

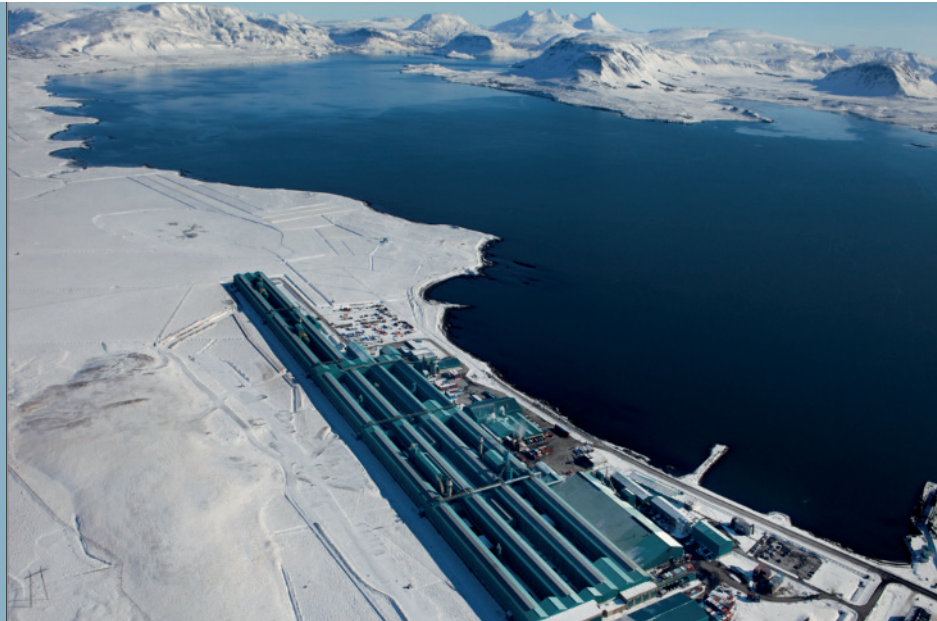
# ABB electromagnetic stirring improves furnace productivity by 17 percent at one of Europe's largest aluminium smelters

## MAIN DATA

**CUSTOMER SITE:**  
NORDURAL GRUNDARTANGI,  
ICELAND

**CUSTOMER NEED:**  
ENABLE EFFICIENT, CONSISTENT  
MELTING OF CHEAPER, HARDER  
MASTER ALLOY VIA IMPROVED  
DISSOLUTION RATE

**APPLICATION:**  
ALUMINIUM ALLOYING FURNACE



**SCOPE:**  
2 X ORZ 320 AL-EMS  
ELECTROMAGNETIC STIRRERS FOR  
ALUMINIUM FURNACE

**CUSTOMER BENEFITS:**  
17 PERCENT IMPROVED FURNACE  
PRODUCTIVITY INCLUDING REDUCED  
CYCLE TIME, REMOVAL OF  
PRE-ALLOYING STEP, SIMPLIFIED  
DE-DROSSING, IMPROVED SAFETY

**COMMISSIONING YEAR:**  
2017

Electromagnetic stirrer for aluminium furnace (AL-EMS) reduces cycle time, eliminates pre-alloying, facilitates dedrossing and increases safety for Nordural.

Nordural in Grundartangi, Iceland is one of Europe's largest aluminium smelters, responsible for supplying 2 percent of aluminium globally with an annual production of around 317,000 tons of pure aluminium and aluminium alloys. In line with the company's commitment to producing low carbon aluminium, the plant uses electricity from renewable and sustainable resources and considers it key to have well-maintained equipment and to run their smelter at maximum efficiency.

### Customer need

As demand for more complex alloy products grows together with the need to keep costs at a minimum, aluminium producers are increasingly turning to cheaper alloys which are much harder to dissolve. The need to stir the aluminium melt becomes greater, though in ways that do not compromise on modern safety standards. In 2017, Iceland's Nordural Grundartangi installed two ABB AL-EMS systems with the aim of increasing the

overall efficiency and safety of its alloying furnaces.

### ABB solution

"Stirring the melt decreases temperature gradient, resulting in lower surface temperature. A cooler surface significantly reduces surface oxidation and minimizes dross formation, which is major challenge with aluminum furnaces," said Tommy Jonsson, Regional Sales Manager for North Europe at ABB Metallurgy. "Full power stirring is particularly well-suited to improving alloy dissolution rate, which enables aluminium producers to melt harder master alloys without compromising on efficiency."

