TECHNOTES
by Texwipe®
An ITW Company

TexTab™ TX6460
Solution Decay Study

Prepared by:
Jay Postlewaite, Ph.D.
Laura Taraban, M.D.

VOLUME XVI NO. 2 1.2017

TexTab™ TX6460 **Solution Decay Study**

Introduction

The scope of this study was to determine the effect of storage, if any, on available hypochlorous acid in a TexTab TX6460 use solution. To accomplish this goal a sodium dichloroisocyanurate (NaDCC) solution decay study was performed. Several solutions containing varying concentrations of hypochlorous acid were prepared. The solutions were stored in the dark at room temperature and tested at 0, 3, 4, 5, 6, 7, days and once a week thereafter for five weeks. The solutions were prepared using 775 mg NaDCC tablets. The concentrations of the solution that were analyzed are:

- 10,000 ppm (20 tablets in 1L of water)
- 5,000 ppm (10 tablets in 1L of water)
- 2,000 ppm (4 tablets in 1L of water)
- 1,500 ppm (3 tablets in 1L of water)
- 1,000 ppm (2 tablets in 1L of water)
- 500 ppm (1 tablet in 1L of water)

The samples were analyzed by titration at each time point and the result recorded on the relevant result sheet.

Purpose

To determine the effect of storage, if any, on available hypochlorous acid in solution.

Reagents

- 775 mg NaDCC Tablets
- 0.1N Sodium Thiosulphate
- Glacial Acetic Acid
- 20% ($^{w}/_{v}$) Potassium Iodide
- Starch Indicator
- De-Ionized (DI) Water

Equipment

- 5,000 mL Plastic Containers
- 1,000 mL Volumetric Flask
- 250 mL Beakers
- 250 mL Conical Flasks
- 10 mL Pipettes
- 25 mL Burette
- 100 mL Graduated Cylinders
- Analytical Balance

Experimental

1. Added 1,000 mL of DI water, measured using a 1,000 mL volumetric flask, to a clean 5,000 mL plastic container.
2. Labeled the plastic container as “10,000 ppm”.
3. Weighed out twenty of the 775 mg tablets and recorded the total weight on the assay sheet.
4. Placed the tablets into the 5,000 mL plastic container prepared in step 1 above.
5. Allowed the tablets to dissolve fully and ensured the solution was well mixed.
6. Once dissolved and well mixed, took a 10 mL sample (in duplicate) and pipetted into a 250 mL conical flask and added 40 mL of DI water.
7. Added 5 mls of glacial acetic acid and 10 mls of 20% ($^{w}/_{v}$) potassium iodide to each flask and agitated to mix.
8. Titrated the liberated iodine in each flask to a colorless end point with 0.1N sodium thiosulphate VS using a few drops of starch indicator.
9. Calculated the mg NaDCC and available hypochlorous acid (ppm) in the sample using the calculation below (Step 13) and recorded on the result sheet.
10. Repeated Steps 1 to 9 for each of the concentration listed in the introduction and using the stated number of tablets required for each concentration and labeled each container as the corresponding concentration of available hypochlorous acid.
11. Once all samples had been tested, sealed the containers and stored in the dark at room temperature.
12. Analyzed each sample (as per Steps 6 to 9) at the time intervals indicated in the Introduction for the duration of the study.
13. Calculations:

$$\textbf{mg NaDCC / Sample} = \frac{\text{Titre x F X 5.4975 x Theoretical Tablet}}{\text{Sample NaDCC Content}} \times \text{Adjustment Factor}$$

Where:
F = Concentration Factor taken from certificate of analysis of sodium thiosulphate solution
Theoretical Tablet = 775 mg

Adjustment Factor, Sample NaDCC Content values are taken from the Table 1.

