



Request for Proposals: November 25, 2009
Pre-proposals Due: January 20, 2010

FlexTech Alliance Mission/Objectives

The FlexTech Alliance is an industry-led, public/private partnership providing a common platform for flexible, printed electronics and display manufacturers/developers and their supplier base to develop the next generation of manufacturing equipment and materials. The FlexTech Alliance's mission is to develop and organize the U.S. manufacturing expertise to expand the infrastructure required to support world-class manufacturing capability for displays and flexible, printed electronics. The FlexTech Alliance will oversee and administer funds provided by the U.S. Government through the Army Research Laboratory (ARL) for this purpose.

The specific mission includes development of the manufacturing equipment, materials, components, and processes required for more cost-effective fabrication of current and next generation flexible electronics and display products. A special emphasis is on the developments necessary to enable displays to be fabricated on flexible substrates as part of the Army's Flexible Display Initiative. An emphasis is also being placed on developments directed at enabling web-based (roll-to-roll) manufacturing of displays and other electronic components.

Projects selected on flexible display materials, process technology and batch processing tools will be evaluated and may be integrated into the work plan for the Army R&D Center for Flexible Displays, located at the Arizona State University, as a part of the Army Flexible Display Initiative. Projects related to development of roll-to-roll manufacturing tools will be evaluated and may be integrated into the prototype production facility of the Center for Advanced Microelectronics Manufacturing [CAMM], which is directed by the State University of New York at Binghamton, and located in the facilities of Endicott Interconnect Technologies.

Proposal Process

To achieve the objectives on supplier quality and insertion into manufacturing, FlexTech Alliance is actively seeking proposals for the design, development and delivery of new or substantially improved process technology and manufacturing equipment, materials and components supply used in the fabrication of electronic displays and printed, flexible electronics. This new class of electronic devices will have a pervasive impact across several markets and applications, including, but not limited to, sensors, displays for communication, energy harvesting and storage as "power films", and solid state lighting (SSL) devices.

This is an open solicitation, such that detailed objectives and end point specifications/requirements for a specific manufacturing process or material have not been predefined.

You may submit a proposal on any topic related to enhancement in capability and/or cost for display or flexible, printed electronics manufacturing as cited above. Topics that impact across the application space of the four markets above are of particular interest. The section labeled "Priority Proposal Topics" provides a list of topics for which FlexTech Alliance member companies have expressed interest. This list is not all-inclusive, but is meant as a guide on topics viewed as priority needs for the industry by the FlexTech Alliance Technical Council members.

The FlexTech Alliance proposal process is conducted in two stages: pre-proposal and full proposal. The initial response to this RFP may be a brief pre-proposal (fewer than 5 pages). It should highlight the proposed project scope, objectives, technical approach, risk, benefits to the industry, and expected

deliverables. An estimate of the project cost and schedule should also be provided. No information considered to be company proprietary should be divulged.

The members of the FlexTech Alliance Technical Council will review the pre-proposals and down-select to those that create the greatest interest in terms of meeting a critical industry need, as perceived by the FlexTech Alliance members, and which demonstrate a viable solution. The selected companies will be notified and invited to submit a complete proposal by following the guidelines enumerated in latter sections of this document.

Following completion of the evaluation and prioritization of the complete proposals by the FlexTech Alliance technical teams, and consistent with the available budget for 2010 new project starts, those identified as worthy of support will be recommended to the FlexTech Alliance Governing Board for approval of funding.

In soliciting these proposals, FlexTech Alliance plans to grant and administer funding which must be matched (50% minimum) with funds in the form of cash and in-kind contributions provided by the grant recipients to cover the total project cost. If all other criteria are equal, preference will be given to proposals with a higher percentage of cost share. It should be noted that historically, cost share for the funded development programs has averaged over 65% industry funding. Project Teams of skilled technical resources from the FlexTech Alliance member companies will be identified to provide project oversight and direction, as well as support for the process integration and evaluation at one or more of the consortium members' manufacturing facilities, the Army Flexible Displays Center at ASU, or the CAMM at Binghamton University. These Project Teams typically will be comprised of 2 to 4 experts from the consortium companies and members from the successful individual supplier or supplier team.

