ALPHAMIRROR

OTFAMP 10-601

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus OH 43215

10/12/2009

Re: 2010 OTFAMP LOI

To whom it may concern:
This letter is to inform you that Alphamirror Inc. intends to submit a proposal for Ohio Third Frontier FY2010 Advanced Material Program.

Lead Applicant:
Alphamirror Inc,
1950 State Route 59.
Kent, OH
Phone: 2167735487.

Contact person:
Yehuda Borenstein
Alphamirror CEO
yehuda@alphamirror.com

Project Title:
Manufacturing of Plastic Liquid Crystal Auto Dimming Mirror.

Estimated Grant Funds to be requested:
$1,000,000

Known Partners\Collaborators:
Magna Mirrors GmbH & Co. KG
AlphaMicron Inc.
Elbit Systems

Project Summary:
Alphamirror proposes to develop a plastic auto dimming liquid crystal mirror using AlphaMicron VALiD technology. The auto dimming mirror will be used as interior and exterior automotive mirrors that will protect the driver vision at night. The scope of the proposed project is to commoditize the technology and adapt the process to meet the OEM automotive specifications.

It is anticipated that the program will lead to manufacturing of auto dimming mirrors based on liquid crystal for automotive market in the USA and would wide.

Sincerely,
Yehuda Borenstein
Alphamirror CEO.

OTFAMP 10-602

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Re: 2010 OTFAMP LOI

October 8, 2009

To Whom It May Concern:

This letter is to inform you that AlphaMicron Inc. intends to submit a proposal for Ohio Third Frontier FY2010 Advanced Materials Program

Lead Applicant:
AlphaMicron Inc.
1950 State Route 59
Kent, OH 44240
Phone: 330-676-0648

Contact Person:
Roy E. Miller IV
Director of Technical Sales and Marketing
roy@alphamicron.com

Project Title:
Commercialization and Manufacturing of Electronically Controllable Liquid Crystal Motorcycle Visors

Estimated Grant Funds to be Requested:
$1,000,000

Known Collaborators:
Akuma Helmets
Suomy Helmets
AGV Helmets
UVEX Helmets

Project Summary:
AlphaMicron proposes to commercialize their liquid crystal VALiD technology into the market of motorcycle helmets. The electronically controllable liquid crystal motorcycle visor addresses a current need in the motorcycle industry, enabling the rider to control the amount of transmitted light through the visor. Several companies have already requested samples and are doing testing. The team is ready to create final commercial prototypes and introduce a groundbreaking technology into the motorcycle market.

It is anticipated that the program will lead to manufacturing of several thousand motorcycle visors geared toward OEM manufacturers and to an aftermarket application as well.

Sincerely,

Roy E Miller IV
Director of Technical Sales and Marketing

OTFAMP 10-603

MOMENTIVE
performance materials

Dr. Raymond F. Kolberg
President & CEO
Quartz & Ceramics
ray.kolberg@momentive.com

October 21, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Dear Ohio Department of Development:

Please accept this Letter of Intent from Momentive Performance Materials Quartz, Inc. for our Fiscal Year 2010 Ohio Third Frontier Advanced Materials Program proposal.

Lead Applicant Name:	Momentive Performance Materials Quartz, Inc.
Address:	22557 West Lunn Road Strongsville, OH 44149
Telephone:	(440) 878-5633
Contact Person:	Mr. Gregory W. Shaffer, Technology Manager
Contact Email:	gregory.shaffer@momentive.com
Project Title:	Optimized Boron Nitride and Production Efficiency for Lower Cost Polymer Composites in LED Luminaires
Estimated Grant Amount Requested:	$1 million
Known Collaborators:	The University of Akron and others to be determined

Summary of Proposed Project:

Momentive Performance Materials Quartz, Inc. ("Momentive") is a premier specialty advanced materials company, providing high technology materials solutions to the silicones, quartz and ceramics markets. The company, as a global leader with worldwide operations, has a robust product portfolio, an enduring tradition of service excellence, and industry-leading research and development capabilities.

Energy efficient lighting enables greater environmental sustainability and economic efficiencies for consumers. Light emitting diodes (LEDs) are quickly gaining popularity as substitutes for more traditional lighting sources such as incandescent and fluorescent light bulbs. In the past, LEDs were used primarily in small and/or niche applications with only moderate illumination

demands. However, with significant improvements in LED technology, LEDs are now competing with incumbent lighting technologies across a wide range of lighting applications. For example, LED-based bulbs designed to replace 40W and 60W incandescent bulbs have recently been introduced in the market. LEDs posses a number of advantages over existing lighting technologies which drive rapid adoption including, for example, higher efficiency, long lifetimes and the absence of hazardous chemicals.

To enable use in diverse lighting applications, LEDs are often assembled with other essential components into housings tailored to suit unique, application-specific demands. Momentive has recently witnessed significant and unprecedented growth in the demand for its boron nitride (BN) powders due to the surging demand for thermally conductive polymer composites used to produce LED housings.

Boron nitride is a synthetic ceramic material with several unique properties. However, the chemistry and extremely demanding processes required to produce BN make it expensive to manufacture. Apart from cost, the use of boron nitride powders in polymer composites involves technical challenges which arise from the anisotropic nature and unusually inert surface chemistry of BN. An important consequence of these technical hurdles is only moderate thermal conductivity performance of polymer-BN composites is currently achievable. A boron nitride-based composite solution offers a number of advantages over competing materials considered for LED housings; however, the high cost and technical challenges hinder widespread use.

Momentive proposes to embark on a project aimed at solving the challenges described above. Process improvement approaches will be examined to reduce BN manufacturing costs. Momentive expects to build on its relationship with the University of Akron, other Ohio collaborators, and a key customer to understand the fundamental science and engineering principles governing the use of boron nitride powders to enhance thermal conductivity of thermoplastic resin systems.

The proposed project will address technical and commercial challenges by leveraging a unique collaboration amongst Ohio's state initiatives, Ohio industry, and Ohio academic resources to build and sustain a commercially successful business for fully customized Boron Nitride Materials in Ohio. This project presents a unique opportunity to leverage Momentive's expertise to position Ohio as the leader in customized advanced materials to meet the needs of the LED luminaire industry.

Proof of concept development work has also been demonstrated and the proposed project will involve developing more efficient commercial scale processes and establishing manufacturing in Ohio to produce lower cost Boron Nitride powders. The project will include the development and installation of production scale manufacturing equipment, employing newly hired and well paid employees in an Ohio production facility.

Third Frontier funding would enable Momentive to: (1) Exceed the demands of the LED lighting industry; (2) supply global demand for Boron Nitride powders at a reduced cost through process

improvements; and (3) help position Ohio as a world leader in advanced materials development and commercialization.

Sincerely,

Dr. Raymond F. Kolberg
President & CEO
Momentive Performance Materials, Inc.
Quartz & Ceramics

OTFAMP 10-604

Hansen, Andrew

From: Lou Luedtke [lluedtke@drtechnologies.com]
Sent: Wednesday, October 28, 2009 6:26 AM
To: OTFAMP2010
Subject: 2010 OTFAMP LOI

Folks,
It is our intent to submit a proposal for the current Ohio Third Frontier Advanced Materials Program.

Lead Applicant:

Third Millennium Metals, LLC
110 E. Emmitt Avenue
Waverly, Ohio 45690

Lead Contact:

Louis A. Luedtke, CEO
937-367-7229
lluedtke@tmmetals.com

Proposed Project Title:

"Sequential Commercialization of Copper Based NanoComposites; Cu NCMs"

Estimated funds to be requested:
$1,000,000 plus potential extension.

Collaborators:

Ajax Tocco Magnethermic
American Trim
University of Toledo
Youngstown State University

Summary:

Third Millennium Metals, LLC has a proprietary process with a patent applied for, to add carbon to metals to produce nano carbon metals. The material produced with copper is called Cu NCM. This project will advance the commercialization of Cu NCMs by evaluating the design and scale-up of the furnace modifications needed to produce NCMs, by studying and applying Cu NCMs in induction furnace applications and by studying and applying Cu NCMs in thin film applications via sputtering techniques. Three sequential commercialization pathways will be followed with this grant request.

Please respond with an LOI for this effort so we may submit on December 7, 2010.

Sincerely,
Lou Luedtke, CEO
Third Millennium Metals, LLC

OTFAMP 10-605

Letter of Intent

August 19, 2009

Applicant:
Lead Applicant: Radco Industries, Inc.
Address: 3226 Frenchmens Road
Toledo OH 43607
Contact: Richard Yorde, Jr.
Tel: 419 531-4731 Ext 213 Email: richard.yorde@radcoindustries.com
Project Title: Surface Functionalized Advanced Plastic Components Through In-line Additive Infusion Manufacturing
Grant Funds to be Requested: $1,000,000.00
Known or current Collaborators: Bayer MaterialScience LLC.

Summary Proposed Project:

This project will develop a process for applying functional surface treatments to plastic parts made from engineering and biobased polymers without impacting the parts physical properties. Initial results have shown improvements and advantages of surface additive infusion over traditional method of using additives compounded in the resin. The project will utilize surface infusion of UV inhibiting organic molecules to demonstrate efficacy of the process in achieving UV stabilized parts suitable for outdoor use. The objective is to expand the use of polymer materials by increasing long term ultraviolet (UV) durability in clear plastic components.

There is an increasing need for improved UV stabilized plastics. With the attention on alternative energy and energy efficiency, many new products are and will be emerging that will become economically viable through the use of clear, UV stable, light weight plastic components. Among these are building integrated photovoltaics, lenses for concentrating solar power, and passive solar lighting as well as glazing for alternative energy vehicles and outdoor LED optics.

Bayer MaterialScience LLC is developing an eco friendly technology that allows plastic articles to be surface infused with UV performance additives. The technology relies on a reusable and recoverable aqueous solution infused through immersion. The process has been successfully implemented on a small commercial scale to infuse and produce colored parts. Radco Industries has gained experience building equipment and advancing the commercial technology of this process. Infusion has been proven to work effectively with standard industrial equipment at low temperatures as a batch operation. Initial screening experiments indicate that UV infused parts can readily match the performance of most severe applications; including those of polycarbonate sheet with 15 year outdoor exposure.

Further advancement would involve: selecting and optimizing UV additive infusion solution, infusion process optimizations, and the design and production of on-line equipment.. The project plan would also account for validation of aging and field testing on commercial full size components in collaboration with OEM's. Industry promotion and demonstration of efficacy would also follow from this development. Development of this initial step will catalyze research into the application of other surface treatments including electric conductivity, anti-microbial and scratch resistance.

Letter of Intent
2010 Ohio Third Frontier Advanced Materials Program

Lead Applicant: Angstron Materials Co.
1240 McCook Ave. Dayton, Ohio 45404
Phone (937) 331-9881

Contact Person: Dr. Aruna Zhamu
ArunaZhamu@gmail.com

Project Title: Large-Scale Production of Functionalized Nano Graphene Materials

Estimated Grant Funds Requested: $1,000,000

Known Collaborators: Wright State University

Project Summary:

Nanomaterials are considered one of the leading emerging technologies with near-term growth and investment opportunities. However, a major hurdle for the widespread market acceptance of nanomaterials is making the material affordable and commercially available in large quantities. This proposed effort is designed to overcome this significant economic and technical hurdle.

Specifically, this effort will introduce a new, inexpensive nanomaterial – Nano Graphene Platelets (NGPs) – to a world market hungry for affordable nanomaterials. NGPs exhibit exceptional properties as other carbon nanomaterials, such as carbon nano-fibers (CNFs) and carbon nanotubes (CNTs), but can be mass-produced at much lower costs. Most significantly, NGPs have recently been proven to exhibit the highest intrinsic strength and highest thermal conductivity among all the existing materials.

Angstron Materials Co., the original developer of pristine NGP compositions and several breakthrough processes for mass-manufacturing NGPs, is currently a global leader in the research, development and production of NGPs. Angstron is not just the first to bring NGPs to the market. More importantly, with 20+ issued or pending US patents, several pending international patents related to NGPs, and a proactive R&D program, Angstron will maintain its competitive advantages for many years to come. This project will focus on introducing NGP into several key markets: polymer nanocomposites and energy storage, i.e., lithium-based batteries, fuel cells, and supercapacitors.

The proposed work will achieve the following technical objectives: (a) Development of the mass production capability of making functionalized NGPs of desired geometries and properties, with a specific goal of scaling up and optimizing the processes for cost-effectively manufacturing ultra-thin NGPs (e.g., < 1-5 graphene layers) in large quantities through a fundamental understanding of various process parameters; (b) Scale up of functionalized NGP production line; and (c) Development and commercialization of NGP-enhanced products. The team will work with selected customers and business partners to co-develop prototype devices or components that meet cost and performance requirements.

OTFAMP 10-607

NEASE PERFORMANCE CHEMICALS

October 29, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Dear Ohio Department of Development:

Please accept this Letter of Intent from Nease Corporation for our Fiscal Year 2010 Ohio Third Frontier Advanced Materials Program proposal.

Lead Applicant Name:	Nease Corporation
Address:	4480 Lake Forest Drive Suite 312 Cincinnati, Ohio 45242
Telephone:	513-587-2800
Contact Person:	Philip C. Benes, Director of Technology and Product Development
Contact Email:	phil.benes@neasecorp.com
Project Title:	Development of Commercially Superior Bio-Based Hydrotropes
Estimated Grant Amount Requested:	$1,000,000
Known Collaborators:	The University of Cincinnati

Summary of Proposed Project:

Nease Corporation ("Nease") has been manufacturing reliable and customized hydrotropes since 1959. Through more than five decades of industry experience, Nease has established an outstanding reputation for customer service and product innovation. Today, Nease's product line includes hydrotropes, acid catalysts, naphthalene sulfonates, and various other specialty advanced materials.

