

# AL-EMS, Electromagnetic Stirring of Aluminium

## Boosted productivity by 21% at AMAG Rolling in Ranshofen, Austria



"The project management and start-up procedure was very professional. The downtime of the furnace was only one shift."

Eng. Thomas Mrnik  
Project Manager

### Summary

- AL-EMS was installed and commissioned in 2007
- Productivity increase of 21%
- Dross reduction of 14%
- Less than 4°C thermal displacement between surface and bottom
- Payback within one year

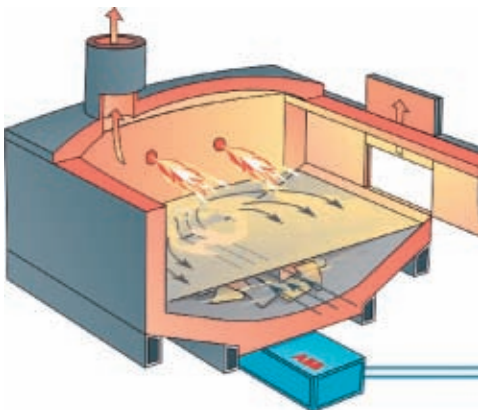
### Customer

AMAG Rolling is a globally active manufacturer of high quality, rolled aluminium products and has established a position as a specialist through constant improvements to already high quality standards. AMAG Rolling provides products which meet the highest requirements for applications in aircraft, automobiles, sporting goods, lighting, coolers, zinc electrolysis, foil stock and mechanically engineered products.

### Highlights

The ABB AL-EMS System was installed in 2007 on an existing 35-tonne melting furnace. Evaluation of stirrer performance showed a productivity increase of 21% and at the same time a dross reduction of 14%.

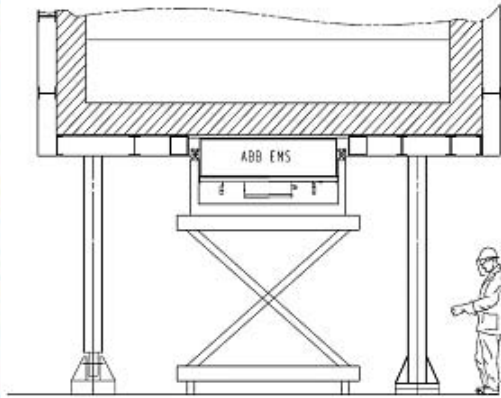
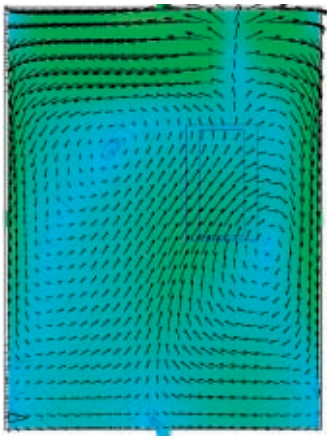
### Electromagnetic stirring by ABB



In metallurgical processing, effective and reliable stirring of the melt is one of the prerequisites for higher productivity and improved process performance. In over 1200 installations, the steel and aluminium industry has chosen non-contact electromagnetic stirring technology, invented and continuously adapted by ABB, to deliver necessary long-term and important viable results.

By electromagnetic stirring (EMS) it is possible to attain effective stirring through the interaction between the magnetic field from the static induction coil placed on the outside of the furnace and the electrically conducting metal bath. EMS effectively reduces elevated surface temperatures and eliminates hot-spots of the melt. This and the minimised oxidation of the melt surface greatly improves the heat transfer to the melt for increased productivity. Stirring by EMS also allows for a more uniform chemical analysis.

# Reliable, Consistent and Boosted Melting Productivity at AMAG Rolling



Simulation tools are based on 1200 EMS installations and quickly indicate a possible solution, project payback and performance guarantee for any 5-200 tonne furnace. At AMAG Rolling the result is effective stirring of the entire melt, ~1 rotation/minute.

## ABB scope

- Supply and commissioning of the EMS with performance guarantee
- EMS unit, standard model ORD18
- Control system integration
- Auxiliary EMS system parts
- Commissioning and training

## Benefits

- Productivity increase of 21%
- Dross reduction of 14%
- Rapid homogenisation of temperature and chemical analysis
- Short time for start-up and high system availability
- Payback within one year

## Leading solutions for challenging objectives

Based on vast process experience and accurate simulation tools ABB can define the results of implementing EMS early. Possible results depend on customer targets, current process conditions and chosen solution. ABB can conclude the following, based on 100 installations of EMS at aluminium melting and alloying furnaces:

- Up to 25% increased productivity due to effective stirring of the entire melt, 5-200 tonnes
- Up to 15% fuel savings and simultaneous reduction of fuel-related emissions
- Up to 25% reduction of dross
- Up to 50% cost savings for fork lifts, rakes and manual labour
- 100% availability since EMS unit has no moving parts and is never in contact with the furnace or the melt
- Safe and easy operation of stirring, typically 1-2 melt rotations/minute, fully variable and reversible
- No change of design or function to existing or new furnace and no need for any heel
- Rapid implementation with one day start-up and pay back within 12 months
- Turnkey and performance guarantee commitments with financial solutions/packages and worldwide service organisation



## ABB AB

Metals/Metallurgy Products  
Terminalvägen 24  
SE-721 59 Västerås, Sweden  
Phone: +46 21 34 00 00, Fax: +46 21 18 17 24  
E-mail: [info.metallurgy@se.abb.com](mailto:info.metallurgy@se.abb.com)  
Web: [www.abb.com/metals](http://www.abb.com/metals)