

Linear Chemical Dose Controller

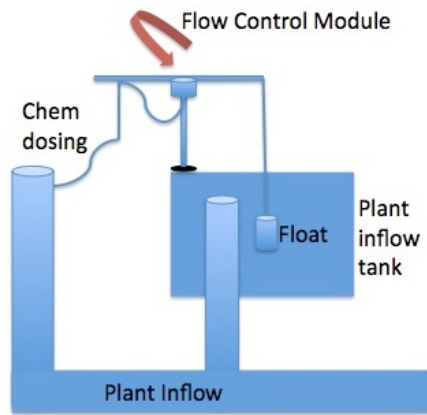
Linear Chemical Dose Controller

Abstract

The original Chemical Dose Controller (CDC) is designed to have a linear relationship between the flow of alum and the height of water in the entrance tank. The CDC itself is a combination of three previous subteams: the [Linear Flow Orifice Meter](#); the [Linear Chemical Doser](#); and the [Flow Controller](#). These three devices work together to automatically change the amount of alum that enters rapid mix as the flow through the plant is increased. A description of these devices, and how they work can be found below. Since the linear CDC is currently in use in Honduras, the current goal for this project is to make the design more robust.

Current Research

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The vertical chemical dosing tube portion of the CDC was tested with various tubing diameters to determine the failure point. If free fall or open channel flow was observed within the vertical drop tubing, then the dosing would be accurate. We determined that the smallest allowable inner tubing diameter is one quarter inch.

Currently, a preliminary manuscript based on the development and research of the Linear Chemical Dose Controller is being written for publication as a journal article. All drafts of the scientific research paper are attached to this page for viewing and editing by all AguaClara team members. Considerable editing and revising is required for the paper. The research that has been conducted in previous semesters will need to be reconciled and verified. In addition, much of the data may not be publishable. Many experiments will need to be redone or performed for the purpose of the paper.

Relevant Data Files

[LFOM Failure Experiment](#)
[LFOM weir design documentation](#)

Previous Research

Linear Flow Orifice Meter (LFOM)

The [Linear Flow Orifice Meter](#) riser pipe, LFOM, is located in the entrance tank. It is used in the plant when chemical dose flows are laminar. The LFOM tank creates a linear relationship between the flow rate through the plant and the height of water in the entrance tank so that a float system can be used to control the chemical dose.

Linear Chemical Doser

The [Linear Chemical Doser](#) creates a directly proportional relationship between the plant inflow tank water level and the flow controller outflow tubing level.

Flow Controller

The [Flow Controller](#) maintains a constant head level in a small bottle so that hydraulics can be used to dose a specific chemical flow rate solely by controlling the outflow tubing level.