As a leader in the production of sulfonated aromatics, Nease has a broad hydrotrope line complemented by an expanding capacity for specialty products with a strong foundation in sulfonation technology. These hydrotropes are based on refinery petrochemical products

NEASE CORPORATION
Performance Chemicals

Philip C. Benes
Director of Technology and Product Development

4480 Lake Forest Drive, Suite 312
Blue Ash, Ohio 45242
Tel: 513-587-2804
Fax: 513-587-2828
phil.benes@neasecorp.com

NEASE PERFORMANCE CHEMICALS

including toluene, xylene, and cumene, which are chemically reacted and purified in the Nease plant in Harrison, Ohio. Functionally, these hydrotropes are used to couple various cleaning surfactants into water formulations. These hydrotrope products are widely used in conjunction with surfactants in many consumer, industrial, and institutional cleaning products, such as laundry detergents, hand dish soaps, and various hard surface cleaners.

Since the most effective hydrotropes on the market utilize petroleum bases, a strong movement exists within the industry, especially among surfactant producers, to offer "sustainable" products based upon environmentally friendly bio-based materials. A number of surfactants offer the performance needed to replace traditional products, although these products often carry a premium. While current non-petroleum based bio-hydrotropes (known as alkyl polyglucosides or "APGs") offer the benefits of renewable sources and superior biodegradability, they offer a poor efficacy compared to traditional non-renewable hydrotropes. To date, no comparable alternative to petroleum based hyrdrotropes exist that can competitively match efficacy while utilizing green resources.

With Ohio Third Frontier and match funding, Nease and its collaborators propose to develop and commercialize an environmentally friendly hydrotrope to enhance and potentially replace current hydrotrope products derived from crude oil. This new product will be based on a renewable, naturally based feedstock and will satisfy industry standards for biodegradability and toxicity.

The bio-based hydrotropes developed during the project period are forecasted to capture significant market share, as Nease will fulfill a significant market need for cost effective environmentally friendly hydrotropes. Nease has developed a laboratory scale process, similar to the traditional petroleum based technology produced at the Nease Harrison, Ohio production plant. In addition, Nease has received preliminary encouragement from a large committed end user with the capability to incorporate the new bio-based hydrotropes in its line of products sold around the globe.

Following the confirmation of product economies and potential commercial pricing, expansion of customer sampling, pilot production and scale-up, and the production of commercial quantities, Nease expects to have a commercialized product within 24 months of the project's commencement. Taken together, Third Frontier funding would enable Nease to become a leading supplier of commercially validated and superior bio-based hydrotropes which fulfill well defined end user needs for sustainable products. The proposed project will strengthen Ohio's position as a global advanced materials industry leader.

Sincerely,

Philip C. Benes

Customized Performance – Innovative Expertise

NEASE CORPORATION
Performance Chemicals

Philip C. Benes
Director of Technology and Product Development

4480 Lake Forest Drive, Suite 312
Blue Ash, Ohio 45242
Tel: 513-587-2804
Fax: 513-587-2828
phil.benes@neasecorp.com

OTFAMP 10-608

Letter of Intent

Ohio Third Frontier Advanced Materials Program (FY2010)

Project Title:

Bistable nematic liquid crystal display devices based on nanostructured surface alignment

Estimated Grant Funds:

$1,000,000.00

Lead Applicant

Liquid Crystal Institute, Kent State University

Kent, Ohio 44242

Phone: 330-672-2654

http://www.lci.kent.edu/

Contact Person:

Hiroshi Yokoyama, Ph.D.

Ohio Research Scholar & Professor of Chemical Physics

Phone: 330-672-2633, E-mail: hyokoyam@kent.edu

http://www.nanolog.jp/mysite/

Collaborator

LXD, Incorporated

7630 First Place, Cleveland, Ohio 44146

Phone: 440-786-8700

http://www.lxdinc.com/

Contact Person:

Kevin (Hailiang) Zhang, PhD.

Director of R&D

Phone: 440-786-8700 ext:229 , Fax: 440-786-8711

E-mail: kzhang@lxdinc.com

Bistable nematic liquid crystal display devices based on nanostructured surface alignment

Project Outline:

The objective of this project is to develop and commercialize bistable (memory) "nematic" liquid crystal display devices based on the nanostructured surface alignment (NSA) technology. The bistability allows drastic reduction of energy consumption and opens up an entirely new area of consumer market such as electronic books/magazines/news papers, solar powered price tags and smart ID/credit/medical cards, rewritable wall paper, paint, packages or apparels, to name but a few. The liquid crystal TV industry, which was born at the Liquid Crystal Institute, Kent State University 30 years ago, has created 100 Billion dollar market and millions of jobs worldwide. The low or zero-energy consumption display will be the key to the second revolution of liquid crystal technology that pushes the liquid crystal industry to another dimension.

The nanostructured surface alignment (NSA) technology was invented by Hiroshi Yokoyama and his colleagues in 2001 [1,2], and is multiply patented globally [3]. After eight years since its inception, the technology has been brought up from the academic proof-of-concept level to the product demonstration level by successfully addressing the critical manufacturing issues. Unlike the existing bistable liquid crystal devices that require a special type of liquid crystal materials, the NSA technology is fully compatible with the nematic liquid crystals and their processing methods used in LCD TVs.

The 5-year project is the joint effort of the Liquid Crystal Institute and LXD Incorporated, and will focus for the first two years on the production and design issues of the NSA technology-based bistable nematic devices. LXD Inc. is a leading company in Custom Module Display design and manufacturing utilizing nematic liquid crystals with over 35 years of history. Located in Cleveland, LXD Inc. is the perfect partner of the Liquid Crystal Institute to closely collaborate on this ground breaking commercialization project toward the next generation liquid crystal displays.

About the technology:

The nanostructured surface alignment (NSA) technology is based on the idea to split the surface of a liquid crystal cell glass into small domains (nominally less than 1μmX1μm) with different local molecular orientations. The patterned alignment surface is theoretically shown to generate multiple stable alignments, which was experimentally proven by using the scanning probe microscope[1]. For manufacturing of practical size devices, the photo-alignment method has been recently successfully employed to demonstrate 40mmX40mm size bistable display [2].

1. J. Kim, M. Yoneya and H. Yokoyama: *Nature* **420**, 159(2002).
2. J. Niitsuma, M. Yoneya and H. Yokoyama: *Appl. Phys. Lett.* **92**,
3. US 7,342,628, Liquid crystal display device

OTFAMP 10-609

Letter of Intent

Ohio Third Frontier Advanced Materials Program (FY2010)

Lead Applicant: LXD L.L.C
7630 First Place
Cleveland , Ohio 44146

Contact Person: Dr. Hailiang Zhang
Director of Research and development
Email: kzhang@lxdinc.com
Phone: 1-440-786-8700 ext: 229

Project title: Switchable Energy-Saving Windows Based on Advanced Liquid Crystal and Polymer Materials

Anticipated grants funds to be requested: $1,000,000

Known collaborators:

Kent State University
Professor Deng-Ke Yang
Department of Chemical Physics
Email: dyang@kent.edu
Phone: (330) 672-2565

Akron Polymer Systems
2990 Gilchrist Rd.
Akron, OH 44305

Proposal Summary

Statistics provided by the Department of Energy (DOE) indicate that the windows of residential and commercial buildings typically contribute ~30 percent to their overall heating and cooling loads which translates to an annual energy cost of more than 4.4 quadrillion Btu (quads) in the US alone. Traditional windows transmit solar radiation in the summer which increases cooling costs. Some currently available windows reduce the low solar heat gain coefficient (SHGC) by using an invisible, spectrally selective low-emittance (low-E) coating between the panes of dual-glazed windows. These windows reduce heat gain in the summer, but also reduce beneficial heat gain in the winter. This issue has been partially addressed by polymer-dispersed liquid crystal (PDLC) windows which can be turned on and off depending on the weather conditions, but these windows are relatively inefficient at reducing the SHGC and introduce more haze into the window. Thus there is still significant demand for windows that can tune the SHGC across a wide range to provide energy savings in both the summer and winter with reduced haze levels in the transparent state.

Leveraging LXD's experience in the development and production of liquid crystal devices, and the extensive R&D experience of Professor Deng-Ke Yang of Kent State University (KSU) in liquid crystals and Akron Polymer System (APS) in polymer materials, we will develop a switchable energy saving window with a SHGC that can be tuned across a wide range. Our energy-saving window is based on the innovative integration of an optimized polymer-stabilized cholesteric texture (PSCT) panel (as shown in Fig.1) and a polymer cholesteric thin film with a broad reflection band. Compared with other approaches such as polymer-dispersed liquid crystal (PDLC) windows and dye absorption based light-adjustable windows, this technology has several advantages including a haze-free, high transmission (high SHGC) transparent state with a large viewing angle, and a high reflection (low SHGC) heat-blocking state. The proposed bi-stable system minimizes electrical power usage, and can be fabricated using a mature manufacturing process for low-cost high volume production which improves the economics of this product.

The overall objective of this project is to design, fabricate, test, optimize, and commercialize a switchable energy-saving window that controls the solar heat gain of buildings. Specifically, the project involves collaborative efforts in three areas: 1): optimization of the design, materials and fabrication process, with optimized design parameters for polymer cholesteric films and demonstration of small PSCT panels by professor Deng-Ke Yang's research group; 2): design, fabrication, testing, and optimization of the polymer cholesteric film by Akron Polymer System (APS); 3): Process optimization, fabrication, performance and reliability testing, and commercialization of large energy-saving windows with integration of large PSCT panel and polymer cholesteric films by LXD. A successful project will expand the market for switchable energy saving windows to include geographic areas with cooler or cloudier climates that can be commercialized to compete favorably with current Low-E windows and PDLC dynamic windows on the basis of both economics and performance.

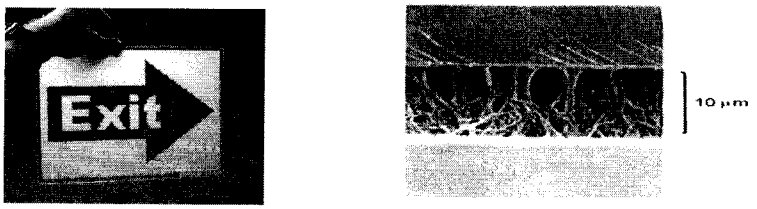


Fig.1. A PSCT panel fabricated in LXD (a); A microscopic image of polymer network of a PSCT sample from Professor Deng-Ke Yang's research work (b).

OTFAMP 10-610

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

October 30, 2009

Letter of Intent to submit a proposal to Third Frontier Advanced Materials Program

The Goodyear Tire & Rubber Company in collaboration with NASA Glenn Research Center and M-7 Technologies intends to submit a proposal to the Third Frontier Advanced Materials Program for a "Non-Pneumatic Tire Design for Heavy Vehicle Applications."

The **Lead Applicant** on this proposal will be The Goodyear Tire & Rubber Company located at 1144 East Market Street, P.O. Box 3531, Akron, OH 44309.

The **Contact Person** for this project is Chris Varley, Global Program Manager, External Science & Technology Programs for The Goodyear Tire & Rubber Company. Mr. Varley's email address is chris_varley@goodyear.com. He can also be reached by phone via 330-796-8697.

The proposed **Project Title** is "Non-Pneumatic Tire Design for Heavy Vehicle Applications."

The estimated total **Grant Funds** requested will be $1,000,000 over a two-year period.

Current **Known Collaborators** include NASA Glenn Research Center, Cleveland, OH, and M-7 Technologies, Youngstown OH.

A **One Page Summary of the Proposed Project** is provided on the following page.

Sincerely,

Surendra K. Chawla, Ph.D.
Senior Director
External Science & Technology Programs
The Goodyear Tire & Rubber Company
Innovation Center – P.O. Box 3531, Dept. 480A-5SW
Akron, OH 44309
schawla@goodyear.com
Phone: 330-796-1994
Fax: 330-796-9601

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

Project Description: Non-Pneumatic Tire Design for Heavy Vehicle Applications

Our proposal will detail a two year, $2 million project with specific milestones and deliverables that is designed to culminate in a prototype for a non-pneumatic tire that has been scaled for large vehicles operating in harsh terrain applications.

In 2007, Goodyear and NASA (through its Innovative Partnerships Program Seed Fund) jointly explored opportunities for "Generalizing Moon Tire Technology" with Mr. Vivake Asnani from NASA and Mr. Dave Glemming of Goodyear serving as co-Principal Investigators. Several important discoveries were made along the way, including the fact that NASA's load and longevity requirements suggested a radial, spring-based design. This new design provides improved obstacle enveloping, scalable load capacity, and simplified manufacturing compared to the wire-mesh design used on the original Lunar Roving Vehicle. A field test conducted on April 28, 2009 at NASA's Johnson Space Center validated that the spring-based concept has the potential to make significant contributions to NASA's mobility applications in harsh terrains, such as future planetary explorations. A video of this test can be found at:

http://www.nasa.gov/offices/ipp/video/hallmarks_moontires_index.html.

Field tests of the spring tire also suggested that, with further development, this concept could be adapted for terrestrial vehicles used in harsh terrain applications. The original scope of the NASA partnership project, however, did not allow for such development, which Goodyear now proposes. Specifically, the proposed work would explore modifications of the spring-tire design to consider:

- Traction on surfaces common to earth-vehicles including on- and off-road surfaces,
- Speeds beyond the 15 mph lunar application and consistent with common earth-vehicle operation,
- Durability and robustness commensurate with such operation,
- Manufacturing process and scalability consistent with tire volumes in the thousands.

Deliverables will include full-scale field testing of the selected design as well as a viable Ohio-based manufacturing scenario. The project is expected to last 2 years.

