These instructions accompany a product called the **Carbon Fibre Bonnet/Hood Skinning Kit** which is a complete starter kit available from Carbon Mods in the UK (worldwide shipping available). To buy the kit; please visit **www.carbonmods.co.uk**.

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Carbon Fibre Bonnet/Hood Skinning Kit

How to Skin a Bonnet/Hood with Carbon Fibre

Introduction

The Carbon Mods carbon fibre bonnet/hood skinning kit has been developed in response to customer demand for a larger version of our carbon fibre skinning kit designed specifically to accommodate the dimensions of skinning the bonnet/hood of a modern road car. The kit includes a very large single piece of woven 2/2 twill carbon fibre fabric that can cover even a large bonnet in a single piece ensuring anyone with average practical skills can transform the appearance of their plain steel bonnet with the stunning look of genuine carbon fibre.

The kit includes all the necessary materials and supplies (with the exception of a pair of scissors and hair dryer/heat gun) and uses the very same carbon fibre skinning technique that can be used to cover just about any piece of exterior or interior trim with a genuine carbon fibre finish, given a little patience effort. The end result is truly stunning and without opening the bonnet/hood is indistinguishable from a pure carbon fibre bonnet. There are also advantages to skinning a bonnet in carbon fibre rather than replacing it with a carbon fibre one, for example the quality and alignment of the hinge and catch assembly remains factory quality, as does the bonnet's crash safety performance.

What can I use this kit on?

The kit was designed for the skinning of steel vehicle bonnets/hoods up to 1500mm x 1000mm although there is no reason why the kit can't be used to skin any large vehicle panels (like a roof or boot/trunk) or interior parts. If you already have a fibreglass bonnet/hood, this kit can certainly still be used to give it a carbon fibre upgrade!

The bonnet/hood that you're going to be skinning doesn't have to be in perfect condition, particularly in terms of light scratches, faded paint, stone chips etc. If there are any larger dents, bends or deep scratches you should repair these using body filler and abrasive paper so that no matter what the bonnet/hood may look like, it has smooth and flat finish.

Having the finished part lacquered

At the end of this process we strongly recommend that you have the bonnet professionally sprayed with a U.V. resistant lacquer. The idea of this kit is to get the bonnet/hood to the stage where a spray shop will be able to simply lacquer the bonnet to leave you with a professional quality carbon fibre skinned bonnet.

As with our small scale skinning kit and technique, it might be possible to leave the bonnet without any final lacquer, or to lacquer the bonnet/hood yourself but on such a large, prominent and sun exposed panel a

professional lacquer will leave the most amazing gloss and protect the carbon fibre from sun damage for years to come.

Kit Contents

Please make sure your kit includes all of the following materials:

- 1.25m x 1.60m 2/2 Twill carbon fibre fabric
- 0.333kg Epoxy skinning basecoat
- 0.666kg Clear epoxy topcoat resin
- 0.5Kg Epoxy hardener
- 2 Sheets of each grit of abrasive paper: 120, 240, 400, 800, 1200
- 4 Pairs of Nitrile gloves
- 4 Mixing cups and stirrers
- 2 x 2" Laminating brushes
- 35ml Polishing compound

Before you Start

In addition to the original steel (or fibreglass) bonnet/hood that you want to skin in carbon fibre, you will also need the following household tools and equipment:

- Pair of sharp scissors
- Kitchen scales
- Masking tape
- Bucket
- Some blocks or similar to lift the bonnet/hood off the work surface

You should also ensure that you have a work area with sufficient room to allow you to sit the bonnet/hood flat and still be able to access all around it and sufficient height to allow you to turn the bonnet/hood over.

Step by Step Guide

Step 1. Remove and Prepare the Bonnet/Hood

Under no circumstances should you attempt to apply the carbon fibre skin to your bonnet/hood with the bonnet/hood still in place on your car. Remove the bonnet/hood from your car by undoing the hinges, you will probably require someone to help you do this.

If your bonnet/hood has dents or deep scratches, these need repairing using body filler and abrasive paper before you start skinning the bonnet. Very light scratches will not need repairing.

