The Truth About Paint



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Why Prepared PAINT?

A Paint Talk to Paint Dealers



By G.-B. HECKEL

Author of "A Paint Catechism for Paint Men," "Why Paint Peels," "Paint Guarantees," etc.

WHY PAINT PEELS

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THE world progresses. It is related that in 1639 a Reverend Thomas Allen, of Charlestown, near Boston, was called to task for having paint about his dwelling, and only secured immunity from punishment by assuring the authorities that the offensive substance had been applied by a former occupant. Today the man who neglects to paint his home is considered deficient in community pride and improvident in defying the ravages of the weather.

Similarly, the industry of paint-making has advanced, particularly during the last several decades. "In days of old when knights were bold" there was little need for paint and painting. The abundance of substantial timber rendered its protection an unnecessary extravagance, and, it was not until the end of the Eighteenth Century that the first White Lead Factory was established in the United

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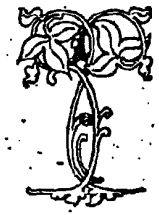

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States. Then, for nearly a hundred years the only paint used was that made from corroded white lead and linseed oil mixed together by a stick or wooden paddle.

Science enters paint-making

Shortly after the close of the Civil War, science invaded the realms of the paint industry, and with the passing of the spinning wheel and the introduction of steam-driven machinery, came the paint chemist with his scientifically correct formulas to take the place of the rule-of-thumb method, and the powerful grinding-machine operating at a high velocity to supersede the old-time hand stirring.

Lead is no longer the only paint pigment at our disposal. The principal ingredients used in modern paint manufacture are white lead, zinc, linseed oil, driers and coloring matter. The lead, zinc and other solids are called the pigment and the linseed oil, turpentine, etc., called the vehicle.

Obtaining white lead

The white lead of commerce is usually made by corroding metallic lead by the fumes of diluted acetic acid (vinegar). This is called the Old Dutch Process. At first the lead is cast into "buckles" or disks perforated with holes and after corrosion—which usually takes about a hundred days—is washed in water, dried, pulverized and often ground in linseed oil.

Lead is used in paint to give body and opacity or covering power, but when used alone—as it still is in hand-mixed lead and oil—it does not produce a sufficiently hard surface to resist the wear of the weather—the burning sun of Summer and the damp wet Wintry days. Another fault of white lead when used alone is that it soon loses its lustre and powders or "chalks" badly. You have probably noticed that homes painted with lead and oil alone lack that spick and span, glossy appearance. Nevertheless, it is a very important ingredient when used in combina-

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tion with zinc—another white pigment.

Oxide of zinc—why used

We could just as well make paint from lead and oil alone but science has proved that by the addition of zinc the paint is given hardness, is whiter and has better spreading power. "Sublimed" or oxide of zinc, as it is called, is produced by mixing the ore with anthracite coal and collecting the vapor from the fires in muslin bags. If used alone for outside painting, zinc would dry too hard and be apt to crack or peel. It is the combination of these two pigments in exact proportion which largely determines the wearing value of the paint.

Linseed Oil has been called the "life" of paint and the quality of this ingredient is of great importance. It is made by crushing flaxseed until the oil is extracted after which it is filtered and properly aged. Turpentine is produced by distilling the sap of the pine tree; some of the coloring pigments are earth colors, like Umber, Sienna, Venetian Red, etc. Blacks are made from burnt bones and oil soot, and other colors from coal-tar dyes and chemical combinations.

Producing the raw materials

In making SWP—as Sherwin-Williams Paint, Prepared is familiarly known—we have a great advantage because we manufacture most of the important ingredients, operating our own mines and smelters, white lead corroding plant, linseed oil mills, and extensive dry-color factories. Lead manufacturers advocate lead alone; zinc-makers will advise the use of zinc; the oil-crusher urges larger proportions of oil, while SWP contains these important raw materials only in those proportions which produce the best results. From the very start everything is done with scientific precision and exactness—the same as your druggist exercises in compounding a prescription. The "raw" materials as they are called—are analyzed by our paint chemists so that there is no variation in the color, chemical

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or physical properties of the ingredients. This is one of the great advantages over hand-made paint because we can be positive of the purity of the ingredients, while the painter has not the necessary equipment at his disposal.

