

# Bureau of Standards

## Certificate of Analyses

OF

### STANDARD SAMPLE No. 6a

### IRON D

| ANALYST.         | CARBON.            |                          |                    |                   | SILICON.      |                    | TITANIUM.          |                      | PHOSPHORUS.       |                      |                             |   | SULPHUR.           |                         | MANGANESE.                  |                |             |                      |          | COPPER. |       |
|------------------|--------------------|--------------------------|--------------------|-------------------|---------------|--------------------|--------------------|----------------------|-------------------|----------------------|-----------------------------|---|--------------------|-------------------------|-----------------------------|----------------|-------------|----------------------|----------|---------|-------|
|                  | TOTAL.             |                          | GRAPHITE.          | COMBINED.         | DROWN METHOD. | OTHER METHODS.     | COLOR METHOD.      | GRAVIMETRIC (Blair). | ALKALI-MOLYBDATE. | MOLYBDATE REDUCTION. | WEIGHING PHOSPHO-MOLYBDATE. | AS $Mg_3P_2O_7$ FROM PHOSPHO-MOLYBDATE. | OXIDATION.         | EVOLUTION (CaS-Iodine). | FORD (Mn as $Mn_2P_2O_7$ ). | FORD-WILLIAMS. | BISMUTHATE. | COLOR (Persulphate). | VOLHARD. |         |       |
|                  | DIRECT COMBUSTION. | SOLUTION AND COMBUSTION. |                    |                   |               |                    |                    |                      |                   |                      |                             |   |                    |                         |                             |                |             |                      |          |         |       |
| 1. . . . .       | 2. 45              | .....                    | 1. 82              | . 63              | .....         | 2. 64              | . 08               | .....                | .....             | . 548                | .....                       | .....                                   | . 041              | . 036 <sup>a</sup>      | .....                       | .....          | .....       | .....                | .....    | .....   | . 043 |
| 2. . . . .       | .....              | .....                    | 1. 82              | .....             | .....         | 2. 60              | . 08               | .....                | .....             | . 555                | .....                       | .....                                   | . 047              | . 045 <sup>a</sup>      | 1. 56                       | .....          | .....       | .....                | .....    | .....   | ..... |
| 3. . . . .       | .....              | 2. 45                    | 1. 90              | . 55              | 2. 52         | .....              | . 076 <sup>b</sup> | .....                | .....             | .....                | . 557                       | .....                                   | . 044              | . 042                   | .....                       | .....          | 1. 56       | .....                | .....    | .....   | . 049 |
| 4. . . . .       | 2. 47              | 2. 45                    | 1. 85              | . 61              | 2. 60         | 2. 59              | . 088              | .....                | . 530             | . 524                | . 522 <sup>c</sup>          | .....                                   | . 041              | . 026 <sup>d</sup>      | .....                       | .....          | 1. 552      | .....                | .....    | .....   | . 046 |
| 5. . . . .       | 2. 48              | .....                    | 1. 85              | . 63              | 2. 53         | .....              | . 096              | .....                | .....             | .....                | . 527                       | .....                                   | . 053 <sup>e</sup> | .....                   | 1. 66 <sup>e</sup>          | .....          | .....       | .....                | .....    | .....   | ..... |
| 6. . . . .       | 2. 45              | .....                    | 1. 86              | . 59              | 2. 60         | .....              | .....              | .....                | .....             | . 508                | . 507                       | .....                                   | . 041              | . 033                   | 1. 53                       | .....          | .....       | .....                | .....    | .....   | ..... |
| 7. . . . .       | 2. 46              | 1. 85                    | . 61               | .....             | 2. 66         | . 052 <sup>a</sup> | .....              | . 540                | . 544             | .....                | .....                       | .....                                   | . 041              | . 036                   | .....                       | .....          | 1. 554      | .....                | .....    | .....   | . 042 |
| 8. . . . .       | 2. 48              | 1. 85                    | . 63               | .....             | 2. 60         | .....              | .....              | .....                | .....             | . 527                | .....                       | .....                                   | . 044              | .....                   | 1. 55                       | .....          | .....       | .....                | .....    | .....   | ..... |
| 9. . . . .       | 2. 47              | 2. 45                    | 1. 87              | . 60              | 2. 53         | .....              | . 080              | .....                | . 524             | .....                | .....                       | .....                                   | . 041              | . 038                   | 1. 50                       | .....          | 1. 53       | .....                | .....    | .....   | ..... |
| 10. . . . .      | .....              | 2. 52                    | 1. 88              | . 64              | 2. 54         | .....              | . 075              | .....                | .....             | . 524                | .....                       | .....                                   | . 049              | .....                   | 1. 53                       | .....          | .....       | .....                | .....    | .....   | . 04  |
| 11. . . . .      | .....              | 2. 45                    | 1. 87              | . 58              | 2. 56         | 2. 52              | . 077              | .....                | .....             | . 525                | .....                       | .....                                   | . 040              | . 036                   | 1. 56                       | .....          | .....       | .....                | 1. 56    | .....   | . 04  |
| 12. . . . .      | .....              | 2. 43                    | 1. 79              | . 64              | 2. 55         | .....              | . 078              | .....                | .....             | . 515                | .....                       | .....                                   | .....              | . 033                   | .....                       | .....          | .....       | .....                | 1. 56    | .....   | . 04  |
| 13. . . . .      | 2. 58 <sup>e</sup> | 2. 55 <sup>e</sup>       | 1. 99 <sup>e</sup> | . 57 <sup>e</sup> | 2. 51         | .....              | .....              | .....                | . 550             | . 544                | .....                       | .....                                   | . 044              | . 034                   | 1. 516                      | .....          | .....       | .....                | .....    | 1. 52   | ..... |
| Av. . . . .      | 2. 464             | 2. 461                   | .....              | .....             | 2. 55         | 2. 60              | . 078              | . 084                | . 545             | . 540                | . 524                       | . 528                                   | .....              | .....                   | 1. 527                      | 1. 55          | 1. 55       | 1. 56                | 1. 52    | .....   | ..... |
| GEN. Av. . . . . | 2. 46              |                          | 1. 85              | . 61              | 2. 57         |                    | . 081              |                      | . 532             |                      |                             |   | . 044              | . 037                   | 1. 54                       |                |             |                      |          | . 043   |       |

<sup>a</sup> Evolution- $Na_2S$ -Iodine.  
<sup>b</sup> Author's volumetric method.

<sup>c</sup> As  $Mg_3P_2O_7$  after acetate method.  
<sup>d</sup> Evolution-PbS- $BaSO_4$ . Not included in summation.

<sup>e</sup> Omitted from summation.

### INDEX TO ANALYSTS

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10. R. J. Wysor, Carnegie Steel Co., Duquesne Works.
11. C. H. Rich, Carnegie Steel Co., Clairton Works.
12. J. L. Harvey, Carnegie Steel Co., Homestead Works.
13. Carnegie Steel Co., Edgar Thomson Works.

N. B.—As cast, this iron contained 3.13 per cent total carbon and 2.52 per cent graphite, thus approximating the original D of the American Foundrymen's Association. Most of the loose graphite was purposely blown out in preparing the sample, but its loss has affected in no way the nature of the compounds existing in the iron, which are those proper to the iron as cast.

S. W. STRATTON,  
Director.

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