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.

GRAY
IRON FOUNDRIES 12.10
AP-42 Section ~~7.10~~
Reference N mber
27

27

Report of Source Emissions Testing

at

Newbury Manufacturing

Talladega, Alabama

309-0010

May 15 - 16, 1979

Test Report Prepared by:

Alabama Air Pollution Control Commission
Technical Services Section
645 South McDonough Street
Montgomery, AL 36130

Summary of Results

Results of emissions testing are displayed in Tables 2 and 4. Table 2 is a listing of particulate emissions captured in the sampling train prior to, and including, the glass fiber filter. Table 4 lists emissions as noted above plus hydrocarbon emissions retained in the impinger solution.

Particulate emission rates of 1.72, 1.27 and 1.65 pounds per hour were calculated for the three respective sample runs. Total emissions (particulate plus hydrocarbons) were being emitted at rate of 3.53, 3.43 and 3.86 pounds per hour during the test cycle.

The process rate during the sample period was computed to be 51.3 tons per hour based on data furnished by Newbury Manufacturing. Section 4.4.1 of the Alabama Air Pollution Control Commission's Rules and Regulations allows an emission rate of 32.5 pounds per hour of particulate for a process rate of 51.3 tons per hour.

Analysis of the condensible portion of the sample was performed for informational purposes only. These emissions are not regulated by Section 4.4.1.

The visual emissions evaluations made during Run 2 showed emissions ranging from 20% to 55% opacity. The average opacity during the evaluation was 37%.

COMPANY NAME Newbury Manufacturing FACILITY NO. 309-0010 EVAL BY [illegible]

TEST BY AAPCC TEST DATE 5/15-16/79 EVAL DATE 6/19/

TEST ON Sand Handling System

STO	Production	51.3 T/hr	51.3 T/hr	51.3 T/hr
1	Run #	1	2	3
2	Pg	-.5	-.5	-.5
3	Pb	29.64	29.63	29.68
4	$\overline{\Delta H}$	1.58	1.44	1.60
5	Y	.981	.981	.981
6	$\bar{t}_m$	92	110	95
7	$\%O_2$	20.5	20.5	20.5
8	$\%CO_2$	0	0	0
9	$\%N_2+\%CO$	79.5	79.5	79.5
10	V_m	101.986	99.559	100.284
11	V_{1c}	73.7	76.7	73.3
12	θ	144	144	144
13	D_n	.185	.185	.185
14	$\sqrt{\Delta p}$	1.12	1.07	1.13
15	C_p	.84	.84	.84
16	$\bar{t}_s$	96	102	97
17	A_s	8.125	8.125	8.125
18	M_n	43.0	31.7	40.0

COMPANY NAME: Newbury Foundry FACILITY NO. 309-0010 EVAL. BY: [illegible]

TESTED BY: AAPCC TEST DATE: 5/15-16/79 EVAL DATE: 6/19/79

TEST ON: Sand Handling System (not incl condensibles)

RUN #	1.	2.	3.	
$\overline{\Delta H}$	1.58	1.44	1.6	
$\sqrt{\overline{\Delta P}}$	1.12	1.07	1.13	
P_b	29.64	29.63	29.68	
$\overline{t_m}$	92.	110.	95.	
$\overline{t_s}$	96.	102.	97.	
% O_2	20.5	20.5	20.5	
% CO_2	0.	0.	0.	
V_m	101.986	99.559	100.284	
V_{1c}	73.7	76.7	73.3	
θ	144.	144.	144.	
D_n	0.185	0.185	0.185	
P_s	29.60	29.59	29.64	
$V_{m(std)}$	95.1	89.9	93.2	
% Moisture	3.5	3.9	3.6	
M_s	28.4	28.4	28.4	
v_s	65.4	62.8	66.0	
Q_s	28885.	27364.	29124.	
M_n	43.0	31.7	40.0	
C_s	0.0070	0.0054	0.0066	
PMR	1.72	1.27	1.65	
%I	100.	99.	97.	
PRODUCTION	51.3	51.3	51.3	AVG. 51.3
ALLOW. EMS.	32.5	32.5	32.5	AVG. 32.5
EMISSIONS (PMR)	1.72	1.27	1.65	AVG. 1.55

