# Chlorine Testing


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10:30 – 10:55 am

# Water

- It’s the most important natural resource in our environment
- Not pure - contains microorganisms and dissolved minerals which need to be controlled so water can be used safely

# Chlorine in Water

- Effective against a broad range of microorganisms
- Chlorine first used in 1908 for public health
- More than 79,000 tons of chlorine are used per year in the United States and Canada to treat water
- The primary disinfectant for drinking water in the world
- Monitoring chlorine is very important

# Chlorine in Water

- Chlorination has plays a critical role in protecting America's drinking water supply from waterborne infections
- 98 percent of systems that treat water employ chlorine-based disinfectants
- Over 200 million Americans receive chlorine-disinfected drinking water every day

# Sources of Chlorine

| Chemical Name | Chemical Formula | Form | % Chlorine |
|---|---|---|---|
| Chlorine Gas | $Cl_2$ | Gas | 100% |
| Calcium Hypochlorite | $Ca(OCl)_2$ | Solid | 65-70% |
| Sodium Hypochlorite | NaOCl | Liquid | ~12% |

# SenSafe Free Chlorine Water Check #481026

- First approved EPA test strip for compliance testing
- Published in the 2007 Federal Register *(vol 72, no 47, Monday, March 12, 2007 p. 11204, ITS method D99-003)*
- Approved for use by most U.S. States
- Patented procedure *(US Patents 6541269, 5491064)*
- Detection levels 0, 0.05, 0.1, 0.2, 0.4, 0.6, 0.8, 1.2, 1.5, 2.0, 2.6, 4.0, >6.0 pm (mg/L)

# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Safe and non-hazardous
- No monochlormine interferences
- Reagents impregnated on test strip pad
- No external chemicals needed
- Very stable

# Benefits of SenSafe™ Free Chlorine Water Check #481026

- No instrument required
- Results in under a minute
- Four year shelf-life
- Patented aperture strip is 10 times more sensitive then regular test strips

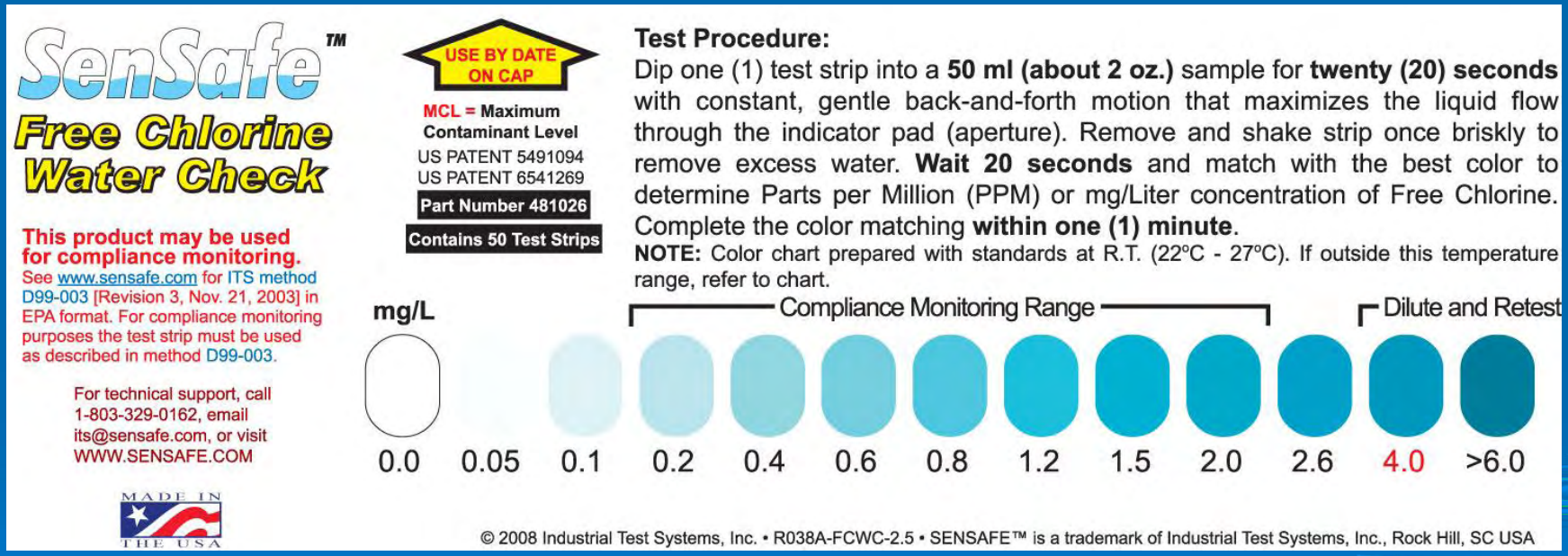
# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Uses patented TMB indicator pad - *U.S. patent # 5491094*
- Allowed by the USDA for use in food processing facilities
- No indicator bleach out even at 500 ppm (mg/L) Chlorine
- Ideal for measuring cloudy and turbid water samples with no effect on test results

