



BASICS OF SCALE MODELING



CONTENTS

1 GETTING
STARTED

2 TOOLS OF
THE TRADE

3 BASIC BUILD
TECHNIQUES

4 PAINTING
TIPS

5 DECALING
MADE EASY

6 WEATHERING
ESSENTIALS

GETTING STARTED

1



7



FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com

■ The 10 (or so) tools you need to get started

Need to stock your toolbox from scratch? Here are the top ten tools you'll need to get started. As your skills increase (or as you specialize in one genre of modeling) you can tailor your selection of tools and supplies.



1. Hobby knife. Keep a small collection of fresh blades on hand, along with a small “variety pack” of specialty blades.

2. Sprue cutter. A good quality cutter makes trimming parts much easier.

3. Glue. Start with standard tube glue and white glue.

4. Toothpicks. The inexpensive, disposable, tool of a thousand uses. Ideal for everything from stirring paint to applying glue.

5. Wet-or-dry sandpaper and sanding sticks. These will help you smooth imperfections and eliminate seams between parts.

6. Pin vise and drill bits. The best way to open up exhaust stacks and mounting holes.

7. Paint brushes. (Previous page.) A good set should include a fine-point detail brush and a variety of larger brushes. As your brushes wear out, save them for less-accurate work such as applying washes, pastel powder, and weathering pigments.

8. Paint. Start with a collection of standard colors and expand from there.

9. Files. Flat, round, large and small. These help tackle serious fit problems.

10. Masking tape. Use a good-quality, low-tack painter’s tape. Look for it at hardware and home-improvement stores.

11. Tweezers. Mandatory – you’re going to be dealing with lots of small parts!

■ Which glue should I use?

There isn't a single one-size-fits-all glue for scale modeling. Here's a list of the best adhesives to have on hand, as well as a description of their most common applications.



1. Solvent-based glue: Time-honored tube glue or liquid cement. Solvent-based glues melt the mating surfaces of plastic parts to weld them together to produce extremely strong bonds. Solvent-based glues should be used sparingly to avoid damaging the plastic parts. Non-toxic tube glue is available for younger modelers.

2. Super glue: Available in several grades, from ultra-thin, ultra-fast setting to thick, gap-filling, slow-setting varieties. Good for general assembly and bonding

dissimilar materials. Always have a bottle of debonder within arm's reach. Super glue should not be used for clear or "chromed" plastic parts; the glue's vapors can fog their surface.

3. White glue: Ideal for attaching clear and chrome-plated parts. Can be thinned with water and applied with a fine paintbrush. Errors clean up with water.

4. Epoxy: Two-part adhesive consisting of a "resin" and a "hardener." Epoxy begins to cure when the two parts are mixed.

Different varieties cure at different rates, from minutes to hours, and the resulting bond is extremely strong. Ideal for joining dissimilar materials. Thicker epoxy putty can be used to fill gaps and can be used for sculpting.

5. Clear-part adhesive: Usually water-based and formulated specifically for use with clear parts. Usually thicker than standard white glue, this adhesive dries clear and can be used to simulate small windows, landing lights, and instrument-panel gauge faces.

Basic painting tips

The days of the tiny countertop paint rack at the hobby shop are long over. (That's a good thing, though – no more mixing paints labeled “Yellow” and “Green” in an attempt to arrive at “Dunkelgelb.”) Visit any modern hobby shop and you'll undoubtedly find rack after rack (and brand after brand) of carefully formulated, carefully color-matched model paint in both bottles and spray cans.

If you're just getting started modeling, it's probably a good idea to start with one brand and/or type of paint. The folks at the hobby shop should be able to advise you as to what selection will work best for the type of modeling you're doing. As you get the hang of things, you can expand your arsenal of paints to include everything from acrylics, to enamels, to lacquers and everything in between. Here are some guidelines to help you tell things apart so you can get started properly.



Never thin paint in the bottle.

Unthinned paint will last a long time in a properly sealed bottle or tinlet. Adding thinner, however, will shorten its shelf life. Always mix paint and thinner in a separate (third) container, and dispose of any excess.

Don't mix different brands. Sure, you can use different brands of paint on your project, but don't mix colors between brands.



Shaken, or stirred? Generally, it's best to stir paints thoroughly before you use them. Shaking the paint bottle can introduce air bubbles into the mix, which can affect the final finish. Buy a big box of sturdy toothpicks or coffee stirrers to mix things up.

Use the recommended thinner.

While some modelers like to use their own concoctions to thin paint, your best bet is to use the thinner recommended by the paint manufacturer; usually it's listed on the paint bottle.

Test first. Unsure of how a particular paint will work? Will it match? Is the bottle too old? Is it the right sheen? If you have questions about a particular formulation of paint, always test it first. An empty section of the kit's parts tree is a great place to check.

Don't judge color in the bottle.

Some paints can change color dramatically as they cure. When in doubt, apply the paint to a test swatch (a leftover piece of parts tree or a scrap piece of white sheet styrene will work well) and let it cure for at least 48 hours. You'll have a textbook example of the paint's “final finish.”

Apply paints in the proper order.

Model paints are available in a wide variety of formulations. Generally speaking, you'll want to apply paints that are chemically “hottest” first, followed by their “cooler” counterparts. Cooler paints have less chance of affecting their more-durable, hotter cousins. Generally the rule of thumb is to apply lacquers first, then enamels, then



acrylics. Paint formulations vary widely, however, so when in doubt, test first.

Date your spray cans. Unlike bottled paint, spray cans eventually wear out, starting with their first use. The propellant inside slowly leaks out and renders the cans unusable. The first time you use a spray can, mark it with the day's date with a permanent marker. The next time you reach for it you'll know how long it's been on the shelf, so you don't accidentally run out of propellant halfway through your paint job. When in doubt, it's best to buy a fresh can of paint for your latest project.

Do the right thing. Always store and dispose of paint and thinner safely and properly. Many communities offer regularly scheduled “paint drop-off days” at recycling and trash-collection centers.

■ Understanding decals

Decals can make or break the appearance of a model. Here's a guide to how they should be applied.

Decals are best applied over a smooth, glossy surface. If you're applying them over flat paint, first apply a clear gloss finish and allow it to dry completely.

Apply the decals to the glossy finish, following the manufacturer's instructions. Using a setting solution will help the decals conform to the surface.

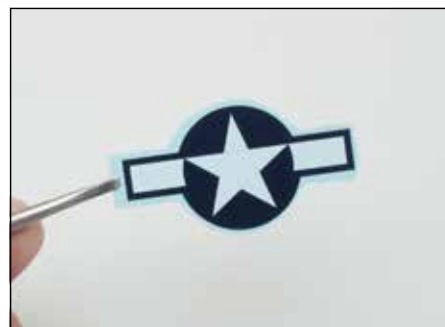
Should your model have a flat finish overall? After the decals dry, apply a coat of clear flat finish. Here's a step-by-step guide to applying a decal over flat paint.



Shiny! Decals adhere best to a smooth, glossy surface. A coat of Pledge Future floor shine can be applied with a soft brush.



Trimming. Trim the decals from their carrier sheet one at a time as you apply them. Small scissors are ideal for this.



Tweezers. Leave enough backing paper to hold the decal securely with a good pair of round-point tweezers.



Water. Dip the decal in cool clean water for 5-10 seconds. It doesn't take much time to activate the decal's adhesive.



Release. Place the moistened decal on a paper towel for a minute or so. It will continue to loosen from its backing paper.



Setting solution. Using a clean paint brush, add a thin coat of setting solution to the area where the decal will be applied.



