

SaferEx - MULTI-ACTION WATER PURIFIER

FOR AGRO-PROCESSING WASH-AND-RINSE WASTEWATER TREATMENT AND SAFE WATER RECOVERY FOR REUSE

PRODUCT INFORMATION SHEET

INNOVATIVE FEATURES

- Safe in Agro-wastewater purification
- Sediments Salts and high/heavy metals
- Kills pathogens.
- Disinfects salt and fresh Wash-and-Rinse (W-and-R) wastewater
- Sediments suspended particles.
- Clarifies the water.
- Removes colour, taste and odour.
- Keeps sediments at the bottom for easy filtration/decantation.
- Brings high acidity and alkalinity of recovered water close to pH7.
- Works in single application and in a unit process.
- Can be used preliminarily to detect safe recovered water (forms cloud instantly with unsafe water but remains clear with safe water)
- Keeps recovered water safe from pathogen contamination.
- Non-flammable
- Non-toxic
- Use with existing containers, tanks, vessels, etc
- Use in by peasant households, cottage, small and medium food/agro-products processing industries to purify Wash-and-Rinse wastewater for reuse without the use of sophisticated equipment.
- Easy to use without formal training but simple instructions .
- Reduces high and additional consumption water in Agro-products processing.
- More economical and efficient.

SaferEx treatment for easy and affordable recovery of safe water from Wash-and-Rinse (W-and-R) wastewater without using sophisticated equipment!

SaferEx!

Recovers safe water for reuse from your agro-products processing W-and-R wastewater at home and industry!

PRODUCT DESCRIPTION

Wash-and-Rinse (W-and-R) processes in food and agro-products (roots, tubers, grains, fruits, vegetables, etc) processing at home and industries generate very large amount of wastewater. Millions of peasant households, cottage, small and medium scale food/agro-products processing factories in Nigeria and Africa, others alike, are in need of safe water recover-and-reuse solutions that is cost-efficient, easy and simple to use as they battle daily with solutions that are not efficient and cannot afford sophisticated safe water recovery facilities. They dispose of the W-and-R wastewater or reuse some with the serious consequences of contaminations, shutdown food processing due to water scarcity or source for more water - spending more and causing water shortages.

SaferEx - MULTI-ACTION WATER PURIFIER FOR AGRO-PROCESSING WASH-AND-RINSE (W-and-R) WASTEWATER TREATMENT is the solution; an innovative multi-action and safe colourless liquid that purifies Wash-and-Rinse (W-and-R) wastewater in food/agro-products processing to recover safe water for reuse. It purifies salt and contaminated W-and-R wastewater and borehole water, makes them safe for food/agro-products processing reuse/uses. It effectively and economically does the purification by; disinfecting/killing pathogens, sedimenting suspended particles, high/heavy metals and salts, removing odour, colour and taste, all in "a single application and unit process" without the use of sophisticated equipment but using existing water containers, tanks, vessels and other water holders and mixing the W-and-R wastewater with appropriate amount of SaferEx in the water containers and allowing for 30 minutes to 6 hours (depending on the quantity, contamination type and level). The sediments are easily removed by simple decantation or filtration. It is formulated from refined and regular potable water treatment chemical raw materials. It has been confirmed efficient in killing harmful microbes (bacteria, viruses and protozoa) in wastewater; sedimenting suspended particles, salts, heavy/high metals and others that cause water hardness (Calcium and Magnesium) and staining (Iron and Manganese), removing odour, taste, and colour when added and mixed with the unsafe wastewater, unlike other single or combinations of two or more treatments. It brings the pH of highly acidic and alkaline wastewater close/towards pH7. It has made it possible for consumers to recover and reuse large amount of safe water from W-and-R wastewater devoid of pathogens and certain unwanted metals, reducing costs and suffering of women and children in fetching water, especially for the peasant households and cottage factories, and ultimately producing more food with less water.

SaferEx is an invented chemistry and innovation as a time and cost-efficient "multi-action single liquid" that works in a "single application in a unit process", and easy to use with only simple instructions like never done before. It instantly forms a cloudy solution with certain unsafe water (sediments impurities later) and clear solution with safe water

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(without sediments), therefore can be used to preliminarily detect safe and certain unsafe water instantly.

PACKAGING: 1 Litre : 4 litres : 10 Litres : 25 Litres: 200 Litres drum (in High Density Polyethylene (HDPE) Plastic containers).

