

## Clear Bra - Paint Protection Film (or Protecting your car against paint chips)

by **Elton Noway** » Sun Feb 28, 2010 3:04 pm

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Let me start by saying this isn't a FAQ in the standard FAQ format, nor is it a step by step guide. It might have been more accurate to title this thread "Everything you ever wanted to know about clear bras and [paint protection films](#) but were afraid to ask." (But that wouldn't fit in the Subject field)

Will this thread identify the best clear film / bra on the market? No

Will this thread offer insight into selecting a film and installer? Hopefully

Will this thread reduce the amount of research you have to do. It should!

Background: [Paint Protection Film](#) (actually the concept behind it) was invented by 3M in the early 1990s to help the US Military prevent erosion that was occurring along the leading edges of helicopter blades during the first Gulf War. It worked great, protected the blades from abrasion and saved millions of taxpayer dollars. As you might guess the film is incredibly strong.



When originally developed, the films appearance was not a primary concern to the military. As a result, when companies initially started applying the film on automobiles it was discovered the product would yellow after 2 to 4 years of use. The good news is 3M has since re-engineered their films several times. Today, both 3M as well as the other films on the market, will maintain their non-yellowing clear appearance for many years. (Net: When surfing the web for information you can ignore early threads and forums discussing the yellowing problem.)

Today's [paint protection films](#) are constructed of thermoplastic urethane, a tough, conformable plastic material used for its long-term durability. The top layer consists of a clear coat that contains UV protectants to counteract harmful ultraviolet rays and to resist yellowing. The film is attached to the vehicle via a high-performance, pressure-sensitive adhesive that ensures excellent adhesion to all OEM paints.



For those unfamiliar with Clear Bras (i.e., Paint Protection "Film") it is NOT sprayed on, nor is it a paint based product. This thread is addressing dry film plastic products only. The reason for this clarification is there are paint protection products that are sprayed on, like [ArmorCoat](#). While products like [ArmorCoat](#) sound great, I wasn't crazy about the fact that they have to sand down the areas of your car where the spray is to be applied. Also, because the product is sprayed on like paint, you really need to know that the guy spraying your car can deliver a factory like showroom finish. The last thing I would want it is to have my brand new car look like it was repainted! Another thing I wasn't crazy about... once its on... it "cannot" be removed other than by sanding it down. If interested you can read more about ArmorCoat [here](#).

<http://www.apdistributors.com/index.html>

**Paint Protection Film** (hereafter referred to as PPF) is also not a wax type product. To get your head around the PPF concept... think of it as a clear "Saran Wrap" type of plastic sheet that when applied to your car, repels the stones and prevents the chipping of your paint. While PPF films are great... they are not a force field for your vehicle. Obviously PPF films will not stop a rock the size of our fist bouncing towards the hood of your car. A dent is a dent! But for the everyday stone chips its a fantastic way to keep your car looking new.

To get an idea how well these films can protect your cars paint finish, check out this side swipe damage:



Or this damage... averted when the driver hit a wall pulling into a garage.



Even better... heres a quick 1 minute video showing a Gravelometer being using to test and demonstrate the films effectiveness ( a device that hurls one pint of gravel (250-300 stones) at a painted surface at a velocity of 30-60 mph.

<http://www.youtube.com/watch?v=d7cLCcBhfro>

As you may know, due to various environmental laws and chemical hazards over the years, paint is not formulated like it was in the good old days. As a result it is much softer and chips easier. Hence, Nissan vehicles, as well as other manufacturers, have been plagued with paint chipping problems for a least the last decade. Unfortunately even some owners of the new 2008/09 Rogue are reporting chipping along the underside of the doors panels (even with the [mud flaps](#) installed). 😞

<http://forums.nicoclub.com/zerothread/349293>

If it makes you feel better... (as alluded to above), its not just a Nissan problem. This Google search on paint chipping should give you a good idea of how the newer paint formation has yet to be perfected.

