

BUILDING

MODEL AIRPLANES

by JOE WAGNER

Fillets and ding repair: materials and techniques

NOTHING beats fillets for adding strength where a model airplane's fuselage and flying surfaces are joined. They improve performance and appearance, too. What would a scale Spitfire, Airacobra, or P-40 look like without fillets?!

Structurally, fillets provide extra "stress-transfer" area, so that sudden loads (e.g., from an unplanned landing) are distributed over a wide cross section, rather than being concentrated at a sharp change of contour. Fillets also allow air to flow more smoothly over the junctures of wings and fuselages. This not only reduces drag, but it also eliminates turbulent eddies in the

airstream, which can interfere with the tail surfaces' functioning—especially at high angles of attack.

Fillets aren't used nearly as much as they could be, however, because they seem difficult to make, and if they're not done right, they add weight. It's easy to make strong, lightweight fillets, though. The trick is to use the *right materials*, and at least three good ones are available.

Epoxolite is sold by Sig*,

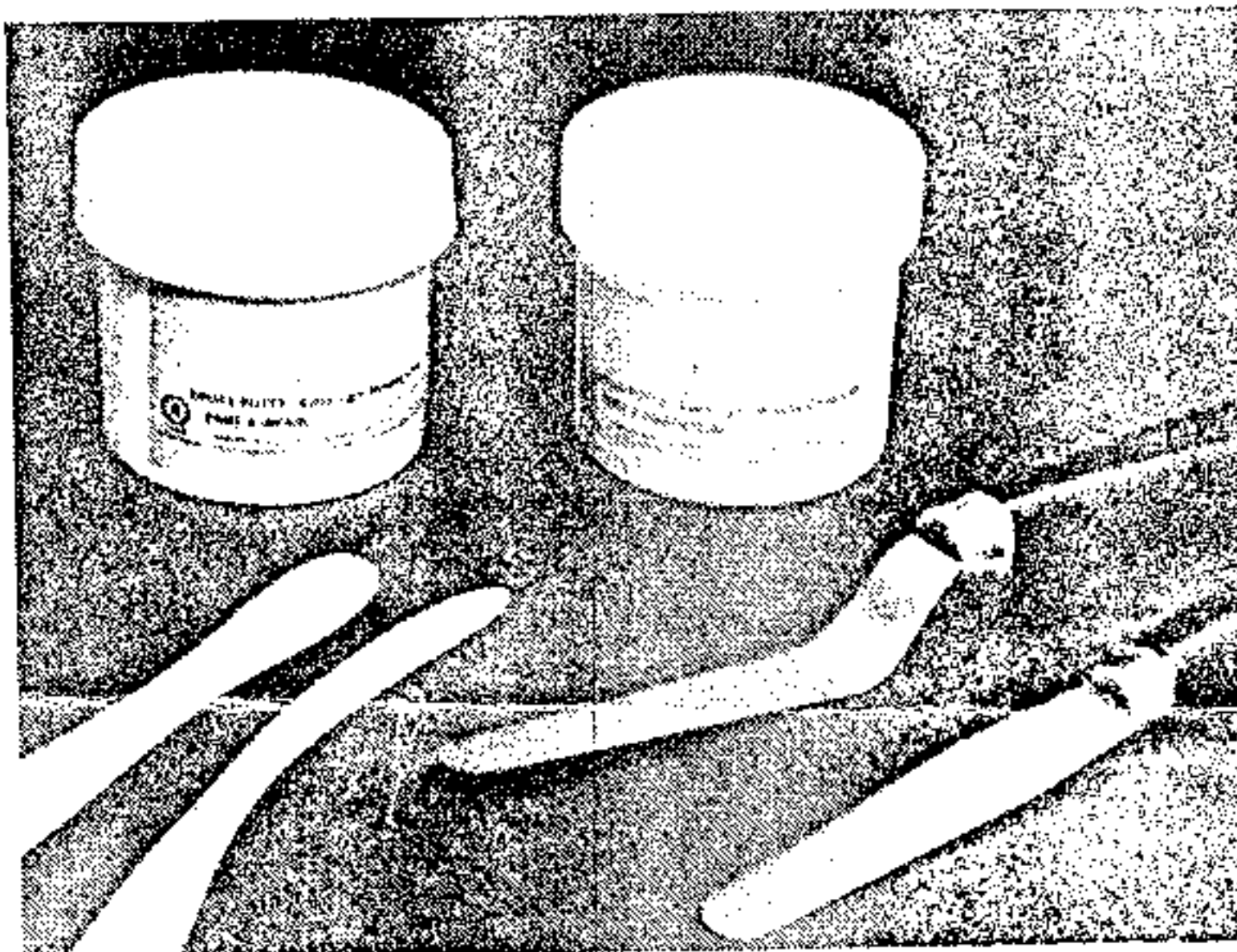
and the company's catalogue explains how to use it. The recommended procedure can be improved, however. For example, Epoxolite becomes lighter and easier to finish-sand if microballoons are thoroughly mixed with the putty before it's applied. A half-and-half blend works well.

