



# ART IN ALLOY

## Aluminum Icon

BY PHIL SCHILLING

**T**HREE YEARS AGO, ROBERT STEFFANO, A MECHANICAL engineer from Garberville in Northern California, had an idea. He wanted to build a special based on a Ducati 916 stripped of its aerodynamic bodywork and non-essential parts. Far from being "enveloped," this "exposed" machine would showcase the hardware that defines the essential, elemental, modern high-performance motorcycle.

Steffano called his concept "Café Roadster," a bike intended to ride to breakfast over fun, twisty backroads, but distinguishable from the café-racers of the 1950s and '60s, which belong to a different era. The one-off Ducati would be known as the 969 Café Roadster, the "969" having nothing to do with displacement.

"The designation," explains Steffano, "parallels the extremely illogical naming that Ducati has traditionally used. So we are having fun here: The number 969 looks cool."

Steffano had the resources to create the motorcycle of his dreams. He could rely on his own custom motorcycle fabrication shop, Acme Rocket Bike ([www.acmerocketbike.com](http://www.acmerocketbike.com)), to build much of the machine and provide an array of trick parts.

But his vision included special custom bodywork, and Evan Wilcox was *the man* for that job. Because Wilcox creates large-scale jewelry in pure aluminum.

In its pure form, aluminum is soft, ductile and malleable. It can be shaped by beating it with a hammer or by pressing it between rollers. Although Wilcox's finished works look as if they belong in the industrial-art section of a museum or an exhibition in an uptown gallery, the fundamental process of beating and shaping aluminum is a violent, noisy, earthy, hot, sweaty enterprise.

"Hand-forming aluminum isn't kin to microchip production in a super-clean environment," Wilcox explains. "Beating aluminum more resembles making sausage."

Wilcox came to this vocation late, when he was in his mid-30s. Earlier, he had attended the Art Center College of Design in Los Angeles, studied photography, and subsequently became a commercial shooter. But Wilcox always had a strong design sense, and a keen interest in "making stuff." So life's little twists and turns brought him out from behind the camera, and put his handiwork in focus, squarely in the frame.

Like a sculptor, Wilcox coaxes and teases the metal, allowing the aluminum sheet to yield up the shape hidden within. Aluminum resists being worked into sharp angles or creases. But the metal naturally works into flowing organic forms, because, as Evan explains, aluminum "wants to transition slowly from curve to curve." That's why early Ferraris with handmade aluminum bodies have long, rolling curvatures, and why the gas tanks of vintage Grand Prix bikes from the 1950s have the same characteristic fluidity.



Wilcox can picture clearly what he will build before striking the first hammerblow, and yet there's a creativity that comes from the forming process itself. "As I beat the aluminum, it goes places I hadn't anticipated. I make many beautiful mistakes as the metal teaches me how to shape it." He can carefully examine the shaping of a gas tank from a 1960 MV Agusta GP bike and see something that escapes other eyes. "I can recognize these beautiful mistakes in that man's work as well. I'm like a cellist hearing a subtle nuance in another cellist's playing, and I realize what a small club I'm in."

At the Art Center, Wilcox learned about composing shapes, light, shadow, color and texture. "The photography department was adjacent to transportation design, where I watched students sculpting cars out of clay," he remembers. "I could see them struggle to come up with a pleasing shape, just as we struggled to draw out the shapes of fruit with one light in a still-life photo."

Wilcox wasn't sure about collaborating with Steffano on the Café Roadster project. He balked at re-skinning Ducati's most beautiful motorcycle. Steffano persisted and eventually convinced the panel-beater.

"His art direction," says Wilcox, "was that my bodywork should be like liquid flowing over the mechanical beauty beneath. I got it. We then talked in detail about each part, and how it could be more abbreviated or pronounced. Robert even made computer overlays for comparison."

For several reasons, aluminum bodywork was the clear choice for this coachbuilt bike. Steffano is a vintage bike guy who wanted some retro-styling, so aluminum was a perfect fit. Furthermore, Steffano simplified and modified the 916's engine compartment and running gear to emphasize, adorn and highlight the Ducati's hard mechanical presence. Aluminum, as a metal, harmonized perfectly with this hardscape, and that's why the unpainted, polished aluminum bodywork looks so right.

Although he worked closely with Wilcox, Steffano also trusted Evan's craft and talent. For example, at the rear Steffano simply specified that the exhaust pipes and tailsection should look like they were shrink-wrapped together. "I ran with this," says Wilcox, "and surprised him. He was pleased."

Steffano realized that sometimes the aluminum was as much in control as Evan was. Wilcox elaborates: "The thing about hand-formed aluminum is >

## THE EDUCATION OF EVAN WILCOX

One man's journey through a modern metal landscape

**A**luminum attracted attention as a lightweight metal about 125 years ago. With a low relative density, about one-third that of steel, aluminum became an important metal in the 20th century. But this was only because it could be united with other metals to create strong and hard alloys that retained aluminum's first virtue, its light weight. The ongoing development of alloyed aluminum kept the metal at the forefront in construction of all kinds for the last century. On the other hand, pure aluminum—the stuff Evan Wilcox forms—has found few uses.

Constructing body panels for high-value, low-production automobiles was one realm where purer forms of aluminum reigned early. The 1908 Bugatti Type 10 had an aluminum body, and until about 1960 hand-formed aluminum bodywork remained an option for small runs of European automobiles. Tooling up for stamped body panels (steel or aluminum) was just too expensive. A cadre of expert panel-beaters working with very simple tooling could build lightweight bodies efficiently in tiny numbers.

For the last half century in the U.S., hand-forming sheet aluminum with mallets, hammers, rollers, sandbags, sweat and muscle has been a lost art outside of a few aircraft, race car and restoration specialists. So when Wilcox decided to build aluminum gas tanks for vintage roadracing bikes, he found himself on his own.

