

Get the most out of your steelmaking facility:

Engineering & Projects



BSE

BADISCHE STAHL-ENGINEERING GMBH

From Steelmaker to Steelmaker

Engineering and projects for plant optimisation:

Trust in decades of engineering experience!

When steelmakers start to realise that they could get more performance out of their facility, there are many good reasons why BSE is the first to be asked. An integrated engineering approach, backed by the operational experience of BSW – one of the world's most efficient mini-mills – helps us to always see the complete picture and so to come up with solutions that by far exceed the customer's expectations.

No matter if you are thinking about revamping parts of your production line or an entirely new facility – BSE's long standing experience in green- as well as brownfield projects will make things happen for you!

Our project approach fulfils your expectations:

In Budget. In Schedule. In Expected results.

Basic principles.

- Dedicated steelmaking-process-oriented approach, based on the operational experience of our own BSW steel plant, one of the world's most efficient mini-mills.
- Close partnership with the customer for incorporating their invaluable know-how and setting of goals for mutual success.
- Implementation of state-of-the-art technology under close consideration of all neighbouring equipment.
- Design and solutions selected under strict consideration of the "easy to maintain and operate" aspect.
- Optimum utilisation of already existing equipment.
- Calculation of expected performance values, benefits and payback estimations.

Project concept.

- Detailed investigation of current situation on site, customer needs and process requirements.
- Elaboration of individual and tailor-made solutions.
- Project execution and management in close cooperation with the customer.
- Applying the "KISS" (Keep it simple and stupid) principle for maximum operational reliability.
- Start-up and commissioning with personnel with operational background from our own production facilities.

Your key advantages.

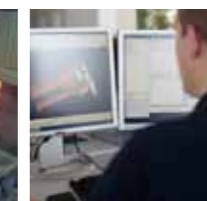
- Increase of efficiency and productivity.
- High availability at lowest possible operation and maintenance cost.
- Optimum capital planning and employment by:
 - Meeting the warranted contract price and estimated customer budget
 - Meeting the delivery time and required downtime for installation
 - Meeting the calculated and expected performance figures and economical results



BSE provides solutions that even exceed the customer's expectations



Detailed investigation on-site and...



...engineering excellence at BSE...



...combined with local experience of the customer...



...are all key factors for successful projects!



Electric Arc Furnace

Engineering and design from steelmaker to steelmaker



Secondary Metallurgy

Ladle furnace and vacuum technology for optimum heating rate and product quality

Principles.

- Providing mechanical and electrical engineering as well as hardware key components or complete furnaces of many types and operations:
 - Power source: AC or DC
 - Operation: Single shell or twin shell
 - Tapping system: EBT or spout
 - Input material: all mixes of scrap, hot metal and DRI/HBI
 - Product: all steel grades
- Elementary design based on the process know-how of own steel production, engineered for customer applications and adapted to local circumstances.



Seeing the complete picture, yet having an eye for detail

Components.

- Gantry with columns, guiding rolls and electrode lifting mechanism.
- Rocker frame with foundation lifting design.
- Hydraulic system.
- Entire shell, roof, elbow and other water-cooled EAF parts.
- Electrical and automation systems.
- Current conducting electrode arms.
- Chemical energy tools for injection of oxygen and solid material from sidewall, EBT and slag door.
- Measurement and control devices.



Electrode arms and oxygen injection tools for efficient energy input

Advantages.

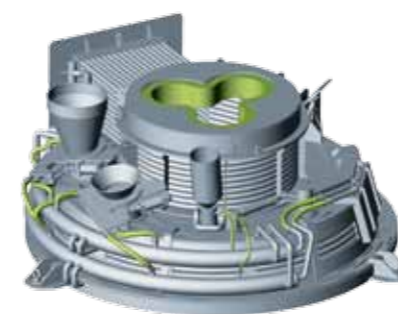
- Rigid construction and design for high productivity and performance.
- Design, layout and movements for optimum efficiency of energy and consumables with conventional technology.
- Components and features designed from steelmakers for steelmakers – making operation easy, safe and efficient (e.g. user-friendly HMI).
- Engineered for defined input materials and/or mixtures, yet providing flexibility for future capacity increase.



Our engineering excellence masters any challenge

Components.