<http://www.google.com/search?h...=&aqi=>

Anyway... like it or not... I couldn't let the fear of easily chipped paint keep me from buying a new car. After a couple months of research, my mind was made up on purchasing a new [Nissan Rogue](#) but I'll admit I was more than a little worried whenever I thought about its large painted front end and the inevitable onslaught of flying gravel and stones bouncing towards it as I motored down the highway.



I originally considered getting one of those familiar, old standard, black vinyl bra's that have been around for years... but I've had them before on other cars and they require more work than I'm willing to consider. FACT: If you don't keep them clean and dry and/or take them off for cleaning on a regular basis they can actually do more harm than good. Dirt under the bra can cause paint abrasion.



**Abrasion damage due to dirt trapped under bra**

The hassle of removing and reinstalling vinyl bra when washing the car, the edge flapping at higher speeds etc. had turned me against them. I went surfing the web for alternative bra options (hoping they'd been improved upon) and I was fortunate enough to stumble upon a newsgroup discussing clear bras. The rest is history. Within two days of taking delivery of my



Rogue... she was sporting a "full" frontal clear bra. Sweet!

In fairness to the vinyl bra fans... there have been some advancements. This new design features "magnets" to hold it in place. They even claim the new design won't cause paint damage due to abrasion. But...for me I don't want the hassle of taking it off and on whenever I wash my car.

<http://www.magnetbra.com/bras.html>

I'll be the first to admit the decision to purchase a clear bra wasn't easy! I tried surfing the net for information but soon discovered there was a ton of information. It was near impossible to sort through it all. There were factors like; millimeter thickness, orange peel appearance with some films, clearcoats vs nonclear coats, yellowing, peeling, paint damage with removal of some films, wrinkles, bubbles, poor installations, expensive installation, kits for DIY installation, lifespan, dulling, color shift after X amount of hours of UV exposure, razor cuts into the factory paint by the installer, independent lab material test reports etc... as well as the overwhelming myriad of PPF manufacturers: 3M, Avery Dennison, Clear Shield, LLumar, [Venture Shield](#), Xpel, just to name a few ... and all of them claiming to be the best on the market. Whew! and on top of all that... there was the expense to consider. Clear bra installs, properly done, can run several hundred dollars... or more... depending on how much area you want to cover/protect.

Anyway... after spending several weeks reading everything I could find on [paintprotection films](#) on multiple forums, from car and truck forums, to [motorcycles](#), aircraft and formula 1 racing applications forums... (as well as getting free samples in the mail)... I was eventually able to compile the following pieces of information:

> Clear Bra and/or Paint Protection Film... they are one in the same. Period. Granted, there are many different names for the products, some are textured more than others, some have a higher gloss finish etc) Most all the manufacturers claim their product has been tested worldwide... or by independent laboratories... and has proven to be the clearest, strongest [paint protection film](#) on the market.. blah, blah , blah. FACT: They all, more or less perform the same function and level of protection.

> That said, all PPF Films, Film Patterns, Film Installers and Film Warranties are not created equal!

> The internet is awash with tons and tons of comments, reviews and forum posts on clear bras and [paint protection films](#)... HOWEVER... a lot of them are very old! 5 to 8 years old! Technology has changed. Manufacturers have reformulated their products to address problems identified with the earlier films. For example... you will find plenty of threads reporting problems with 3M film yellowing over time. In truth, that problem was resolved several years ago and 3M is now one of the top choices in [Paint Protection Film](#). You may also find reviews stating VentureShield does not have a clear coat like the 3M films do. Again this is no longer the case. In 2006 VentureShield announced what they called "Progressive Technology", in which their paint protection film is now coated with a flexible, UV stable clear coat, yielding a very glossy clear film the same as 3M. In other words... reading threads, or forum complaints or reviewing lab tests results "on any film" posted more than three years ago is a waste of your time.

