

## INNOVATION STORY : IMPROVING PRODUCT EFFICIENCY

## A 'FINE' SOLUTION TO PROCESSING CHROMITE SAND

**THE INNOVATION:** DEVELOPING A NEW SYSTEM TO PROCESS FOUNDRY CHROMITE SANDS

**BACKGROUND:** The vast majority of chromite sand used in foundries across the world comes from South Africa. Traditionally, these chromite foundry sands were a byproduct of other mining operations typically resulting in less than 3% of mine production going to foundry sand. The sands are sorted by size from lumpy, to small lumpy, to fine for processing. Fine grain sized particles are especially challenging to process due to their low chromite content and high silicates content. The traditional method to process those fine sands, the Humphrey Spirals, was developed in 1914 and utilizes a high volume of water to sort out the chromite into usable product. The process takes approximately one ton of water for every one ton of chromite processed, resulting in a low output of product for foundries and a high volume of wasted water.

In 2010, AMCOL International decided to take control of supply quality and maximize the sources and yields of their Hevi-Sand™ Foundry Chromite Sand. To accomplish these goals, several groups under AMCOL came up with a new and fundamentally different process than anything that processing companies were doing before. The resulting Hevi-Sand™ process uses a unique combination of liberation, separation and classification processes to produce an ultra low impurity chromite foundry sand in a variety of size ranges. The Process is differentiated in that it controls the liberation of the chromite grain from the silicate impurities in order to maximize the yield of foundry quality product.

**RESULT:** The unique combination of innovative processes created by our groups at AMCOL resulted in an 75% yield of saleable foundry product compared to a 30% yield from the traditional spiral process, ultimately reducing the waste from chromite resources. By recycling the wash water for chromite and eliminating water usage after the dry separation, AMCOL also was able to reduce water consumption and waste by 70% along with a 50% reduction in power usage compared to the traditional spiral process. The unique Hevi-Sand™ process also allowed for foundry products to be sorted into a range of sizes with fewer impurities, a service not previously offered in the market. AMCOL has been implementing this process since 2010



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