In place. Position the decal over the model. Hold it in place with a wet brush and slowly pull away the backing paper.



In place. Slide the decal into position. If the surface is irregular (as here) apply more setting solution to help the decal conform.



Flat coat. After the decal has dried thoroughly, a coat of clear flat can be applied to even the finish and seal things up. **FSM**

SCALE MODELING GLOSSARY

Browse through our updated list of modeling terms

Whether you're new to scale modeling or have returned to the hobby after a hiatus, you're bound to stumble upon unfamiliar jargon. *FSM*'s here to help. A few years ago, we launched our online Scale Modeler's Glossary and asked you to submit your own modeling terms. Here are a few you submitted and other popular modeling terms. Visit www.FineScale.com to browse our complete online glossary and submit your own terms.



Rick Lawler used color modulation to enhance a monochromatic scheme on Tamiya's 1/48 scale Marder III, featured in the September 2009 *FSM*.

COLOR MODULATION

A fool-the-eye technique that simulates natural lighting effects with highlights and shadows that bring out details on a model and give it a realistic look. Because this is a permanent color correction, it locks the lighting and shade orientation regardless of the actual ambient light.

— Tom Zmudzinski
Fort Washington, Md.

ACCURIZE

To improve the accuracy of a piece.

AFTERMARKET

Parts sold independently of the kit to replace or enhance what's included in the kit. These can include decals, detail parts, weapons, etc.

ADVANCED MODELER SYNDROME (AMS)

The need or desire to superdetail every model, often at the expense of completing any.

ARTIST'S OIL

Fine-art paint; slow drying and easily blended, it's often used for figure painting and washes.

BACKDATE

Converting a model to represent an earlier version of the subject.

BOX SCALE

A model in a nonstandard scale.

Early kits were scaled to fit existing boxes.

BUSY UP

Adding detail to an area of model lacking it.

— Corey Reece
Olivehurst, Calif.

CONSTANT SCALE

Models produced in the standard, consistent scales (1/35, 1/72, etc.).

CONVERSION

A model that has been modified to represent a different subject or variant.

DECAL

Thin, printed transfers used for lettering, markings, and national insignia. Their adhesive is activated by water, so they're sometimes referred to as "water-slide" decals.

DIORAMA

A miniature scene, often including vehicles and figures, in a natural setting.

DRY-FIT

Test-fitting parts for alignment before cementing them together.

DRY-BRUSHING

Using a nearly dry paintbrush to highlight raised detail and edges, usually with a lighter color.

EJECTOR-PIN MARK

A circular depression in injection-molded plastic parts. Caused by the molding process, these flaws often must be filled and removed.

GREEBLIES

Inaccurate, odd parts used to fill in areas where accurate detail is not provided, making empty space look busy; very common in science-fiction subjects. See *gizmolology*.

— Jim James
Orlando, Fla.

INDIVIDUAL-LINK TRACKS

Treads for tanks and other tracked vehicles in which each



Dan Jayne spent five months building this cutaway from Academy's 1/32 scale F/A-18C Hornet. See more of the talented late modeler's creations in the October 2016 issue.

CUTAWAY

A model where the skin has been "cut away" so interior details can be viewed.

track is made up of individual links glued or pinned together as on the real vehicles. Once an aftermarket purchase; recently, more kits have this type of track.

– Mike Thompson
Ames, Iowa

KITBASH

To combine parts from different kits.



Using gizmology, Tim M. Quinlan II detailed his USS Brooklyn (featured in the July 2010 issue) with Christmas tinsel, piano wire, and snaps.

GIZMOLOGY

Using or creating detail parts for models or small models themselves from unlikely sources, such as other model kits, toys, household items, and scrap.

– Mike Thompson
Ames, Iowa

LIQUID SPRUE

Sprue from a model kit cut into small pieces and dissolved in liquid styrene cement. Used as a filler.

– Dave Eyles
Weybridge, Surrey,
United Kingdom

PHOTO-ETCHED METAL TOOL

While this refers mostly to small folding tools, a photo-etched metal tool can be anything in a modeler's arsenal dedicated to cutting, filing, annealing, folding, rolling, or shaping photo-etched parts.

– Tom Zmudzinski
Fort Washington, Md.

REVERSE WASH

A technique to create a wash effect on raised panel lines by painting the lines the desired color, usually black or dark gray, then painting a protective clear coat. Once the final color coat is applied, the panel lines are lightly sanded, revealing the darker color underneath.

– Harvey Baker
Jemison, Ala.

PIN MARKS

Impressions left in plastic by the pins that eject parts from a mold.

SLIDE MOLD

Injection molds that use more than the traditional two-part

top and bottom steel molds. In a slide mold, additional mold pieces can be placed into the sides of the main mold halves, allowing for undercuts and even hollow parts impossible with two-part molds.

– Mark Wilson
Alexandria, Va.

SILVERING

When air is trapped between a decal and the model surface.

SUPERDETAILED

A model that has been detailed (often with many additional parts) to the highest standards of detail and accuracy.

UNOBTAINIUM

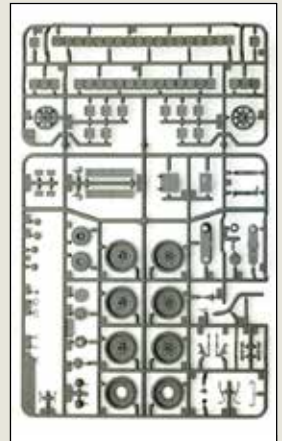
A part (usually aftermarket) that looked good on another modeler's work but unfortunately is no longer available for your model.

– Tom Zmudzinski
Fort Washington, Md.

WASH

Weathering process: Highly diluted paint is flowed into small details, such as recessed or raised panel lines, rivets, etc., to color them or simulate accumulated grime and dirt.

– Hoi Sing Chan Tang
Moncton, New Brunswick,
Canada



SPRUE

The cylindrical plastic "tree" that parts are attached to inside a kit. These are the result of channels that feed molten plastic into part cavities in a mold.

ZIMMERIT

Nonmetallic paste applied to German armor during World War II to thwart magnetic mines. **FSM**

 www.FineScale.com

Look up more scale modeling terms and submit your own to our online modeling glossary.



Karl Logan, known for his heavily-weathered armor, used a bunch of different weathering techniques to wear out Dragon's 1/35 scale SdKfz 251/17.

WEATHER

To simulate the appearance of wear and tear (battle damage, exposure to the elements, age) on a model.

TOOLS OF THE TRADE

2



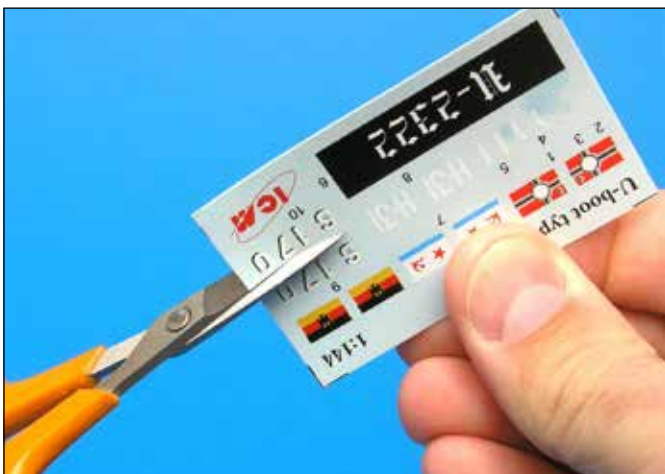
FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com



Cutting tool roundup

Outfit your workbench with the tools you need



It's an ironic fact of model building that before you glue parts together, you usually have to cut some apart. Not surprisingly, having the right tool for the job makes building a lot more enjoyable, so here's a look at the most commonly used knives and cutters for model building.