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COMPANY NAME Newbury Manufacturing FACILITY NO. 309-0010 EVAL BY Sdd

TEST BY AA PCC TEST DATE 5/15-16/79 EVAL DATE 6/19/

TEST ON Sand Handling System (Condensibles Included)

STO	51.3	51.3	51.3
1 Run #	1	2	3
2 Pg	-.5	-.5	-.5
3 Pb	29.64	29.63	29.68
4 $\overline{\Delta H}$	1.58	1.44	1.60
5 Y	.981	.981	.981
6 $\bar{t}_m$	92	110	95
7 $\%O_2$	20.5	20.5	20.5
8 $\%CO_2$	0	0	0
9 $\%N_2+\%CO$	79.5	79.5	79.5
10 V_m	101.986	99.559	100.284
11 V_{1c}	73.7	76.7	73.3
12 θ	144	144	144
13 D_n	.185	.185	.185
14 $\sqrt{\Delta p}$	1.12	1.07	1.13
15 C_p	.84	.84	.84
16 $\bar{t}_s$	96	102	97
17 A_s	8.125	8.125	8.125
18 M_n	88.1	85.4	93.6

COMPANY NAME: Newbury Manufacturing FACILITY NO. 309-0010 EVAL. BY: JAR

TESTED BY: AAPCC TEST DATE: 5/15-16/79 EVAL DATE: 6/19/79

TEST ON: Sand Handling System (Condensibles Included)

RUN #	1.	2.	3.
$\overline{\Delta H}$	1.58	1.44	1.6
$\overline{\sqrt{\Delta P}}$	1.12	1.07	1.13
P_b	29.64	29.63	29.68
$\overline{t_m}$	92.	110.	95.
$\overline{t_s}$	96.	102.	97.
% O_2	20.5	20.5	20.5
% CO_2	0.	0.	0.
V_m	101.986	99.559	100.284
V_{1c}	73.7	76.7	73.3
θ	144.	144.	144.
D_n	0.185	0.185	0.185
P_s	29.60	29.59	29.64
$V_{m(std)}$	95.1	89.9	93.2
% Moisture	3.5	3.9	3.6
M_s	28.4	28.4	28.4
v_s	65.4	62.8	66.0
Q_s	28885.	27364.	29124.
M_n	88.1	85.4	93.6
C_s	0.0143	0.0146	0.0155
PMR #/hr	3.53	3.43	3.86
%I	100.	99.	97.

PRODUCTION

ALLOW. EMS.

EMISSIONS

AVG.

AVG.

AVG.

Source Operation

Newbury Manufacturing Company produces ductile iron castings. The foundry has two gray iron furnaces that are operated on an alternating basis. Hot metal is transferred from the furnace to a station where additives chemically change the gray iron to ductile metal. The hot metal is then transferred to pouring ladles and castings molds are poured. The castings cool to hardness between the pouring site and dump site while travelling on a continuous conveyor. At the dump site the mold frames are released and the mold and casting are transferred by vibrating conveyor to the sand shake-out system. At the shake-out the sand molds are broken down and sand is removed from the castings. The castings travel to a turntable where they are sorted. The mold sand travels through a rotating screen where the sand is sized and then through a cooler. The sand then goes through a muller where make-up sand and chemical additives are added to the recycled sands. The sand is then transferred back to the mold machines and the process is repeated.

The cupolas are controlled by a positive pressure baghouse. The sand handling system is controlled by a orifice scrubber. This includes emissions from the conveyor system, sand shake out, rotory screens, cooler and muller. Emissions from the vibrating conveyor are exited uncontrolled into the mold line area.

