



## FACTS

Alcoa Howmet Research Center, located in Whitehall, Michigan, supports Alcoa Power and Propulsion's worldwide activities through materials and process research and development, manufacturing technology, and a broad scope of engineering and laboratory services.

Materials and process R&D activities address near-term production needs of the manufacturing operations and strategic plans to maintain technical leadership and implement disruptive technologies. Alcoa Howmet invests in independent research and development activities, partners with customers to develop proprietary advancements, and receives U.S. Government funding to advance a number of specialty areas. Commercial testing and external projects extend the Center's activities into adjacent technologies.

Established in 1973, the Center occupies 100,000 sq ft (9,000 sq m).

## CONTACT INFORMATION:

### Alcoa Howmet

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& Manufacturing Technology

### Major R & D Innovations

- Hot Isostatic Pressing to eliminate shrinkage porosity in castings
- Grainex® fine-grain casting process
- VPX™ low-pressure, plasma sprayed, overlay protective coatings
- Microcast-X® ultrafine grain casting process
- Investment-cast, titanium aluminide gas turbine components
- Electron beam physical-vapor deposition of thermal barrier coatings
- Bicasting of titanium alloys with MMC inserts

### Major Equipment Development Projects

- Vacuum/Induction Melting systems for aerospace and industrial gas turbine superalloy components
- Induction Skull Remelt casting equipment for titanium alloys
- Electron beam phase vapor deposition coating equipment used in Thermal Barrier Coatings

- Automated material handling equipment for the complete automation of shell lines in the investment casting industry
- Shop floor automation for cut-off, gate grinding, and finish grinding equipment
- State-of-the-art wax pattern equipment: injection, control systems and pattern assembly

### Process Materials Technology

- Advanced core materials and processes
- Advanced investment shell materials and processes
- Rapid prototyping development services
- Advanced pattern materials and processes

### Metals Technology

- Superalloy melting and heat treatment
- Advanced materials casting
- Titanium and titanium aluminide casting
- Advanced coatings and processes

## OPERATIONS

### Technical Services

- Commercial testing services
- Analytical and testing laboratories (chemistry, physical testing, mechanical testing, metallography, electron optics)
- Engineering services (e.g., material and process approvals, failure analysis, nondestructive test)
- Manufacturing services (thermocouple design, manufacture and sales, instrument calibration)

### Foundry Technology

- Core prototyping
- Development foundry services (commercial equiax/DS/SC test material)
- Process modeling development and application
- Electronic data utilization

## MANUFACTURING TECHNOLOGY

- Advanced manufacturing engineering
- Manufacturing development (e.g., robotics, controls, automation)
- Design and fabrication of furnaces, aerospace coatings and foundry finishing equipment
- Foundry equipment design, build and servicing