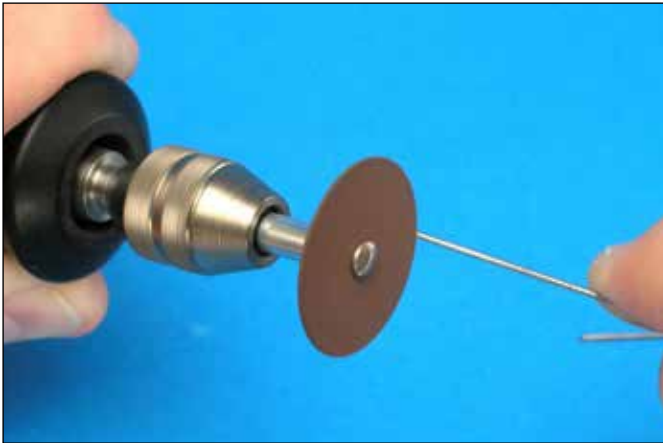
A small pair of sharp scissors makes cutting decals and masking tape a whole lot easier. This pair was found in the needlework section of a craft store, and we recommend having a similar pair with curved blades.



Cutting shears are a great all-purpose tool, but they're especially handy for removing delicate parts from the sprue. This pair is from Xuron (www.xuron.com). Precision shears like these save a lot of time at the workbench. What little sprue remains on the parts can be trimmed away with a hobby knife.



For most of us, our first modeling tool was a hobby knife with a pointed No. 11 blade. But you should keep several knives on your workbench. We recommend color-coded handles to tell them apart easily. When the blades wear out, place them in a plastic "sharps" container. You may have seen a sharps container in a doctor's office; they're normally used to dispose of syringes. With a sharps container, the old blades are stored safely, and when the container's full, it's disposable.



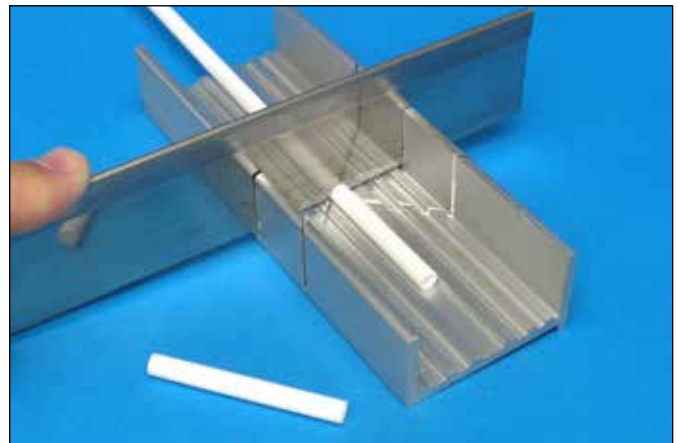
Although it's especially handy for grinding, drilling, and sanding, you may not think of a motor tool as a cutting tool. But if you need to cut more substantial materials, such as music wire, you may want to outfit a cutting tool with a mandrel and cutting discs.



When you use a motor tool or most of the cutters outlined here, it's always a good idea to wear a pair of safety goggles, which are available inexpensively at hardware and home stores. Cutting wheels can break, and tiny bits of wire and plastic can go flying – protect yourself properly.

Safety first

FEW THINGS ARE SHARPER than a new hobby-knife blade, and few things can tear you up more quickly. We've all gone through plenty of Band-Aids in our modeling careers, some of us even ending up in an emergency room, but we'll spare you the details. Bring up workbench accidents at a model-club meeting and you'll hear a wide variety of "modeling injury" stories. Learn from our mistakes. All of the tools outlined here should be handled and stored with the utmost care.



A general-purpose razor saw and a miter box will serve you well, particularly if you're thinking about doing conversion or scratchbuilding work. There's no easier or more accurate way to cut a right angle in styrene stock. **FSM**

FROM THE PUBLISHERS OF FINESCALE MODELER MAGAZINE

BASIC BUILD TIPS

3



FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com

TRIMMING PARTS

Yeah, it's basic, but getting parts off trees is the first step to a successful build

BY AARON SKINNER

Remember your first models, when you grabbed parts and twisted until the sprue relented and the pieces came loose? Never mind the big chunk you

took out of the part's edge, or the clear part that got cracked.

One of the first things you learned as your modeling skill set expanded – right after *No.11 blades are really, really sharp,*

and *glue will stick to you as well as a lot of other things* – was to cut, rather than twist, the parts from the trees. It's still one of the most basic skills, and one that bears a second look.

RESIN

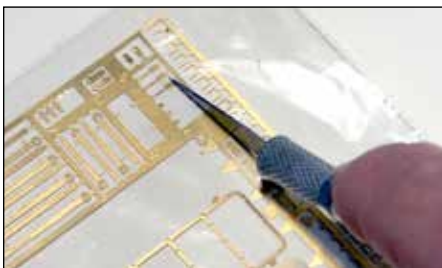


Resin parts almost always have pour plugs to be removed. A razor saw is the best weapon for this work, although large parts can be removed quickly with a carefully wielded cutoff wheel in a rotary tool. Work slowly and check often to be sure the blade hasn't gone off track.



Depending on how closely you cut, sanding is usually all you need to clean up resin parts. It's a good idea to wear respiratory and eye protection while cutting or sanding resin. The dust is very fine and can be irritating if inhaled.

PHOTO-ETCHED METAL



The thin strips that attach most photo-etched metal parts to frets are easily cut with a sharp knife. The main danger is sending the part orbital. Try cutting the part through the bag it came in. This keeps the part corralled until you can super glue it to the model.



Alternatively, you can place the fret on the sticky part of a Post-it Note. The adhesive is strong enough to stop the part from taking off for parts unknown, but it lets go of the parts easily to prevent damage (and leaves little residue, better for the adhesion of paint and glue).



Photo-etched parts usually have small tabs where the attachment points were. A fine file, sanding stick, or whetstone will take care of those – but be careful not to bend or crimp the parts while you work.

PLASTIC



One of the best tools you can buy is a pair of side or sprue cutters. The blades should have a flat side and an angled side. With the cutters, it's a simple matter to place the flat side next to the part and cut the attachment point. It pays to be gentle and to look after your cutters. Use them only for plastic; things like metal and artificial flower stems will nick the blades, in turn damaging model parts.



Speaking of sanding: After using the side-cutters and hobby knife, it usually takes only a few swipes with a sanding stick to remove any remaining sprue. Go lightly and pay attention to where the abrasive touches the model.



I've lost count of the number of small parts I've sacrificed to the carpet monster over the years. An easy way to avoid that is to make the parts bigger. When attaching small items like the lifting rings on a Dragon 1/35 scale T-34 turret, I cut off part of the sprue with the part. It serves as a handle when placing the part and applying glue.



Clear parts need a little TLC to ensure they reach the model unharmed. Clear plastic is much more brittle than regular styrene, so trimming it with sprue cutters can cause twisting or cracking, as on this 1/72 scale Italeri H-34 canopy that I messed up with careless handling.



Next, I use a sharp No.11 blade to shave off the remaining little stub. Be careful. (Did I mention it's sharp?) If the plastic is soft, it is easy to cut too deeply and damage the part. My intention is to remove as much excess plastic as possible without cutting into the part. I find this lessens the amount of sanding I have to do, thus decreasing the amount of collateral damage to surrounding areas.



