



STEELMAKING TECHNOLOGY CONSULTING

EXPERT ASSISTANCE FOR
PERFORMANCE IMPROVEMENT IN
STEELMAKING

STEELMAKING TECHNOLOGY CONSULTING

EXPERT ADVICE FOR PRODUCTION EXCELLENCE

YOUR CHALLENGE

As productivity and quality requirements in steelmaking are continually increasing, steel producers are forced to fully optimize their steel works. Especially, the need for raw material flexible plants and energy saving technologies is getting more and more important in order to remain competitive. Thus, steelmakers are called upon to identify their existing process potentials and maximize the plant performance by expert advice from a highly experienced supplier of steelmaking technology.

OUR SOLUTION

Primetals Technologies offers technology consulting services which help producers to achieve and maintain high standards in production excellence. On the basis of decades of experience in the engineering, installation, start-up and commissioning of steelmaking plants worldwide, our specialists are skilled in identifying potentials for plant performance improvement in the course of a performance check. Detailed and individual concepts are proposed for optimizing the process, equipment and quality from raw material to liquid steel. By implementing these measures steel producers can ensure a permanent production excellence of their plant on a cost-effective basis. Discover why - Primetals Technologies.

Steelmaking Technology Consulting from Primetals Technologies stands for expertise in the fields of process, equipment and quality improvement. In order to provide the best feasible solution depending on the specific customer requirements, we have at our disposal long-term plant making experience along with steelmaking expertise and a comprehensive metallurgical and operational database.

| | | |
|-----------------------------------|-------------------------|---|
| Steelmaking Technology Consulting | Consulting Approach | <ul style="list-style-type: none">• Performance Check• Customized Study• Implementation Support |
| | Consulting Capabilities | <ul style="list-style-type: none">• Process Performance• Equipment Evaluation• Steel Quality |
| | Process Routes | <ul style="list-style-type: none">• Converter Steelmaking• Electric Steelmaking |

