Wet clay adhesion to antistick coatings: Effects of binder type and surface roughness - DTU Orbit (03/10/2019)

Wet clay adhesion to antistick coatings: Effects of binder type and surface roughness

The handling of sticky raw material can cause problems during operation of process equipment in the cement production industry. These handling problems are generally observed when raw material (e.g. wet clay) sticks to machine walls and causes blockage of outlets. This leads to frequent production shutdowns and expensive cleaning operations. In this work, the effects of surface material and process parameters on the friction forces between wet clay and surface were investigated. Various surface materials and clay impact speeds were investigated.

The results demonstrate that not only the equipment surface material but also the surface roughness influences the observed frictional behavior. The ranking of the materials in terms of effective static friction coefficients fell in two groups with equal performance within the group: 1) Two Teflon-based coatings (Accofal 2G54 and Accolan LB), polished AISI 304 stainless steel, Matrox lining, and a polyurethane-based coating (best performing surfaces), 2) Mild steel, a silicone-based coating, and AISI 304 stainless steel (worst performing surfaces). However, the friction coefficients of the two groups only varied by a factor of two, suggesting that adhesion of wet clay to surfaces is difficult to avoid by the use of coatings.

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