

SDK Develops New Carbon Nanofiber for Addition to Resins

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Showa Denko K.K. (SDK) has developed “VGCF-S,” a new grade of carbon nanofiber suitable for addition to resins in which electrical conductivity is required. SDK has already commercialized vapor-grown carbon fiber (VGCF) with a diameter of 150 nm for use in lithium ion batteries. With the development of “VGCF-S,” SDK will accelerate the development of new applications for multi-walled carbon nanofiber.

Carbon nanofiber tends to exhibit more useful characteristics as its diameter becomes smaller, but it also means that the handling—dispersion and blending—of carbon nanofiber becomes more difficult. However, when added to resins, the newly developed “VGCF-S” provides electrical conductivity equal to that of carbon nanotube (CNT, having a diameter of approx. 20 nm) and, at the same time, enables high dispersion and blending into base material.

In the development of “VGCF-S,” SDK utilized its VGCF technology developed jointly with Prof. Morinobu Endo of Shinshu University. SDK is the sole commercial producer in the world of VGCF, producing 40 tons a year. SDK has developed “VGCF-S” by optimizing the diameter and length of VGCF to achieve high electrical conductivity and good handling properties.

“VGCF-S” can be added to resins to produce highly antistatic trays and jigs for clean rooms. The resultant trays and jigs can protect fine circuits of electronic devices by preventing discharge of static electricity. Some customers have already started using “VGCF-S” for this application and expressed a great deal of satisfaction. Furthermore, “VGCF-S” can also impart to base material heat conductivity, electromagnetic shielding, and sliding properties. SDK will develop new applications for this material by fully utilizing the combination of these useful properties.

	VGCF-S	VGCF	CNT
Fiber diameter (nm)	100	150	20
Fiber length (μm)	10	9	--
Aspect ratio (Fiber length/diameter)	100	60	--
Conductivity (powder resistivity: Ωcm)	0.010	0.013	0.010
Dispersion	Good	Good	Not good

SDK has established “VGCF-S” production technology and is planning to begin commercial production in 2005. SDK expects to start selling 30 tons per year of “VGCF-S” in 2008.

In October last year, SDK established MEFS Co., Ltd., a joint venture with Prof. Endo, to speedily develop new applications for advanced ceramic materials, including carbon nanofiber. SDK will continue to strengthen the foundation of its fine carbon business by commercializing the fruits of R&D by MEFS and its own laboratories.