



# 7<sup>th</sup> INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS”

## Analysis of Water Consumption in Toilets with Shewhart Control Charts

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### Abstract

The article aims to show if it is possible for Shewhart Control Charts to have competent data monitoring capabilities when observing a switch in toilet flush equipment from single flush to dual flush in a public University building located in Joinville, southern Brazil. Sensors collected data such as volume of water and time length of the flush. Such data was then trimmed and compiled into days and finally plotted into a Shewhart Control Chart. The switch in flush equipment indicated a reasonable reduction in water consumption for both male and female bathrooms presenting an average total reduction of 33.15% in water consumed during a day and a reduction in the average time length of flush of 23.95%. With periodic monitoring Shewhart Control Charts proved to be useful for observing large shifts of data, water consumption reduction and events such as leakages and droughts that occurred during the data gathering period.

*Keywords: Water consumption, monitoring, Shewhart Control Charts.*