

Improvement and Optimization of Performance of Iron Ore Beneficiation Plant

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Abstract

JSW steel in an integrated steel plant of 2.5 Mtpa crude steel capacity and is being expanded to 10 Mtpa in phases. The plant facilities include 3 Mt Iron Ore Beneficiation Plant, 4.2 Mt Pellet Plant, 1.6 Mt Corex iron making, 0.9 Mt Blast Furnace, 2.5 Mt BOF – CCP and 2 Mt Hot Strip Mill.

In order to control alumina in iron ore fines, the iron ore beneficiation plant was installed based on in-house developed process. During its operation of last two years, number of improvements and innovations have been introduced to improve the reduction in alumina, improve yield and reduce moisture of concentrate.

- 1. The 100 mm vortex finder of 10 inch stubcyclone was replaced by 80 mm. The product of primary + secondary cyclones increased by 7 % w.r.t feed to cyclones without impacting drop in alumina.*
- 2. The moisture of concentrate was being controlled using de-watering classifier but it was 22 %, which was not acceptable. The dewatering classifier was replaced by horizontal belt filter which reduced moisture to 14 %.*
- 3. In order to improve the yield of concentrate, trials were conducted with third stage 4-inch hydrocyclone with 35 mm vortex finder, 12.5 mm spigot and 29 psi feed pressure. The concentrate yield increased by 7 % with 58 % yield w.r.t to cyclone feed and 64 % drop in alumina which resulted in tailing loss coming down from 13 to 6 %.*