



The 2006 Corvette Z06 introduced a unique aluminum-intensive chassis.

Quite an Auto Story Behind Lightweighting the Corvette

DETROIT – It's a scientific fact: Low weight plus high horsepower equal exhilarating performance.

That combination has defined the Corvette for six decades, as increasing power output matches the use of advanced materials to minimize curb weight.

The 2013 Corvette Z06 exemplifies that philosophy. With a curb weight of only 3,199 pounds and 505 horsepower, it is not only one of the lightest sports cars available in America, it has one of the best power-to-weight ratios of 6.33:1.

That's better than the Aston Martin DBS (7.5:1 – 510 horsepower/3,836 pounds), Porsche 911 Turbo S (6.7:1 – 530 horsepower/3,561 pounds) and Nissan GT-R (7.1:1 – 545 horsepower/3,887 pounds).

"Horsepower isn't the only measure of performance," said Harlan Charles, Corvette's marketing manager. "Balance and low weight are just as important and that's where the Corvette excels. It has a heritage of employing cutting-edge technologies and materials to help optimize performance."

Corvette's use of advanced materials began in 1953, when the first Corvettes were produced with all-fiberglass bodies. Every Corvette since has featured a composite-material body.

Fiberglass, the lightweight, rust-proof composite material, was first considered for use on a GM vehicle by legendary designer Harley Earl. Besides being an exotic choice for the early Fifties and having an undeniable weight advantage, fiberglass offered an economical way to create the low-volume Corvette without the expense of large sheet metal stamping dies.

Starting with the third generation in 1968, the body parts were manufactured with a press mold process, whereby the fiberglass material and resin were shaped in

a die-like tool that produced smoother parts more quickly. It was a significant advancement in forming technology and laid the groundwork for a change in the body panels' material in 1973.

That year, the composition changed from conventional fiberglass to sheet-molded composite, or SMC, which was composed of fiberglass, resin and a catalyst formed under high heat and pressure. The ratio of resin to fiberglass was reduced with SMC, while the fiberglass itself was a bit coarser. The new material helped produce panels that were smoother right out of the mold, resulting in higher-quality paint finishes.

All Corvettes since 1973 have used SMC body panels, but the material composition has changed dramatically, featuring less traditional fiberglass and more lightweight plastic. The early SMC material created parts that were stronger and more rigid, but more brittle.

As SMC technology and production experience evolved, Corvette engineers were able to alter the material composition and the body parts' specifications to trim the Corvette's curb weight. Mostly, that happened through making thinner body panels, because SMC was denser and stronger than conventional fiberglass.

It's rare that a next-generation model of any vehicle is lighter than its predecessor, but that was the case with the fifth-generation (C5) Corvette in 1997. In fact, the 1997 Corvette was larger overall – longer and wider – than the 1996 model, but it weighed nearly 100 pounds less. A greater emphasis on advanced materials was the reason.

The contributors that helped drive down the C5's curb weight included the use of SMC body panels with more plastic than ever be-



1953 Corvette featured a lightweight fiberglass body.

fore. The material, basically the same used in the current sixth-generation (C6) Corvette, was composed of about 40 percent resin – polyester, vinyl ester, styrene or a blend of all three – 33 percent calcium-carbonate filler, 20 percent chopped fiberglass, the remaining 7 percent is resin and hardeners that improve the out-of-mold surface finish.

The C5's panels were excep-

tionally light, but so was the Corvette's all-new chassis, which used beefy rails and hydroformed sections to provide strength with less complexity and weight. The floor sections used a sandwich of materials including featherweight balsa wood – a renewable material – to minimize mass.

That tradition continues with the C6 cars.

MSED Golf Event At Twin Lakes GC Benefits Charity

The Sales and Marketing Professionals' Golf Outing to Benefit Scholarships will be held on Weds., Aug. 22 at Twin Lakes Golf Course, located at 455 Twin Lakes Drive in Oakland Twp.

For its 20th anniversary, Marketing & Sales Executives of Detroit (MSED) is partnering with the Sales and Marketing Councils of the Original Equipment Suppliers Assn., and the Motor and Equipment Remanufacturers Assn. (MERA).

Space is still available for singles, doubles and foursomes as well as for sponsors.

Proceeds from the event will fund scholarships for college juniors and seniors pursuing careers in sales and marketing at local universities.

Since 2002, MSED has contributed over \$80,000 toward scholarships. This contribution helps sustain the future of the organization and supports its goal of fostering value for the sales and marketing profession throughout the community.

The golf outing will begin with a shotgun start at 12:30 p.m., followed by a cocktail reception from 5:30 p.m. to 7:30 p.m., which includes hors d'oeuvres, open bar, silent auction, prizes and various giveaways.

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Motorcyclists to Ride Badlands, Tibetan Plateau to Honor 110th Anniversary of Harley-Davidson

MILWAUKEE – Two groups of Harley-Davidson motorcycle riders set off last week to explore opposite corners of the globe, tracing routes across the American West and the Tibetan Plateau of China.

These adventures kick off a year-long celebration of Harley-Davidson's 110th anniversary, and for the first time the iconic American brand is inviting everyone to ride along through social media.

"Harley-Davidson's 110th anniversary year is about celebrating the experiences of riding and inviting all to join in on the good times, in ways and places our founders couldn't have imagined," said Mark-Hans Richer, Harley-Davidson chief marketing officer.

"It's a powerful way of life that bridges time and cultures. Our 110th anniversary year starts tomorrow with journeys on two continents.

"The first with a group of riders who've never before experienced the adventure of Sturgis,

and the other is on the opposite side of the world with a group of enthusiasts riding in China across the Tibetan Plateau."

One group of riders that includes GoPro-sponsored athletes will ride into the Badlands of South Dakota to experience the thrill of the legendary Sturgis Motorcycle Rally for the first time.

The annual rally, which has been hosted in the Black Hills for 72 years, draws hundreds of thousands of motorcycle enthusiasts from all corners of the world.

Another group of adventurers will head east – way east. Led by Richer and Harley-Davidson Asia Pacific Managing Director Dave Foley, this group of enthusiasts will explore the Tibetan Plateau across western China.

They'll begin their adventure in Xining, China, a 2,100-year-old city of history that is home to more than two million people and is 2,000 feet higher than the city of Denver.