OTFAMP 10-611

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

October 30, 2009

Letter of Intent to submit a proposal to the Third Frontier Advanced Materials Program

The Goodyear Tire & Rubber Company in collaboration with NASA Glenn Research Center and M-7 Technologies intends to submit a proposal to the Third Frontier Advanced Materials Program for a "Non-Pneumatic Tire Design for ATV Applications."

The **Lead Applicant** on this proposal will be The Goodyear Tire & Rubber Company located at 1144 East Market Street, P.O. Box 3531, Akron, OH 44309.

The **Contact Person** for this project is Chris Varley, Global Program Manager, External Science & Technology Programs for The Goodyear Tire & Rubber Company. Mr. Varley's email address is chris_varley@goodyear.com. He can also be reached by phone via 330-796-8697.

The proposed **Project Title** is "Non-Pneumatic Tire Design for Heavy Vehicle Applications."

The estimated total **Grant Funds** requested will be $800,000 over a two-year period.

Current **Known Collaborators** include NASA Glenn Research Center, Cleveland, OH, and M-7 Technologies, Youngstown OH.

A **One Page Summary of the Proposed Project** is provided on the following page.

Sincerely,

Surendra K. Chawla, Ph.D.
Senior Director
External Science & Technology Programs
The Goodyear Tire & Rubber Company
Innovation Center – P.O. Box 3531, Dept. 480A-5SW
Akron, OH 44309
schawla@goodyear.com
Phone: 330-796-1994
Fax: 330-796-9601

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

Project Description: Non-Pneumatic Tire Design for ATV Applications

Our proposal will outline a two year, $1.6 million project with specific milestones and deliverables that is designed to culminate in a prototype for a non-pneumatic tire that has been scaled for all-terrain vehicle (ATV) applications.

In 2007, Goodyear and NASA (through its Innovative Partnerships Program Seed Fund) jointly explored opportunities for "Generalizing Moon Tire Technology" with Mr. Vivake Asnani from NASA and Mr. Dave Glemming of Goodyear serving as co-Principal Investigators. Several important discoveries were made along the way, including the fact that NASA's load and longevity requirements suggested a radial, spring-based design. This new design provides improved obstacle enveloping, scalable load capacity, and simplified manufacturing compared to the wire-mesh design used on the original Lunar Roving Vehicle. A field test conducted on April 28, 2009 at NASA's Johnson Space Center validated that the spring-based concept has the potential to make significant contributions to NASA's mobility applications in harsh terrains, such as future planetary explorations. A video of this test can be found at:

http://www.nasa.gov/offices/ipp/video/hallmarks_moontires_index.html.

Field tests of the spring tire also suggested that, with further development, this concept could be adapted for small terrestrial vehicles such as personal ATVs. The original scope of the NASA partnership project, however, did not allow for such development, which Goodyear now proposes. Specifically, the proposed work would explore modifications of the spring-tire design to consider:

- Traction on surfaces common to ATV operation including on- and off-road surfaces,
- Speeds beyond the 15 mph lunar application and consistent with common ATV operation,
- Durability and robustness commensurate with ATV operation,
- Manufacturing process and scalability consistent with ATV tire volumes.

Deliverables will include full-scale field testing of the selected design as well as a viable manufacturing scenario. The project is expected to last 2 years.

OTFAMP 10-612

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

October 30, 2009

Letter of Intent to submit a proposal to the Third Frontier Advanced Materials Program

The Goodyear Tire & Rubber Company in collaboration with NASA Glenn Research Center and M-7 Technologies intends to submit a proposal to the Third Frontier Advanced Materials Program for a "Multi-Purpose Non-Pneumatic Tire Design."

The **Lead Applicant** on this proposal will be The Goodyear Tire & Rubber Company located at 1144 East Market Street, P.O. Box 3531, Akron, OH 44309.

The **Contact Person** for this project is Chris Varley, Global Program Manager, External Science & Technology Programs for The Goodyear Tire & Rubber Company. Mr. Varley's email address is chris_varley@goodyear.com. He can also be reached by phone via 330-796-8697.

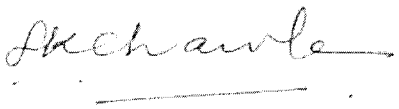
The proposed **Project Title** is "Non-Pneumatic Tire Design for Heavy Vehicle Applications."

The estimated total **Grant Funds** requested will be $1,000,000 over a two-year period.

Current **Known Collaborators** include NASA Glenn Research Center, Cleveland, OH, and M-7 Technologies, Youngstown OH.

A **One Page Summary of the Proposed Project** is provided on the following page.

Sincerely,



Surendra K. Chawla, Ph.D.
Senior Director
External Science & Technology Programs
The Goodyear Tire & Rubber Company
Innovation Center – P.O. Box 3531, Dept. 480A-5SW
Akron, OH 44309
schawla@goodyear.com
Phone: 330-796-1994
Fax: 330-796-9601

GOODYEAR INNOVATION CENTER AKRON

P O BOX 3531
AKRON, OHIO 44309-3531

Project Description: Multi-Purpose Non-Pneumatic Tire Design

Our proposal will outline a two year, $2 million project with specific milestones and deliverables that is designed to culminate in a prototype for a multi-purpose, non-pneumatic tire that is scalable for future lunar and other harsh terrain applications.

In 2007, Goodyear and NASA (through its Innovative Partnerships Program Seed Fund) jointly explored opportunities for "Generalizing Moon Tire Technology" with Mr. Vivake Asnani from NASA and Mr. Dave Glemming of Goodyear serving as co-Principal Investigators. Several important discoveries were made along the way, including the fact that NASA's load and longevity requirements suggested a radial, spring-based design. This new design provides improved obstacle enveloping, scalable load capacity, and simplified manufacturing compared to the wire-mesh design used on the original Lunar Roving Vehicle. A field test conducted on April 28, 2009 at NASA's Johnson Space Center validated that the spring-based concept has the potential to make significant contributions to NASA's mobility applications in harsh terrains, such as future planetary explorations. A video of this test can be found at:

http://www.nasa.gov/offices/ipp/video/hallmarks_moontires_index.html.

The original scope of the Innovative Partnerships Program (IPP) project limited the ability to optimize the spring design for weight, traction, and durability. Given the expanded potential of the spring-based design, Goodyear now proposes to increase both the robustness and the technical readiness level of the non-pneumatic spring-based tire. Specifically, the proposed work would explore:

- New materials to reduce weight and improve durability
- Alternative spring geometries to optimize stress distribution
- Various configurations to optimize footprint geometry for improved traction

The project has been divided into two phases. Phase One will consist of material and structural design studies, along with initial prototypes of up to three selected designs. Key deliverables will include: laboratory testing; small-scale field testing; and identification of the most promising design. Phase Two will consist of iterative refinement of the key design. Deliverables in Phase Two will include full-scale field testing of the selected design. This will include life-testing, to be designed and executed as part of this program. Goodyear and NASA will also jointly ensure that the project is adequately documented. Phase One is expected to require fourteen months and Phase Two will require ten months.

OTFAMP 10-613

Department of Materials Science and Engineering

Rudolph G. Buchheit
Professor and Chair
177 Watts Hall
2041 College Rd.
Columbus, OH 43210
phone: 614-292-6085
fax: 614-292-9857

November 1, 2009

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, Ohio 43215
OTFAMP2010@development.ohio.gov

Re: 2010 OTFAMP LOI

Please accept this letter as an expression of intent to submit a proposal to the 2010 Ohio Third Frontier Advanced Materials Program.

Lead Applicant:

The Ohio State University
Department of Materials Science and Engineering
177 Watts Hall
2041 College Rd.
Columbus, Ohio 43210

POC: Professor Rudolph G. Buchheit
Tel. (614) 292-6085
buchheit.8@osu.edu

Collaborators:

The Sherwin-Williams Company
Breen Technology Center
601 Canal Road
Cleveland, OH 44113

POC: Dr. Morgan S. Sibbald
Tel. (216) 566-2129
morgan.s.sibbald@sherwin.com

Project Title: Low-cost, Environmentally Friendly Coating and Paint Products with Enhanced Functionality Derived from Biopolymer Binders and Nano-dispersions

Estimated grant funds to be requested: $880,000

Project Summary: The Ohio State University and Sherwin Williams propose to collaborate on a 2-year program to develop and commercialize coating and paint products that utilize novel biopolymer-based binders and additives in paints and coatings to lower cost, reduce dependency on petroleum-derived components, reduce product environmental hazards and increase functional attributes such as protectiveness and durability. This program combines expertise in chemistry and materials at The Ohio State University with expertise and capabilities at the Sherwin-Williams Company in product development and commercialization to develop coating products targeted for high-volume, low-cost coating applications.

OTFAMP 10-614

PROMERUS®
Subsidiary of Sumitomo Bakelite Co. Ltd.

Robert A. Shick, Ph.D.
President and Chief Operating Officer
9921 Brecksville Road
Brecksville, OH 44141-3289
Tel: 440-922-1448
Fax: 216-803-2311

November 2nd, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, OH 43215
Attention: "2010 OTFAMP"

Subject: Letter of Intent for 2010 Ohio Third Frontier Advanced Materials Program

Dear ODOD Representative:

Please accept this Letter of Intent for the above-mentioned project. Below is all the required information listed in the 2010 OTFAMP Request for Proposals:

Lead Applicant:	**Promerus, LLC**
Address:	9921 Brecksville Road Brecksville, OH 44141
Phone Number:	440-922-1435
Contact Person:	Leah Langsdorf , PhD
E-mail Address:	leah.langsdorf@promerus.com
Project Title:	Development and Commercialization of Polymer Membrane-based Purification Systems for Bio-chemicals and Bio-fuels
Grant Funds Requested:	$ 1,000,000.00

Known Collaborators:
Promerus is interacting with a broad cross section of Ohio universities, federal agencies (e.g. USEPA) and industrial concerns (who will utilize such membranes commercially) to form an attractive team to commercialize this unique polymer technology platform for membrane-based purification products. The final collaborator list will be transmitted in our proposal in December.

If you have any additional questions or require any additional information, please contact me at 440-922-1448.

My warmest regards,

Robert A. Shick, PhD
President and Chief Operating Officer, Promerus LLC

PROMERUS®
Subsidiary of Sumitomo Bakelite Co. Ltd.

Robert A. Shick, Ph.D.
President and Chief Operating Officer
9921 Brecksville Road
Brecksville, OH 44141-3289
Tel: 440-922-1448
Fax: 216-803-2311

Proposed Project Summary:

Bio-derived chemicals and fuels are a rapidly growing industry of interest to Ohio and the United States. Because bio-based chemicals are generated as dilute aqueous solutions via fermentation, the purification and separation can be expensive and energy-intensive process steps. Promerus has developed a polymer-based technology platform that is in commercial use in a variety of semiconductor applications. Using the requested Third Frontier funding, we propose to develop membrane-based separation systems utilizing this polymer-based technology platform for the purification of a wide range of valuable bio-chemicals, such as bio-butanol, bio-methyl ethyl ketone, and other similar chemicals.

Membrane-based systems designed using Promerus polymers are expected to have better economics than alternate purification/separations technologies including distillation, absorption, and extraction, particularly at smaller scales. However, to assure commercial success, widespread use, and to displace current technology, the membranes require improved material systems, attractive manufacturing costs, and technology demonstration at pilot scale. In order to achieve successful commercialization, Promerus will partner with world-class Ohio-based collaborators and subcontractors at universities, government-based agencies, and industrial concerns. These collaborations and subcontracts will assist in the synthesis of the advanced membrane materials, design, develop, and fabricate suitable membrane elements and membrane cartridges, and test them in our own laboratories and at pilot scale in application-specific end-user facilities. The requested Third Frontier funding will catalyze growth and sustainability of a cluster of companies within Ohio, including Promerus, with polymer processing, process system development, and bio-chemical industry expertise. We will leverage the strong clusters of industrial and academic entities that are already deeply involved in the Ohio polymer industry and the Ohio agriculture processing industry to ultimately manufacture and sell such membrane cartridges from Ohio-based facilities to users within the US and the rest of the world.

OTFAMP 10-615

NanoSperse
Dispersion technology for a small world

2000 Composite Drive / Kettering, Ohio 45420 ph 937.296.5030 fax 937.296.5032

Date:	November 2, 2009
Subject:	Letter of Intent for FY2010 Ohio Third Frontier Advanced Materials Program (OTFAMP)
Lead Applicant:	NanoSperse 2000 Composite Drive Kettering, OH 45420 Tel: (937) 296-5030 Fax: (937) 296-5032
Lead Project Director:	Arthur W. Fritts President & Chief Executive Officer
Contact Person:	Sandra K. Dennison Manager, Administrative Operations e-mail: sdennison@nanosperse.com
Proposed Project Title:	Nanocomposites for Additive eManufacturing
Estimated Grant Funds to be requested:	$3 million
Known Collaborators:	University of Dayton Research Institute The Ohio State University ElectroScience Laboratory The Edison Materials Technology Center (EMTEC) Polymer Ohio

Summary:
The focus of this proposal is to commercialize Nanocomposites for Additive eManufacturing targeted for insertion on military and commercial aviation programs. The project will commercialize materials research from the University of Dayton for high temperature selective laser sintering (SLS) powders and specialized 3D printing materials (3DP) where nanocomposites are shown to deliver significant performance enhancements in target applications.

Additive eManufacturing techniques such as SLS and 3DP have traditionally been used for rapid prototyping. But, recent trends clearly demonstrate the importance these manufacturing processes will play in the future of the polymer industry; those target industries for insertion include aerospace, sensors, electronics and medical devices (such as prosthetics) due to the need for custom manufactured parts that require complex shapes which must be manufactured in a relatively low volume.

Nanocomposites impart unique and valuable properties to these materials, but they require transition from demonstration to market entry in order to meet timelines for initial target applications.

