

In secondary metallurgy, gas-stirred ladle treatments play a key role in achieving the desired quality of the melt and of the end product. In order to monitor and optimally control these processes, it is necessary to know the stirring gas volume that is actually available to perform the metallurgical work in the ladle. The BFI stirring process monitoring system supplies this information and further online control parameters by evaluating the size of the open eye on the melt bath surface. It consists of a camera system for visible or infrared light and image processing software adapted for the stirring process, and is linked up to the process control system in the steel melt shop.

The image analysis software detects the open eye on the bath surface and determines its characteristics, such as size and contour length. The size of the open eye provides a new, meaningful control parameter for achieving process reliability in gas-stirred ladle treatments. The contour length indicates the degree of slag emulsification during ladle treatment. Numerous additional data, such as the slag surface coverage, quantification of the bath movement, and the detection of splashing expand the scope of process monitoring still further. Furthermore, operational problems, such as leakage, wear and clogging of the stirring plug can be detected quickly, allowing corrective action to be taken without delay. The BFI stirring process monitoring system also enables collective evaluation of stirring operations and their archiving for quality assurance and documentation purposes.