Sig advises you to shape the putty with water-wet fingertips. I do this—but only in the final stages. Earlier in the

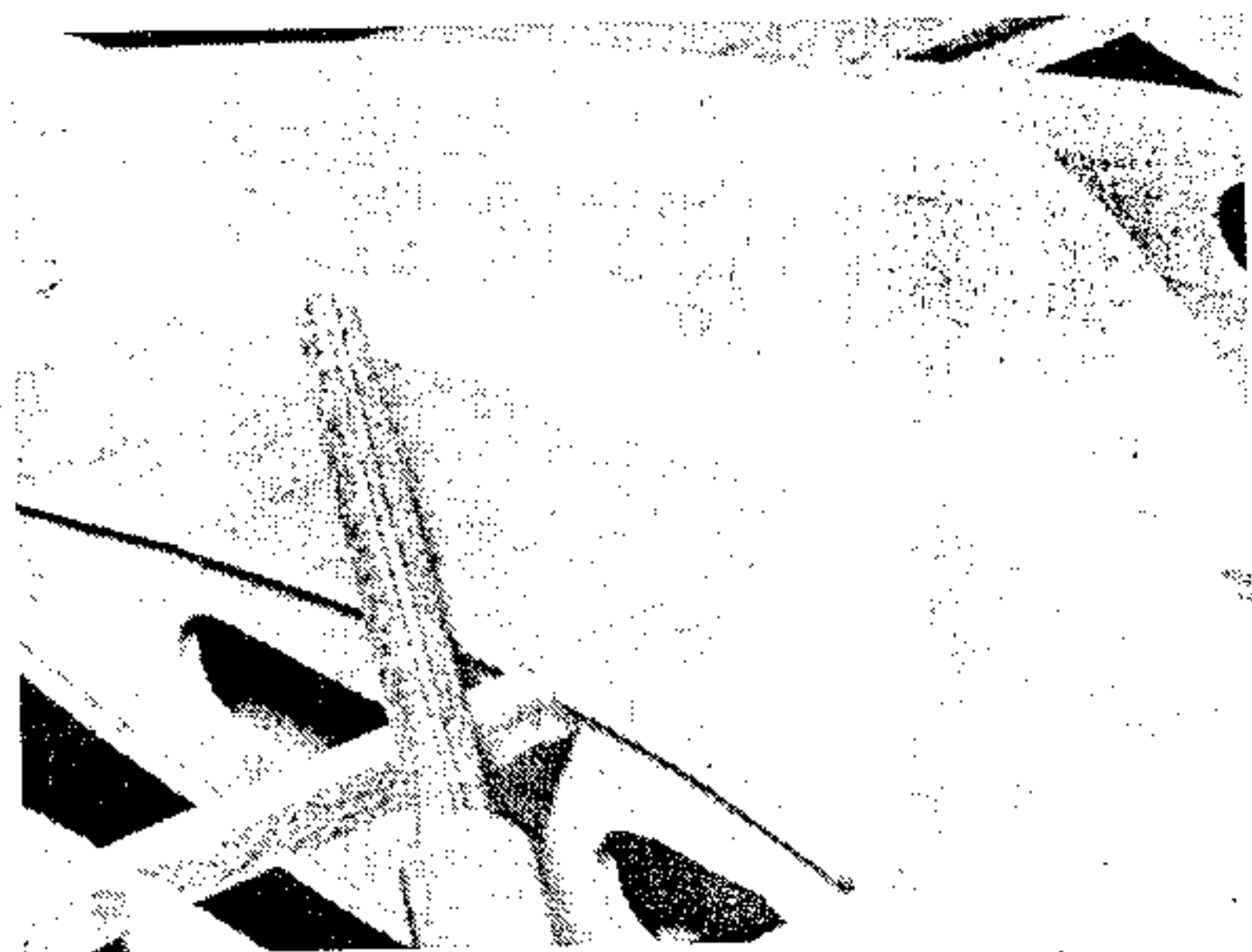
process, I wet my fingers with lacquer thinner instead. This prevents waterlogging the area around the fillet and ensures a strong bond between putty and wood. Don't overdo the lacquer thinner, as too much will weaken the putty, and *never* use lacquer thinner on Styrofoam!

Epoxolite takes much longer to cure than the instructions state, particularly in cool weather. I've found that a minimum of 48 hours is required when the temperature is approximately 70 degrees. (You can reduce this time slightly by heating the partly cured fillet with a hot-air gun.) If the fillet feels at all rubbery when you begin to sand, let it cure for one more day.

Round Permagrait sanders are excellent tools for shaping cured Epoxolite fillets. They resist clogging, and their half-coarse, half-fine abrasive surfaces are ideal for the job. They're available from Ace R/C* in three sizes



The different-colored components of Sig's Epoxolite simplify thorough mixing. (The wooden sculptors' tools shown is handy for fillet-making.)



Without fillets, engine vibration and maneuvering stress would crack the wing-fuselage joint of this profile U-Control stunter in just a few flights! (Round Permagrait tools make fillet-shaping easy.)



Fillet materials: Hobby Poxylite and microballoons (left), Model Magic and thin CA (right). Artists' palette knives make good mixers and applicators; so do popsicle sticks!