A WELL-EXECUTED COVER-UP

If something (or everything) needs painting at your cottage this summer, read this before you pick up a brush. You don't want to do it all over again next year, do you?

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THE SCIENCE

It's time to paint the cottage, inside or out, and you should know that there've been a few changes in the paint can, and not just that 2017's Millennial Pink has come and (almost) gone. From the dominance of water-based paints to reduced volatile chemicals and no more lead at all, understanding more about paint and how it works can help your paint job look better for longer.

All paint has four basic ingredients: solvent, pigment, binder, and additives. The solvent, or vehicle, is what evaporates as the paint cures. These days, about 95 per cent of the house paint sold is latex, using water as its solvent. Even many alkyd paints, the formerly stinky ones we used to call "oil," have been reformulated as "hybrid" paints that use water as the main solvent, which reduces the odour and means that you can clean brushes with water (check the label first).

Pigment gives paint colour. Most of the pigment, already in the can before it's tinted and shaken, is titanium dioxide, a common mineral. TiO_2 also adds opacity to paint, which helps you hide that feature wall you painted in the 2000s to cover the rag-rolled wall from the '90s.

To make an opaque, bright white, titanium dioxide particles reflect light best if they're about 280 nanometres in diameter, roughly half the wavelength of visible light. The particles also have to be distributed evenly, since clumped particles won't reflect light or hide previous coats. A paint with too much TiO_2 pigment also doesn't work—crowded particles start to cancel out their own reflective properties. Luckily, we have coatings chemists and materials scientists to figure this stuff out.

The binder is the glue that gives the paint film structure and adhesion, through a process called polymerization. Small molecules—monomers—hook up with each other as the paint cures, forming a tough network of solid polymers. Most latex paints use blends of monomers, usually acrylic, vinyl, or polyvinyl acetate. Acrylic performs best but is expensive, so paint brands using 100 per cent acrylic latex tout it on the label.

Finally, there's a miscellaneous category of ingredients called "additives." Some additives give the paint special powers, such as scrubbability or mildew resistance; others reduce drips and sags when you lay down a thick coat; still others keep the paint stable in the can. But every paint formula requires some tradeoff. No single paint can do everything well. ››

ON PREP

The first step for any painting task is the same as it's always been: prep the surface. The more you do now, the better the paint will stick and the longer it will look good. On a new surface, prep is easy. Make sure the wall is clean, prime it if needed (more on that below), and get painting.