Steelmaking Technology Consulting by Primetals Technologies

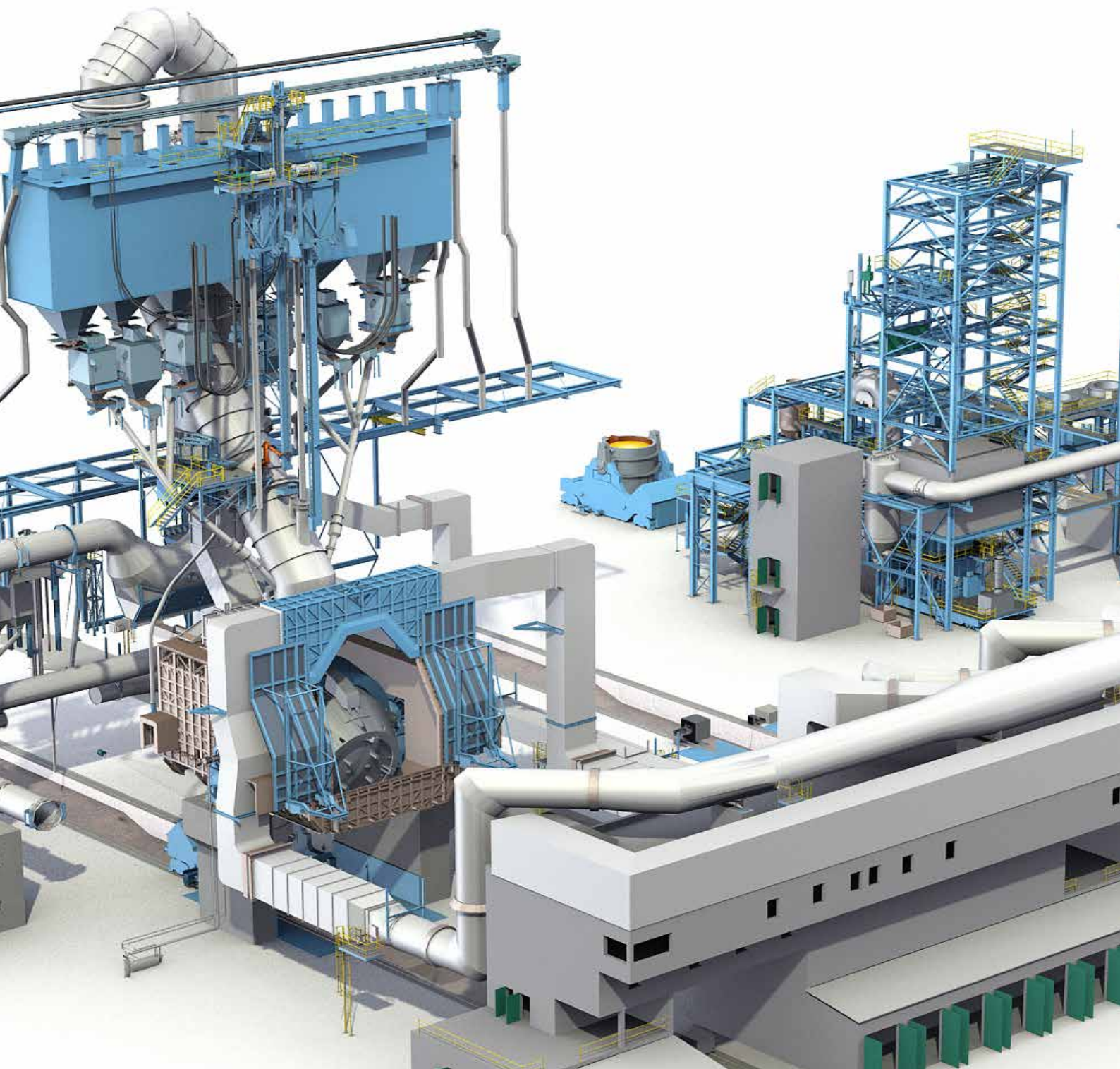




ADVANTAGES FOR STEELMAKING TECHNOLOGY CONSULTING

- World-class know-how and decades of experience in steelmaking
 - Efficient consulting methodology - only 3 steps to maximize your plant performance
 - Available for converter and electric steelmaking - LD (BOF), AOD and EAF including secondary metallurgy
 - More than 50 successful references - also including non-Primetals Technologies-supplied steelworks
 - Even small changes can have significant effects - in cost savings and production quality
 - Implementation of customized solutions and services - in steelplants of any type and supplier
 - Expert advice pays off - proven fast return on investment (ROI)
-

EFFICIENT CONSULTING APPROACH
ONLY 3 STEPS TO MAXIMIZE YOUR PLANT
PERFORMANCE





PROCESS STEPS OF STEELMAKING TECHNOLOGY CONSULTING:

Step 1: Performance Check

- Customer questionnaire
- On-site inspection
- Standardized indication report



Step 2: Customized Study

- Detailed investigation and simulations based on customer requirements
- Presentation of results and proposals
- Estimation of investment costs and time schedule



Step 3: Implementation Support

- Realization of proposed measures
- Training for qualified personnel



STEELMAKING PERFORMANCE CHECK WITHIN ONE WEEK

This performance check is comprised of two modules: First, a questionnaire has to be completed by the customer in advance of a visit, followed by a thorough on-site inspection of the plant by Primetals Technologies experts. This includes the evaluation of installed equipment, the discussion of quality issues and the identification of potentials for performance improvement in the steelmaking process. The results are summarized in a standardized indication report with expert comments.

EVALUATION OF DETAILED CONCEPTS BY CUSTOMIZED STUDY

Individual consulting requirements or subsequent steps for a detailed investigation of performance check indications are discussed with the customer. Based on this discussion a customized study is executed accordingly, followed by a detailed presentation of results and proposed solution measures. In addition, the customer is also informed about the expected costs and the time schedule for the subsequent implementation of the required services or solutions.

