



HIGH-GLOSS PAINTS

By reputation, high-gloss enamels are tough and versatile paints. They're recommended for use on indoor furniture, toys, woodwork, kitchen cabinets, kitchen and bathroom walls, machinery, pipes, playground equipment and other outdoor metalwork, and any number of other subjects in the school of hard knocks.

The enamels we tested more than a decade ago (CONSUMER REPORTS, July 1959) lived up to that reputation pretty well. The 13 brands we tested for this report did even better. On the whole, they protect better, look better and keep their looks longer. However, they generally take longer to dry—a sacrifice paint formulators have had to make in exchange for improved wearing qualities. Not that the newer enamels show any radical changes in formulation, such as a switch to a latex base; like the older enamels, they're solvent-thinned.

A high-gloss enamel should be easy to apply. It should flow out smoothly and cover evenly, hiding colorations and minor surface imperfections. It should dry reasonably quickly to a gleaming, durable coat. That's a large order for any paint to deliver, but the check-rated *Dutch Boy* came close to delivering it. We consider it an outstanding general-purpose enamel. Its characteristics and those of the other tested enamels are presented in the Ratings.



CU'S KEY FINDINGS

For looks and wear, the current crop of high-gloss enamels is generally a good one, although none of the 13 brands we tested was as fast-drying as some painters might like. The check-rated *Dutch Boy*, at \$3.20 a quart, was judged best for all-round use. But three other brands were also rated Very Good—among them the *Mary Carter's*, our choice where resistance to corrosion is the ruling consideration and, at \$1.89 to \$2.09 a quart, a Best Buy besides.

Since some characteristic properties of paints are dependent on color, we tested four colors of each brand—white, red, green and black—and used the results to evaluate the quality of the brand as a whole. We also scrutinized the labels of all the brands in an attempt to determine whether the enamels pose any threat of lead poisoning. For a discussion of that possible hazard, which should be considered if you're thinking of painting, say, children's toys, see the box on page 153. One important paint distributor is not represented in the Ratings. We bought and tested, along with the other brands, *Sears Interior Exterior Acrylic Enamel*—only to learn that most of our samples had been replaced by a new formulation, sufficient samples of which were not available in time to be included in this report.

Some characteristics usually associated with good paint don't appear in the Ratings. That's because, as far as those characteristics are concerned, there was little or nothing to choose between brands. All the high-gloss enamels, for instance, were equally easy to brush on. (We didn't check ease of application with a roller, but you should get similar results, with perhaps not quite so smooth a finish and with somewhat less hiding power.) All the enamels were judged excellent in leveling (the tendency of paint to flow slightly after application, erasing brush marks), and all dried to a relatively easy-to-clean surface. Color and gloss uniformity were just that—uniform. In other properties, however, the tested enamels varied significantly.

DRYING SPEED. We tested for three different drying times: dust-free time (when tiny particles no longer adhere to the paint film), light-handle time (when you can pick up an item gingerly without damaging the paint job) and dry-through time (when the paint has dried enough to stand light use). Our drying-speed tests were conducted at 77°F, in 50 per cent relative humidity and with some air movement. Different conditions would change the drying times, but the relative order should stay the same.

None of the enamels were really quick drying. And drying times varied widely from brand to brand and, within some

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brands, from color to color. The average dust-free time ranged from a little over half an hour to almost two hours; the average light-handle time, from about 3½ to 15 hours; the average dry-through time, from about 6 to 24 hours, though some samples took a couple of days.

Average dry-through time was given the most weight in the drying-speed portion of the Ratings. So the *Fuller* (six hours) and the *Spred Gloss* (8½ hours) were judged excellent and very good, respectively. Brands rated good in drying speed averaged 12 to 17 hours, but those with the longer dry-through time had relatively short dust-free and light-handle times. The *Dutch Boy* and the *Dri-Rite*, both rated good in drying speed, are examples; despite their relatively long dry-through times, the *Dutch Boy* had the shortest light-handle time and the *Dri-Rite* had a dust-free time as short as that of any of the brands tested. Those could be considerations if you're more concerned about getting a painted surface into a state of semipreparedness quickly than actually subjecting it to use.

