

# PRESS RELEASE

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## THE SPECIALTY GROUP PIONEERS UV CURING RESIN TECHNOLOGY

**MELBOURNE – April 1<sup>st</sup>, 2003** - Moorabbin based technology manufacturer, The Specialty Group, announced today that it has pioneered a revolutionary Australian made resin system for use in composite manufacturing that requires no catalyst or mixing, has an indefinite shelf life, and cures in minutes through photo-initiation with minimal styrene emissions when it is exposed to ultraviolet (UV) light. The technology breakthrough sounds too good to be true and may just provide manufacturers with a whole new system which could revolutionize how a varied array of industrial parts are made.

Lead composites research Scientist, Dr. Floreanna Coman, who has been developing the technology for several years states, "As companies globally move more and more from metals to composites, the industry's prime innovation is now characterized by the search for faster production line speeds and easier to use materials".

The Specialty Group intends to manufacture and sell its UV curable resin system as an already impregnated fibre glass product that will enable companies to purchase roll lengths of UV curable "prepregs" and do away with most of the "hand lay up" or resin infusion process altogether.

Dr. Coman explains, "The technology works using three light parameters for successful UV cure: 1) the correct wavelength, 2) sufficient brightness or radiant energy (referred to in the UV cure industry as "peak irradiance") and 3) the appropriate "dosage," or the amount of energy delivered to the part over time. First, the issue of wavelength: although UV light is often referred to as a single entity, practitioners typically divide the UV spectrum into discrete chunks, classified as UV-A, UV-B or UV-C, depending on wavelength. The "A" category contains the longest wavelengths (ranging from about 315 to 400 nanometers (nm), the closest to visible light) and C is the shortest (between 200 and 280 nm). The shorter the wavelength, the more powerful the energy, but longer wavelengths are better at penetrating the resin and are not absorbed as easily by the glass reinforcement".

The UV curing process is typically best utilized in conjunction with transparent materials, which include woven glass fibre of almost every kind. Woven carbon fibre and aramid fibre or even blends thereof, which are either black or opaque can't be used in conjunction with the technology since they prevent full penetration of the light into the resin and this interrupts full curing. However, sandwich cored composites are easily made, if the core is transparent, such as in polypropylene honeycomb", She adds.

Because the photo-initiator chemistry is introduced to the resin system like any other additive, both vinyl ester and polyester resins can be made UV-curable. The science behind the technology relies on radiant energy (i.e., the UV light) cleaving an atom from the photoinitiator molecule, whereby a free radical is created that acts similarly to a peroxide-type catalyst, linking

with the resin molecules and causing rapid crosslinking. The photoinitiators have been designed to act in the presence of UV (or visible) light absorption in the 365-420 nm spectrum.

“The UV curing process represents the greatest recent technological breakthrough to effect high-speed industrial production of composite derived products - where cost effective set ups can be arranged easily without expensive parts and tooling”, Coman admits.

As the company begins discussions with manufacturers of boats, buses, wind turbine blades, and many other industrial parts and products, it’s likely that their technology will find its way into fiberglass shops throughout the country. But that may also going to require a re-thinking of the equipment needed from a safety, cost and ease-of-use perspective especially as fabricators have been use to hand lay up, autoclaving, or resin infusion processes.

Dr. Coman believes the health and environmental benefits as well as the increased production capabilities of curing in minutes versus up to ten hours will easily see companies embrace the change in manufacturing processes. She also feels that a low styrene environment could easily become preferred from a processing standpoint , also from a safety standpoint, because it poses a lower health risk in the type of fabrication environment common in composites.

There may also be other environmental advantages by way of energy savings to The Specialty Group’s UV curable technology. As parts cure in minutes with light, the amount of electricity required in the curing process in minimal. “We have even demonstrated that parts can be successfully cured by moving vacuum bagged moulds into full sunlight and not require electricity at all”, She adds.

And if Dr. Coman is correct the cost savings for some companies who have access to reliable outdoor lights could mean hundreds of thousands of dollars in reduced energy bills each year, something that’s going to make stakeholders and the EPA alike, very happy.

Dr. Coman and her team are currently investigating the design and creation of a full scale manufacturing plant that can take their laboratory work and produce repeatable commercially available product.

“We feel very confident that we have created a very special technology here with our UV curable system, one that should lead to exciting changes within the composites industry and have wide spread economic benefits.

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