MTAF Round 3
Notice of Intent Submissions
Sector: Composite Materials

MTAF #	Project Title	Name	County	State	Amount ($)
3022	E-Pack Drum	Packgen	Androscoggin	ME	999,999.00
3025	High-precision composites materials kitting and installation	ACSM, Inc.	Cumberland	ME	670,000.00

Form Data (May 04, 2010 at 09:56:29 AM)

1. Project Title. Character limitation: 80 including spaces.

Project Title	E-Pack Drum

2. Lead Institution

Name	Packgen

Lead Organization Type: Choose One

Profit

Mailing Address 1	65 First Flight Dr
Mailing Address 2	65 First Flight Dr
City	Auburn
County	US
State	ME
ZIP	04211

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name	John
Rep. Last Name	Lapoint
Rep. Title	President
Rep. Institution	Packgen
Rep. Telephone	2077844195
Rep. Email Address	jlapoint@packgen.com
Rep. Mailing Address 1	65 First Flight Dr
Rep. Mailing Address 2	65 First Flight Dr
Rep. City	Auburn
Rep. State	ME
Rep. ZIP	04211

4. Project Director: Scientific lead and/or project manager.

Dir. First Name	John
Dir. Last Name	Lapoint
Dir. Title	President
Dir. Organization	Packgen
Dir. Mailing Address 1	65 First Flight Dr
Dir. Mailing Address 2	65 First Flight Dr
Dir. City	Auburn
Dir. State	ME
Dir. ZIP	04211
Dir. Telephone	2077834238
Dir. Email Address	jlapoint@packgen.com
Dir. Fax	(207) 784-4195

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators	None

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount ($)	999999

7. Technology Sector

Chose One Sector Composite Materials

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Packgen has developed an unusual way to increase the amount of empty rigid containers to ship by roadway, rail and sea contai

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from None

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.
Character limitation: 6,000 including spacing

Description Area

In 2008 Packgen was awarded a development award of approximately $320,000 to advance its IBC (Intermediate Bulk Container) packaging design to transport Sodium Cyanide, a dangerous substance used globally in the extraction process of mining gold. Dupont, our primary interested customer, continues to perform trials throughout their global customer network and the future remains very promising. The positive feedback we are receiving could lead to an additional 20 positions on top of the already 8 additional positions added since the award. Receiving the Development Award dollars helped us in the development of a clever and unique collapsing method for our product. We took the concept and advanced the technique and applied it to our first of its kind, a collapsible rigid non-bulk package which is intended to be an alternate and superior replacement for a 55 gallon, and smaller, steel drum. The development of the collapsible drum is so unique we have initiated the patenting process to protect our ideas on a couple of key design features. We are now reaching out to obtain proper funding to support the continuation of this mammoth project North American market alone uses over 80 million drums a year and is controlled by two major players. We have developed a working and marketable collapsible drum that allows us to ship 1872 empty composite drums per truck load as compared to 206 steel or poly drums per truckload. The economics are significant from a transportation, handling, disposal and safety perspective. Our unique design allows us to roll up the rigid unit thus shrinking its footprint and eliminates expensive air space within the transportation enclosure. The 12 pound lightweight stature is comparable in compression strength to a 60 lb., 18 gauge steel drum and exceeds that of a rigid plastic drum based on recent independent compression testing. The economic impact to our State is huge. If awarded the funding of this project along with the matching funds, this could lead to hundreds of new jobs within 2 years. Companies we have introduced the concept to and have provided samples to are Dupont, 3M, Dow, Clean Harbors, Safety-Kleen to name just a few. The feedback is exciting and compelling to move forward with speed and focus. The field test are encouraging and exciting. Dupont is discussing our latest packaging concept with their corporate packaging experts in two weeks. They use in excess of 3 million drums per year. The projected saving is in the millions. The award money will enable us to buy new equipment, customize new equipment and buy new tooling to accelerate the project. Our customers have clearly stated definite interest in our packaging. This award could lead to significant job opportunities and bring change to a market place in much need of innovation and will have a multifaceted positive impact on our environment. The product concept fits in with supporting manufacturing here in Maine, creates new jobs, reduces green house toxins and saves companies significant dollars.

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

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In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Submission Metadata

IP	127.0.0.1
Browser	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_6_3; en-us) AppleWebKit/531.21.11 (KHTML, like Gecko) Version/4.0.4 Safari/531.21.10

Form Data (May 04, 2010 at 11:35:51 AM)

1. Project Title. Character limitation: 80 including spaces.

Project Title	High-precision composites materials kitting and installation

2. Lead Institution

Name	ACSM, Inc.

Lead Organization Type: Choose One

Profit

Mailing Address 1	49 Pleasant Street
Mailing Address 2	None given.
City	Brunswick
County	USA
State	ME
ZIP	04011

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name	Andre
Rep. Last Name	Cocquyt
Rep. Title	President
Rep. Institution	ACSM, Inc.
Rep. Telephone	207 522 5646
Rep. Email Address	GRPguru@yahoo.com
Rep. Mailing Address 1	49 Pleasant street
Rep. Mailing Address 2	None given.
Rep. City	Brunswick
Rep. State	ME
Rep. ZIP	04011

4. Project Director: Scientific lead and/or project manager.

Dir. First Name	Andre
Dir. Last Name	Cocquyt
Dir. Title	President
Dir. Organization	ACSM, inc
Dir. Mailing Address 1	49 Pleasant street
Dir. Mailing Address 2	None given.
Dir. City	Brunswick
Dir. State	ME
Dir. ZIP	04011
Dir. Telephone	207 522 5646
Dir. Email Address	GRPguru@yahoo.com
Dir. Fax	None given.