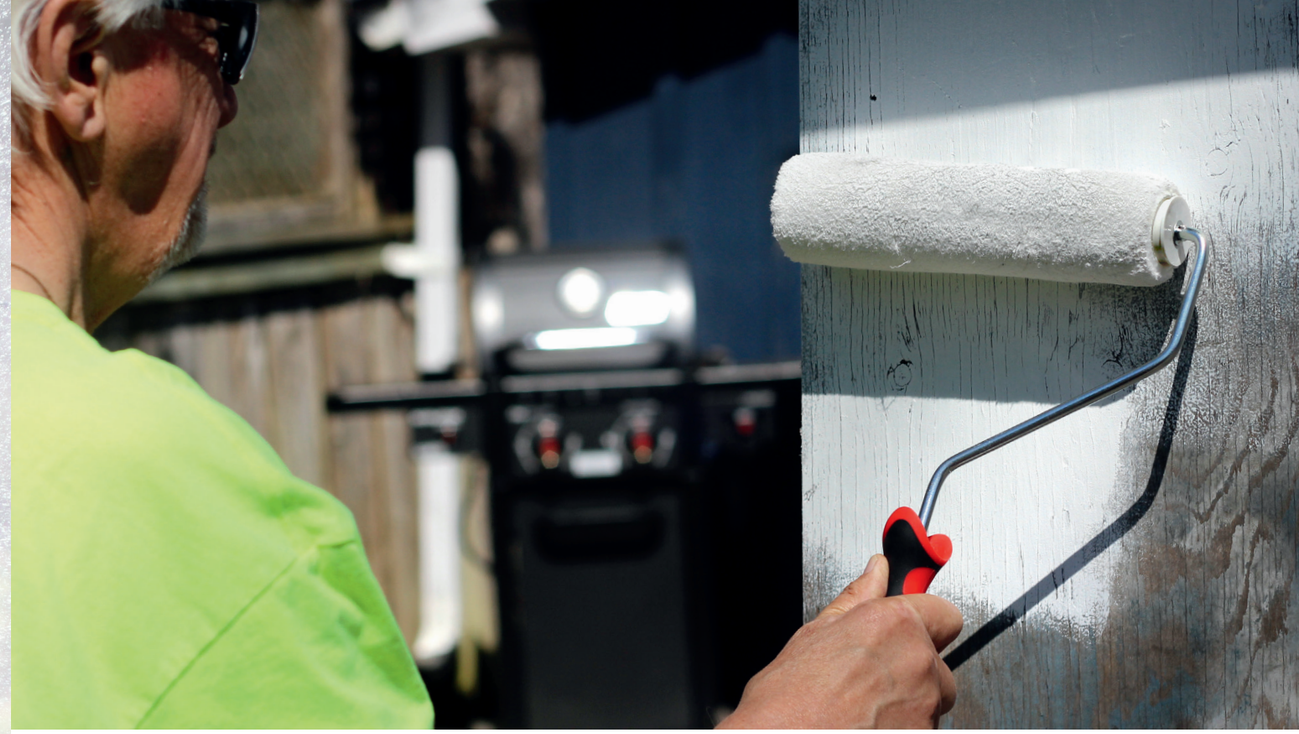
On a surface that's already painted and is holding up well, prep is also simple. You'll need to clean the surface to remove dirt, oil, soap scum, or anything else that will prevent paint adhesion. A sponge and warm water will do for most walls; if you need to use a grease-cutting detergent, make sure you wipe off any soap residue. Always let walls dry thoroughly.

Cleaning the exterior cladding of your cottage used to require a scrub brush and a lot of elbow grease, but pressure washers have made the job much easier—just take care to avoid forcing water behind the siding or damaging it with too much pressure. And if you still remember recipes for harsh exterior cleaners that used trisodium phosphate (which is linked to algae growth in water bodies) and bleach (not good for wood surfaces), look instead for eco-friendly, biodegradable products, such as Simple Green's line of pressure washer concentrates.

Indoors, use household cleaners to thoroughly degrease kitchen walls and remove soap scum or surface mildew from bathroom walls—mildew stains can migrate through new paint, so you'll probably need a stain-blocking primer too. Bedroom walls likely won't need much cleaning at all, but don't forget to sweep away any cobwebs.

You'll also need to scuff up any glossy parts. Just as dirt doesn't stick to trim, doors, and cabinets painted in high- and semi-gloss, neither will a new coat of paint, unless you rough up the old surface first. Using 120-grit sandpaper, hand sand the surface until it's dull (don't forget to wear your dust mask).

Now that the old surface is clean and dull, it's inspection time. Scrape off failing paint and spot-prime any bare surfaces. Exterior paint has it tough and is more likely to fail—UV light from the beating sun can degrade binders, moisture can break the paint's bond with the substrate, and seasonal temperature extremes stretch the paint film. Some paint failures come from using the wrong paint or simply building up too many layers of paint, but most problems are moisture-related. At many cottages, trees and other plants block air circulation that can help walls to dry.



PRIME TIME

Primer, or undercoat, is paint on a mission. It's not pretty, but it solves problems. Each primer has one job: to support the top coats of paint so they look and perform their best.

Bonding primers are like double-sided tape, designed to help paint stay firmly attached to a tough surface like metal or vinyl. Many can also bridge between an old layer of oil paint and a new layer of latex. You can determine whether old paint is latex or not by rubbing it with a cloth dipped in rubbing alcohol or acetone. If the colour comes off on the cloth, it's latex.

