

TSB GEN 0004

TECHNICAL SERVICE
BULLETIN

HARDCAKING



DEFINITION

Clays and shales with a high percentage of free silica, lime, or both have a tendency to have fly ash, bottom ash, or grog addition to improve overall brickmaking characteristics. These materials set up and can harden like concrete with the moisture, pressure, and heat generated in the pug sealer and extruder.



SYMPTOMS AND INDICATIONS

- Defined segregation of particles packed in the liners



- Sealing auger case liners



- Unusual wear pattern on auger wing OD



HARDCAKING RESULTS

Hardcaking has the potential to break the auger shaft. It can also cause premature auger wear, decreased auger efficiency and column speed, inflated motor amperage and gearbox torque, premature failure of gearbox or main auger shaft, high column temperature, and differential temperatures across the extruded product.

DIAGNOSING THE PROBLEM

Hardcaking can be tested for by using extrusion efficiency data (see TSB GEN 0001). First, clean all augers and liners of material. Inspect the augers and liners then resume normal operation. The column speed may initially increase, sometimes dramatically. If amps rise, back feeding is observed, and the column temperature rises in the following two hours, hardcaking is likely.

SOLUTIONS

1. Liner lubrication
 - a. Inject oil into modified liner bolts at custom injection points
 - b. The system should allow individual flow and pressure control
 - c. Liner lubrication leads to decreased extruder amps and decreased pug amps, which makes the extrusion process more efficient



2. Liner changes
 - a. Using smooth, spiral, or a combination of liner styles should allow individual flow and pressure control
 - b. Pre-slicking liners and modified liners are good options
3. Using waste oil at shutdown
 - a. Pour several gallons of oil in the vacuum chamber at the end of the shift
 - b. Run enough to distribute oil in the barrel
 - c. Let it sit overnight to loosen packed material