

NE-26-37838 Development of High-Purity Graphite Matrix for Nuclear TRISO Fuel

Orbia Fluor & Energy Materials USA, Inc., located in Madison, Wisconsin, is a leader in advanced materials and specialty chemicals with deep expertise in chemical purification and graphite refinement. Their mission is to supply ultra-high purity graphite for advanced energy applications including next generation nuclear systems.

The nuclear industry relies heavily on foreign sources and potential adversaries for access to graphite in critical energy and defense applications. Orbis Fluor has developed a flexible manufacturing system and process to produce ultra-high purity graphite feedstock from natural, synthetic, and recycled graphite. Orbis lacks the necessary infrastructure capabilities for TRi-structural ISOtropic (TRISO) relevant matrix graphite fabrication, machining, and nuclear materials testing under qualified procedures to validate whether their graphite could meet nuclear graphite standards.

Orbis Fluor will partner with Oak Ridge National Laboratory (ORNL) to produce and test Orbis produced purified graphite feedstock for use in nuclear applications. ORNL has unique capabilities for TRISO relevant graphite matrix fabrication, machining, and nuclear materials testing under qualified procedures. Under this project, Orbis will produce purified feedstock powders and graphite matrix with the support of ORNL and then ORNL will test the produced graphite to assess the viability of meeting nuclear standards. This work will help build domestic capabilities to purify graphite feedstock for nuclear energy.