Caring for the samples

If you were to visit our factories at Cleveland, Chicago, Newark, Montreal and London, one of the most interesting sights would be the Fire-Proof Storage-Room where the standard samples of SWP are kept. These are very valuable because they represent the result of years of study and experimenting. All the colors of SWP are made according to definite formulas or recipes, but before a single shade is approved, it is minutely compared with the standard sample in a similar manner to the Government standard of weights and measures at Washington. There are also rigorous durability tests. Of course the man who mixes his own paint from the "rule-of-thumb" recipe cannot compete with such a scientifically manufactured product.

About painting conditions

SWP is made in fifty-one attractive, permanent colors, ranging from the light creams and grays to the rich, deep browns and restful greens. It is an economical paint, not because it is cheap in first cost, but because it covers a large area of surface, wears as though it were a part of the house itself, and leaves a perfect surface for subsequent repainting. SWP is put up in full United States measure cans and sold by paint merchants from coast to coast. It has been on the market for nearly 50 years.

No matter the quality of the paint, good results cannot be obtained unless the paint is properly applied and the surface in good condition. For this reason we wish to call attention to a few fundamental principles which must be observed and some specific directions for the treatment of various characters of surfaces.

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How to thin SWP

It is a well-known fact that conditions surrounding painting are yearly becoming more difficult to meet, for several reasons, first, the character of lumber now being used for many so-called first-class structures is in reality the forest culls left standing on the stump or unmilled when the prime timber was taken off only a few years ago. A great deal of such timber is sappy, full of wind-shakes, knots, etc., and as frequently soft and punky, through long waterlogging or partial decay.

Again, on account of the scarcity and high price of properly paintable lumber, many varieties of woods are being utilized for exterior siding which only a few years ago were regarded as wholly unfit for such use, among which we might mention the yellow and other hard pines, spruce, cypress, cedar, basswood (linn), gum, redwood and other similar woods which are either full of rosin and pitch or very soft and spongy by nature.

In addition there is a scarcity of properly seasoned lumber. Much that is employed is either so full of sap or moisture that it is bound to make any paint peel as soon as the moisture is acted on by the sun. Again, other lumber has been so excessively kiln-dried that it is as absorbent as a sponge, and unless any paint applied on the same has been well thinned with pure linseed oil with the addition in some cases of pure spirits turpentine to assist in penetration, and thoroughly brushed out, in thin, even coats (not flowed on with a wide brush in thick, heavy coats, as is so frequently done) the soft, extra dry surface soon soaks up the liquids entirely and leaves the film of pigment with an insufficient amount of oil to enable it to bind to the surface, and here again peeling is very likely to ensue.

Very frequently no thought is given to the proper thinning of paint to be used on yellow pine or similar woods "fat" with rosin, and paints are "regularly" applied

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to such surfaces with the result that the action of the sun on the outside of the paint film soon draws the pitch out of the lumber and the full oil coat of paint, lacking penetration, can do nothing else than let go and peel off—a result which might have been avoided by the intelligent use of pure spirits turpentine in connection with pure raw linseed oil for thinning the first and second coats.

Another serious menace to good results in painting comes from the unintelligent application of any paint whereby on old work one coat is required to do the work that should properly be done by two, or in the case of new work two coats are wanted to do the work of three.

To accomplish this the paint is flowed on with a wide wall brush in heavy coats instead of being properly thinned and then well brushed out in thin, even coats with a smaller oval brush, thus allowing the paint to not only fill the absorbent surface, but also to retain a sufficient amount of oil in the pigment film to bind thoroughly and withstand the destructive action of the elements.

We desire, therefore, to emphasize what is a well accepted truth among all good workmen, viz.: *"Thin your paint properly and then brush it out thoroughly."*

Better by far to have paint thinned with pure linseed oil and spirits turpentine and brushed out too thin to cover well, than to flow on thick coats of heavy paint which temporarily look better but very soon are likely to induce cracking, peeling, etc., and forever after prevent the surface from being properly repainted except all of the heavy under-coating is burned off or otherwise removed.