OTFAMP 10-616

AquaBlok®
Composite Particle System

AquaBlok, Ltd.

3401 Glendale Avenue
Suite 300
Toledo, Ohio 43614

Phone: (800) 688-2649
Fax (419) 385-2990

E-mail Address:
services@aquablokinfo.com

Website Address:
www.aquablokinfo.com

October 30, 2009

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, Ohio 43215
email: OTFAMP2010@development.ohio.gov

RE: 2010 OTFAMP LOI;
AQB105.100.0080.DOC

To Whom It May Concern:

This letter of Intent pertains to a proposed set of research and development, material procurement, and field installation and monitoring activities to demonstrate the commercial feasibility of an *Integrated Solar Landfill Cap System Using New Complimentary Ohio-Based Technologies.*

The market potential for prospective applications is significant.

The lead applicant will be AquaBlok, Ltd., an Ohio-based company that has developed and commercialized a new composite aggregate product for environmental and geotechnical applications.

Collaboration will include the University of Toledo, College of Engineering; Hull & Associates, Inc., an Ohio-based environmental engineering firm; an Ohio sanitary landfill; XunlightCorp, an Ohio-based solar panel manufacturer; and a major manufacturer of flexible membrane liners.

The grant requested will be in the order of $1,000,000 with a combination of cash and in-kind services as a match.

The primary contact will be:

John H. Hull, P.E., BCEE
President
AquaBlok, Ltd
3401 Glendale Avenue, Suite 300
Toledo, Ohio 43614
jhull@aquablokinfo.com
Phone: 419-385-2980 or 419-204-5840

Enclosed is a one page project summary.

Your consideration of this request will be very much appreciated.

Respectfully submitted,

John H. Hull, P.E., BCEE
President

Enclosure

ct: Greg Knudson, RGP
Eileen Granata, NW Ohio, DOD
Xunming Deng, Chairman, Xunlight Corp

Ohio Third Frontier Advanced Materials Program
OTFAMP2010

Integrated Solar Landfill Cap System Using New Complimentary Ohio-Based Technologies

In a drive for sustainability, leaders in the public sector and the waste management industry have made significant progress in minimizing the amount of waste going to landfills, maximizing the usable airspace in a landfill, removing energy from methane generated in landfills, and considering final use plans for closed landfills that will be of beneficial use to the host communities, where possible.

Closed landfills have been considered as host sits for traditional flat panel solar arrays and recent innovations in flexible solar panels have led to the concept of incorporating a solar array directly on the landfill cap. One test facility in Texas has completed installation of a test area with solar panels manufactured by UniSolar being glued onto a flexible membrane liner (FML) cap component material manufactured by Firestone. While this approach might be acceptable in some climates and states, the direct exposure of the FML to UV can degrade the FML over time, different material properties can limit the life of adhesives, and the lack of frost protection required in many landfill caps can be counter to landfill cap design requirements. Landfill cap systems must be long-lived and function to not only minimize water penetration through the cap, but also contain gas produced in the landfill from waste degradation.

The approach considered in this project will use an Ohio developed geotechnical material, AquaBlok®, in conjunction with the most widely used FMLs in the landfill market, to support flexible solar panel arrays, such as those developed by Xunlight Corp (also an Ohio company), to provide an alternate cap design that will meet regulatory performance standards, create additional landfill capacity, be cost competitive with conventional landfill caps, and be configured to host flexible solar panels.

There are over 2,000 U.S. operating landfills that could be candidates for this system. Many such landfills are often over 100 acres of fill area. If only 10 acres per site used this technology, the market for AquaBlok would be over a billion dollars and the market for flexible solar panels, such as those manufactured by Xunlight, would be over a trillion dollars. This sustainable reuse of landfills could generate over 4,200 megawatts of renewable electricity and conserve over 100,000,000 cubic yards of landfill space.

The Third Frontier Grant will facilitate the design, permitting, installation, and testing of a field application on an operating Ohio landfill. AquaBlok, Ltd. has filed provisionary patents on the concept and will be the lead applicant. Collaborators will include the University of Toledo College of Engineering; Hull & Associates, Inc. – an Ohio-based engineering firm with significant landfill design experience (who have helped pioneer a number of design innovations in the landfill industry); Xunlight, an Ohio-based technology, also developed and supported by the University of Toledo; a major producer of FMLs for the landfill market; and a to-be-determined landfill site. The field application will be on the order of 1/2 to 1 acre.

The proceeds of the grant will be used to offset costs of the design, permitting, manufacture of AquaBlok and the solar panels, a test facility installation, and multi-year performance monitoring. Matching for the grant will include: in-kind services, materials, and construction installation.

William A. Whittenberger
President
waw@catacel.com

B: 330-527-0731 x108
C: 330-219-7250
F: 330-527-0761

November 2, 2009

The Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Dear Sir or Madam,

This letter is to advise the Ohio Department of Development of our intent to submit a proposal towards the FY2010 Third Frontier Advanced Materials Program RFP, as follows:

Applicant Organization: Catacel Corp., 7998 Gotham Road, Garrettsville, OH 44231
Contact: William A. Whittenberger, President – 330-527-0731x108, waw@catacel.com

Project Title: Sorbent Coated Foils for CO2 Capture.

Known Collaborators: Youngstown State University, Parsons

Estimated Dollars Requested: $1,000,000

A one-page summary of the project follows.

Very truly yours,

William A. Whittenberger
President, Catacel Corp.

LOI.doc

Sorbent Coated Foils for CO2 Capture

Catacel Corp. practices an engineered materials technology that involves coating formed metal foils with catalytic materials. This material combination delivers considerable performance and cost advantages to fuel cell, hydrogen, and other advanced energy applications that use catalytic reactions that also require heat transfer. By substituting high-performance CO2 sorbents for the catalytic materials, Catacel's coated foil and associated reactor technology would provide a cost-effective, durable, and energy efficient method for CO2 capture, the most costly step of the carbon capture and sequestration processes. Successful implementation would reduce green house gas emissions and reduce imports of energy from foreign sources.

The proposed process uses Catacel's formed thin metal foils to support sorbent materials recently developed at the National Energy Technology Laboratory (NETL) to create a structured composite CO2 sorbing material. Inserts made from this composite material would be placed in a scaled-up version of Catacel's existing heat-exchanging reactor technology, mounted in an exhaust stream to create a high-performance CO2 capture system.

Significant effort has been invested by NETL and others into the development of numerous materials that can achieve target capture and desorption specifications, yet, a viable reactor platform on which to deploy these materials for commercial application does not exist. The barriers to deployment of sorbent systems are identical to those faced by other capture technologies- excessive capital costs and high parasitic power penalties. In the case of sorbents, the sources for these issues evolve around heat management issues (i.e. extraction or removal of heat). Previous system studies have shown that a transformational capture system would result if proper heat management could be achieved with a sorbent based system. Initial calculations suggest that Catacel's proprietary materials and reactor technology would provide the necessary heat management capabilities thus resulting in an economical capture system. The integration of Catacel and NETL technologies would then represent the first such practical and commercializable process that overcomes the physical and chemical challenges of separating CO2 from the exhaust of power plants.

In this project, NETL will supply candidate sorbent materials to Catacel Corp., who will use their technology to adhere them to the surface of metal foils. The sorbent coated foils will be evaluated by Youngstown State University to measure sorbing and regeneration (desorbing) performance in a simulated flue gas. The preferred material and process will be demonstrated for ~100 hours of continuous operation in a lab-scale demonstration device. As a commercialization partner, Parsons will provide project management and assess the feasibility of deploying the composite materials technology in a power plant from an economic and engineering perspective.

The strong technology team of Catacel Corp., NETL, Youngstown State University, and Parsons provides all of the elements needed to deliver an effective solution to the CO2 challenge. Deployment of this technology to capture 90% of the CO2 emitted from coal-fired power plants in the United States could reduce CO2 emissions by approximately 1.7 billion tons per year in the electric power sector alone. It could also provide economic benefit to the Ohio, Pennsylvania, and West Virginia region through the creation of over 22,000 Ohio jobs over a 10 year time frame.

IF Technologies
Innovations for a sustainable future

OTFAMP 10-618

November 2, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Subject: 2010 OTFAMP Letter of Intent

Via: E-mail to OTFAMP2010@development.ohio.gov

To whom it may concern:

This letter serves as IF Technologies, LLC's notice of intent to apply for the fiscal year 2010 Ohio Third Frontier Advanced Materials Program (OTFAMP). Below is the information requested in Section 1.3.3 of the Request for Proposal for the OTFAMP.

Lead Applicant: IF Technologies LLC, 2201 Pebblebrook #4, Cleveland, Ohio 44145
Contact Person: James R. Colangelo, President
E-mail: jrcolangelo@iftechnologies.com
Phone/Fax: 440.356.1210

Proposed Title: Commercial Integration of >50% Bio-based Matrix Resin into Pultruded and sheet molding compound (SMC) products.

Estimated Grant Funds to be requested: $1,000,000

***Targeted* Collaborators:**

The University of Akron
The Ohio State University
Ohio BioProducts Innovation Center
Zehrco, Inc.
Premix, Inc.
MFG, Inc.
National Composites Center
PolymerOhio, Inc.
Wire-Net
OmniGlass, Ltd.
GlasForms, Inc.
Plastpro, Inc.
Northcoast Composites, Inc.
Joseph E. Sumerak Enterprises, Inc.

Project Summary: Please see attached summary page.

Respectfully submitted,

James R. Colangelo, President

Project Summary

Reinforced polymer based composites are utilized in many industries because of the strength, sustainability, and the design latitude they provide. These Advanced Materials are a key element of Ohio's manufacturing base and are used extensively in the automotive/transportation, aerospace, advanced energy, building construction, and electrical markets. In Ohio production of polymer products provides employment for more than 140,000 workers with wages of $5.6 billion. With an anticipated growth of 4%, 3 times that of other materials, it is a sound investment area. Those companies that innovate and stay ahead of the technology curves including green integration will be the major participants in that growth.
Two popular forms for polymer composite products are pultruded cross-sections and molded components from Sheet Molding Compound, SMC. These forms typically employ polyester resins containing styrene as a crosslinking agent. Styrene is coming under increased scrutiny as a probable carcinogen. In addition, both the styrene monomer and the polyester resins are made from petrochemical feedstock which results in dependence on foreign oil and an unfavorable carbon footprint. Reduction of the impact of the process feedstocks, manufacturing and in-use toxicity, as well as end-of-life wastes are of interest. The successful Advanced Material manufacturers of the future must deal with these issues to increase market opportunity in the evolving environmentally sensitive social climate.

A novel resin technology of interest to pultruders and sheet molding compound producers has been developed. An epoxidized plant oil from domestic crop production is used at 50% content with a hardener to produce a composite matrix resin with improved toughness versus conventional bisphenol A, BPA, epoxies. Polyesters touting bio derived feed stocks typically contain less than 25% bio-content and still rely on styrene monomer. The new technology, therefore, addresses rising concerns over toxicity of BPA based products as well as styrene emissions and exposure facing increasing regulation.

This resin has shown excellent composite properties, a glass transition temperature of 130°F, and can be thickened to the nontacky elastomeric state required for SMC handling and molding. It has a low stable viscosity enabling excellent glass wetting and high filler loading. Commercial applications for the matrix resin include windmill components, solar panel support platforms, automotive exterior and interior components, mass transit panels, construction beams, window lineals, door skins, tubs/sinks and shower stalls.

The proposed effort is to support commercialization of this bio-based, low toxicity, sustainable composite matrix resin for pultrusion and SMC applications utilizing US agricultural feedstock. Early work done in Germany with non-US materials was not immediately replicated with US raw materials. The key objectives for the project are to develop US feedstocks, scale-up production, accelerate cure to meet the demanding needs of the marketplace, optimize the bio-content, and complete full scale proof of concept projects demonstrating cost and performance capability. The effort will result in the commercialization of greener high performance alternatives to current reinforced composite products within 3 years. This competitive edge will accelerate the development and growth of the advanced materials industry and its supply chain in Ohio, thus maintaining and creating employment opportunities for our large Ohio Composites Industry.

OTFAMP 10-619

NOVO FOAM PRODUCTS
1991 Crocker Rd. Suite 600
Westlake, Ohio 44145
www.novofoam.com

LETTER OF INTENT Nov. 2, 2009

SUBJECT: 2010 OTFAMP LOI

Lead Applicant: Novo Foam Products LLC, 1991 Crocker Rd. Ste 600, Westlake, OH 44145
Phone: 877-937-6686 Fax: 440-348-2342

Contact: Dave Hedley, dave.hedley@novofoam.com

Role: Project Lead

Project Title: Air Ride Eco-Chain

Estimated Grant Funds: 1.2 M$/ 2 years

Collaborators: AFP, 2200 International Street, Columbus, OH 43228
Phone: 614-527-7853

Role: Assembly, Distribution, Logistics, Warehousing

Nova Chemicals, 786 Hardy Rd., Painesville, OH 44077-4524
Phone: 440-352-3381

Role: Lab, Testing, Materials, Quality, Eco-reporting.

Project Summary: Novo Foam Products LLC, the inventor of the Air Ride Pallet® line of lightweight recyclable pallets for the air cargo industry and patent holder of the INOVO process for manufacturing strong, lightweight alternative plastics wishes to introduce a re-useable line of lightweight eco friendly products for the ground distribution industry within the USA.

Air Ride Pallet reduces fuel consumption 1.5-3% over wood and plastic pallet counterparts, increases pay load capacity, reduces emissions by 15lbs per use, reduces truck loads, improves refrigerated transport performance, is 100% recyclable, provides a 0% carbon footprint and increases competitiveness through less weight and extended use capability.

Ohio is an ideal location to introduce this green technology as it is geographically and structurally centered as a key distribution location.

