PetroFree™

Engineered Phenolic Resins

manufactured by

Paneltech International, LLC

Paneltech's innovative **PetroFree™** engineered phenolic resins include naturally derived substances like cashew nut shell liquid. These resins signal a new, environmentally responsible approach to creating solid surfaces that contain no volatile organic compounds. Our goal is to design and produce the greenest resin systems possible.

PetroFree™ is a division of **Paneltech International, LLC.**

Cashew trees are native to northeastern Brazil, but are now widely grown in tropical climates.

A composite is made with resin and fibers. The strength of a composite is determined by the strength of the fibers and the ability of the cured resin to transmit stresses to the fibers.

Cellulose fibers derived from trees and plants are surprisingly strong. Mechanical properties compare with metals and synthetic fibers like glass. Replacing the petroleum-derived, synthetic fibers that are most commonly used in composites with cellulose substantially reduces greenhouse gas emissions (see Sain and Panthapulakkal, **Green Composites**, 2004).

Paneltech uses cellulose produced from discarded office paper and cardboard containers in the production of **PaperStone** and **RainStone**. But there is an opportunity to produce extremely strong, affordable composites – with or without cellulose fibers – and reduce greenhouse gases even further. Paneltech's PetroFree™ phenolic resins are derived from plant-based and industrial by-product sources eliminating the need for synthetic, petroleum-derived resins.

Phenolic resins have been around for a very long time. The World War II era British 'Spitfire' fighter aircraft featured a fuselage made from a phenolic resin and flax fiber composite. And phenolic composites have an excellent performance reputation. Phenolic resin based composites produced with cellulose (or other fibers) have superior tensile strength, modulus of elasticity, compressive strength, flexural and impact strength, moisture absorption and flammability resistance.

With growing concern over the use of fossil reserves as feedstock and environmental concerns over the ultimate disposal of polymer products. The stage seems set for the widespread adoption of so-called 'green', 'eco' or 'biopolymers.'

Tucker and Johnson
Low Environmental Impact Polymers

Krishan Sudan, Master of Phenolic Resins

After a long and distinguished career that has taken him around the world, Krishan Sudan, Paneltech's technical director, is arguably the 'old master' of phenolic resin design and production.
Born in India, Krishan eventually emigrated to Germany where he spent his earlier years conducting research and creating safe, synthetic resin compounds and paper overlays. He then took his research and 'safe chemistry' concepts to companies in Canada, Italy, Japan and the U.S., always searching for better ways to make safe, useful, exceptionally strong resins out of materials most discarded as useless.
Beginning in 2002, Krishan helped Paneltech design and then build a new resin system/composite development lab and a new resin plant. He has subsequently employed his considerable skills and experience to develop and produce specialty, high performance resins from industrial by-products and renewable, natural raw materials like cashew nut shell liquid.
The result is a continuous stream of innovative composite resin systems that perform without compromise, don't require further depletion of the world's remaining petroleum reserves and do not cause harm to our health or environment.

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