Weathering Plastic-shelled N-Scale Model Trains

Introduction

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Graphic Designer 40+ years; draftsman in the EE biz for nearly 10 years; BS Industrial Design

New to Railroading and Model Railroading as of 2008 — I learn new things about MRR ALL the time.

Las Vegas is home, initially from Orange County, CA.

Please ask questions but keep them on point. Other questions or off-topic questions, please wait until the end of the planned presentation. Everyone is welcome to hit me up with questions down the line. Reach me via email: WebDrum007@gmail.com

About the methods presented today:

The methods contained herein are shared by Michael Pacillo, as taught to me by Robert Tecau — mentor, friend, master weathering artist. These are methods, techniques, and tricks adapted from 40 years of military model painting, weathering, and detailing — adapted to model railroading. There's always more than one way to skin a cat, however, the methods presented herein are time-honored, proven effective techniques.

As with any art, some experimentation is encouraged; expand your horizons and add to what works for you.

Lastly, please don't take offense to my thoughts and opinions on specific products. Such opinions reflect MY experiences as well as others who have taken a deep dive into weathering. Your experiences likely differ from mine - and as with skinning cats, there are several means to the end result - *that being a finely weathered subject*.

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Weathering Plastic-shelled N-Scale Model Trains

Basic Rules and Experience:

Rule #1 — STRIVE FOR REALISM, don't settle for OK.

Rule #2 — As often as possible (read ALWAYS!), work from a photograph of a prototype.

No need to reinvent the wheel or fake it when a perfectly good blueprint can be found.

Rule #3 — Just because you have a cool hammer doesn't make every piece of rolling stock a nail.

Don't create a fleet of rolling stock which looks identical - one car to the next. Not every car needs to receive the same treatment, not every car should be a rust bucket, not every locomotive needs to be weathered the same way.

Rule #4 — BE PATIENT!

Rome didn't crumble in a day. Nearly every major mistake I've made was due to a short-cut I was taking, or being cheap and trying to save some paint (or supplies) or being impatient or in a hurry…

Rule #5 — Take NO short-cuts.

They always lead to a mistake, a disaster, a ruined model.

Rule #6 — Don't be penny-wise and pound foolish

i.e. saving an ounce of paint winds-up ruining a $28 model...

Rule #7 — Sneak-up on your weathering finishes, don't rush it being a one-pass hero.

Quality finishes take time. If quality doesn't matter to you, why are you bothering in the first place?

Rule #8 — Rattle Cans - JUST SAY NO!

They're only good for convenience but they're filled with unknowns, you can't control the pressure, pattern, or chemical make-up. Use an airbrush instead!

Rule #9 — Remember, this is a hobby.

Please don't forget to enjoy what you're doing! Happy weathering.

Why bother with the hassle?:

- Free-moN is about raising the bar!
- Our craft is more prototypical than most other expressions of the hobby.
- So avoid the temptation of "good enough".
- Don't settle for OK, go for the best results you can obtain.

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Q: What are we attempting to visually recreate?

A: Realistic Models which visually feature:

- Terrestrial effects (mud, rocks, sandstorms, dirt, ballast dust)
- Atmospheric effects (rain, snow, sun)
- Wear/Tear (scrapes, boots, chains, damage, hinges, vandalism, spills, etc.)

The nature of a railroad's fleet (of cars and motive power) — new cars are added as aged pieces are removed from the fleet. There is a constant state of flux of aged vehicles on the rails, from brand new equipment to rust buckets - and everything in between. (Figure 1)