> You can find both positive "and negative" reviews and comments on every single PPF one the market. In other words you

can always find someone complaining about something with the choice of film they selected regardless of manufacturer. Each film has its pro's and con's... no one single film is 100% perfect across all areas regardless of what you may read or a film installer or manufacturer may tell you.

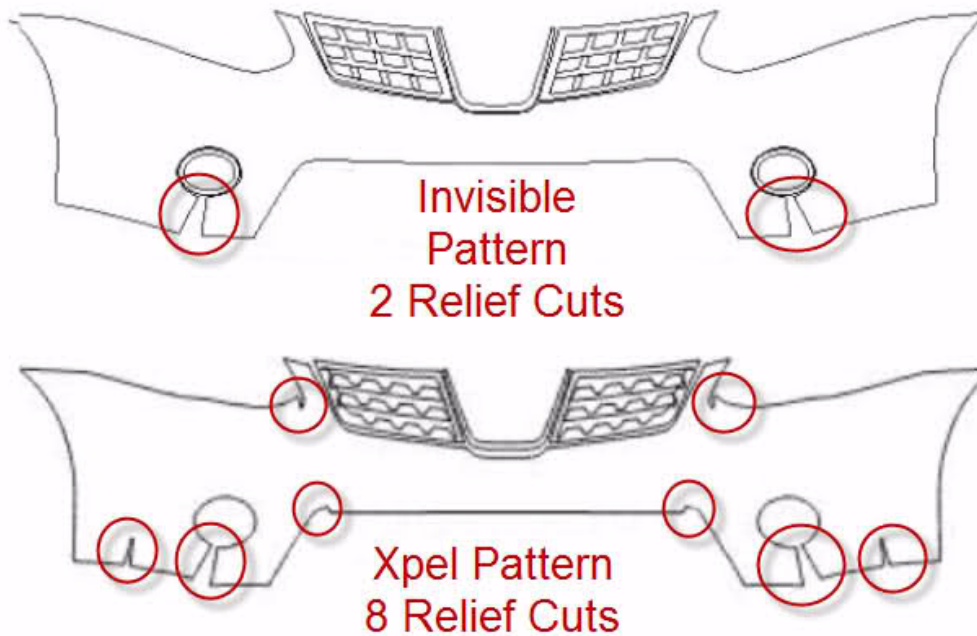
> If possible, you should not install PPF film on a car that has been repainted unless it was properly prepped prior to painting "and" has been oven baked and/or has had at least 30 days at a minimum to cure and harden. Even then you risk peeling the paint on film removal.

> Do you want Precut film installed or Custom install? Some installers give you a choice of installations (i.e., a precut pattern vs. custom cut on the car.) Precut pattern employ a large plotter that cuts out a pattern specifically designed for your car for your car. Precuts are easier and faster to install.

1) The Custom install entails a large sheet of bulk film placed over the area to be protected and the installer, using a razor knife, carefully cuts out the pattern by hand as he guides the knife around headlights, [bumpers](#) etc being careful not to cut into the paint finish. FAIR WARNING: Only the most skilled of installers can be trusted to [cut film](#) while its on the car. (i.e. cutting the film on a painted surface "without" cutting into the paint or cutting the paints clear coat. The last thing you need is to have the film removed 5 years down the road only to discover your car hood looks like the cutting surface of a craft mat.

2) Precut patterns usually contain relief cuts. The relief cuts allow the film to go around complex corners and curves without having excess material bunch up. The downside, although minimal, is the relief cuts can result in an occasional seam. But, if you find a qualified experienced installer they can minimize the number of relief cuts and perform magic at making the seams disappear.

> Not all Precut patterns are created equal. Each company creates a pattern. Some better than others... The number of pieces and number of relief cuts is dictated by the elasticity of the film. Some films have more stretch etc. For instance, I did not want to take a chance with razor cuts by risking my paint job to a custom cut installer but also wanted a precut pattern with the fewest number of relief cuts and seams possible. To give you an idea... here are two patterns for the Rogue. My installer selected the top one.