When an enamel ages on the shelf, its drying time may increase. It's a good idea, then, whatever brand you select, to pick the freshest-looking cans you can find in a store that has a high-volume business.

ABSENCE OF SAC. Sag occurs when a paint flows so easily that it forms runs or curtains on sloping and vertical surfaces. Seven of our enamels showed little tendency to sag; they were given excellent marks in that Ratings category. Only one enamel, the *Duco*, got as low a mark as fair-to-good. Unskilled painters would probably be better off not using the *Duco* on vertical surfaces.

HIDING POWER. We tested hiding power—the ability to mask the appearance of the underlying surface—in two ways: first, by judging how well brushed-on enamel covered contrasting-color patterns on special charts; and second, by making instrument measurements of the opacity of uniformly thick films of paint. The greens, which can be considered representative of the darker colors, all proved excellent in hiding power. The whites and reds, however, showed enough differentiation in performance to warrant listing our judgments of them in the Ratings.

The whites, which we consider roughly representative of the pastel colors, were generally very good in hiding power. The two exceptions were the *Fuller* white, which was judged only fair, and the *BPS* white, which was judged fair-to-good in hiding power; with those, you're more likely to need two coats. Ideally, a white enamel should be close to chalk-white. Most aren't, because manufacturers put tinting additives in them to improve hiding power and to cloak color changes caused by age and exposure to light. But the *Impervo* was the only tested brand with an easily noticeable off-white cast.

The reds were by far the worst coverers. Only the *Dutch Boy* and the *Duco* were judged as high as fair in hiding power; the rest were poor. Looking ahead to the next repainting, there's another consideration in using the high-gloss reds. As undercoats, they tend to bleed through subsequent topcoats. With the *Spred Gloss*, the *Kem* and the *Duco*, the bleeding was relatively conspicuous in our tests,

staining a white topcoat pink. You'd almost certainly need two coats of a light color to hide all signs of their redness.

Quite independent of color, all the tested brands were judged to have a high-gloss finish. The *Mary Carter's*, however, was somewhat flatter than the others.

WEAR AND TEAR. Since high-gloss enamels are called upon to protect many different surfaces, we wanted to see how well they stood up under various kinds of abuse. We tested them for adhesion, flexibility and resistance to impact, scratching and abrasion. The overall results of those tests are summarized in the Ratings under the heading of "Wear and tear." But because in many cases an enamel is chosen to withstand a particular form of hard usage, we'll itemize the individual test results here:

We checked the adhesion of each enamel by scoring a painted area with a razor blade and then trying to pull the paint loose with a piece of tape. All the enamels came through that test in excellent shape.

Flexibility is especially important for painting on metal surfaces such as lawn furniture. As metals heat and cool, they expand and contract; an enamel must be able to move with the metal in order not to crack. We tested for flexibility by bending painted metal panels around rods of varying diameter. Most of the enamels refused to crack even when their panels were bent around the smallest diameter rod; they were graded excellent in flexibility. The *BPS*, however, merited only a fair grade because its white cracked on the larger rods. The *Mary Carter's* white showed a slight tendency to crack, lowering the brand's flexibility grade one notch, to very good.

We dropped a weight on white and green painted surfaces to see how much force it took to break the paint film. The greens generally resisted impact better than the whites. But both whites and greens of the *Dutch Boy*, the *Spred Gloss*, the *Fuller*, the *Kem* and the *PPG Waterspar* were judged excellent. Chiefly because of the poor showing of their whites, the *Mary Carter's*, the *Duco*, the *Wards* and the *Devoe* were judged fair-to-good in impact resistance. The *BPS* white did even worse, dragging its impact-resistance rating down to fair. The rest of the brands got very good marks.

