AP32 Section:	12.5.1
Background Chapter	3
Reference:	1
Title:	Performance Test Report PM10 Emissions Evaluation, Slater Specialty Steels, Ft. Wayne, Indiana. Prepared for Slater Specialty Steels, Ft. Wayne, IN. Prepared by FBT Testing and Environmental Services, West Chester, OH. December 1997.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF AIR MANAGEMENT

OFFICE MEMORANDUM

To: Phil Perry

Date: 2/01/98

From: Dave Cline DC

Thru: E. Surla
F. George

Subject: Slater Steel PM-10 Testing
Ft. Wayne IN, Allen County

Source ID No. 003-00011
FESOP ID No. F003-5725-00011

The subject company has submitted a report concerning PM-10 testing of their Electric Arc Furnace (EAF) located at their Ft. Wayne facility. The testing was conducted on November 6, 1997 by FBT Env. The test protocol was reviewed by Dave Cline, Steve Friend observed the field testing. EPA reference methods 1-4, 201A, and 202 were used to determine compliance. The purpose of the test was to determine compliance with FESOP limits. I have reviewed this report and found the sampling procedures used and the results obtained to be acceptable to this office. A copy of the test report is filed in the Compliance Data Section. The following is a summary of the test report:

Maximum Permitted Capacity:	10 TPH
Average Rate During Test:	15.5 TPH
PM-10 Results:	
Measured Emission Rate:**(filterable PM-10)**	1.37 Lbs/hr
Measured Emission Rate:**(condensible fraction)**	14.08 Lbs/hr
Total PM-10 Determination	
Total Emission Rate:	15.46 Lbs/hr
	1.0 Lb/Ton Metal Produced*
PM-10 Allowable Emission Rate:	.46 Lbs/Ton Metal Produced
Visible Emission Testing:	
Highest Six Minute Opacity:	0.0%
Average Opacity:	0.0%
Allowable Opacity:	20%
Type of Fuel:	N/A
P_{min} P_{max} Ranges Exceeded:	No
Cut Size: (between 9 and 11 microns)	Yes
Baghouse Pressure Drop Ranges During Test:	6.3-6.9 Inches of Water

*NOTE: This test showed that the actual PM-10 emissions from the EAF was above the calculated value in the TSD. John Hacker, Slater's Env. contact indicated that when they applied for this permit they did not anticipate organic condensible emissions resulting from lubrication oil that was present on some of the scrap metal they process (turnings specifically).

Currently their permit limits the source's total PM-10 emissions to 99 TPY. Slater is currently putting together a letter requesting a modification to their permit. This would raise the current EAF limit of.46 lbs/ton metal produced from the EAF baghouse. Slater has suggested 1.05 lbs/ton metal produced. This would put Slater's total at 76 TPY of PM-10 based on a production limitation of 81,500 tons of metal produced per year. The total PM-10 emissions are still below the 99 TPY PTE. Therefore, the actual EAF PM-10 emissions did not cause an exceedance of the total source's PM-10 limitation.

cc: D. Cline
M. Salenda
WPS/General File Allen County

PERFORMANCE TEST REPORT

PM_{10} EMISSIONS EVALUATION

SLATER SPECIALTY STEELS

FT. WAYNE, INDIANA

prepared for

Slater Specialty Steels

2400 Taylor Street

Ft. Wayne, IN 46802

prepared by

FBT Testing & Environmental Services

7419 Kingsgate Way

West Chester, Ohio 45069

(800) 755-1711

Drafted by

Peter Hilty

Environmental Scientist

Reviewed by

David Wetmore

Director, Environmental Services

December, 1997

1.0 INTRODUCTION

FBT was retained by R.S. Consulting to perform an emissions evaluation of Melt Line Furnace baghouse at the Slater Specialty Steels facility in Ft.Wayne, Indiana. Four measurement runs were performed on November 6th, 1997. The FBT team of Messrs. Peter Hilty, Chris Gottschalk and Brian Murphy conducted the testing. Mr. Rick Stinnett, of RS Consulting, and Mr. Jon Hacker, of Slater Steels, coordinated testing and process operations. Mr. Steve Friend, of the IDEM Office of Air Management, observed the testing.

