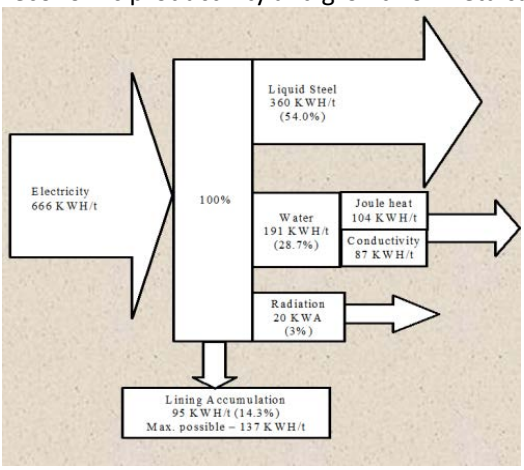
METALCASTING E-SMARRT

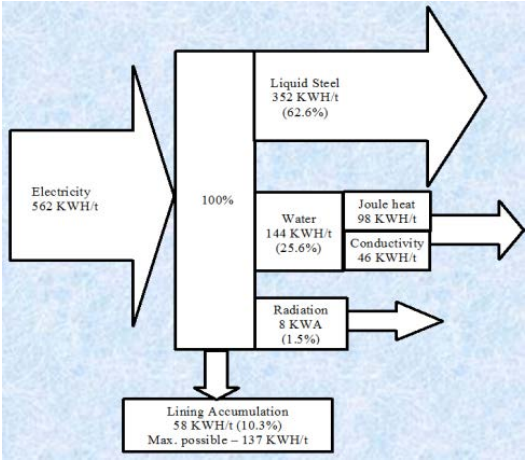
Energy-Saving Melting and Revert Reduction Technology

Saving Energy Through More Efficient Melting

The Missouri University of Science and Technology (MS&T), partnering with the Cast Metals Coalition on the E-SMARRT program, evaluated energy use and requirements for steel foundry operations to develop melting techniques and practices that improved melting energy efficiency. This effort resulted in reductions in energy use, operation costs, greenhouse gases and other emissions, while increasing productivity which will stimulate the economic productivity and growth of metalcasting manufacturing.



Electrical Energy Use Before Changes



Electrical Energy Use After Changes (preheat + covers)

SUCCESS STORY

Problem: An induction melting foundry averaged electrical consumption between 500 and 666 KWh/ton for melting on hot and cold linings, respectively. Heat losses during steel melting included heat accumulation and conduction to the cold lining and radiation from the open surface. Energy efficiency was 30 - 50% during heating of the molten bath to tap temperature.

Solution: Gas preheating of the induction lining prior to the first heat reduced the energy requirements of the first heat and radiation losses were reduced by using covers during melting in the furnaces. New alloying practices reduced the time the liquid steel was in the furnace.

Benefits: The foundry realized a 16% reduction in electrical energy on the first heat of the day and 5-10% reduction in energy on heats melted in hot linings.

"Improving efficiency in melting has helped us significantly reduce our energy and operating costs and improve quality and safety without new capital investments. We were fortunate to be able to work with the group from Missouri S&T on this project."

Jay Triplett, President
Monett Metals, Inc.

SCRA Applied R&D

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