

# Corvette Body & Paint Repair Basics

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This tech paper will discuss simple repair (non-structural) and refinishing processes to produce high-quality results on fiberglass (Corvette) panels. Recognize that there are many different product lines out there, and several work techniques for accomplishing body repairs. Different auto body professionals have different preferences as to how to do things, and I may get some disagreement on the specifics of this article. This article will provide you with a group of products and materials, and my personal technique, for accomplishing first-class results.

## General 'Vette Info

Two different construction techniques have been used to manufacture Corvette body panels over the years. When the 'Vette made its debut, the new "FRP" body was a major innovation. "Fiberglass Reinforced Plastic" was a construction method that could be used to make lightweight panels with curves and design features that could not be easily duplicated in stamped steel. The body was basically built just like a fiberglass swimming pool or a boat hull: A "chopgun" was used to blow fiberglass strands and resin into a mold that was first coated with resin to produce a smooth surface finish on the body parts. This technique was used through the 1981 model year.

1982 was a unique transition year in many respects. Fuel injection was added to the 'Vette, and a computer was installed to manage all major engine functions. '82 also saw the advent of a revised body panel construction. "Structural Matted Components," or SMC panels, were thinner and lighter due to a laminate construction using more plastic and less 'glass. This panel type is used on all of our C4 'Vettes, and partially on the groundbreaking '82.

The composite materials on all 'Vettes require use of specific techniques and materials. Treating a 'Vette like a steel car can cause irreparable damage to the body: metal paint stripping techniques cannot be used, and fillers designed for use on steel will not adhere properly to the FRP or SMC panels. So read on to get the real scoop on the right stuff to use....

## Tools required

Body shops use a lot of air-powered tools in order to speed up repairs and improve profits. All cosmetic bodywork can be performed without the use of air tools, and you will often get better results due to the slower progression of the work. You will, however, need a paint gun, and you'll need compressed air to power it.

## Hand Tools Needed

### File Board

A File Board isn't a file at all: it's a long backing board with handles for mounting long strips of sandpaper, called "file sheets." The length and stiffness of the file board allows you to produce perfectly smooth, straight panels and repairs. It's the most important tool you'll use in the repair and refinishing of your 'Vette. The most common Boards are molded hard rubber, and require use of sticky-backed sandpaper. I personally prefer the old style wooden ones with metal clips securing the sandpaper: they allow me to use either sticky-backed or standard sandpaper. Cost of a wooden File Board with clips is about \$25. They are available at all body and paint supply stores. The long ones, which I highly recommend, are 16" long and 2-1/2" wide.

### Sanding Block

In addition to your File Board, you'll need a small, rubber sanding block. These soft, flexible black rubber blocks are about 3/8" thick, and measure 2-1/2" wide by 5" long. These dimensions allow you to tear a

piece of standard sandpaper in half and wrap it perfectly around this semi-flexible block. You'll use it to do all of your finish sanding and color sanding (discussed later).

### **Filler Handling/Mixing Tools**

To mix and apply any body fillers, you'll need a flat plate and a spatula/spreader. Flat plastic/nylon mixing plates and spreaders are available from your body & paint supply store, but I just use a flat piece of aluminum plate that measures about a foot square, and the paint supply store gives me a handful of the low-cost yellow plastic spreaders.

### **Paint Mask**

All of the paint supply places carry low-cost, disposable, cartridge-type paint masks. They work great, you don't have to throw them away after use, and they're cheap. Get one.

## **Power Tools Needed**

### **Paint Gun**

A topic all to itself, paint guns come in a huge range of qualities, types, and prices. For home use, there are two basic types: Suction Feed and Gravity Feed.

The Suction Feed gun is the paint gun we're all used to seeing: it has a detachable paint cup slung underneath, and operates by siphoning the paint up from the cup and into the discharge nozzle. These are the most economical guns, and can produce quite acceptable results. Economy versions, which are spin-offs and near-duplicates of the top-end name-brand guns, can be found at Buyer's Club, Eagle Hardware, Pace Membership Warehouses, and other hardware stores. Prices range from about \$25 - \$75. I have actually painted complete cars with a \$35 siphon feed generic paint gun with outstanding results.