- ### Ladle furnace
- Gantry, mast and guiding systems.
 - Electrode arms (current conducting or conventional).
 - Platform structure and roof lift.
 - Roof, elbow and other water-cooled LF parts.
 - Hydraulic system.
 - Ladle car.
 - Electrical and automation system.
 - Alloy and wire feeding system.
 - Temperature and Sampling Manipulator.
 - Foundation engineering.



Ladle furnace roof design considering all process requirements

- ### Vacuum technology
- VD, VOD, RH and ladle degassing station.
 - Vacuum pumps – steam ejector and dry mechanical.
 - High-temperature filter technology.
 - Process optimisation system (level 2).



Example of dry mechanical vacuum pump



Easy, precise and safe operation via user-friendly HMI design

Advantages.

- Optimum heating rate.
- Minimum space requirements.
- Optimum integration into process and material flow between primary melting unit and consecutive casting process.
- Optimum product quality.



Special solutions such as inverted gantry design for situations with limited space available



Fume Extraction System

Optimal for our environment and your efficiency

Principles.

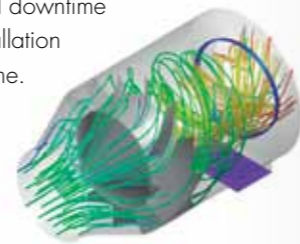
- Analysis and supply of key components for complete offgas systems to improve productivity and cost efficiency – along with strict compliance with environmental legislations.
- Overall engineering supply under consideration and evaluation of process, maintenance, human and economic aspects.

Components.

- Analysing tools:
 - Conceptual Engineering
 - Computational Fluid Dynamics
 - Fluid Dynamic Modelling
- Implementation:
 - Efficient Dedusting Control
 - High Temperature Quenching (HTQ)
 - Optimisation of further key components, e.g. canopy hood, water-cooled ducts and filter technology.

Advantages.

- Improved dedusting efficiency in Am^3/kWh .
- Reduction of specific dedusting costs in Cost/Am^3 .
- Reduction of emissions at the stack and in the building.
- Control and visualisation of the entire dedusting system.
- Reduced investment cost by preservation, reuse and/or upgrade of existing installation parts.
- Minimum required downtime by possibility of installation during production time.



Application of various analysing tools



Intelligent offgas monitoring and control



Proven solutions backed by the long-standing experience from own steel production at BSW



HTQ technology for rapid offgas cooling and reduction of dioxin emissions

Automation & Control System

Power is nothing without control



- Providing solutions and upgrades for automation and control systems:
 - Electrode regulation, switch gear, MCC
 - Level 1 up to level 2
- Highest flexibility due to independence from PLC system and HMI system/supplier.

- HMI driven by the individual needs of the customer and process.

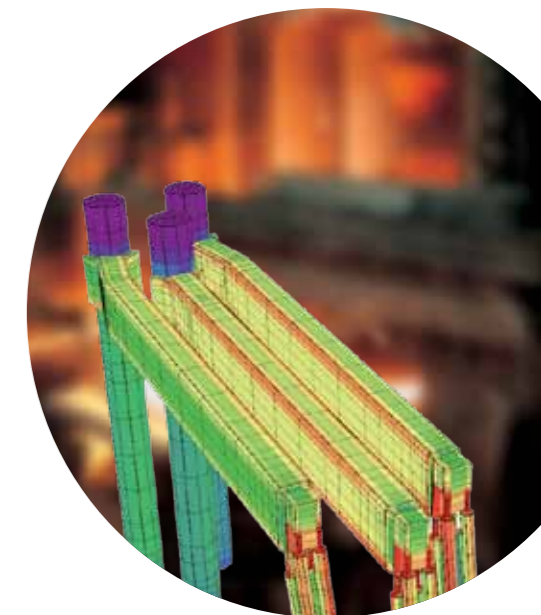


- Proper set-up of main parameters facilitates operation and analysis.



Electrical Engineering

Specification and optimisation of the electric power supply



- Elaborate calculation of high current flow for exact dimensioning of components and optimum power input of the system.



- Basic specification and offer comparison for transformers and reactors.



- Power input calculation and measurement
- Power profile optimisation.





Consulting & Qualification



Tools & Equipment



Services & Spare Parts



Engineering & Projects

We are Steelmakers!

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

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 world-wide.

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.

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