



Dr. Clem Hiel. Photo by Brian L. Gillogly

On The Cutting Edge

"You have to disconnect yourself from the past. That's how you move into the future. That's how you create and innovate."

by Brian L. Gillogly

Dr. Clem Hiel is a trailblazer on the frontier of Space Age "composite materials." Defined as super-materials composed of two or more components, advanced composites are being utilized in everything from tennis rackets to boat masts to Formula One cars. Hiel and his "incredible team" of employees at Composite Support & Solutions Inc. in San Pedro are known for thinking out of the box, merging special resins or ceramics with graphite and glass fibers to take composites in novel directions. The Rancho Palos Verdes resident, in fact, has won several prestigious international awards for breakthroughs in the field, including: firewalls to protect transformers along our aged electrical grid, snap joint units capable of being quickly assembled into huge communication towers, and even a total redesign of the common bread baking pan.

A former NASA engineer and a professor at the University of Brussels, Hiel is actually a native of Belgium. He makes no apologies for his telltale accent, despite over 20 years living and working in this country. Instead, he brings it up as an exam-

ple of our strong attachment to the familiar and how that urge can inhibit innovation.

"It just shows how incredibly hard it is to disconnect ourselves from our past. And it applies to my field too. Often engineers are only looking for things they know. For example, they may construct a part in composite materials in exactly the same shape as they would in steel, because they are familiar with that part in steel. But it very well may be that in a composite material it shouldn't look like that at all to be functional and a good product."

A primary advantage of composites is that strength can be focused where it's most critical. "You can design the material for its function and have the fibers directed to carry the loads. This cannot be done with any other material. When you buy a piece of steel or aluminum and you are stuck, because the strength is the same in all the directions. If you want a lightweight material with superior strength and stiffness, then you need a composite."

Hiel's 10-year career at the NASA Ames

Research Center in the Silicon Valley also gives him particular insight into the fire retardant properties of certain composites. This background was put to the test in the development of his revolutionary firewall to contain conflagrations between clusters of electrical transformers (www.intellifirewall.com). Initially working with Southern California Edison, Hiel's company has installed 13 walls, but expects to go national and international in the coming years. "When we plug an appliance into a wall socket, we don't realize that we just hooked up to one of the most complex machines on earth. The reliability of the electrical power delivery to our homes and businesses is something we expect and take for granted. Our firewalls help keep it that way."

Hiel's snap joints, on the other hand, are both hi-tech and time tested. Molded in an epoxy, glass and carbon fiber composite, the pieces snap together with a technique that originated in traditional Japanese joinery. "The Japanese only had wood and this is how they constructed these