Our tests for scratch resistance were performed by passing white and green panels under a sapphire needle at various applied weights. The whites generally did better than the greens. Among brands, the *Wards* was judged best, excellent, followed by the *Mary Carter's*, the *O'Brien Flexico* and the *BPS*, very good. The *Dri-Rite* was judged worst, fair. And the other brands were either good or fair-to-good in scratch resistance.

We measured resistance to abrasion by subjecting white and black painted panels to a standard machine-performed rubdown and comparing weight losses. We chose black because past tests have shown it to be superior in abrasion resistance; that finding was reconfirmed. Overall among brands, the *Dutch Boy* was judged excellent. All the rest were judged very good or good except the *Dri-Rite*, which received a fair-to-good grade.

RESISTANCE TO LIQUID DAMAGE. To arrive at the composite judgment for resistance to liquid damage, we performed four sets of tests: We let cool water stand on painted panels for 24 hours; we put hot water on the panels for one hour;

we soaked the panels in a detergent solution for seven hours; and we let 100-proof alcohol stand on the panels for 15 minutes and for an hour. After each test we examined the panels for loss of gloss, change of color, softening and blistering. The next day we rechecked to see if there was any recovery from damage by liquids.

The *Dutch Boy* was the only brand judged excellent in both the cool-water and detergent tests. The least liquid resistance in those two tests was shown by the *Mary Carter's* and the *Devoe*, judged fair-to-good, and the *BPS*, judged fair. The 15-minute alcohol test (a spill allowed to evaporate) produced excellent grades for all the enamels, but they didn't survive the one-hour alcohol soaking so well. The *Fuller* got a very good grade; the rest merely good. Since all the enamels were judged good in resistance to the one-hour hot-water soaking, that test factor was not used to determine the overall grade.

Short exposure to water and alcohol shouldn't harm any of the enamels. But a longer soaking may soften them or cause blisters. If that happens, be especially careful to blot up the liquid and let the surface dry for a day before using it again. Where there was liquid damage, we found that within 24 hours the paints usually recovered from softening and blistering, but any change of color or loss of gloss seemed to be permanent.

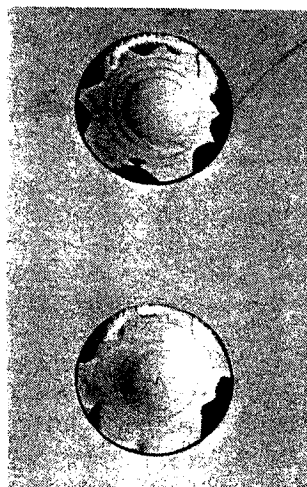
RESISTANCE TO WEATHERING. We simulated the effects of sun and rain with a Weatherometer, a contraption in which painted panels were exposed to 300 hours of artificial sunlight and intermittent sprays of water (theoretically the equivalent of one year of outdoor exposure in the northeastern United States). That test gave us information on change of gloss and color, chalking and water spotting.

All the enamels showed a marked decrease in gloss; all the greens showed some color change; and some enamels developed water spots. The *Dutch Boy* and the *Mary Carter's* showed the least overall change and were judged very good. The three brands least resistant to weathering were judged fair-to-good: the *Kem* because its green changed markedly in color, the *Duco* because its white and green changed color and became water-spotted, and the *Devoe* because its green changed color and its white was the only paint that chalked even slightly.

