

## Energy Science Laboratories, Inc.

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## PRODUCT DATA SHEET

# Vel-Black<sup>®</sup> G100C-M2

## Ultra-Black Velvet Applique

### Applications

Diffuse, black, high-emissivity coating; light trap; beam dump; radiation absorber; black standard.

### Composition

Fibers: PAN carbon\* (max temp 500°C in oxygen, 2500°C in inert atm)  
Substrate: Cured, ceramic-filled, high-temperature epoxy (max temp 260°C)  
Backing: Polyester sheet with acrylic PSA (max temp 150°C)

### Optical Properties

Directional Hemispherical Reflectance at 0.65 μm, 9° incidence	0.1 – 0.2 %
<sup>1</sup> Directional Hemispherical Reflectance (2 - 15 μm), 20° incidence	< 0.5 %
<sup>1</sup> Bi-directional Reflectance Distribution Function @ 0.63 μm	3 x 10 <sup>-4</sup>
<sup>1</sup> Bi-directional Reflectance Distribution Function @ 10.6 μm	1 x 10 <sup>-3</sup>

<sup>1</sup>K. Snail *et al.*, "Optical Characterization of Black Appliques", *SPIE* **2864**, p. 465-474 (1996).

Available for download at <http://www.esli.com/products/velblack/index.html>

### Physical Properties

Thickness ~ 0.1 in (2 ½ mm)  
Mass ~ 0.3 g/in<sup>2</sup>  
Max operating temp 150°C (limited by PSA attach)

### Installation Procedure

1. Clean surface onto which applique will be applied (remove oxides and residues).
2. Cut applique to size (or oversize) with scissors, sharp blade, or paper cutter.\*
3. Peel away release liner to expose PSA.
4. Place applique on surface starting at one edge and "roll" it on.  
Once in contact, applique cannot easily be removed nondestructively. Avoid trapped air.
5. Trim off excess with sharp blade or scissors.
6. For maximum adhesion, allow PSA to fully cure for 24 hours at room temperature. Do not excessively cool applique until fully cured.
7. Clean coating by carefully blowing off excess fibers with compressed air into a filtered fume hood or vacuum, or by gently collecting with tape.\* Edges can be effectively cleaned by lightly touching with tape (such as Scotch tape).

**\*Caution:** This product consists of numerous small diameter carbon fibers. Some of these fibers can escape as debris that, although not a serious health hazard to humans (classified as an irritant), can potentially cause shorting of electrical equipment, or possibly electrostatically cling to dielectric optics. Such debris can best be removed by vacuuming or collecting with tape.