Disadvantage of these econo-guns is that they cannot be rebuilt (replacement parts are generally not available), you cannot change nozzle and tip sizes (various sizes not available), and they wear out faster than the high-end name-brand guns. I still have my \$35 gun that I bought over 10 years ago, and my son is now using it to paint his car. There are also name-brand, better-quality siphon feed guns made by Snap-On, Devilbiss, Sharp, and others. These guns can be rebuilt indefinitely, lots of parts are available, and they produce excellent results. Overall disadvantage of the siphon feed guns is that not all of the paint in the paint cup is usable: they will quit spraying while there is still 1/4" of paint in the cup. Also, as paint level gets low, they will occasionally paint intermittently as the siphon tube is uncovered during the painting process. Clean-up is a bit of a mess, as there will be some paint to dispose of. Yet, I would recommend one of these econo-guns to the beginner, as they will perform quite well for the \$\$.

The gravity-feed gun is what is primarily used in the industry. Most of the gravity feed guns are also what are known as "High Volume Low Pressure," or "HVLP." The key characteristic about these guns is that the paint cup is mounted on top of the paint gun instead of underneath. This produces a very uniform flow of paint to the discharge nozzle, allowing use of lower air pressure (and lower paint emissions from overspray). It also allows all of the paint in the cup to be used, and simplifies cleanup. Good, econo-versions are available, but at a higher price than the econo-version of the siphon feed guns. All of the major paint gun manufacturers make gravity feed guns, and they are excellent quality. We use them exclusively at our restoration facility, but I still use my siphon feed guns at home. If you have \$200 to spend, buy a gravity feed instead of a siphon feed.

### **Compressor**

Here you want something that will keep up with your paint gun and not drop off significantly in pressure while you're painting. This requires at least 5 horsepower. I've seen guys do it with 3-horse, but it won't keep up continuously with a paint gun. If you have a 220-volt outlet in your garage, go with the 220 power, otherwise you'll have to do with a 120-volt unit. Compressors of this size are always on sale at the big hardware chain stores. Look for a deal. I've been running a 5-horse, 120-volt Craftsman for the past 15 years with great success. I can sure tell on my utility bill when I'm painting a car, though...

### **Buffer**

To finish off your paint job, you'll need to be able to buff it out. Don't do this by hand: Get an electric buffer. Your paint supply store can then sell you a good foam pad to go on it.

## Consumable Supplies

These are the basic consumables you'll need no matter what kind of car you're doing:

### Econo-Grade Lacquer Thinner

For general clean-up, get at least a one-gallon can of the econo-grade stuff. You'll use it to clean up your filler application tools as well as your paint gun. The paint supply stores actually sell stuff labeled as econo-grade thinner, and it's cheap. Any more, I buy it in 5-gallon cans even for home use.

### Paper Towels

Pick up a three-pack: you'll be blowing through paper towels like you won't believe for all your clean-up work.

### Sandpaper

You're going to be surprised how much \$\$ you'll spend on sandpaper.

First, you'll need a few different grits for your File Board. These are available in pre-cut lengths in boxes with 50-or-so sheets per box. But if you want to save about 50% on costs, you can buy the sticky-backed file sheet paper in uncut rolls that are 2-1/2" wide and cut it to length yourself. If you're as cheap as me, you go for the rolls, and steal your wife's kitchen scissors to cut them to length. Here's what you need:

1 roll 80-grit

1 roll 150 grit

1 roll 220 grit

Then get a ream of regular 600 grit wet-or-dry and a pack of 1500 grit wet.

Each of these items will run you at least \$25, so don't fall over from the sticker shock...

### Masking tape

Get several rolls. I like to use both the regular 3/4" wide stuff as well as some of the big, 2" wide. Don't buy the really cheap stuff: either it won't stick well, or the glue will transfer to your car. I like the 3M tape products.

### Fillers

Since fiberglass flexes and expands/contracts differently than steel, you don't want to use just plain ol' "Bond-O" on your 'Vette. There are two products you'll need to do a little fixin' on your 'Vette.

First, for filling missing chunks and major nicks (damage that extends through the gelcoat and into the 'glass structure), you want to pick up a quart of 3M Short Strand Fiberglass Reinforced Filler, part number 051131-05815. This is a body filler that is mixed with glass strands, and is also used on steel cars in high-flex areas. It will do the major structural filling, but will not produce a fine, closed-cell surface finish. So for general smoothing and filling, like finishing off the Fiberfill and for filling the defects caused by the last body shop when they sanded the whole car with a D/A sander, use the filler product line by Evercoat.