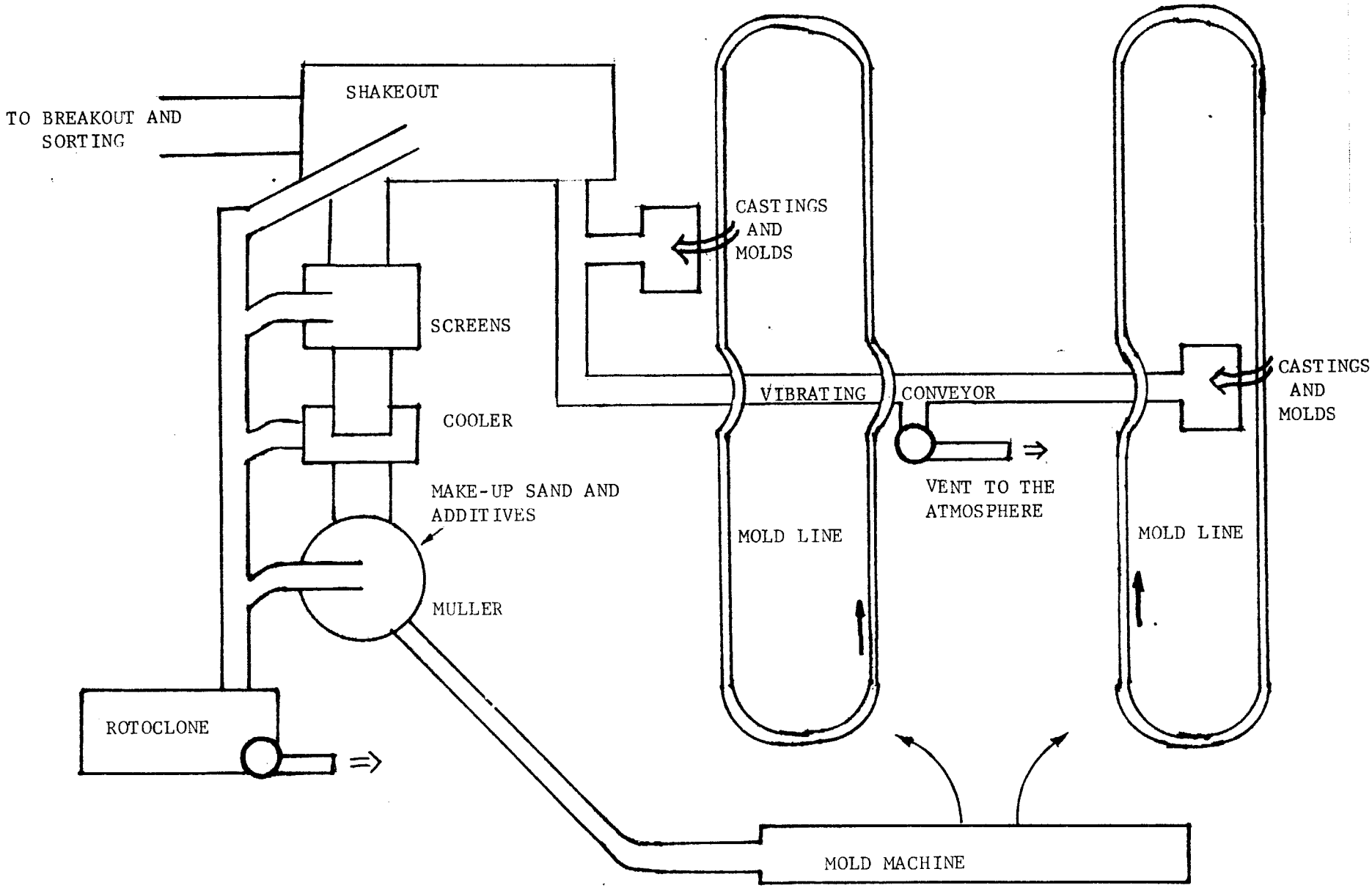

Figure SCHEMATIC OF SAND HANDLING SYSTEM- NEWBURY MANUFACTURING COMPANY

State of Alabama
Department of Public Health
State Office Building
Montgomery, Alabama 36130