Table 1. Factors Used to Determine NaDCC Amount for Each Solution

Sample Concentration	Sample NaDCC Content	Adjustment Factor
10,000 ppm	155.00	20
5,000 ppm	77.50	10
2,000 ppm	31.00	4
1,500 ppm	23.25	3
1,000 ppm	15.50	2
500 ppm	7.75	1

Available Hypochlorous acid (ppm) / Sample = mg NaDCC / Sample x 0.645

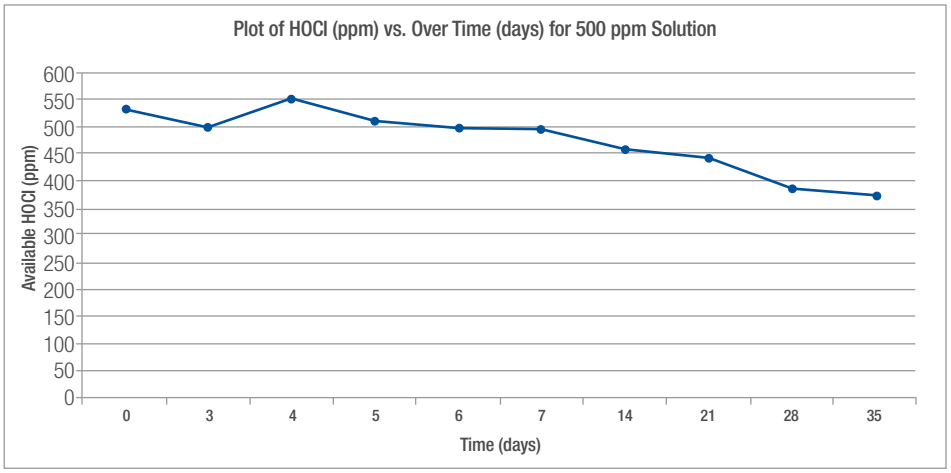
Table 2. Results for 500 ppm Solution

Time Point (Days)	Available HOCl (ppm)
0	531
3	495
4	549
5	513
6	495
7	495
14	460
21	441
28	388
35	371

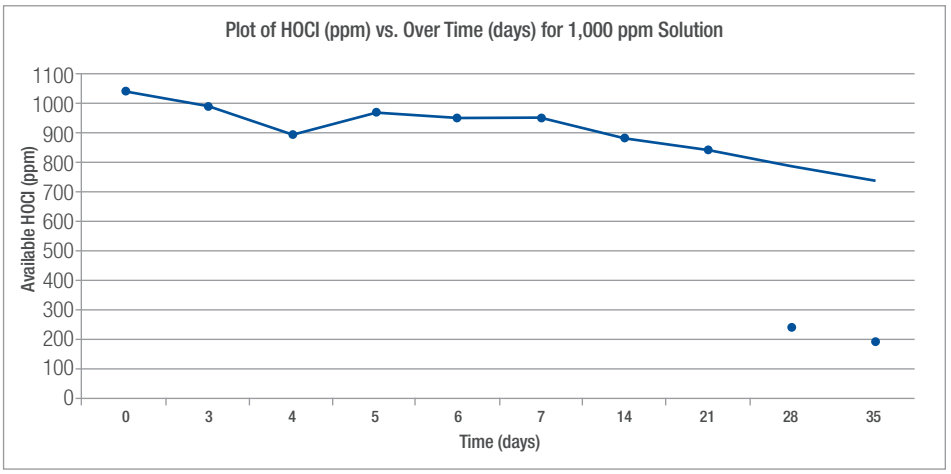
Table 3. Results for 1,000 ppm Solution

Time Point (Days)	Available HOCl (ppm)
0	1,044
3	991
4	902
5	973
6	955
7	955
14	885
21	848
28	795
35	742