Evercoat makes a product line for fiberglass cars called "Plasticworks." Evercoat 870 is the part number for the quart can. 880 is the gallon container. It's pretty cheap, actually, so I buy it by the gallon. If you need to bond any Corvette panels for repair or modification, they also make what they call a Vette Panel Adhesive: The Type 1 adhesive is for the FRP cars. Type 2 is for SMC or when bonding FRP to SMC. Check with your paint supply store: they can give you the exact details and applications for the product line. If you choose other product lines, just make sure that the filler products are intended for use on, and compatible with, FRP and/or SMC.

### Tack Cloth

A sticky little rag, these are available in packs at your paint supply store. You only need one.

### Polishing Compounds

To get the nice finish, you're going to have to rub it out after its painted. 3M makes a nice set of compounds. You'll need a quart bottle of 3M rubbing compound, and a quart of "Perfect It II" finishing compound.

### **Rubber Gloves**

Get a good, heavy duty pair of rubber gloves and use them anytime you're working with the filler or the paint products: the more you can keep off your hands, the better off you'll be.

### **Safety Goggles/Glasses**

Any time you're working with power equipment, like an electric buffer, you'll want to protect your eyes.

### **Scotchbrite**

Finally, you'll need a couple of sheets of Scotchbrite pads. Scotchbrite pads come in different colors to designate the "grit" of the pad: red, green and grey are the most common. Pick up two sheets of the grey stuff.

### **Degreaser**

Buy a gallon of PPG DX330 wax and grease remover. You'll use it throughout the refinishing process.

## **Primer & Paint**

Volumes of books have been written on this subject, and you can buy them at any bookstore if you'd like to become an expert. But for what we're going to do in our garage, we'll keep it simple: we need a system that will be relatively easy to apply, and something that will dry fast (so the dust and bugs don't get into it while it's wet).

Here's the object:

1. We need to be able to "seal" the surface we're working on. Fact is, a lot of our cars have had some questionable work done to them, and we don't know exactly what materials have been applied. We need to be able to seal up whatever is already there to make sure it doesn't adversely react with the new materials & paints we will be applying. The sealer should also provide a good adhesion base for the work we will be doing. Epoxies work well as sealers.
2. We need a good, thick primer/surfacer that will go on easily, dry quickly, fill minor defects, and be easily sandable to produce a perfectly smooth surface. Catalyzed urethane primers fit this bill perfectly.
3. We want a basecoat/clearcoat system for our topcoat. Basecoat paints dry extremely fast; almost as fast as you spray them. They can be applied fairly "dry." This eliminates runs & sags, and greatly reduces the amount of dust and bug defects in the finish. The clearcoat that gets applied over the basecoat dries much slower, but any defects in the clear can simply be sanded out and buffed to produce a perfect finish.

Every body-guy has his favorite paint supplier. The most popular ones are PPG, Dupont, and Sherwin Williams. Recently, some good foreign suppliers have entered the US market, like Standox. All of these suppliers produce excellent products, and I wouldn't hesitate to use any of them. At our Shop facility, we use the top-end Standox products. For home use, I use PPG. Due to its general availability, I'll discuss the PPG products here. All of the other manufacturers have similar product lines, so use what's available to you in your area.

#### **1. Primer/Sealer**

An outstanding product to seal the underlying surface, create excellent adhesion, and to provide very good corrosion protection (in the case of steel substrates) is the PPG "DP" series primer. This primer can be applied directly to bare steel, aluminum or fiberglass. It is available in a variety of colors, but I recommend staying with the light colors, either light grey or white, to assure uniform coverage of your subsequent topcoat color:

DP 40LF	Grey-green
DP 48LF	White
DP 50LF	Grey
DP 74LF	Red-brown
DP 90LF	Black

It's mixed 2:1 with a catalyst, part number DP401LF (regular) or DP402LF (fast). I use the fast 402 catalyst when working at home to keep the dust out of the primer. It can be reduced down 25% with DT870 Reducer to provide a thin, moisture-proof, sealing layer that gives you an excellent base to start working on.

## 2. Primer/Surfacer

To satisfy the requirement of a fast-building surfacer that is easy to sand and which will cover all kinds of minor defects, I recommend Prima K36 Acrylic Urethane. This light grey primer looks like eggnog with baby powder added to it: it's pretty thick, and when properly mixed and sprayed, it's like spraying on a thin coat of body filler. And that's what we want: a nice layer of sandable material to work with. The K36 is mixed in a ratio of 5:1:1 with K201 hardener and the same DT870 reducer you used for the DP sealer (amazing how the products all work together, huh?).