Because sprue cutters put pressure on the parts, there is a risk of breaking small, fragile items such as grab handles. A razor saw is a must here. Working slowly, it's easy to trim the part from the tree – and the cut is usually very clean.



Once the glue is dry, I trim the extra plastic from the part and clean it up.



Using a razor saw to carefully cut the part from the sprue minimizes damage and reduces the amount of plastic that needs to be sanded off. This means less handling (and fewer fingerprints) before the parts reach the model. **FSM**

Stretching sprue

This basic technique has multiple applications for builders

BY AARON SKINNER

Modelers have used sprue (parts trees) as a detail source since plastic replaced wood as the primary material used to manufacture kits. Using the same substance as the model means you don't need special glues to attach it.

You only need a few things to get started. First, some sprue: I'm sure you have some lying around. After removing

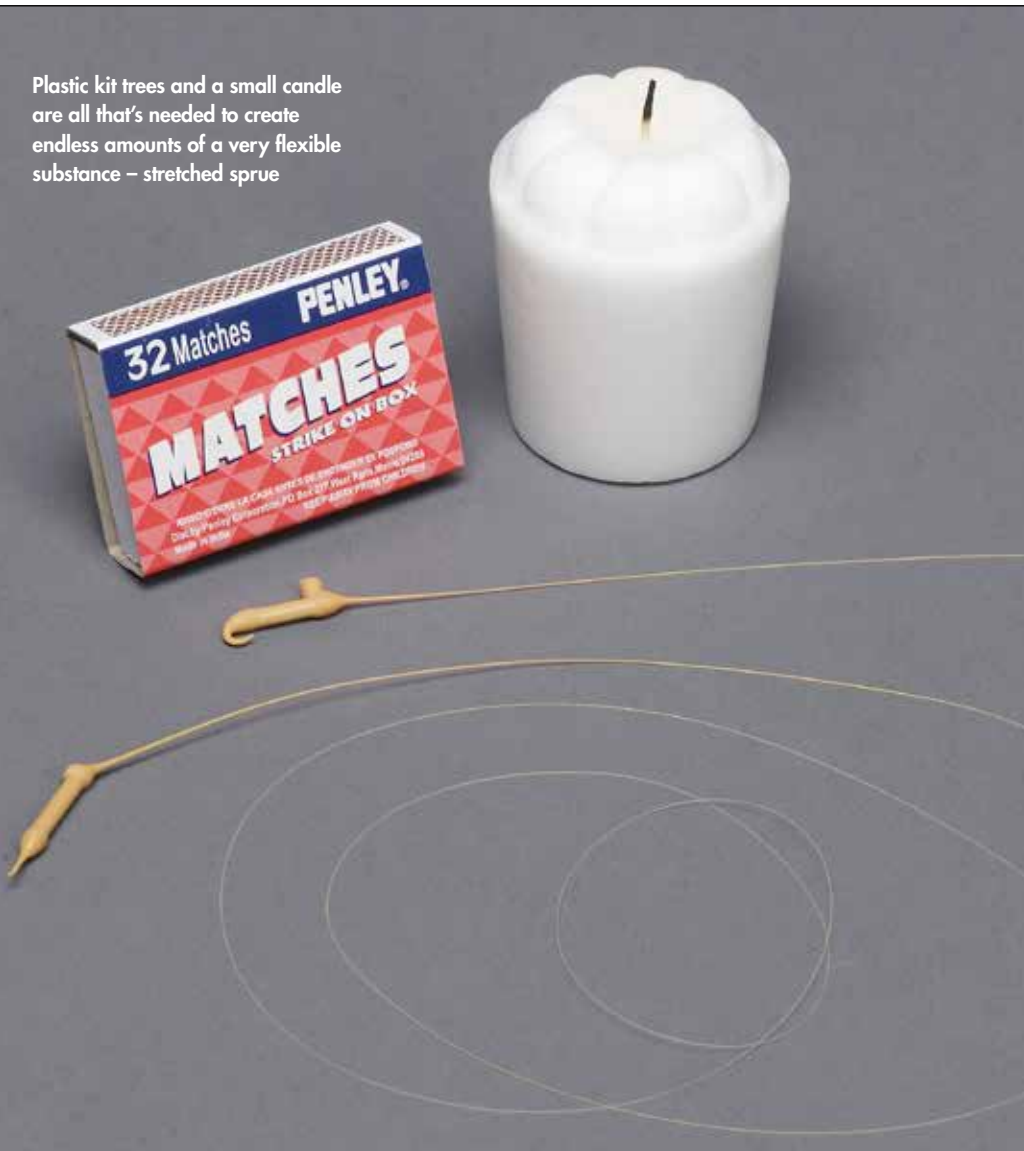
any extra parts from a finished model's parts trees, I cut away likely pieces for stretching. Experiment with different sprue sections. My experience is that different manufacturers' plastic stretches differently. And clear sprue performs differently from opaque plastic.

Next, you'll need a heat source. A short, round candle is the perfect thing: It gives off a nice, even flame, generating just

the right amount of heat. Most of them smell good, too, so when you're done you can use the candle to create the perfect mood for a romantic dinner (always good when you have to tell your significant other the financial damage caused by your latest hobby store outing).

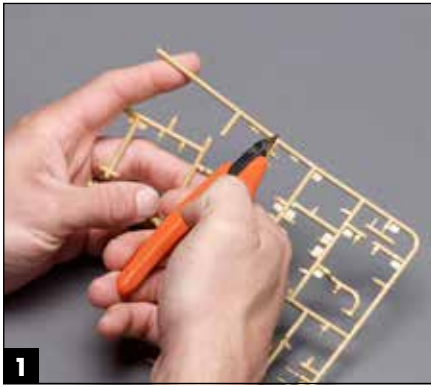
In addition, keep a box of matches handy. They're useful for more than just lighting the candle.

Plastic kit trees and a small candle are all that's needed to create endless amounts of a very flexible substance – stretched sprue



Common uses for stretched sprue

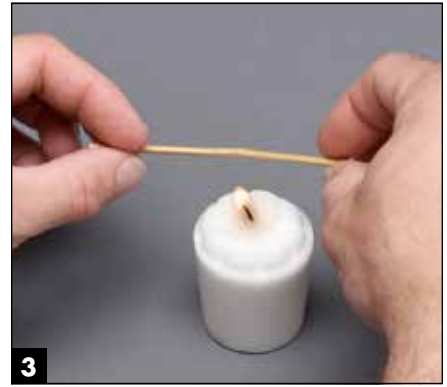
- Radio antennas
- Rigging
- Wires
- Gun barrels
- Wheel spokes
- Rod antennas
- Pitot tubes
- Landing-gear struts
- Instrument-panel switches
- Rivets
- Cigarettes
- Canopy hinges
- Ammunition
- Ladders
- Bomb fuses
- Axles
- Gunsight cross hairs
- Door and hatch hinges
- Panel reinforcements
- Hydraulic cylinders
- Super glue applicator
- Filling seams
- Replicating weld beads
- Tire stems
- Race-car frame parts
- Control or shift levers
- Replacing raised detail lost to sanding
- Filling holes (like unused locator holes)
- Conduit



1 When selecting sprue to stretch, look for longer straight arms without ejector-pin marks or branches in the middle. Trim the sprue so there is enough to hold onto at each end while heating it. Remember, there's fire involved, so you want to be able to keep your fingers away from the heat and flame.



2 After lighting the candle, let it sit a minute until the flame settles into a steady burn. Then, grasping the ends of the sprue in either hand with the center of the section about 3/4" above the flame, turn it slowly back and forth. Don't get too close! Burning plastic not only smells bad – it isn't healthy to inhale the fumes.