2.0 PROCESS DESCRIPTION/STACK DESCRIPTION

2.1 Process Description

Slater Steels operates the Electric Arc Furnace (EAF), and accompanying Argon-Oxygen De-Carbonization (AOD) vessel, in the production of stainless steel alloys. This is a batch process that involves smelting of scrap steel in the EAF, transfer of the molten steel to the AOD vessel, followed by pouring of ingots. Emissions from the EAF are exhausted to a dedicated 200,000-CFM fabric filter baghouse for particulate matter control. Emissions from the AOD vessel are exhausted to a dedicated 50,000-CFM fabric filter baghouse for particulate matter control. Fugitive, charging, tapping and ingot pouring emissions from within the melt shop are captured through a multi-point roof pickup system and are exhausted to a dedicated 100,000 CFM fabric filter baghouse through the General Exhaust vent. Maximum batch operating capacity is 40,000 pounds/batch, which includes both AOD and EAF simultaneous operations. The EAF baghouse was the source tested for this evaluation.

2.2 Stack Description

The sampling ports are located in a round 120" I.D., 240" from the closest upstream disturbance (2 diameters) and 60" (0.5 diameters) from the closest downstream disturbance (atmosphere). 6 sampling points per traverse were used. Figure 2.1 depicts the stack and sampling location.

3.0 TEST RESULTS

The first test run was omittd from the calculations because the batch process was completed before a complete particulate test run could be completed.

Table 3.1 summarizes stack gas conditions.

Tables 3.2 & 3.3 summarize emissions.

Visible emissions observation data is included in Appendix D. ***The observed opacity never exceeded 5%.***

Table 3.1 Stack Gas Conditions for Baghouse Exhaust

Run #	Date/Time	Vs (fps)[a]	Flow Rate (acfm)[b]	Flow Rate (dscfm)[c]	Ts °F	H_2O %	O_2 %	CO_2 %
1	11/6/97 1025-1155	52.2	245,802	224,012	113	1.3	21.0	0.0
2	11/6/97 1236-1358	66.6	313,897	283,069	118	1.1	21.0	0.0
3	11/6/97 1441-1609	58.9	277,564	245,430	118	1.3	21.0	0.0
Average		**59.2**	**279,088**	**250,837**	**116**	**1.2**	**21.0**	**0.0**

[a] Velocity in feet per second

[b] Actual cubic feet per minute

[c] Dry standard cubic feet per minute

Table 3.2 Baghouse Exhaust Total PM_{10} Emissions Summary

Run #	Date/Time	Concentration (mg/dscf)[a]	Concentration (lb/dscf)[b]	Emissions (lb/hr)[c]
1	11/6/97 1025-1155	6.25E-01	1.38E-06	18.53
2	11/6/97 1236-1358	3.48E-01	7.68E-07	13.04
3	11/6/97 1441-1609	4.57E-01	1.01E-06	14.83
Average		**4.77E-01**	**1.05E-06**	**15.47**

Table 3.3 Baghouse Exhaust PM_{10} Fractions

Run #	Filterable (mg/dscf)[a]	Filterable (lb/hr)[c]	Organic Condensable (mg/dscf)[a]	Organic Condensable (lb/hr)[c]	Inorganic Condensable (mg/dscf)[a]	Inorganic Condensable (lb/hr)[c]
1	0.042	1.25	0.355	10.53	0.228	6.75
2	0.039	1.47	0.180	6.74	0.129	4.83
3	0.042	1.37	0.428	13.88	-0.013	-0.43
Average	**0.041**	**1.36**	**0.321**	**10.39**	**0.115**	**3.72**

[a] Concentration in milligrams per dry standard cubic foot

[b] Concentration in pounds per dry standard cubic foot

[c] Emission rate in pounds per hour

4.0 SAMPLING PROCEDURES

The sampling and analytical procedures used conform to the most recent revisions of USEPA Reference Methods for stationary sources. Specifically, USEPA Reference Methods 1, 2, 3, 4, 9, 201A, and 202 were used. A brief description of each procedure is included below:

4.1 Measurement Sites

The location of measurement sites and the number of traverse points were determined as specified in **USEPA Method 1**, "Sample and Velocity Traverses for Stationary Sources." Figure 2.1 shows the sample port locations.

