

Brammer Standard Company, Inc.

Certificate of Analysis

B.S. 100A
Iron-making Slag

| Expressed as oxide | | Expressed as total element | |
|--------------------------------|--------|----------------------------|--------|
| CaO | 37.6 | Ca | 26.9 |
| MnO | 0.35 | Mn | 0.27 |
| SiO ₂ | 35.2 | Si | 16.4 |
| Al ₂ O ₃ | 10.13 | Al | 5.36 |
| MgO | 12.9 | Mg | 7.8 |
| TiO ₂ | 0.50 | Ti | 0.30 |
| P ₂ O ₅ | <0.005 | P | <0.002 |
| Na ₂ O | 0.18 | Na | 0.13 |
| K ₂ O | 0.49 | K | 0.41 |
| | | Fe, total | 0.30 |
| | | C | 0.07 |
| | | S | 1.82 |

(analysis listed as percent by weight)

Note: The iron is not expressed as an oxide since some metallic iron may be present and all the iron may not be present as FeO.

See reverse side for more information.

Certificate Number 100A-032592

Brammer Standard Company, Inc., 14603 Benfer Road, Houston, TX 77069
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Some of the co-operating laboratories were:

Andrew S. McCreath & Son, Inc., Harrisburg, Pennsylvania
 Brammer Standard Co., Inc., Houston, Texas
 J. Dirats and Co., Inc., Westfield, Massachusetts
 Hoesch Stahl AG, Dortmund, Germany
 SKODA concern, Plzen, Czechoslovakia
 TCR Engineering Service Pvt. Ltd., Bombay, India
 VHG Laboratories, Inc., Manchester, New Hampshire

| BS 100A | | Certificate No. 100A-032592 | | | | | |
|-----------|--------|-----------------------------|------------------|--------------------------------|--------|------------------|-------------------------------|
| Analysis | CaO | MnO | SiO ₂ | Al ₂ O ₃ | MgO | TiO ₂ | P ₂ O ₅ |
| 1 | 37.48 | 0.31 | 35.04 | 10.07 | 12.66 | 0.47 | 0.001 |
| 2 | 37.65 | 0.344 | 35.12 | 10.09 | 12.79 | 0.498 | 0.004 |
| 3 | 37.66 | 0.36 | 35.15 | 10.10 | 12.82 | 0.507 | 0.004 |
| 4 | 37.77 | 0.37 | 35.26 | 10.15 | 12.92 | 0.51 | <0.002 |
| 5 | | | 35.31 | 10.16 | 13.02 | | <0.002 |
| 6 | | | | 10.20 | 13.10 | | <0.005 |
| Average | 37.640 | 0.346 | 35.176 | 10.128 | 12.885 | 0.496 | |
| Std Dev | 0.120 | 0.026 | 0.109 | 0.050 | 0.161 | 0.018 | |
| Certified | 37.6 | 0.35 | 35.2 | 10.13 | 12.9 | 0.50 | <0.005 |

| Analysis | Fe | C | S | Na | K |
|-----------|-------|-------|-------|-------|-------|
| 1 | 0.27 | 0.058 | 1.78 | 0.12 | 0.41 |
| 2 | 0.28 | 0.067 | 1.81 | 0.13 | 0.412 |
| 3 | 0.292 | 0.062 | 1.82 | 0.13 | 0.42 |
| 4 | 0.292 | 0.064 | 1.84 | 0.145 | |
| 5 | 0.296 | 0.07 | 1.84 | | |
| 6 | 0.31 | 0.083 | 1.86 | | |
| 7 | 0.32 | 0.09 | | | |
| 8 | 0.323 | | | | |
| Average | 0.298 | 0.071 | 1.825 | 0.131 | 0.414 |
| Std Dev | 0.019 | 0.012 | 0.028 | 0.010 | 0.005 |
| Certified | 0.30 | 0.07 | 1.82 | 0.13 | 0.41 |

Chemical analyses were made on bulk powder material. The individual values listed above are the average of each analyst's results.

Methods of analysis used were a combination of classical "wet" methods plus additional ICP, and AA spectrometric methods. The following Certified Reference Materials were used to validate the analytical data listed above: ECRM 878-1, JSS 900-1 through 904-1, CAN SL-1

This Reference Material was tested for homogeneity and found acceptable. The material has been processed to pass a number 100 mesh sieve. If the material is stored for a prolonged period of time, it is recommended that the material be dried at 105° C for 1 hour.

A Material Safety Data Sheet (MSDS) is not available for this material. This material will not release or otherwise result in exposure to a hazardous chemical, in the quantity supplied under normal conditions of use. Inquiries concerning this Reference Material should be directed to:

Brammer Standard Co., Inc. Phone: (281) 440-9396
 14603 Benfer Road
 Houston, Texas 77069-2895 USA Fax: (281) 440-4432

Certified by: _____ on March 25, 1992.
 G. R. Brammer