The scope of the project is to produce a newly introduced high performance pallet, with costs equal or close to wood, maintaining and creating jobs while at the same time benefiting the logistics industry through performance and cost savings. Bringing the manufacturing expertise and infrastructure to Ohio will also avail the capability of future applications of the technology in the construction, automotive and aerospace industries.

Sincerely,
Dave Hedley

Nanomaterial Innovation Ltd.

1109 Millcreek Lane
Columbus, OH 43220
Tel: 614-582-5296
Email: yongm86@yahoo.com

October 28, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215-6130

Dear ODOD:

I am writing to inform ODOD of our intent to submit a 2010 RCP proposal in response to the recent announcement of RFP.

The Lead Applicant:

Nanomaterial Innovation Ltd.

Address: 1109 Millcreek Lane
Columbus, OH 43220
Tel: 614-582-5296

Contact Person: Yong Min

Email for the contact: yongm86@yahoo.com

Project title:

Multifunctional Nanoparticle Papers for Structural and Wear-Resistant Applications

Estimate Grand Funds to be requested:

$1 million

Known collaborators:

Composite Division, Owens Corning
The Ohio State University

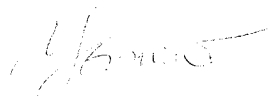
Project summary:

This RCP project is to develop and scale up new group materials such as, Carbon nanotubes and naoparticles reinforced paper (e.g., Buckeye Paper™) for high strength light composite applications by using innovative nanotechnology developed by The Nanomaterial Innovation Ltd. (NIL). The Buckeye Paper™ has family products, which included in Buckeye Paper™- Coating Solution, Buckeye Paper™- Sheet, Buckeye Paper™- Preprege, Buckeye Paper™ - Laminates, and Buckeye Paper™ - Parts, etc. The materials contain many ingredients such as, carbon nano-tubes, carbon nano-fibers, montmorillonite (MMT) clay, graphite, and graphene, etc. This proposal will explore the fabrications of Buckeye Paper™ and their potential industrial applications.

The Buckeye Paper™ has many advantages in terms of light weight, high mechanical strength, high thermally, chemically and electric-chemically stabilities, and easy to use and incorporate with polymeric resins, which are very attractive in the composite industry. A successful implementation of this novel material can lead to significant impact on enhancing composite performance, energy saving, and material saving. For examples, the Buckeye Paper™ reinforced helicopter blades and wind mill blades had shown some unique features on enhancing the mechanical properties and surface wear resistance.

The potential market for this material is huge especially in the composites industry, which is about US$19 billion globally based on "Global Composites Market 2009 - 2014: Opportunities, Markets & Technologies" report. Although the constructions, automotive and marine were badly hit in 2008 due to recession in industrialized nations, wind energy, aerospace and pipe & tank segments continued to grow at a healthy pace despite the global downturn. Our primary focus will be on the wind energy market with close collaboration with Owens Corning, a world leader in this field. Applications at aerospace and pipe & tank are also attractive in Ohio for those materials/equipment suppliers and end users. Carbon nanofibers and carbon nanotubes based Buckeye Paper™ also has a broad range of electric conductivity, which could open new markets in the electronic industry.

Sincerely yours,



Yong Min, Ph.D.

Chief Scientist
Nanomaterial Innovation Ltd.

Nanomaterial Innovation Ltd.

1109 Millcreek Lane
Columbus, OH 43220
Tel: 614-582-5296
Email: yongm86@yahoo.com

October 28, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215-6130

Dear ODOD:

I am writing to inform ODOD of our intent to submit a 2010 RCP proposal in response to the recent announcement of RFP.

The Lead Applicant:

Nanomaterial Innovation Ltd.

Address: 1109 Millcreek Lane
Columbus, OH 43220
Tel: 614-582-5296

Contact Person: Yong Min

Email for the contact: yongm86@yahoo.com

Project title:

Nano-Reinforced Polymer Foams for Insulation and Structural Markets

Estimate Grand Funds to be requested:

$1 million

Known collaborators:

Foam Insulation Division, Owens Corning
The Ohio State University

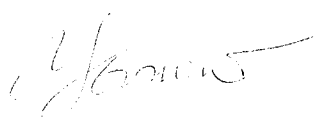
Project summary:

This RCP project is to develop and scale up a new group of light-weight, high-strength and fire-resistant polymeric foams by using innovative nanotechnology developed by The Nanomaterial Innovation Ltd. (NIL). The U.S. market for polymer foams was more than 7.4 billion pounds in 2001. However, their applications are limited by poor mechanical strength, surface quality, thermal stability and flame retardance. Furthermore, traditional chlorofluorocarbon (CFC) blowing agents cause ozone depletion and will be banned by 2010.

This proposal explores the synthesis of nanocomposites using both plate-like and fiber-like nanoparticles with high carbon dioxide (CO_2) affinity. Copolymers and polymer blends including a minor phase with high CO_2 solubility are used as the matrix material. To improve fire-resistance, surfactant-free and water-expandable polymer/clay nanocomposites are also prepared by suspension polymerization of inverse emulsion. Since low molecular weight surfactants are not needed, there is no fire hazard problem. These polymer blend nanocomposites are then used to produce high performance foam products aimed at both insulation and structural applications. The presence of nanoparticles in polymer blends allows better control of cell morphology and foam density in the manufacturing processes. Ultra-low-density foams with thermal insulation properties better than the existing insulation materials can be achieved. As environmentally benign blowing agent CO_2 is used to replace CFCs, the success of this project will be extremely valuable for environmental protection.

A successful implementation of this novel technology can lead to significant impact on energy saving, material saving, and environmental protection that are critical to our Ohio's economy and societal health. The potential market for this technology is huge because polymer foams touch nearly every aspect of modern life. The primary focus will be the thermal insulation market with close collaboration with Owens Corning, a world leader in this field. Many materials/equipment suppliers and end users in Ohio will participate in the project as partners. Nanocomposite foams can be also used in applications that require light-weight and high performance. Injection molding and co-injection molding of microcellular foams made of nanoparticle reinforced thermoplastic polymers will be pursued for automotive and other transportation applications. The major partners in this field include Honda America and CVG. Carbon nanofibers and carbon nanotubes based nanocomposite foams may open new markets in the electronic industry because of their EMI shielding properties.

Sincerely yours,



Yong Min, Ph.D.

Chief Scientist
Nanomaterial Innovation Ltd.

OTFAMP 10-622

Letter of Intent
Request for Proposals
Ohio Third Frontier Advanced Materials Program Fiscal 2010

Prospective Lead Applicant:	GrafTech International Holdings Inc. 12900 Snow Road Parma, OH 44130
Collaborators:	1) SuGanit Systems Inc. Suite #2000E Research and Technology Complex 1 2600 Dorr Street Toledo, OH 43606 2) The University of Toledo Toledo, OH 43606
Contact Persons:	1) Dr. John Chang (Technical Contact) Sr. Corporate Fellow GrafTech International Holdings Inc. Phone: 216.676.2530 john.chang@graftech.com 2) Lionel Batty (Business and Commercialization Issues) Director, Corporate Research & Development GrafTech International Holdings Inc. Phone: 216.676.2300 lionel.batty@graftech.com
Proposed Project Title:	**Carbon Fibers from Biomass for Wind and Solar Energy Applications**
Estimated Grant Funds To Be Requested:	$1,000,000 from Ohio Third Frontier program +$1,000,000 (Cost Share by the applicants)

A brief summary of the proposed project is provided on the next page.

Carbon Fibers from Biomass for Wind and Solar Applications

Lignocellulosic biomass (agricultural and forestry residues, herbaceous and wood crops) is the most abundantly available renewable material on this planet. Use of such renewable resource is a major part of the solution for producing renewable fuels and chemicals and reducing the carbon footprint. SuGanit Systems Inc. in collaboration with The University of Toledo has successfully develop a platform (that is currently being scaled up for pilot scale level operations) to produce sugars and lignin from various types of biomass feedstock. The intent of this proposal is to produce carbon fibers from lignin. GrafTech, a major producer of carbon and graphite products in the world, has extensive experience in evaluating the carbon fiber feedstock and in processes for making carbon fibers (GrafTech is the inventor of the high strength high modulus mesophase pitch fiber and rayon fiber), and applying them in various energy related and industrial applications.

Carbon fiber is typically manufactured from petroleum based feedstock. As such, it suffers from the vagaries of high price fluctuations of the crude oil in addition to being imported to a significant extent. The goal of the proposal would be to develop technology for the production of carbon fibers from lignin for use in renewable energy systems manufacturing applications – mainly in solar photovoltaic and wind energy manufacturing applications. More specifically, various graphite crucibles and insulating products (made from carbon fibers) are used to produce single crystal silicon for use in solar panel. For wind energy, carbon fiber reinforced plastics are used for making the wind turbine blades. Developing a reliable framework for production of carbon fibers from lignin will reduce the need for importing crude oil, increase the use of locally grown biomass and also help reduce the carbon footprint of the carbon fiber manufacture process, and at the same time help stabilize the price of carbon fiber products.

As SuGanit scales up its cellulosic bio-fuels/chemicals process, lignin is produced on a very large scale (a 10 ton/day pilot scale plant could produce 1 to 2 tons of lignin per day, and commercial production is fifty to hundred times larger in scale). Finding proper uses for lignin becomes an important business driver. Similarly, for GrafTech, finding a steady and renewable replacement source for petroleum based feedstock to make carbon/graphite products, such as low cost carbon fiber, is a significant goal.

The collaborators, GrafTech International, SuGanit Systems Inc., and The University of Toledo, have the expertise and the capability to carry the project all the way from receiving feedstock at a cellulosic ethanol plant, separating and refining lignin and manufacturing carbon fibers from it. By promoting such collaborations, Ohio can lead the way in exploiting the synergies that are available between different types of renewable resource usage technologies.

Cell-Core LLC
F
www.cell-core.com
740.528.6020

November 3, 2009

OTFAMP2010@development.ohio.gov

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Re: "2010 OTFAMP LOI"

Dear Administration,

This letter signifies the intent of Cell Core, LLC to submit a proposal for the above referenced RFP.

The lead applicant will be:

Cell Core, LLC
Tom Lambers, Chief Executive Officer
P.O. Box 1
Prospect, OH 43342
Office Tel: 740-528-6020
Mobile Tel: 740-972-4876
Email: tlambers@cell-core.com

Project Title: "Superior Core Material for use within Advanced Composite Structures"

Estimated Grant Funds: $350,000

Known Collaborators: Ashland Inc.

Project summary: Cell Core, LLC has developed core material technology which economically creates composite structures that are both lighter and stronger to be used in many markets and applications. The successful funding of this project will result in Cell Core supplying core materials and composite parts and products to numerous manufacturers, distributors and end users throughout the State of Ohio as well as other states, and is projected to create a minimum of 110 new jobs within the State of Ohio. Current core products are manufactured in plants in both other states and other countries.

Sincerely,

Tom Lambers, CEO
Cell Core, LLC

OTFAMP 10-624

Delivering Value-Added Innovation

Letter of Intent

Submitted In Response To:

Ohio Department of Development's

Ohio Third Frontier Advanced Materials Program

Fiscal Year 2010

Request for Proposal

November 3, 2009

CRG Point of Contact
Thomas Margraf
Business Development Lead
Phone: (937) 320-1877 ext. 1145
E-mail: margraftw@crgrp.com

CRG Business Official
Patrick Hood
President/CEO
Phone: (937) 320-1877 ext. 1104
E-mail: hoodpj@crgrp.com

CRG is a long-time supporter of the Third Frontier Program. CRG's past Third Frontier projects have surpassed the original objectives for both job creation and sales. Through CRG's Ohio Third Frontier Commercialization Grant, CRG created 20 full-time jobs with an average annual salary of $45,000 (original job creation objective: 10 full-time positions), and at two years into the program, total related sales have already exceeded the overall project objective by 12.3%. CRG is also a participant in the Ohio Third Frontier Internship Program. CRG has been a strong advocate of college internship opportunities since its incorporation: 47.5% of CRG's current full-time engineering and scientific staff started their technical careers at CRG through internship positions. CRG has hired 81 college interns under the Ohio Third Frontier Internship Program; 13 of those interns have been hired into full-time positions at CRG.

Cornerstone Research Group Inc. is pleased to submit this Letter of Intent in response to the Research Commercialization Program (RCP) being sponsored by the State of Ohio Third Frontier Program.

Lead Applicant:

Cornerstone Research Group Inc.
2750 Indian Ripple Road
Dayton, OH 45440

Thomas Margraf
Business Development Lead
P: 937-320-1877 ext. 1145
F: 937-320-1886
Margraftw@crgrp.com

Project Title:
Smart Tooling for Low-Cost Wind Blade Fabrication

Estimated Grant Funds:
$1 Million from the Third Frontier Research and Development Fund

Anticipated Collaborators:
Spintech Ventures (Dayton, OH); National Composites Center (Dayton, OH); EMTEC (Dayton, OH); MAG Cincinnati (Cincinnati, OH); TPI Composites (Springfield, OH)

SMART TOOLING FOR LOW-COST WIND BLADE MANUFACTURING
PROJECT SUMMARY

Cornerstone Research Group Inc. (CRG) is a for-profit technology incubator focusing on applied research and development activities with direct application to the commercial and military marketplace. Leveraging the established technologies and capabilities among partner organizations, CRG proposes to demonstrate a revolutionary tooling system, Smart Tooling, capable of increasing throughput while lowering manufacturing costs. Advances in material development, conducted in Ohio, enables CRG's Smart Tooling to easily and rapidly fabricate large, complex composite structures resulting in lower fabrication costs.

CRG's Smart Tooling has successfully penetrated the aerospace market. The results of working in this industry have proven savings of up to 80% of costs associated with composite fabrication, while improving throughput more than two times the current, state-of-the-art process.