In responding to this solicitation, partnering among industrial companies or industrial company/ R&D organization/university teams is appropriate and in some cases encouraged. Individual company responses are likewise appropriate where company size, breadth and expertise are adequate to cover effectively all areas (e.g., technical resources, financial stability, and market presence) critical to the successful delivery of the equipment or material proposed.

FlexTech Alliance will support technical approaches that are revolutionary, thus having a more significant element of risk, as well as approaches that are evolutionary improvements upon existing capability, which tend to be less risky and involve shorter development and delivery intervals. It is recognized that it may be desirable to include information that is considered confidential and proprietary by the submitter in order to fully and effectively convey the technical merits of the proposal. While a best effort will be made to restrict the proposal information to those with a need to know expressly for purposes of the review, it is recommended that the inclusion of proprietary information be limited to the minimum necessary to convey the highlights of the technical approach.

With respect to intellectual property developed under a FlexTech Alliance contract, the following policy has been established to encourage equipment and materials suppliers to cooperate with FlexTech Alliance in the accomplishment of its objectives:

Legal title to any technology developed under a FlexTech Alliance funded research and development contract will be the property of the development contractor. Agreements will stipulate, however, that the development contractor must provide each member of the FlexTech Alliance an opportunity to procure any materials, equipment or processes developed with such technology on a right-of-first-acceptance basis for the first year of commercial availability.

Contracts generally will be awarded as fixed payment, not-to exceed contracts, with payments to be made on achievement of milestones, as presented in the proposal. If your company has a U.S. government approved rate structure, use it. If not, the normal commercial cost accounting system used for internal R&D projects will be acceptable. The methods used to value "cost sharing" cost must be the same as those used to value the full project costs. All suppliers are expected to have a government

approved or industry standard accounting system by which actual project costs are tracked and reported. This is an absolute requirement to be sure that cost share obligations are met.

If a full proposal is requested, a work breakdown structure should be the basis of project schedules, milestone definitions, and cost estimates. Cost estimates for each major step leading to completion of a milestone should be used as the basis for the amount from the grant to be paid at each milestone. A spreadsheet showing these calculations should accompany each proposal. The same spreadsheet should also show the specifics of how you will contribute your matching share of the total costs of the development contract. Cost sharing expectations have been established in the master agreement between FlexTech Alliance and ARL, and a minimum 50/50 cost sharing ratio between government and industry is required.

Priority Proposal Topics

The new class of flexible electronic devices, impacting sensors, displays for communication, energy harvesting and storage as "power films", and SSL devices have many common manufacturing threads that include, but are not limited to:

- New functional substrates – lightweight, able to incorporate electronics, adaptable for R2R manufacturing
- Barrier layers and encapsulation solutions
- Materials – adhesives, conductive inks, thin films, UV stabilized materials
- High speed fabrication processes, especially printing
- Web handling, especially incorporating inspection and testing functions

Priority applications in Technology Development:

- Electronic textiles
- Flexible touch screens and actuators
- Improved materials & process for chips on flex
- Medical applications for printed and flexible electronics
- Combined sensors and displays using printed electronics
- Novel applications of flexible and printed electronics for DoD, DOE, NIH, and/or commercial applications

Pre-proposals and complete proposals will be accepted on all topics related to materials, equipment, and process technology development for flexible, printed electronics and display manufacturing. Of particular interest are those topics which leverage across the above four application areas. As a guide, a selection of topics for which the FlexTech Alliance Technical Council members have expressed specific interest is listed in the Tables below. Please note, however, that responses do not need to be restricted to topics in the Tables.

Table I
Flexible, Printed Electronics
Priority Topics
(1-2 Years)

		Development Thrusts		
		Materials	Manufacturing Equipment Lab to Fab Wafer / Roll – Roll	Process Engineering
Performance & Manufacturability Drivers	Patterning/Feature Size	Non-lithographic patterning at features < 20um	High throughput, low defectivity printing	Novel manufacturing TFT fab processes
	Lower Resistance Interconnects	Smaller particles		Lower annealing temperature
	Transparent Conductors	Low haze, low cost	Pattern < 20um	Integrated process
	Low Leakage, Low V Operation	Low-T/Low K dielectrics		
	Application Uniformity, Reproducibility, Yield	-High Tg optical quality, transparent functional polymers/films -Improved planarization layers -Transistor stability improvements	-Deposition and etching tools -Non-contact cleaning tools -Annealing for transistor stability	-Planarization process technologies -Non-contact cleaning processes
	Inspection Tools / Test & Repair	Barrier testing standards for comparison of materials and coatings	-Upstream Inspection -Pattern defect inspection -Patterned conductor repair -Real-time, in-line inspection for device performance	-Pattern defect inspection process -Process for array testing of backplanes
	Packaging and Assembly	Edge adhesives/sealants		
	Shelf Life/Environmental Stability	-Monolithic packaging techniques -Improved barrier layers	Improved accelerated tests	Improved barrier layer structures/ application