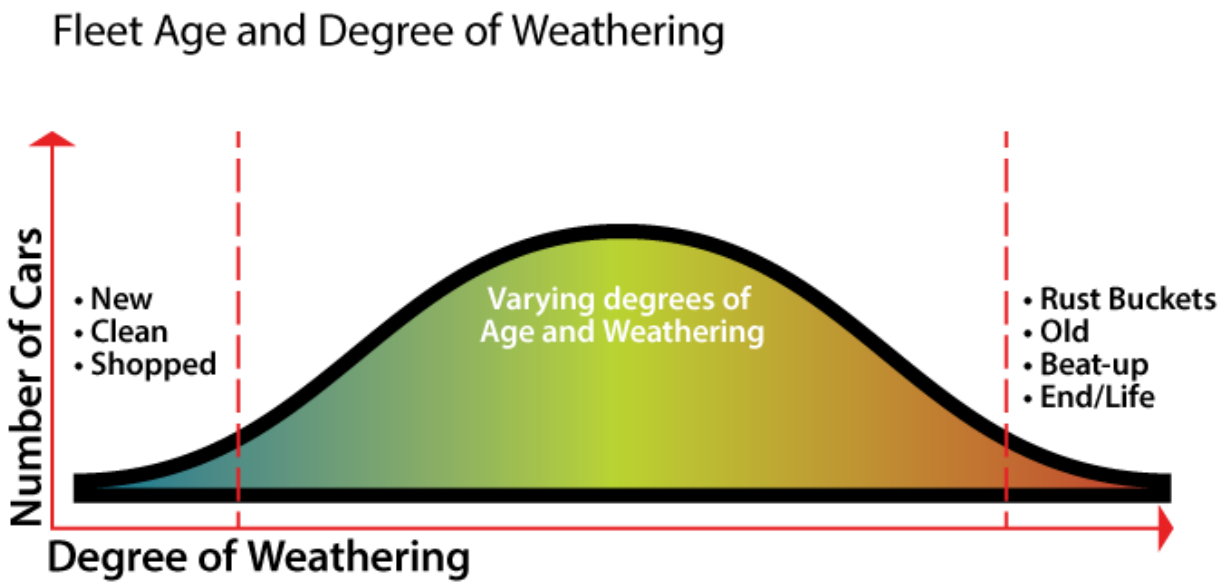

Fig. 1

Optimal disbursement of equipment age across a fleet is:

- 15% New and very clean equipment (locomotives AND rolling stock)
- 70% mid-range weathering - mild to pretty gnarly
- 15% super-aged and distress (rust buckets, end-of-life cycle)

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Basic Model Preparation

1. Subject = locomotive: There is a more prep. work than rolling stock
    a. Remove the shell from the chassis
    b. Remove window glazing
    c. Remove side rails if possible
    d. NOTE: Kato locomotives are masterfully designed, and therefore disassemble logically and easily. But, take pictures at each stage of disassembly to assist you in reassembly.
2. Subject = rolling stock: Remove the trucks, wheels, and couplers. ***MikeP Tip:*** use small fast-food salsa cups with lids to keep track of parts, labeling the cup with the model's road number.
3. Use rubber gloves AT ALL TIMES - which serves to keep skin oil off of the cars. (***MikeP Tip:*** mark the outside, back of hand on the glove exterior to track which side of the glove is covered in skin oil, and which side is the "work" side.)
4. Give each subject a quick rinse/bath in warm water and dish detergent. Just a small squirt of detergent into a sink filled with water is sufficient (too much detergent causes rinse-off problems). Swish the subject in the water for a minute, then rinse it THOROUGHLY. If heavy finger oil is suspected, use a small cosmetic sponge to wipe the surface while it's soaped-up.
5. Completely dry the shell. Avoid using a hair dryer to dry water (or paint) on plastic models as excessive heat WILL EASILY DEFORM the model. Best to let the model air dry overnight AFTER you've used the airbrush (air only) to blow water out and off of the model. Pay particular attention to water trapped inside the shell!
6. Wear gloves at all times when handling the subject during all phases of weathering — until the finished model is sealed with its final protective sealer coat.
7. It is highly recommended to work from accurate color photos of prototype subjects; use your *eyes* and weather WHAT YOU SEE. This will always yield more realistic results as opposed to "*intellectual weathering*" from our imagination. It makes the difference between creating a believable scale representation of reality versus creating a model with non-sense all over it.

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Weathering Plastic-shelled N-Scale Model Trains

Weathering Process Overview:

1. Wash/dry, and mask areas as needed.
2. Using an airbrush, apply a substantial "protective" sealer coat with Model Master Flat Acryl.
3. Any super detailing should be completed at this point: grab irons, lift rings, ladders, brake wheels, screens, sun visors, railings, roof fans, mirrors, hoses, cut-levers, etc.
4. Contrast Wash (Con Wash) next, building-up atmospheric and terrestrial weathering as needed.
5. Any fade or "relief" coat could be applied at this point (after the Con Wash is dried & relieved).
6. Graffiti and rust details (blisters, rust weeps) could now be applied as necessary.
7. Further con-washes and/or fading coats and/or patch paint repairs would now be applied to further "age" graffiti and other weathering effects. I call this "compounded weathering".
8. Don't forget to age the couplers, trucks, and wheels. Avoid getting pigment of ANY kind in the coupler's and/or wheel set's moving parts. ***MikeP Tip:*** use old pizza cutter wheels as masks in the trucks
9. Finish-off the model with a last application of sealer — a good solid final sealer coat of Flat Acryl (MAS).
10. Remember, N-scale is small; sometimes it's best to "indicate" an effect rather than to attempt to render it literally. i.e. What works for larger scales doesn't always translate well in N-scale!