Scale-up and demonstration of Smart Tooling for the alternative wind energy market will better position the development team to competitively bid work from original equipment manufacturers (OEMs), resulting in an increase in revenues and jobs for Ohio

Funds from the Ohio Third Frontier Sensors Program will be used to accomplish the following:

1. Perform trade studies on current wind blade designs that would benefit from a new manufacturing process.
2. Conduct scale-up efforts required to make medium to large composite wind blades (30-50 meters).
3. Identify mechanical and performance based benefits of Smart Tooling, both as fabricated blades and in-service, as compared with traditional fabrication techniques.
4. Conduct pilot manufacturing validation studies of wind blades fabricated using Smart Tooling to establish manufacturing capability, quality, and throughput capacity as compared with conventional tooling manufacturing processes.

Successful completion of this project will increase Ohio's wind blade manufacturing capabilities through increased manufacturing efficiency, thereby increasing capacity without capital costs and better positioning Ohio to be the premier wind blade supplier to the world.

OTFAMP 10-625

Letter of Intent to Submit a Proposal for the Third Frontier Advanced Materials Program

Lead Applicant: American Trim, LLC
1005 W. Grand Ave.
Lima, OH 45801

Technical Director: Steve Hatkevich
Director of R & D
419-996-4740
shatkevich@amtrim.com

Expected Collaborators: EMTEC, Strategy 3

Proposed Project Title: Commercialization of energy efficient selective protective mask for industrial applications

Estimate Dollars Requested: $1,000,000

Description:

This project will focus on market entry activities for an energy efficient selective protective mask (SPM) for industrial applications. Currently most industrial applications rely on laminated films to protect materials during the manufacturing process. The process requires substantial labor to apply and selectively remove the laminate. The new process relies on advancements within polymer and nano materials to allow the protective mask to be applied selectively and then cured via an energy efficient process. The new process allows for automation within the manufacturing assembly facilities ensuring American competativeness.

This proposed project will significantly increase commercialization opportunities in the following markets:

- Automotive
- Appliance
- Advanced Energy
- Fuel Cells

OTFAMP 10-626

Swagelok

Swagelok Technology
Services Company
3150 Aurora Road
Solon, Ohio 44139-3492

440.349.5934
440.349.5843 Fax
www.swagelok.com

3 November 2009

Ohio Department of Development
Technology Division
77 South High Street 25th Floor
Columbus, OH 43215

Via e-mail: OTFAMP2010@development.ohio.gov
Subject line: 2010 OTFAMP LOI

Reference: Ohio Third Frontier Advanced Materials Program, Fiscal Year 2010, Request for Proposal: Letter of Intent

To whom it may concern:

Swagelok Technology Services Company, an Ohio-based business with headquarters at 31500 Aurora Road, Solon, OH 44139, (phone 440-649-5614) intends to submit a proposal in response to the above solicitation, in the opportunity area of Advanced Materials. The contact person is John Buda, email john.buda@swagelok.com. We will be collaborating with the Materials Science and Engineering Department of the Case School of Engineering at Case Western Reserve University, Cleveland, OH 44106. Our project title is "Improve Processing of Advanced Stainless Steel Hardening by Vacuum." A one-page summary of the proposed project is attached.

We estimate that the project will begin April 1, 2010 and will be 2 years in duration, with 3 years of follow-up reporting. Total project cost over 2 years is projected to be $2 million. Funds requested will be $1 million over 2 years, with $700,000 to Swagelok for process development, and $300,000 to Case for microstructural evaluation, mechanical testing, and field service trials.

Please feel free to contact me if you need additional information.

Sincerely,

John Buda
President
Swagelok Technology Services Company

Cc: Mike Butkovic, Vice President, Marketing, Swagelok
Dave Peace, Vice President, Engineering, Swagelok
Sunniva Collins, Sr. Research Fellow, Engineering, Swagelok
Arthur H. Heuer, Professor, Materials Science and Engineering, CWRU

Improve Processing of Advanced Stainless Steel Hardening by Vacuum

Summary of Proposed Project

We propose process development and commercialization activities that will accelerate the adoption and market growth of a novel and significant method that improves the properties of corrosion resistant alloys. Performing the treatment in an atmospheric environment has been recognized as a significant advancement in materials knowledge with strong commercial potential. Activities to commercialize the process as well as continued technical research have identified the technique of treatment in a vacuum as offering further benefits to achieve the goals of the Ohio Third Frontier's Advanced Materials Program. Besides the potential commercial benefits of treatment in a vacuum, this technique will provide more insights that push the frontiers of materials science and enhance Ohio's position as a center for materials advancement.

Efforts by Swagelok to commercialize a surface carburization treatment referred to as low-temperature colossal supersaturation, named the SAT12® process by the company, using atmosphere furnace techniques have had some market success. These commercialization efforts have shown where areas of improvement in the treatment technique could offer pricing advantages and increase the potential market size. Recent scientific research by Swagelok and Case Western Reserve University supports the commercial advantages of vacuum treatment. Furthermore, successful accomplishment of the project will offer growth opportunities for surface treatment equipment manufacturers, service providers, and component and assembly manufacturers in Ohio.

Only through commercializing the atmospheric process were the additional opportunities for a vacuum process discovered; they were not expected at the time atmospheric commercialization was proposed. Additionally, vacuum treatment general knowledge, equipment availability and acceptance have grown. Preliminary tests of low temperature, gas phase vacuum carburizing have provided results supporting scientific theory and providing initial proof of the benefits of the technique.

Gas carburizing at low temperature in a vacuum has not been researched to much extent and not commercialized to our knowledge; it represents a significant new direction in advanced processing technology. It is expected to retain or improve the drastic improvements in wear, erosion and fatigue life demonstrated using the atmosphere technique while lowering cost, reducing lead times, and increasing availability.

Additional process development and characterization are required in order to develop robust and economical treatment procedures. Swagelok will undertake process development and commercialization activities. The Materials Science and Engineering Department of Case Western Reserve University will perform microstructural characterization and testing (fatigue and wear) to quantify improvements.

Hansen, Andrew

From: Carol Lazerick [clazerick@gmail.com]
Sent: Tuesday, November 03, 2009 4:00 PM
To: OTFAMP2010
Subject: 2010 ORFAMP LOI

Ohio Department of Development
Ohio Third Frontier Advanced Materials Program
77 South High Street, 25th Floor
Columbus, OH 43215

November 3, 2009

RE: Letter of Intent: Ohio Third Frontier Advanced Materials Program

Lead Applicant name & address:
Tribco Inc.
18901 Cranwood Parkway
Cleveland, Ohio 44128

Phone number:

216-486-2000
Contact person
and **e-mail**:
Carol Lazerick
c.lazerick@tribco.com

Proposed Project Title

: Commercialization of Nano-modified Braketex KEVLAR® composite Brake Pads for Automobiles and Light Trucks

Estimated grant funds is

$750,000

Known Collaborators include

Transportation Research Center, the University of Dayton Research Institute, Southern Illinois University *Center* for Advanced *Friction* Studies

Project Summary:

Founded in 1980, Tribco is the developer and manufacturer of ***Braketex®*** and ***Clutchtex®***, 100% KEVLAR® fiber composite friction materials for brakes and clutches. ***Braketex*** and ***Clutchtex*** are currently found on the brakes, clutches and automatic transmissions in tractors, bulldozers and other off-

road vehicles as well as on brakes on wind turbines, in metal stamping presses and on cranes, winches and hoists.

Brake pads made with ***Braketex*** are more durable, lighter and longer lasting than brake pads made with traditional friction materials like molded graphitic, sintered bronze and ceramic. KEVLAR is non-polluting and dust-free. Tribco linings are not yet available for consumer highway brake applications due to this small company's limited resources.

Tribco proposes to develop, test and commercialize an advanced non-polluting ***Braketex*** with nano materials for use on traditional automobiles and small trucks, hybrids and electric cars. The project entails compounding ***Braketex*** with nano materials; dynomometer testing the material and road testing the material. Tribco is looking to the University of Dayton Research Institute and Southern Illinois University Carbondale Center for Advanced Friction Studies to perform the dynamometer testing. Subsequently, the Transportation Research Center will perform a test on passenger cars to ensure compliance with the Federal Motor Vehicle Safety Standard No. 135 "Passenger Car Brake System."

Successful development and commercialization of the nano-modified ***Braketex*** KEVLAR composite brake lining for automobiles and light trucks would represent a significant advance in current technology and would eliminate brake pad pollution associated with copper, other metals and wheel contaminants. Additionally, being a new Ohio Tier 1 manufacturer/supplier of brake pads for automobiles and light trucks, Tribco would increase manufacturing jobs in Ohio and solidify Ohio's position in the center of the motor vehicle industry.

OTFAMP 10-628

ASHLAND

Ashland Inc.
Global Technology

Address Reply:
P.O. Box 2219
Columbus, OH 43216

November 3, 2009

To whomever it may concern,
Ashland is submitting this letter of intent for a 2010 Third Frontier Advanced Materials grant.

Lead Applicant:	Ashland Performance Materials
Address:	5200 Blazer Parkway Dublin, OH 43017
Contact person:	Joseph R. Fox jfox@ashland.com 614-790-3686
Project Title:	Accelerating the Commercialization of Bio-Based Building Products
Estimated Request:	$1,500,000
Collaborators:	Ohio Bioproducts Innovation Center (OBIC) and a select group of composite manufacturers in Ohio
Summary:	Ashland and its collaborators intend to produce and market a family of green building products that are made with ENVIREZ® bio-based resins. The proposed program is an outgrowth of an OBIC "Cell to Sell™" project for ENVIREZ® resins conducted this past year. This project has quantified the interest of residential homeowners, commercial architects and building designers in specific green building products that are made with rapidly renewable, bio-based raw materials.

Please contact me if you have any questions. Thank you.

Sincerely,

Joseph R. Fox

Joseph R. Fox, PhD.
Director, Emerging & External Technologies
Ashland Inc.

OTFAMP 10-629

2010 Ohio Third Frontier Advanced Materials Program Letter of Intent

November 3, 2009

Applicant Information

Lead Applicant: Bayer MaterialScience LLC
Address: 100 Bayer Road
Pittsburgh, PA 15205

Contact: Kevin Elsken
Tel: 412-777-4134 Email: kevin.elsken@bayerbms.com

Project Title: Biobased Engineering Thermoplastics

Grant Funds to be requested: $1,000,000.00
Collaborators: TBD

Summary of Proposed Project:

Bayer MaterialScience LLC (BMS), with sales of approximately $3.5 billion in North America, is a leader in the manufacturing and commercialization of polymer based products. Specifically, BMS is a global leader in the production and technology of blended plastic resins based on polycarbonate.

For the past 30 years, BMS has operated a compounding plant in Newark, Ohio. The facility has grown into the primary compounding site for BMS in North America. In addition to compounding, the Newark site houses the BMS North America Design Center and Color Competence Center. In 2009, the Newark site received the "2009 Business of the Year" award from the Licking County Chamber of Commerce.

The goal of the project is to develop a commercially viable engineering polymer blend that incorporates a biobased resin in order to meet defined customer needs. The scope of the proposed program is to take initial pilot plant generated trial formulations, and optimize and scale them for commercial production. The work will involve compounding optimization (formulation, process and equipment) at BMS's Newark, Ohio plant, and product formulation optimizations to meet injection molding process requirements and stringent end use part specifications. This project will focus on the automotive segment, a significant market for engineered blended products, and one that has a demonstrated interest in biobased materials.

The purpose of this letter of intent is to provide an overall summary of the proposed project, and it is not intended to be legally binding.

OTFAMP 10-630

Letter of Intent

2010 Ohio Third Frontier Advanced Materials Program RFP LOI

Contact Information:
Name: Seng C. Tan
Title: President

Lead Organization: Wright Materials Research Co.
Address: 1187 Richfield Center
City, State Zip: Beavercreek Ohio 45430
Telephone #: (937) 431-8811
Fax #: (937) 431-4746
E-mail address: sctan@sprintmail.com

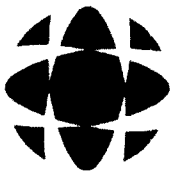
Project Title: **Scale up and Commercialization of Advanced Nanocomposite Filter Media**

Anticipated Request: $ 1,000,000

Collaborators: The University of Akron, Great Lakes Filters Corp, IBR, Wright Brothers Institute, and may involve additional end users

Project Summary

Developing filter materials with high capture efficiency of fine particles, especially metals, is of great industrial significance in pollution control processes such as water purification and waste-water treatment. The main problem facing development of an effective filter is in filtering fine particles below one micron. Wright Materials Research Co. (WMR) has develop a novel porous polymeric material as advanced filter media to separate any ultra-fine particles from liquid systems such as water and oil. In this OTF project, we propose to scale up our novel filter system, based on nanotechnology concepts, to production scale. Our main focus is to further develop and scale up our cost-effective fabrication technique to produce nano-structured lightweight filter materials that can effectively remove micron and sub-micron-sized particle contaminants, especially heavy metal species. We will match the proposed funding with federal funding. The proposed team will develop a commercialization strategy from production, quality control, distribution, to end users. Pursuing a $100 billion filtration market, WMR is projecting significant returns and economic benefits through this OTF project.



SCI Engineered Materials

SCI Engineered Materials, Inc.
2839 Charter St., Columbus, Ohio 43228
Phone: (614) 486-0261, 1-800-346-6567 FAX (614) 486-0912
www.SCIEngineeredMaterials.com

November 3, 2009

Ohio Department of Development
Ohio Third Frontier Advanced Materials Program

Dear Sirs,

I am writing on behalf of SCI Engineered Materials, Inc. to notify the Ohio Department of our intent to submit a proposal in response to the 2010 RFP for the Ohio Third Frontier Advanced Materials Program. The proposed title of the project will be "Commercialization of Base Metal/Precious Metal Composite Sputtering Targets used for Hard Disk Drive and Automotive Electrochromic Mirror Manufacturing". The grant funds requested will be on the order of $1,000,000. A known collaborator for this project is H. C. Starck, Inc. of Elyria, Ohio.

