

# Certificate of Analysis

## Standard Reference Material 5L

### Cast Iron

ANALYST	C		Mn	P	S	Si	Cu	Ni	Cr	V	Mo	Ti	As	N
	Total	Graphite	Peroxydisulfate-arsenite	Photometric	Combustion-titration	HClO <sub>4</sub> dehydration	Photometric	Photometric			Photometric	Photometric	Photometric	Distillation-Photometric
1	2.58	1.96	0.68	{ 0.287 <sup>a</sup> .281 <sup>b</sup> }	0.130 <sup>c</sup>	1.82 <sup>d</sup>	1.01 <sup>e</sup>	0.085	0.147 <sup>f</sup>	0.036 <sup>g</sup>	0.018	0.045 <sup>h</sup>	<0.002	0.006 <sup>i</sup>
2	2.60	1.97	.67	.292	.124	1.84	1.01	.088	.149	.032	.023	.051	.003	.005
3	2.61	2.00	.68	.277 <sup>a</sup>	.123	1.81 <sup>d</sup>	1.01 <sup>j</sup>	.082	.150 <sup>k</sup>	.037 <sup>l</sup>	.018	.054 <sup>m</sup>	---	.006 <sup>n</sup>
4	2.59	1.99	.67	.278 <sup>a</sup>	.120	1.84	1.01 <sup>o</sup>	.086	.144 <sup>p</sup>	---	---	---	---	---
5	2.60	---	.69	.287 <sup>q</sup>	---	1.79 <sup>r</sup>	1.00 <sup>s</sup>	.091 <sup>t</sup>	.150 <sup>u</sup>	.032 <sup>v</sup>	.020	---	---	.004 <sup>n</sup>
Average	2.60	1.98	0.68	0.284	0.124	1.82	1.01	0.086	0.148	0.034	0.020	0.050	---	0.005

<sup>a</sup> Molybdenum-blue photometric method.

<sup>b</sup> Mg<sub>2</sub>P<sub>2</sub>O<sub>7</sub> gravimetric method.

<sup>c</sup> 1-g sample burned in oxygen at 1425 °C and sulfur dioxide absorbed in starch-iodide solution. Iodine liberated from iodide by titration, during the combustion, with standard KIO<sub>3</sub> solution.

<sup>d</sup> Double dehydration with intervening filtration.

<sup>e</sup> Atomic absorption spectrometry.

<sup>f</sup> Coulometric method.

<sup>g</sup> Activation analysis.

<sup>h</sup> Polarographic method.

<sup>i</sup> Distillation-indophenol photometric method.

<sup>j</sup> Copper-ammonia complex photometric method.

<sup>k</sup> Peroxydisulfate oxidation-Fe(NH<sub>4</sub>)<sub>2</sub>(SO<sub>4</sub>)<sub>2</sub> titration.

<sup>l</sup> Nitric acid oxidation-Fe(NH<sub>4</sub>)<sub>2</sub>(SO<sub>4</sub>)<sub>2</sub> titration.

<sup>m</sup> Vanadium separated with Na<sub>2</sub>CO<sub>3</sub>.

<sup>n</sup> Distillation-photometric with Nessler's reagent.

<sup>o</sup> Diethyldithiocarbamate photometric method.

<sup>p</sup> Diphenylcarbazide photometric method.

<sup>q</sup> Alkali-molybdate method.

<sup>r</sup> Double dehydration with H<sub>2</sub>SO<sub>4</sub>.

<sup>s</sup> H<sub>2</sub>S-CuS-CuO.

<sup>t</sup> Weighed as nickel dimethylglyoxime.

<sup>u</sup> Bicarbonate hydrolysis-Fe(NH<sub>4</sub>)<sub>2</sub>(SO<sub>4</sub>)<sub>2</sub>-KMnO<sub>4</sub> titration.

<sup>v</sup> Bicarbonate hydrolysis-KMnO<sub>4</sub> titration.

The material for this standard was prepared at the American Cast Iron Pipe Company, Birmingham, Alabama.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of O. Menis and J. I. Shultz.

The technical and support aspects involved in the preparation, certification, and issuance of this standard reference material were coordinated through the Office of Standard Reference Materials by R. E. Michaelis.

Washington, D. C. 20234  
November 9, 1970  
(Replaces Prov. Cert. 10/16/67)

J. Paul Cali, Acting Chief  
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