REFRACTORY DRYOUT

1. Introduction

Drying of refractory is an essential prerequisite to the operation of the incinerator whenever it is started up for the first time and any time repairs to the refractory lining of the incinerator or its interconnecting ductwork is undertaken. The purpose is to remove moisture from the refractory lining to cure the mortar. In order to ensure prolonged service of the refractory it is essential that the moisture be removed as slowly as possible and the temperature rises be maintained as per schedule.

The dryout procedure consists of blowing the fluidizing air through the incinerator and also raising the incinerator temperature at specified rates described in the attached graph and dryout schedule.

2. Preparation

During the drying out period all equipment and instruments must be fully operative so that process parameters can be checked throughout the system. During the drying out, all temperatures, pressures and differential pressures must be observed and recorded every hour, and after each temperature increase. It is also recommended that the operators keep a record of the temperatures, pressures, etc., on log sheets. Close all valves not actually used in the dryout process. Close all man doors at this time.

Prior to the commencement of the dryout process, the openings provided as "weep" holes on the incinerator roof should be opened to bleed moisture. The purpose of the "weep" holes is to observe steam or vapor being exhausted through the holes while the drying out procedure is in progress. If at the end of the dryout period steam or vapor is still observed coming out from these weep holes, then the dryout is not complete!

3. Dryout Procedure

a. *Phase 1 (Air Drying with Fluidizing Air Blower)*

(1) Start water into the venturi and the tray scrubber.

(2) Start purge blower overbed air blower.

(3) Start the fluidizing air blower and any other equipment to satisfy preheat burner interlocks.

b. *Phase 2 (Drying with Preheat Burner)*

(1) Start preheat burner.

(2) Monitor and control the **windbox** temperature increases and soaking times as per details in graph and schedule. The rate of increase of temperature is not to exceed the stipulated rate. In case the rate of increase of the temperature too great even at the lowest of the preheat burner settings, then shut down the preheat burner periodically. **Under no circumstances should the cooling water sprays be turned on to hold down the temperature during dryout or to bring its temperature down thereafter!**

This process completes the dryout and the curing of the refractory. Its duration is approximately eight days. However, this can vary depending on the amount of moisture in the refractory and therefore, it may be necessary to increase the soaking periods.

c. *Dryout Schedule*

(1) Start fluidizing blower. Air dry for 48 hours. Temperature should be around 165°F

(2) Start preheat burner. Increase **windbox** temperature to 250°F at a rate of 30°F per hour (where possible). Note that due to size of the preheat burner and minimum firing rate, the 250°F might not be maintained. The Actual temperature may be higher than 250°F.
Hold the temperature for 24 hours

(3) Increase **windbox** temperature to 400°F at a rate of 30°F per hour
Hold the temperature for 48 hours

(4) Increase **windbox** temperature from 400°F to 600°F at a rate of 30°F per hour.
Hold the temperature for 25 hours

(5) Increase **windbox** temperature from 600°Fto 800°F at a rate of 30°F per hour.
Hold the temperature for 24 hours

(6) Increase **windbox** temperature from 800°F to 1000°F at a rate no greater than 30°F per hour.
Hold the temperature for 24 hours

4. Measurement of Differential Pressure Through Tuyeres

This process checks that the differential pressure through the tuyere holes is within an acceptable range for proper incineration operation.

If the differential pressure is not acceptable, then the furnace temperature must be reduced to gain access for welding some of the tuyere holes closed. Reduce the furnace temperature at not more than 30°F per hour. If the differential pressure

through the tuyeres is in the acceptable range, then sand can be installed as outlined in the next section.

Remember; always reduce the furnace temperature at a rate not exceeding 60°F per hour to 1000°F and a rate of 30°F per hour below 1000°F.

5. Adding Gravel and Sand to the Top of the Dome

Add gravel on the dome to just cover the tuyeres. Sand can be added during dryout when the furnace temperature is above 600°F.

Add sand in low quantities, as the introduction of sand will lower the furnace temperature in the short term.

IMPORTANT: Do not walk on or otherwise disturb the tuyeres during the installation of the gravel or sand.

6. Heat-Up of the Furnace

Increase temperature of the furnace at a rate not exceeding 30°F per hour up to 1000°F at a rate of 60°F over 1000°F to operating temperatures according to the attached temperature schedule.