

TR8-202-204

R. 436

FERROMANGANESE—T.E.M.C.O., BELL BAY**Sample**

Two samples of ferromanganese were submitted by Mr. S. Olsen, Plant Metallurgist, Tasmanian Electro-Metallurgical Co., Bell Bay. The samples were designated:—

“ A ” minus $\frac{7}{8}$ ” Ferromanganese.

“ B ” minus $\frac{1}{4}$ ” Ferromanganese.

The samples were stated to contain some 30 to 40 per cent by weight of slag, and concentration tests were requested to separate the slag from the ferromanganese. Production of high quality ferromanganese was requested.

The following information was supplied by Mr. Olsen.
 Iron content of slag—0.26 per cent.
 Specific gravity of slag—4.3.
 Iron content of Ferromanganese—21.6 per cent.
 Specific gravity of Ferromanganese—7.1-7.2.

No responsibility is accepted for the results shown in this report, except in so far as they apply to the sample tested.

Sizing

	Sample "A" Per Cent Weight	Sample "B" Per Cent Weight
— ½" + ½"	33.3
— ½" + ¼"	39.8	7.1
— ½" + ⅜"	9.9	21.9
— ⅜" + 18 mesh B.S.S.	18.1	40.2
— 18 + 44 mesh B.S.S.	14.5
— 44 + 60 mesh B.S.S.	3.8
— 60 mesh B.S.S.	12.5

Investigation

Sample "B" was sized by wet screening to the sizes shown above. Sizes finer than ½" plus 60 mesh B.S.S. were concentrated by jigging. The minus 60 mesh fraction was concentrated by tabling. Because of the high proportion of ferromanganese metal in jig and table feeds, clean tailings were not produced by one treatment. Tailings were retreated once or twice as considered necessary.

Sizes coarser than ⅜" were not concentrated, as the laboratory jig is not designed to treat feeds coarser than this sizing. The fractions plus ¼" and minus ¼" plus ⅜" were examined with a low power microscope. No slag-metal composites were observed in minus ¼" plus ⅜" fraction. Some composites were observed in the plus ¼" fraction. These amounted to about 2 per cent by count.

Sample "A" was sized by wet screening and the fractions examined for the presence of slag-metal composites with similar results to the coarse fractions of sample "B".

Specific gravities were determined on the jig concentrate and tailing of sample "B" minus ⅜" plus 18 mesh separation. Specific gravities were 6.89 and 3.57 respectively.

Test products were evaluated by determination of their iron contents.

Summary

1. High grade ferromanganese concentrate can be produced by gravity concentration methods in all the sizes tested.
2. Examination of sized fractions coarser than those tested showed negligible composite material and it can be expected that jig concentration of those fractions would result in the production of high quality ferromanganese.
3. Recovery of ferromanganese in concentrates from the sizes tested was approximately 90 per cent. This figure was derived from the iron contents of the ferromanganese and gravity tailings, using the figures supplied by Mr. Olsen.

Test Results

Sample "B" Minus $\frac{1}{4}$ " Ferromanganese

Product	Per Cent	
	Weight	Fe
+ $\frac{1}{4}$ " Untreated	7.1	20.6
- $\frac{1}{4}$ " + $\frac{1}{8}$ " Untreated	21.9	19.5
- $\frac{1}{8}$ " + 18 mesh Jig Conc. 1	14.2	22.7
- $\frac{1}{8}$ " + 18 mesh Jig Conc. 2	7.7	22.8
- $\frac{1}{8}$ " + 18 mesh Jig Conc. 3	5.0	22.1
Total Conc.	26.9	22.6
Tailing	13.3	8.3
- 18 + 44 mesh Jig Conc. 1	7.8	21.7
- 18 + 44 mesh Jig Conc. 2	1.2	21.6
- 18 + 44 mesh Jig Conc. 3	0.2	19.6
Total Conc.	9.2	21.6
Tailing	5.3	3.8
- 44 + 60 mesh Jig Conc.	2.0	21.6
- 44 + 60 mesh Tailing	1.8	2.6
- 60 mesh Table Conc. 1	3.9	21.6
- 60 mesh Table Conc. 2	1.8	19.8
Total Conc.	5.7	21.0
Tailing	6.8	4.1
- $\frac{1}{8}$ " Total Conc. produced	43.8	22.2
- $\frac{1}{8}$ " Total Tailing produced	27.2	6.0