Safrax® Chlorine Dioxide for Post-Harvest Banana Treatment

SAFRAX® IS THE PIONEERING COMPANY MANUFACTURING A READY-TO-USE CHLORINE DIOXIDE SOLUTION, HOLDING A PATENT SINCE 2011.

Welcome to Safrax®, the pioneering company behind the creation of ready-to-use chlorine dioxide tablets, holding a novel patent since 2011. Our revolutionary technology allows you to generate chlorine dioxide whenever and wherever you want, offering unprecedented flexibility.

At Safrax®, our passion for innovation is reflected in products that are not only effective and convenient but also safe and environmentally friendly. Our commitment to excellence has set new standards in the industry, providing reliable and advanced solutions for your disinfection and purification needs.

In this brochure, I invite you to discover how Safrax® chlorine dioxide can be a game-changer in your operations, offering exceptional benefits for your business, your community, and the environment.

Sincerely,

Steve Dan
Founder of Safrax

Steve Dan

1

DISSOLVE THE SAFRAX TABLET(S) IN A SPECIFIED VOLUME OF WATER

2

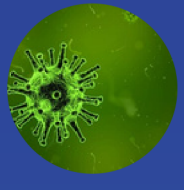
WAIT 60 SECONDS

3

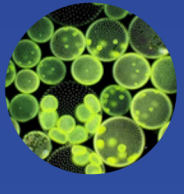
THE SAFRAX CHLORINE DIOXIDE SOLUTION IS READY FOR USE

Safrax® chlorine dioxide is recognized for its exceptional effectiveness in multiple areas, standing out as the best option available on the market for:

Elimination of BACTERIA: Offers unparalleled bactericidal action, ensuring the complete elimination of harmful bacteria in various environments and on surfaces.



Elimination of VIRUSES: Its potent viricidal effect deactivates and efficiently eliminates viruses, providing a safe environment free from pathogenic agents.



Elimination of ALGAE: Acts as a superior algaecide, eradicating algae and preventing its reappearance, maintaining the balance and clarity of water.

Elimination of FUNGI/MOLD: Stands out as an exceptional fungicide, eliminating fungi and preventing their development, protecting surfaces and environments from potential proliferation.

Control of BIOFILM: Effective in dissolving and eliminating biofilm. It prevents the formation of this protective layer created by microorganisms, keeping pipes and systems free from blockages and contamination.

Elimination of BAD ODORS: It neutralizes and eliminates bad odors by addressing their source rather than just masking them, resulting in a fresh and pleasant environment.

Safrax® chlorine dioxide has been proven as the most effective and safe solution, guaranteeing outstanding results in each of these critical areas.

SAFRAX® CHLORINE DIOXIDE PROTOCOL FOR POST-HARVEST BANANA TREATMENT

Safrax® is your ally in preserving the quality and freshness of bananas during transportation.

We recognize the challenge posed by mold and other pathogens during long-distance shipping, as they can compromise the quality of the fruit and result in significant economic losses.

Safrax® chlorine dioxide provides the solution to ensure bananas arrive in perfect condition, free from mold or pathogens. Our post-harvest treatment prevents the occurrence of these issues, preserving the product's integrity and freshness until it reaches its final destination.

By adopting our protocol, you not only enhance the quality of your product but also increase customer satisfaction while reducing costs associated with product loss. Next, we will demonstrate how Safrax® chlorine dioxide can optimize your post-harvest process, ensuring bananas maintain their optimal quality during transportation.

Objective:

Ensure the Quality and Extend the Shelf Life of bananas during their transport and storage by using Safrax® chlorine dioxide in the post-harvest wash and employing our slow-release bags in each container for continuous protection.

1 Pre-Wash:

Spray the bananas with a **10 PPM** Safrax® chlorine dioxide solution. This process is designed to reduce contamination from the field, human handling, environmental pathogens, and any other type of residue. Pre-washing prevents the introduction of pollutants to the water in which the bananas will be soaked.

