

Analysis of Iron Produced.

Cast No. 102, Grey Iron:	
Total carbon	4.20
Si	1.75
S	0.005
P	0.047

Analysis of Slag Produced.

SiO ₂	30.90
Al ₂ O ₃	12.30
CaO	40.09
MgO	12.91
S	1.48
Fe	0.56

Slag 2556
Iron 7150
= 0.36

Length of run 38 hours, 20 min.
Mean volts on furnace 36.5
Mean amperes 4993
Power factor 0.919
Pig iron produced 7150 pounds.
Watts = 36.5 × 4993 × 0.919 167483
E. H. P. = $\frac{167483}{746}$ = 224.50
Output of pig-iron per 1000 E. H. P. days = $\frac{7150 \times 24 \times 1000}{38.33 \times 224.50 \times 2000}$ = 9.97 tons.

Run No. 17.

Ore treated magnetite from Calabogie mine.*
Reducing agent Charcoal.
Flux Limestone.
Quartz.

Analysis of Raw Material.

Calabogie Ore:	
SiO ₂	4.00
Fe ₂ O ₃	55.31
FeO	25.20
Al ₂ O ₃	2.24
CaO	2.40
MgO	4.00
P ₂ O ₅	0.95
S	0.45
CO ₂ & undet	5.45
	100.00

Fe = 58.29
P = 0.415

Charcoal same as in Run No. 15. Limestone same as in previous runs.

Composition of Charge.

	Pounds.
Ore	400
Charcoal	125
Limestone	20

Occasionally small quantities of sand were added.

Analysis of Iron Produced.

Cast No. 111, Grey Iron:		Cast No. 113, Grey Iron:	
Si	1.49	Si	1.55
S	0.016	S	0.015
P	0.500	P	0.520

Analysis of Slag Produced.

SiO ₂	26.96
Al ₂ O ₃	20.64
CaO	27.40
MgO	15.50
S	1.41
Fe	0.21

Slag 3263
Iron 8303
= 0.39

Length of run 43 hours, 5 min.
Mean volts on furnace 36.79
Mean amperes 5000
Power factor 0.919
Pig-iron produced 8303 pounds.
Watts = 36.79 × 5000 × 0.919 169050
E. H. P. = $\frac{169050}{746}$ = 226.6
Output of pig-iron per 1000 E. H. P. days = $\frac{8303 \times 24 \times 1000}{43.08 \times 226.6 \times 2000}$ = 10.20 tons.
E. H. P. years per ton of pig = 0.268.

Run No. 18.

Ore treated Roasted Pyrrhotite.
Reducing agent Charcoal.
Flux Limestone.

Analysis of Raw Material.

Roasted Pyrrhotite:

SiO ₂	10.96
Al ₂ O ₃	3.31
Fe ₂ O ₃	65.43
CaO	3.92
MgO	3.53
S	1.56
P	0.016
Cu	0.41
Ni	2.23
Metallic iron	45.80

Charcoal and limestone same as in previous run.
The limestone in the charge was decreased from 120 pounds, when starting to 50 pounds. The composition then being:

	Pounds.
Ore	400
Charcoal	110
Limestone	50

Analysis of Iron Produced.

	Cast No. 125.	Cast No. 230.	Cast No. 233.
Total carbon	3.23	3.38	2.50
Si	4.90*	4.50*	6.32*
S	0.007	0.006	0.007
P	0.062	0.037	0.042
Cu	0.86	0.87	0.71
Ni	3.70	4.12	4.00

Analysis of Slag Produced.

SiO ₂	16.44
Al ₂ O ₃	13.86
CaO	53.25
MgO	8.80
S	5.28
Fe	0.65
Cu	trace
Ni	trace

Slag 5060
Iron 7336
= 0.69

Length of run 56 hours, 20 min.
Mean volts on furnace 36.05
Mean amperes 5000
Power factor 0.919
Pig-iron produced (ferro-nickel) 7336 pounds.
Watts = 36.05 × 5000 × 0.919 165649
E. H. P. = $\frac{165649}{746}$ = 222.05
Output of pig-iron (ferro-nickel per 1000 E. H. P. days = $\frac{7336 \times 24 \times 1000}{56.33 \times 222.05 \times 2000}$ = 7.038 tons.
E. H. P. year per ton of pig = 0.389.

Run No. 19.

Ore treated Titaniferous iron ore.
Reducing agent Charcoal.
Flux Limestone
Fluorspar

Analysis of Raw Material.

Titaniferous Iron Ore:

SiO ₂	7.12
Fe ₂ O ₃	30.30
FeO	28.78
Al ₂ O ₃	7.00
CaO	1.00
MgO	4.14
P ₂ O ₅	0.064
S	0.04
TiO ₂	17.82
Cr ₂ O ₃	2.50

Cr = 1.42

99.684

Charcoal and limestone same as in previous run.

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*By increasing the limestone of the charge the silicon content of the ferro-nickel pig recently produced has been depressed to 2 per cent.