

# Product Evaluation: 3M Scotchcal Car Bra



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**Envisage Design Labs', Daniel Cook, begins the Transparent Bra application by cleaning the surfaces to which the Bra will be applied in a manner that will allow Scotchcal's adhesive to form a strong bond.**

**Image: Author**

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**by Hib Halverson,  
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Before I discovered car bras made from 3M's urethane film "Scotchcal", I thought all bras, no matter what the design or color, were ugly and eventually worked loose to flap in the wind. Another reason I've never liked fabric bras is that most of them are attached in a manner which traps dirt and dust underneath. Once trapped, this dirt scratches the paint as it's impossible to keep the bra from moving.

Scotchcal Paint Protection Film has been around for a number of years. It is a clear, polyurethane-based film. One place where it's been used on a Corvette for a long time is on the rear deck lid of convertibles. Since the early 90s GM has applied Scotchcal to the part of the deck lid that is contacted by the edges of the convertible top when the top is up.

Scotchcal Paint Protection Film is a three-layer sandwich consisting of: a clear outer coating, a layer of polyurethane (either 6-mil or 12-mil thick, with the 6-mil version the most common), an acrylic adhesive backing and a peel-off liner. When applied to exterior surfaces of a vehicle, it increases the resistance of those surfaces to damage from: rubber particles, insects and fuel or oil spray and, most importantly, impacts of small stones. Because the urethane-based, clear coating is capable of impact absorption, small stones do not leave marks and even bigger ones will leave less of a mark than they would on an unprotected surface.



*Click image for larger view*

**Envisage's Edre Mendoza has selected the C4 Corvette, Transparent Bra nose and hood patterns on his PC prior to sending that data to a vinyl cutting machine.**

**Image: Author**

*Click image for larger view*

**Envisage's vinyl-cutter spits out the C4 Transparent Bra. This machine cuts the material to the right shapes in a few minutes. The raw material comes in 125-ft rolls which are 24-in. wide.**

**Image: Author**



*Click image for larger view*

**C4 Transparent Bras which include film on the front of the hood come with specific Scotchcal sections that go on the headlight buckets.**

**Image: Author**

Scotchcal is resistant to: acid, most solvents, gasoline and oil, temperatures up to 160°F and moisture. It's shrinkage is rated at less than 0.1%. 3M claims Scotchcal is immune to weathering for two years. The data 3M uses to support this claim was derived from two, outdoor "weathering" tests, one with the sun at 45 deg. (said to be typical of Arizona) and the other with the sun at 5 deg. (said to be typical of southern Florida). With either test, after a 24-month period, there was less than 10% loss in the product's glossiness and no more than 2.5-dE change in color. "dE" is a unit of measure in a "color space" system commonly used by industry to quantify changes in color. In that system, 2.5 is a small color shift which might be noticeable on a light-colored surface. In a practical sense, Scotchcal's dE will be less than that of a dye-colored, fabric car bra over the same length of time. 3M warrants that Scotchcal Film will meet those specifications for two years.

Back in the late-'90s, 3M developed the idea of marketing die-cut sheets of Scotchcal on an aftermarket basis for use on impact prone parts of a car's exterior. As computer-controlled cutting of the film allows mass-production of a bra which is a specific fit to each car, a lot of the labor involved in fitting a car with Scotchcal on an aftermarket basis was eliminated. As the product is difficult to apply properly, 3M initially sold the product through factory-authorized and trained installers. One of the first businesses in the West to get into selling Scotchcal for auto bras was Envisage Design Labs of Torrance, California. Envisage calls its product the "Transparent Bra."



*Click image for larger view*

**Once the Transparent Bra is positioned, smoothing it, removing any air bubbles and getting it to conform to curved surfaces takes skill, knowledge, patience and some specific application tools.**

**Image: Author**

I undertook a real-world test of a Transparent Bra with my 1995 Coupe. The

car's paint is not seriously damaged, but it shows the car's 67,000 miles with a fair amount of chips on the nose and the hood. I took the car to Envisage Design Labs to have it install die-cut Scotchcal to the nose, the forward part of the hood and the forward facing surfaces on the side-view mirrors. My intent in having this done was to prevent further deterioration of the car's finish due to stone impacts and other "pepper spray" (as Envisage's Daniel Cook calls it) which you get during highway driving. I was amazed to notice that, once the Transparent Bra was installed, most of the smaller existing chips and mars disappeared. That, alone, is worth the price of the installation.