3 Keep your eye on the section of plastic over the flame. As it heats, the surface sheen will change and the plastic will begin to swell. Like a muffin in an oven, the swelling is an indicator that it's almost ready. Another way to check is to let go of one end; when it begins to bend and sag, it's ready.



4 As you move the sprue away from the heat, begin steadily pulling the ends apart; the plastic will begin to stretch. Be careful, though – if you pull too fast, you risk breaking the plastic; too slow and the plastic will cool, resulting in an uneven strand. Varying the speed can yield different diameters appropriate for different uses.



5 A magical aspect of stretched sprue is that the altered section retains the shape of the original. For example, if you stretch half-round sprue you should get a half-round segment with a smaller diameter – same for tubing or multifaceted pieces. You can stretch styrene strip, rod, tube, or stock to the same effect.



6 Use super glue to attach thin, stretched-sprue wiring such as the antenna on this Heinkel He 111. Thin styrene is easily dissolved by solvent-based styrene glues. Note the stretched-sprue nub being used to precisely apply the glue. Simply anchor both ends and don't worry about getting it perfectly taut...



7 ...because it's easy to take care of the sag. Strike a match, let it burn for about 10 seconds, then blow it out. Move the match back-and-forth underneath the wire; the heat will shrink the sprue, taking up the slack. You can also try heating a nail (hold it in a pair of pliers, it'll get hot!), then running it under the wire.



8 Warning: Be careful doing this, as a little heat goes a long way; it's easy to melt the wire completely. Also, watch how close you hold the match or nail to the model's surface. Few things are more depressing than watching the nicely finished surface of your model bend and sag because it got too hot.



9 Stretched sprue has many uses beyond wires. I used it to replicate weld seams on the turret of a KV-1 tank, placing thin filaments on the surface and applying liquid glue (this is one time when melting plastic is good). With so many uses, stretching sprue is a technique every modeler can use – and it's easy! **FSM**

PAINTING TIPS

4



FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com



As well as creating a good foundation for paint, primer can reveal and fill minor blemishes, start the weathering process, and cover troublesome colors and materials.

A PRIMER ON PRIMER

A good finish is all in the beginning • BY AARON SKINNER

Anyone who has painted a full-size car or a plank of bare wood knows the value of primer; it smooths out the surface and gives the color coats something to hold onto.

The same is true of models; the secret of a great-looking paint job is to start with a good surface.

But ask a group of modelers whether or not they prime and they'll tell you never, every time, or that it depends on the model.

What is primer?

When modelers talk about priming, they may be referring to a ready-mixed primer or simply referring to a base coat of

paint that they've applied to a model.

Generally speaking, primers are special paints designed to promote paint adhesion and coverage, especially on porous surfaces. "But wait," I hear you say, "Styrene isn't usually porous." That's true. But paint will stick better to primer than to smooth plastic, especially when you are using acrylic paints.

Some primers are a little thicker than standard paint so they will fill minor scratches and other blemishes left from construction and/or sanding.

There are a lot of primers on the market from major hobby manufacturers, especially for

scale models, **1**. Alternatively, some spray-can primers sold for household or automotive use can be used, **2**. Most of these are light gray or white. If your main reason for priming is to provide a uniform base, rather than to fill scratches, you can use standard paint. In these instances I use neutral gray or dark brown, depending on the subject.

How to prime

Primer is applied like any other paint. To ensure a smooth coat, use either spray-can paint or an airbrush. My favorite is Tamiya Surface Primer in the spray can; it goes on super smooth, and I haven't had any problems using

enamels or acrylics over it, **3**. I've also had nice results with Gunze's Mr. Surfacer and Vallejo's acrylic-urethane primers. As with any paint, experiment until you are comfortable with one or two brands for different effects or surfaces.

Use spray-can primer as you would any other spray can: Keep the can 6" from the surface, start and end each stroke off the model, and keep the can moving. I have decanted Tamiya primer before and applied it with an airbrush, but the results straight from the can are smoother, **4**.

If you are spraying primer or paint through an airbrush, thin with the recommended thinner.



1

Most model-paint manufacturers make primer, including (from left) Vallejo, Model Master Acryl, Badger Modellflex, Tamiya, Gunze Sangyo, Model Master, and Polly Scale. They are more expensive than what you get at the hardware or discount store, but ready to use on plastic.



2

Some modelers prefer household or automotive primers. They are generally cheaper than scale modeling primer, but test them first. Some can aggressively attack plastic.



3

Aaron's preferred base coat is Tamiya Surface primer in the spray can. It's a little more expensive, but almost foolproof.



4

Aaron sprays Tamiya primer on AZ Models' 1/144 scale Douglas DC-9.

Surface Prep

Equally as important as primer for a great finish is making sure the surface is ready to receive paint. In addition to sanding away mold seams and excess filler, I usually lightly rub the surface with 2,000-grit sandpaper or even a piece of soft cloth, like an old T-shirt, to knock off any little lumps.

I always wash the parts in a weak solution of dish detergent, **A**, then leave them to air-dry. If speed is an impor-

tant consideration, a hair-dryer can help. But make sure the water is completely gone from the model, including any that may be hiding in corners or interiors; nothing ruins a surface faster than water trickling across wet paint.

Finally, shortly before painting, I apply Polly S Plastic Prep with a cloth, cotton ball, or cotton swab to remove any lingering oil or grease from the surface, **B**. Allow it to air dry, then paint.



A

Aaron washes the AZ Models DC-9 in mildly soapy water to remove sanding residue as well as finger oil and mold-release agent that could interfere with paint adhesion.



B

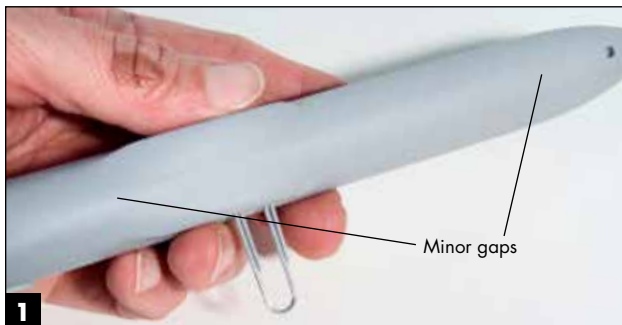
A rubdown with Polly Scale Plastic Prep ensures primer will stick.

(continued)

WHY PRIME?

Check for surface problems

The most common reason given for priming by *FSM* authors is to expose surface flaws. A uniform coat of white or light gray can highlight unfilled gaps, ejector-pin marks, or scratches. In any case, the aim is a smooth, uniform coat covering the entire surface. If, after the first pass, you discover blemishes, **1**, correct them with filler and sanding, **2**, then respray the affected areas. You're done when the model's surface is smooth and clean. Some modelers like priming with silver because metallic paints make surface problems even more obvious, **3**.



The first primer coat revealed a couple of under-sanded filler blobs on the DC-9's belly and a small gap near the nose.