To achieve a 10 PPM solution, add 10 tablets per 100 liters (26 gal) of water.

2 Washing Process in Tanks:

1st Tank: Utilize a chlorine dioxide solution with a concentration of 1 or 2 PPM for effective disinfection.

2nd Tank: Maintain a 1 to 2 PPM solution to ensure continuous disinfection.

To obtain a final solution of 1 to 2 PPM, add 1 or 2 tablets per 100 liters (26 gal) of water.

The initial number of tablets required may vary depending on the original water source. For example, if river water or another non-potable source is used, more tablets will be needed to achieve a final concentration of 1 PPM. Moreover, a greater quantity of tablets will be necessary if there is a significant accumulation of biofilm on the tank, walls, pipes, or other surfaces in contact.

3 Post-Wash:

Perform a spray treatment on the banana crowns using a **10 PPM** solution to ensure the elimination of any residual pathogens. This step reinforces the cleaning process and helps prevent potential cross-contamination from human handling during the procedure.

To obtain a 10 PPM solution, add 10 tablets per 100 liters (26 gal) of water.

4 Container and Pallet Cleaning:

Clean the shipping container and pallets using a chlorine dioxide solution at a concentration of **500 PPM** to ensure effective disinfection, prior to loading the bananas.

To obtain a 500 PPM solution, add 500 tablets per 100 liters (26 gal) of water.

5 Slow-Release Chlorine Dioxide Bags Inside the Container:

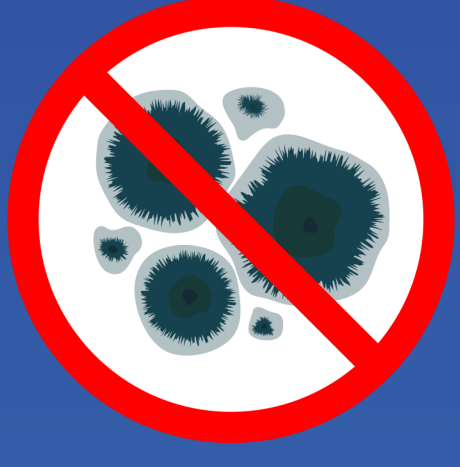
Place 2 Safrax® chlorine dioxide **Slow-Release** bags inside the shipping container. This will keep the air inside free from pathogens, mold, and bacteria, ensuring that the bananas arrive at their destination in perfect condition.

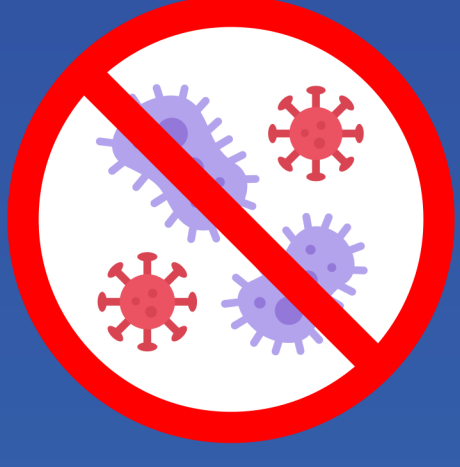
Advantages of Using Safrax®:

- **Extended Shelf Life:** Safrax® chlorine dioxide effectively extends the shelf life of bananas by reducing microbial load, thus preventing premature ripening.

+15 days of Extended Shelf Life

- **Mold and Pathogen Prevention:** Chlorine dioxide solution inhibits the growth of mold and other pathogens, ensuring that the bananas arrive at their destination without mold or decay.





Advantages of Using Safrax®:

- **Quality Maintenance:** Treated bananas maintain their aesthetic appeal, free from damage and undesirable marks, ensuring customer satisfaction.

We 100% Guarantee That the Bananas Will Arrive in Optimal Condition to the Client.

- **Safe and Eco-Friendly:** Safrax® chlorine dioxide is safe for food applications and leaves no harmful residues, making it an environmentally friendly option.

