



**THE FIRST 100%** CARBON FIBER WHEEL



After nearly a decade of research and development, Australian based Carbon Revolution has taken the advantages of carbon fiber and exceeded all performance requirements and industry standards, to create and produce the world's first one-piece carbon fiber wheel.

With unparalleled weight savings and all associated benefits determined through its own testing regime, as well as with major premium OEMs throughout Europe, Carbon Revolution has set its trajectory on a global playing field and will be showcasing these efforts throughout the world.



# THE TECHNOLOGY



Brett Gass, Engineering Director and a founding member of Carbon Revolution, has been intricately involved in the development of the technology since its inception. Over much of the past decade the team has developed a method for creating a one-piece carbon fiber wheel by deploying a product development strategy similar to those utilized by NASA and the Department of Defense.

“Our approach not only requires attention to detail, thorough testing and a strong focus on product quality and safety,” says Gass, “but by combining design and product validation techniques that are similar to the aerospace industry, we’ve found that we can go well beyond our own industry requirements.”

Gass noted that carbon fiber wheels are really the next major evolution in automotive and aerospace wheel development. “Creating a composite wheel that is made entirely in one piece from continuous fibers is particularly challenging given the significant geometric complexities,” said Gass. “We have successfully developed an architecture that optimizes the outstanding properties of continuous carbon fibers through the complex range of operational loads that are seen on a vehicle.”

The benefits of carbon fiber have long been associated with its relative strength, light weight and stiffness. Carbon Revolution’s single piece wheel architecture produced through a patented manufacturing process reflects the remarkable properties expected from carbon fiber.



“Our advanced approach to engineering and working with a series of academic and industry partners to assist with all elements of product development, have led to the successful release of the CR-9,” continued Gass. “The Carbon Revolution Product development team is hard at work developing the next generation of industry leading wheel technology for both the world’s next generation super cars and high efficiency vehicles.”

Utilizing a testing focus that includes wheel bolt retention, rough road durability and limit handling executed on the major tracks in Europe, Carbon Revolution has additionally established a certification regime that encompasses all known OEM and Certification Body requirements including SAE 2530; TUV German Aftermarket, and German OEM AK-LH 08. Continuous test plans have additionally been executed on the Dudenhofen Proving Grounds near Frankfurt, Germany.

# THE CR-9

The first patented Carbon Revolution wheel to enter the marketplace is the CR-9, a full one-piece carbon fiber product, designed with the use of sophisticated computational modeling techniques. “Throughout our ongoing research and testing, we’ve found a way to create a continuous fiber structure,” said Gass. “With the potential for up to 50 percent weight savings compared to conventional wheel technology, our wheels are a significant ride and handling technology. Unlike typical chassis modifications that may improve handling but degrade NVH, CR wheels offer no down side, we simultaneously improve vehicle performance in acceleration, braking, steering and handling while reducing noise and vibration.”

Drawing on accepted automotive manufacturing systems and tools to ensure optimal product performance, each wheel is put through rigorous dimensional checking and a full X-Ray CT scan before being coated with an Aerospace coating system, resulting in a high grade automotive surface finish. To further ensure the part’s aesthetic performance will match its structural performance, each wheel’s coating additionally provides excellent UV, damage and water resistance.





# THE EFFICIENCY

- The direct application of Carbon Revolution's wheels to current vehicles can yield an efficiency benefit of approximately 2 – 4%, providing a significant cost saving over the life of the vehicle and leading to reduced emissions.
- Full vehicle integration of Carbon Revolution wheels can yield efficiency benefits of up to 6% or possibly more depending on type and degree of integration.

In addition to mass and inertia related efficiency gains, aerodynamic wheel designs can improve vehicle efficiency by up to 5%. Carbon Revolution manufacturing technology allows for a much less weight compromised wheel compared to aluminum. The aerodynamic design is achieved by the ability to easily manufacture thin sections in addition to the main structural components of a wheel.

The wheels are initially being produced in sizes 19x8.5 (15.4lb) & 19x12 (17.9lb) and are designed to mount directly on Porsche 911's. They are compatible with factory tire pressure monitoring systems, accept factory center caps and come complete with all required installation hardware. A broader range of fitments and sizes are now being developed for the CR9 style and will be available over the coming months. All parts will be manufactured in Carbon Revolution's Australian based production facility.

In addition, Carbon Revolution will be offering 19"x 8.5" & 19"x 12" CR-9 wheels by the end of 2012 for fitment to the following vehicles pending individual vehicle fitment assessment:

- Porsche 911
- Lamborghini Gallardo
- Audi R8

Porsche center-lock fitments are currently being developed and validated through the company's extensive testing process. New sizes and fitments for various vehicles will be coming from Carbon Revolution in 2013.



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