

PNNL-SA-159035

# **Manufacturing Hybrid Copper-Aluminum Rotors for High Power Induction and Permanent Magnet Electric Motors**

**CRADA 475**

**December 2020**

*Piyush Upadhyay*

**General Motors Research & Development**

## DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes **any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.** Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

PACIFIC NORTHWEST NATIONAL LABORATORY  
*operated by*  
BATTELLE  
*for the*  
UNITED STATES DEPARTMENT OF ENERGY  
*under Contract DE-AC05-76RL01830*

Printed in the United States of America

Available to DOE and DOE contractors from the  
Office of Scientific and Technical Information,  
P.O. Box 62, Oak Ridge, TN 37831-0062;  
ph: (865) 576-8401  
fax: (865) 576-5728  
email: [reports@adonis.osti.gov](mailto:reports@adonis.osti.gov)

Available to the public from the National Technical Information Service  
5301 Shawnee Rd., Alexandria, VA 22312  
ph: (800) 553-NTIS (6847)  
email: [orders@ntis.gov](mailto:orders@ntis.gov) <<https://www.ntis.gov/about>>  
Online ordering: <http://www.ntis.gov>

# **Manufacturing Hybrid Copper-Aluminum Rotors for High Power Induction and Permanent Magnet Electric Motors**

CRADA 475

Abstract

December 2020

Piyush Upadhyay

Prepared for  
the U.S. Department of Energy  
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory  
Richland, Washington 99354

## Abstract

General Motors Research & Development (GM R&D) and Pacific Northwest National Laboratory (PNNL) will develop an electric rotor manufacturing technology with the potential of making electric motors lighter and more efficient. This will be achieved by developing a solid phase joining method to effectively join the Copper shorting bars to Aluminum end cap.

# **Pacific Northwest National Laboratory**

902 Battelle Boulevard  
P.O. Box 999  
Richland, WA 99354  
1-888-375-PNNL (7665)

***[www.pnnl.gov](http://www.pnnl.gov)***