

Topeka WTP Installs Integrity Municipal Systems' A-758 PLUS™ Lime Slaker System to Replace its Wallace & Tiernan® A-758 Lime Slaker

The Topeka Water Treatment Plant (WTP) - a 60 million gallon per day facility - serves Topeka, Kansas and surrounding areas. Built in 1945, the plant underwent several renovations with the most recent upgrading the plant to its current capacity in 1993.

A crucial step in the plant's treatment process is water softening, in which lime is added to hard water to remove calcium, magnesium, and other metal cations. Lime softening, which makes the water softer and less corrosive throughout the

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Infrastructure Support Manager
Topeka Water Treatment Plant

distribution system, involves adding hydrated lime ($\text{Ca}(\text{OH})_2$) to the plant clarifiers. Hydrated lime is produced by adding water to dry quicklime (CaO), a process known as slaking. Producing hydrated lime on-site with a lime slaker is much more cost effective than purchasing pre-made, hydrated lime. During the 1993 plant upgrade, five 2,000 lb/hr Wallace and Tiernan® paste-type lime slaker systems were installed. Paste-type lime slakers utilize

a 2:1 water-to-lime slaking ratio to slake lime as a paste and to achieve the complete slaking reaction ($\text{CaO} + \text{H}_2\text{O} \rightleftharpoons \text{Ca}(\text{OH})_2 + \text{heat}$). This ratio provides a number of benefits over the older 4:1 water-to-lime, or slurry, slaking process (detention slaking), including reduced power requirements, faster slaking, a smaller footprint and, most importantly, a more reactive lime slurry solution which reduces chemical costs for the WTP.

Paste-type lime slakers have served the Topeka WTP well for over two decades. In 2015, plant officials decided to replace the first of the existing slakers and, after considering offers

from several slaker suppliers, chose the A-758 PLUS™ paste-type lime slaker manufactured by Integrity Municipal Systems, LLC (IMS). The A-758 PLUS™ paste-type lime slaker was chosen because of its competitive price, as well as the unique improvements made by IMS to the product. In addition, the system fits into the exact space occupied by the previous lime slaker, requiring minimal re-piping and modifications to the existing infrastructure.

The A-758 PLUS™ lime slaker maintains the consistency of the paste using an electronic modulating slaking water valve to control the water flow to the slaking reaction chamber. The slaker uses a PLC and a VFD to monitor the amperage draw on the motor that turns the paddle shafts. Paste consistency is controlled by maintaining a specified motor amperage monitored by the VFD. A higher amperage (which opens the water valve) indicates a thicker paste, while a lower amperage (which closes the water valve) indicates a thinner paste.



A-758 PLUS™ Lime Slaker System

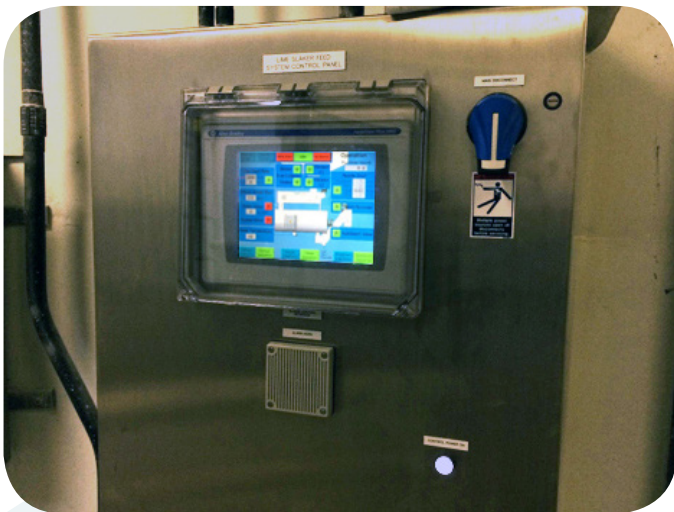
The new IMS A-758 PLUS™ lime slaker system used at the Topeka WTP and started-up in October 2015 boasts several enhancements that improve system reliability, accessibility, quality, and performance, while also reducing maintenance

requirements and the number of system parts:

- Stainless steel materials of construction for the feeder, slaker trough, grit remover, and control panel make the system more resistant to corrosion.
 - A patent-pending, pre-assembled water panel simplifies water controls, eases connection complexity, and improves machine accessibility. All water piping, instrumentation and accessories are mounted on a stainless-steel panel providing a single water source-point.
 - A screw-type grit remover with only one moving part makes maintenance easier.
 - A modular dust arrestor and spray-bar allows quick assembly removal for cleaning and maintenance.
 - Clean-out ports for the water weir and slaker bottom eases access to the slaking chamber.
- A control panel with Allen-Bradley PLC and 10-inch touch screen user interface makes startup, pause, and shutdown sequences each a push-button operation.

Infrastructure Support Manager, Joey Filby, was also impressed with the ease of access to slaker parts, which normally ship from the IMS slaker manufacturing facility in Zeeland, Michigan within one day after an order is received. Filby said of IMS: "Both sales and support crews have been excellent. They are responsive and always willing to answer their phone to help us out with any questions we might have."

As a result of the complete satisfaction of the plant operators with the IMS A-758 PLUS™ lime slaker system, the Topeka WTP decided in January 2016 to purchase two additional slakers from IMS.



Control panel with Allen-Bradley PLC and 10" touch screen



Patent-pending, pre-assembled water panel