Airbrush Use Overview:

1. Ambient air conditions will affect the results of your airbrush efforts. Spraying in hot dry air will yield different results than spraying in cold moist temperatures. Avoid spraying in extremely HOT (Santa Ana Winds) conditions — the pigments and/or sealer may dry too quickly. Also, airbrushes are prone to clogging in hotter, dry conditions.
2. Avoid spraying in dusty locations (dirty, dusty garages, laundry rooms filled with airborne lint); nothing mars the finish like lint, dust, hair, etc. attaching to your newly sprayed model via static cling... This stuff ALWAYS shows-up in detail photography.
3. Airbrush artist's tip: Cut-up old panty hose/stockings into 6" squares and use these for straining the paint mixture ***as you pour that mixture into the airbrush cup/bottle***. This indeed helps to eliminate lumps or clumps. If nylons or stockings are unavailable to you, some artists suggest a paper coffee filter works (I've never tried a coffee filter).

   Clumps of paint/matte acrylic in your solution will cause flawed results, marring the finish of the model. Matte acrylic is prone to clogging an airbrush's needle in very hot, dry weather. Take the time to strain your paints ***- you've been forewarned.***
4. Spraying pressure (PSI = pounds/sq. inch) is never a one-size-fits-all proposition. Sometimes shooting at a higher (25+ psi) is better than using lower pressures. Other times, for close-in detail work (like inside the coupler well of a hopper) very low pressure (~10 psi) will suffice.
5. Wear a mask! Not a $.50 "dust mask" but rather a proper anti-fume rated painter's mask. Now isn't the time to "cheap-out" on your health. You're working with carcinogens and fine powders.

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Airbrushing Matte Acrylic Sealer (MAS):

Sealer Overview:

a. Prep. the MAS
b. Strain the sealer as it goes into the airbrush's well/cup.
c. Build-up the MAS in a few passes, don't be an impatient one pass hero.
d. NOTE: Clean-out the air brush immediately after finishing the MAS. Acrylics dry fairly quickly, and it's plastic. Airbrush cleaners won't dissolve it/clean it out once it's dried.
e. Allow the MAS at least 12 hours to cure before applying subsequent weathering applications of any kind.

MAS Details:

1. Using **Model Master #4636/Flat Clear Acryl 1 Fl oz. bottle** with approximately 60% Flat Acryl, 40% Thinner*, dilute the matte acrylic to the consistency of non-fat milk using **Testors/Aztec Universal Acrylic Thinner (Green label #50496 4 oz.**, older stock is blue label). You can also dilute Acryl with 70% IPA (Isopropyl Alcohol) if #50496 isn't available, but keep in mind IPA evaporates rapidly and my yield questionable results.

2. ***NOTE:** Dilution varies depending on ambient temperatures and humidity levels. Some experimentation is required here.

   MikeP Tip: Test on scrap plastic, never on a good model!

3. With approximately 25 psi, apply the MAS in steady even passes. Your spray pass should extend (left-to-right) "beyond the model". Do not over-saturate one area, this sealer can easily puddle and run on you. Check for drips or uneven spray patterns. Try to obtain a good "wet-out" coat without running. Keep your airbrush moving and the tip approximately 8–12" away from the subject, depending on your PSI.

4. On the initial application of MAS, be sure to cover all surfaces of the subject: sides, ends, top, and bottom. Remember, the goal here is to protect and seal the factory paint and graphics with this initial "plastic shrink-wrap layer" of acrylic.

5. Let the MAS dry **thoroughly** before moving on**,** best if left overnight**. Don't rush this process, it's the foundation of every subsequent step.**

6. Clean your airbrush immediately after you've completed spraying your subject(s). The manufacturer claims that **Acryl Solvent #50498** will clean dried flat Acryl.

   MikeP Tip: Batch-process MAS your models; this makes set-up/clean-up well worth the investment of your valuable time.

