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by Phil Patton

Cloth Encounters *BMW's GINA proves there's more than one way to skin a car.*

Her "eyes" blink, her "nostrils" flare. Her "body," which is made of polyurethane-coated Lycra, twists and bends.

I open her door and her whole side peels away. I slide into the seat and it curves to fit me. I extend my arm and the controls inch toward my grasp.

She's GINA, a BMW concept car that was released to much fanfare in July. The name is an acronym for "Geometry and Function in 'N' Adaptions [sic]," which was awkwardly coined by BMW technocrats translating from their native German. It basically means she's remarkably supple. GINA's motorized metal frame flexes like a muscle, and her LED tail lights glow like embers beneath her Lycra skin. For improved aerodynamics, the grille mouth narrows as speed increases, and the rear deck wing or spoiler lifts to provide downforce.

The idea for GINA was born nearly eight years ago when Chris Bangle, BMW's design chief, challenged his company's California studio, Designworks, to come up with fresh approaches to the automobile. "What would you do," Bangle asked the team, "if you weren't beholden to 80 years of tradition?" Fernando Pardo's response was to stretch fabric over a wire frame to create the automotive equivalent of a Sandy Chilewich bowl.

Soon after, Bangle discovered at New York-based Material Connexion a variety of textiles with stunning strength and resilience. He wondered whether fabric might be tough enough to replace steel in a car's body.

Bangle ordered up such a car. The result is angular and sleek but not entirely alien. You have to get close to GINA to see that the material stretched over her jointed frame isn't metal.

In fact, to truly appreciate GINA, it helps



to stand back a bit—as I did with Bangle, on a balcony in BMW's Munich factory last spring. We were staring at a bunch of multistory-high stamping machines. The equipment acts like huge, hot pile drivers, lifting 20,000-pound weights and dropping them with a crash to produce fenders and hoods. Four hundred tons of tools and dies go into a single new car model. "That's why it costs a billion dollars to make one," Bangle says.

To amortize the cost of the dies used in manufacturing, millions of cars must be produced in exactly the same way, limiting distinctive elements. Body shapes are restricted by the fact that parts must slip easily from the stamp like a cake from its pan. Fabric means the end of cookie-cutter designs. It also means that messy spray painting could give way to a rainbow of customized surfaces.

Fabric makes assembly faster, cleaner, and more efficient. "Sven here can skin a car in two hours," Bangle says of the hefty Swedish man who stretches Lycra over GINA's frame. "That's a tiny fraction of standard production time, of course." If Bangle gets his way, a squad of darting, raptorlike orange robots that currently bend and weld metal in BMW's factory would make auto manufacturing even speedier.

Most important, fabric drastically reduces weight and therefore potential fuel consumption.

Despite these benefits, Bangle worried that a literal-minded automotive press would find much to criticize in a car made of cloth and kept GINA a company secret for years. Sophisticated observers might have picked up a few hints: BMW's 2002 CS1 concept car offered a GINA-like neoprene interior with slits that opened to reveal the radio and other controls, and GINA has inspired production BMWs from 2002's Z4 roadster to 2004's 5 series. How better to describe these flame-surfaced cars' taut lines and twisting planes—which made Bangle the best known and most controversial auto designer in the world—than *tensile*?

GINA even inspired ideas about car-making that had nothing to do with her, such as research into laser-scored metal for making chassis.

Indeed, much of GINA's contributions to the future of automobile design have been hidden in plain sight. She was never meant for the road but has been installed in BMW's newly renovated museum in Munich, where her influence will continue to ripple. Bangle hopes she'll ultimately effect a change as dramatic as the 1930s appearance of the first stamped steel car bodies, which replaced wood. "She's taken on a life of her own," Bangle says. "GINA is a philosophy, not a car."

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