> When investigating your installers... find out if he cleans and polishes the area to perfection before beginning the film application process. Does he just do a quick wipe down and apply the film or does he really concentrate on preparing the surface. You might want to watch the installer do someone else's car to determine this. (While it's not as critical on a brand new car... it offers insight into your installer's level of perfectionism.)

> Some films are harder (stiffer) than others. Harder films offer more protection from flying rocks, but are more difficult to install on complex curved surfaces without wrinkles or blemishes due to excessive stretching. They also tend to have more relief cuts (seams). Softer films are more forgiving on installation, stretch more without leaving stretch marks, have fewer seams or relief cuts but stain easier with tree sap and bird droppings.

> Venture Shield isn't as stiff or rigid as the 3M product meaning it can be formed around curves and odd angles with less stretching or relief cuts.

> NOTE: [Venture Shield](#) is now owned by 3M, but both are independently operated. Film labeled VentureShield is not 3M film nor is [3M film](#) the same as a Venture Shield film. Both have their own pros and cons.

> Some clear finish films can actually be glossier than the new paint jobs coming from the factory. While a high gloss finish is nice, you will be able to tell where the film starts and stops. This is especially true across the hood if you elect to only apply a strip rather than cover the entire area. For example: Venture Shield film on a new BMW. The paint finish not covered with the film can look duller next to the area that is covered. [Venture Shield film](#) has a wet look whereas a BMW paint finish does not.

> Some films can produce a very slight color shift to the car color making the film easier to see. This is usually more noticeable on a white or light colored car. Make sure you identify this as an area of concern when discussing films with your

installer.



- > Installers using the Xpel film cutting program can cut patterns using film from any manufacturer.
- > Xpel originally promoted [3M film](#) until they came out with their own line of PPF film
- > Each film, regardless of manufacturer, has its own set of positive and negative qualities. For instance:
- > 3M is very durable but harder to install and is reported to be more noticeable on the car.
- > [Venture Shield](#) is extremely smooth (almost no orange peel to its surface) is easier to install on complex cars but easier to scratch and can turn yellow if waxed with the wrong product





> NOTE: Regardless of the film applied, DO NOT apply any product, wax or polish over the film that has a Petroleum base as it can cause yellowing. If the product ingredients list petroleum... do not apply to the film.

> Avery Dennison is easy to install and is very durable but is known to have noticeable orange peel when applied over darker colors.

> Can these films be removed. Absolutely... and they leave no residue behind! To remove the film the areas are typically heated with a heat gun to soften the adhesive then starting at a free edge, the film is pulled off.

> How long will the film last? Life expectancy for these films is 5 to 7 years.

After 5 to 7 years of highway abuse, the film will be showing all the punishment your paint job would have suffered. Remember, the film is plastic. Being a soft material it will show scratches and scuffs. The lighter the car color, the longer you can leave it on before it begins showing signs of age.

> Can surface scratches be buffed out? Yes! Plexus Plastic Polish is generally agreed to be a great polish for buffing out minor surface scratches and swirls. More severe scuffs or scratches can be buffed out with an electric buffer, but this technique is best left to the professional. The problem is if the electric buffer is left in one area for too long will build up heat and melt the plastic.

> Whichever film you end up with make sure the wax and or plastic polish you use has NO color to it. Use white or clear waxes and polishes only! Make sure NONE of the ingredients listed on the label say petroleum.

> A super clean car and super clean installer work area is key to a perfect installation.

> Do yourself a BIG favor and pay a “professional” installer. Yes, kits are available but practice makes perfect and with a kit you only have one shot to get it right. Instead try to find an installer that has done hundreds of cars.

> Ask your installer for references and inspect several of his clear bra installations to verify the quality of his installation.

> TIP: Rather than agonizing over which manufacturers film you want installed... place the majority of your research emphasis on the installers in your area and the quality of their work. Why? Because even the best film in the world can look like crap if your installer does not know what he is doing or does a poor installation.