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Adding Color – Contrast Wash (aka Con Wash)

Contrast Wash Overview:

a. Match Con Wash color to the subject's predominant color
b. Dilute enamel paint with proper solvent, consistency of whole milk or thicker
c. Apply Con Wash, allow to thoroughly dry
d. Relieve (remove) excess wash from larger, flat areas (using cosmetic swabs or sponges)
e. Repeat as necessary to obtain desired aged effect
f. Optionally, layer applications of Con Wash and MAS, alternating between the wash and MAS.

Con-Wash Details:

The "Contrast Wash" (Con Wash) is arguably the simplest, most effective means to age and/or weather a subject. The goal of this step is to approximate years of terrestrial and atmospheric abuse of a subject's finish, thereby indicating aging through the apparent gathering of dirt, grime, and general wear-n-tear of a subject's surface. The name "Contrast Wash" implies that we're enhancing the contrast between large flat surface area(s) and off-surface details such as seams, folds, corners, grabs, ladders, clasps, locks, hinges, panels, and other such details.

This effect is typically achieved by using a DARKER color (as compared to the subject's base color), and washing this darker "stain" across the entire model surface, allow capillary action to pull the pigment up against surface details. This darker stain gathers in the nooks and joints, enhancing the contrast between larger, flat areas of surface areas and neighboring off-surface features.

Example: Subject is "Oxide Red"; start with a similar red paint (similar to the subject's base color) and *shade it darker* by adding a few drops of black paint to the closely-matched red paint. Sometimes the color you'll wash with can be close, no need to be exact, because you are adding black paint to it.

This wash (or stain if you will) is created by taking a basic Testors (or Model Master) ENAMEL paint, and diluting it with an enamel thinner, to a desired consistency. The wash/stain is applied liberally with a brush, then allowed to throughly dry. Next, the excess stain on large flat panels/areas is removed — or RELIEVED — using various applicators moistened/dampened with the same solvent used to create the wash. The "relief" step is vital to producing the desired contrast effect.

The effect works because the applicators (swabs, sponges, etc.) cannot reach into the tiny crevasses, leaving behind a small amount of the darker color.

Relief tools used with great success include:

- "Salon Plus" Make-up Applicators (lollipop-ended cotton swabs, Rite-Aid brand #RTSP080H)
- Cosmetic Sponge Wedges (be sure the cosmetic sponges you buy DO NOT have any additives such as vitamin E, aloe, or moisturizers)
- Tamiya "Craft Cotton Swab" fine-tipped detail applicators: #87106, #87103, etc.

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1. **Using Testors or Model Masters' ENAMEL paints only**, start with a base color which closely matches the model's overall basic color.

   WARNING: Avoid using Flo-Quil paints in the Con Wash process. These paints are excellent for airbrushing, however, they are "lacquer-based pigments" and as such, their thinners are FAR more aggressive than the Testors enamel airbrush thinner*. Flo-Quil may eat right through the MAS sealer and — and possibly into the factory paint! (This happened to me — once!)

   *NOTE: Testors CLEANER is more aggressive than its THINNER. Use cleaner ONLY for clean-up of brushes and airbrush parts, never for Con Wash solutions.

   WARNING: **DO NOT attempt a Con Wash with an acrylic paint**. Unlike solvent-based paints, you CAN NOT "reactivate" an acrylic paint. Once it has dried it's a plastic coating impervious to reactivation. Hence, you cannot "relieve" a dried acrylic paint.

2. Add BLACK to the base color, or in certain circumstances a DARKER *analogous* color which is sufficiently darker than the base color — creating a much darker version of the subject's original color.

   Color Examples of mixing a Con Wash:
   An oxide red box car = Testors Red Enamel, add a few drops of Testers Black Enamel to darken the red, mix and dilute, then test it before applying it to your subject.

   Cascade Green = a Dark Forest Green or even a Dark Blue.

   Uncle Pete Armor Yellow = start with Testors Yellow and add a Testors Leather Brown.

3. Using **Testors Universal Airbrush Thinner for Enamels (#8825C)**, dilute the paint/pigment to a consistency of whole milk. The goal is to create a solution whereby the color pigment is suspended loosely in a solution/emulsion of mostly thinner. If you had to put numbers on this solution, it's roughly a mixture of 2 parts thinner to 1 part paint. Some experimentation is required to get a feel for the solution. This ratio varies depending on how dark you want the wash to be.