Results



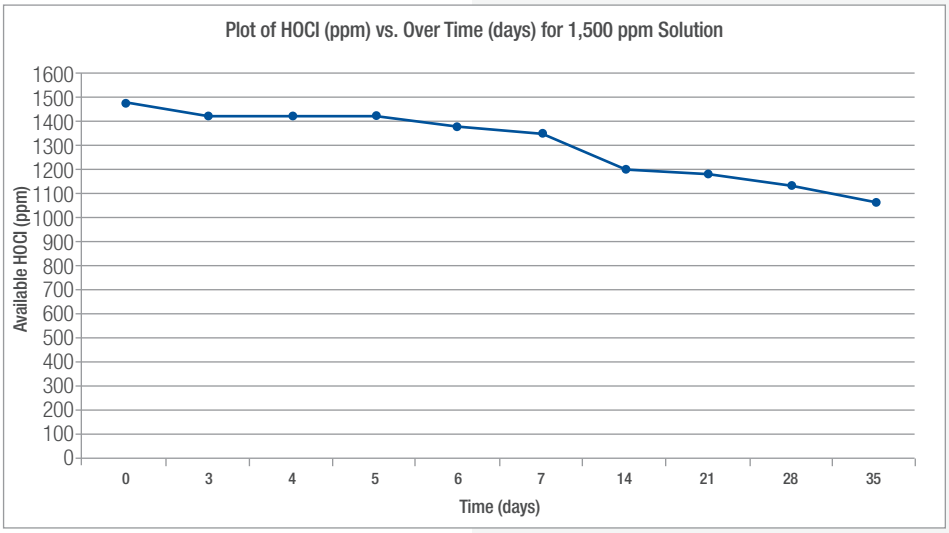
± 10% Specification: 450.00 – 550.00 ppm



± 10% Specification: 900.00 – 1,100.00 ppm

Table 4. Results for 1,500 ppm Solution

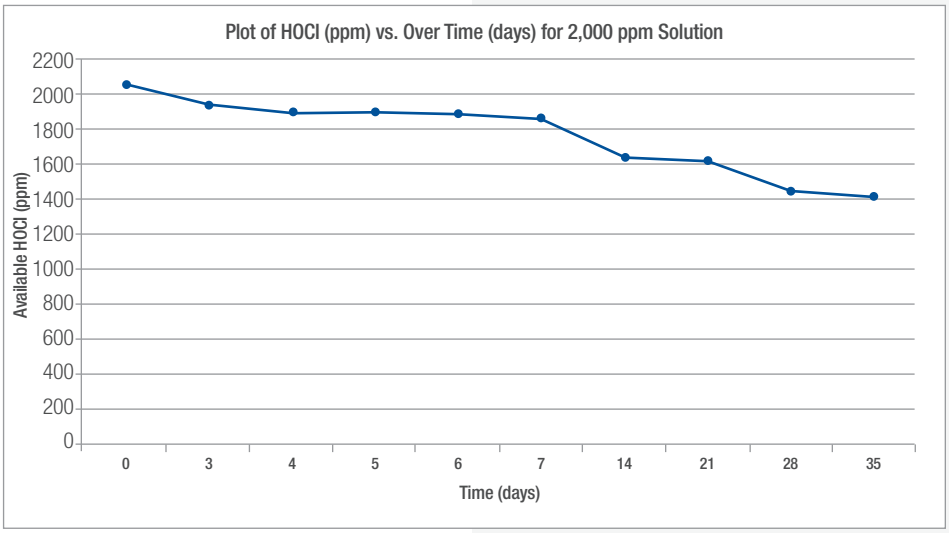
Time Point (Days)	Available HOCl (ppm)
0	1,486
3	1,416
4	1,416
5	1,416
6	1,380
7	1,345
14	1,203
21	1,183
28	1,130
35	1,060



± 10% Specification: 1,350.00 – 1,650.00 ppm

Table 5. Results for 2,000 ppm Solution

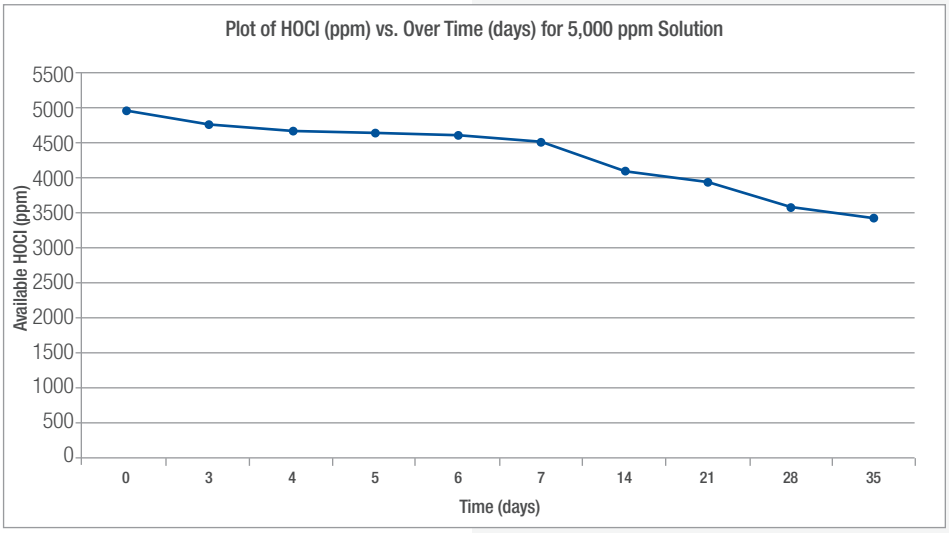
Time Point (Days)	Available HOCl (ppm)
0	2,070
3	1,982
4	1,929
5	1,911
6	1,911
7	1,876
14	1,663
21	1,625
28	1,448
35	1,413



