



Certificate of Analysis

Standard Reference Material 152A

Basic Open-Hearth Steel 0.5% Carbon

(Tin-Bearing)

ANALYST	C	Mn	P	S	Si	Cu	Ni	Cr	V	Mo	Sn
	Direct combustion	Persulfate-Arsenite	Photometric	Combustion Iodide titration	Perchloric acid dehydration	Photometric	Weighed as nickel dimethylglyoxime	FeSO ₄ -KMnO ₄ titration		Photometric	
1.....	0.484	0.714	^a 0.012	^b 0.030	^c 0.202	^d 0.025	^e 0.057	^f 0.047	^g 0.001	0.035	^h 0.035
2.....	.486	ⁱ .718	^j .012	{ ⁱ .030 ^k .030}	^c .205	^l .022	.055	^m .046	ⁿ <.001	.039	^h .031
3.....	.488	ⁱ .716	^j .012	ⁱ .031	^c .204	^o .021	^e .058	^p .049	^q <.001	.037	.031
4.....	^r .484	.720	^j .012	.030	.203	^o .024	.052	.041	ⁿ .001	.036	^h .033
5.....	.491	^e .72	.012	.028	.198	^l .023	^e .054			.037	
6.....	.485	.714	^j .013	ⁱ .031	.202	^l .021	^e .057	^p .048	ⁿ .003	.033	.031
Average.....	0.486	0.717	0.012	0.030	0.202	0.023	0.056	0.046	0.001	0.036	0.032

^a Molybdenum-blue photometric method. See J. Res. NBS 26, 405 (1941) RP 1386.

^b 1-g sample burned in oxygen at 1425 °C. and sulfur dioxide absorbed in starch-iodide solution. Iodine is liberated from iodide by titration, during the combustion, with standard KIO₃ solution. Titer is based on 93 percent of the theoretical factor.

^c Double dehydration with intervening filtration.

^d Diethyldithiocarbamate photometric method. See J. Res. NBS 47, 380 (1951) RP2265.

^e Dimethylglyoxime photometric method.

^f Chromium separated from the bulk of the iron in a 10-g sample by hydrolytic precipitation with NaHCO₃, oxidized with persulfate, and titrated potentiometrically with ferrous ammonium sulfate.

^g Vanadium separated as in (f), oxidized with HNO₃, and titrated potentiometrically with ferrous ammonium sulfate.

^h Sulfide-iodine method. See BS. J. Res. 8, 309 (1932) RP415.

ⁱ Titrating solution standardized by use of a standard steel.

^j Alkali-molybdate method.

^k Gravimetric method. Sulfate precipitated with BaCl₂, ignited to BaSO₄ and weighed.

^l H₂S-electrolytic method.

^m Sodium bicarbonate hydrolysis-persulfate oxidation.

ⁿ Sodium bicarbonate hydrolysis-FeSO₄-(NH₄)₂S₂O₈-KMnO₄.

^o Copper-ammonia complex photometric method.

^p Diphenylcarbazide photometric method.

^q Spectrographic method.

^r Gasometric method.

^s KIO₃ photometric method.

^t Diethyldithiocarbamate photometric method.

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The steel for the preparation of this standard was furnished by the United States Steel Corporation.