Table II
Flexible, Printed Electronics
Priority Topics
(3-5 Years)

		Development Thrusts		
		Materials	Manufacturing Equipment Lab to Fab Wafer / Roll – Roll	Process Engineering
Performance & Manufacturability Drivers	Design Tools		Low cost simulation and design (BSIM/SPIICE etc.)	
	Patterning/Feature Size Finer Printed Channels 50 um to 5um	Low cost deposition of nano inorganic particles, wires, tubes	-Non-lithographic patterning features < 10 um -Micro dispensing tools	Coating and non-lithographic processes at features <10um
	TFT Mobility Low Leakage, Low V Operation	-Low-T/High K dielectrics -Higher performance solution processable inks -Novel OSC alternatives to those used on glass or metal -Compatible nanodielectrics	-3D system integration (ways to integrate Si into a flex environment) -Hybrid flexelectronic systems (combination of discrete and flexible functionality)	-Low T/High K dielectric processes -Solution processing of hybrid materials -New OSC manufacturing processes
	Real-Time Alignment and Registration 1/10 of Feature Size		Multi-layer alignment tools	Directed self-assembly
	Application Uniformity, Reproducibility, Yield	UV curable hybrid organic/ inorganic dielectrics and conductive inks	-Microdispensing tools -Improved planarization -Wide-web (2 meters plus)	Wide-web (2 meters plus) process deposition uniformity
	Inspection Tools / Test & Repair		-Higher resolution -Larger FOV -Higher throughput	
	Packaging and Assembly	-Ultra low refractive index adhesives for optical systems -Compatibility with novel materials		

Requirements for Submitting a Proposal

In order to submit a response to this FlexTech Alliance request and subsequently to be considered for a grant, several requirements must be met as detailed below.

To receive an award from FlexTech Alliance, the company or composite team of companies must have a significant presence in the U.S. in the form of R&D activities and/or manufacturing. At least 50% of the work activity (funds) must be spent within the United States operations. The primary company leading the proposal must be a U.S. owned company. In certain cases, where it can be demonstrated that the development is both critical to U.S. manufacturing capability and unique, this "preference for U.S. operations" requirement can be waived with ARL approval.

The company or companies must be committed to volume manufacturing of the developed equipment or materials and provision to the U.S. flexible, printed electronics and display manufacturing industry on a right-of-first acceptance basis. Applied research conducted by universities will be considered and does not need to meet this requirement. However, in this latter case a pathway to commercialization must be envisioned and described.

The company or companies, including universities, must provide a matching share of the development cost in cash and in-kind contributions (e.g., labor and materials) of at least 50%.

To submit a pre-proposal for this RFP, the company or companies must be a member of the FlexTech Alliance. Those companies that were members in good standing of the US Display Consortium are considered to now be members of the FlexTech Alliance.

All full proposals must be submitted along with a \$995.00 application fee made payable to the FlexTech Alliance. Fees may be paid by check, credit card, or wire transfer as specified below.

Pre-proposals received by companies that are not members of the FlexTech Alliance and full proposals received without the application fee will not be evaluated.

Wire Instructions:

Wells Fargo Bank
400 Hamilton Avenue
Palo Alto, CA 94301
Funds Transfer Contact: Rosanna Wong
Phone: (415) 396-7191 Fax: (415) 975-6012
Bank Routing #: 121 000 248
Checking Account #: 4584-563084
SWIFT: WFBIUS65

By Check:

Payable to FlexTech Alliance
Mail to:
FlexTech Alliance
3081 Zanker Road
San Jose, CA 95134

By Credit Card:

Send Credit card information (*card number, cardholder name, expiration date and billing address*) via e-mail or fax to:
soya.clapp@flextech.org
Fax: (408) 577-1301

If sending by wire, please also e-mail Soya Clapp at the address above confirming the wire transfer.

