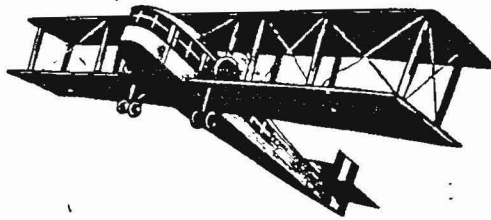


Southwest



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New aircraft surface treatment available

by Mike Wilkinson

For years aviation folklore has held that a clean, freshly painted plane will fly faster than a dirty one with old paint. The makers of a new self-bonding polymer called Speed Cote concur with that premise and add that for about \$■, they can do even better. After years of use on racing boats, they have recently packaged their product for aircraft use and claim it not only reduces drag, but also protects paint, eases cleaning chores and promotes

water and ice shedding. Their explanations also provide a glimpse of what is going on at a microscopic level as an airplane flies through the air.

Product Manager Darren Friberg's handout shows that the ideal surface treatment would not react with any other chemical. This would make it impervious to corrosive elements in the air and free it from the damage of the sun's ultraviolet rays. Moving air or water molecules would not bind to it, so drag would be reduced. The real-world problem with this



Continued next page

hypothetical treatment is that since it cannot react, it will not stick to whatever it is supposed to protect. Teflon, for example, requires pretreatment of the base material and then a curing process, making it unsuitable for aircraft. Conventional silicon treatments eventually migrate off of surfaces, because they will not stick to the material they are supposed to protect. The polymers from which Speed Cote is made are said to eliminate these problems because one face of the molecule is reactive and will stick to the base material. The other face is nonreactive, providing the desired surface protection. This nonreactive face is also responsible for the aerodynamic benefits.

A flashback to ground school days may bring to mind the major components of aerodynamic drag on airplanes. Induced drag is a result of the wings creating lift and accounts for about 40% of the drag. Research into wing shapes and devices such as winglets has taught builders how to make lift with less drag. Form drag and parasite drag are often used to explain the drag that comes from air inlets, exhausts, and such imperfections as wing/fuselage junctures and flap gaps. Several companies sell streamlined nose cowls, flap gap seals and so on to reduce form drag. However, since these typically account for just 20% of drag, there is another component that is often ignored and is responsible for the remaining 40% or so. That gets us back to the original premise that a clean plane with new paint is faster.

Corroded paint has microscopic peaks and valleys that can literally stop individual air molecules trying to flow over it. Stopping the molecules requires force and that aerodynamic force is called skin drag. If a plane has old paint, a paint or polish job may give it a higher cruise speed. However, aircraft paint in good condition is aerodynamically clean, meaning that making it smoother would yield little benefit. It is, however, still somewhat reactive and air molecules can chemically bind to the paint as they flow over it. Waxes can actually make things worse. Binding stops the air molecules, creates drag and is exactly what the nonreactive surface of Speed Cote is said to reduce.

Wind tunnel tests confirm Speed Cote drag reductions and Mr. Friberg says Cessna 172s or similar planes will gain about 2 knots in cruise. Just as important, Speed Cote does not react with the acids, bases and other wonderful chemicals in the air, so it protects that expensive paint job. The treatment is said to extend the life of paint by about 50%. It also promotes shedding of rain and can be used to enhance the performance of ice boots.

Speed Cote is a liquid that is applied with a terry cloth over the entire surface of a plane. Since only one side of the molecule is reactive and sticks to the paint, the ideal application is just one molecule thick. This means a little will cover a lot

Southwest Aviation Report

Aircraft surface treatment from 11

and a four ounce bottle is enough for a typical piston single airplane. It typically lasts for one to two years before it is abraded off by microscopic particles in the air or wash solutions. Anyone can put it on, but it works best on paint that is nearly perfect, so it may make sense to have it professionally applied. Brian Gerdes of Gerdes Aviation Services at Fullerton Airport in California has the experience and can be reached at 714-994-4929. Mr. Friberg can field technical questions and dealer inquires at 714-751-0411.

Asked whether a couple of knots is worth \$150, Mr. Gerdes says "Don't buy it just to go faster. It's worth just as much to protect your paint and make it easier to clean. On the other hand, I don't know of anything else that will give you a couple of knots for just \$150. And, if you really want to go faster, we sell and install LoPresti speed kits." Oh well, few pilots fly for strictly practical reasons, but do enjoy the fun, excitement and pride of flying. If Speed Cote protects that nice paint job and gives a couple knots on the side, it is worth the price to many pilots.