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators	SMCC OCV Eastman Machine Co (Buffalo, NY) Assembly Guidance Systems (Chelsmford, MA)

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount ($)	670000

7. Technology Sector

Chose One Sector Composite Materials

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

CAD CAM KBE CAx PLM Laser Projection technology

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 none

Reviewer 2 none

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from **WITHELD BY MTI**

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.
Character limitation: 6,000 including spacing

Description Area

High-precision composites materials kitting and installation For critical structural applications. ACSM, Inc. May 4, 2010 1. Introduction: The advantages of composites are well known and understood. Lighter weight, greater strength, good corrosion and fatigue resistance are often cited. There is however a critical difference in composites manufacturing that sets it apart from manufacturing with traditional structural materials. For the purpose of this introduction, this is addressed as the missing step: while most other structural materials come in the form of rolled goods, sheet stock, pipe, bar, etc. -with precisely characterized mechanical properties, composite materials are supplied in the form of raw materials that are undergoing the transition from raw material to end product in one step. In order to obtain consistent product quality in composites manufacturing, it is critical to have precise placement of reinforcements in molds. Pre-cutting fabrics and placing the net-shaped pieces in a specific order and location are part of composites state-of-the-art technology. While the technology to cut fabrics has been long available, there has been significant progress in recent years to integrate cutting and placement into a complete manufacturing methodology that starts at the drawing board: CAD (computer aided design) files can be used to separate out individual laminate plies and generate the required shape for each ply. The data are then converted to G-code, the common language that is used to input the data into CAM (computer aided manufacturing) software. G-code drives CNC (computer numerically controlled) machine tools to follow the machine tool path that generates 2D (two-dimensional) or 3D (three-dimensional) components. During the cutting process, specific location marks and lay-up orientations can be added, in addition to identifying the components with bar-code or with plain writing. These marks and instructions can be used during ply installation for proper sequencing and precisely locating of plies or ply components on the tool. This task in turn can be greatly facilitated by the use of laser ply positioning, which started in the 90ties and is increasingly replacing physical templates. Laser technology however is expanding far beyond the simple task of guiding ply placement: scanning of existing tools or objects can be done with great accuracy, and the resulting data can be fed into CAD programs to generate drawings or verify the accuracy of the object versus the design. Thus, with too many acronyms, this introduction has described the first phase of PLM (product lifecycle management) and drafted a potential way to address the inherent issues created by the missing step in composites manufacturing: Automation and precision manufacturing of composites parts. CAD, CAM, CNC and laser projection systems do however not eliminate the need for skilled professionals such as computer savvy designers, manufacturing engineers, NC programmers, or machinists.

All samples were infused with the same resin, but only a general observation was given with respect to
�making sure that the samples needed to be fully cured�. A technical data sheet with the cure and post cure schedules was made available to the technicians prior to the testing. All samples were infused on a TCM (Temperature Controlled Mold) table, with manual temperature settings. What were the variables resulting from the �missing step�? The mechanical properties of the laminates which had the potential for fiber misalignment and incomplete cure or post cure were �even for the designers of the test- simply astonishing: the tensile strength of CNC machined specimen from all three stacks was tested in accordance with ASTM D3039. Tensile strength varied by a range of over 50% from the median. Stack #1 and # 3 showed brittle failure modes, voiding the differences in fiber strength. In addition, some individual specimen from stack # 1 failed at less than half the median value of stack #1 due to a combination of brittle matrix and fiber misalignment. In detail: For stack # 1, the technicians were given precut plies of 14" X 16" of unidirectional materials, with marginal deviations in the cutting angles. Fiber angle variations of up to 7% were observed. The combination of brittle matrix (incomplete cure) and fiber misalignment made some specimen fail at 1/3 of the highest observed load. Stack # 1 was infused late in the day, and the cure was cut short due to the reluctance of the crew to keep the TCM table running after the end of the shift. For stack # 2, the technicians were given an unidirectional material with similar appearance to the stack #1 material, but with colored tracer strands along the 0 and the 90 degree axis, facilitating the alignment. Stack #2 was fairly properly aligned and fully cured, and matched or exceeded the tensile strength numbers of stack #3, despite the fact that the fiberglass of stack # 3 was 20% stronger per TDS For stack # 3, the technicians were given a material with higher tensile strength but with a different appearance. An engineer supervised the fiber placement to make sure that the alignment was close to perfect. Stack # 3 was infused with only marginal time left between completion of the infusion session and the delivery to the CNC cutting unit. The production records showed however that the stack had been fully post cured. Slippage in the testing grips and later DMA testing however indicated incomplete cure of the matrix.

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Submission Metadata

IP	127.0.0.1
Browser	Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.0; Trident/4.0; GTB0.0; SLCC1; .NET CLR 2.0.50727; Media Center PC 5.0; .NET CLR 3.5.30729; .NET CLR 3.0.30729; yie8)