ode: 3510-13

DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

Additive Construction by Extrusion (ACE) Consortium

AGENCY: National Institute of Standards and Technology, Department of Commerce.

ACTION: Notice of research consortium.

SUMMARY: The National Institute of Standards and Technology (NIST), an agency of the United States Department of Commerce, in support of efforts to establish the measurement science required for development of the standards and industry for Additive Construction by Extrusion (ACE), is establishing the Additive Construction by Extrusion (ACE) Consortium ("Consortium"). The Consortium will bring together stakeholders to identify and address gaps in current standards related to materials, methods, structural performance, and engineering design. The Consortium efforts are intended to study the measurement science needs for the successful adoption of ACE by the construction industry, and to identify and propose new standards to address industry needs not met by existing standards. Participation fees will be at least $10,000 annually or in-kind contributions of equivalent value. Participants will be required to sign a Cooperative Research and Development Agreement (CRADA). At NIST's discretion, entities which are not permitted to enter into CRADAs pursuant to law or other governmental constraint may be allowed to participate in the Consortium pursuant to a separate non-CRADA agreement.

DATES: The Consortium's activities will commence on October 15, 2023 ("Commencement Date"). NIST will accept letters of interest to participate in this Consortium on an ongoing basis.

ADDRESSES: Completed letters of interest or requests for additional information about the Consortium can be directed via mail to the Consortium Manager, Dr. Shawn Platt, Materials and Structural Systems Division of NIST's Engineering Laboratory, 100 Bureau Drive, Mail Stop 8615, Gaithersburg, Maryland 20899, or via electronic mail to *shawn.platt@nist.gov.*

FOR FURTHER INFORMATION CONTACT: J'aime Maynard, Consortia Agreements Officer, National Institute of Standards and Technology's Technology Partnerships Office, by telephone at (301) 975-8408, by mail to 100 Bureau Drive, Mail Stop 2200, Gaithersburg, Maryland 20899, or by electronic mail to *Jaime.maynard@nist.gov*.

SUPPLEMENTARY INFORMATION: Additive construction by extrusion (ACE) technology has the potential to revolutionize the construction industry by eliminating the need for formwork and enabling architectural and structural designs that cannot be achieved through current standard practices. As ACE remains in the early stages of development, this Consortium will study the measurement science needs for the successful adoption of ACE by the construction industry. The objective of this Consortium is to identify and then translate cementitious material measurements to in-line or in-process measurements for quality control and quality assurance in the ACE process. Participants in the Consortium will work with NIST toward the following goals:

1) *Correlating Off-line Measurements to Print Quality*

   A focus will be on correlating off-line measurements of fresh and hardening ink to a measure of print quality. The objectives are to determine material performance characteristics that are critical to the success of ACE.

2) *In-situ and In-process Measurements*

   A focus will be on developing in-situ and in-process measurements that may be used to provide feedback into the control of the ACE process. The objective is to implement material property measurements in line to the ACE process.

3) *Hardened Properties and Scaling up from Paste to Concrete*

   A focus will be on measurements at the structural scale, including a proper consideration of in-field issues. This includes, but is not limited to, hardened property measurements; studies on curing practices and finishing procedures; and development of numerical simulations of material deposition. The objectives are to develop measurement techniques to assess hardened

properties of 3-D printed structures and investigate how early age properties and measurements may inform ACE through the use of numerical simulations.

Participation Process:

NIST is soliciting responses from all sources, including other Federal Government agencies, State or local governments, foreign government agencies, industrial organizations (including corporations, partnerships, and limited partnerships, and industrial development organizations), public and private foundations, and nonprofit organizations (including universities). Eligibility will be determined by NIST based on the information provided by prospective participants in response to this notice. NIST will evaluate the submitted responses from prospective participants to determine eligibility to participate in this Consortium. Prospective participants should provide letters of interest with the following information to NIST's Consortium Manager:

1. Narrative of interest in ACE and description of related experience and expertise to contribute to the Consortium.
2. List of anticipated participating individuals.
3. If proposing in-kind participation instead of a fee contribution, description of anticipated in-kind donation and its equivalent value to fee.

Letters of interest must not include business proprietary information. NIST will not treat any information provided in response to this notice as proprietary information. NIST will notify each organization of its eligibility. In order to participate in this Consortium, each eligible organization must sign a CRADA for this Consortium. Entities which are not permitted to enter into CRADAs pursuant to law or other governmental constraint may be allowed to participate in the Consortium, at NIST's discretion, pursuant to separate non-CRADA agreements with terms that may differ, as necessary, from the Consortium CRADA terms.

Participants will contribute US $10,000 annually in funds or equivalent in-kind contributions to be members of the Consortium. NIST does not guarantee participation in the Consortium to any

organization submitting a letter of interest. This phase of the Consortium will be for up to five years.

Authority: 15 U.S.C. 3710a.

Alicia Chambers,
NIST Executive Secretariat.
[FR Doc. 2023-19647 Filed: 9/11/2023 8:45 am; Publication Date: 9/12/2023]