

metal casting



Metal Casting
— Industry of the Future



Industrial
Partnerships:
Advancing
Energy and
Environmental
Goals



Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Office of Industrial Technologies





Industry collaboration

In 1995, the metal casting industry and the U.S. Department of Energy's (DOE) Office of Industrial Technologies (OIT) signed a compact to form a partnership that would identify and implement industry research and development needs, and develop methods to cut energy costs, increase productivity and competitiveness, and provide environmental benefits. The Cast Metals Coalition (CMC) was established by the American Foundry Society (AFS), the Steel Founder's Society of America (SFSA), and the North American Die Casting Association (NADCA) to provide direct partnership with OIT. The CMC developed the industry vision document

“The DOE Industries of the future program helped revitalize the metalcasting industry through the development and transfer of new technology.”

**—Raymond Monro,
Cast Metals Coalition**

Beyond 2000: A Vision for the American Metal Casting Industry, in September 1995. Subsequently, the AFS, SFSA, and NADCA signed a compact to establish a voluntary collaborative effort between members of the metal casting industry and OIT. In January 1998, CMC finalized a technology roadmap that identified products and markets, materials technology, manufacturing technology, environmental technology, human resources, and industry health as the primary needs of the industry. In partnership with OIT, CMC manages research and development activities through the Metal Casting Industries of the Future Program.


Successful alliances

Research conducted through the Lost Foam Technology Center at the University of Alabama, Birmingham, and supported and partially funded by the Metal Casting Industry of the Future Program, is providing the means to advance process control measures to produce high quality, high precision castings. The Lost Foam Casting Process is a breakthrough technology that involves creating foam molds for metals casting. The process has significant cost and environmental benefits including minimizing assembly, operations, and machining; and reducing solid waste and emissions. In addition, it allows metal casters to reproduce complex shapes that are difficult to achieve through other processes. This technology has traditionally been underutilized in the industry because proper control measures were poorly understood. By utilizing the OIT-CMC partnership to identify research needs and identify

What's working

The partnership between the metal casting industry and OIT combines several elements that make it particularly effective.

- CMC receives guidance from an industry oversight panel (IOP) composed of respected experts in the field. The IOP provides comments regarding project selection and oversight and important insights into industry needs and goals. The IOP is an informal group with extensive knowledge of the industry that meets yearly to comment on the DOE research portfolio, and also provides input on a request basis.
- The metal casting industry benefits from a dual approach to research in which industry tests new technologies simultaneously with university research. In this approach, results are being used by industry at the same time as the technologies are being developed in the laboratory. This system allows industries to provide researchers with feedback while the project is underway and permits researchers to make course changes to reflect industry findings. This has the added benefit of training university students in casting technologies as part of their student research, which will eventually provide the industry with a highly skilled labor force.



funding opportunities, the Lost Foam Technology Center has made significant progress in advancing understanding and control technologies related to the Lost Foam process.

Another successful partnership involved a Metal Casting Technology Showcase Demonstration held at Lester Precision Die Casting in Twinsburg, Ohio. The die casting technology showcase was co-hosted by industry, OIT, Lester Precision Die Casting, and NADCA. The event showcased results from 11 research projects identified through the OIT-CMC partnership. During the showcase, Lester used plant tours, seminars, and poster presentations to demonstrate ways in which the partnership projects are increasing energy efficiency, productivity, and competitiveness to 300 showcase attendees. The success of the showcase was due in large part to the involvement of the partners who provided expertise to identify and implement projects and those who shared in the coordination and cost of the event.

Partnering benefits

For U.S. metal casting companies, OIT partnerships can bring clear competitive advantages. The OIT-CMC Industry of the Future partnership has created opportunities for the metal casting industry to develop new technologies to increase yield, improve competitiveness, and reduce environmental impacts. Participating companies benefit from the reduced cost and risk of collaborative research and development, and streamlined access to Federal scientific resources.

The partnership has also allowed the industry to focus its research resources more efficiently by clearly identifying industry priorities and goals. Because of consortium research partnerships, market share for the lost foam process is expected to increase significantly by 2010; energy savings created by developing permanent molds for copper-base engineering alloys are expected to eventually reach 1.09 billion Btu annually. In addition, the metal casting industry has been able to realize the benefits that come from conducting university-level research, including the future availability of a trained work force.

How to participate

There are many ways to get involved with the metal casting industry of the future.

- Contact the OIT Metal Casting Industry of the Future Team Leader, Harvey Wong (harvey.wong@ee.doe.gov, 202-586-9235), or the members of the Cast Metals Coalition by visiting our Web site at <http://www.oit.doe.gov/metalcast/>.
- Monitor our Web pages for news and announcements of research solicitations. Check the Metal Casting Industry of the Future Web site at: www.oit.doe.gov/metalcast/ and the Cast Metals Coalition Web site at: <http://cmc.aticorp.org>.
- Team with other organizations and respond to solicitations for cost-shared research issued by OIT's Metal Casting Industry of the Future team, our Enabling Technologies programs, and our Financial Assistance programs.
- Begin saving energy, reducing costs, and cutting pollution in your plant today by participating in OIT's BestPractices.
- Call the OIT Clearinghouse at (800) 862-2086 to learn more about OIT publications and services.





For more information on the Metal Casting Industry of the Future, contact the OIT Clearinghouse at (800) 862-2086 or visit www.oit.doe.gov/metalcast/

Please send any comments, questions, or suggestions to webmaster.oit@ee.doe.gov

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