> The better installers offer films from multiple films... In this case its best to let the installer select the film for your vehicle. He will pick the film that will offer the best finished product, based on your vehicles color, curves, bends, number of relief cuts and the complexity of the install.

> As of today 3M and [Venture Shield](#) are considered the #1 and #2 films on the market respectively. Here are links to both products:

[http://solutions.3m.com/wps/po...\\_Info/](http://solutions.3m.com/wps/po..._Info/)

<http://www.ventureshield.com/>

As alluded to earlier, 3M corporation purchased Venture Tape Corp several years ago. However, 3M did not acquire Venture Tape to get its hands on VS [Paint Protection Film](#) but rather to acquire [Venture Shields](#) market share of Tape products. While 3M is a publicly traded company, Venture Tape Corp is not. It is a separate, privately run "S Corporation." 3M PPF film and Venture Shield PPF films are two different animals. Both offering their own advantages.

> Both the 3M and Avery are approx the same thickness of 8.0-8.5 mil respectively, with 3M having a scratch resistant clearcoat whereas Venture Shield does not. While 3M offers the .5mil clear coat advantage it has a less than ideal orange

peel effect especially on darker cars. Venture Shield is very clear and has no orange peel effect but its recommended that you apply plastic polish like Plexus or some another non-petroleum wax at least once a month or so to protect it from tree sap, bird droppings and other elements that can stain in the surface of the plastic. Venture Shield is more pliable and easier to install than 3M with fewer relief cuts.

> The 3M product is considered 8.5 mil thick, however it is really 6 mil thick with 2 mil of adhesive. As mentioned the 3M product comes with a clear scratch resistant top coat. This not only allows the product to be very scratch resistant, it seals the pores against staining from insects and dirt. Again, the downside to this hard coat is that it has a slight orange peel look.

Venture Shield has been around for about 9 years but has proven itself in the industry. In fact 3M and Venture Shield are the current leaders in the PPF industry with all other coming in a distant 3rd. Not to confuse the issue, but on a side note, [Venture Shield film](#) is the only paint protection product that Scuderia Ferrari recognizes and authorizes. Its also 8 mils thick (6 mil material, 2 mil adhesive), but it does not have a hard top coat. The benefit to this is that the product has virtually no orange peel and looks fabulous on the cars. The negative is that with no hard coat it is easier to scratch and stain. Because of this, Venture requires you to clean the car frequently and protect it with a wax or Plexus type product to stay looking good. Most people considering the expense of these films already baby their cars religiously and would be applying cleaner and or wax regularly anyway. People who have had both 3M and VS applied to their cars generally agree they prefer the look of the [Venture Shield film](#).

> If you find a experienced 3M installer make sure he is using the latest generation film and not clearing his inventory of some older generation films that might still be on hand.

> When taking delivery of your car and its new clear bra... give the installation one full week to cure and dry before complaining about bubbles and/or surface imperfections. Water bubbles and areas of haze from adhesives under the surfaces are normal following an installation. They should all dissipate and clear within a week.

> Some people may argue... "Why go through the expense of having a clear bra installed when you could just have the front of your car repainted in 5 years for what the clear bra costs." Although it sounds like a valid argument, in reality... very few people will go thru the hassle or expense of having their car repainted after 5 years of ownership. By then the new car excitement will be long gone. Finding a paint chip on a 5 year old car won't have the same emotional impact as finding it on your car when it only has 200 miles on the odometer. Also... (some may argue this point)... but you really can't get a professional factory looking paint job applied paint job to the front of your car for \$600.

> Can PPF films be applied over [headlight lenses](#). Yes! Due to its optical clarity it does not diminish light transmission and serves to protect the expensive plastic lenses from abrasion and pitting. Is it legal? Yes and no. While many states have laws forbidding the installation of film over headlights, these laws were established to prevent owners from blacking out their headlights or altering their color and/or light output. Today's film are 100% optically clear and undetectable.



