

Laboratory tests of "Sagewash Sanitizer" Spray Gun

Report Number: C440a

Alan Wicks
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LPD Laboratory Services

Blackburn MicroTech Solutions Ltd.

Philips Road
Blackburn

Lancashire, BB1 5RZ

United Kingdom

www.lpdlabservices.co.uk

enquiries@lpdlabservices.co.uk

Tel 01254-507379

Fax 01254-507402

Mescerflex

Unit4, Cheney Manor Estate

Swindon, Wiltshire

SN2 2UD

U.K.

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Blackburn
MicroTech Solutions

Philips Road Blackburn Lancashire, BB1 5RZ, UK
Tel: +44 (0)1254 507379
Fax: +44 (0)1254 52040

Blackburn MicroTech Solutions Limited
Registered in England & Wales No 5679069
Registered office: Philips Road, Blackburn,
Lancashire, BB1 5RZ, UK

Description

A "Sagewash Sanitizer" spray gun and calcium hypochlorite cartridges were supplied for analysis / assessment. The system is designed to deliver a constant flow of sterile chlorinated water with a chlorine content in the range 60 to 200ppm. The gun is delivered preset for use, and requires no adjustment. The gun is supplied with town water at a pressure between 40 and 60 PSI. The gun has an adjustable spray nozzle and can deliver water from 1 litre per minute to above 10 litres per minute. In these tests the chlorine content of the water delivered by the gun was analyzed with under various conditions.

Results

The variables examined during the test are:

- Water feed pressure
- Water flow rate
- Calcium Hypochlorite cartridge condition

In addition the active lifetime of a solution delivered by the gun was examined. (The gun can be used to deliver say a bucket of chlorinated water which can be used on an intermittent basis for sterilizing / disinfecting. The lifetime of such a solution was examined.)

The chlorine content of the water samples was determined by a colorimetric method based on the DPD reaction. Chlorine solutions react with the test reagent to give a red solution. The intensity of the red colour is proportional to the concentration of available chlorine. The system is calibrated using standardized potassium permanganate solutions.

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Reproducibility:

The reproducibility of the gun was monitored by dispensing 5 samples from the gun over a 1 hour period.

Sample	Gun flow	Water pressure	Cartridge Condition	Chlorine
1	5 litres per minute	50PSI	new	92ppm
2	5 litres per minute	50PSI	~5% used	92ppm
3	5 litres per minute	50PSI	~8% used	92ppm
4	5 litres per minute	50PSI	~12% used	92ppm
5	5 litres per minute	50PSI	~16% used	92ppm

In addition a sample taken with the cartridge 80% spent had a consistent chlorine delivery value of 92 ppm Chlorine.

Water Pressure:

Samples were taken from the gun at water pressures of 60 PSI, 50 PSI and 35 PSI. At 35 PSI the flow rate from the gun is diminished, but the concentration of the delivered solution remains remarkably consistent.

Sample	Gun flow	Water pressure	Cartridge Condition	Chlorine
1	6 litres per minute	60PSI	~16% used	92ppm
2	5 litres per minute	50PSI	~16% used	92ppm
3	2 litres per minute	35PSI	~16% used	92ppm

Delivery pH and ORP:

The system delivers a mildly alkaline solution of hypochlorite. The pH of the water supply in the test system was 9.0, at delivery the pH of the hypochlorite solution was 9.64 i.e. the pH was raised by 0.64 pH

units. The ORP values of the solutions are between 710 and 800 mV. The water temperature of the inlet water was 18 C.

pH measurement repeatability:

The measurements were repeated on another water supply which had an inlet pH of 7.8 (18 C), the outlet pH of this supply across a range of flow rates was between 8.5 and 9.0 units. The pH measurements were measured using a calibrated probe and test solutions traceable to international primary standards.

Cartridge Condition:

With a new cartridge fitted the gun takes less than 1 minute to deliver the full 92ppm solution, at a flow rate of 5 litres per minute. A nearly expired cartridge still delivers 92 ppm of free chlorine.

Stability of Dispensed Solution:

A 10 litre sample dispensed from the gun was monitored over several hours. The starting concentration was 92 ppm available chlorine. After 1 hour standing the solution had not measurably changed. After 3 hours a slight drop in concentration to 88 ppm could be observed. (In these tests the sample was allowed to stand at room temperature, with no biological challenge). The test does illustrate that the gun could be used to safely dispense sanitizing solutions that could then be transported to remote sites, the solution still retaining its sanitizing potential for some hours).

Summarizing:

The "Sagewash gun" system provides a safe, convenient, and reproducible system for dispensing hypochlorite sanitizing solutions. The tests indicate that the gun will provide a consistent product over a wide range of operating conditions. The system dispenses a consistent product at high and low flow rates, and delivers a consistent product with new and old cartridges.

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Analysts Name: Alan Wicks
Function: Senior Analyst
Signature: (hard copy only)_____

End of Report