THE CHEMISTRY OF FILM FORMERS is a complex science in itself, from the architecture of the resin polymer to the final "tailoring" of a commercial formulation for the job it must do. Monsanto can guide you in your use of basic resin intermediates, in the flexibilizing of films, and in the creation of special properties in the product. This advertisement shows a few of the many ways that selected Monsanto products make coatings perform better at less cost.

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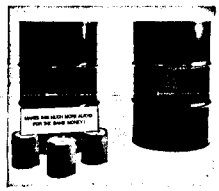


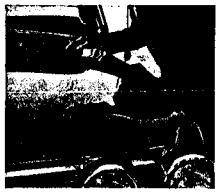
BENZOIC ACID, TECHNICAL... new way to make better alkyd resins—at lower cost

Benzoic acid now has new potential as a modifier of alkyd resins, since the price has been reduced to 20 cents a pound. With pentaerythritol and other higher polyalcohols it produces coatings with better gloss and durability than similar films made with up to 40% excess glycerin. Try holding excess alcohol to 5% in alkyd formulations by replacing up to 10% of the phthalic anhydride with benzoic acid.

Benzoic acid can partially replace higher-cost pelargonic and lauric (from coconut oil) acids in 40% and less oil length alkyds—with noticeable improvement in the gloss and durability of the enamel. At its new low price, 66 pounds of benzoic acid can replace 100 pounds of *para-tertiary*-butyl benzoic acid to give equal film performance.

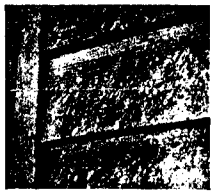
For trade-sales paints consider benzoic acid for water-soluble alkyds; emulsion alkyds; and alkyds for blending with polyvinyl acetate, styrene-butadiene, and acrylics.

No profit-conscious alkyd resin manufacturer can ignore the potential savings and improved coatings made possible by benzoic acid.



SANTICIZER® 160 . . . "flexibilizes" acrylic coatings and safeguards gloss

Acrylic resins put high-gloss "sales appeal" in coatings—though sometimes the gloss fades and the flexibility just isn't good enough. The resins stubbornly refuse to respond to most plasticizers. But there's *one* plasticizer acrylics really "go" for: Santicizer 160. It's highly compatible up to at least 35% with acrylic resins—and a coating with 28 PHR actually retains a *better gloss* after 12 months of Florida exposure than an unplasticized formulation! Acrylic coatings formulated with Santicizer 160 have outstanding resistance to water spotting, too, plus improved flow and leveling. Their sheen and durability have been proved over the years. Want to make a flexible, high-quality, fast-drying acrylic finish? Monsanto can guide you in formulating with Santicizer 160—the most *compatible* plasticizer for acrylic resins.



SANTOBRITE®... the penny-and-a-half per gallon insurance against mold and fungi

Shelf life and storage in warm environments make protection against microorganism attack imperative if a manufacturer wants to insure the quality of his brand. Organic materials in paint pigments—whether formulated for water-base or solvent-base—are variously susceptible to mold and fungi. The result can be "spoilage" in the form of bad color, unsightly growth, and foul odor on opening the container.

Penta (oil-soluble pentachlorophenol) and Santobrite (its water-soluble sodium salt) kill these quality-destroying microorganisms in low concentrations. Cost? *As little as 1½ cents per gallon!* Water-soluble Santobrite is ideal for preserving water-base casein, rubber latex, and other resin emulsion paints. It can be used in oil-base products, too, simply by grinding with the pigment. Or Penta can be used—dissolved directly in one of the oils or solvents. Penta can also be easily converted to the potassium salt for addition to latex paints where the sodium ion might cause "bloom." In higher concentrations than the tiny amounts needed for shelf-life protection, Penta and Santobrite make paint *permanently* mildew-resistant. Try them and see.

Monsanto task force chemicals

MISSION:

CHEMICAL PATHS TO NEW COATINGS

Paint chemistry breaks the "profit squeeze"! New ways have been found to make new film formers—different, tougher, more economical than anything before. They *have* to be. Today's needs demand paints, lacquers, and special coatings with superior chemical and weather resistance; stronger adhesion to a wider variety

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61-OMC-4469 Chemical & Engineering News, November 20; Chemical Week, Novemb

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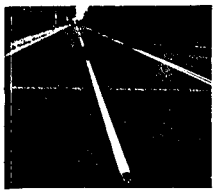
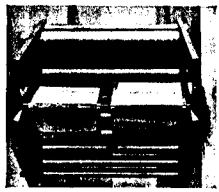


AROCLOR®... improves chlorinated rubber and epoxy coatings, cuts cost

In swimming-pool paints, industrial coatings, and marine and traffic-marking paints—the Aroclor liquids and resins (*12 to select from*) impart a variety of performance improvements. In chlorinated-rubber paints, the presence of an Aroclor resin increases resistance to water, acid, alkali—improves adhesion and film strength—imparts greater weather resistance. Makes the coatings flame-retardant, too!