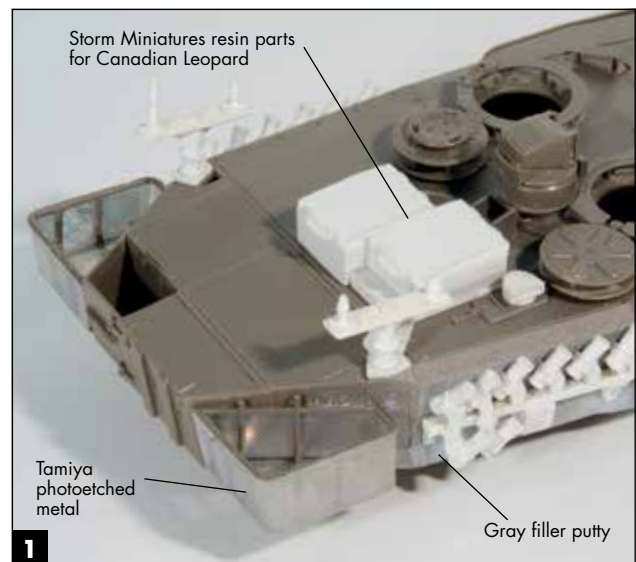
The primer also revealed that Aaron hadn't been thorough when he sanded the leading edge of one wing. When the primer line disappears, the gap is smooth.



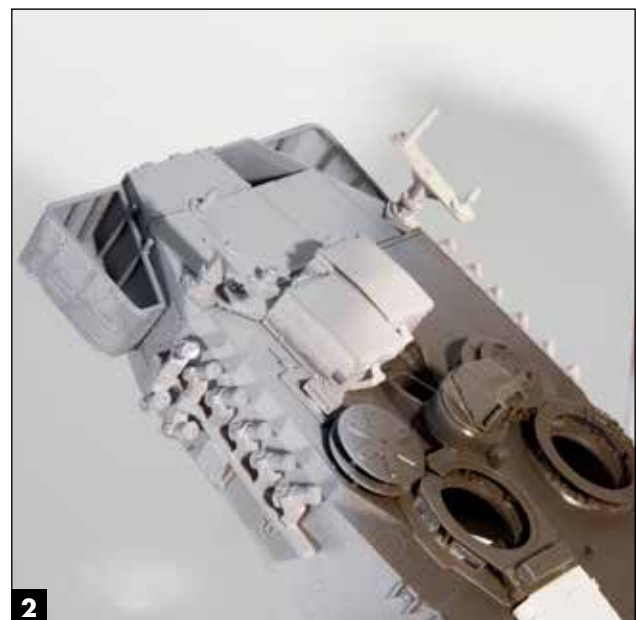
Tamiya gloss aluminum reveals panel lines that need to be repaired on the spine of Eduard's 1/48 scale Su-7 Fitter.

Provide a uniform color base

If your model has contrasting colors of plastic or contains resin or metal, **1**, applying primer evens out the base so subsequent color coats look uniform, **2**. The primer also gives the paint something to "bite" into, and it helps paint adhere to metal.



Primer is essential when preparing to paint multimedia models like this Tamiya 1/35 scale Leopard 2A6 with photoetched-metal baskets and Storm Miniatures resin details.



Tamiya gray primer covers resin, photoetched metal, and dark green styrene, producing a uniform finish that is ideal to paint over.

Add depth

A lot of armor builders use a dark primer, such as a black or dark brown, **1**. The dark base remains in recesses and low spots, helping to create depth in details and add the illusion of shadows overall, **2**.



In addition to revealing unfilled gaps and glue blobs, dark primer produces depth and shadows to start the weathering process.



When airbrushing camouflage over the dark primer, Aaron doesn't have to put as much paint into recesses and under fenders. The dark shade replicates natural shadows.

Help difficult colors

This is less of an issue than it once was, but if a model's plastic is unusually bright or dark, **1**, priming can cover it and make applying lighter colors easier, **2**. Some builders even apply sealer — thick, opaque paint — to prevent color from bleeding through.



If you have a model molded in, say, bright orange plastic — but you want to paint it white — then primer is your friend.



The primer will cover and seal the brightly colored plastic, allowing color on the new body to appear true. **FSM**

DECALING MADE EASY

5



FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com

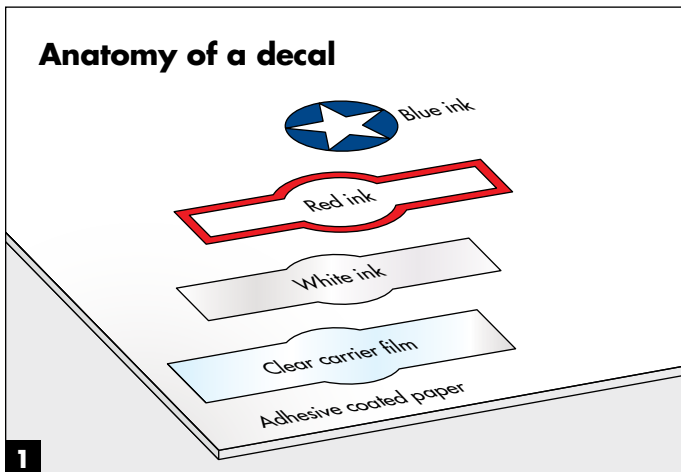
Tips and techniques for **MASTERING DECALS**

What they are and how to make them stick

BY AARON SKINNER



Applying decals has always been one of my favorite steps in building a model. It's the moment when a chunk of painted plastic starts to look like the full-size vehicle, the model gains a human element, and I start zooming it around and making engine noises. Most decals are easy to apply; the trick is making them look like they are painted on, much as they do on the full-size subject.



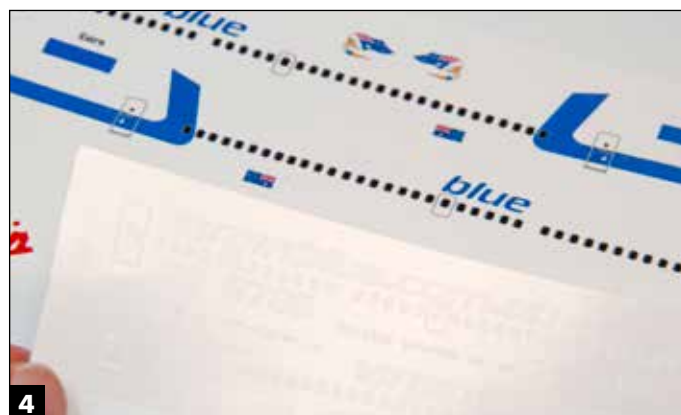
1 Traditional screen-printed decals comprise layers of ink over clear carrier film on adhesive-coated paper.



2 These screen-printed decals for 3D-Kits are printed on small areas of carrier film, seen here as slightly shiny edges around some of the markings.



3 Spada Decals are laser-printed on continuous clear coat and need to be trimmed from the sheets before application.



4 Underworld Decals' sheet for Virgin Blue 737s includes a sheet of white decals to underlay the livery and make the markings opaque.

What are decals?

Usually, *decals* refer to the waterslide markings found in most model kits.

They comprise a layer of water-activated adhesive with a clear carrier film over it and designs printed in ink, often more than one color layered together, **1**.

Traditional decals are screen-printed, but modern computer technology has brought an increase in decals produced on inkjet and laser printers. These latter types are often sold as aftermarket decals and can be printed at home, as Don Stauffer did in the December 2012 *FSM*.

Are there differences in handling different decals?

The carrier film on most mass-produced decals, like the ones found in most kits, is restricted to the area around the marking, **2**. These decals can usually be cut out individually, dipped in water, and slid from the backing onto the model. I have a dedicated pair of fine scissors for this kind of work.

Some aftermarket or short-run kit decals come on a sheet with continuous carrier film, **3**. They need to be trimmed by

running a hobby knife around the marking. Press just hard enough to cut the carrier film — it's thin, so it doesn't take much — before cutting the marking from the paper. You don't want to cut too close to the printed marking because pressure from the knife or scissors can crack or tear the ink. After the marking has been dipped in water, gently remove the excess clear coat with a toothpick or knife tip. Then you can slide the marking from the backing as you would with other water-slide decals.

