The alignment of the concentrate or matte burner is known to have a great effect on the overall efficiency of the Flash Smelting or Flash Converting process. If the process air distribution is not optimal, the furnace campaign times can also be noticeably shorter. A misaligned burner can result in increased weak acid production as well, as was learned at the Atlantic Copper Huelva smelter after the 2011 shutdown (refer to Figure 19 in 13th Flash Conference Article “A Review of recent improvements to control weak acid production at the Huelva smelter”). Before the introduction of the Outotec® FlashGuard a few years ago, measuring the alignment required quite a bit of manual work using the chain & ball tool, results of which might vary based on the user as well.

Our first generation FlashGuard enabled the online measurement of the burner’s alignment with the help of digital cameras and sophisticated machine vision algorithms. Now the second generation of the Outotec FlashGuard has been further developed based on customer feedback and experiences. In this latest design the cameras are easier to retrofit to the air chamber without modifications to the air chamber’s roof as the camera boxes can be installed on the existing air chamber inspection windows.

Additionally adjusting the cameras during commissioning and maintenance is now easier and the cameras are updated to higher resolution models, which can withstand higher operating temperatures.

The estimates of the current buildup conditions on the visible surfaces are also provided by the system. The results are calculated as easy to understand percentage KPI’s as “alignment efficiency” and “buildup prevention efficiency”. These results are available through OPC for the client for further use and analysis.

Still the single feature we’re most enthusiastic about is the new optional automatic concentrate or matte burner alignment system (patent pending), which removes the need for traditional “measure, adjust, re-measure, re-adjust” - workflow and hence significantly reduces the manual work and downtime required for the task and aligns the results by removing the human aspects. The alignment and buildup measurements from the FlashGuard system are automatically utilized in the alignment control of the burner so that the burner is always properly aligned to the center of the guiding cone so that the process air flow to the reaction shaft is as even as possible. The arrangement with three servo motors adjusting the alignment of the burner based on the FlashGuard measurements is illustrated in the pictures.
Like the FlashGuard system’s cameras, the new burner alignment option is straightforward to retrofit into an existing Outotec concentrate or matte burner: only the flexible bellow together with the servo motors is required. The existing flexible bellow is simply replaced with the servo equipped flexible bellow - this way the system can be preinstalled on the spare CJD in the workshop and taken into use during a CJD changeover.

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