Woods which need great care when applying SWP

Let it be remembered, then—

First, That to insure good results on new or very old, spongy surfaces, there must be sufficient pure raw linseed oil used in the first and second coats of any paint to fill

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properly the wood and arrest the absorption of the oil and binder from the paint film, and still leave enough oil to bind the pigment thoroughly, and that where any new surfaces are hard and resinous, a liberal percentage of pure spirits turpentine must be added in first and second coats to insure adequate penetration and assist the drying to a proper "face" or surface for recoating.

Second, That on old work that has been previously painted and presents a hard, impervious surface, equal parts of pure spirits turpentine and pure raw linseed oil must be used in reducing the first coat to a thin consistency to secure proper penetration and homogenous drying of the new coat of paint.

Third, That "elbow-grease" must be used to spread any paint out into thin coats and brush it well into the pores of the wood, and unless so spread, satisfactory results cannot be insured.

Fourth, That a much more satisfactory and durable job of work can be done with a 5-0 or 6-0 round or oval brush than with a long, wide wall brush.

Fifth, That under no circumstances should a new house be painted before wet basements or the plaster have dried out. *It should be borne in mind that every yard of green plaster contains nearly a gallon of water, and unless thorough ventilation is given and the moisture is allowed to evaporate and escape in that way, it must necessarily escape through the siding (which may have been thoroughly dry when put on) and the result must inevitably be blistering or peeling.*

Sixth, That painting during or following soon after a dew or heavy frost or fog, or in any heavy, damp atmosphere, is likely to produce unsatisfactory results, as dry siding absorbs moisture very rapidly.

Seventh, That to the greatest extent possible, painting in the direct heat of the Summer sun should be avoided. Paint on the shady side of a building as much as can be done.

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Eighth, Painting around fresh mortar beds should be avoided on account of the tendency of the oil in any paint to absorb the moisture and fumes from the lime, destroying the life of the oil and causing the paint to flat out and perish.

Ninth, Not to apply one coat of paint and let that stand a year or so before a subsequent one is applied. It will have weathered sufficiently in that time to absorb some of the elasticity of the succeeding coat, so that the final result cannot be so satisfactory.

Tenth, Again, don't apply a coat of paint and let it stand until it is bone hard before continuing the work—one coat should follow another within reasonable time until the work is finished. If the under surface is allowed to get too hard, it will not have the proper "tooth" to allow the succeeding coat to get a "grip" or hold on it.

Eleventh, That leaky roofs and gutters and broken downspouts are responsible for many a case of blistering or peeling which might, without investigation, be attributed to the paint.

Twelfth, That it is always best to employ a practical and well-experienced painter, who is capable of exercising right judgment with reference to the proper painting of any particular surface, and who is interested in turning out a properly finished piece of work even at a somewhat higher cost, rather than to entrust the job, at a lower price, to a workman who cannot be thoroughly depended upon.

Thirteenth, That Yellow Ochre and Mineral Reds, such as Venetian, Rossie and other oxides as well as Princes mineral, etc., are totally unfit for use as primers on any work which will be subsequently coated with lead and zinc colors, for the reason that when mixed dry they do not combine readily with linseed oil, and many of the particles, unless ground, are never thoroughly saturated—the result being that after being applied to the surface, the absorption of the oil by such particles and the sur-

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face to be painted, leaves the film of ochre or oxide, without any binder, brittle and lifeless. The result is perishing and peeling.

Again, on account of the character of the pigments named, they are very difficult to spread to uniform consistency over any large amount of surface, and for that reason, as well as to meet a demand for a "good, heavy priming-coat," are frequently applied in a very heavy strata which, if allowed to become perfectly hard, presents such an impervious surface as to prevent the proper adhesion of later coats of paint.

General directions for the proper use of SWP on both new and old work are to be found in our "C" sample folder and on the top label of each package. We, however, enumerate herewith some of the various woods that need special treatment, and what that treatment shall be.