Pay attention to manufacturer recommendations; in a lot of cases, they will give information unique to their sheets. For example, Draw Decal uses a digital silk-screen process that gives sharp markings, but they are quite thick. The instructions tell you to use very warm water when applying the decals to soften them and allow them to conform to complex surfaces.

Also, some decals need to be sealed before application.

Inkjet and laser-printed decals are often very thin, and the manufacturer may supply a sheet of white decals designed to go under the markings, **4**.

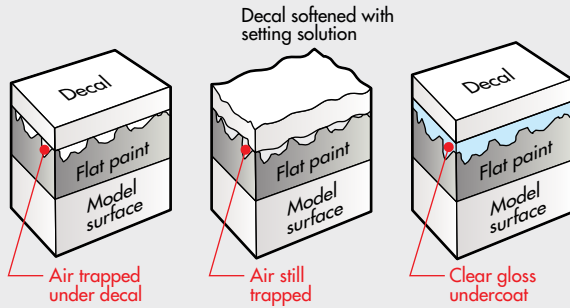
Surface preparation

Decals need to stick to the surface, and they do that best on a smooth surface where they make complete contact. That means applying them to a gloss surface. Flat or matte paints may look smooth, especially after being lightly sanded or buffed, but the reason they lack sheen is because their rough surfaces scatter reflected light. Those tiny ridges and valleys are microscopic, but they prevent the decal from sticking completely, **5**.

If you can't apply gloss paint — and let's face it, most model paints are flat because military subjects tend to be dull — cover the model with a clear gloss before decals.

Most paint manufacturers sell clear glosses that will be compatible with the paint used on the model. You can use other types, but be mindful of paint compatibility when applying one type over another. It's usually OK to use acrylic over enamel and lacquer, but don't use enamels or lacquers over an acrylic base. Don't overcoat either enamels or acrylics with lacquers. The latter are extremely "hot," and many of them will attack the underlying paint.

Why use gloss?



5

Air trapped in microscopic spaces between the decal and paint causes sil-vering, so it's best to apply decals to glossy surfaces.



6

Aaron sprays Tamiya clear gloss over a Tamiya 1/48 scale Sea Harrier to seal the flat gray paint and prepare the surface for decals.



7

Aaron repackages any loose decals in sealable bags to prevent moisture and insect damage.



8

To keep decal sheets dry, Aaron keeps them in airtight storage bins with silica or dessicant packages found in many pill bottles.

I prefer Tamiya acrylic clear gloss or Pledge FloorCare Multi-Surface Finish as a surface preparation. Both are relatively neutral and produce a hard, smooth surface that proves receptive to decals, **6**.

Setting solutions

Decals are designed to be flexible. But that doesn't mean they always lie over or stick to the surface. Setting solutions make that happen, promoting adhesion and softening carrier film so decals lay down better and look like they've been painted on the vehicle, ship, or aircraft.

Most decal solutions are two-part systems. Common examples are Microscale's Micro Set and Micro Sol, Testors Decal Setting Solution and Decal Solvent, and GSI Creos Mr. Mark Setter and Mr. Mark Softer. Some, like Walthers Solvaset, have just a single component.

Generally, you apply the setting solution before the decal. It is a wetting agent that helps the decal stick. The solvent is a stronger chemical that softens the decal and draws it into details such as panel lines.

Not all decal solvents are the same.

Some are much stronger than others, which can be good or bad depending on the type of decals you are using and the surface they are going over. Solvaset, for example, is very strong and best used only after testing on a spare marking.

Cartograf from Italy prints a lot of modern aftermarket and kit decals. I've had great luck using Microscale's system with those markings. On the other hand, the decals supplied with Trumpeter and HobbyBoss kits are extremely thin. Micro Set makes them stick too soon, and Micro Sol distorts them. I find it best not to use any solutions with them.

Older Hasegawa decals are thick and don't seem to respond to milder setting solutions. I use strong solvents such as Solvaset and Mr. Mark Softer.

If you aren't sure about the compatibility of a solution with the decals you have, test it on an unneeded marking. When I built Zvezda's Boeing 787 a few years ago, I treated the large tail marking with Micro Sol and was horrified to come back the next day and find the decal wrinkled and distorted. I ended up removing it and using

a sheet from another kit. I could have saved myself a lot of trouble with a simple test on a separate decal from the same sheet.

Storing decals

Hi. My name is Aaron, and I have a problem: I'm addicted to decals. I can't resist all the pretty colors and the endless possibilities. Case in point: I have at least six sheets for 1/48 scale P-47s ... and not a single Thunderbolt kit.

My addiction to decals means finding a good way to store them.

Decals are extremely susceptible to extremes of temperature and humidity. I place each sheet, even the kit decals, in a zip-lock bag to minimize moisture and prevent insect predation, **7**. (For the record, I've had sheets destroyed by bugs eating the adhesive.)

Keep the sheets in an airtight box or drawer where the temperature doesn't fluctuate much; avoid basements, attics, and garages that aren't climate-controlled. I keep silica packages from medicine bottles in my decal containers to keep moisture out and my decals dry, **8**. **FSM**

TROUBLESHOOTING

The pitfalls of decals, and what to do instead of throwing the model away

Decaling can go horribly wrong, and there's nothing more depressing than being in the closing stretch of a build and being tripped up by misbehaving markings. Here are a few common problems and what to do about them.

Disintegration

Decals that become a jigsaw puzzle once dampened are sure to make you tear your hair out. It is always a good idea to test an unneeded decal before dipping that unique nose-art marking. This is often a symptom of too-thin or incomplete clear carrier on the sheet. In some cases age, heat, and humidity can cause the carrier to break down. If you have a sheet you know has bad decals, or you are concerned it might disintegrate, give the sheet a coat of clear gloss or use a decal sealer like Microscale Liquid Decal Film. These will form a new carrier to hold the decal together. But you will need to trim each marking closely to apply it.



Folded or tangled decal

A decal can sometimes curl onto itself during application. Remove it from the model and float it in the water. It should straighten out as it soaks, and you can float it onto used backing paper. Then you can transfer it to the model as usual.

Decal does not stick

If no setting solution seems to help the decal stick, brush diluted white glue or Pledge FloorCare Multi-Surface Finish onto the model and float the decal into the liquid. The adhesive will dry clear but should help the decal adhere.

Yellowed clear-film

Decal sheets that have lain around for a while will show yellowing of the clear film. In some cases, it might be best to replace them. But, if you must use them, hang them in a window where they will get direct sun. I place them inside a zip-lock bag and tape the bag to the glass. You can check it periodically, but leave it there for a few days. The sunlight should bleach out the yellow. Don't leave them there for weeks or months, though, because sunlight can bleach out color in the decals, too.



Silvering

When a decal is applied to flat paint, air pockets under the clear film show up as light, silvery patches. Prevention is the best cure: Always apply decals over glossy surfaces. Sometimes silvering shows up after the clear flat finishing coat is on. Prick the decal with a pin or a No. 11 blade and apply decal solvent. It should soften the decal and draw it onto the surface.



Ink runs or decal distortion

This is most likely a sign that the solvent is too strong and is dissolving the ink. Switch to weaker setting solution or don't use any on the rest of the project.

Bubbles

Air trapped under the decals as it dries can sometimes leave little pimples in the surface. Prick them with a pin or knife point and apply solvent.

Stains

Dark discolorations around markings are caused by decal solutions left on the model. Wipe the model off with a damp cotton swab to remove the dried solution before sealing the decals. —A.S.