Step 2. Key-up the bonnet/hood

In order to ensure that the skinning basecoat gets a good mechanical as well as chemical bond to the bonnet, it is important to 'key-up' the bonnet by rubbing it all over using a coarse abrasive paper. Using the 120 grit paper, included in the kit, rub the whole surface of the bonnet, including all the edges, with the paper so that the paint gets a rough, matt finish. Spend a good 5-10 minutes doing this.

Once you have finished on the surface of the bonnet/hood, turn it over and use the same process to key-up the edges of the bonnet/hood on the underside. When you apply the carbon skin, you will be wrapping the skin

around onto the underside of the bonnet by about 30mm(1”) so you should key up an area of at least this much on the underside of the bonnet/hood.

Step 3. Add basecoat to the underside

Mix enough basecoat to completely cover the whole top surface, and perimeter of the underside of the bonnet/hood with a very thin layer of basecoat.

Use a set of kitchen scales, a mixing cup and stirrer to measure out basecoat and hardener at a ratio of 2 parts basecoat to 1 part hardener. Make sure you mix the hardener and basecoat very thoroughly. Any unmixed basecoat or hardener will not cure and cause lots of problems. A typical bonnet/hood will require about 350g of basecoat (when mixed with the hardener). If you don’t mix enough, it’s no problem, you’ll have plenty of time to mix some more.

Wearing a pair of latex gloves (included) and with the bonnet/hood still lying upside down, paint a thin layer of the basecoat all the way around the edge of the bonnet on the underside, on top of the area that you keyed-up in the previous section. This will provide a tacky edge which the carbon can be stuck onto when we wrap it around the edge of the bonnet.

Step 4. Add basecoat to the surface of the bonnet/hood

Turn the bonnet/hood over and sit it on some blocks (or similar) to keep the edges from touching the work surface.

Using the same brush and basecoat, start coating the main area of the bonnet/hood with the black basecoat. You only need a very thin layer of basecoat, providing that the coat is thick enough to prevent the original colour of the bonnet from showing through too clearly there is no limit to how thin the basecoat can be and it is actually important that the coat is quite thin so as not to create a textured surface onto which the carbon will sit.

Take your time and coat the whole surface of the bonnet with the basecoat. If you run out, mix some more. There is no hurry at this stage.

Like working with gloss paint, try to leave the surface as smooth and even as possible and ensure there aren’t large pools or drips of basecoat around the edge of the bonnet/hood.

Step 5. Let the basecoat cure to a tack

Leave the basecoat to cure to a state where it is still tacky but cured enough so that if you touch it (with a glove on) none of the basecoat will come off on the glove.

The temperature of the room where you are working will have a significant impact on this and mean that this time could vary between a couple of hours up to 8 hours. The best thing to do is to just keep checking.

Tip: When checking, use the area of basecoat on the underside around the edge (which will not affect the surface of the bonnet/hood).

Step 6. Remove any drips from the edge

Once you are happy that the basecoat has cured to the correct point, remove any drips of basecoat that will have formed around the underside of the outer edge of the panel. This needs to be done as they will prevent the fabric from sitting around the edge of the panel neatly.

If you have caught the basecoat at the right point you will find that these drips of basecoat will still be slightly soft and can be easily cut off using a Stanley knife. If the resin is too hard to make this possible, use a file or sanding block.

Step 7. Lay the carbon onto the bonnet/hood

You are ready to put the carbon down onto the bonnet/hood. To do this, it is strongly recommended that you get a friend to help you.

Unroll the carbon, in full, onto a clean surface. Using a pair of scissors; cut the carbon fabric away from the cardboard tube and cut any masking tape from the roll-end of the fabric too.

With the help of a friend, grip the carbon fabric at each corner, using the yellow woven edge. By doing this you will hold the fabric without fraying or distorting the weave. Still holding the fabric by each of the four corners, lift the fabric up and over the bonnet/hood. Without letting the fabric touch the bonnet/hood, pull the fabric quite tight (length-ways, so that the yellow edging strip goes tight) and make sure that you are holding the fabric lined up square with the bonnet/hood below. This will ensure that the pattern of the weave lines up attractively with the bonnet/hood.