After much anguish... I picked an installer. My selection was based on my inspection of other vehicles he has finished and after talking to his previous customers. It also helped that he installed VentureShield as I was leaning that way. On visiting his shop I learned he actually primarily installs 3 different types of film. Avery Dennison Stone Shield, Venture Shield and 3M.

When I arrived at his shop he came out and inspected my vehicle. He said he had heard of the Rouge but it was the first one he had ever seen in person. He checked all the compound curves and angles, considered the paint color and took into consideration the areas I wanted to be treated. He then explained the pros and cons of each film he carried.

Here's an interesting piece of information:... the price of the installation was "the same" regardless of which one of the films I picked!

Anyway... knowing what I know (after doing all my research) I left the decision up to him. I simply said, "If this were your car, and you wanted the best, most perfect installation possible... which film would you use?" His answer was immediate.

He said Venture Shield. He explained the gloss finish of the [Venture Shield film](#) would match the gloss finish of the Nissan paint and it was better suited for stretching around the rounded curves of the Rogues front end without the worry of stretch marks that can occur with the other films. He also said it since (since I was concerned if the film would be noticeably visible), that Venture Shield had less orange peel than 3M. PLEASE NOTE: I AM NOT plugging Venture Shield! He also gave a really good arguments for the benefits of both Avery Dennison and 3M films. All of them sounded terrific but I let him make the final choice. For instance, he warned me, of the three films, that the surface of the [Venture Shield film](#) was the most susceptible to stains. He said I would need to be vigilant at cleaning off bird droppings and tree sap as soon as possible after finding it on the car. The good news, as I have since discovered, even if I miss a spot and it stains... the stain bleaches out after a day or two in the sun. Even still... I keep a can of Plexus in the car s I can wipe down any gunk that ends up on the film.

I watched the entire install. I never left his shop for one minute. Installation took a little over 4 hours.

NOTE: In addition to the front bumper area, most clear bra installs involve the installation of a band of film about 2 feet wide that goes across the hood, about 1/3 to 1/2 way up to the windshield. This edge continues down both sides of the car over the fenders, just like the areas protected by the strap on black vinyl bras. Personally... I didn't want any chance of being able to see a detectable edge where the film stopped. Even though the installed assured me on a white car it would be difficult to see, I elected to have him do the entire hood all the way back to the windshield and both fenders all the way back to the edge of both front doors (hence no free edges) As a result my bra installation if virtually undetectable. Very cool.

Can you install paint protection film kits yourself? Sure!... that is... if you have patience, are not easily frustrated, and willing to buy additional pieces should you screw them up.

Would I ever be tempted to install a kit myself? Maybe. Then again... after watching every step of the installation... I would have to think long and hard about trying it. It would also depend on the complexity of the curves involved.

FYI... At a real high level, the film has an adhesive on the back. After removing a protective covering that protects the film during transport, you spray it down with a water based solution to wet the adhesive. You also wet the surface of the vehicle so the film can slide / float into position. Once in position, a squeegee is used to push out the excess water and any air bubbles. While working the film around curves you have to take care not to stretch the film more than it was designed to be stretched. If you stretch the film to much it can acquire stretch marks that will show after the installation is finished. If during the install too much water is used or the film is worked too much and it can loose its adhesive properties and fail to stick. You then have to use another solution of water and alcohol which serves to reactivate the glue, while being careful when pulling the film back up not to stretch it. Whew!

Do I think I could have installed a flawless full front end wrap on a [Nissan Rogue](#) anywhere near the quality of the installation I received? No way! Not a chance!

