MÖLLER® Direct pot feeding technology

Emission reduction and consistent alumina quality
Challenge
The supply of ever longer pot rooms with an increasing demand for alumina faces plant manufacturers with ever greater challenges. Through the installation of various direct pot feeding systems, FLSmidth Hamburg has compelling references in the safe supply of alumina to the electrolysis cells (pots). With the aid of a newly developed design software, direct pot feeding systems can be optimal calculated for different conveying distances and various conveying capacities. Besides the sufficient supply of the pots with alumina, emissions from the pot feeding system to the gas treatment centre must be minimized and all pots have to be fed with a consistent alumina quality.

Functionality
With the direct pot feeding system from FLSmidth, the alumina distribution to the pots takes place through horizontally arranged Fluidflow™ distribution airslides along the pot room. To prevent flow disturbances, it is absolutely necessary to ventilate the Fluidflow distribution airslides at regular intervals. The vent domes are wear- and maintenance free gravity separators with the task of separating swept-up alumina from the vent air in order to minimize dust emissions to the gas duct and maintain a uniform bulk material quality along the conveying distance.

Development
Through studies on full-scale test systems at the technical centre of FLSmidth in Hamburg, the degree of separation could be determined and optimized for different vent dome geometries and operating modes. For this reason, FLSmidth is capable of calculating and guaranteeing the degree of segregation and vent air emissions for future systems.

Implementation
Based on the test results in the technical centre, in early 2017 FLSmidth in Hamburg was commissioned to reduce the dust emissions from the direct pot feeding systems of pot line 8 at the Jebel Ali Aluminium Smelter from Emirates Global Aluminium (EGA). To achieve this target, it was decided to adjust the geometry of the vent domes, the control system and the fluidisation air distribution of the Fluidflow distribution airslides. The plant modification took place in July 2017. During the following emission measurements in August 2017, a reduction of the emission values by 90% was proven and the ambitious targets were clearly achieved.

FLSmidth has repeatedly proven to develop and successfully implement customer-oriented solutions.