ROCKET PAINTING & FINISHING TIPS

BALSA WOOD

Problems With Balsa Wood

Balsa wood is a great material for building rockets, because of its high strength-to-weight ratio. But there is a problem with balsa wood. Unless it is prepared well, it can look very bad when painted. One problem is it can look *fuzzy* after painting because of the fine wood fibers which cover the surface of the wood after sanding. Another problem is that the wood grain can show even after painting.

Ways to address the problems with wood grain showing are discussed in the section on Primer. Ways to address problems with fuzziness are described in the section on Sanding Sealer.

Sanding Sealer

One way to get rid of the fuzziness is to cover the balsa wood with sanding sealer. Once dried, the sealer makes the fine hairs stick up straight and stiff, so that they can be removed by very light sanding. Apply the sealer with a Q-tip, allow it to dry and then sand. Don't sand too hard after applying a coat of sanding sealer, because then you will just end up back where you started, with a fuzzy rocket part. *It is usually good to apply two or three coats of sanding sealer, sanding very lightly after each coat.* You can buy sanding sealer at places like Lowe's or Menard's.

There are two kinds of sanding sealer: water-based and solvent-based. The label on the water-based sanding sealer will say it is water-based. The solvent based sanding sealer label won't tell what kind it is. If you can find it, the water-based sanding sealer works just as well, and doesn't give off very much in the way of noxious odors. If you do use solvent-based sanding sealer, work in a well-ventilated area.

Super Glue

You can also use super glue (cyanoacrylate glue) as a sanding sealer. Super glue dried on the fins has the added benefit of making balsa wood fins stronger. Two or three coats, sanding between coats, is usually adequate coverage. One other good use for super glue is to apply just enough to the ends of your body tube to wick into the cardboard. When the superglue dries, it will make the body tube ends stronger, and not as likely to get bent, or worn out when the nose cone is installed repeatedly.

Super glue does have some serious safety issues that need to be heeded. One problem is you can glue yourself to your rocket parts if you are not careful, or even glue one part of yourself to another part of yourself. Another problem is that, like the solvent-based sanding sealer, super glue gives off some pretty noxious fumes. If exposed to too many of these fumes, you could feel lightheaded and sick. The fumes can also sting your eyes. If you use superglue, make sure you work in a well ventilated area where the fumes won't bother you. If you are a younger member, ask an adult to help you whenever using super glue.

Paper Covered Fins

One way to get around the problems with both the wood grain and the fuzziness is to cover them with paper. The paper does not need to cover the edges – just the flat fin surfaces. It is usually best to use a good grade of typing paper. First trace out the shape of the fins and cut the shapes out of the paper. You will need two paper fin shapes for each wood fin. Cover each side of the fin with Elmer's glue and glue the paper on each side of the fin. Be sure to do both sides at the same time, or else the fin may warp when drying. After applying the glue and paper, sandwich the fin between two sheets of wax paper. Then lay the wax paper sandwiched fins on a flat surface weighted down on top with something like a heavy book. After the paper has dried, it is then even better to go one step further and thinly brush superglue on the paper surfaces of the fin.

Not only is the paper surface easier to paint and finish, but it makes the fin stronger too. Engineers have found that they can combine two or more materials that by themselves are very lightweight but also weak, and when combined the resulting material has become strong but still remains lightweight. These materials that are formed when combining two or more other materials together are called ***composite materials***. Many airplane and race car designs use composite materials to achieve both structural strength and light weighted.

PLASTIC NOSE CONES & FINS

One problem with plastic rocket parts is they oftentimes have a seam from the plastic mold that was used to form the part. The seams are best removed by shaving them off with a hobby knife. Then sand what remains of the seam with 220-400 grit sandpaper.

Plastic parts will often have a very smooth and sometimes glossy look to them. It is a good idea to rough up the parts with some 400-600 grit sandpaper until the parts look dull all over. Paint will stick to the slightly roughed-up surface better than it will to the smooth and glossy surface. The same thing can be done with launch lugs or cardboard body tubes that have a slick or shiny finish on them.

FILLING IN LOW SPOTS

If you have sanded too hard and created a low spot in your balsa fin or nose cone (or dented it), do not despair. You can usually fix the flaw by using some sort of wood filler or wood putty. *One good wood filler to use is Elmer's Wood Filler Light*. This wood filler is also good to fill out your fin fillets or launch lug fillets if you are not getting a good smooth fillet from using glue alone.

For filling low spots or other imperfections in plastic parts, you can use automotive body putty, plastic filler putty bought at a hobby store, or drywall spackling.

When using any of these fillers you will want to fill in the low spot with a little more than you actually need. It will be too hard to form the filler to the exact smooth shape you want while it is still pliable. Instead, after the filler dries, use 200-400 grit sandpaper on the filled-in spot to get the shape and form you want. When working with fillers, you will want to work in a well ventilated area to drive away the chemical vapors from the filler.