100%
Compatible with
Organic culture

- **Cost-Effective:** By reducing waste and extending the commercial life of bananas, Safrax® chlorine dioxide provides a cost-effective solution as a post-harvest treatment.

Advantages of Using Safrax®:

- **Safe & Eco-Friendly: Safrax® meets international standards for food quality and safety. Safrax® chlorine dioxide leaves no chlorate or perchlorate residues, ensuring an environmentally friendly and safe treatment prior to consumption.**

The European Commission published two new regulations in the summer of 2020, establishing maximum levels for chlorates and perchlorates in food products. The **maximum allowed level for most fruit and vegetables is 0.05 mg/kg.**

Chlorate: REGULATION (EU) 2020/749 OF THE COMMISSION, from June 4, 2020, amending Annex III of Regulation (EC) No. 396/2005 of the European Parliament and of the Council concerning maximum residue levels of chlorates in or on certain products.

Perchlorate: REGULATION (EU) 2023/915 OF THE COMMISSION, from April 25, 2023, on maximum levels of certain contaminants in foods.

Additional Hygiene and Cleaning Protocols:

- **Instrument Cleaning:** Rigorous hygiene of instruments used during the banana handling and packaging process is crucial. It is recommended to regularly wash all utensils with a **100 PPM** chlorine dioxide solution to eliminate any potential contaminants and to ensure the instruments are free of pathogens, mold, and bacteria.

- **Worker Hand Washing:** It is vital for workers to maintain optimal hygiene by washing their hands with a **100 PPM** Safrax® chlorine dioxide solution. This procedure should be carried out before touching the bananas and after any breaks to reduce the risk of contamination and provide effective protection against pathogens.

Additional Hygiene and Cleaning Protocols:

- **Water Source:** The initial number of tablets required may vary depending on the original water source. For example, if river water or another non-potable source is used, more tablets will be needed to achieve a final concentration of 1 PPM. It is best to use an RLU tester; Safrax® provides a service to periodically test your RLU levels and the PPM level of your water.

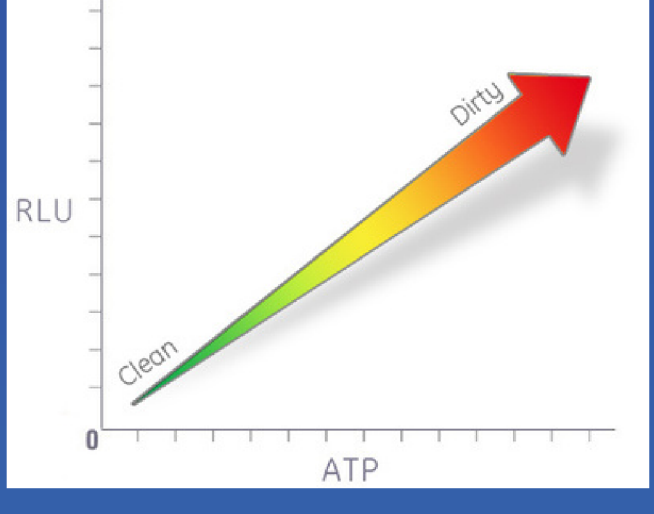
Assessing Water Quality:

- **Initial Inspection:** Analyze the water for contaminants, pathogens, and algae.
- **Determine Cleaning Level:** Choose the desired level of cleaning based on the water's condition.

We use an ATP/RLU tester to test the quality of the water. The relationship between the amount of ATP in the sample and the RLU result reading on the luminometer is simple:

High contamination (improper cleaning) = Large amount of ATP = More light produced in reaction= High RLU reading.

We use Hygiena to test the water quality:



RLU stands for Relative Light Units and is the unit of measure used in bioluminescence. Luminometers measure and quantify that light as an RLU output.

It is imperative to maintain an ATP level below 30 Relative Light Units (RLU) to ensure an optimal environment for banana cleaning.

