NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Buried Anode Device Development

Cooperative Research and Development Final Report

CRADA Number: CRD-11-451

NREL Technical Contact: Robert Tenent

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Cooperative Research and Development Final Report

In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

Parties to the Agreement: e-Chromic Technologies, Inc. f/k/a US e-Chromic, LLC

CRADA Number: CRD-11-451

CRADA Title: Buried Anode Device Development

Joint Work Statement Funding Table Showing DOE Commitment:

Estimated Costs	NREL Shared Resources
Year 1	$ 20,000.00
Year 2	$ 25,000.00
Year 3	$ 30,000.00
Year 4	$ 300,000.00
TOTALS	$ 375,000.00

Abstract of CRADA Work:

The possibility of a reflecting electrochromic device is very attractive, and the "Buried Anode" architecture developed at NREL could yield such a device. The subject of this cooperative agreement will be the development and refinement of a Buried Anode device process. This development will require the active involvement of NREL and US e-Chromic personnel, and will require the use of NREL equipment as much as possible. When this effort is concluded, US e-Chromic will have enough information to construct a pilot production line, where further development can continue.

Summary of Research Results:

Over the course of this project NREL developed multiple proof of concept device structures to demonstrate the ability of the buried anode concept to form a reflectance switching electrochromic device. Successful demonstrations were developed on flat glass substrates in both half-cell and full-cell configurations using a liquid testing cell format. Multiple attempts were made to form integrated device structures using an NREL developed ion conductor layer suitable for use in large-scale glass lamination. Such devices were produced on flat, rigid glass substrates as well as on flexible substrates of glass and polymeric materials. Multiple issues with processing, materials stability, and cell fabrication were identified that will be helpful to US e-Chromic as they move forward. Finally, NREL successfully demonstrated for a potential US e-Chromic strategic partner that the metallic films proposed for the US e-Chromic device structure could be optically opaque. This demonstration was not conducted or tested in a functioning device, but was simply a vapor phase deposition of the key reflective material we believe to be forming in the proposed US e-Chromic structure.

Subject Inventions Listing:

International Application No. PCT/US14/18565.

Report Date:

1/15/2015

Responsible Technical Contact at Alliance/NREL:

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