One you are happy that you are holding the fabric squarely over the top of the bonnet/hood, start to lower it down onto the surface of the panel. Due to the shape of almost all bonnets/hoods this will mean that the fabric contacts in the centre first and then works its way out, which is just what we need to happen. Without any difficultly, you will be able to lower the fabric down to fully cover the bonnet/hood.

Using your hand and starting from the middle, start to press the carbon fabric down firmly against the basecoat. At this stage, do not attempt to wrap the fabric around onto the underside of the bonnet/hood at the edges.

Step 8. Trim off any excess carbon fabric

Using a pair of scissors; trim the carbon fabric so that approximately 30mm (1”) of fabric extends beyond the edge of the panel. Once you have removed the excess fabric store it somewhere safe so that you can use it on future smaller projects.

Step 9. Wrap the edges of the fabric under

Start working your way around the edges of the bonnet/hood, folding the overhanging carbon fabric round onto the underside of the bonnet/hood. If necessary you can use scissors to make a cut into the fabric on difficult corners but if possible avoid doing this. The idea at this stage is simply to get the majority of the fabric wrapped round and under. If some difficult parts don’t sit down properly we can resolve this in the next section.

Step 10. Turn the bonnet/hood over and tape the edges down

To make sure that the edges are pulled tight and properly stuck down on the underside we will turn the bonnet/hood over.

Protect the carbon fabric with a small sheet of plastic film in the middle of the panel. Turn the panel over with this plastic film sitting between the carbon and your work surface. If your work surface is unclean or bumpy then you might want to use some foam or similar to protect the carbon whilst we work with the bonnet/hood upside-down.

Check how well the edges have stuck down onto the basecoat on the underside of the bonnet/hood. Where necessary, use some masking tape to pull the edges tight and stick them down to the underside of the bonnet/hood. You want to avoid any 'slack' fabric no being tight around the edge of the panel.

One this is done, you can turn the bonnet/hood back over so that it is the right way round.

Step 11. Apply the first topcoat

You're now ready to mix and apply the first layer of clear resin to the carbon covered bonnet/hood.

Important Tip: Unless you're already working in a really hot environment, take both the resin and the hardener and put them in a bowl of hot water for about 5 minutes before you start. This will dramatically lower the viscosity (thickness) of the resin making it easier to mix and less likely to get air bubbles trapped in it when it is mixed and applied.

A typical sized bonnet/hood will use about half of the clear resin on this coat and the remainder on the next coat. Accurately measure the amount you think you will need (probably half of the clear resin) with hardener at a ratio of 2 parts resin to 1 part hardener. When you mix the resin and hardener, do so thoroughly but steadily to avoid 'whipping' the resin and filling it with tiny air bubbles. If you've warmed both the resin and hardener they (see tip) then this should be much easier.

Important Tip: What you want to do with this first clear resin is wet through all of the carbon but without trying to build up a tick layer of resin over the top of the fabric. In fact, you want only enough resin to wet out the fabric, and no more. This will allow the air from around the fabric to rise through the very thin layer or resin you applied and escape. If you coat the resin on thickly (and without warming it first to reduce its viscosity) you will find that the air around the carbon fibres does not escape and you can end up with tiny air bubbles visible in the resin. If you warm the resin well, apply it thinly and then warm it over with a hair dryer or heat gun, you won't have this problem.

One you've mixed the resin, using one of the 3" brushes (included in the kit) start to 'paint' the resin onto the top of the carbon fabric. Start at the middle and work your way out. Remember that you are really trying to apply as little resin as is necessary to wet-out the fabric. Make your brush strokes slow and use pressure to push the resin into the fabric.

Expect to spend about 15 mins applying the resin to the fabric. Keep looking at the whole of the bonnet/hood and ensuring that no areas have more or less resin than others. You want a thin, even coat or resin. At this stage the bonnet will have a very bumpy texture, do not expect the resin to have filled the gaps between the fabric and formed a smooth gloss. If it does, your resin is much too thick.

Step 12. Check thoroughly and apply heat

It is crucial at this stage to inspect the bonnet thoroughly for any stray bristles from the brush (they're special no-loss brushes but it still happens often enough), dust, flies or any other contaminants that could detract from the finish of your bonnet/hood. If you find anything, use your finger or some tweezers to remove the contaminants.