Sealing primers block stains from seeping through the top coat of paint. They also stop wet paint from soaking into an absorbent surface. That's why you need to prime raw drywall—the paper surface would otherwise absorb paint differently than the dried and sanded joint compound. Raw wood likewise. Without primer, the paint can dry with different sheen levels, depending on what's underneath. Even covering a flat interior paint with a higher-sheen paint works better if you prime first.

When you're applying a deep, dark top coat you'll get better results, often in fewer coats, by using a primer that has some colour. Tinting primer to a lighter version of the final colour is a common approach, but many pros use grey primers instead. Especially if the old wall has a high-contrast pattern (as in those wide, *Metropolitan Home* stripes, *circa* 1995), grey primer often hides better. Sherwin-Williams takes this approach: the colour chips for about 20 per cent of its colours suggest one of six grey primers that you should use.

Primer is usually unnecessary if you're repainting a similar colour over the same paint type. And in the past decade or so, many manufacturers have introduced products that promise paint-and-primer in one, such as Behr Ultra. These paints generally have excellent hiding properties and leave a thicker "high-build" film of paint. But they often come in limited colours (because too much colourant can affect paint performance) and, as the fine print on the label may suggest, work best over an existing coat of paint. ››

LEAD PAINT IMAGE, ISTOCK

Got the lead out

Was your cottage built before 1960? It probably has some lead paint. In the 20 years that followed, the use of lead went down significantly; by 1980, a new cottage wouldn't likely have any lead paint indoors, but may have had some on the exterior. Since 1990, house paint in Canada has been virtually lead-free.

If you're concerned, lead testing kits are available at some hardware stores and online. But even if there is lead paint somewhere, unless it's chipping badly or you have children who could chew painted woodwork (lead paint can taste sweet), covering it with new paint, wallpaper, or something else is safer than removing it. If you really need to remove lead paint, Health Canada has a long explanation of the precautions you need to take—think paint stripper, respirators, and careful cleanup. Among the worst things you can do without personal protective equipment is sand lead paint or use a heat gun to remove it.

PAINT

Now the fun part: the paint. While prep work is necessary but unexciting, painting itself is instant gratification. A few roller swipes and you can see your progress, your cottage starts to perk up, and neighbours yell compliments from the water.

Especially in a Canadian climate, exterior paints need both good adhesion and flexibility—every part of your cottage contracts in the winter and expands in the summer. That's one reason almost all paint pros now recommend latex for exterior paints. Latex binders create a paint film that retains flexibility; alkyd paints continue to cure and harden slowly over time, eventually becoming brittle and prone to cracking.