Class One—Cottonwood, Basswood (Linn.)

These comprise woods which are soft and even-grained without pitch or hard spots, may be safely primed and painted by using SWP Primers and SWP which have been thinned with pure raw linseed oil only.

Primer, two gallons to one of primer; second coat, ½ gallon to each gallon; and third coat, ¼ gallon to each gallon of paint.

Spirits turpentine are not required to assist penetration, as these woods take paint very readily, and on account of their absorbent character should be fully satisfied with liberal coats, rich in oil, which, however, should be well brushed out and given longer time to dry before subsequent ones are applied than is required where some turpentine is used for thinning.

On account of the even color and texture of woods in this class, a satisfactory job of work may be done by a thoroughly competent workman, under favorable circumstances, with two coats. It is,

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however, safer to give three coats, properly applied, on all new work.

Class Two—White Pine, Poplar, Spruce, Fir, Gum (selected), Redwood, California Cedar, White Cedar.

These comprise a class of woods which, while soft, are not spongy, and on account of their closer, firmer texture, do not admit of penetration as readily as Class One.

For such woods, on new work, SWP Primers and SWP should be thinned as per directions in "C" sample folder and as per top labels on can as follows:

S-W Primers, light and dark, *must* be thinned before use by the addition of two gallons pure *raw* linseed oil and three pints of pure spirits turpentine to each gallon of primer and brushed out thin.

If S-W Primers are not used, thin the shade of SWP selected with one gallon of pure raw linseed oil and a pint of pure spirits turpentine, to each gallon of paint and apply it for first coat. For second coat, add one pint of pure spirits turpentine to each gallon of paint.

For third and last coat, apply paint just as it comes from the can, or, if too thick, reduce paint with one quart pure raw linseed oil to each gallon of paint.

All of Class Two take paint readily and should be treated with medium coats (that is not with a scant brush) and then such coats well brushed and worked into the grain of the wood.

The four latter, White Pine, Poplar, Spruce and Gum, when the wood has been carefully selected for color and texture, may be satisfactorily painted under favorable circumstances by the use of two coats. Three coats properly applied are, however, safer and better.

Class Three—Hemlock, Cypress, Washington Cedar, Red Cedar, Hard Pine (Georgia, Norway, Southern).

These comprise a class of woods the character of which makes them difficult and more or less hazardous

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to paint over and whenever they are encountered, need the intelligent judgment of an experienced and competent painter if satisfactory results are to be reasonably insured.

The first three in the group, *i. e.*, Hemlock, Cypress and Washington Cedar, belong to a class which, on account of their structure, require the use of paint thinned with a larger percentage of spirits turpentine than is used in Class Two, to insure proper penetration and satisfying of the surface.

Red Cedar, on account of absorbing paint slowly and also by reason of the powerful solvent character of its sap (out of which is distilled oil of cedar), requires the use of a still larger percentage of turpentine to counteract such tendencies.

Hard Pines—(Georgia, Southern, Norway, and all allied species), are so "fat" with pitch (from which resin spirits turpentine is distilled, and rosin is the residue) that they more than any of the other woods in this class require the use of paints in which an excess of turpentine has been used for thinning in order that the hard, impervious surface of the "fat" parts may be penetrated sufficiently to enable the paint to adhere.

For use on all woods in Class Three (hard pines excepted) the thinner for priming-coats should be composed of at least one-third to one-half (equal parts) of pure spirits turpentine with raw linseed oil, the paint should be reduced to as thin a consistency as can be properly handled, and then applied with not a full brush, and well rubbed into the surface.

For painting on hard pines indicated, pure spirits turpentine should be used in excess of linseed oil for priming-coats.

Second and third coats for use on woods in Class Three should also contain a liberal percentage of spirits turpentine, although in diminishing amount as compared to the priming-coat.

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On account of the hazardous and paint-repellent character of woods in this class, a satisfactory job of work cannot be done with two coats and should never be attempted. In a word, for this class—use spirits turpentine liberally—apply paint moderately or sparingly, use three coats and work well into surface.

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