BSE Excellence Story

BADISCHE STAHL-ENGINEERING GMBH

# Increasing Operational Safety while Reducing Maintenance Effort

## Installation of Furnace Roof and Elbow with Spray-Cooling Technology at Walsin Lihwa (Taiwan)

**Walsin Lihwa operates a 65 ton stainless steel furnace at their meltshop in Tainan Hsien (Taiwan). The operation at the EAF created a lot of splashing, leading to formation of heavy skulls at the conventional roof design. Roof leakages and time-consuming cleaning were disturbing the production.**

### Project Approach

The installation of a new spray-cooled roof and elbow should increase the operational safety. Walsin Lihwa also expected an easier skull removal with the spray-cooled roof design. With the roof modification, the size of a new spray-cooled elbow should be increased to cope with the future fume emission at the EAF.

Walsin Lihwa delegates visited BSE/BSW in October 2015 to see the operation and maintenance of the spray-cooled roofs at BSW meltshop. The spray-cooling concept together with the impression of the visit at BSW convinced Walsin Lihwa to realise the project with BSE.

### Scope of Supply

- Detail engineering of one spray-cooled roof with spray-cooled delta
- Hardware supply of one spray-cooled roof with refractory delta
- Hardware supply of one spray-cooled elbow
- Basic engineering of all necessary modification to the water supply and pump station
- Supervision of erection and start-up including training for operation and maintenance staff

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### Results / Benefits

In April 2017, the roof and elbow were installed successfully by Walsin Lihwa under the supervision of BSE. Starting from the very first heats, the operation of the new equipment was trouble-free, giving the team of Walsin Lihwa and BSE the time to test and determine the optimum water flow rate and pressure.

*Open roof at BSE workshop displaying the collector ring and cooling elements*

*Roof and elbow ready for the first heat*

*Bottom view of the roof after several heats showing less skulls compared with previous roof design*

### Spray-Cooling Technology

The BSE spray-cooling technology provides **safe, simple and reliable cooling** of furnace components. The components are tested and proven at BSW, the steel plant of the Badische group, and at many customers' plants worldwide.

- Cooling elements consisting of water header and spray bars providing a **pressure-less water flow**
- Support structure with collector ring as an integral part used for water supply and return
- Heat transfer through steel plate cooled by a thin water layer
- Reliable operation and long lifetime due to proven design with well-balanced cooling performance


- Lower consumption of cooling water compared with tubular design
- Maximum safety in operation based on pressure-less function, thus **eliminating the risk of explosions** – in case of leakages the water droplets will just evaporate





# We are Steelmakers!

Since 1983, the Badische Stahl-Engineering GmbH (BSE) has been acting as a service provider for increasing the efficiency and productivity in the electric steel industry worldwide.

BSE is a sister company of the Badische Stahlwerke GmbH (BSW), one of the world's most efficient Electric Arc Furnace steel plants.

This unique partnership between BSW and BSE ensures that all products and services provided by BSE are not just based on mere theory, but on more than 4 decades of own proven operational experience.

BSW and BSE – a unique partnership that will help you to reach even ambitious goals.

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