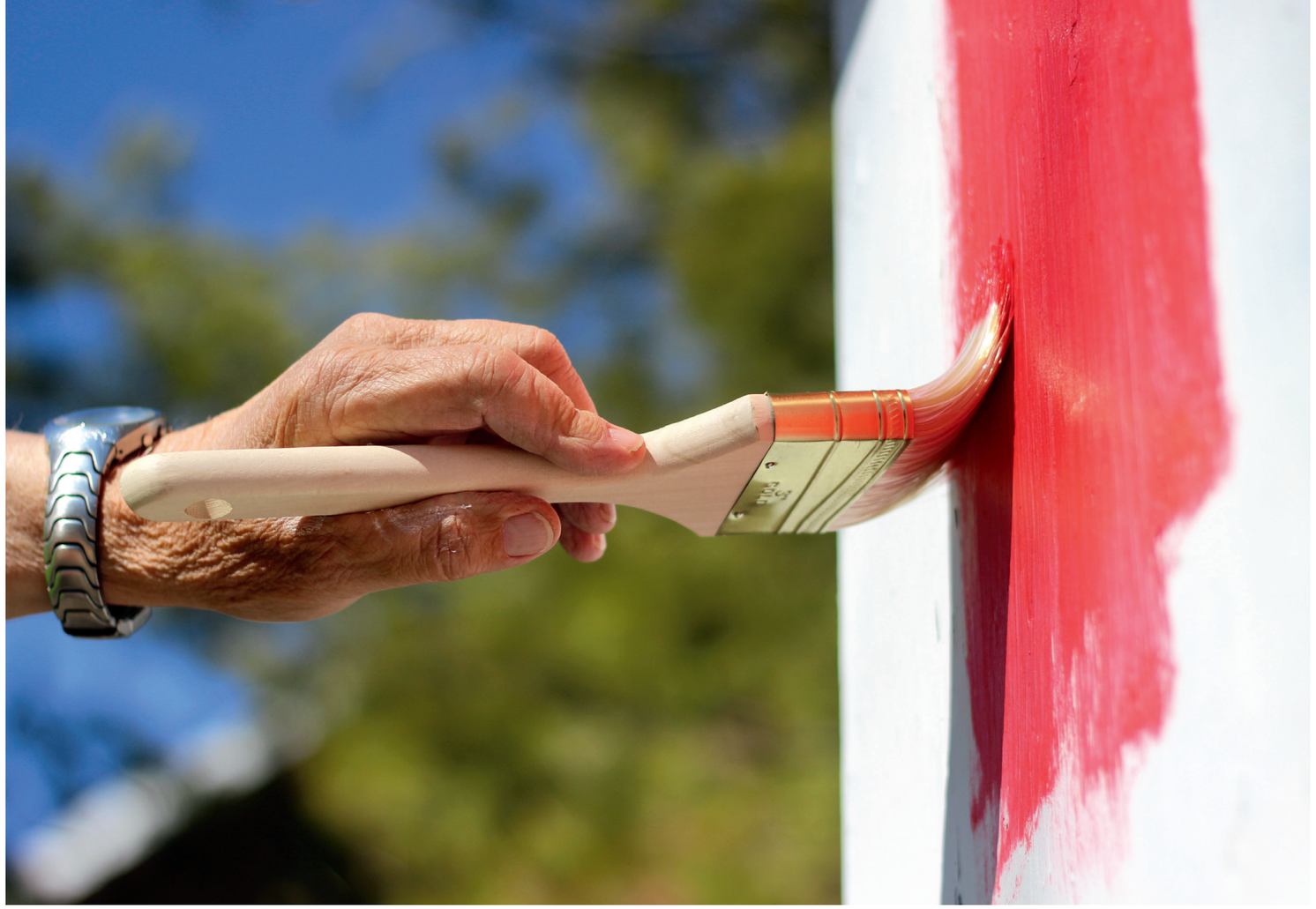
Another challenge for exterior paints is ultraviolet light. Titanium dioxide pigments react with invisible UV light to produce free radicals that damage the binder. If you've ever rubbed coloured powder off an old cottage wall, you've experienced the effects of UV degradation. To reduce this chalking, manufacturers now coat the TiO_2 particles in something non-reactive, such as alumina, silica, or zirconia.

Interior paints go up against a different set of challenges—that's one reason you can't use interior paints on the outside of your cottage or vice versa. Indoors, the problem is us. We can't keep our grubby paws off the walls. The tried-and-true solution for paint durability in high-traffic areas (kitchens, bathrooms) is a paint with a glossier, more scrubbable sheen—at least an eggshell or a semi-gloss finish. As the sheen level goes up, the paint film becomes smoother, losing the microscopic pores and texture that, in a flat or matte finish, can hold on to dirt. But the sparkle of higher sheens emphasizes every tiny flaw in a wall; unless a wall is perfectly smooth, a high-gloss finish will often look cheap, like a shiny suit.

Low-sheen finishes—flats, mattes, velvets—used to be confined to low-traffic areas such as bedrooms because cleaning them often burnished the surface. Even an accidental rub could leave a shiny scuff mark. Improved binders have allowed for a new generation of tougher flat paints that can handle cleaning. Even so, if a flat-finish paint is labelled "washable," better to clean any marks by blotting rather than scrubbing.