He couldn't take an educational sabbatical from his regularly scheduled life, but he felt confident that he had the aptitude and talent to teach himself how to shape aluminum. His own history offered ample evidence of that.

Wilcox grew up immersed in Southern California motor culture. The first real motorcycle young Evan ever saw was an AJS 500 down the block. He recalls: "The big Single never ran, but it was the most impressive memory of beauty and design of my youth. It had an aluminum gas tank, and I studied it often."

In high school, Evan "made a beeline for metal shop." His directness had a purpose. After seeing *On Any Sunday*, Wilcox and his friends stripped down their trailbikes, hand-making expansion chambers, seats, footpegs and so on. He began imitating the spare, functional look of racing bikes he had seen at Ascot Park half-mile and TT events.

In shop classes, building expansion chambers, Evan

found a practical use for high school math. "My geometry teacher taught me how to lay out a cone so the ends would be flat when rolled. The heavens opened and the angels sang! I was on my way."

Wilcox confesses that he never saw anyone shape aluminum before he started himself, repairing old BSA and AJS tanks for vintage bike friends. Eventually, someone recommended a book, Ron Fournier's *Sheet Metal Handbook*. From this essential manual, Wilcox really learned his art.

Shaping compound curves from sheet aluminum requires patience, skill and experience. In a high-tech world, aluminum-shaping tools seem almost medieval. Metal formers work with many kinds of wooden and plastic mallets, sandbags, cutters, dollies, slappers, whappers—even sawed-off tree trunks!

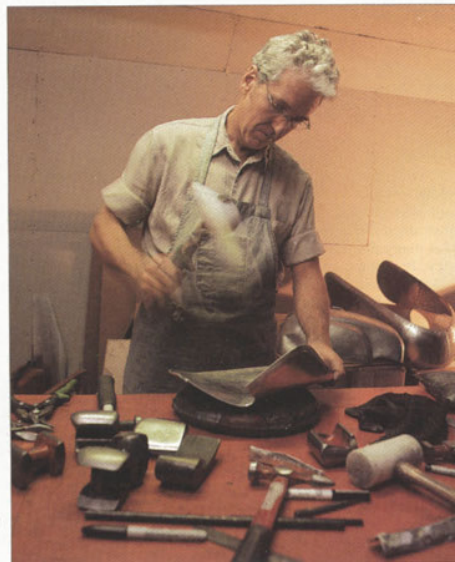
There's also the English Wheel, introduced in larger numbers to the United States during the 1980s. This device presses and smooths out the hand-hammered dents in the aluminum. The formed (but dented) aluminum is run by hand between two precision rollers or "wheels." Typically, the larger, upper wheel is about 8 inches in diameter with a flat working face. The smaller, lower wheel has a working surface that can range from flat to semicircular. Normally, an English Wheel has a set of interchangeable lower wheels that have faces with different radii. Metal shapers pick particular rollers, or a sequence of rollers, to smooth out hammer marks and add larger curves.

Characteristically, Wilcox bought a set of plans, built his own English Wheel, and then taught himself how to use it.

Gas welding aluminum is an equally devilish art to master, and a necessary one. Aluminum gas tanks are welded together in sections. Wilcox gas welds with pure aluminum rod because this operation doesn't leave the area around the weld embrittled and susceptible to vibration-cracking. With exactly the right amount of heat and rod, you get a beautiful bead. But with just a bit too much heat, you open an ugly hole.

In the beginning, Evan says, "My reality was blown holes or corners falling off entirely. I learned that it's all about being sensitive to the required temperature window (1100 to 1200 degrees) and adjusting to thicker or thinner sections.

"This," he explains, "is a dance where the metal leads." —Phil Schilling



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that it will guide me to a nice shape if I'm observant and willing. Robert understood this and left room for my variation in every part."

Wilcox made nine different pieces. "Some more than once," he laughs. The hardest piece was the small radiator-overflow tank that nestles between frame members behind the steering head. The fuel tank wasn't easy, either. A number of things constrained the latter design because it had to cover many points—the engine, chassis, battery, fuel pump and all the electrics. Then there was the seat pan, which was tough because it tied the tank and tail together. On the other hand, the aluminum pipes, which join stainless-steel headers, were a joy to make, though getting a close fit with the tail was slow going.

Wilcox and Steffano consciously composed the overall visual feel, which has many fine subtleties. "At the Art Center," Wilcox stresses, "we learned to take design cues from what is already there and repeat it somewhere else in the composition. For instance, the radius of the cam pulleys are seen again in the tank, seat and radiator scoops."

A formal taillight/plate-holder assembly would maim the bike's gorgeous tail and ruin the clean,

composed look. Steffano's ingenious—but legally dubious—solution houses the tail/brake lights in the footpegs while the license plate slips into a clear plastic pocket on the back of his jacket. There are no turnsignals. In this case, California's vehicle code yields to Steffano's sense of style.

This 969 Café Roadster was the first remodel from Acme Rocket Bike. A Yamaha YZF-R1 has recently been completed. Steffano is investigating the possibility of making a limited number of bodywork sets for the R1 (perhaps 200), but these would be stamped aluminum rather than hand-formed. This stamping process is similar to the methods used to produce aluminum panels for modern low-production automobiles like the Acura NSX, or for that matter, aluminum gas tanks on many present-day Superbikes.

In the future, don't expect to find Wilcox sitting at a computer designing tanks and tailpieces with a fancy software program, or shaping clay models. The interplay of man and metal will continue, the aluminum guiding Wilcox, ever willing and observant, when he holds an object up and lets the highlights draw its shape.

The mind shapes the metal, and the metal shapes the mind. And in that chemistry lies the artistry of it all. □