

U. S. Department of Commerce  
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 Secretary

National Bureau of Standards  
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# Certificate of Analysis (Rev. 4/69)

STANDARD REFERENCE MATERIALS 1090, 1091, 1092

## Oxygen in Ferrous Materials

The oxygen content of these three standards has now been determined by three independent methods of analysis, namely, vacuum fusion, inert gas fusion and fast neutron activation analysis. The results of the vacuum fusion determinations were reported on a Certificate of Analysis dated March 1, 1966. At this time recommended or certified values are not being reported because of small but undetermined systematic biases which exist in one or more of the methods used. For this reason, all the pertinent analytical data are presented in tabular form below.

## Oxygen in Ferrous Metals

(ppm by weight)

SRM No.	Material	Vacuum Fusion			Neutron Activation			Inert Gas Fusion		
		$\bar{X}$	s	n	$\bar{X}$	s	n	$\bar{X}$	s	n
1090	Ingot Iron	484	14	216	492	28	6	497	13	12
1091	Stainless Steel (AISI 431)	131	8	286	132	7	6	129	8	11
1092	Vacuum Melted Steel	28	2	105	28	4	5	29	5	20

$\bar{X}$  = mean oxygen value; s = Standard deviation of a single determination; n = number of independent determinations.

(Note: the standard deviation includes error due both to the imprecision of the analytical method and to possible heterogeneity of the materials analyzed).

Size: SRM 1090 and 1092 are in the form of rods 1/4 in in diameter and 4 in long. SRM 1091 is 5/16 in in diameter and 4 in long.

The analyses reported herein were performed by staff members of the Analytical Chemistry Division, Institute of Materials Research, National Bureau of Standards.

Additional technical information on this series of standards, including the names of cooperators who participated in the original analyses is to be found in NBS Miscellaneous Publication 260-14, Standard Reference Materials: Determination of Oxygen in Ferrous Materials; SRM 1090, 1091 and 1092. (1966)

Washington, D. C. 20234

W. Wayne Meinke, Chief

March 1, 1966

April 2, 1969 (Revision)

Office of Standard Reference Materials

Caution: Oxygen determinations should be made on thoroughly and freshly cleaned samples that represent the full cross-section of the rods.

SUPPLEMENTARY INFORMATION

Although not certified at this time, the nitrogen content of these three SRMs has been determined by the analytical methods shown below:

SRM No.	Method of Analysis	Nitrogen (ppm by weight)		
		$\bar{X}$	s	n
1090	Acid digestion - distillation - indophenol - photometry	61.5	3.5	14
	Pressure bomb - distillation - indophenol - photometry	59.4	2.0	4
	Vacuum Fusion	60	1	15
1091	Pressure bomb - distillation - indophenol - photometry and titrimetry	945	20	12
	Vacuum Fusion	861	3	48
1092	Pressure bomb - distillation - indophenol - photometry and titrimetry	3.6	0.7	8
	Vacuum Fusion	4.0	1	6

The symbols  $\bar{X}$ , s, and n have the same meaning as given for the oxygen determinations and the note appended thereto applies here as well.