ATTACHMENT B

Reverberatory Furnace
Enclosure Hood Modification
and
Test Protocol for Revised Capture & Collection System Hood
Actual Volumetric Flowrate Measurement

revised 4/16/08

MI METALS - OLDSMAR
SUMMARY SHEET revised 4/16/08
ENCLOSING CHARGING HOOD MODIFICATIONS FOR
REVERBERATORY ALUMINUM MELTING FURNACE

1) Increase enclosing charging door capture hood ductwork size from 22 inches ID to 36 inches ID.
Result – Increases measured enclosing hood ductwork ventilation flow from 12,434 acfm to 24,740 acfm.

2) Add side curtains to capture hood to extend to bottom of furnace opening and add front curtain without charging forklift boom cutout, extending to 9' above furnace working floor.
Result – Changes charging capture hood type from low canopy hood to enclosing hood classification.
Reference – Section 3.3.1, 3.4.2, 23rd Edition ACGIH-IV

3) Change the enclosing charging door capture hood face opening to 96" x 187" (8' x 15' 7").
Result – Enclosing charging door hood face velocity (Capture Velocity) becomes 198.4 fpm.
Reference – Table 10.99.2, Figure 3-1, Sections 3.1 and 3.2, 23rd Edition ACGIH-IV

4) Add ventilation sampling ports (minimum 2.0 diameters downstream and 0.5 diameters upstream of disturbances) in capture hood duct and relocate sampling ports in main ventilation ductwork as per 40CFR Part 60, Appendix A, USEPA Reference Method 1 criteria.
Result – Allows for ventilation flow rate measurements, USEPA Reference Method 2
Reference – 40CFR Part 63 Subpart RRR, 63.1506 (C) (1)

5) Add lockable ventilation damper in enclosing hood ductwork.
Result – Allows for flow balancing of ventilation system.
Reference – Section 5.5.2, 5.5.6, Table 5-1, 23rd Edition ACGIH-IV

MI METALS – OLDSMAR
REVERBERATORY FURNACE ENCLOSURE HOOD MODIFICATION
ENGINEERING DESIGN CALCULATIONS
revised 4/16/08

New Capture Hood Face Opening

Length = 15 feet 7 inches I.D. = 187 inches

Width = 8 feet I. D. = 96 inches

Opening Area = 187 inches x 96 inches ÷144 inches^2/feet^2 = 124.67 feet^2

Hood Duct Flow Rate (proposed estimate)

Duct Diameter = 36 inches I. D. = 3 feet

Estimated Duct Velocity = 3500 feet/minute

Duct Area = π x (3 feet ÷ 2) ^{2} = 7.0686 feet^2

Flow Rate = 7.0686 feet^2 x 3500 feet/minute = 24,740 feet^3

Hood Capture Velocity (enclosure type)

Hood Velocity = 24,740 feet^3 ÷ 124.67 feet^2 = 198.4 feet/minute

Reference: Table 10.99.2 of 23rd Edition of the "Industrial Ventilation – A Manual of Recommended Practice" requires minimum 150-200 fpm capture velocity

Sample Port Locations

Duct Diameter = 36 inches

Downstream Distance = 120 inches ÷ 36 inches = 3.33 diameters

Upstream Distance = 60 inches ÷ 36 inches = 1.67 diameter

Reference: Method 1, Section 11.1.1 requires minimum 2 diameters downstream and 0.5 diameters upstream

MI METALS – OLDSMAR
FACILITY ID 1030114
TEST PROTOCOL for
REVISED CAPTURE & COLLECTION SYSTEM HOOD
ACTUAL VOLUMETRIC FLOWRATE MEASUREMENT
revised 4/16/08

1. In accordance with EPA Memorandum "Compliance with American Conference of Governmental Industrial Hygienists Ventilation Manual in the Secondary Aluminum Production National Emission Standard for Hazardous Air Pollutants" dated 8/12/06, EPA Method 1, and EPA Method 2.

2. Average 3 sets of traversed flowrate measurements.

3. Sample ports 90 ° apart with minimum 2 diameter downstream & 0.5 diameters upstream of disturbances.

4. During second charge cycle (larger tons charged and higher reactive flux rate than first charge cycle).

5. Furnace charge door opened and charge table in place.

6. Furnace burner flue gate open.

7. Emergency malfunction relief valve in stationary closed position.

8. Hood duct damper locked in fixed operational position.

9. Above test conditions 4 through 8 represent charge operation during the emission capture period when the enclosure hood will have the expected lowest flow rate.

10. Type of hood is classified as an enclosure for Aluminum Furnace.

11. Minimum requirements of 150-200 fpm capture velocity in accordance with Table 10.99.2 of 23rd Edition of the "Industrial Ventilation - A manual of Recommended Practice".

12. Schedule annual hood flowrate measurement test and annual inspection of capture and collection system.