Project Summary

Precious metals are widely used in the electronics industry in numerous applications including the manufacturing of hard disk drive media platters and read/write heads and automotive electrochromic mirrors (self dimming rear view mirrors). One of the main techniques used to apply thin films of precious metals to electronic devices is the physical vapor deposition technique called "sputtering". In the sputtering process, the raw material is in the form of a dense solid called a sputtering target.

During the sputtering process, roughly 20-30% of the sputtering target is eroded away before the target requires replacement. Due to the basic physics of the sputtering process, the target erosion pattering is not uniform and eventually forms a deep groove in the target material commonly called a "racetrack" due to its shape. The sputtering target is considered spent when this groove comes within 1 mm of penetrating the backside of the target. For most sputtering targets, the material cost is low enough and the value added of the film high enough that either disposal or recycling of spent sputtering targets is cost effective. However, due to the high cost of precious metals, this ratio can quickly change due to the fluctuation of precious metal prices and the ever ending drive to reduce device prices to capture or maintain market share. Companies using precious metal targets have developed very precise cost of ownership models for precious metal inventory control purposes and use these models to evaluate new designs or processes that can significantly reduce the cost of using precious metals.

SCI Engineered Materials, Inc., is currently supplying precious metal targets (the platinum group metal ruthenium) to several automotive customers and has also worked with a hard disk drive manufacturer on cost of ownership reduction projects. The first and most obvious method to reduce the cost of ownership is to use the spent sputtering target as a base for

SCI Engineered Materials

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a new sputtering target by simply adding more material. At present, this method is cost effective at the current price of ruthenium which is at a low point of $95 per troy ounce. However, the price of ruthenium has fluctuated wildly in the past with a recent high of over $800/ounce and may do so again as the global economy recovers from the current recession. As the price of ruthenium passes the $200/ounce mark, the cost effectiveness of reusing spent targets begins to diminish offering an opportunity for a new technology to reduce the cost of ownership

For the past two years, SCI has been working on a concept whereby the a relatively inexpensive refractory (base) metal is used as the base of the precious metal target and only portion of the target that is sputtered is filled with precious metal. The concept called the Base Metal/Precious Metal Composite Sputtering Target technology has been advanced from the imagining through to the demonstration phase of commercialization by SCI and a hard disk drive manufacturing company. However, the division of the hard disk drive manufacturing company supporting the effort supporting the effort was closed down in late 2008 and as the price of ruthenium has fallen below $200/ounce and the recession leaving them with a surplus of precious metal in their inventories, the other divisions have put this effort on hold. Other companies have expressed an interest in the technology, but at the current price of ruthenium are reluctant to evaluate new technologies. SCI's automotive customers have also expressed an interest in the technology again, when the cost of ruthenium returns to previous high levels. SCI has filed for both domestic and foreign patent protection of this technology and have put the project on hold for the present time.

The proposed project is intended to take advantage of the current relatively low coat of ruthenium to advance the technology from the demonstration phase to the market entry phase in order to be positioned to offer this technology to the market place once the price of ruthenium rises sufficiently. SCI will collaborate with H. C. Starck, a large refractory metal company with production facilities in Elyria, Ohio to commercialize the Base Metal/Precious Metal Composite Sputtering target technology.

I, Dr. Scott Campbell, will serve as the contact person for SCI and my e-mail contact information is provided below. Thank you for the opportunity to propose a project for this RFP.

Regards,

Dr. Scott Campbell
scott@sciengineeredmaterials.com

OTFAMP 10-632

Momentum Technologies, inc.

November 2, 2009

The Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Subject: 2010 Advanced Materials LOI

Momentum Technologies intends to submit a Third Frontier Advanced Materials proposal.

Project title:	**"Accelerating commercialization of a novel Bio-Resource Resin (BR^2) for agricultural, construction, and industrial applications."**
Lead Applicant's Name:	Momentum Technologies, Inc.
Contact Person:	Jim Sattler, Vice President/General Manager
Address:	1507 Boettler Road Uniontown, Ohio 44685
Phone Number:	(330)896-5900
Email:	jsattler@momentumtech.net
Known Collaborators:	The Ohio State University OARDC and other OBIC Alliance Member Companies and Research Institutions.
Anticipated Grant Request:	$1 million

Momentum Technologies, inc.

Project description

Ohio, with its strong agbioscience and industry base, is uniquely poised to become a leader in the research and commercialization of renewable specialty chemicals, polymers, and advanced materials. Momentum Technologies, Inc. (MTi), an Ohio company founded in 1996 as a subsidiary of Deli-Universal, offers a wide range of laboratory and polymer distribution services for the North American market. MTI has developed novel technologies producing a multi-use bio resin from readily available non-food feed stocks. This proposal provides operating funds for the operation of a demonstration facility to be used for further refinement of the bio resin and to attract additional early adoption of the production technology in Ohio. Funds will also be used to further develop application technologies for a number of Ohio based companies who can purchase the finished bio resin. The further development and commercialization of this novel advanced material also provides workforce opportunities to develop the talent necessary to support Ohio's leadership position in the emerging bio-economy.

The major goal of this effort will be to create the next generation bio resin industry with advanced materials that not only meet the stringent performance requirement demands of asphalt, building and construction, and fertilizer markets but are also bio-based, environmentally-friendly, cost-competitive, and derived from renewable resources . The creation of these new technologies will enable Ohio to sustain a national leadership position in the number of bioproducts industry manufacturing jobs over the next several decades.

Sincerely,

James Sattler
Vice President/General Manager

1507 Boettler Road - Uniontown Ohio 44685 - 800 720 0261

OTFAMP 10-633

COOPER TIRE & RUBBER COMPANY
701 Lima Ave • Findlay, OH, 45814 • 419-423-1321

To: The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

From: Chuck Yurkovich, VP of Technology
Cooper Tire & Rubber Company
701 Lima Avenue
Findlay, OH 45840
419-424-4170

Date: November 3, 2009

Cooper Tire & Rubber Company intends to submit a proposal as the Lead Applicant in response to the Request for Proposals under the Ohio Third Frontier Advanced Materials Program for fiscal year 2010. A one page summery of the project titled "Improved Tire Properties through Modification of the Tire Cord Surface" is attached. Collaborators in the project will be Tokusen, USA Inc., a supplier of steel tire cord to Cooper and other tire producers and ECOSIL Technologies, LLC, a developer and supplier of proprietary rubber bonding and metal coatings products, located in Fairfield, Ohio. The estimated OTFAMP funds requested is $755,000 during the first 3 years of the project. Successful completion of the project can bring about commercialization of new tire technology that will increase jobs in Ohio for suppliers of advanced materials and equipment serving Ohio's manufacturing industries and preserve important high paying manufacturing jobs in the tire industry.

The contact information for each participant in the project will be:

For Cooper Tire
Mr. Clay Lewis
Director of Materials Applications Development
701 Lima Avenue
Findlay, OH 45840
Phone 419-424-4143
cslewis@coopertire.com

For Tokusen, USA Inc.
Mike Hill
Research Engineer
1500 Amity Road
Conway, AR 72033
Phone 501-327-6800 ext 269
mhill@tokusenusa.com

For ECOSIL Technologies, LLC
Dr. William Vanooij
Chief Technology Officer
160 A Donald Drive
Fairfield, OH 45014
Phone 513-858-2365
wvanooij@ecosiltech.com

Chuck Yurkovich
Cooper Tire VP of Technology

COOPER TIRE & RUBBER COMPANY
701 Lima Ave • Findlay, OH, 45814 • 419-423-1321

IMPROVED TIRE PROPERTIES THROUGH MODIFICATION OF THE TIRE CORD SURFACE

Successful completion of the project can bring about commercialization of a new tire technology that will increase jobs in Ohio for suppliers of advanced materials and equipment serving Ohio's manufacturing industries and preserve important high paying manufacturing jobs in the tire industry. The key to these benefits is that the project will provide the tire industry with a new tire cord coating technology that will allow for optimization of the rubber belt compound for resistance to oxidative aging and other tire requirements including adhesion of the tire cord to the rubber used to embed the steel tire cord. Production of tires has been and will continue to be a major strength in the Ohio economy. This strength can be maintained by keeping the Ohio tire industry on the leading edge of technology. Ohio has also had a history of leading in the equipment required for support of this and other local industries. The design and development of new equipment required for application of the surface treatment will also result in new jobs for Ohio. The third area of benefit will be in expansion of jobs for material scientists and technicians required to produce and distribute the silane coating products needed for this new process. In these areas jobs can be created through sales revenue coming into Ohio from out-of-state and international companies. The technology is also useful to other rubber products manufacturers. Saving 10% of the tire and rubber products jobs in Ohio and at the same time adding manufacturing technology jobs and equipment builders could affect 200-300 jobs.

Cooper Tire, Tokusen and ECOSIL have been working together for the past 5 years to develop a new technology for improving tire performance. The project involves providing improved coatings on the brass-plated steel tire cord used in all radial tires today by applying a thin film of a silane mixture on the cord and reformulating the rubber compound used in the tire belts.

This project was born out of a study funded by Environmental Protection Agency Phase I and Phase II SBIR Grants ending in 2005 which demonstrated that it was possible to improve the rubber bonding characteristics of tire cord using silane solutions. The team has stayed together since that time in an SBIR Phase III and has continued to improve the processes for application of the silane to the tire cord and to reformulate the rubber compounds that are used to embed tire cord in the belt.

The initial prototype equipment used for the application of the silane to the tire cord has been re-engineered as far as is reasonably possible. The chemistry of the silane solutions and the operating parameters has also been optimized for the process on this equipment. Several patents were filed covering the knowledge gained during this period of time. Two test tire builds have also been performed by Cooper Tire using tire cord treated with silanes and new rubber formulations have been developed and used in the test tire programs.

The funds required to carry this project forward to commercialization stage are $1,510,000 counting cash and in-kind contributions to the project from the project participants. These funds would be used for the construction and operation of a new high productivity prototype coating machine to apply the silane to the tire cord. In addition, two tire test programs will be conducted by Cooper Tire on tires produced with the new compounds and tire cord in standard production equipment. The project will take 3 years to perform this part of the work. Upon successful completion of the second tire test evaluation, Cooper will be in a position to develop marketing plans for the new technology.

OTFAMP 10-634

Cell Core LLC 740.528.6020

November 4, 2009

OTFAMP2010@development.ohio.gov

The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Re: "2010 OTFAMP LOI"

Dear Administration,

This letter signifies the intent of Cell Core, LLC to submit a proposal for the above referenced RFP.

The lead applicant will be:

Cell Core, LLC
Tom Lambers, Chief Executive Officer
P.O. Box 1
Prospect, OH 43342
Office Tel: 740-528-6020
Mobile Tel: 740-972-4876
Email: tlambers@cell-core.com

Project Title: "Improved Thermoset Prepreg for Composite Structures"

Estimated Grant Funds: $500,000

Known Collaborators: Ashland Inc.

Project summary: Cell Core, LLC has developed technology which economically creates Thermoset Prepregs for the manufacture of Advanced Composite Structures. The successful funding of this project would result in Cell Core supplying prepregs to manufacturers and end users throughout the State of Ohio and others out of the State of Ohio. Current prepreg technology requires making prepregs in plants close to manufacturing sites not located in the State of Ohio

Sincerely,

Tom Lambers, CEO
Cell Core, LLC

OTFAMP 10-635

LETTER OF INTENT

THIRD FRONTIER ADVANCED MATERIALS PROGRAM

Lead Applicant: **The University of Akron Research Foundation (UARF)**

Address: 411 Wolf Ledges Parkway, Suite 105
Akron, Ohio 44311

Phone Number: 330 972 8821

Contact Person: Dr Barry Rosenbaum, Senior Fellow, UARF
E mail: barry@uakron.edu

Principal Investigators at The University of Akron College of Polymer Engineering and the College of Computer and Electrical Engineering:

- Assoc Professor Kyonsuku Min
- Professor Mukerrem (Miko) Cakmak
- Professor Tom Hartley
- Professor Joe Payer

Project Title: **Novel Polymeric Separator Membranes for Energy Storage Devices: Batteries and Fuel Cells**

Estimated Funds Requested: **$1,000,000 to be expended over a 2 year program period**

Known Collaborators:

- **eVionyx, Inc** – An energy technology company currently located in Hawthorne, NY
- **ZnErgy, Inc** – An early stage company formed in Akron, Ohio that will commercialize the new separator membrane technology
- **Case Western Reserve University -** Professor Uzi Landau, electro chemistry expert in Chemical Engineering Department who will research the fundamental membrane performance
- **University Innovation Ventures** – A for-profit company which builds collaborations to develop and commercialize private sector technologies as regional initiatives for wealth creation

- **Battelle Corp.** - Research partner to test and develop the polymer separator membrane in Ag – Zn batteries for DoD Navy applications.

SUMMARY OF PROPOSED PROJECT
Novel Polymeric Separator Membranes for Energy Storage Devices: Batteries and Fuel Cells

The Background / Market Opportunity

Advanced energy storage technologies have been identified as a national strategic priority for the United States to achieve energy independence. Billions of dollars have recently been appropriated by the Federal Government to support Li ion technology and battery manufacturing, in spite of the inherent issues with lithium: high cost, safety concerns, environmental impact, and limited strategic lithium supply. Li ion batteries work well for relatively small applications, but scale up to support larger battery packs for transportation, industrial, utility storage, and some military applications create major problems. A lower cost, safe, environmentally compatible alternative to Li ion technology without sacrificing performance would capture significant market share and provide enormous business potential for Ohio.

