

The Potential for Pure Magnetite Concentrate from Hawsons

Abstract

The Hawsons magnetite resource is located in the most eastern section of the Braemar formation which is 250km in length and stretches from the Razorback Ranges in South Australia to Hawsons Knob located near Broken Hill in far west New South Wales. Unlike the magnetite resource at the western end of Braemar and the BIF magnetites in Western Australia, Hawsons magnetite resource has the potential to produce a very pure magnetite concentrate. The rhombdodecahedron shaped grains of magnetite have no inclusions of silica or hematite and when the ore is crushed and ground, liberates mostly around the grain boundaries. The titania content is low and limited to specific areas of the resource and no other elements are in solid solution with the magnetite. This paper charts the course plotted through mineralogical examination and metallurgical test work to achieve close to a 100% magnetite concentrate. Optical and QEMSCAN technologies were used to determine the association of magnetite with gangue minerals both on the ore samples as well as magnetically upgraded concentrates. In fact both mineralogical techniques were required to develop the metallurgical processes needed to produce >70% Fe Magnetite concentrate.