Furthermore, it's crucial to conduct regular tests to monitor ATP/RLU levels and ensure water quality. Safrax provides a service that includes periodic visits to check RLU and PPM levels, thus ensuring water is suitable for effective banana cleaning.

Hygiena ATP Levels of Cleanliness		
Ultra-Clean	0-10	**Potable Water**
Very Clean	11-30	Maximum clean water range
Good Clean	31-80	The water has a moderate level of microbial activity or contamination
Somewhat Dirty	81-200	Caution: Some risk of contamination from disease causing bacteria
Dirty	201-500	Warning: Medium risk of contamination from disease causing bacteria
Very Dirty	501-1000	Danger: Medium to High risk of contamination from disease causing bacteria
Filthy	> 1000	Danger: High risk of contamination from disease causing bacteria

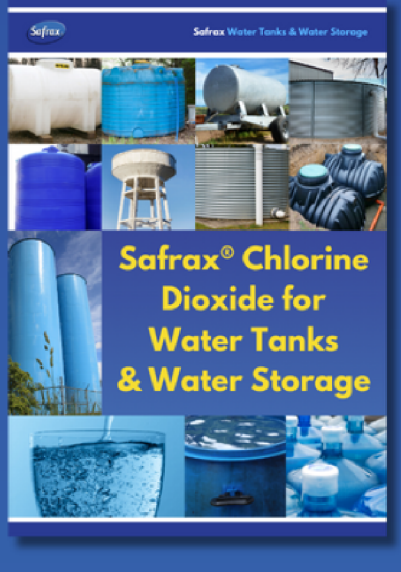
Additional Hygiene and Cleaning Protocols:

- **Biofilm in Tanks and Pipes:** When using chlorine dioxide in tanks for the first time, it's common to encounter significant biofilm accumulation on the pipes and tank walls. A shock treatment is recommended to eradicate the biofilm, which is a source of bacteria and pathogens. This treatment should be carried out on a day when bananas are not being processed to prevent the removed impurities from coming into contact with the bananas.

Using Safrax® chlorine dioxide helps prevent the formation of biofilm, ensuring cleaner and safer water.

Please Consult Our Brochure for More Information:

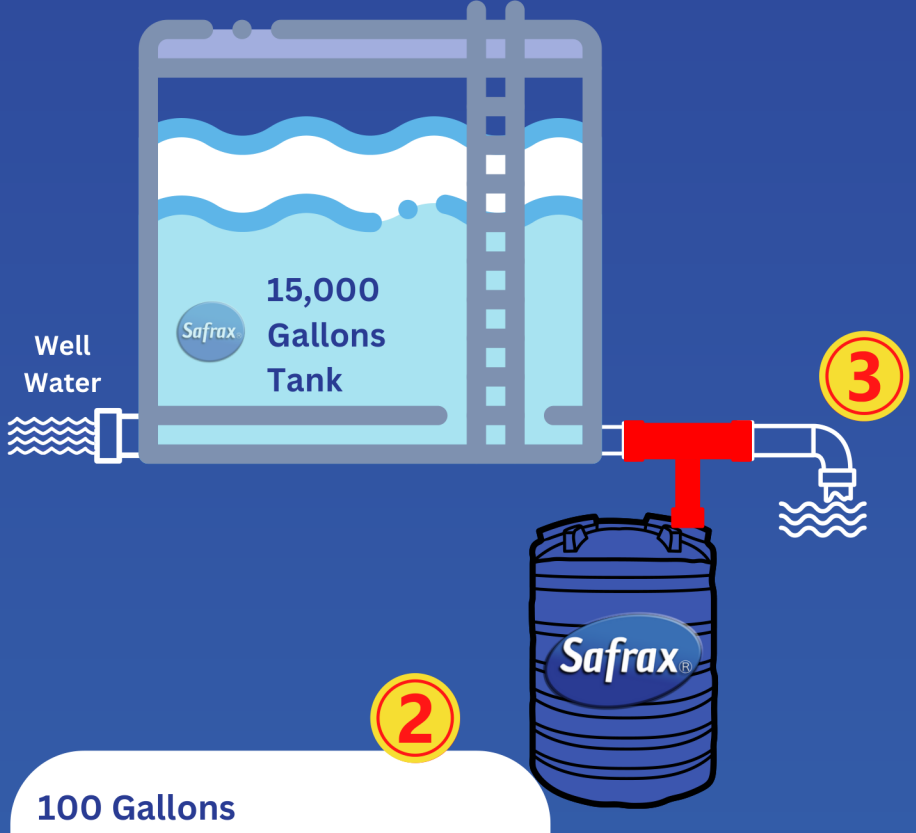
Safrax® Chlorine Dioxide for Water Tanks & Water Storage