Aroclor plasticizers are compatible with epoxy resins. The *liquid* Aroclor compounds give epoxies a high degree of flexibility—the *resinous* compounds act as reinforcing resin extenders. The addition of an Aroclor greatly retards the burning rate of epoxy compositions, and, when formulated with a small amount of antimony oxide, produces *non-burning* formulations!

A major value of Aroclor compounds is their complete *inertness*. Alkyds, polyesters, rosin esters—in contact with cement—all saponify, thus losing some chemical resistance; chlorinated paraffin under weathering conditions loses chlorine and becomes subject to attack. But the Aroclor compounds for all practical purposes are *immune* to chemical change. Aroclor additions to coatings invariably improve their performance—and frequently reduce their cost per gallon, as well.

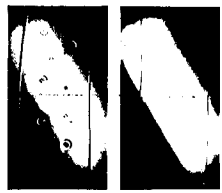


DIBUTYL MALEATE, DIBUTYL FUMARATE... permanently pre-plasticize polyvinyl acetate coatings

DBM and DBF, highly reactive monomers, readily copolymerize with vinyl acetate—give desired flexibility that is *permanent*. The internally-plasticized polyvinyl acetate coating is not subject to extraction or volatilization; and such coatings show a marked improvement in general properties over the *best* post-plasticized formulation. A polyvinyl acetate latex paint formulated with 20% DBM or DBF has sufficient flexibility for good low-temperature performance.

In addition, the pigment-binding power, weather resistance, and abrasion resistance are greatly improved. The coatings dry fast and—since the film is *internally* plasticized—problems of migration are virtually eliminated. The DBM and DBF esters are the most efficient comonomers on a price/performance basis. Data show savings of 1¢/lb. on resin solids when compared to other monomers for this use.

DBM and DBF also copolymerize with vinyl chloride, acrylics, styrene-butadiene, and other resins and monomers. Blends of these modified systems with alkyds can be expected to produce low-cost, high-performance, alkyd-extended resin systems.



WITHOUT WITH

MODAFLOW®... new additive improves leveling, flow-on, eliminates "pinholing"

Modaflow is one of those special materials that work wonders even with small "doses." It's so new in the coatings field that its span of uses is just beginning to define itself. Basically, Modaflow acts on the surface tension of organic liquids. Added in the range of only 0.10 to 2.0%, Modaflow promotes leveling and spreading. It completely eliminates bubbles and foam entrapment in many acid and neutral organic coatings systems.

Modaflow has such a unique action that it should improve the film uniformity and the application characteristics of any flow-on, dip, or roller-coat formulation—whether the base resin is alkyd, melamine, phenolic, polyester, or epoxy. Modaflow appears to be water and pH sensitive. However, it will tolerate up to 2% water in the system, and the concentration needed will vary with the resin and with degree of acidity. In evaluating Modaflow in any specific coating formulation, a wide range of concentration must be tried "stepwise," since the modification usually takes place in a certain critical concentration range, which in some coatings is quite low; in others, much higher. In any case, just a little Modaflow does a lot.

of substrates; increased flexibility; even better resistance to mildew and biological attack.

Monsanto offers a whole task force of compounds that can help you make surface coatings perform *better*, process *easier*, cost *less* to manufacture. Check the six profit-stretchers above. Use them to "build" new products of your own.

For more details, use this handy coupon

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Organic Chemicals Division
Task Force Chemicals, Department 4469
St. Louis 66, Missouri

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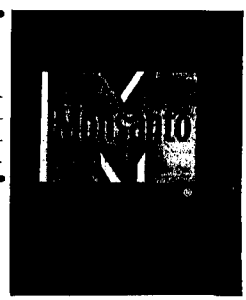
Please send more information about:

☐ Benzoic Acid ☐ Aroclor
☐ Santicizer 160 ☐ DBM and DBF
☐ Santobrite ☐ Modaflow



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25. Industrial & Engineering Chemistry, December; Paint and Varnish Production, December, 1961.

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