



Optimization of Well Chlorination & Disinfection with F-25 Well Conditioner™ and IntelliClor™

F-25 Well Conditioner™ and IntelliClor™ work together to optimize chlorination and disinfection of the well, dispersing loose debris, reducing slime-forming, iron-related, and sulfur bacteria and improving the flow rate and efficiency of the well.

F-25 Well Conditioner™ is designed to remove coliforms and nuisance bacteria from water wells. Injected into the well prior to shock chlorination, F-25 Well Conditioner™ accelerates the cleaning action by loosening biofilm growth and mineral scale.

IntelliClor™ Chlorine Enhancer is the smart and safe alternative for pH adjustment to improve chlorine efficiency. Reducing pH in a well cleaning application substantially reduces the amount of bleach required for disinfection. IntelliClor™ sequesters and disperses solids and debris to improve the cleaning process.

BENEFITS OF F-25 WELL CONDITIONER™

- Penetrates biofilm slime and mineral scale to make final flushing more complete.
- Disperses loose debris until flushed from the well.
- Reduces slime-forming, iron-related, and sulfur bacteria to improve water quality.
- Increases the flow rate and capacity of the well.
- Reduces the frequency of well cleaning.

BENEFITS OF INTELLICLOR™ CHLORINE ENHANCER

- Enhances performance of chlorine treatment.
- Safely lowers the pH of well cleaning solution.
- Safer to use than mineral acids.
- Reduces the cost of well cleanup.
- With F-25, cleans well to restore water quality.



Iron, sulfur, and slime-forming bacteria reduce the effectiveness of conventional well cleaning.



F-25 Well Conditioner™ and IntelliClor™ greatly increases the disinfection provided by the chlorine and restores flow capacity.

PROPERTIES AND CERTIFICATIONS OF F-25 WELL CONDITIONER™

- Amber color, mild odor, totally soluble
- Concentrated anionic solution
- Certified to ANSI/NSF Standard 60 for well cleaning
- Freezing Point < 36° F
- Specific Gravity 1.34 ± 0.03
- pH (1% Solution) > 5.8

APPLICATION OF F-25 WELL CONDITIONER™

- Inject 2-5 gallons of F-25 Well Conditioner™ per 1,000 gallons of water volume in well hole.
- Surge well to mix, and allow to soak for 6-8 hours before chlorine addition.
- Flush out well conditioner and pump well to waste, according to state or local regulations.
- Follow IntelliClor application procedures and chlorination recommendations
- Review all MSDS safety, handling and compatibility information prior to use

PROPERTIES AND CERTIFICATIONS OF INTELLICLOR™

- Clear liquid
- Totally soluble and freeze/thaw stable
- Freezing Point < 10° F
- Specific Gravity 1.2 ± 0.1
- pH (neat) < 2.0
- Certified to ANSI/NSF Standard 60 for well cleaning

APPLICATION OF INTELLICLOR™

Add IntelliChlor™ after F-25 Well Conditioner has been flushed out of the system. Dosing of IntelliChlor™ is based upon the pH and alkalinity of each well.

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| • pH range 6.8-7.5, Alkalinity < 220 | 1 gal IntelliChlor per 300 gal of well water |
| • pH range 7.5-8.2, Alkalinity < 220 | 1 gal IntelliChlor per 200 gal of well water |
| • pH range 6.8-7.5, Alkalinity > 220 | 1 gal IntelliChlor per 150 gal of well water |
| • pH range 7.5-8.2, Alkalinity > 220 | 1 gal IntelliChlor per 100 gal of well water |

These are general dosing rules that should get the water close to the desired pH of 3-5 before bleach addition. When adding IntelliChlor™, do not allow the pH to drop below 3.0 (check often). After 1,000 ppm bleach addition, the pH may rise to 7. If the pH rises above 7, gradually add more IntelliChlor™. Do not mix concentrated IntelliChlor™ and bleach together (add IntelliChlor™ to the water first).

CASE HISTORY

Background

A municipal water well had significant problems with iron and slime-related bacteria (non-coliform) that were detected at levels above the State standard (200 cfu/mL). Repeated attempts to treat the well with acid and bleach did not resolve the problem and alternatives were investigated. A combination treatment of F-25 Well Conditioner™ followed by IntelliChlor™ Chlorine Enhancer resolved the problem allowing the well to be returned to service.

Procedure

F-25 Well Conditioner™ was diluted into a storage tank (0.5% solutions) equal to the well volume. This F-25 solution was mixed in the well by repeated pumping between the storage tank and the well. The pumping was continued for 6 hours and inspected for the presence of debris and color. Continued pumping was performed until the intensity of debris and color did not change (times will vary depending upon the condition of the well).

The well was flushed to remove any remaining F-25. Then, IntelliChlor™ was added to drop the pH to 3.5 before bleach addition. The calculated dose rate of chlorine (15% sodium hypochlorite) was 1,320 mg/L for final disinfection. The pH of the well water increased to 6.9 and remained stable at a pH of 7.0.

After pumping and mixing, the free chlorine residual was determined to be 720 mg/L. The dramatic drop in free chlorine was attributed to the high levels of bacteria and iron in the well interacting with the chlorine. Free chlorine levels continued to fall as the well was allowed to remain idle for 8 hours. The solution was then flushed according to State and local regulations.

Several days later, bacteria were still detected in the well water and it was decided to repeat the F-25 and IntelliChlor™ treatment. After the second treatment, the bacteria level remained below the State guidelines for non-coliform bacteria and the well was returned to service. It was recommended that this well be cleaned periodically to prevent excessive build-up of biofilm making future well cleaning easier.

F-25 Well Conditioner and IntelliChlor™ Conclusions and Observations

- Removed excessive iron, and slime forming bacteria from the well
- Effectively stabilized the pH during chlorination
- Improved the chlorine disinfection rate
- Allowed the well to be returned to service when prior acid/bleach treatment failed

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