## 3. Basecoat

The Basecoat is your color coat. Your paint supply store will custom mix the color for you. The product line is called Deltron, or "DBU," and it gets mixed with a reactive reducer, DRR1170 (1170 is a fast-dry reducer, great for use in the garage. DRR1185 and 1195 are slower drying, and better suited for use in a paint booth). A gallon of DBU, once reduced, is enough to paint a mid-sized car like a Chevelle: it gets mixed 1 part color to 1-1/2 parts reducer, so you get a lot of paint out of a little color. A quart will do the front clip on a 'Vette.

## 4. Clearcoat

Again, a lot of products are available, but for our home-use purposes, I would use the Concept 2021. This is a urethane clear that dries very glossy and very hard, producing excellent long-lasting results. It is mixed in a ratio of 4:1:1 with the DT reducer and DCX61 hardener.

# Technique

Now that we have a list of all the tools, materials and products, it's time to do some work. So here's the technique:

## Paint Stripping

There is seldom a need to strip a 'Vette down to "bare" glass or gelcoat. You need to remove oxidized, flaking, and non-adhering paint, but you don't need to go any further if you're using a good sealer (which we are).

## Chemical Strippers

Never use "Aircraft Stripper" on a 'Vette. Remember the movie "Alien" when they cut the Alien's knuckle and the "blood" ate its way right through the floor and didn't stop going? That's what Aircraft Stripper will do to your FRP or SMC panels: you can't get it to stop "eating." We once spent 2 days with a Hotsie, steamcleaning and solvent wiping a 'Vette that a customer had tried to "strip," before we were able to get the stuff to quit eating away the body. There are other chemical products out there intended for 'Vettes, but I've never trusted them enough to use them.

## Media Blasting

The other method of stripping that creates lots of work for us at the shop is when a customer takes his 'Vette to a place and has it blasted. Even the plastic bead blasting and walnut shell blasting will erode the surface of the FRP and SMC panels. This creates lots of work to restore the surface to a smooth, paintable condition. There are people out there who specialize in this and who can get good results. I've just never seen one.

## Sanding

Yup, you guessed it, Vern. If you want sure-fire, good results, and you don't want to screw anything up, you're gonna' be sanding. For rough, damaged, or filled areas, you can load up your 16" file board with a

sheet of 80-grit and block sand the area to shape. For the rest of the car and panels, 150-grit works well to remove paint oxidation and to blend and smooth minor defects.

## **Repair Process**

As an example, let's assume we have a 'Vette hood with oxidized paint and a couple of chips and gouges. Here's the step-by-step fix:

Prep:

Wash the surface to be worked to get rid of the "big chunks" of dirt and grime. Then wipe everything down liberally with the DX330 wax and grease remover: you don't want to "grind in" surface contaminants with your sandpaper, so you have to have a clean surface before you do any sanding. Also, if you suspect that any silicone products, like "Armor All" or "Son of a Gun" have been used anywhere near the car or on the tires, you'll want to wipe everything down with a good silicone remover. If you don't, your paint, when applied, will "fish-eye" like crazy, no matter how much sanding you do to the car. DX440 can be used as a one-step wax/grease/silicone remover.