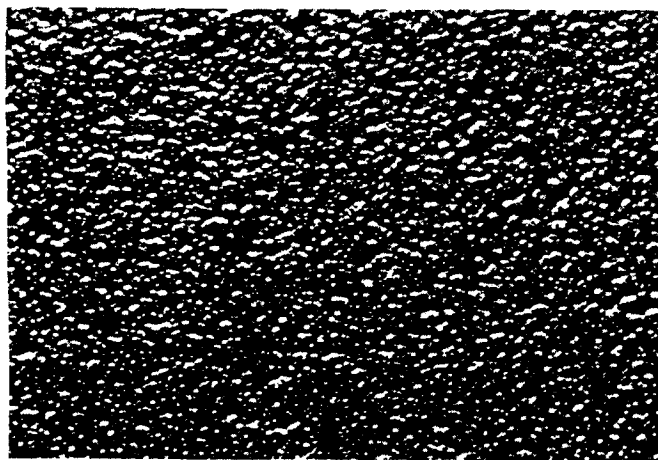
It would have been a very serious defect if any of the enamels had showed signs of checking (developing a network of fine cracks) or cracking. None did, but that doesn't prove a great deal because our weathering test didn't take into account temperature changes—the main cause of cracking. Still, we'd estimate that any of the tested enamels could endure a year's exposure in a moderate climate away from the sea and require repainting only for esthetic reasons.

RESISTANCE TO CORROSION. Each brand, painted on metal panels, was subjected to two 300-hour salt-fog tests after having its surface scored to accelerate corrosion. In one test, the enamel was applied on a steel plate already coated with a recommended primer; in the other test, it was applied on bare steel. The Ratings give only the results of the enamel-plus-primer tests because the enamels by themselves offered relatively little antirust protection.

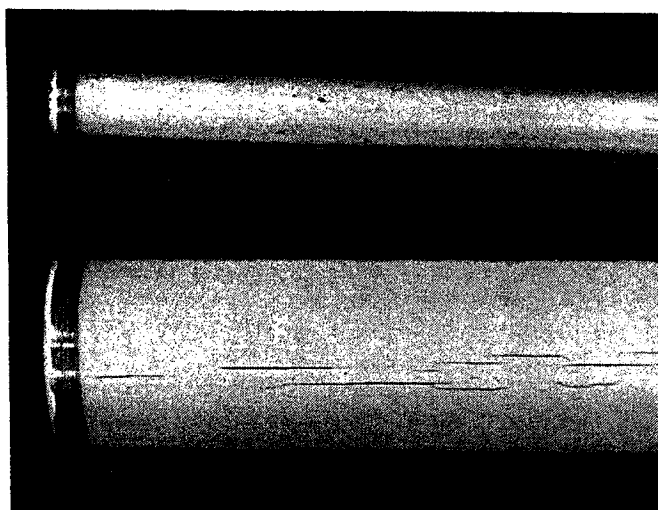
Mary Carter's, as a topcoat over primer, was the only brand judged excellent in inhibiting corrosion. It would be



The surface of a panel painted with BPS (left) cracked from an impact of 60 foot-pounds. A coat of Kem (right) survived, dented but uncracked, impacts as hard as 160-foot pounds



Seediness is a serious defect in any paint. The Dri-Rite red (above magnified four times) had a rough, speckled surface when dry. We judged its seediness Not Acceptable



When we bent a BPS-painted metal panel (bottom) around a 7/16-inch rod, the paint cracked. Most others refused to crack when their panels were bent around a 1/4-inch rod

RATINGS OF HIGH-GLOSS PAINTS

Listed in order of estimated overall quality. Except as noted, colors tested were white, red, green and black. All brands were judged about equal in ease of application, leveling, ease of cleaning, color uniformity and gloss uniformity. Prices are manufacturers' suggested retail for 1 qt.

