



U.S. DEPARTMENT of ENERGY



NATIONAL
ENERGY
TECHNOLOGY
LABORATORY

CRITICAL MINERALS
& ADVANCED ALLOYS
CENTER of EXCELLENCE

www.NETL.doe.gov

June 2026

CRITICAL MINERALS & ADVANCED ALLOYS

CENTER of EXCELLENCE

As a national laboratory, NETL executes the strategic priorities of the Department of Energy (DOE), supporting the mission of the Critical Minerals and Energy Innovation and the Hydrocarbons and Geothermal Energy Offices. The Center serves as a vital R&D interface, connecting the needs of U.S. industry with world-class scientific capabilities to rebuild a secure, domestic supply chain and ensure the U.S. has the materials needed for a reliable and affordable energy future. The Critical Minerals & Advanced Alloys (CMAA) Center of Excellence (CoE) comprises three divisions aligned with upstream, midstream, and downstream market segments.



Extraction & Recovery

Securing the Resource Base

This division unlocks the nation's unconventional mineral wealth to reduce import dependence. We provide industry with unparalleled resource characterization using advanced imaging, multi-sensor core logging, and AI/ML-driven analytics to rapidly assess diverse domestic feedstocks, including industrial waste streams from mining and energy production. Our in-situ experimental testing capabilities allow partners to simulate and de-risk extraction technologies under real-world conditions, making domestic mining more predictable and economically viable.



Process Development

Building a Reliable Midstream

This division develops the crucial processing technologies that bridge the gap between domestic resources and U.S. manufacturing. At our Feedstock Beneficiation facilities, partners can conduct pilot- and scalable processing validation. We employ advanced mineral liberation analysis and develop integrated digital flowsheets to modernize and de-risk new processing circuits, enabling industry to test and refine processes before making significant capital investments.



Alloys & Products

Strengthening Domestic Manufacturing

This division develops cost-effective, high-performance alloys for critical energy infrastructure, defense, and aerospace applications, translating materials science concepts into practical commercial technologies. Anchored by the Advanced Alloy Signature Center, its core strengths include advanced prototyping, harsh-environment simulation testing, and a high-performance computational pipeline for rapid materials discovery. By collaborating with industry, academia, and national laboratories, the division ensures research relevance and accelerates the deployment of next-generation alloys.



U.S. DEPARTMENT
of ENERGY



The NETL CoE is a cornerstone of the DOE's strategy to secure the nation's energy future. By providing U.S. industry with unparalleled R&D capabilities, the CMAA Center is enabling the re-establishment of a domestic materials foundation that is affordable, reliable, and secure, ensuring that the future of American energy is built with American resources.