IRA L. MYERS, M. D.
STATE HEALTH OFFICER

May 16, 1979

M E M O R A N D U M

TO : Ron Gore

FROM : Bill Wood BW

SUBJECT: Facility Inspection and Observation of Emission Test, Newbury Manufacturing Company (309-0010)

On May 15, 1979, the writer visited Newbury Manufacturing Company in Talladega to observe an emission test being conducted by the AAPCC Technical Services Section on the company's sand system wet scrubber (Rotoclone). During the visit the other sources at the plant were inspected also.

In preparation for the stack test on the wet scrubber, Newbury had prefabricated an additional top section for the exhaust stack and installed a platform for access to the sampling ports. Tim Owen, Roger Reehl and Steve Taylor of the AAPCC Technical Services had arrived at Newbury on May 14 to set up for the test.

On May 15, 1979, two successful test runs were accomplished. The first run was started in the morning shortly after the plant was in full operation, and the second run, accomplished in the afternoon, was completed just prior to the plant being shut down for the day at 3:30 p.m. A third (final) run was planned for the next morning, May 16. No serious problems were encountered during the two test runs on May 15.

Plant operation during the test appeared normal. The sand system equipment (mullers, shakeout, conveyor system, etc.) ran continuously except for 3 scheduled 10-minute break (rest) periods. The test was suspended during these times.

According to Mr. Don Warren, the amount of metal poured was approximately 12 tons/hr and the process weight of the sand averaged 51.3 tons/hr, as calculated below:

1.5 minutes/batch
40 batches/hr x 2700 lbs/batch =108,000 lbs/hr
= 54 tons/hr
54 tons/hr less estimated 5% spillage, etc.
= 54 - 2.7 = 51.3 tons/hr

The chemical composition of the material added to the sand is to be provided at a later date, but the makeup of each batch was:

18 quarts of southern bentonite
4 quarts of wood flour
3 quarts of seacoal
6 ounces of western bentonite
3 ounces of soda ash
0.485 gallons of plasti-bond

While visiting the foundry, a few minor problems were noted with other emission sources. The cap on the operating cupola was leaking, and visible emissions from the cupola baghouse and from a small baghouse on the core sand system were higher than expected. These problems were discussed with Mr. Warren and they were to be corrected as soon as the equipment cooled down at the end of the work day.

BW/ldg

cc: Tim Owen

ALABAMA AIR POLLUTION CONTROL COMMISSION

Taken during emiss. test on Rotoclone.

FIELD SURVEILLANCE VISIBLE EMISSION OBSERVATION FORM

Facility Number: 309 - 0010

Date: 5/15/79

Facility Name: Newbury Foundry

Clock Time: 2:40 pm

Location: Talladega

Wind Direction: N

Type Facility: Foundry (Gray Iron)

Wind Speed: 3-5 mph

Emission Source: Sand System

Ambient Temperature: 85°F

Control Device: AAF Type N Rotoclone

Sky Condition: Clear

Stack Height: ≈ 28'

Sky Color: Blue

Estimated Distance from Source: ~~100'~~ 80'

Plume Background: Brown

Direction from Source: West

Color of Plume: Bluish-tan

	Seconds				Steam Plume		
MIN	00	15	30	45	Attached	Detached	Comments
0	30	25	20	20			
1	20	20	20	25			
2	30	35	45	50			
3	50	55	50	50			
4	40	35	35	35			
5	40	35	40	35			
6	35	30	30	40			
7	40	35	35	40			
8	45	50	35	40			
9	40	40	50	45			
10	45	45	45	40			
11	40	35	30	30			

Readings Ranged from 20 % to 55 % Opacity

~~Six~~ 12-Minute Average (~~24~~ 48 Consecutive Observations): 37 % Opacity

Observer and Certification Date Wood / 3/28/79 Signature [signature]

APC 099
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