Next, it's time to get rid of any tiny air bubbles (these really will be tiny but can be seen on close inspection). To do this, we use a heat gun or hair dryer with a high heat setting to heat the resin, lowering the viscosity, expanding the air bubbles and allowing them to escape.

Look closely at the surface of the bonnet/hood and direct plenty of hot air from the heat gun or hair dryer at any areas where you can see these tiny bubbles. Depending on your technique and the temperature and humidity of where you work there might be lots or there might be none. Either way, now is the time to get rid of them.

You're not done until you can see no tiny bubbles anywhere on the surface of the bonnet/hood. In a cool-ish workshop in the UK we spend about 15-20 mins doing this.

Step 13. Leave to fully cure

Now leave the bonnet/hood to cure fully. At typical room temperature this will take around 8hrs so overnight is ideal.

Step 14. Remove any high spots

Safety – Wear a dust mask for this section

Once the resin has fully cured, take the coarsest grade of abrasive paper and start to roughly flatten out any high spots on the bonnet/hood, including any resin drips around the bottom edge and areas where any fabric has lifted up (often at the corners of the bottom edge).

It doesn't actually do any harm to the finished appearance of the bonnet if you break through into the carbon fabric when you're doing this however you should be aware that you're not truing to make the surface flat at this stage, you just want to remove any bumps, ridges, loops of fabric or resin drips.

When you're done the bonnet won't look too great but if you smooth your hand over it, nothing should catch your hand as you do. Once this is complete; use a clean brush or duster to remove all the resin and carbon dust from the bonnet/hood.

Step 15. Apply the final coat of clear resin

You can now go straight in with the final coat of clear resin. The idea of this layer is to fill in all of the gaps between the carbon fibres to great a finish that can be rubbed perfectly flat ready for the lacquer. The idea is not to get the resin as thick as possible (far from it) you just want enough resin to allow the bonnet to be rubbed completely flat in the next stage.

A typical bonnet/hood will now use the remaining resin, mixed 2 parts resin to 1 part hardener. As with the first coat, we suggest warming the resin and hardener before use to reduce their viscosity and make them less prone to air bubbles when mixing.

Apply the resin using a 3" laminating brush, starting from the middle and working outwards. Work slowly to avoid getting air bubbles in into the resin.

Coat all of the bonnet/hood with the resin, looking regularly at the whole panel and ensuring that the coat of resin is even with no areas having more resin than others. Don't worry too much about resin that runs off the bonnet at the edges. The bonnet will hold as much resin as it needs. Remember, we aren't trying to build a very thick layer, just enough to allow us to make it completely flat in the next steps.

Step 16. Check thoroughly and apply heat

Just like in a previous section, check the whole surface of the panel for any stray hairs, dust, flies or other contaminants. Carefully remove anything you find using your finger or tweezers.

Again, as in the previous section, use a heat gun or hair dryer to heat any area of the resin that have any tiny air bubbles trapped in them. Because the dry fabric was effectively 'sealed' by the last cost or resin we applied, there is likely to be much less of these tiny bubbles visible in the resin at this stage but nonetheless you should

inspect thoroughly and use focussed attention from the hair dryer or heat gun to heat the resin and release the bubbles. In our experience, we spend another 15 to 20 mins doing this to be 100% sure.

Step 17. Leave the to cure fully

Leave the resin to cure fully. At typical room temperature this will be around 8 hrs, overnight is normally right.

Step 18. Flat bonnet/hood with 100 Grit abrasive paper

Looking at the bonnet/hood now you should have a good idea of what the finished part will look like and hopefully it's good. It's now time to use traditional body shop techniques to flatten the resin surface of the bonnet/hood ready for it to receive its final gloss lacquer finish.

Tip: When flatting out in this stage, use the foam block to create a sanding 'block'. This is essential in order to 'flat' the bonnet making you less likely to just polish ripples in, as you would if you used the abrasive paper in your hand without the sanding block.

