

## APPENDIX IV.

## RAPID DETERMINATION OF PHOSPHORUS AND MANGANESE.

THE following rapid methods of determining Phosphorus and Manganese may be found useful. The method for Phosphorus only gives comparative and very approximate results, but is useful for determining whether this constituent is above or below a certain limit in the bath of a basic Siemens furnace previous to tapping. The Manganese method gives excellent results, even as compared with the gravometric method.

## PHOSPHORUS.—Solutions required—

- No. 1, 400 grms. of Ammonium Nitrate + 500 c.c. Nitric Acid made up to 1,000 c.c.  
 No. 2, 50 grms. of Ammonium Molybdate + 100 grms. Ammonium Nitrate made up to 1,000 c.c.

2 gm. of the steel is dissolved in 4 c.c. of No. 1 solution in a 6-inch test tube 1 inch in diameter, and is warmed; when dissolved, 4 c.c. of No. 2 solution are added, and the liquid heated to just the boiling point, diluted with hot water to a mark to fill tube one-third full, well agitated, and compared for turbidity with two standard steels, treated under identical conditions. Assuming it is necessary that the steel should contain less than .08 per cent. Phosphorus, but not less than .05 per cent., two standards of these percentages, respectively, are used. The comparison can be made in a few minutes, and enables the sample passer to say if the Phosphorus is well under .08 per cent., and if the bath is ready to be tapped.

## MANGANESE, WALTER'S METHOD.—Solutions—

- Nitric Acid, specific gravity 1.2.  
 Nitrate of Silver, 1.33 grms. in 1,000 c.c. of water.  
 Ammonium Persulphate, 10 grms. dissolved in 30 c.c. of cold water *immediately before use.*

Dissolve .1 gm. of steel in 5 c.c. of the acid, and heat in a water-bath until all nitrous fumes are expelled. Add  $7\frac{1}{2}$  c.c. of Nitrate of Silver solution and 3 c.c. of Ammonium Persulphate solution, well mix by pouring solution to and from a clean test tube, place in water-bath (not allowing water to boil), and warm for about two minutes after oxidation commences. Cool in cold water, and compare with standard steels containing known percentages of Manganese treated under identical conditions. It is absolutely necessary that fresh Ammonium Persulphate solution should be prepared every time.

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