

## **Lab protocol and gage r&R of a spin tube test, simulating centrifugal dewatering of activated sludge by compaction**

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### **ABSTRACT**

Dewatering of activated sludge by compaction in a solid bowl decanter centrifuge is simulated in the laboratory with the spin tube test. This bench scale test allows research of cake compactibility (cake dewaterability) under controlled lab conditions and has shown already its value as described in a previous paper. The insights gained by executing the spin tube test on a regular basis allowed the optimization of an industrial centrifuge-dryer system.

This paper describes the formal gage r&R (repeatability and reproducibility) study that was executed at the early beginning, before the test was even introduced as a standard test. Since the spin tube test was a brand new test in the lab, before intense collecting data would be started, it was necessary to assure that the measurement system would not lead to erroneous conclusions. The paper first starts with a short introduction of a gage r&R study as part of the Six Sigma methodology and then the applied lab protocol to execute the spin tube test is described in detail. The results of the gage r&R study showed the spin tube test procedure to be consistent: the cake dryness results are repeatable for the individual analysts, and the dryness results between the analysts are reproducible. After the formal gage r&R, results of further lab exploration of the compaction mechanism are discussed. These additional results confirm indirectly the consistency of the spin tube test.

### **KEYWORDS**

spin tube test, compaction, decanter centrifuge, activated sludge, dewatering, gage r&R