

Iron Ore Sampling and Blending Operations for Shipment

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Summary:

Ironmaking plants place much importance on preparation of feed materials to provide uniform charge to a blast furnace. To assist in the effect of preparation, an iron ore producer supplies a product with a narrow range of qualities for each shipment.

Prior to shipment Mt. Newman ore is analysed at 4 different stages in order to ensure the same quality in each shipment as follows:

1. Analyses of drill holes used for blasting are used for mine planning and ore grading operations.
2. After ore is mined and passes through the crushers, it is again sampled. This sample is crushed to lump & fine and separately analysed as a train analysis for a guide to blending operations at the port.
3. After receiving the ore at the port it is crushed to 30 mm top size and screened at 6 mm. Fine & lump ores are sampled from conveyors to the blending stockpiles, and the building of a blending stockpile is based on these analyses. A computer assists in controlling the stockpile.
4. The ore is again sampled from the conveyor feeding the shiploader to provide the shipment analysis to the customer and is also a quality check on our stockpile operation. Stockpiles are built using the windrow system and are reclaimed in 3 benches to achieve uniformity of product.

Figure 1. shows the results of blending operations at the port. The Fe range of ore received from trains, each train load containing about 6,000 tons of fines before crushing and screening, varies from 58 per cent to 65 per cent with the majority of trains in the range of 60.5 to 63 per cent. Blending operations achieve a shipment analysis range of 61.4 to 62.2 per cent.

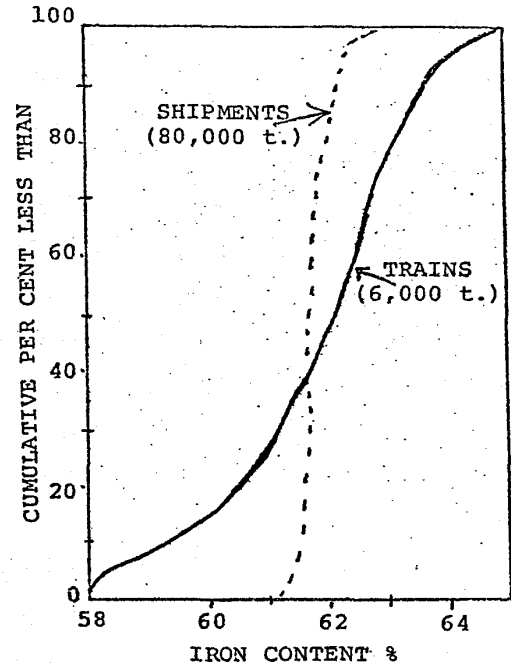


Fig. 1 Distribution of high grade fines shipment and high grade fines train samples

Iron Content Scatter - Actual Results of Blending (1977-1978)

	55	56	57	58	59	60	61	62	63	64	65	66	67	68
Blast Blocks %	4.1	4.3	5.1	5.9	6.9	8.9	8.8	9.4	10.0	10.5	8.3	8.3	7.3	2.2
Fines - Train Analysis %				1.5	5.6	14.3	30.4	31.1	14.2	2.9				
Fines - Ship Analysis %							73	27						
Lump - Train Analysis %							0.9	2.3	4.5	20.0	41.1	27.0	4.2	
Lump - Ship Analysis %										25	72	3		