

Macawber Installation Case Study: Reclaimed Sand - Indiana, USA

IN BRIEF

A company that 3D prints fine, reclaimed sand (molds) reached out to Macawber in hopes of finding a material handling solution that could transfer their sand without breaking the particles down. This particular sized sand has been screened and reclaimed to 5 reception bins that are located above 5 separate 3D printers that operate 24 hours a day. For our customer, to achieve good quality, 3D printed layers, they must have very uniform sand. If the quality of the sand is poor, they will have varying sized sand particles, and the print will end up with porous sections, rough surface finish, or may fail altogether. We conducted a material test in our in-house material testing facility, witnessed by the customer, and proved that we could convey this material with virtually no degradation. Multiple samples were collected, and sieve analysis testing was performed to analyze the particle distribution before and after conveying. Very little to no degradation occurred between cycles. For the application, there are 5 printers, each with 4 large sand bins, and a reception bin will be mounted above and funnel material into the 4 sand bins. A level probe will be in each reception bin. When the probe detects low material, the Sandpump® will activate and convey material to that bin until it is full. A series of Dome Type Switch Valves are located in the pipeline to either let material go to the next bin or divert into the respective reception bin. The design rate is 1 T/hr. for a pipeline distance of 370'. The 3/4-3 Sandpump® is automated and will run by itself when material is called for, keeping the reception bins full and the printers contented.

MATERIAL CHARACTERISTICS

| | |
|------------------|----------------------------|
| Material | Reclaimed Sand |
| Bulk Density | 93.64 lbs./ft ³ |
| Temperature | Ambient |
| Moisture Content | < 0.1% |
| Condition | Free Flowing |

SYSTEM OBJECTIVES

1. Convey material with minimal to no degradation
2. Generate savings
3. Minimize downtime

SYSTEM PERFORMANCE

| | |
|--------------------|---------|
| Transfer Capacity | 1 T/hr. |
| Conveying Distance | 370 ft |
| Reception Points | 5 |

IMPROVEMENTS ACHIEVED

1. Material conveyed with minimal to no degradation
2. Production time and operating cost savings generated
3. Decreased downtime