Nickel – Zinc electro chemistry would address all of these deficiencies if battery life and multiple deep charge / discharge cycles can be obtained and confirmed in market driven end use applications. The raw materials are plentiful, relatively cheap, non toxic, and the power / energy density of Ni – Zn batteries is extremely high. A novel prototype polymeric separator membrane has now been developed which allows Ni Zn batteries to achieve a minimum of 500 – 1000 deep discharge cycles. Optimization and commercialization of the separator membranes will revolutionize the rechargeable battery industry for Ni Zn and other battery electro chemistries, such as Ag – Zn..

eVionyx, Inc and The University of Akron have confirmed that these separator membranes eliminate the formation of dendrite – imperfections that can grow on the surface of the zinc electrode quickly leading to short circuiting of the battery. Under an existing Third Frontier Program Advanced Energy Grant optimized separator membrane compositions have been prepared.. The Proposed Project will bring this membrane technology to commercial readiness for Ni Zn batteries and , and will demonstrate separator membrane application for other battery electro chemistries.

The Project Proposal

Under an existing Third Frontier Program Advanced Energy Grant the University of Akron has confirmed Ni Zn battery performance in laboratory testing at 500 deep discharge cycles, has characterized separator membrane structure / property performance, has developed proprietary approaches to improve membrane performance, and developed a film casting process to fabricate the membrane. The proposed project would address the commercialization issues associated with membrane product / process development to position Ohio as a global leader in energy storage.

The project would have three primary focus areas:

+ Complete membrane coating process development using the state of the art Coating Pilot Line at the College of Polymer Engineering that was supported by The Third Frontier CMPND Grant Program. The deliverable would be creation of a separator membrane manufacturing business in Ohio supplying membrane globally. Achieving 6 sigma standards of quality control is essential.

+ Continued optimization of membrane composition / performance. The deliverables for Ni Zn batteries would be extending battery life up to 10 years, increasing upper service temperature to 80C, and increasing battery energy density above 150 wh/kg by optimizing battery component and polymer membrane design. Separator membrane performance in other battery electro chemistries would be confirmed in collaboration with Battelle and others.

+ Battery testing with the new membrane in end use applications to achieve multiple customer approvals. Beta testing customers have been identified in several areas: Hero, India for electric bicycles, Myers Motors for electric vehicles, Eaton for UPS back up power supply, EPRI for utility energy storage applications, and Battelle for DoD applications

A strong research and development team has been assembled including eVionyx, The University of Akron, and Case Western Reserve University. This team, working with strategic customer / partners, will support development of a strong energy industry cluster in Ohio based upon commercialization of the proprietary polymer separator membrane.

OTFAMP 10-636

AkzoNobel

15885 W. Sprague Road
Strongsville, OH 44136
440-297-8198

November 2, 2009

Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215

Subject: 2010 OTFAMP Letter of Intent
VIA: E-mail to OTFAMP2010@development.ohio.gov

To Whom It May Concern:

Please let this letter serve as notice of intent for Akzo Nobel Paints LLC to apply for the fiscal year 2010 Ohio Third Frontier Advanced Materials Program (OTFAMP). Below is the information requested in Section 1.3.3 of the Request for Proposal for the OTFAMP. The attached project summary provides additional details about our project.

Lead applicant: Akzo Nobel Paints LLC
Address: 15885 W. Sprague Road Strongsville, OH 44136
Telephone: 440-297-8198
Contact: Chris Burich
E-mail: Christopher.burich@akzonobel.com
Proposed project title: Nano-based Antimicrobial Paints & Coatings
Estimated grant funds to be requested: $1 million
Potential Collaborator(s): University of Akron, Cleveland State, Ohio State, MAGNET

Thank you for your assistance. Please feel free to contact me if you need additional information.

Sincerely,

Chris Burich

Chris Burich
Environmental Manger North America
Akzo Nobel Paints LLC

Akzo Nobel Paints LLC
Nano-based Anti-microbial Paints & Coatings Project
2010 Ohio Third Frontier Advanced Materials Program
Project Summary

Swelling concern over rapidly spreading and treatment resistant viruses and bacteria such as the H1N1 flu virus, Escherichia coli (E-coli), and Staphylococcus aureus (Staph) have created an unprecedented market opportunity for anti-microbial products. In hospitals, where more people die from diseases that they contracted while in the hospital than from the health problems that brought them to the hospital, demand for such products is acute. While many coatings manufacturers are pursuing the goal of developing a broad-spectrum anti-microbial paint, mediocre effectiveness and high cost have stood in the way. Akzo Nobel Paints LLC has developed a promising broad-spectrum anti-microbial paint technology in the U.K. and tested it in Japan, which utilizes silver nanoparticles as the biocide. The technology promises a high level of effectiveness for viruses, bacteria, and mold. In addition, the paints would be able to be produced cost-effectively enough to allow not only their widespread use in health and environmental applications, but also schools, day care facilities and homes.

Full commercialization of the technology will involve additional research and development, product testing, certification by the US EPA, the Department of Agriculture, and/or other regulatory agencies, development and design of the manufacturing process, and development of a supply chain for the new raw materials required by the products. Technical proof of concept has been achieved and the proposed Third Frontier Advanced Materials project would take the development of the technology to the point of market entry within two to three years. Development of the technology would occur at Akzo's R&D center in Strongsville, Ohio, and the finished product would be produced in Huron, Ohio, where Akzo has one of its primary manufacturing locations. Intellectual property protection would be secured during the grant period to ensure that a lasting competitive advantage would be created for the State of Ohio and the Company.

With Third Frontier funding, additional researchers, including a Chemist and Senior Researcher would be hired immediately at the Company's Strongsville facility. Job creation at the Company's manufacturing facility in Huron will occur at the end of the Third Frontier project, and additional job creation is expected in the largely Ohio-based supply chain.

M&G Polymers l

OTFAMP 10-637

To: The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Subject: 2010 Third Frontier Advanced Materials Program Letter of Intent

To Whom It May Concern:

This letter provides notice of intent that M&G Polymers USA, LLC intends to submit a proposal to the Ohio Third Frontier Advanced Materials Program.

Project Title:	***Lignocellulose to EG Transformation Facility***
Lead Applicant Name:	M&G Polymers USA, LLC
Lead Applicant Address:	P O Box 590 6951 Ridge Road Sharon Center, OH 44274
Lead Applicant Phone:	330-239-7401 (Office) 330-351-6261 (Cell)
Lead Applicant Contact Person:	Delane N. Richardson, Director of Research and Development
Lead Applicant Email Address:	Delane. N. Richardson@GruppoMGUS.com
Estimated Funds Requested:	$2,132,700 ($800,000 Capital Innovation Ohio Loan Fund - IOLF)
Known Collaborators:	Ohio State University, Columbus, OH Ohio Agricultural Research and Development Center, Wooster, OH Berry Farm II, Sharon Center, OH OBIC, Columbus, OH Polymer Ohio, Columbus, OH
Project Duration:	Three Years

Summary of the Proposed Project:

M&G Polymers, LLC, Sharon Center, Ohio, is working with collaborators to develop and commercialize a proprietary biorefinery technology which generates a biobased ethylene glycol suitable for use in the coolant industry or in the manufacture of polyethylene terephthalate from renewable sources. The effort in this project will focus on the design, construction, equipping and staffing of a ***Lignocellulose to EG Transformation Facility*** to be located in Sharon Center, Ohio. M&G anticipates the ***Lignocellulose to EG Transformation Facility*** project will reach commercialization in thirty-six months. This project will lead to commercialization of green technology in the area of biobased renewable polymers and, ultimately, investment by M&G in the economy, industry, and workforce of the State of Ohio. The Ohio Third Frontier funds will allow M&G to accelerate its path from research to commercialization.

Headquarters and Plant
State Route 2
Apple Grove, WV 25502
Tel: (304) 576-2041
1-888-234 7383
Fax: (304) 576-4520

Sales & Marketing:
450 Gears Road
Houston, TX 77067
Tel: (281) 874-8072
Fax: (281) 873-5787

GRUPPO MOSSI & GHISOLFI

Polymers Technology Center
6951 Ridge Road – P.O.Box 590
Sharon Center, OH 44274
Tel: (330) 239-7400
Fax: (330) 239-7403

M&G Polymers L

OTFAMP 10-638

To: The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Subject: 2010 Third Frontier Advanced Materials Program Letter of Intent

To Whom It May Concern:

This letter provides notice of intent that M&G Polymers USA, LLC intends to submit a proposal to the Ohio Third Frontier Advanced Materials Program.

Project Title: ***Lignocellulose to Lignin Transformation Facility***

Lead Applicant Name: M&G Polymers USA, LLC

Lead Applicant Address: P O Box 590
6951 Ridge Road
Sharon Center, OH 44274

Lead Applicant Phone: 330-239-7401 (Office)
330-351-6261 (Cell)

Lead Applicant Contact Person: Delane N. Richardson, Director of Research and Development

Lead Applicant Email Address: Delane. N. Richardson@GruppoMGUS.com

Estimated Funds Requested: $1,202,700 ($1,600,000 Capital Innovation Ohio Loan Fund - IOLF)

Known Collaborators: Ohio State University, Columbus, OH
Ohio Agricultural Research and Development Center, Wooster, OH
Berry Farm II, Sharon Center, OH
OBIC, Columbus, OH
Polymer Ohio, Columbus, OH

Project Duration: Three Years

Summary of the Proposed Project:

M&G Polymers, LLC, Sharon Center, Ohio, is working with collaborators to develop and commercialize a proprietary biorefinery technology which generates a lignin intermediate for the production of renewable aromatic chemicals. The effort in this project will focus on the design, construction, equipping and staffing of a ***Lignocellulose to Lignin Transformation Facility*** to be located in Sharon Center, Ohio. M&G anticipates the ***Lignocellulose to Lignin Transformation Facility*** project will reach commercialization in thirty-six months. This project will lead to commercialization of green technology in the area of biobased renewable aromatic chemicals and, ultimately, investment by M&G in the economy, industry, and workforce of the State of Ohio. The Ohio Third Frontier funds will allow M&G to accelerate its path from research to commercialization.

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M&G Polymers U

OTFAMP 10-639

To: The Ohio Department of Development
Technology and Innovation Division
77 South High Street, 25th Floor
Columbus, OH 43215

Subject: 2010 Third Frontier Advanced Materials Program Letter of Intent

To Whom It May Concern:

This letter provides notice of intent that M&G Polymers USA, LLC intends to submit a proposal to the Ohio Third Frontier Advanced Materials Program.

Project Title:	***Lignocellulose to PTA Transformation Facility***
Lead Applicant Name:	M&G Polymers USA, LLC
Lead Applicant Address:	P O Box 590 6951 Ridge Road Sharon Center, OH 44274
Lead Applicant Phone:	330-239-7401 (Office) 330-351-6261 (Cell)
Lead Applicant Contact Person:	Delane N. Richardson, Director of Research and Development
Lead Applicant Email Address:	Delane. N. Richardson@GruppoMGUS.com
Estimated Funds Requested:	$2,302,700
Known Collaborators:	Ohio State University, Columbus, OH Ohio Agricultural Research and Development Center, Wooster, OH Berry Farm II, Sharon Center, OH OBIC, Columbus, OH Polymer Ohio, Columbus, OH
Project Duration:	Three Years

Summary of the Proposed Project:

M&G Polymers, LLC, Sharon Center, Ohio, is working with collaborators to develop and commercialize a proprietary biorefinery technology which generates a biobased ethylene glycol suitable for use in the manufacture of polyethylene terephthalate from renewable sources. The effort in this project will focus on the design, construction, equipping and staffing of a ***Lignocellulose to PTA Transformation Facility*** to be located in Sharon Center, Ohio. M&G anticipates the ***Lignocellulose to PTA Transformation Facility*** project will reach commercialization in thirty-six months. This project will lead to commercialization of green technology in the area of biobased renewable polymers and, ultimately, investment by M&G in the economy, industry, and workforce of the State of Ohio. The Ohio Third Frontier funds will allow M&G to accelerate its path from research to commercialization.

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OTFAMP 10-640

Letter of Intent

Lead applicant: Materials Research Institute, LLC
Address: 1321 Research Park Drive, Beavercreek, Ohio 45432
Phone number: (937) 320-4640
Contact person: Dr. Chyi-Shan Wang
E-mail: chyi-shan.wang@materialsri.com

Project title: Metalized Nanomaterials
Estimated grant funds: $1,000,000.00
Collaborators: Wright Brothers Institute and others

Project Summary:

The proposed project will develop and commercialize a class of conductive metalized nanomaterials (MNMs) of large aspect ratios. Materials Research Institute, LLC (MRI) has an extensive background in metalizing nanomaterials such as carbon nanotubes, carbon nanofibers, exfoliated graphite, and layered silicate nanoclays with highly conductive materials, such as silver, copper, and nickel. Benefiting from the large aspect ratio of the base substrate and the high electrical conductivity of the metal coating, the MNMs can introduce significant electrical conductivity to polymer resins at moderate concentrations. Further, the MNMs allow design flexibility to tailor their performance and cost by varying the base substrate nanomaterial and the type and amount of metal coating. The MNMs can be readily integrated with polymer resins to formulate conductive adhesives and coatings for applications ranging from signal and power transfer, electromagnetic shielding, electrostatic discharge, and electrical grounding to energy storage and conversion. In addition to developing new conductive adhesives and coating materials with applications in space, aerospace, electronic, automobile, chemical, and medical industries, MRI will work with the Wright Brothers Institute to advance this technology for military markets, and work with other Ohio collaborators on further developing advanced material for integration in electrodes, photovoltaic solar cell collectors, and second generation lithium ion batteries.