

Q-CHARGE

Least-cost calculator for EAF charges

BENEFITS

- Minimization of EAF production costs
- Support for long-term production planning
- Faster and more reliable charge calculations
- Charge optimization models are powerful tools to minimize EAF production costs, while at the same time fulfill quality requirements. The reduction in material costs is particularly significant if the optimization is applied to a sufficient number of heats
- For stainless steel - The Least-Cost Charge calculator optimizes the EAF charge for the given inventory levels
- For carbon steel - Optimization of residual element levels generates cheaper charge mixes

PROCESS

Q-CHARGE least-cost calculator for EAF charge is designed to find the most economical scrap mix, from among all those possible, to obtain the required charges for the selected production orders. Q-CHARGE uses the following input data:

- > Target steel analysis, included the restrictions on residuals and contaminants, and analysis formulas
- > Limiting maximum and minimum values on materials: both for single or multiple heats
- > Target tapping weights: weights of liquid steel to be produced
- > List of available materials and weights: the SYD inventory, if available (or needed)
- > Characteristics of each scrap material: chemical analysis, specific cost, specific density (and density code)

Based on this data, Q-CHARGE then calculates the following output data:

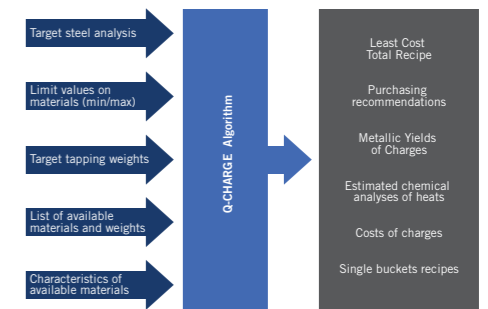
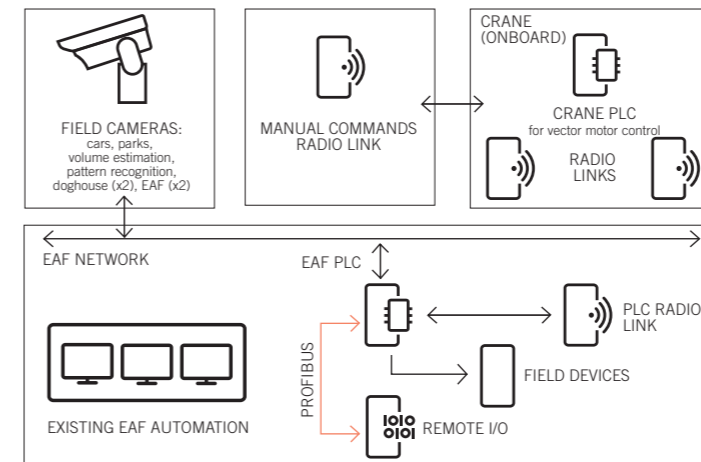
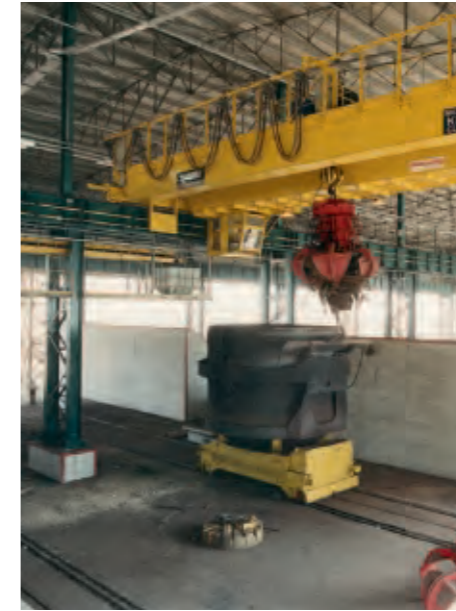
- > Least-cost recipes: the optimal scrap mix for the generation of acceptable bath compositions and tapping weights
- > Purchase list of the required materials
- > Metallic yield of the charge
- > Predicted analyses and steel weights for the heats covered
- > Materials costs for the proposed charges.

Furthermore, Q-CHARGE can perform

'What-if' calculations, to see the predicted analyses, steel weight and cost for any provided charge. This second calculation splits the total charge recipe across two or more buckets, if required. After verification and possible manual update by the operator, the calculated scrap layer weights are memorized in the Level 2 database.

EQUIPMENT

The typical HW consists of a processing unit (PC/Server) that will be interfaced through Ethernet to existing L2/L3 automation systems. Production planning can be downloaded from L3 systems, as well as entered manually. Q-CHARGE is designed to reduce to the minimum the number of manual operations needed to perform the actual calculations. Therefore, the required inputs are retrieved from the database. Together with the crane positioning system, Q-CHARGE features a set of field cameras to allow complete process supervision by the operator, which can operate the crane also with a set of manual commands. Dedicated HMIs show the bucket status overview and the crane position in the EAF bay.



PERFORMANCE ACHIEVEMENTS

- > Cogne Acciai Speciali, Aosta / Italy
- > Allegheny Ludlum, Pittsburgh (PA) / USA
- > Charter Steel, Saukville (WI) / USA