Key: E, Excellent; VG, Very Good; G, Good; F, Fair; P, Poor

	Price	Drying speed	Absence of sag	Hiding power of		RESISTANCE TO					
				White	Red	Wear and tear	Damage by liquids	Weathering	Indoor aging	Corrosion (with primer)	
											Stability
ACCEPTABLE—Very Good											
✓ DUTCH BOY DRY SWIFT ENAMEL (National Lead Co., Paint Div., NYC)	\$3.20	G	E	VG	F	VG	E	VG	G	G	VG
SPRED GLOSS ALL-PURPOSE ENAMEL (The Glidden-Burke Co., Div. of SCM Corp., Cleveland)	3.00	VG	E	VG	P [Ⓐ]	G	G	G	G	VG	G
IMPERVO HIGH GLOSS ENAMEL (Benjamin Moore & Co., NYC)	3.22	G	E	VG	P	G	G	G	VG	G	VG
MARY CARTER'S LIQUID GLASS ENAMEL [ⓑ] (Mary Carter Paint Co., Tampa, Fla.) A BEST BUY	2.09 [ⓑ]	G	G	VG	P	G	F-to-G	VG	VG	E	VG
ACCEPTABLE—Good											
FULLER HEAVY DUTY ENAMEL (Fuller-O'Brien Corp., So. San Francisco)	3.35	E	VG	F	P	VG	VG	G	VG	F-to-G	G
KEM HI-GLOSS INTERIOR-EXTERIOR ENAMEL (The Sherwin-Williams Co., Cleveland)	3.49	F	E	VG	P [Ⓐ]	VG	VG	F-to-G	F-to-G	G	VG
O'BRIEN FLEXICO ENAMEL (The O'Brien Corp., South Bend, Ind.)	3.10	G	E	VG	P	VG	G	G	VG	F	G
PPG WATERSPAR ENAMEL (PPG Industries, Inc., Coatings & Resins Div., Pittsburgh)	3.47 [ⓑ]	G	VG	VG	P	G	G	G	G	G	G
DUCO HI-GLOSS ENAMEL (E. I. du Pont de Nemours & Co., Wilmington, Del.)	3.95	F-to-G	F-to-G	VG	F [Ⓐ]	G	VG	F-to-G	VG	VG	G
WARDS ANTI-RUST ENAMEL (Montgomery Ward)	2.49 [ⓑ]	F	G	VG	P	G	VG	G	VG	G	G
DRI-RITE REAL ENAMEL [ⓑ] (Luminall Paints, Inc., Los Angeles)	3.00	G	E	VG	F [ⓑ]	F-to-G	G	G	VG	VG	VG
ACCEPTABLE—Fair-to-Good											
DEVCO MIRROLAC INTERIOR-EXTERIOR GLOSS ENAMEL (Devco Paint, Div. of Celanese Coatings Co., Louisville, Ky.)	3.30	P	E	VG	P	F-to-G	F-to-G	F-to-G	VG	F-to-G	VG
BPS SUPER-GLOSSFAST ODORLESS ENAMEL (Patterson-Sargent, Div. of Textron, New Brunswick, N.J.)	3.15	VG	G	F-to-G	P	F	F	G	VG	F	G

[ⓐ] Red tended to bleed through next topcoat.

[ⓑ] Red, green and black are designated as Mary Carter's Trim & Deck Enamel and are priced at \$1.89 per qt.

[ⓐ] Somewhat lower gloss than the others.

[ⓑ] Red is priced at \$3.97 per qt.

[ⓑ] Plus shipping.

[ⓑ] Ratings based on white, green and black colors only. The Dri-Rite Real Enamel red was rated Not Acceptable because of seediness (small specks) in all samples.

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continued

our first choice for outdoor use on metal that must withstand rain or a saltwater atmosphere. Our second choice would be any of the three enamels whose corrosion resistance was judged very good: the *Spred Gloss*, the *Duco* and the *Dri-Rite*.

RESISTANCE TO INDOOR AGING. To check for gloss and color changes, we compared portions of painted panels that had been exposed to indoor lighting for two months with portions that had been kept covered. (You wouldn't ordinarily notice such changes on a uniformly lighted area, but they'd become readily apparent if, say, you switched a shelf or towel rack from one place on the wall to another.) The exposed *Kem* white yellowed and lost gloss, while its green darkened. The exposed *Dutch Boy*, *Spred Gloss* and *PPG Waterspar* whites yellowed somewhat less. The rest of the enamels showed little change.

