

DRIPAX DR OPTIMIZER

PROCESS OPTIMIZATION FOR DIRECT REDUCTION PLANTS

SEAMLESS DR PLANT OPERATION

Maintaining smooth and stable operation of Midrex direct-reduction (DR) plants in order to produce consistent-quality, direct-reduced iron (DRI) can be a demanding task. This task is supported by DRipax, an advanced process optimization system leading to considerable savings in the downstream area or by higher product prices on the market.

PREDICTION OF PRODUCT QUALITY

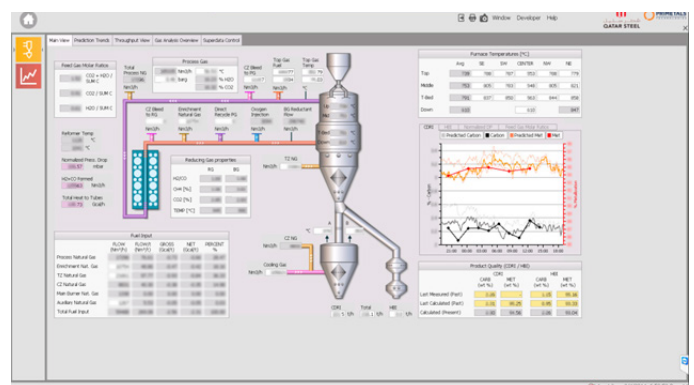
One of the greatest challenges for direct-reduction plant operators is having to cope with delays of several hours between a process change and the arrival of laboratory measurements for the resulting product. Primetals Technologies and partner Midrex Technologies have therefore devised a new Level 2 process-optimization system, which accurately predicts product quality based on first principle models, and delivers the result hours faster than any laboratory. The ability to predict metallization and carbon levels quickly following a change in the reduction process or in raw-material properties enables better control over DRI consistency.

DRipax DR Optimizer thus typically reduces deviations from target values of metallization and carbon by about 30%.

EXPERT SYSTEM

The DR Plant Expert System is a rule-based advisory system and was created to assist panel operators in the decision-making process and—if the operator so chooses—to make data-driven decisions entirely on its own in “closed-loop” mode. Among other things, the system helps to avoid inconsistencies in plant operation owing to shift changes.

At the heart of the Expert System is a knowledge base that incorporates comprehensive metallurgical and automation know-how from Primetals Technologies and Midrex, as well as plant-specific operational know-how and control philosophies of individual customers. This essentially means that customers benefit from an individual Expert System perfectly tailored to their needs.





DRlpax DR Optimizer supports increased DR plant performance

STANDARDIZED OPERATION

The diagnoses, corrective actions, and explanations given by the Expert System are based on the logic defined in the knowledge base. An adaptive system design makes it easy to expand and adapt the Expert System to each individual type of Midrex DR plant. If required, diagnoses or corrective actions can easily be adjusted or added depending on the particular plant situation.

In conjunction with the full scope of the DRlpax DR Optimizer, the Expert System represents a major step toward fully automated quality control in DR ironmaking that is uniform across all operators and allows for shift-independent “best practice” plant operation.

MAIN BENEFITS

- Quality improvement: typical reduction of standard deviation of product analysis by ~30 % both for
 - product carbon content
 - product metallization
- These improvements lead to significant savings in the downstream plants using the DRI
- Typical pay-back time of less than one year



Primetals Technologies Austria GmbH
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Turmstrasse 44 | 4031 Linz | Austria
primetals.com

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