± 10% Specification: 1,800.00 – 2,200.00 ppm

Table 6. Results for 5,000 ppm Solution

Time Point (Days)	Available HOCl (ppm)
0	4,972
3	4,760
4	4,689
5	4,671
6	4,618
7	4,530
14	4,105
21	3,956
28	3,567
35	3,426

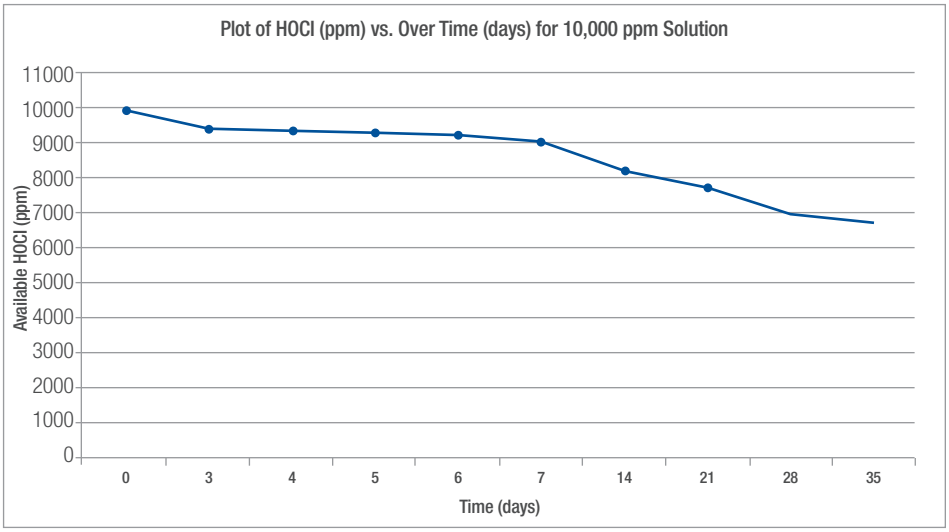


± 10% Specification: 4,500.00 – 5,500.00 ppm

Results

Table 7. Results for 10,000 ppm Solution

Time Point (Days)	Available HOCl (ppm)
0	9,891
3	9,325
4	9,289
5	9,272
6	9,112
7	9,024
14	8,281
21	7,805
28	6,993
35	6,746



± 10% Specification: 9,000.00 – 11,000.00 ppm

Conclusion

A study to determine the effect of storage, if any, on available hypochlorous acid in solution was performed. From the results, it was determined that a 500 ppm solution of available hypochlorous acid remained stable and within a ± 10% specification for fourteen days. A 1,500 ppm solution of available hypochlorous acid remained stable and within a ± 10% specification for six days. It was determined that a 1,000 ppm, 2,000 ppm, 5,000 ppm, and 10,000 ppm solution of available hypochlorous acid remained stable and all stayed within a ± 10% specification for seven days.

Therefore, it can be concluded that if a solution of 500 ppm available hypochlorous acid is prepared, it will remain stable for fourteen, a 1,500 ppm solution will remain stable for six days, and a 1,000 ppm, 2,000 ppm, 5,000 ppm, and 10,000 ppm solution will remain stable for seven days.

For additional information, please contact Texwipe Customer Service at the number listed below.

Customer Service

+1.336.996.7046

Visit us at www.texwipe.com