

Macawber Installation Case Study:

Ground Biomass Ash - Grupo Modelo Brewery, Zacatecas Mexico

IN BRIEF

Problem: Large brewery wishes to recycle waste grain and malt from the brew process for the production of electric power. Handling the biomass ash cleanly and economically was required.

Solution: Macawber pneumatic conveying systems were used to convey boiler bottom ash and fly ash away to storage. The biomass is dried and transferred to a boiler where it is burned with #6 oil. The biomass fly ash is gathered from four electrostatic precipitator (ESP) hoppers and pneumatically conveyed to an ash silo. The bottom ash is crushed and transferred a short distance via customer's mechanical conveyor to a pneumatic conveyor where it is transferred to an ash silo for truck loading.

MATERIAL CHARACTERISTICS

Material	Brewer Grain Fly Ash Brewer Grain Bottom Ash (brewer grain fired with #6 oil)
Bulk Density	Aerated 570-730 kg/m ³ (36-76 lb./ft ³)
Size	Fly Ash: 100% < 100 mesh Bottom Ash: 300x150x65 mm (max)
Temperature	161°C – 300°C
Moisture Content	~0%
Condition	Free flowing when aerated

SYSTEM OBJECTIVES

1. Minimize wear and air usage.
2. Reliable and consistent conveying.
3. Operate with -15.1" wc vacuum in baghouse.
4. Operate with elevated bottom ash temperature of 300°C

SYSTEM PERFORMANCE

Transfer Capacity	BA: 635 kg/hr (1400 lb/hr) FA: 657 kg/hr (1450 lb/hr)
Conveying Distance	BA: 120m (394ft) FA: 56m (184ft)
Reception Points	One

IMPROVEMENTS ACHIEVED

1. System operation is stable, reliable and efficient
2. System capacity exceeded specified rates
3. Air consumption was below MEI quoted average