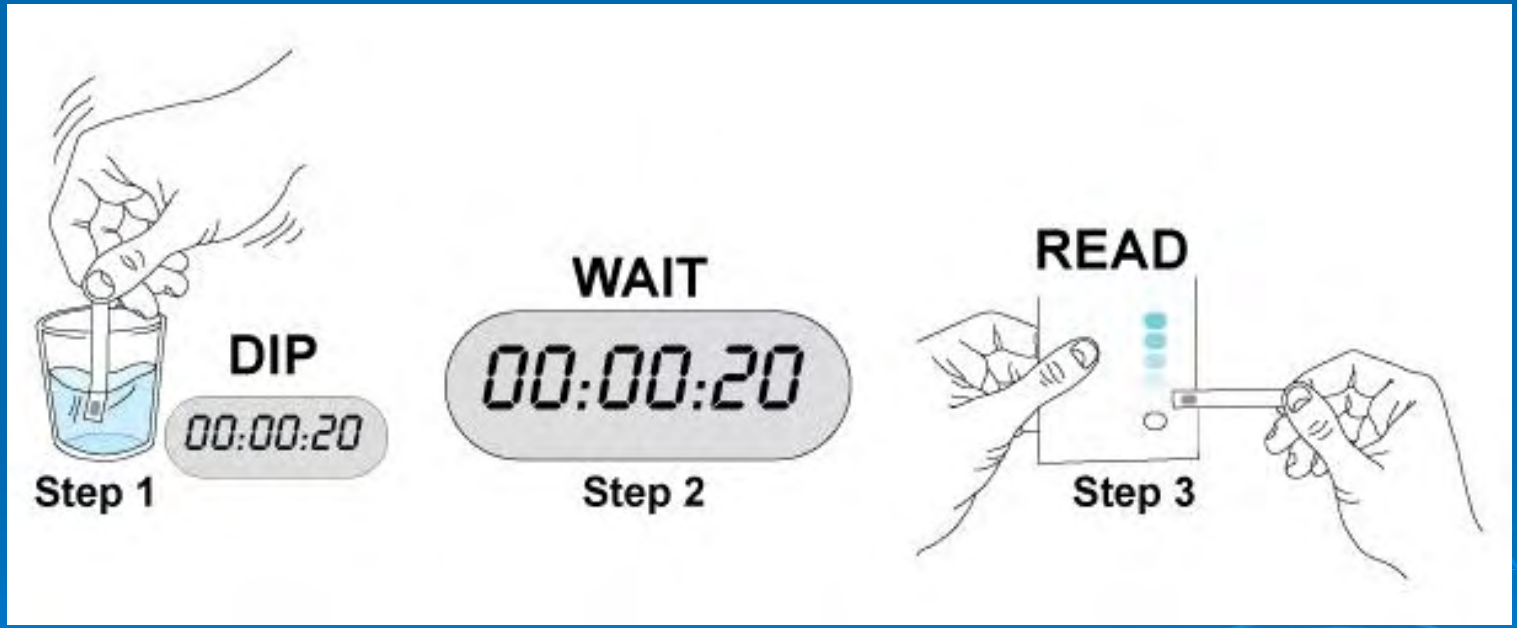
# EPA Approved in 2003

- Defined as products approved by the United States Environmental Protection Agency (EPA) for reporting and recording purposes
- Published in 2007 in the U.S. Federal Register *(vol 72, No. 47, Monday March 12 p.11204, ITS Method D99-003)*
- Each state may have different requirements and approvals

# SenSafe™ Free Chlorine Water Check Label #481026



# SenSafe™ Free Chlorine Water Check #481026 Procedure



# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Accuracy
  - No chemicals to mix and no instrumentation to calibrate, SenSafe™ Free Chlorine Water Check minimizes user error.

# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Ease
  - Professional accuracy for non-technical user with no special training needed

# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Time
  - No set up is required so results are available in a fraction of the time required by other methods

# Benefits of SenSafe™ Free Chlorine Water Check #481026

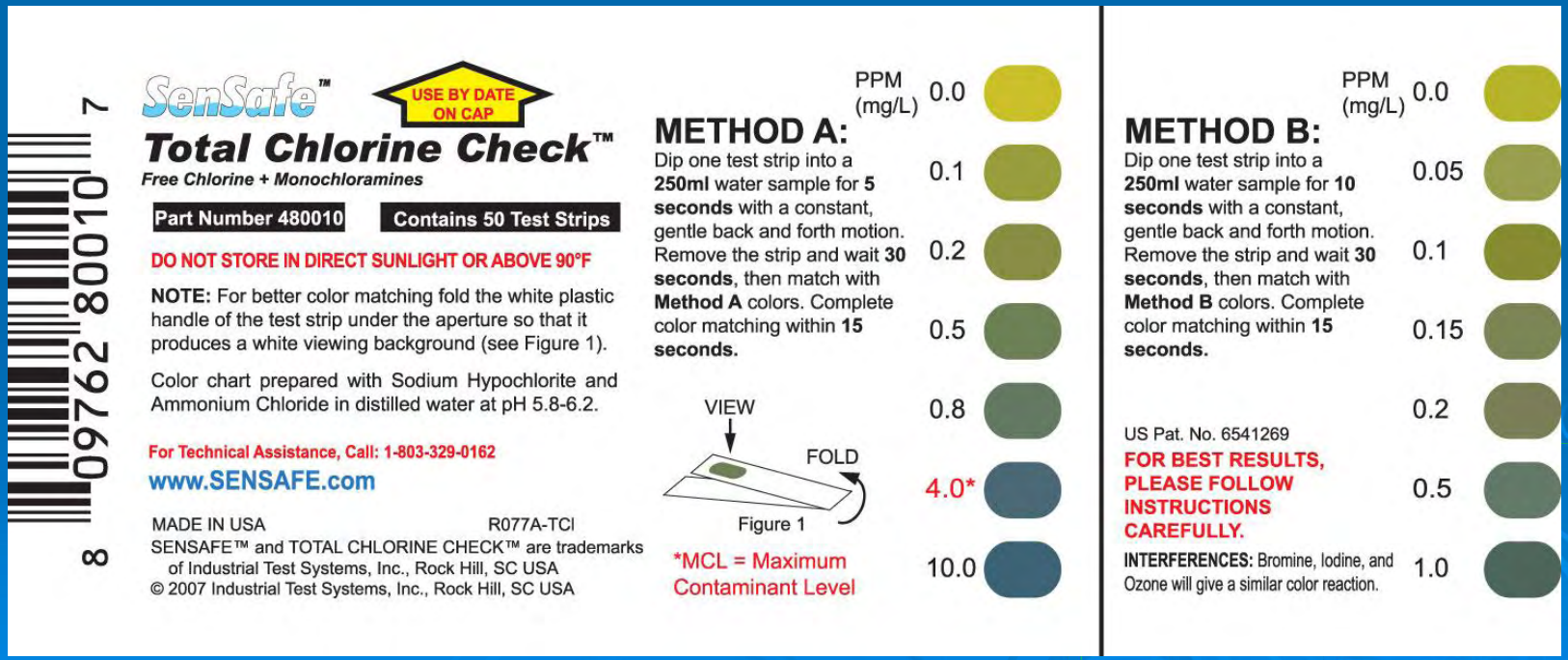
- Safety
  - SenSafe™ Free Chlorine Water Check is classified by OSHA to be non-hazardous because of the small amount of chemicals involved

# Benefits of SenSafe™ Free Chlorine Water Check #481026

- Transport
  - Small and portable - makes it ideal for field testing

# Total Chlorine Test Available

## Total Chlorine Test #480010



# To achieve good test results

1. Test is acceptable or compliant
2. Test is appropriate for the staff technical ability
3. Test is robust, reagents and equipment are reliable & stable
4. Test is not affected by interferences
5. Test is accurate when staff performs the test correctly

# TEST KIT PERFORMANCE IN A LAB

- Analysis will provide good results in a Laboratory setting
- A lab is a controlled environment where Reagent stability is assured
- Recalibration of test kit reagents or kit performance can be easily confirmed

# TEST KIT ON-SITE PERFORMANCE (Challenges)

- Test kits and instruments on-site operate under different environmental conditions
- Customer home or business can have a great deal of affect on results and operator
- Distractions like noise and activity
- For some tests (especially Liquid reagents) stability is affected by elevated Temperature in transport vehicle
- On-site precise results are a challenge
- Easy, non-technical procedures are desirable

# EPA Endorsement

"We (EPA) believe that the ITS test strips will provide the regulatory community with a valuable option for monitoring free chlorine levels in drinking water."


# Questions?

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