

Success story

ArcSave®

Stirring up a 6% increase in productivity at Steel Dynamics



Customized electromagnetic stirring solutions help to improve electric arc furnace operation in Virginia, USA. In 2014 ABB completed commissioning of ArcSave® on a 90 ton furnace for scrap melting at Steel Dynamics Roanoke Bar Division Inc. and delivered optimized metallurgical performance.

Customer challenges

Steel Dynamics Roanoke Bar Division Inc. (SDI) of Roanoke, VA, USA, have a long-standing tradition of embracing and implementing new technologies that help them to maintain their competitive edge. And it's a tradition that's just as essential today as it was in 1962, when they installed the very first commercial continuous caster in the United States.

SDI firmly believe that every ton of steel produced should be done so as safely and efficiently as possible. And that is what motivated them to once again improve their operation with the help of the best available technology.

Our solution

ArcSave® is our new generation of electromagnetic stirrer (EMS) for electric arc furnace operation (EAF); developed in direct response to the demand for solutions that do even more to increase safety and productivity, and lower costs. With more power, ArcSave works harder to generate a variety of benefits and cost savings for your business. And that is exactly what ArcSave is doing for SDI.

In April 2014 the world's very first ArcSave was delivered to SDI for installation on their 90 ton arc furnace. To minimize disruption we had the ArcSave control system pre-assembled and tested before arrival on-site, and carried out most of the preparatory work, including installation, during available down times. By tailoring a stirring profile to SDI's specific process needs; a profile that controls stirring intensity, duration and direction, SDI get maximum benefits from ArcSave. And with our performance warranty we guarantee results.

Benefits

By using ArcSave, SDI has achieved safer and more reliable EAF operation, increased productivity and a whole range of other cost savings and benefits.

Savings at SDI*

Productivity	+6%
Total energy consumption	-4%
Iron yield	+0.9%
Tap oxygen	-114 parts per million
Ferrosilicon consumption	-12%
Calcium carbide consumption	-15%
Lime (EAF tap & ladle furnace additions)	-5%
Electrode consumption	-3%
Furnace repairing material	-20%
Tapping temperature	-15°C
Eccentric bottom tap hole free opening frequency	+20%

*Based on data from 6 months without and 6 months with ArcSave®

Extensive process experience and precision simulation tools allow us to accurately predict the specific benefits your business can expect from an ArcSave installation.

“ArcSave® is a technology that is totally invisible but helps the melting process make liquid steel safer, quicker and at a lower cost.”

Paul Schuler, Meltshop Manager at Steel Dynamics Inc., Roanoke, VA, USA.

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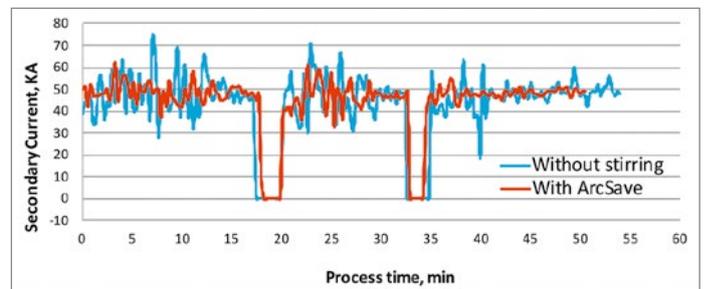
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Effect of ArcSave on the electrode current swings

Electromagnetic stirring from ABB

Can your business improve its productivity and process performance with effective and reliable stirring? That's exactly why the steel and aluminum industry have chosen ABB's non-contact EMS technology for over 1200 installations worldwide; technology we invented and continuously develop to ensure that you get long-term, significant results. And with the widest and most versatile range of EMS products on the market, we are able to offer you a solution which is customized to your process needs and delivers maximum process improvements.

With EMS effective stirring is achieved when the magnetic field from the static induction coil, placed on the outside of the furnace, interacts with electrically conducting metal bath. EMS effectively reduces elevated surface temperatures and eliminates hot-spots in the melt. This, coupled with minimized oxidation in the melt surface, significantly improves heat transfer to the melt leading to increased productivity, a safer working environment and a more reliable process. Since ABB's EMS products provide stirring in the entire bath you will even get more uniform chemical analysis using ArcSave.

ABB doesn't just provide electromagnetic equipment but offers comprehensive performance solutions for your business. That means our mission is achieved when we deliver the improved metallurgical results guaranteed by our performance warranty. Through expert analysis of your electric arc furnace process we are able to select the EMS product which best suits your needs. To get the most out of our product, and your process, our in-house experts create a stirring profile to control intensity, duration and direction. During the commissioning phase we test the equipment on-site to guarantee performance, not just in theory, but also in practice.

ArcSave® is an ABB registered trademark.