

PMC-ND

(1.08.09.13)

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

**RECIPIENT:** Veloxint Corporation**STATE:** MA

PROJECT TITLE: Affordable, stronger, lighter, next-generation nanocrystalline metal alloy technology with scalable manufacturing

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001980	DE-EE0009115	GFO-0009115-001	G09115

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)

B3.6 Small-scale research and development, laboratory operations, and pilot projects Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

B3.15 Small-scale indoor research and development projects using nanoscale materials Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Veloxint Corporation to critically evaluate physical and performance characteristics of bulk metal components manufactured from a nano-crystalline chrome-based powder alloy, Veloxint Fortified Chrome (VFC). This alloy would be tested for the potential to be used for fabrication of aircraft engine compressor blades and, in turn, more simple applications. The project would be completed over 3 Budget Periods (BPs), with a Go/No-Go decision point between each BP. This NEPA determination is applicable to all 3 BPs.

Proposed project activities would include computational modeling, materials characterization, mechanical testing, and process development to produce components of Chromium-based alloy from nano-crystalline powder. VFC alloy would be tested for characteristics such as tensile strength, yield strength, and cost of production. The alloy would be extruded into a round bar and then a compressor blade prototype on which further testing would be performed in order to evaluate suitability and cost effectiveness of the VFC alloy in the manufacturing process of compressor blades.

Proposed project activities by location are listed below:

Veloxint Corporation
 Framingham, MA

- Administration and research and development which would include the production of powder compounded with polymers/waxes and sintered to full density and the examination of specimens under microscopes.

Veloxint Corporation
 Natick, MA

- Research and development which would include the production of powder, electrodischarge machining, and compositional and mechanical testing of metallic samples.

GE Research - Niskayuna, NY

- Thermomechanical processing trials and material characterization of Veloxint VFC alloy, including elevated temperature extrusion and forging operations.

Beck Research Lab, University of Kentucky – Lexington, KY

- Computational modeling and theory, characterization of materials (electron microscopy, Gleeble processing, x-ray diffraction).

Oak Ridge National Laboratory – Oak Ridge, TN

- Advanced processing, microstructural analysis, and high temperature mechanical testing.

Project activities would involve the use and handling of nanoscale materials, hazardous chemicals, heavy equipment, and the processing of materials under high temperatures and loads. Veloxint Corporation and its project partners would observe all applicable environmental, health, and safety laws and regulations. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment (including respiratory protection), observation of lock-out-tag-out procedures, and radiation surveys and other monitoring and record keeping. All waste products would be disposed of by licensed waste management service providers. No modifications, new permits, or change in the use, mission, or operation of any facility would be required.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Advanced Manufacturing Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Shaina Aguilar on 8/17/20.

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____



NEPA Compliance Officer

Date: 8/18/2020

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____

Field Office Manager

Date: _____