BULLETIN

The BHM THERMAL SAND RECLAIMER by EC&S

JANUARY 1, 2011

The **BHM THERMAL SAND RECLAIMER** by **EC&S** is a fluidized bed type, indirect fired sand reclaimer designed for the express purpose of reclaiming 100% clay-bonded foundry sands, 100% chemically-bonded foundry sands or a random mixture of both. BHM's world leading experience and success is documented by the unprecedented number of successful operating Thermal Sand Reclaimers on Clay-Bonded Sand, a quantity greater than reported by any other manufacturer in the world. The **BHM THERMAL SAND RECLAIMER** is reported to be the **only thermal sand reclaimer processing 100% clay-bonded sand producing reclaimed sand to a condition comparable to new sand, this product being used 100% in cores with unsurpassed consistency!**

Currently, the **BHM THERMAL SAND RECLAIMER** can be supplied with capacities ranging from 500 lbs./hour to 10 tons/hour. While operating unattended twenty-four (24) hours per day, the ten (10) ton per hour unit can process up to two hundred forty (240) tons per day. Tailoring each **BHM THERMAL SAND RECLAIMER** to an individual foundry's needs, assures that the reclaimed sand can be successfully used both in the core room for making cores and as sand addition in the molding system. This can eliminate up to 95% of the new sand requirement as well as 75-80% of the disposal costs normally associated with green sand systems. The proven success of the **BHM THERMAL SAND RECLAIMER** virtually eliminates all problems with varying acid demand values and AFS Grain Fineness Numbers Variation in these values can create numerous problems related to binder formulation.

The **BHM THERMAL SAND RECLAIMER** is the only successful fluid bed calciner that is reclaiming feed materials made up 100% from clay bonded foundry system sands. The **RECLAIMER** produces reclaimed sand suitable for reuse in the core room without dilution; processing feed material on a continuous basis by means of hot air scrubbing and gravity transfer. The **BHM THERMAL SAND RECLAIMER** operates continuously, unattended, monitored only by a remote station.

The process flow of the **BHM THERMAL SAND RECLAIMER** is quite simple.....

The pre-processed, spent sand is fed into the surge bin which has a storage capacity of at least two hours operating time. From the surge bin, the material is fed via a variable speed, low speed, feeder into the **BHM THERMAL SAND RECLAIMER** where the temperature of the calcining fluid bed operates in the range of 1350 to 1650^{o}F., depending upon the characteristics of the foundry's spent sand. Calcining heat is added via the fossil fuel combustion system as required to supplement the 500^{o}F. secondary air (which has gained its heat via the recuperator located in the exhaust flue) and the heat generated by the combustion of organic materials within the feed material. All supplemental fuel is fired in the fire box just below the calcining chamber, with total combustion of the fossil fuel taking place there. **There is no supplemental fuel fired in the bed!** This design feature assures a very consistent and even temperature in the calcining bed eliminating hot spots or coking conditions. After the silica leaves the calcining chamber by flowing over a weir, it then travels through the transfer duct by gravity into the precook chamber, where it is cooled with ambient air to a discharge temperature in the range of 700 – 850^{o}F.

The discharge from the precool chamber is connected directly to the front section of the **BHM COOLER-SCRUBBER**. The **BHM COOLER-SCRUBBER** has been designed specifically for this high temperature application, offering the foundry efficient sand cooling with integrated post scrubbing. Conditions within the cooler section fluid bed result in rapid and intimate mixing, which in turn produces rapid heat transfer between the cooling coils, fluidizing air and the sand. This externally supplied cooling is needed during the cooling operation to control and maintain the sand discharge temperature to design conditions. These cooling coils furnish indirect cooling. When added to the direct cooling provided by the fluidizing air, the total cooling efficiency is increased. Above the bed of sand is a freeboard space which is kept at a slight negative via the dust collection system. This withdraws the air introduced as fluidizing air, providing additional classification by removing some fines that remain in the sand as it enters the cooler section.

The sand will flow over a weir, entering the pneumatic scrubbing sections of the **BHM COOLER-SCRUBBER**. The pneumatic scrubbing units provide gentle sand-to-sand attriting action on the sand grains, removing the dead clay and residual organic materials. These clay materials, along with remaining organic materials and fines, are removed via an automatically controlled air curtain producing a final calcined and scrubbed product with properties similar to the properties of new sand. The final calcined, cooled and scrubbed sand flows over a final weir, discharging from the **BHM COOLER-SCRUBBER** with a temperature in the range of 100 to 120^{o} F., depending upon the ambient and wet bulb temperature for the location of the reclamation operation. The reclaimed sand is now ready for transporting back to the new or reclaimed silo.

