather. Some chalking is necessary to shed the dirt which otherwise would accumulate on the surface, and we cannot expect to have both chalk and retention of gloss at the same time.

The durability of the present SWP appears to be at least equal to that of the pre-war paints. We have mentioned that balancing the slight reduction in spreading rates against the decrease in loss of binder by penetration there is relatively little drop in film thickness. Furthermore, the durability of a bodied oil binder is definitely higher than that of an entirely raw oil binder or one containing only small portions of bodied oil. The new result is good exterior durability, with entirely adequate protection and pleasing appearance throughout the life of the film. The paint system weathers by controlled, shallow chalking, with a high degree of resistance to checking and cracking.

The best paint technology today recommends a specially designed undercoater and a specially designed top coat, rather than the former practice of self-priming. In self-priming the painter simply adds oil and/or turpentine or other thinner to regular house paint for the first or intermediate coats and follows with the same paint as a finish coat, usually without further reduction. Today, on new work we prefer one, or even better, two coats of an undercoater especially formulated to do its specific job of priming the surface and furnishing a good ground coat for the succeeding top coat. On repaint work we recommend one coat of undercoat and one coat of top coat. Thus, the top coat can be formulated to do its own assignment - to beautify and preserve the surface on which it is applied and to resist the attack of the elements.

Many years of laboratory and house testing, and practical experience since 1938 with the manufacture and sale of millions of gallons of SWP Undercoater have shown beyond doubt the advantages of our SWP Undercoater-SWP top coat system over SWP self-primed. This advantage has not been changed in any way during the war period. SWP Undercoater from its inception has been built on a vehicle designed for controlled penetration, so that its bodied oil content and total binder really anticipated the so-called oil conservation house paints. When the oil restriction order M-332 was issued there was no need to revise SWP Undercoater in any way because it already conformed in binder content to the restrictions of the order. This, of course, means that one of the two paints in the SWP house paint system remained unchanged. Thus, the effects of any changes necessitated by war-time restrictions were halved. When we recall the discussion of the top coat formulation we can appreciate how the general quality of the SWP house paint system has been maintained, and in some characteristics actually has been improved.

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Plate VII shows a comparative performance of pre-war and current types of SWP Gloss White after three and one-half years' exposure, south vertical, at our Chicago Exposure Farm. Neither film shows any particular failure at this point, since all that has occurred so far has been some chalking, which should be expected. The exposures will be continued to the point of some definite film failure. However, when we realize that this is a south exposure of panel tests which, in themselves, constitute an acceleration of average paint performance on a house, it is obvious that we are assured of very satisfactory performance and good protection.

There is a world-wide shortage of fats and oils, and almost as universal a shortage of paint pigments. Under such circumstances, we cannot make anywhere near the amount of SWP which people want, and actually need. However, if you can find the paint, you can use it with confidence. It is not a "War Baby" or a "War Substitute." It is a high grade product representing a technological advance of sufficient magnitude so that we would not revert to the pre-war quality even if all the present scarcities of ingredients cleared up and we could formulate on the basis of free supply.

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