



*Structured Composites and Integrated Media
for the Specialized Materials Market*

Intelligence by design





CONQUER TECHNOLOGY ROADBLOCKS

For 200 years, companies have turned to Knowlton's knowledge, technology and service expertise to increase sales and profitability by helping launch technologically advanced, structurally sound products and processes for wet-laid substrates and solvent saturated media.

Our web solutions run the gamut. From accelerated prototypes to the manufacture of wet-laid non-wovens and complex composite media structures, Knowlton possesses the expertise, experience and insight to transform technology obstacles into a new generation of commercial successes.

Process to "wet lay" non-cellulose friction composites



62% pan pre-oxidized
fiber 168x

Melamine formaldehyde
micro-fiber 280x

The demands of the automotive friction market called for the continuous development of high tech friction media materials with greater thermal stability and stable torque performance. Knowlton's development group met the challenge by developing several processes to manufacture totally non-cellulose friction materials on Fourdiner equipment, while constantly finding new ways to continuously improve upon these unique processes.

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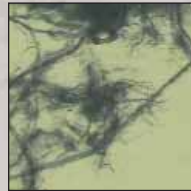


WEIRD SCIENCE

We explore science like no one else, creating exotic structured media utilizing a host of diverse materials and fibers to create high strength, energy-saving alternatives as strong as steel – but with a fraction of the weight. In addition, our capability to handle many operations (i.e.: laminations, chemical treatments, etc.) enables us to meet exacting customer requirements quickly and cost-effectively.

Our wet-end chemistry expertise is a core foundation, upon which we build composite webs from materials normally deemed next-to-impossible to include in a wet-laid process. While others may take months or years – or even give up – Knowlton engineers process complicated materials in a few hours, or a few days.

A high temperature resin compound for military/ aerospace hydraulics



*Fibrillated aramid pulp
280x*

A high temperature resin compound for military/ aerospace hydraulics was requested. The Aerospace Industry needed a flexible resin system that could survive the high temperatures and brutal environment of helicopter hydraulic systems. The Knowlton team developed a high temperature resin compound to exceed the requirements of these extreme conditions.

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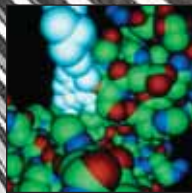


LEAP TALL BUILDINGS

Knowlton goes above and beyond, blending our knowledge, technology and tenacity with our substantial manufacturing facilities and service commitment. In fact, we've literally transformed technology into art, pioneering the development, design and production of a broad range of innovative composite materials.

Our most important resources however, are the creative minds needed to turn bright ideas into exciting products that will expand your business. We will develop, prototype, test and produce the material with our cutting-edge processes through sound research and development.

Process to suspend mineral granules in high temperature ceramic insulation



Nano acrylic fibrils 280x

An automotive components OEM had a conceptual formula for a media whose composition was primarily made up of mineral granules much heavier than water. The Knowlton team developed an ionic-controlled process to suspend the materials in a greater than 95% aqueous system to form into a wet-laid composite media.

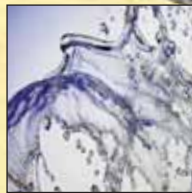
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CHEMISTRY CREATES SUCCESS

Within the "Hyper-Specialty" material segment, we remain steadfast to our customers' needs, applying our "problem-solving expertise" to develop technical applications, products and processes. But there's more. Applying the right chemistry to meet the needs of our customers means working in partnerships within select markets where our technical and service capabilities add value. It's about asking the tough questions and working hard to understand our customer's expectations and true end-use requirements. From rigid company-wide adherence to confidentiality, to our niche collaborations – as needed – with other mills, you'll quickly discover we're more than just another paper company.

A silicious media to protect military armament PC components



Cut end of silicon carbide
fiber 168x



When preparing delicate computer components for shipping as part of a military/defense contract, a customer needed to protect the components in a wet environment, while at the same time not expose them to damage from an absorbent pack. Knowlton engineers developed a process to wet lay a technical board material that acted as a silica absorbent and provide the protection and security needed while the components were in transit.

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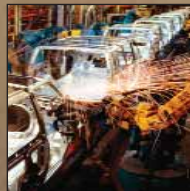


NO MORE PAIN

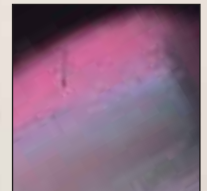
Sick of dealing with all those technology roadblocks? Whether in processes, materials or development, Knowlton has the experience and expertise to solve your wet-laid problems. Give us the opportunity and we'll show you how we make technology meet performance.

When the task is tough and the stakes are high, challenge us! Call on the knowledge of Knowlton. Even if you cannot imagine how to put a material into a web, we can, and will, or it can't be done!

A process to hold carbon-char in place for intumescent barriers



Crystalline graphite structure in oil 168x



Cornerview of alumina ceramic composite mat 56x

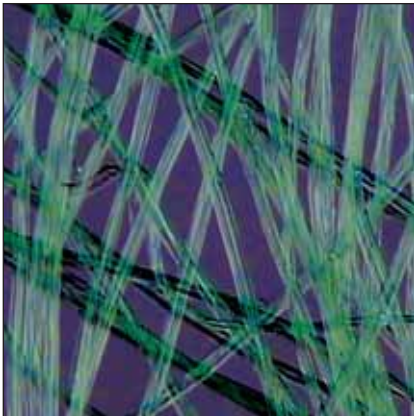
Knowlton developed a specialized densifying process for a proprietary thermoset polymer that resulted in a high performance fire and flame retardant barrier. This combines notably longer thermal defense and burn-through protection characteristics as the product swells as a result of heat exposure.

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THE KNOWLEDGE OF KNOWLTON

Customers come to Knowlton because we know how to make products where others fail.

- Rapid proto-typing & sample development
- Removal of technical roadblocks
- Development of intellectual property
- Design, engineering and manufacture of wet-laid non-wovens
- Solvent saturation services
- Material processing specialists
- Custom designed webs, veils, sheets, prepregs and pre-form webs
- Fire retardants, heat, noise and radio frequency shields/substrates
- Conductive and non-conductive media and papers
- Porous, absorbent and anti-corrosive media
- Performance & filled composite media development
- Micro-glass media



3DPF polyester fibers



Aspen hardwood vessels



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