The **BHM** Thermal Sand Reclamation Systems employ the **BHM** GRAPHICS MONITOR DISPLAY CONTROL SYSTEM, providing unequaled, precise process control assuring continuous consistent calcined sand suitable for reuse. The **BHM** GRAPHICS MONITOR DISPLAY CONTROL SYSTEM features archiving capability and visual operating displays as well as documenting and profiling trends at all critical process points. Status and alarm screens, plus system self-help diagnostics screens for trouble shooting assistance are part of this latest system; all integral to the Thermal Sand Reclaimer. Additionally, the user friendly **BHM** GRAPHICS MONITOR DISPLAY CONTROL SYSTEM provides the means to monitor the entire sand reclamation system from a remote location which can include a REMOTE MONITORING STATION miles away from the physical location of the equipment. A station could also be included in the EC&S Office in Birmingham, Alabama, USA. This REMOTE MONITORING STATION can provide continuous monitoring, acting as the Foundry's Operator or merely be used to assist the Foundry in the operation of the **BHM THERMAL SAND RELCAIMER (TSR)**. This may be accomplished via modem and telephone or internet connection. This station would provide service and support as if there were a Service Engineer as a part of the foundry staff on site. Local operator and troubleshooting responsibility can be greatly reduced and the capability to anticipate problems and facilitate corrections is unprecedented.

THE BHM GRAPHICS MONITOR DISPLAY CONTROL SYSTEM includes the following:

HARDWARE:

***COLOR GRAPHICS, HIGH RESOLUTION**

***PROGRAMMABLE LOGIC CONTROLLER (PLC)**

***ACCESS BY REMOTE TELEPHONE**

***EXPANSION CAPABILITY**

***HIGH SPEED**

SOFTWARE:

***MODULAR DESIGN**

***CO-PROCESSING**

***MONITORING**

***ARCHIVING**

***REPORTING**

BASIC SCREENS OF THE GRAPHICS MONITOR DISPLAY CONTROL SYSTEM INCLUDE:

THERMAL RECLAIMER

BHM COOLER FOR CHEMICALLY BONDED SAND or

BHM COOLER-SCRUBBER FOR CLAY BONDED SAND

FABRIC FILTER EMISSION CONTROL SYSTEM

PRE-PROCESSING AND SAND HANDLING SYSTEMS

POST-PROCESSING AND SAND HANDLING SYSTEMS

ALARMS

DIAGNOSTIC SYSTEM(S)

With the precise controls provided by the **BHM** GRAPHICS MONITOR DISPLAY CONTROL SYSTEM, discharged (reclaimed) sand is of a very high quality, allowing the core process to use all sands, new or reclaimed without concern for inferior sand quality.

The **BHM THERMAL SAND RECLAIMER by EC&S** has these unique features:

EPA Approved Exhaust

High Thermal Efficiency

Reclaims 100% Clay Bonded Sands

Reclaims 100% Chemically Bonded Sands

Reclaims a Random Mixture of both Sands

Unsurpassed Consistency of Calcined Product

Material Transfer is accomplished by Gravity

Unattended Operation (min. labor hours / ton)

Absence of "Hot" Moving Parts

Low Maintenance Costs

Continuous Processing

Adjustable Feed Rate

Unequaled Controls

Heat Recuperation

Low Capital Cost

Features of the **BHM COOLER-SCRUBBER** by EC&S **include:**

Direct Connection to BHM Sand Reclaimer

Matches Capacity of BHM Sand Reclaimer

High Scrubbing Efficiency

High Cooling Efficiency

Absence of Moving Parts

Low Energy Consumption

Continuous Processing

Unattended Operation

Low Capital Cost

EC&S provides written guarantees that the **BHM THERMAL SAND RECLAIMER** in coordination with the **BHM COOLER-SCRUBBER** will produce high quality reclaimed sand with these consistent properties:

Sand Screen Distribution

Yield (on base silica)

Thermal Efficiency

Ph Stabilization

Acid Demand Value

Loss on Ignition

Rated Capacity

Residual Clay

EC&S can claim what no other manufacturer can.....

GUARANTEED UNEQUALLED PERFORMANCE

EC&S, Inc.
5639 Millers Industrial Blvd.
Post Office Box 100816
Birmingham, AL 35210

Phone 205-833-9900
FAX 205-833-9905
email: sales@ecands.com
www.ecands.com