

STEEL

Project Fact Sheet

PARTICULATE BRIQUETTING TECHNOLOGY FOR THE STEEL INDUSTRY



BENEFITS

One plant processing 350,000 tons of metal oxide feed materials per year could produce:

- Energy savings of 2.95×10^{11} Btu; 5.9×10^{12} Btu by the year 2010 with 20 units in place
- Economic savings of \$360,000

APPLICATIONS

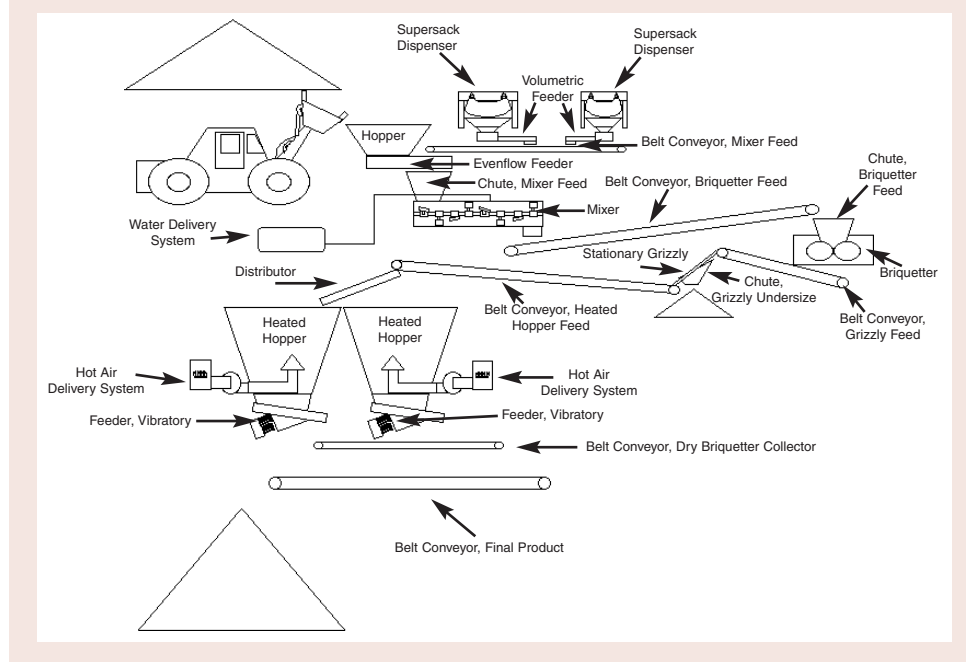
This binding technology will benefit all operations that use blast furnaces, shaft furnaces, or other metallurgical furnaces incapable of processing feed material in the form of dusts or sludges. The technology also applies to mining or metallurgical operations that have a product, by-product, or waste material that would be suitable feed for a metallurgical furnace if it were briquetted.

NEW METHOD PRODUCES METALLURGICAL FURNACE BRIQUETTES THAT IMPROVE FURNACE EFFICIENCY AND REDUCE LANDFILL WASTE

Covol Technologies, with assistance from the NICE³ Program, is demonstrating a binding process that forms a stable briquette for metallurgical furnaces. The duct briquettes retain their shape in harsh furnace environments and decrease the quantity of fines created. The briquettes lower costs and eliminate waste by allowing the steel, metallurgical, and mining industries to feed furnaces with potentially valuable materials that otherwise would be discarded in a landfill.

Currently, about 5% to 15% of the materials introduced into steel-making or smelting furnaces are lost as particulates in the form of dusts or sludges. Covol's innovative process transforms this waste into briquettes large and strong enough to endure the harsh conditions inside a metallurgical furnace. Energy savings for a plant producing 350,000 tons of metal oxide feed material per year are estimated to be 2.95×10^{11} Btu. Annual cost savings for the same plant are projected to be \$360,000.

PARTICULATE BRIQUETTING



This schematic of Covol's unique system follows the steps of processing, from the loading of fine particulate by-products and other wastes with limestone or other fluxing materials, to the final step of producing stable furnace briquettes.



Project Description

Goal: The project goal is to demonstrate a process that can significantly reduce waste generation in metallurgical and mining operations while improving energy efficiency in metallurgical furnace operations. Specific materials will be targeted for demonstration in a full-scale lead blast furnace.

This process forms stable briquettes from fine particulate by-products or wastes generated by the mining and metallurgical industries. These fine particulate materials may be combined with other similar products or with fluxing materials, such as limestone, or carbonaceous materials, such as coke fines, and then processed using Covol's proprietary technology. The briquetted product has sufficient strength and durability to withstand the harsh environment inside a metallurgical furnace. The addition of the briquettes to a metallurgical furnace creates no negative impact on either quality or quantity of throughput and adds no pollutant emissions.

Covol Technologies is demonstrating this new technology with assistance from the Utah Office of Energy Services and the NICE³ Program in the Department of Energy's Office of Industrial Technologies.

Progress and Milestones

- Layout engineering will be completed.
- Equipment will be relocated and installed.
- Facility will be commissioned and commence briquetting.
- A trial batch of briquettes will be produced.
- A trial run will be completed in an operating blast furnace using the batch of briquettes.



NICE³—National Industrial Competitiveness through Energy, Environment, and Economics: An innovative, cost-sharing program to promote energy efficiency, clean production, and economic competitiveness in industry. This grant program provides funding to state and industry partners for the first commercial demonstration of energy efficient and clean production manufacturing and industrial technologies. Total project cost for a single award must be cost-shared at a minimum of 50% by a combination of state and industrial partner dollars. The DOE share for each award shall not exceed \$500,000 to the industrial partner and up to \$25,000 to the sponsoring state agency for a maximum of \$525,000.

PROJECT PARTNERS

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INDUSTRY OF THE FUTURE—STEEL

*Through OIT's Industries of the Future initiative, the Steel Association, on behalf of the steel industry, has partnered with the U.S. Department of Energy (DOE) to spur technological innovations that will reduce energy consumption, pollution, and production costs. In March 1996, the industry outlined its vision for maintaining and building its competitive position in the world market in the document, **The Re-emergent Steel Industry: Industry/Government Partnerships for the Future.***

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