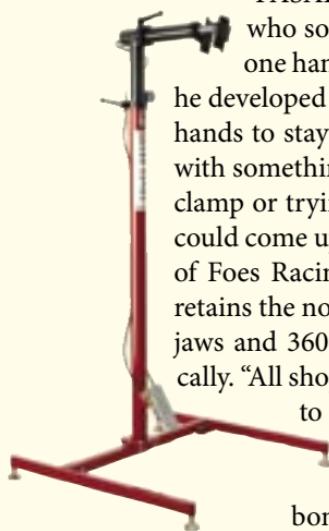


Tech Briefs

Air Clamp Keeps Mechanics' Hands on Bike



PASADENA, CA—Brent Foes empathized with mechanics who sometimes struggle lifting a bike into a work stand with one hand while they fiddle with the clamp with their other. So he developed a work stand that clamps by foot pedal, allowing both hands to stay on the bike. "I'm surprised no one else has come up with something similar. Watching guys constantly fiddling with the clamp or trying to lift a bike into a clamp with one hand, I knew I could come up with something more automatic," said Foes, founder of Foes Racing. The patent-pending design, called Power Clamp, retains the normal functions of a work-stand clamp—self-adjusting jaws and 360-degree rotation—but it opens and closes pneumatically. "All shops have compressed air and all that needs to be done is to hook the stand up to the air. I've built an air port into the stand for tools," he added. Clamping pressure is easily set and Foes said the clamp won't damage carbon frames. With a small CO₂ bottle the stand becomes portable for race or expo support. Foes said users can expect about 300 clamps from a CO₂ bottle. A single-head Power Clamp retails for \$995; a dual-head Power Clamp for \$1,665. Foes Racing offers shops volume discounts.

Racing Helmet Delivers Comfort, Larger Vents

NEWPORT, VT—Aero helmets used to be designed to offer a very short list of features: cheat the wind, be slippery and create no drag. Rider comfort was off the wish list. But Louis Garneau aims to change that with its \$180 Supperleggera aero helmet, the company's most slippery helmet to date. The Supperleggera comes with five huge vents and weighs only 340 grams. It features a new texturized frontal area that simulates a golf ball. "Wind tunnel testing of the golf ball-like dimples showed quite an improvement. And the new vents, while much larger than the vents on Rocket Air, are also lower in drag," said Kim Hackett, Louis Garneau's purchasing manager. The company also centered the helmet's balance point to relieve neck strain, allowing riders to hold an aero position for hours. Garneau's original aero helmet, the Rocket, had no vents. But quite a bit of engineering and wind-tunnel testing later, the company learned how to design low-drag vents. "The Rocket Air is a popular helmet with triathletes, but they wanted more cooling and they wanted better helmet balance. So that's what we delivered with the Supperleggera," Hackett said. The Bouygues-Telecom team wore the helmet during the final prologue of the Tour de France. The company will continue tweaking the design this fall to finalize its shape for 2009 delivery.

A close-up photograph of the front of a white Louis Garneau Supperleggera aero helmet. The helmet has a textured, dimpled front panel and a large, circular vent on the side. The brand name "GARNEAU" is printed on the side panel.

NASA Makes Inroads into Carbon Toughness

HUNTSVILLE, AL—NASA has been working on increasing toughness of its high-pressure fuel tanks. Its scientists have developed a hybrid material they tout as a huge improvement for composite structures. Thomas DeLay of Marshall Space Flight Center, and James Patterson and Michael Olson of Hypercomp Engineering developed a hybrid material using carbon fibers mixed with poly-phenylene benzobisoxazole (PBO) fibers that shows a huge improvement in shrugging off low-speed impacts such as dropped tools. As bike designers know, traditional methods of increasing low-speed impact resistance usually add weight by increasing wall thickness or adding protective materials like toughened epoxies or tough fibers like aramid and kevlar. While tough, aramid and kevlar fibers are not as stiff as carbon, so they contribute little to the structural properties. The new PBO fibers have more than twice the strength and stiffness of aramid, so NASA scientists found that while PBO fibers toughen a structure, they also contribute to a structure's strength and stiffness, allowing wall thickness to be scaled down. NASA has a patent pending on its carbon PBO hybrid composites.