But when you've prepped and primed and chosen the best paint in the perfect new colour—your colour of the year, not the paint makers'—you're not worried about the walls getting dirty at some point in the future. And you probably don't care whether the liquid in the can has changed since the last time you redid the cottage. When you're about to apply that first coat, the only change that matters is whether you're gonna love your new walls or not. And if not, it's only paint.

Martin Zibauer's family cottage on Pogamasing Lake, northwest of Sudbury, was a log cabin painted white with turquoise trim.



A healthier mix

There was a time when consumers found the smell of fresh paint appealing, a bit like new car smell and cleaning products. Like many odours, that paint smell came from volatile organic compounds—a catchall term for organic chemicals that evaporate at room temperature. Paint isn't the only source of VOCs in our homes, but it's used in large quantities. Since some VOCs can cause health problems, especially indoors, the federal government began regulating these chemicals in paint in 2009. Even before that, consumer demand prompted many paint makers to introduce low- or no-VOC options.

But there's a catch. The source of the VOCs in many paint cans isn't the untinted base paint, it's the universal colourants dribbled in to mix your favourite colour. Universal colourants, first developed in the 1940s, can be mixed into almost any paint base—latex, alkyd, whatever—but to be so versatile they need VOCs. That might not be a problem with an off-white that only needs a couple of tablespoons of colourant, but some deep colours can require two cups, an amount that can raise its VOCs back up to the levels of older paints and affect the paint's performance. In response, some manufacturers, such as Benjamin Moore, have created their own *non*-universal zero-VOC colourants, compatible with their own paints.

No filming

Stain is a popular choice for exterior woodwork, especially on siding, decks, and fences. Like paint, stain contains pigment, binder, and solvent. Both add colour and protect wood, but stain is formulated to soak into the wood, while paint creates a film on top. This is both good and bad. No film means no risk of cracking with seasonal temperature swings, but it also means that the wood fibres are more exposed to damaging UV rays. Look for a stain with UV-blocking properties, but know that it won't protect as well as an opaque layer of paint.

House paint is formulated with self-levelling properties; the film it creates smooths over surface texture and imperfections. (That's one reason pros say you should never paint an exterior with the sun on your back; the paint will dry so quickly it won't level out or adhere properly to the substrate.) Stain has less viscosity than paint and doesn't obscure surface texture—which is desirable if your siding has a texture you want to see—but stain does need to be reapplied more frequently.

Transparent stains have very little pigment, letting more of the wood's colour variations and grain pattern show through, but they offer the least protection. As you move through semi-transparent to solid stains, you'll get more protection and less grain. In fact, solid stains behave like a very thin paint. Problem is, with multiple applications, they'll eventually build up a paint-like film on the surface, which can be prone to peeling.

Colour of the Year

Help! The world's top paint companies are working now in their secret lairs, choosing their 2021 colours of the year. They've pasted swatches on dartboards, ginned up the computer algorithms, and sent industrial spies to Fashion Weeks everywhere. But they need a creative mind to come up with moody, evocative colour names. If you can pick the correct name for each of these 2020 colours of the year, then maybe—just maybe—they'll hire you for the job.

Benjamin Moore 2102-70

Is this:
a. Air Kiss
b. First Light
c. Boomer Pink

Sherwin-Williams SW 6244

Is this:
a. Meteor Watch
b. Naval
c. Mom Jeans

Behr S340-4

Is this:
a. Back to Nature
b. Tumbleweed
c. Squished Bug

Pratt and Lambert 117C

Is this:
a. Early Frost
b. Songbird
c. Fresh Toothpaste

Dulux DLX1160-6

Is this:
a. West Nile
b. Blue Steel
c. Chinese Porcelain

Answers: 1 - b, 2 - b, 3 - a, 4 - b, 5 - c