The treatment of steel melts under vacuum has established as an important part in the production of highest grades of steel. To increase the productivity of a vacuum unit the melt-treatment has to be controlled precisely. In addition the costs for energy have to be reduced and the consumption of resources has to be minimized. Therefore models for process control become more and more important.

At the Department of Ferrous Metallurgy (IEHK) the degassing of steel melts is being investigated using the Vacuum-Induction-Furnace 4 (VI 4) with its new integrated online-process data recording. The improved control of the VI 4 allows the definition of the process parameters like the vacuum pressure and the flow rate of the purging gas under pilot conditions. This provides representative and reproductive results. In this context an offline model for hydrogen- and nitrogen removal was created and validated by trials under consideration of modified vacuum pressure and processing time. In addition the impact of stirring with purging gas on the results of the degassing has been regarded. Therefore the kinetics at the interface of the steel melt and the stirring gas had to be considered. Several approaches have been verified, for to find the best solution to prescribe the behaviour of stirring gas in the steel melt, which is vital to the kinetics for the vacuum degassing-model.

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