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Exclusive: Callaway, Lamborghini Execs Speak Out on Carbon-Fiber Partnership

By [Kyle Stack](#) ✉ October 25, 2010 | 5:15 pm | Categories: [Equipment](#), [Science](#)



Basketball shoes are famous for the sleek design characteristics they share with the world's finest sports cars. Yet it's a different piece of sports equipment that is changing the perception for how intertwined the sports and car industries really are.

In the first phase of a long-term relationship, golf club manufacturer Callaway and legendary Italian automaker Lamborghini announced earlier this month that they had [produced a new carbon-fiber material](#) called [Forged Composite](#). The materials' nanoscale strands provide the strength and light

weight which Callaway can insert into its club heads. Lamborghini, in turn, can integrate it into the chassis of its various car models.

These symbiotic seeds were sown several years ago via other research projects, although it wasn't until 2008 when the Forged Composite research began in earnest. "We were looking for enhanced performance in terms of power-to-weight ratio," Alan Hocknell, Callaway's senior VP of R&D, told Wired.com last week in New York.

Standard golf club materials such as titanium and stainless steel don't permit Callaway to decrease club head weight to the degree that carbon fiber can. Forged Composite allows them to achieve that weight-loss goal by knocking off 10 grams (0.35 ounces) in the new Diablo Octane driver club heads. The lighter weight decreases the time it takes for a golfer's swing to strike the ball, and Callaway says the Octane's average distance has increased 8 yards over last year's titanium Diablo Edge model.

'You can define the shape you want. From an engineering perspective, you are free to design the parts like you need.'

Lamborghini has the same intention as Callaway, albeit with a different application. "It's less about increasing the power and more about decreasing the weight of the car," said Lamborghini CEO Stephan Winkelmann. To do that, Lamborghini R&D chief Maurizio Reggiani emphasized focusing on the car's chassis. The introduction of Forged Composite into the skeleton of the concept [Sesto Elemento](#) left the car's weight at 940 kilograms (2,072 pounds), roughly 60 kilos under Lamborghini's original goal. As a result, the sports car reaches 0 to 60 mph in a mind-bending 2.5 seconds. (By comparison, the ultra-fast [Lamborghini Superleggera](#) runs from 0 to 60 in 3.4 seconds.) Winkelmann called the 0.9-second decrease for the Sesto Elemento "unbelievable."

The initial research stage soaked up much of the time and money on this project, a phase which Hocknell and Reggiani described as critical. "We had to start by characterizing the material," Hocknell said. By that, he means determining the consistency of the Forged Composite needed to mold the desired shape for the product. They essentially had to learn where the fiber could and couldn't flow when heated into a mold. Discovering the time, temperature, and pressure application to find the right consistency was paramount.



The inside of last year's titanium Diablo Edge driver (left) next to the new Diablo Octane driver, made from Forged Composite technology.

Forging the material to within a thousandth of an inch gave club designers the chance to optimize weight alignment within the club head. And while emphasis was placed on the club's performance, its aesthetics also were integral.

Hocknell said that product testing showed consumers wanted to see the Forged Composite material — just not too much of it. “We came up with a window shape, which is partly an alignment aid for golfers. It's also a more dynamic presentation of the materials.”

Both companies feel as though they're just scratching the surface of Forged Composite's potential. Reggiani spoke excitedly of its malleability: “You can define the shape you want. From an engineering perspective, you are free to design the parts like you need.”

Forged Composite's efficiency and value to future products from Callaway and Lamborghini have likely erased any concerns that may have initially existed about the partnership. The divide between the sports and automotive industries isn't nearly as wide as might have been previously imagined, aside from basketball shoes. Callaway president and CEO George Fellows emphasized that point: “What you have are two companies that fundamentally have the same DNA and want to be at the cutting edge of technology.”

Images: Callaway