

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP32 Section:	12.5.1
Background Chapter	3
Reference:	22
Title:	Report on NOx and CO Emissions. Annealing Furnace #9. Performed for: Nucor Steel, Crawfordsville, IN. August 24, 2001.

**Supreme
Environmental Service Company**

SESCo Group

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**REPORT on
NO_x and CO EMISSIONS**
Performed for:
Nucor Steel
Crawfordsville, IN
Annealing Furnace #9
on 08/24/01

RECEIVED
OCT 05 2001
State of Indiana
Department of Environmental Management
Office of Air Quality

To the best of our knowledge, the data presented in this report is accurate and complete.

Respectfully Submitted by:



Michael Dicen, Division Manager

1-1 PROJECT OVERVIEW

SESCO Group was contracted by Nucor Steel located in Crawfordsville, Indiana to perform compliance test air sampling of Annealing furnace #9 on August 24, 2001. The objective of the testing was to determine NOx and CO emissions. The following personnel were involved with the testing program:

SESCO	Andrew Young
SESCO	Milo Hatfield
SESCO	Michael Dicen
SESCO	Carlos Brown
Nucor Steel	David Sulc
IDEM	Jed Wolkins

The testing program included flow determination, nitrogen oxide (Method 7E), and carbon monoxide (Method 10). Below is a summary of the results:

*Table 1-1:
Summary of Test Results*

Pollutant	Time 08/24/01	Emission (PPM)	Emission (lbs/hr)	Emission (lbs/MMbtu)
NOx	09:02-10:06	46.43	0.2369	0.0801
NOx	10:16-11:16	52.23	0.2068	0.1081
NOx	11:25-12:25	47.75	0.1730	0.0912
	Averages	48.80	0.2055	0.0931

CO	09:02-10:06	2.60	0.0081	0.0027
CO	10:16-11:16	1.20	0.0029	0.0015
CO	11:25-12:25	2.60	0.0057	0.0030
	Averages	2.13	0.0056	0.0024

2-1 RESULTS

*Table 2-1:
Annealing Furnace #9 Emissions*

<u>Gas Conditions</u>		1	2	3	Average
Ts	Stack Temperature (°F)	720.62	670.63	637.38	676.21
Bwo	Moisture (volume %)	17.20	16.14	17.59	16.98
O2	Oxygen (dry volume %)	10.2	11.1	9.8	10.4
CO2	Carbon Dioxide (dry volume %)	7.2	6.0	6.5	6.6
<u>Volumetric Flow Rate</u>					
Qa	Actual Conditions (acfm)	1912.53	1403.41	1268.42	1528.12
Qstd	Standard Conditions (dscfm)	712.09	552.60	505.72	590.14
NITROGEN OXIDES					
Er	Emission Rate (PPM)	46.43	52.23	47.75	48.80
Er	Emission Rate (lbs/hr)	0.2369	0.2068	0.1730	0.2055
Er	Emission (lbs/MMbtu)	0.0801	0.1081	0.0912	0.0931
CARBON MONOXIDE					
Er	Emission Rate (PPM)	2.60	1.20	2.60	2.13
Er	Emission Rate (lbs/hr)	0.0081	0.0029	0.0057	0.0056
Er	Emission (lbs/MMbtu)	0.0027	0.0015	0.0030	0.0024

Nucor Steel
Crawfordsville, IN

SESCO Project No. 4190

3-1 METHODOLOGY

The sampling followed procedures as detailed in U.S. Environmental Protection Agency (EPA) Methods 1-4, 7E, 10. The following table summarizes the methods:

Summary of Sampling Procedures

Title 40 CFR Part 60 Appendix A

Method 1 "Sampling of Velocity Traverses for Stationary Sources"
Method 2 "Determination of Stack Gas Velocity and Volumetric Flow Rate"
Method 3 "Gas Analysis for the Determination of Molecular Weight"
Method 4 "Determination of Moisture Content in Stack Gas"
Method 7E "Determination of Nitrogen Oxide Emissions from Stationary Sources"
Method 10 "Determination of Carbon Monoxide Emissions from Stationary Sources"

SAMPLE POINT DETERMINATION

Sampling point locations were determined according to EPA Reference Method 1.

*Table 3-1:
Sampling Points*

Location	Dimensions	Ports	Points per Port	Total Points
Annealing Furnace	13" ID	2	8	16

SESCO Group