



## **2012 FLEXTECH ALLIANCE OPEN SOLICITATION**

**Request for Proposals: November 21, 2011**

**Pre-Proposals Due: Tuesday, January 10, 2012**

### **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 and related electronic subsystems 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, R2R) manufacturing of displays and other electronic components.

Projects selected on flexible 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 and Priority Topics**

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 flexible, printed 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 tool, process or material have not been predefined. Consistent with the process and conditions set forth within, FlexTech Alliance anticipates that this solicitation will likely result in multiple awards. 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 multiple sectors of the four market segments noted above are of particular interest.

The RFP 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 Technical Council, however, encourages proposals on all topics supporting significant advancement in any facet of the noted application segments whether contained in the “Priority Proposal Topics” or not.*

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 (up to 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 2012 new project starts, those identified as worthy of support will be recommended to the FlexTech Alliance Governing Board for approval of funding. For reference, of the companies responding to the 2011 Open Solicitation 2/3 were invited to submit Full Proposals and more than 1/3 of those Full Proposals were approved for funding by the Governing Board.

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. Project proposals submitted by university-based industrial design groups with emphasis on solving existing problems/deficiencies are particularly encouraged by the Technical Council as a means to stimulate new ideas and design approaches consistent with this multi-award solicitation. Individual company responses are appropriate where company size, breadth and expertise are sufficient 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 partner. Agreements will stipulate, however, that the development partner 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.”

Development agreements 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**

Evolving and emerging classes 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:

- Materials – adhesives, conductive inks, thin films, UV stabilized materials, and materials integration
- High speed fabrication processes, especially printing
- Web handling, especially incorporating inspection and testing functions
- Improved energy harvesting and storage

These and other high-leverage elements will be key considerations when evaluating the novelty and potential impact of Pre-Proposal and final Full Proposal submittals. Categories noted as “priorities” and highlighted subcategories for this solicitation are listed below and while of particular interest should not be considered as all encompassing. Pre-Proposals and Full Proposals will be accepted on all topics related to materials, equipment, and process technology development for flexible, printed electronics and display manufacturing.

- 1) Touch Technologies for Flexible Displays and Electronics
  - Maximum transparency
  - Applicable ideally to both overlaid and integrated architectures
  - Functionality preserved when cycled through stressed, flexed, and distorted configurations consistent with “flexible” operating environments
  - Low to ultra-low power requirements
  - In-pixel design suitable for actuation by varying means including light, pen/pointer, gloved digits, etc.

- 2) Flexible Color Filters
  - Transparency, especially minimizing haze and scatter
  - Registration control for application to R2R or lamination processes
  - Minimum feature size (<20um) and sharp edge definition utilizing non-lithographic patterning
  - Emphasis on minimizing CF film thickness (excluding substrate material)
  - Applicable to reflective displays including electrophoretic, transfective displays, and emissive displays such as OLED
  - Balanced color densities
  - Integrated process measurement and control
  
- 3) Defectivity and In-Line Metrology for manufacturing yield enhancement - Of particular interest are those tools to detect defects and measure and assess quality of materials upstream as well as downstream in real time, fast enough to enable closed loop control, and on the web in a roll-to-roll (R2R) manufacturing line.
  - Substrate quality metrics in real-time prior to coating on web as well as in process
  - R2R optical inspection tool capable of analyzing the size and number of particulates on un-patterned translucent and transparent substrates, as well as identifying, quantifying and characterizing defects on patterned webs
  - Pattern defect inspection process
  - Tools to detect and measure defects in high speed fabrication processes, especially printing
  - Potential for detection of 5um or smaller defects on R2R with location tracking
  - Inline real-time process information and data collection for post-process analysis
  - Measurement of coating material quality (adhesives, inks, thin films, etc.)
  - Integrated process measurement and control
  - R2R tools to detect and measure line width and height plus film thickness
  - Web handling, especially incorporating inspection and testing functions, for registration and control
  - Real-time inline and/or end of line electrical testing of device performance
  
- 4) Printing applications including –
  - High speed printing of functional materials
  - Traditional printing processes to facilitate low cost/high volume fabrication of organic TFTs
  - Efforts to identify/classify materials grouping or families sufficiently compatible to enhance production of organic devices
  
- 5) Integrated Sensor Systems – FlexTech Alliance has particular interest in integrated sensor systems including on-board energy storage, logic and memory. These systems may incorporate traditional semiconductor devices as “hybrid” electronic designs as necessary to achieve desired levels of functionality. Possible embodiments may include, but are not limited to,:
  - RFID type inventory tags with data collection and capable of recording environmental conditions such as temperature, humidity, chemical ambient, shock, acceleration, etc. and able to store and maintain collected data for prolonged periods.
  - Short functional life sensor devices with long shelf lives. Sensor devices may be field deployed for monitoring and storage of bio-data and are nominally intended to remain functional for days when activated.
  - Flexible food sensors – low cost, 2 week lifetime, “ingestible” without harm
  - Food sensors designed to detect foods exposed to radiation
  