4. Using a small round brush, liberally wash the subject with this stain, getting into all the areas which you desire to stand out (rivets, nooks, hinges, ribs, different contour features, surface details, etc). Allow gravity and capillary action to do some of the work for you, carrying the pigment along seams, grooves, joints, and such surface features. ***MikeP Tip:*** Literally lift/tilt the subject to allow paint to flow down along body lines and features.

5. Once the initial wash is throughly dry (over-night is recommended), RELIEVE the larger flat areas by removing the Con Wash from these flat, featureless surfaces. Using a makeup pad (similar to Q-Tip (NOT a Q-tip, they leave fibers/lint behind)) dipped into the airbrush thinner (and pat on a paper towel to get rid of excess thinner) and using purely vertical passes — straight down ONLY — wipe-away excess Con Wash pigment — as needed — to achieve the desired aging effect. First pass to moisten the surface, second pass to remove some of the wash. ***MikeP Tip:*** Have two bottles of THINNER on hand; one for the Con Wash solution, the other for RELIEVING the Con Wash. Avoid contaminating clean thinner with used relief swabs, etc.

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6. If larger areas of wash need to be removed, use a make-up wedge moistened with the base solvent (airbrush thinner) as the relief tool. Dab the sponge/wedge onto a paper towel to remove excess thinner prior to your relief work. Make steady, vertical downward strokes/passes, LIGHT pressure.

7. Remember, you can always re-apply a Con Wash and subsequently remove/relieve it as needed.

8. MAS can be applied between Con Wash applications. Such a layering method* can really add depth to the color aging of your subject. This takes a lot more time, but the results are well worth that investment of time. An investment of this time is worth it if you're entering a subject in a show or contest and/or you're preparing a photo masterpiece!

   *Layering between plastic (MAS) and solvent-based (Con Wash) applications such that one won't "interact" with the other is the KEY advantage to this weathering methodology.

Sealing the finished artwork

1. Before applying the final sealer coat of MAS, you must allow the paint(s) to cure and set-up for a minimum of 24 hours. Solvent-based paints will "out-gas" for a period of time as the petroleum-based thinner/solvent evaporates, leaving behind the pigment. If you seal-in these gases prematurely, you'll end-up with crazing, bizarre discoloration patterns, wrinkled finishes, your shoes won't fit, your teeth will rot, and your dog may run-away.

2. Using the same MAS formula as the initial protection coat, apply a good, healthy MAS coat and allow it to thoroughly dry/cure.

   MikeP Tip: **AVOID DUST, LINT, POLLEN etc. at ALL TIMES, but especially for MAS applications and most especially at this vital finishing step!**

3. You can always build-up complex weathering finishes, layering between acrylic sealer coats, solvent-based washes, and detail paint work.

4. If you are going to use gouache water colors or oil paints (both excellent for rust detail work) — I recommend applying the oil-based paint(s) on top of a solvent-based layer (such as the con-wash layer) and the gouache/water-based paints on top of the matte acrylic layer.

   a. The reason for this is obvious — oil and water don't mix very well. Trying to get a water-based paint (such as designers gouache) to lay-down on top of a solvent-based layer (such as the Con Wash) equates to a very frustrating experience with poor results.

   b. You can use chalks/powder features (such as AIM Powders) at anytime — onto either the Con Wash layer OR the MAS layer. Be advised that a certain degree of chalk work will fade away with the application of MAS. Experience will help you determine the right touch for chalks.

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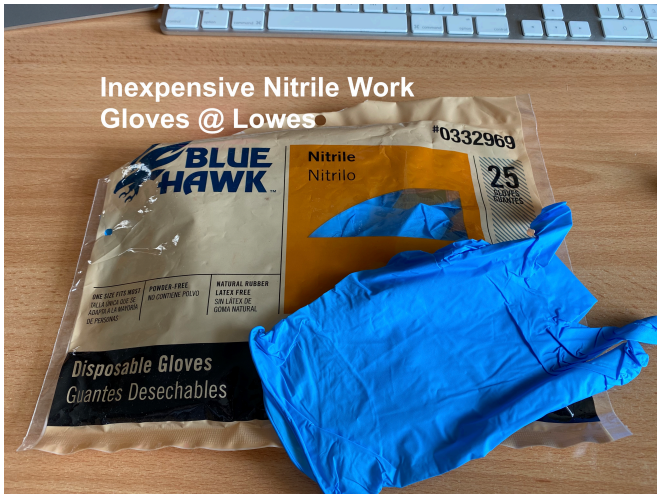
Supplies, Recommended Products



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