Using the 100 grit abrasive paper (the dark red one) you must get the bonnet to a perfectly flat, even finish. It will not be glossy and smooth using this grit but you should run it down until it is totally flat and even. The bumpy texture in the bonnet, caused by 'print through' of the carbon fabric underneath the resin that will be prominent before you start should be eliminated completely by sanding the high spots down until they are level with the low spots. By 'dry sanding' at this stage (i.e. not using water) you will be able to clearly tell when you have sanded down to a flat finish because the last of the 'glossy' spots will vanish, leaving you with a totally matt finish all over the bonnet/hood.

Keep running your hand over the surface of the panel. Look for any feelings of 'wobble' in the surface. Give attention to any of these areas until the bonnet/hood is perfectly smooth.

If you move onto subsequent, finer grits of paper before the bonnet has been properly flatted, you will end up with a glossy but uneven finish that spoils the appearance.

Pro Tip: Expect to spend about 30-60 mins on this stage. If you have an orbital sander and are confident with the use of use of it you can use the sander for the flatting of the larger expanses of panel. You should not be tempted to flat and edges or more intricate areas using the sander.

Step 19. Tidy the underside of the edges

To ensure that the finished bonnet/hood looks as professional as possible, now is a good time to turn the bonnet/hood over and tidy up the underside of the edges where the carbon fabric is wrapped round and where the resin will have run down. Obviously when the bonnet is closed none of the underside will be seen but for a show-ready finish you'll want to give the underside some attention.

Using a piece of clean material to protect the surface of the panel, turn it over so it's on its back. The simplest way to tidy up the way the carbon meets the steel inner of the bonnet/hood is to rub the carbon and resin all the way through on the very underside of the edges. You should then be able to pull away the excess carbon and rub flat any excess resin.

Pro Tip: If you're really going for the best possible finish, you might choose to spray the underside of the bonnet/hood black to reduce the contrast between the original colour of the bonnet/hood and the carbon. Do this after you have rubbed back and cleaned up the underside of the edge and you'll have a very neat finish indeed.

When you've done any tidying up to the underside you see fit, turn the bonnet/hood over ready to start polishing.

Step 20. Start rubbing the bonnet/hood with wet and dry abrasive papers

Included in the kit are a range of different grits of wet and dry abrasive paper. Starting with the 320 grit (the coarsest except for the 100 grit used in previous sections for flatting) together with liberal applications of water and washing the paper in the water, start to polish the scratches (caused by the flatting) out the panel. It is up to you whether you use the papers around a foam block or not at this stage. Because the bonnet was 'flatted' in the previous section, there should be no danger of creating 'wobble' in the surface now so use whatever technique you feel works best.

Keep using plenty of water to rinse off the panel as you go. Run your hand over the panel; look for any scratches that persist and continue to rub back until they're gone.

When you're happy that you're ready for the next grit, using plenty of water, rinse off the bonnet and all of the grit from the previous phase. Any particles of grit left on the surface will cause scratches.

Step 20. Repeat for the remaining grits

You're now ready to start moving up through the remaining grits of wet and dry paper. Don't be tempted to skip any out or do a 'half job'. Each of the grits should be used all over the surface of the panel, with plenty of water used to stop the paper from clogging.

When you're done with a grit wash the panel off thoroughly and change the water before progressing to the next grit.

Repeat for the remaining grits until you have rubbed the bonnet/hood up to a 1000 grit finish.

Step 21. Have the bonnet/hood spray lacquered

By the time you have complete all of the above steps you'll have a perfectly flat and smooth bonnet/hood. The 1000 grit abrasive paper that you finished on won't give the bonnet a gloss finish; instead it should have an ever so slightly satin finish, but be completely free of any surface scratches.

Given the size, prominence and sun exposure of a bonnet/hood, we suggest that the very best way to complete the project is to now have the panel professionally spray lacquered (or clear coated). This will provide the very highest level of gloss finish and will provide additional protection from U.V. damage.

The work you've put into skinning and flatting the bonnet/hood should make the professional finish at this stage straight forward and inexpensive. The super gloss and protection you'll get will be well worth it!

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About Carbon Mods

Carbon Mods is a small specialist carbon fibre products company operating from premises in Staffordshire, England. All our products are designed, tooled and manufactured on site using high quality carbon, resins and other materials.

We design and manufacture niche performance products for motor sports, aerospace and marine applications as well as a range of best-selling kits to introduce people to the world of carbon fibre.