STORABILITY. We stored test samples in containers, partially filled, for two months. Then we noted how much skin had formed, how easy it was to remix the solids and liquids and whether the viscosity had changed. With the brands rated very good, there was only a slight skin. With those rated good, the skin was thicker. None was difficult to remix, and viscosity changes were slight.

When we first opened it, the *Dri-Rite* red was seedy. It contained tiny sand-like specks that could be seen and felt on the painted surface. Since seediness can develop dur-

ing long storage, perhaps on the store shelf, we bought fresh samples. They too were seedy. We therefore rated *Dri-Rite* red Not Acceptable and excluded it from further testing. The other *Dri-Rite* colors behaved satisfactorily in storage; we rated them very good.

You can keep paint in a useful condition longer by storing it properly. Try to store leftover enamel in a metal container that you can fill completely to minimize air contact (but be sure you keep the original label with the new container). If a skin forms, carefully remove it before remixing. You may have to strain the enamel through cheesecloth if the skin breaks up.

Before selecting a high-gloss enamel, you'll want to consider any special requirements for the painting job you have in mind. For instance, if you're painting a bathroom or kitchen wall, sag resistance and water resistance would be important to you. If you're painting a counter top, you'd also be interested in impact and abrasion resistance. Keep in mind, too, that color can make a difference, regardless of brand. In general, whites had the best scratch resistance; red had the poorest hiding power; green showed superior impact resistance; and black was the color most resistant to abrasion.

Overall, the check-rated *Dutch Boy* gave the best performance. But if you need maximum corrosion resistance, the *Mary Carter's* might be a better choice; at \$2.09 a quart for the white and \$1.89 a quart for the red, green and black, it's also a Best Buy. Actually, we think that for general use you can't go far wrong with any of the four top-rated brands.

Paints as poisoners

Although it has been more than 20 years since manufacturers stopped making interior paints with a high lead concentration, lead poisoning among children is still disturbingly common. One estimate places the yearly death toll from lead poisoning as high as 200 and the total number of poisonings as high as 400,000. Most of the poisonings are said to occur when children eat flakes of old paint in old dwellings.

Modern interior paints are relatively safe. Nontoxic titanium dioxide has replaced white lead as the prime white pigment. And the lead compounds still being used in paints, chiefly as coloring pigments in some yellows, greens and reds, are present in much lower concentrations than in the old white-lead paints. Yet the fact that they do contain appreciable amounts of lead suggests that even some modern paints constitute a possible hazard, especially when applied on toys and children's furniture.

The Federal Hazardous Substance Act doesn't require manufacturers to state the lead content of their paints or to post warnings concerning lead on their labels. The American National Standards Institute, however, has set up voluntary standards. One standard pertains to paints deemed suitable for use on toys, children's furniture and all indoor surfaces. It limits the lead content to no more than 1 per cent, by weight, of the paint solids. Some cities—New York and Baltimore, for example—have laws re-

quiring that paints with more than 1 per cent lead bear a statement on their labels warning against use on surfaces that may be chewed by children. The state of Connecticut recently passed a similar law. And regardless of where their products are sold, many manufacturers now issue some sort of caution on the labels of paints that exceed the 1 per cent limit.

CU hopes that all manufacturers soon will provide lead-content information on all their paints—not merely a warning that lead is present, but a clear and prominent statement of the percentage amount. Meanwhile, we suggest that the safest course, if you're planning to paint an area or article easily accessible to young children, is to choose an enamel whose label indicates in some way that it conforms to the ANSI 1 per cent standard. Sample: "This enamel is free from lead pigments and is safe to use on baby furniture and children's toys."

Of course, all claims of nontoxicity apply only to dry painted surfaces. In liquid form, the enamels are toxic, and all the brands warn against internal use. They also serve notice of the dangers of combustibility, inhalation and prolonged or repeated contact with the skin. All of which explain the standard, Government-required and wise-to-heed legend on their labels: "Keep out of the reach of children."