PAINTING

Primer

Before you apply the final paint coating, you will want to primer your rocket. One reason to primer the rocket is that the primer helps the final paint coat stick better to the rocket. Another reason to apply primer to your rocket is to fill in low spots created by the spiral in the cardboard body tube and to fill in low spots in the balsa wood fins and nose cone due to the wood grain. With a well primered and well painted rocket, nobody will be able to see the spirals in the body tube and no one will be able to tell whether the fins and nose cone are made of balsa or plastic.

The type of primer you will want to use is ***sandable primer*** sold in automotive stores in the auto body repair section. You apply at least three coats of the primer to your rocket, and sand most of the primer off between each coat with 220 or 400 grit sandpaper. As you sand the primer off, you will not be able to sand away the primer that fills up the wood grain and tube spirals. This way, when you apply your final paint coats, you are essentially applying the paint to a completely smooth surface. After you have applied several coats of primer (sanding between coats), apply one final coat of primer which you do not sand away.

Types of paint

The paint you will want to use is a good quality enamel or latex spray paint. ***It is very important to read the drying instructions.*** Some spray paints may say something like "apply second coat within one hour or else wait 48 hours." Or 72 hours. Or seven days. These might turn out to be very nice paints to use on your rocket but just be sure you allow enough time for the paint to properly ***cure*** between coats. If you do not allow the proper curing time, the paint will peel or bubble so your rocket does not look very nice.

Some good spray paint brands are: Valspar, Plastikote, and Krylon. However, there are always exceptions to the rule, so be sure to always read the label. Testor's model paint is good and comes in some very nice colors but is going to be a little more expensive for a lot less paint.

Applying the Paint (and Primer)

Paint your rocket in an open area, where the paint fumes will dissipate quickly. Hold the rocket out away the spray can about 12 inches, and move the paint can back and forth in a smooth motion in front of the rocket as you coat it with paint. One trick to make it easier to hold up your rocket tube while painting is to stick a rolled up newspaper in the motor tube and hold onto the newspaper roll. Another trick is to get a plastic spray trigger attachment for your spray can. These spray triggers are sold in automotive stores in the body repair section for about $2 each.

Do not try to get a perfect looking rocket in one coat. You will end up putting on too much paint at once and you will get runs. Put on several light coats, until you have a smooth glossy paint finish when done. Be aware though that there can be too much of a good thing. If you apply many, many coats of paint to your rocket, it may look very nice, but become too heavy to fly.

When painting your nosecone, be sure it does not get stuck to the body tube. Another thing is to be sure you do not get paint on the nose cone shoulder.

Painting with Multiple Colors

One easy way to get a multi-colored rocket is to paint the nose cone one color and paint the body tube another color.

Another way to get multiple colors is masking. You will first apply a base color over the whole rocket, and then mask off parts of the rocket with tape so that only parts of the rocket are covered when applying other paint colors. Always make the first color you apply the lightest color, and then work your way toward the darker colors. It is easier to cover light colors with dark colors instead of the other way around.

Instead of regular masking tape, it always best to use the masking tape found in automotive stores in the auto body repair section. When you use this tape, it will peel away better when done, and will leave nice sharp edges.

DECALS

Water Slide Decals

One type of decal that many rocket kits still use are *water-slide decals*. These are the decals which do not peel away from the decal paper unless they are soaked in water. These decals are difficult to use because they tear easily. However, if successfully applied, they are nice because they lie very flat against the surface of the rocket. Once the decals are wetted, carefully slide them away from the paper onto the rocket and while the decal is still wet, slide it into its final position. You may want to spray on some clear coat after the decals are attached to protect the decals. Spray cans of clear coat can be purchased at hobby stores.

Self Adhesive Decals

Self adhesive decals are decals which peel away from the decal paper without soaking in water, and are very sticky on the back, like a postage stamp. They generally do not tear as easily, but they may be harder to apply because once stuck on the rocket, they cannot be easily slid into the correct position. This can be overcome though if you dip the decals (after peeling from the paper) in a dish of warm water with just a little dishwashing soap in it. The decal is now wetted and slippery enough to be slid over the surface of the rocket. The soapy water will dry and leave the decal stuck in place as you wish. Be sure to smooth out the decal to remove any air bubbles trapped under the surface.

Another disadvantage of the self adhesive decals is that they are usually thicker and stick up a little higher on the surface of the rocket. This raised area caused by the decal can be diminished by spraying a couple coats of glossy clear coat over the rocket.

Military Scale Rockets

If you are making a rocket that is supposed to be an authentic scale model of a military missile or rocket, you may want it to have a drab finish instead of a shiny finish. A trick here is to first paint the rocket with gloss colors, which make a smooth coat easy for applying decals. Then spray over with a dull clear coat to achieve the drab, military look.