"The strong stirring action of the ABB AL-EMS allows us to dissolve Ti80Al20 masteralloys directly in the furnace instead of pre-alloying in a ladle, meaning we can eliminate one step in the process. This, together with a shorter cycle time, has resulted in a 17 percent improvement in furnace productivity,"

said Halldor Gudmundsson, Casthouse Product Development Manager, Nordural Grundartangi.

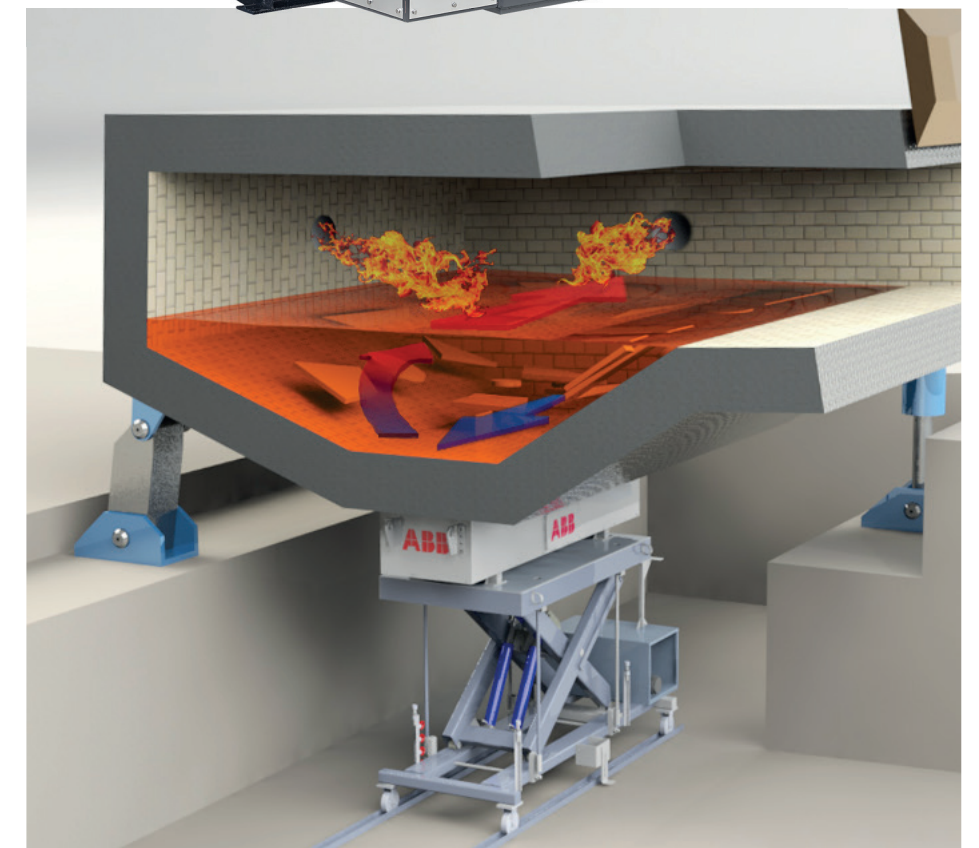
Electromagnetic stirring works on the principle of a linear motor. An induction coil is placed under or at the side of the furnace. A traveling magnetic field is generated when electricity is applied, penetrating the furnace bottom and refractory to create a powerful stirring action throughout the entire melt. The ORZ 320 model installed at Nordural Grundartangi uses a multi-coil concept (MCC) that allows two stirrer coils (located under the furnace) to share transformer and frequency converter via a switch-over unit with one control system and water station for cooling water.

Electromagnetic stirring also helps to reduce rejects and increase aluminium yield due to faults caused by variations in melt chemical analysis. "The global stirring force delivered by the ABB AL-EMS involves minimal operator intervention for the entire furnace cycle, and requires negligible maintenance," said Tommy Jonsson.

Control parameters for the AL-EMS including stirring force, interval and direction can be adjusted as per customer requirements, resulting in optimization of the furnace process as well as reduced energy consumption, which helps to lower costs. Additionally, safety is increased with less human intervention and simplified dedrossing.

What can you expect from an ABB AL-EMS?

Results from our 320+ installations worldwide show that the ABB AL-EMS facilitates energy savings of up to 10 percent as temperature difference between the melt surface and the roof is maximized, improving heat transfer to the melt and reducing heat loss. Dross formation can also be reduced by as much as 16 percent, resulting in higher yield and contributing to productivity improvements of up to 25 percent. The ABB AL-EMS is characterized by simple and safe operation with low running costs and very little maintenance.



Find out more at [www.abb.com/metals](http://www.abb.com/metals)