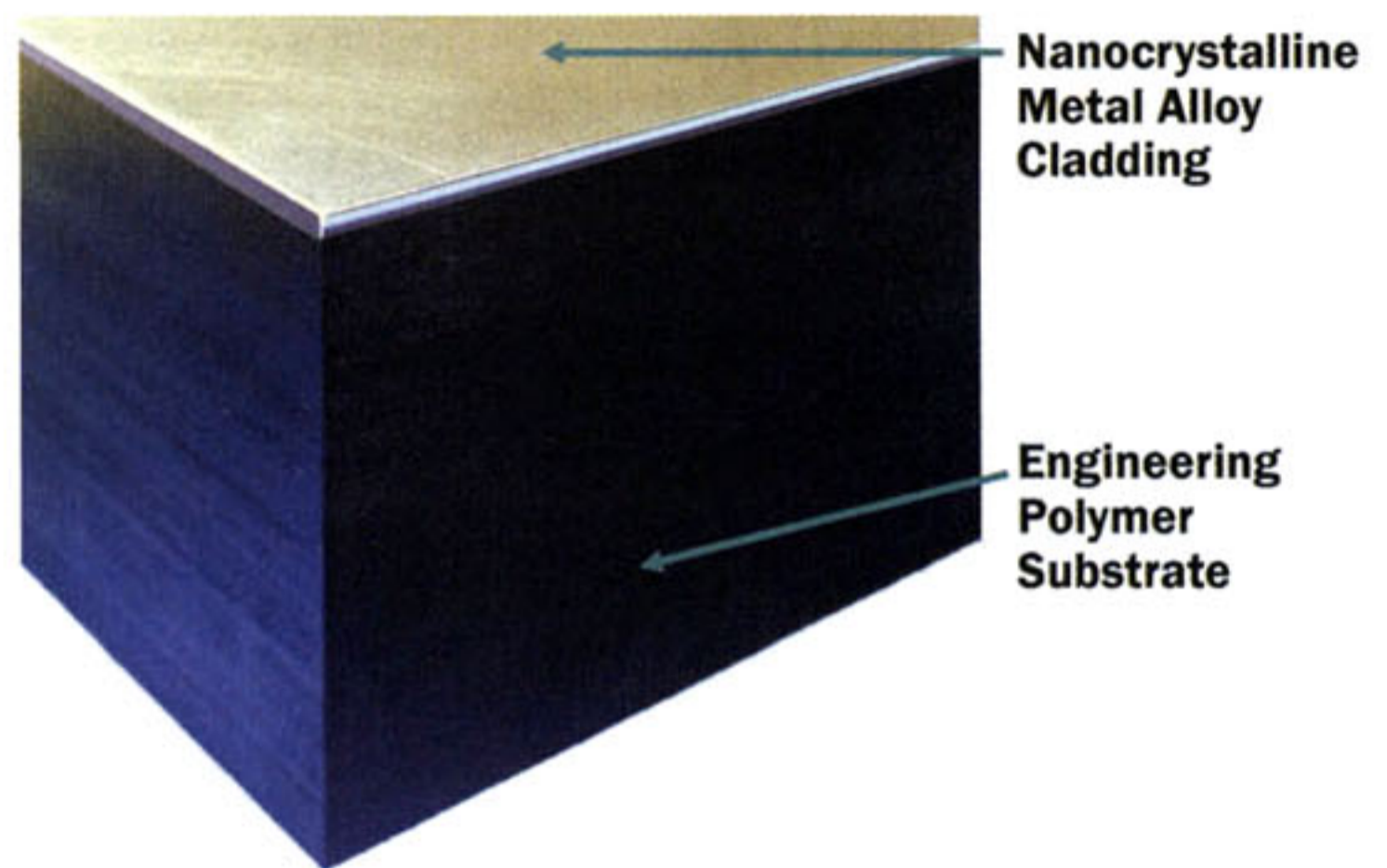


A Whole New Meaning For Plastic/Metal ‘Hybrid’

■ My vote for one of the most intriguing innovations announced at last month’s K 2007 show in Dusseldorf goes to MetaFuse “nanometal/polymer hybrids.” This is a new use of the term “hybrid,” which up to now has meant selective overmolding of plastic onto sheet metal. The idea has been to combine the strength and stiffness of metals with the light weight and design freedom of plastics. The new development from DuPont Engineering Polymers and its partners takes this theme in a new direction—putting a thin shell of metal on molded plastic, instead of the other way around. A layer only 25 to 200 microns thick can double or quadruple stiffness, strength, and impact toughness of engineering plastics. Up to now, metalizing plastics has produced only decorative coatings with no structural value.



DuPont sees a wide range of potential automotive parts, from oil pans, pumps, and brackets, to cylinder heads, and structural components of steering columns and roofs. Nonautomotive uses could include internal frames for cell phones, bicycle parts, and other consumer and sporting goods. Current work involves DuPont’s nylons (66 and HTN) and nanocrystalline nickel or nickel-iron alloy.

The metal is applied to the plastic by a patented, proprietary wet electrodeposition process. The “nano” aspect is the metal coatings’ grain sizes 1000 times smaller than conventional metals, which yields properties two to three times stronger than normal steel, plus greater hardness and wear resistance. The technology was developed by Integran Technologies Inc. of Pittsburgh and Toronto. Two Integran subsidiaries will mold and metalize plastic parts—Morph Technologies for automotive and recreational vehicles; and PowerMetal Technologies for sports and consumer goods (a golf shaft is already commercial). DuPont’s role is application development in cooperation with these others.

BY MATT NAITOVE, EDITOR