- 6) Batteries / Energy Storage

- 7) Flexible and Printed Electronics Technologies – This category is intended to capture and encourage all high-leverage proposal topics not previously addressed including but not limited to:
- Web-based manufacturing processes
  - Novel materials
  - Printing processes and applications

### **Requirements for Submitting a Proposal**

In order to submit a response to this FlexTech Alliance RFP and subsequently to be considered for an award, 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. Further, for the period of award performance plus the 3 years following, the primary company plus all IP resulting from said award must remain under control of a U.S. owned or majority controlled 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. Any responding company requiring such a waiver must make this known in the Pre-Proposal document.
- 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%.
- 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. Full Proposals received without the application fee will not be evaluated.
- Companies and organizations which are selected for an award must subsequently join the FlexTech Alliance at the appropriate membership level. Membership information is available at [www.flextech.org](http://www.flextech.org)

#### **Wire Instructions:**

Contact Dianne Eidson at [dianne.eidson@flextech.org](mailto:dianne.eidson@flextech.org)

#### **By Check:**

Payable to FlexTech Alliance

*Mail to:*

FlexTech Alliance  
3081 Zanker Road  
San Jose, CA 95134 USA

**By Credit Card:**

Send Credit card information (*card number, cardholder name, expiration date and billing address*) via e-mail or fax to:

dianne.eidson@flextech.org

Fax: (408) 577-1301

**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, Tuesday, January 10, 2012. Please submit your questions and completed Pre-Proposal to:

[RFP2012@flextech.org](mailto:RFP2012@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.

The 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.

Content: The proposal shall comply with the following content and structure.

Page 1: Cover Page

Date  
Project Title

Company Name  
Address

Project Leader Contact Information (telephone and email)  
Project Team (Prime & Subs)  
Project Duration

Total Project Cost  
Cost Share  
FlexTech Alliance Funds Requested

Page 2: Table of Contents

Page 3: Executive Summary, containing a short description of the project objective and industry or supply chain impact

Pages 4-20: Proposal Content

1. Project Proposal
  - 1.1. Problem definition
  - 1.2. Project scope and objectives
  - 1.3. Technical approach, rationale and innovative claims with supporting data and diagrams
  - 1.4. Performance target metrics and/or specifications
  - 1.5. Prior work, current status, and results (if any)
2. Statement of Work
  - 2.1. Project management approach
    - 2.1.1. Roles and relationships of key personnel
  - 2.2. Project schedule
  - 2.3. Detailed task description
  - 2.4. Milestones, deliverables, reports, process definition, test results, reviews etc
3. Detailed Project Cost and Cost Share by Task or by Quarter
  - 3.1. Labor, materials, overhead, and capital
4. Project Risk Assessment
  - 4.1. Table: Analysis of Risk and Mitigation Strategy
 

Risk	Consequence	Mitigation Strategy	Impact (L,M,H)
5. Market Needs and Competitive Landscape
  - 5.1. Business justification
    - 5.1.1. Existing product portfolio
    - 5.1.2. Primary markets served and major customers
  - 5.2. Commercialization strategy for target markets
  - 5.3. Cost of ownership benefits of proposed technology in absolute terms or relative to the cost of the typical current process
6. Company Background and Capability to Meet Technical and Business Targets
  - 6.1. Team & key personnel
    - 6.1.1. Management and technical personnel experience and qualifications
  - 6.2. Facilities and equipment
  - 6.3. Relevant company information
    - 6.3.1. Three year financial performance track
    - 6.3.2. Staff size and make-up by function
    - 6.3.3. IP strategy, key previous innovative developments and intellectual property (patents) held related to the proposal topic
7. Contact Information for Technical Lead, Alternative Technical Representative, and Contract Representative
8. Appendix (if needed - NOT INCLUDED IN PAGE TOTAL)
  - 8.1. Technical References
  - 8.2. Letters of Support

Full Proposals will only be accepted electronically up to 5 PM Pacific time on the due date, Thursday, April 5, 2012. Please submit your questions and completed proposal to:

[RFP2012@flextech.org](mailto:RFP2012@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.

### **2012 RFP Schedule**

The schedule of activities for the FLEXTECH ALLIANCE 2012 RFP is as follows:

11/21/11	Solicitation of Pre-Proposals issued
01/10/12	Pre-Proposals Due
02/22/12	Selection for Full Proposals (notification within 1 week of selection)
04/5/12	Full Proposals Due
06/4/12	Final Selection by FLEXTECH ALLIANCE Technical Council (notification within 2 weeks of selection)
June to August 2012	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:

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 3081 Zanker Road  
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 (408) 577-1301 (fax)  
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