1. Load up your file board with a sheet of 150. Using a criss-cross pattern, and a slightly sideways motion to the board, sand the entire hood area down to remove all loose and oxidized paint. Sand and rough up the gouge areas. While sanding like this, any other defects in the hood will become very visible.
2. Seal the entire thing with your DP epoxy primer/sealer. Set your air pressure to 40 – 60 pounds and give it a couple of coats to make sure you have it all sealed up. This layer of epoxy will prevent your topcoat layers from adversely reacting with anything that has been previously applied to the surface, and provides adhesion to the base material. Your filler, applied next, will stick like you won't believe to the DP epoxy sealer, providing a solid, long-lasting repair.
3. Use your 3M Short Strand Filler to build up the damaged areas and allow it to set up. Once hardened, load up your board with a piece of 80-grit and shape and blend the repaired area into the rest of the curves. Smooth it out with 150.
4. Give the repaired area, and any minor dings and imperfections, a coat of your Evercoat Plasticworks filler. Rough shape it if you need to with the 80-grit, then finish smoothing, shaping, and blending with your 150. Always use your board in a criss-cross action to completely blend in the repaired area.
5. Mix up a batch of K36 primer/surfacer and give the whole thing a couple of good, wet coats at about 60 pounds of pressure. Let it dry overnight.
6. Shoot a "guide coat" on the K36. A guide coat is a VERY light, splotchy coat of contrasting color. You can use a can of black spraypaint, hold it well away from the surface, and very quickly wave it back and forth just enough to get a little black overspray onto the K36. I have some cheap, black lacquer that I load up in my paint gun, and just quickly "mist" onto the surface.
7. With a piece of 150 on your board, lightly sand the surface. Again, work the board in a diagonal motion, sliding it slightly sideways. Then reverse the action and cross-hatch back the other way. You can even work the board completely sideways first one way, then the other, until the guide coat is removed. The guide coat, by its presence, will show you any low spots and other defects that need more sanding. Once you have sanded enough to remove all of the guide coat, you will have a perfectly smooth, uniform body panel with no ripples or defects.
8. Shoot another coat of K36 onto the whole thing, and guide coat it again. This process is called "block and re-prime," and is your assurance of very straight panels.
9. What I now like to do is to load up a sheet of 220 on my board and lightly go over the entire surface again, looking for any defects and blocking down any significant high spots. I don't remove all of the

guide coat: just enough to assure myself that there are no defects and that the panel is smooth and straight. I then give this surface a very light, fresh guide coat.

10. Get a bucket of warm water and put a couple of drops of dish soap in it. The soap will act as a lubricant as you sand, preventing your sandpaper from catching or sticking to the surface being sanded. Also, it will give you soft, subtle hands, so your wife and/or girlfriend will want you to touch her when you're all done sanding... (one of the few fringe benefits of doing body work). Tear a few pieces of your 600-grit paper in half, and let them soak in the water until they curl up. Then wrap a piece of 600 around your rubberized sanding block and sand the entire surface in long, cross-hatching motions until all of the guide coat is gone. It takes some time. Once completed, you'll actually have a perfectly smooth, near-gloss surface that's smoother and flatter than the factory ever made it.

11. Touch-up any areas where you have sanded through the K36 with a little DP just to seal it up.

12. Hose down your garage floor with a water hose. The wet floor will "capture" dust and dirt in the air and will give you a better finish.

13. If the K36 and/or DP has been on the car for a while, scuff it down good with your grey Scotchbrite pad. This will open up the pores in the surface and promote better adhesion of your color coat. Go over the entire surface with your DX330 wax and grease remover.

14. After drying and wiping down the surface, masking the car off, and going over it with a tack cloth, mix and shoot your basecoat. Basecoat naturally goes on a little dry, and it does not have a shine to it, so don't succumb to the temptation of laying it on too wet. After the first coat, wait about 20 minutes, then apply a second coat. After the second coat, I like to go over the entire surface with light, diagonal, crosshatching coats. This will eliminate any "tigerstripe" effects in your metallic paint.

15. After 30 minutes, mix and apply your clear. I like to lay on a slightly dry coat first, or a "tack coat." Then put down a nice wet layer, wait half an hour, and lay on a second wet layer. If you get a little run, or some dust gets in it, don't worry about it.

16. Let it all dry for a day. Then throw a few sheets of 1500-grit into your warm water and soap bucket, wrap the 1500 around your rubber pad, and wet-sand the clearcoat down to a smooth, defect-free surface. This is known as "color sanding." Stay away from edges and raised features, as the clearcoat will be very thin in these areas: you don't want to sand through the clear. As the surface dries, and you wipe it clean with a towel, you'll be able to see the areas that need more sanding to eliminate any "orange peel" effect. With a bit of work, you can get the surface as smooth as a piece of glass.

17. Rub the whole thing out with your electric polisher and a foam rubber pad. Wear your safety goggles, because the rubbing compound will really splatter around, including into your face. Also, it's a good idea to wear a protective apron of some sort to protect your clothing, as the compounds will stain your clothes. Start with the Rubbing Compound, and keep the polisher moving with long, smooth motions. Rub until all of the dullness from the sanding is gone, and the surface looks nearly like a mirror. Then switch over to the "Perfect-It" finishing compound and do it again. When you're done, you'll be able to see the second-hand on your watch from 10 feet away in the reflection (no...you can't do this if you own a digital watch).