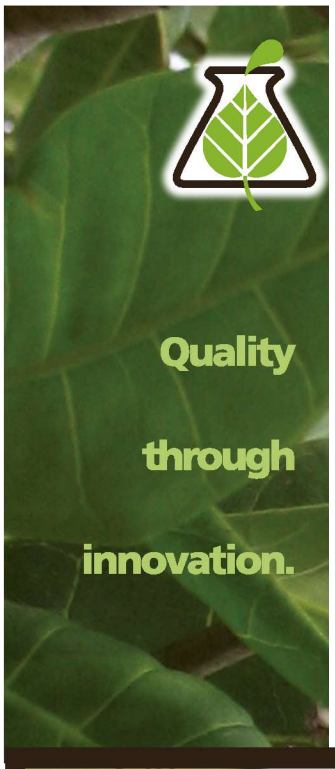

PetroFree™

Engineered Phenolic Resins

manufactured by

Paneltech International LLC

The People at Paneltech, makers of PaperStone, designed and built resin manufacturing capacity and formulated its proprietary resins to utilize a substitute raw material for what otherwise would be a petroleum derivative. This substitute raw material is a by-product of another manufacturing process. Demand for this by-product was limited and excess was used for boiler fuel when the PaperStone team identified it and proved it as a high quality substitute to eliminate the need for petroleum derivatives in PaperStone, leading to the PetroFree designation.

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®**.

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™ resins are made using alternatives to petroleum based raw materials.

Resins are necessary to bind the fibers to form a solid composite. Phenolic resins, used for this purpose, 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