Pre-Proposal Instructions

A pre-proposal does not need to follow a rigid specified format. It is typically less than 5 pages although there is no page limit. In general, it should include the following items:

- project leader and contact information on the first page of your pre-proposal
- total project cost and cost share on the first page of your pre-proposal
- a description of the objective and set of target specifications
- a description of the technical approach and supporting data and diagrams
- a description of the identified industry need that is being satisfied and competitive alternatives that are currently being used, if applicable
- project risk
- schedule

Pre-Proposals will only be accepted electronically up to 5 PM Pacific time on the due date, Wednesday, January 20, 2010. Please submit your questions and completed pre-proposal to:

Robert Tulis
Director of Technology and Business Development
FlexTech Alliance
robert.tulis@flextech.org

Full Proposal Instructions

If your pre-proposal is selected by the FLEXTECH ALLIANCE Technical Council for further consideration, you will be asked to submit a full proposal with more detailed project information, along with the application fee.

A rigid format is not required for completing a full proposal, but there are certain topics which should be discussed. The suggested format below will help us evaluate your proposal and ensure that the major topic areas are covered. A full proposal is typically less than 20 pages, however there is no page limit.

Objective (1 page)

- project leader and contact information on the first page of your pre-proposal
- a short description of the project
- total project cost, cost share, and duration

Technical Approach

- a description of the objective and set of target specifications
- a description of the technical approach and supporting data and diagrams
- a description of the identified industry need that is being satisfied and competitive alternatives that are currently being used, if applicable

Project Risks

- an identification of the major risk elements, challenges and uncertainties in the approach which has been chosen

Schedule

- a proposed schedule of work items, major milestones and deliverables which defines the expected total project length

Deliverables

- a description of physical deliverables, reports, process definition, test results, etc

Cost

- an assessment of project costs broken down by labor, materials, overhead, and capital
- your cost sharing component
- an evaluation of the cost of ownership in absolute terms or relative to the cost of the typical current process
- a proposed payment schedule based on the milestones and/or deliverables in the schedule

Company Background

- relevant company information
- 3 year financial performance track

- staff size and make-up by function
- key management and technical personnel description
- primary markets served and major customers
- key previous innovative developments and intellectual property (patents) held related to the proposal topic
- existing product portfolio

Full Proposals will only be accepted electronically up to 5 PM Pacific time on the due date, Thursday, April 1, 2010. Please submit your questions and completed proposal to:

Robert Tulis
 Director of Technology and Business Development
 FlexTech Alliance
 robert.tulis@flextech.org

Proposal Evaluation

Upon receipt, pre-proposals will be forwarded to the FLEXTECH ALLIANCE Technical Council members for review. No communications between the submitters and the review teams are anticipated during the pre-proposal evaluation phase, however clarifications may be requested. The evaluation will be based solely upon the written pre-proposal.

If your pre-proposal is selected for further consideration, you will be notified by e-mail of this result and asked to submit a full proposal along with the application fee. Full proposals will be assigned to a Project Team consisting of FLEXTECH ALLIANCE Tech Council members to help develop the final submission.

During the final selection process of full proposals, some communication or negotiation between the potential supplier and representatives of FLEXTECH ALLIANCE may be initiated over the terms, conditions, specifications, deliverables, schedule or other relevant factors contained in the proposal in advance of awarding of a contract. Granting of any awards to proposals submitted in response to this RFP is contingent upon the continued availability of funding from the U.S. government.

2009 RFP Schedule

The schedule of activities for the FLEXTECH ALLIANCE 2010 RFP is as follows:

11/25/09	Solicitation of pre-proposals issued
01/20/10	Pre-Proposals Due
02/26/10	Selection for full proposals (notification within 1 week of selection)
04/01/10	Full Proposals Due
05/14/10	Final Selection by FLEXTECH ALLIANCE Technical Council (notification within 1 week of selection)

May to
 August 2010 Presentation to FLEXTECH ALLIANCE Governing Board for approval

Contact Information

Communication and questions during the proposal period and submission of proposals should be directed to:

Robert Tulis
 Director of Technology and Business Development
 FlexTech Alliance
 3081 Zanker Road
 San Jose, CA 95134

(760) 297-1373
 (408) 577-1301 (fax)
 robert.tulis@flextech.org