FROM THE PUBLISHERS OF FINESCALE MODELER MAGAZINE

WEATHERING ESSENTIALS

6



FineScale
Modeler
MAGAZINE

For more on modeling, visit
www.FineScale.com



Weathering powders or pigments are available from several manufacturers for scale modelers and model railroaders.

The why & how of WEATHERING POWDERS

Powdered pigments can improve weathering when correctly applied

BY AARON SKINNER

Read *FSM* and every other author or gallery entry mentions using weathering powders or pigments. It seems especially prevalent among the most dramatically weathered models. Are these magical powders the key to masterpiece modeling? The straight answer is that they are another useful tool in the arsenal. And like the best tools, they reward careful use.



1

Weathering powders are similar to artist's pastels modelers have used for years, but many of the modeler's brands contain a dry adhesive that helps them stick to surfaces of all kinds. Most come premixed in useful colors such as light rust, dark mud, and desert dust.



2

It's best to scoop a little – and a little goes a long way – from the container onto a piece of scrap paper, rather than using it out of the bottle, to prevent contaminating the powder with other colors or solvents.



3

Colors can be mixed using two or more bottles. To add a layer of Caucasus dirt to an Alanger 1/35 scale 259 self-propelled gun, I set out Mig Productions Russian earth, rubble dust, and concrete. Use paintbrushes to apply and manipulate powders, but separate them from brushes used for paint; pigment residue will discolor paint.



4

Using a medium-sized round brush with bristles trimmed about half their length, I mix a little rubble dust into the Russian earth. The mixture doesn't have to be thorough; remember, dirt is rarely a uniform color.



5

I liberally apply the basic mix to one of the 259's road wheels. How much to use is a matter of personal taste. I always try to keep in mind where the vehicle or aircraft was operated and replicate that, using photos when possible. Before proceeding, I lightly blew on the wheel to remove excess powder.



6

Using the same brush, I grind the powders into the wheel, pushing the color and texture into crevices and shadowy areas while removing them from ridges and points. Again, it's better to apply the powder unevenly.



7

A handy blending tool: I use a fingertip (I prefer my own for this) to blend the powders and remove even more from high points where dirt and mud would be rubbed off during operation. Be careful how you handle the model after this – 1/1 scale fingerprints, even in the right shade, will not enhance a model's realism.



8

For a nice coat of dust, stop after Photo 7. For other effects, you can use liquids. Here, Mig's paint thinner carries the powders deeper into the wheel's detail, caking or leaving clumps behind. Experiment with alcohol, water, and other fluids for different effects, but be sure whatever you use won't affect the paint underneath.



9

Although the powders are adhesive, you may want to fix them to the surface to make sure they don't shift. You can use a clear coat, but it may change the color slightly. Mig makes a pigment fixer that's easy to apply and seems less likely to shift the color. Here, I touch a brushful of fixer to a road wheel and let it flow. You can still manipulate the powders while the fixer is wet.



10

It's easy to quickly add a layer of dirt to a model with powders. After about 15 minutes, my 259 looked like a vehicle that had been deployed in the field by the Russian army rather than sitting in a museum. I paid attention to photos and thought about where dirt would most likely accumulate on the vehicle.



11

Here's the same model after drying. First, note how much lighter the color is compared to the previous photo. Also, look at the three-dimensional effect of the dirt – something I've never been able to do with pastels. Used well, weathering powders can dramatically change a model's appearance. Can you do the same thing with artist's pastel? Mostly, yes. But weathering powders' premixed colors and inherent stickiness are a great addition to the toolbox. They're easy to adjust and correct. Experiment! If you find a novel use for the weathering powders, or a technique that gives good results, drop us a line at tips@finescale.com. We may use your tip in a future Reader Tips column. **FSM**

SAFETY

Pigment powders are very light and easily inhaled, so it's a good idea to wear respiratory protection.

Artist's Oil washes



1

The ingredients of an artist's oil wash: a tube of paint (in this case Winsor & Newton burnt umber); Turpenoid (or other thinner); a brush; and a palette.



2

First, squeeze out a small dollop of paint. You don't need much; a little goes a long way. This is an inexpensive plastic palette, but almost any hard plastic container will do; test it first to ensure the thinner doesn't melt it.



3

Transfer some thinner into a separate container or area of the pallet. To avoid spills, I use a large brush, dipping it into the Turpenoid can, then squeezing it into the container.



4

Use a small brush to transfer a little paint into the final mixing container. This lets you add paint and thinner to refine the mix.



5

Add thinner to the paint and mix well to avoid any unevenness in the mixture that can cause changes in the density of the wash.



6

For a general-purpose wash, I aim for a mixture that looks slightly tinted when the loaded brush is touched to the side of the container.



7

For a broad approach, use a large brush and apply very thin paint (I'm using a darker mixture than normal to make the effect more visible) over the entire surface. Note how the paint collects around details like bolts.



8

To refine the effect, I dampen a brush with clean thinner and stroke it across the surface, pausing frequently to wipe the brush on a paper towel. Stroke in the direction water or air would move across the vehicle's surface.



9

Pinwashes are precisely applied washes. Instead of using a large brush loaded with paint to cover the entire surface, you'll use a fine-point brush on specific areas or details.



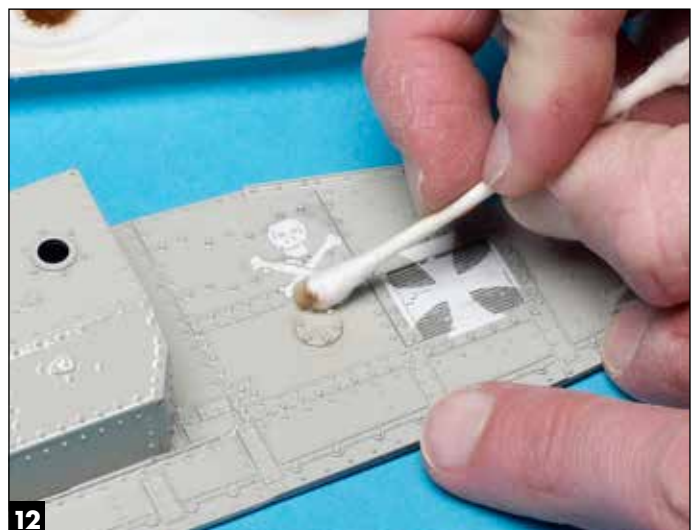
10

Touch the tip of the brush to the edge of a feature you want to accent – capillary action will pull the wash around the detail without affecting the surrounding surface.



11

Artist's oils' long drying time makes it easy to fix mistakes (such as paint in the middle of a panel). First, dip a cotton swab in clean thinner. Use swabs with cardboard stems; thinner will melt the plastic-tube variety.



12

Rub the surfaces where you *don't* want the wash. You can use this technique to feather edges and further refine the wash. **FSM**

Welcome to *FineScale Modeler!*

The essential tool for model builders

Your satisfaction is important to us.

Our customer service team takes pride in making sure that you are completely satisfied with your subscription. To contact us, please use one of these options:

Online subscriber service

<http://subscribe.finescale.com/help>

Available 24 hours a day, 7 days a week

- Pay your bill
- Check your account status
- Change your address or e-mail address
- Report damaged/missing/duplicate issues
- Subscribe or give a gift
- Renew
- Manage email preferences

E-mail

FineScaleModeler@customersvc.com

Postal Mail

Kalmbach Publishing Co.
Customer Service Dept.
3000 University Center Drive
P.O. Box 62320
Tampa, FL 33662-2320

Phone

1-800-533-6644

For more information on our products, visit
www.finescale.com
www.kalmbachhobbystore.com