*Click image for larger view*

**Probably the most difficult application task is getting the edges of the Bra to adhere to certain, tight, complex-curved parts of the nose. Doing this properly takes experience.**

**Image: Author**

A week after I had Envisage apply the Scotchcal, I took the car on the 50th Anniversary Corvette Caravan. In fact, I was assigned the honor of leading the Southern California Caravan from California Speedway in Fontana to Elk

City, Oklahoma where we handed the group over to the Oklahoma Caravan leader. Driving the Goodyear/Flowmaster/MSD SoCal Caravan Lead Car, I gave the Transparent Bra a difficult, 4687-mile test over a two-week period. This product's performance was exceptional. During a close inspection of the Bra while washing the car after the long trip, I noticed only one new mar to the area Envisage applied the Scotchcal and that was from a pretty big stone. In fact, my fiance, the Fairest Sandra the Red, remembers us getting hit with that rock, kicked-up by a truck ahead of us, as it bounced off the front of the hood, then nailed the windshield in front of her, taking a small chip out of the glass. Other than that, you couldn't tell the front end was on a car that had been nearly 5000 miles.

There are two characteristics of a Scotchcal Paint Protection Film which some, who are extremely sensitive to the look of the exterior of their vehicles, might question. First, once applied, when viewed from certain angles and in certain lighting conditions, the Film has a slight texture to it--sort of paint which is slightly "orange-peeled". Also, if you apply Scotchcal to a large, relatively flat surface, such as the front of a hood, there will be a line at the edge of the Scotchcal which is visible from certain angles and in certain lighting. I did not find these two qualities objectionable considering the significant improvement in appearance compared to a traditional auto bra and that the product protects my front end.



*Click image for larger  
view*

**A week after the  
Transparent Bra was  
installed in my ZR1, I  
led the Southern  
California Corvette  
Caravan on a 4687-mile  
trip to Bowling Green  
and back. This product  
did an outstanding job  
of protecting the front  
end of my car.  
Image: Author**

There is one aspect of Scotchcal Paint Protection Film that some hardcore DIYs might find unfortunate. In some information 3M has available on Scotchcal and in several conversations I had with authorized 3M Applicator, Envisage Design Labs, I learned Transparent Bras are really not a DIY product. While some 3M retailers sell Transparent Bras as DIY "kits", after watching Envisage apply the product to my car, I agree with 3M and Envisage: it's definitely a job a DIY needs to carefully consider. Unless you have the correct tools, cleaning solutions and experience applying semi-permanent, adhesive films to surfaces with complex shapes, I'd leave installing Transparent Bras to professionals. Proper pre-installation cleaning is critical. Application to small-radius curves and compound curves is difficult. If you make a mistake, repositioning the Scotchcal is impossible unless done soon after the initial installation and, even then, special measures must be taken prior to installation to facilitate any repositioning. Once the adhesive has begun to cure, removal in an attempt at repositioning damages the Scotchcal.

Some might balk at the cost of a Transparent Bra, especially if you do both the nose and the front of the hood, but considering: the Bra is near impossible to see, is affixed semi-permanently to the car, fades less than a fabric bra, won't rot, won't flap in the wind and protects as well or better than a fabric bra, most will find the price acceptable.

Transparent Bras in die-cut form are available from Envisage Design Labs for the C4 and C5s. Bras for other Corvettes are available in custom-made form going right back to the 1953 cars.

Additional information on Scotchcal is available at 3M's web site at <http://cms.3m.com/cms/US/en/2-168/clelFFC/view.jhtml> . More information on the professionally-installed, Transparent Bra is available from Envisage Design Labs, 20710 Manhattan Pl., Torrance CA 90501. Ph: 866 335 3456, web: [www.transparentbra.com](http://www.transparentbra.com) .

Online URL:

<https://www.corvetteactioncenter.com/tech/knowledgebase/article/product-evaluation-3m-scotchcal-car-bra-300.html>