4.2 Velocity and Volumetric Flow Rates

The stack gas velocities and volumetric flow rates were determined using **USEPA Method 2**, "Determination of Stack Gas Velocity and Volumetric Flow Rate." Velocities were measured with S-type pitot tubes, and stack gas temperatures were measured with calibrated Type "K" thermocouples.

4.3 Dry Molecular Weight

The dry molecular weight was determined using **USEPA Method 3**, "Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, and Dry Molecular Weight." Grab samples were collected and analyzed with fyrite gas analyzers for concentrations of O_2 and CO_2.

4.4 Moisture

Moisture content was determined using **USEPA Method 4**, "Determination of Moisture Content in Stack Gases", simultaneously with the particulate procedures.

4.5 Visible Emissions

Visible emissions (VE) were determined using **USEPA Method 9**, "Visual Determination of the Opacity Of Emissions from Stationary Sources". Visible emissions field data sheets are included in Appendix D.

4.6 PM_{10}

PM_{10} emissions were determined using **USEPA Method 201A**, "Determination of PM_{10} Emissions," in conjunction with **USEPA Method 202,** "Determination of Condensable Particulate Emissions from Stationary Sources." Stack gas samples were withdrawn through an in-stack particle sizing cyclone, a heated probe, and a series of impingers containing deionized water. The condensate collected during the sampling was analyzed separately for organic and inorganic material using the methylene chloride extraction procedure presented in method 202. Total PM_{10} is the sum of the particulate less than 10 μm collected in the sizing device and the condensable particulate. Figure 4.1 depicts the PM10 sampling train.

OFFICE OF AIR MANAGEMENT
TEST OBSERVATION REPORT

Agency: IDEM-OAM-CDS

Date(s) of Test: 11-6-97

Company Name: SLATER STEEL Plant ID: 003-00011

Plant Location: 2400 Taylor ST Title V: Y No FESOP

City: FORT WAYNE County: ALLEN Reported by: SLF

Pollutants: PM-10 Reason(s) for Test: FESOP

Facility(s) Tested: EAF Baghouse

Person(s) Interviewed: John Hacker

Test Observer(s): SLF

Test Methods: 1-4, 201A, 202

Process Description: Raw steel is melted in an Electric Arc Furnace and the exhaust from the EAF is routed through a baghouse to control emissions.

Company Name: _____ Date(s) of Test: 11-6-97

Test Summary/Comments: RUN 1 START 7:18 STOP 7:44 ELECTRODE holder problems. START @ 9:13 – STOP 10:04 DGM leak check good. Pre leak check good. RUN 1 finished after 77 1 min. of sampling out of approx. 100 min. Sampled 8 of 12 points (Since 9 points). All leak checks good. This run was thrown out.

R2 - START 10:26 STOP 11:55 - 89 min. of sample 10 pts. out of 12 sample - All leak checks good. RUN 2 - A damper was changed which allows the AOD to vent to the Baghouse (See Bel. The test period is from the start of the next cycle to the end of the TRO.

RUN 3 START 12:37 pm STOP: 2:12 pm

No production problems - Sampled 90 min. - 9 pts out of 12

RUN 4 START 2:1 STOP 3:3 33 min. - 10.5 pts of 12

No production or TEST problems

ΔP Baghouse = 6.5" H2O (200,000), Baghouse (100,000) = 8.5" H2O, Baghouse (10,000) = 6.5" H2O recorded ΔP and flow thru each baghouse during TEST.

In the FESOP they are allowed to vent the AOD to the EAF Baghouse. The baghouse for the AOD was having problems so they vented a portion of the AOD exhaust to the EAF Baghouse (Runs 2, 3, 4). I told Mr. Hacker that this may invalidate the test, however he said that since the FESOP allowed them to do this and that this would be worst case. He said that if they pass under this condition then there would be no concerns about compliance when operating this way.

cc:IDEM-OAM, Compliance Data Section