SUMMARY OF TECHNICAL AND APPLICATION INFORMATION OF SaferEx

PHYSICAL PROPERTIES			
Appearance:	colourless	Foaming Tendency:	None
Odour:	Slightly chlorite	Concentration Monitoring Techniques:	Titration
Specific Gravity @ 20°C:	1.02	Water solubility:	Complete
Viscosity:	Light	Corrosivity:	None
pH: (Temp dependent)	5.8 - 6.8	Flash Point:	none
Freezing Point:	Approx. -5°C	Boiling Point:	Approx. 100 °C

RATIO OF MIXING FOR PURIFICATION	
DEGREE OF IMPURITY	REQUIRED SaferEx : H ₂ O
Very Heavy	1.5 parts : 1000 parts
Heavy	1 part : 1000 parts
Medium	0.5 part: 1000 parts
Light (for locals)	1 capful or (5mil.) : 20 Litres

HOW TO USE IN SMALL SCALE WATER PURIFICATION

Ratios:

- 5ml or capful to 10 litres of W-and-R wastewater or
- 1 part: 1000 parts of wastewater for high contamination.
- Drop or add into empty container then pour in the wastewater where stirring may be difficult.
- Cover and ensure proper mixing by stirring or shaking
- Allow to stay still for about 30 minutes - 6 hours for full noticeable sedimentation (determined by contamination type)
- Pour off or filter (with cloth) the clear water part and dispose the bottom.
- Store recovered water for reuse/use.

PRECAUTIONS:

- Keep away from children
- Do not drink.
- Avoid contact with eyes, otherwise flush with water.
- If swallowed, drink much water.
- Use in pure state; Do not adulterate.
- Use as directed (see "How to use")

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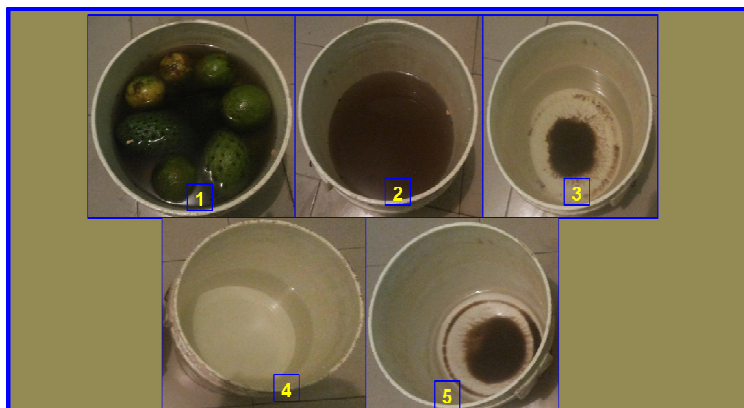
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PHOTO OF MACJAMES® SaferEx - WATER PURIFIER.



PRACTICAL DEMONSTRATIONS OF SaferEx - MULTI-ACTION WATER PURIFIER IN TREATMENT OF UNSAFE AGRO WASH-AND-RINSE WASTEWATER FOR REUSE AND CONTAMINATED BOREHOLE WATER FOR USE IN AGRO-PROCESSING.



Using SaferEx in Wash-and-Rinse wastewater treatment and safe water recovery for reuse
(In situ treatment in local household fruits washing and rinsing in Oyiigbo, Rivers State, Nigeria)

- (1). Fruits being washed locally in water in household.
- (2). Wash-and-Rinse wastewater generated from the household fruits washing.
- (3). Wash-and Rinse wastewater after mixing with 10ml SaferEx – Multi-action Water Purifier (<1hr).
- (4). Recovered safe water for reuse/use, rid of pathogens and other contaminants (>80% recovered).
- (5). Sediments of contaminants left after decanting (pouring off) of recovered safe water.



SaferEx – Multi-action Water Purifier used in treatment and recovery of safe water from muddy, heavy metal and pathogen infested raw borehole water from Okposi Town, Ohaozara L.G.A, Ebonyi State, Nigeria (In situ treatment).

1. Raw and heavily contaminated borehole water from Okposi town, Ebonyi State, Nigeria.
2. Raw water after treatment with SaferEx Multi-action Water Purifier with sediments (<1hr)
3. Purified water in a cup after SaferEx treatment and decantation (>80% of safe water recovered)

P.S:

2016: Selected among top 1000 innovations in Africa, from 54 African Countries, by TEEP 2016.

2016: Winner, Unilever Foundry ideas "Clean Water Challenge", 2016.

2016: Qualified in the "Create the Future Design Contest 2016" by COMSOL and Mouser Electronics, U.S.A.



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