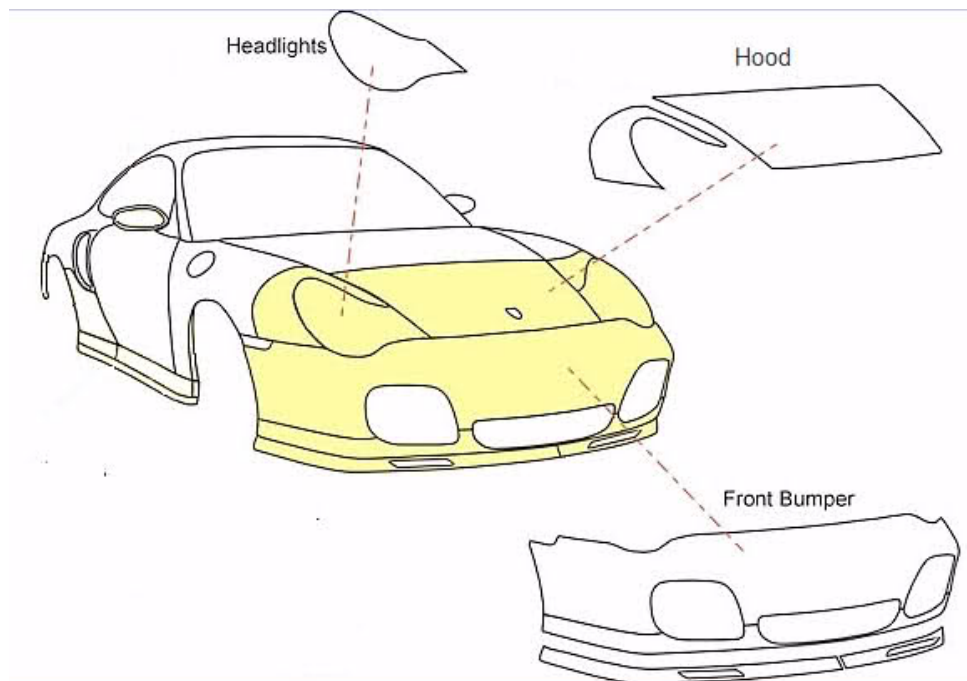
Just some background on my skill set. I consider myself to be handier than most. I've built multiple custom [motorcycles](#), and completed two ground up restoration on automobiles. I've also built two houses from the ground up, and have done 12



total home renovations, doing all the sheetrock, plumbing, electrical, framing and masonry. I almost never pay for any type of service work, home or auto, unless my time is limited or my fulltime job gets in the way. In other words I was confident I could install PPF film myself. However... after reading several horror stories on the internet by other people who "thought" they could tackle the job, I decided against it (besides its my wifes car and she is way too fussy about her stuff) Anyway, after spending several hours watching a professional install the film on my Rogue... I've decided doing it myself would have made me nuts (as well as taken an entire weekend! It was evident the skill involved came with years of practice (of which I had none).

After having time to admire the craftsmanship of the installation I feel it was worth every penny spent. Total cost for a FULL front end wrap... (entire hood, entire surface area of both fenders, both door mirrors, up both windshield pillar posts and along the entire length of both **running boards**: \$980. Granted... it's not cheap but I consider it as a protection on my investment.

However if that's more money than you want to spend... for about half the price you can get the typical protection package (equivalent to a black vinyl bra)



Or if you want to attempt it yourself and save even more... there are several companies offering Do-It-Yourself precut kits. Here are a few:

<http://www.clearbrausa.com/>

<http://www.xpel.com/products/p...s.asp>

Here are some pics of the PPF installation on my 2009 **Nissan Rogue** (during and after):

(Sorry... this was taken with my crappy cell phone)



After:





Since this installation was from a plotter cut pattern, versus cut on the vehicle with a razor knife, the edges are not wrapped (but still clean nonetheless)



To see photos of a PPF install from start to finish check out this link:

<http://www.audizine.com/forum/...38089>

And last... as you might guess... there are tons of videos on YouTube showing PPF film being applied and removed:

<http://www.youtube.com/results...+film>

*Modified by Elton Noway at 11:44 PM 3/6/2010*