IMPLEMENTATION OF SELECTED MEASURES

A fast and professional realization of proposed measures is guaranteed by the implementation support of Primetals Technologies experts. Further, a comprehensive technological training for operators and metallurgists is provided.

SCOPE OF CONSULTING CAPABILITY

GOOD ADVICE IS WELL WORTH THE PRICE



PROCESS PERFORMANCE

Increase the productivity of your steel plant

Primetals Technologies knows the industry benchmarks in steelmaking to increase your productivity. Due to our long-term experience in steel plant building we have models for the different facilities like EAF, LD (BOF), AOD, LF, VD/VOD and RH in place, to optimize the process parameters and reduce the consumption and emission figures.

Process benchmarking

- Operating procedures from steelmaking raw material to secondary metallurgy
- Consumption figures, cost structure and key performance indicators

Logistic studies

- Logistical study of material flow
- Identification of bottle-necks

Energy efficiency and environmental protection

- Electrical and chemical energy input
- Mass and energy balance
- Waste heat recovery
- Emission control and by-product handling

EQUIPMENT EVALUATION

Profit from our engineering experience

The highest plant performance can only be ensured when the installed equipment is thoroughly designed, well maintained and fully integrated with each other. We investigate and predict the life-time of components and provide customized proven solutions to enhance the availability and performance of your plant. With the installation of long-life equipment, maintenance expenditures can also be significantly reduced.

Equipment evaluation

- Equipment investigation
- Equipment status evaluation

Equipment prediction

- Material investigation
- Load calculation
- Life-time forecasts

Customized upgrades of facilities

- Add-on products
- Modernization packages
- Revamps
- Life time extension

STEEL QUALITY

Gain excellence in steelmaking

If your plant is faced with quality related challenges, experts from Primetals Technologies are available for professional support. Investigations begin with a comprehensive evaluation of all factors which have a potential effect on steel quality – the entire steelmaking process is inspected from raw material to liquid steel. Additional support can be provided by external laboratories and universities with whom Primetals Technologies has a long-term working relationship.

Metallurgical investigations

- Current product quality (chemical specification, inclusions, etc.)
- Steelmaking parameters
- Heat reports
- Chemical analyses of steel and slag

Energy efficiency and environmental protection

- Checking suitability of equipment for new steel grades
- Improvement of operational reliability
- Material flow investigation under consideration of new steel grades (treatment times, handling etc.)
- Fine-tuning of steelmaking parameters
- Maintenance recommendations

Logistic studies

- Detailed definition of steel grades to be produced
- Elaboration of standard operating procedures for new steel grades
- Calculation of productivity and cost for the production of the new steel grades
- Elaboration of quality testing concept for new steel grades
- Definition of required technical equipment incl. automation
- Investment estimation for required new equipment (if necessary)

Technological training

- Training of new procedures
- Hands-on training in customer plant

Primetals Technologies Austria GmbH

A joint venture of Siemens,
Mitsubishi Heavy Industries and Partners

Turmstrasse 44
4031 Linz
Austria

primetals.com

Brochure No.: T02-O-N064-L9-P-V1-EN

Printed in Austria

© 2015 Primetals Technologies Ltd. All rights reserved.

The information (including, e.g., figures and numbers) provided in this document contains merely general descriptions or characteristics of performance based on estimates and assumptions which have not been verified.

It is no representation, does not constitute and/or evidence a contract or an offer to enter into a contract to any extent and is not binding upon the parties. Any obligation to provide and/or demonstrate respective characteristics shall only exist if expressly agreed in the terms of the contract.

These estimates and assumptions have to be analyzed on a case-to-case basis and might change as a result of further product development.

Primetals Technologies excludes any liability whatsoever under or in connection with any provided information, estimates and assumptions. The provided information, estimates and assumptions shall be without prejudice to any possible future offer and/or contract.

Any use of information provided by Primetals Technologies to the recipient shall be subject to applicable confidentiality obligations and for the own convenience of and of the sole risk of the recipient.