Case History: Green Sand Regeneration System (ITALY)

Project Requirement: The customer had a green sand regeneration requirement of approximately 14 ton/h coming from a mold line used mainly for producing cast iron motor blocks.

Our Solution: The final solution was to supply a 14 ton/hour green sand regeneration system using both thermal and mechanical treatments.

Scope of work:

The system includes a sand preparation section, sized for a maximum capacity of 15 ton/hour, and includes:

1. Breaking down core butts and sand accretions to an approximate maximum grain size of two millimeters (2mm);
2. Placing the spent sand in a storage silo for regeneration;
3. A primary mechanical treatment uses a pneumatic scrubber to remove a good part of the bentonite and black mineral from the sand;
4. This sand is then treated in a Hot-Rec thermal treatment furnace to burn off any organic elements and neutralize all of the bentonite. It also contains a heat recovery unit that lowers the temperature of the sand coming from the calcination chamber, cooling it to ambient temperature. The extracted thermal energy is then used to preheat incoming furnace combustion air.
5. A secondary mechanical scrubber is used to completely eliminate any remaining bentonite.

An additional cooling and dust removal system keeps regenerated sand temperature to a maximum 30°C. This is accomplished by using an indirect sand/cold water heat exchanger within a pneumatically fluidized sand bed and with cooling water supplied by a chiller unit. The device is connected to the sand discharge outlet on the pneumatic scrubber.

The Scope of Supply includes both the closed-circuit water cooling system and a dirty air exhaust system that draws from all areas requiring dust removal.

The regenerated sand has a maximum LOI of 0.1%, a silica fines level lower than 1%, an active bentonite value equal to 0%, and a maximum spent bentonite value equal to 0.4%.

One-hundred percent (100%) of the regenerated sand is used to mold cores.

System efficiency is equal to approximately 70% of spent sand at system inlet.