Additional Hygiene and Cleaning Protocols:

- **Injector System Installation:** We recommend using our injectors, especially in large tanks that supply the washing tanks. An injection system should be installed that administers chlorine dioxide from a stock solution, maintaining a constant concentration of 1 PPM in the tanks to ensure effective disinfection.

1 Tank Maintenance:
Add 1 PPM (about 560 tablets) every 15 days.



2 100 Gallons
Safrax® Mother Solution:
1 bag (500 grams) = 130 PPM, replenish every 3 or 4 days with injector configured at 5.

The level of chlorine dioxide at the outlet is 1 PPM.

You can increase the PPM level by adjusting the concentration of the Safrax® solution or by increasing the injection rate of the configured injector.

Implementing Safrax® chlorine dioxide in the post-harvest washing process of bananas significantly enhances their quality, safety, and longevity, ensuring they reach the customer in excellent condition.

Safrax® presents a revolutionary alternative to conventional disinfection products used in the banana industry.

In summary, this brochure has detailed how Safrax® for Post-Harvest Banana Treatment can transform the quality and shelf life of your bananas during transport and storage.

By rigorously following our protocols, we ensure that your bananas will arrive in perfect condition at their final destination, free from damage, mold, and decay.

We 100% Guarantee That the Bananas Will Arrive in Optimal Condition to the Client.

With Safrax®, you can trust that your product will meet your customers' quality expectations, ensuring the integrity and freshness of bananas from the field to the final consumer.

OUR INTERNATIONAL PRESENCE OUTSIDE THE UNITED STATES AND CANADA

Dominican Republic:

SAFRAX GLOBAL 7
Laboratory Testing and Research Center

R. Betancourt 549
Santo Domingo, Dominican Rep.
Email: Clo2@safrax.com
+1 829.591.1280

Marc Haddad, Head of Research & Development

Colombia & Latin America:

SAFRAX COLOMBIA SAS
Ed. One Plaza
Medellin, Colombia
colombia@safrax.com

Caribbean / Yacht Provisioning:

SAFRAX SA
The Quarter Big Store
Anguilla, AI
support@safrax.com

China:

SAFRAX BIOTECHNOLOGY
China World Office 1
100004 Beijing,China
support@safrax.com

Mexico:

SAFRAX SA
18-A 322 Ciudad Industrial
Mérida, Yucatán
support@safrax.com

Europe:

SAFRAX SAS
66 Ave des Champs Elysees
75008 Paris, France
europe@safrax.com

Australia:

SAFRAX PTY LTD
L 1 , 8 Beulah Rd
Norwood SA 5067, Australia
support@safrax.com

SAFRAX® IS THE PIONEERING COMPANY MANUFACTURING A READY-TO-USE CHLORINE DIOXIDE SOLUTION, HOLDING A PATENT SINCE 2011.

ECO-FRIENDLY

100%
Compatible with
Organic culture

Available at:

amazon

Walmart

www.safrax.com

SAFRAX Inc.
8 The Green
Dover, DE 19901
Email: support@safrax.com
Toll Free:
1.855.888.CLO2 (2562) / 1.888.795.5888

UNITED NATIONS GLOBAL MARKETPLACE
AUTHORISED SUPPLIER
NUMBER: 873938