



Mechanics of Washing & C.I.P. Products

“CIP” PRODUCTS

160 °F Start
120 °F End

C.I.P.

Follow label directions

Slope 2":10'

Water Quality

Water Volume

95 °F - 110 °F

Diverter
Valve

Vacuum

Slugs

EPA Registered Product

Air Injection

Secondary Drains

10 Minutes (wash cycle)

Elbow Grease

Iron Filters

Milkstone

Chemical Balance

- Combination of processes required:
 - Chemical
 - Remove the Milk Soils and keep them in suspension
 - Remove Minerals from water and milk
 - Sanitize the system prior to milking
 - Thermal
 - Maintain highest degree of chemical activity
 - Physical
 - Contact to milk contact surfaces
 - Scrubbing action in milk lines
 - Drainage

- Provide a circulated cleaning solution to all milk contact surfaces
 - Milking units and components
 - Flooded
 - Spray or deflected to milk contact surfaces
 - Discharge lines from the milk pump is flooded
 - Milk lines are cleaned by columns (slugs) circulating through the milk lines
 - Milk Receivers are cleaned through turbulence

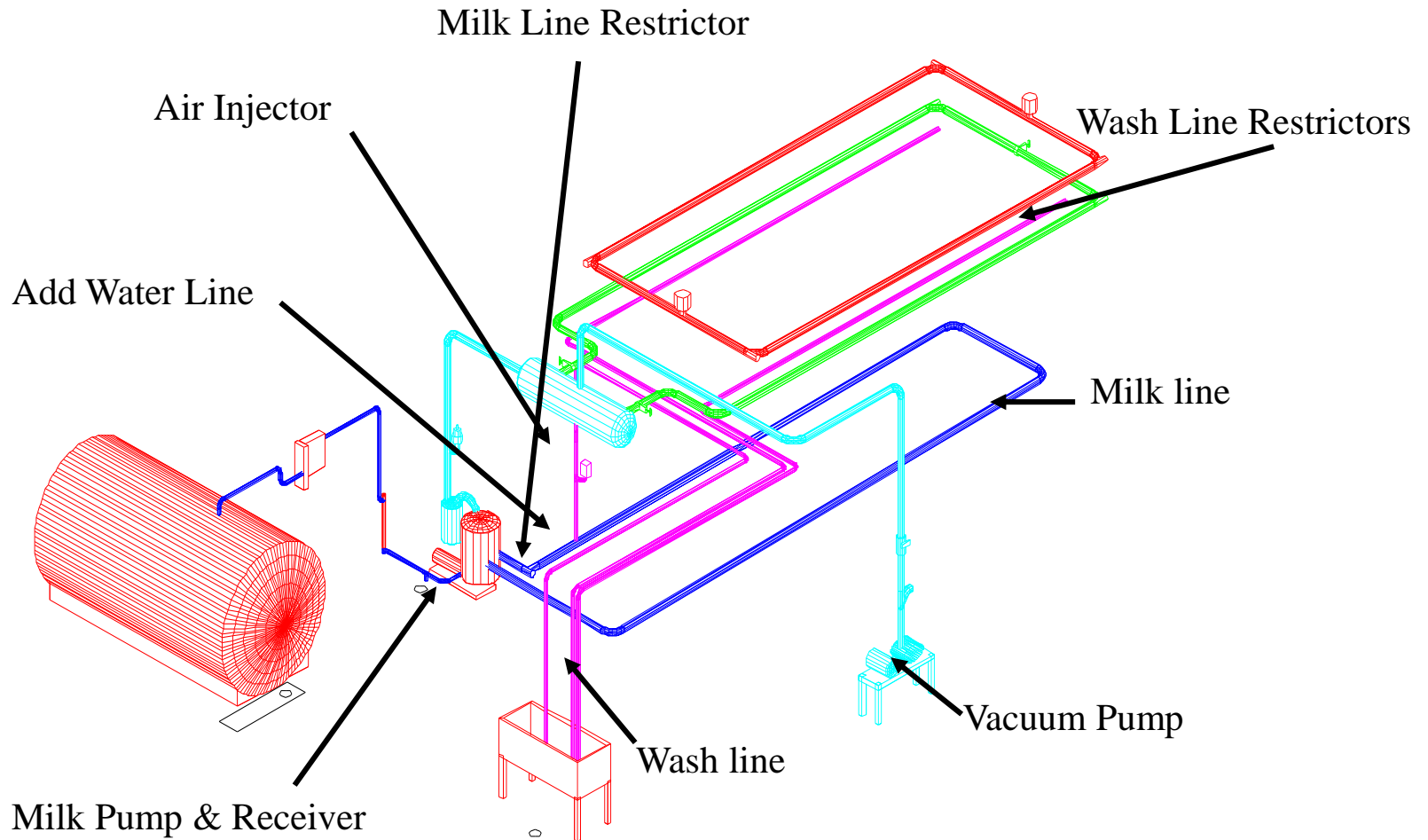
C.I.P. Basics of Cleaning

- Time
- Temperature
- Volume
- Velocity
- Drainage
- Flow Rates
- Detergent/Chemical Balance

- The *Pre-Rinse Cycle* warms up, rinses and flushes the milk line of organic load & milk residue.
- Following the rinse, the *Wash Cycle* utilizes the detergent for “**Clean In Place.**”
- A warm *Acid Rinse* will follow the detergent to reduce the high alkaline pH, to a low acid pH.
- Some “PMO’s” require the *Sanitizing* to done routinely just before milking.
- **Nitric Acid** Cleans better, leaves a polish film on stainless and costs less to use per ounce.
- **Peracetic Acid** combined with **Nitric** will move Orbeseal and heavy mineral load at a lower cost per use per wash.

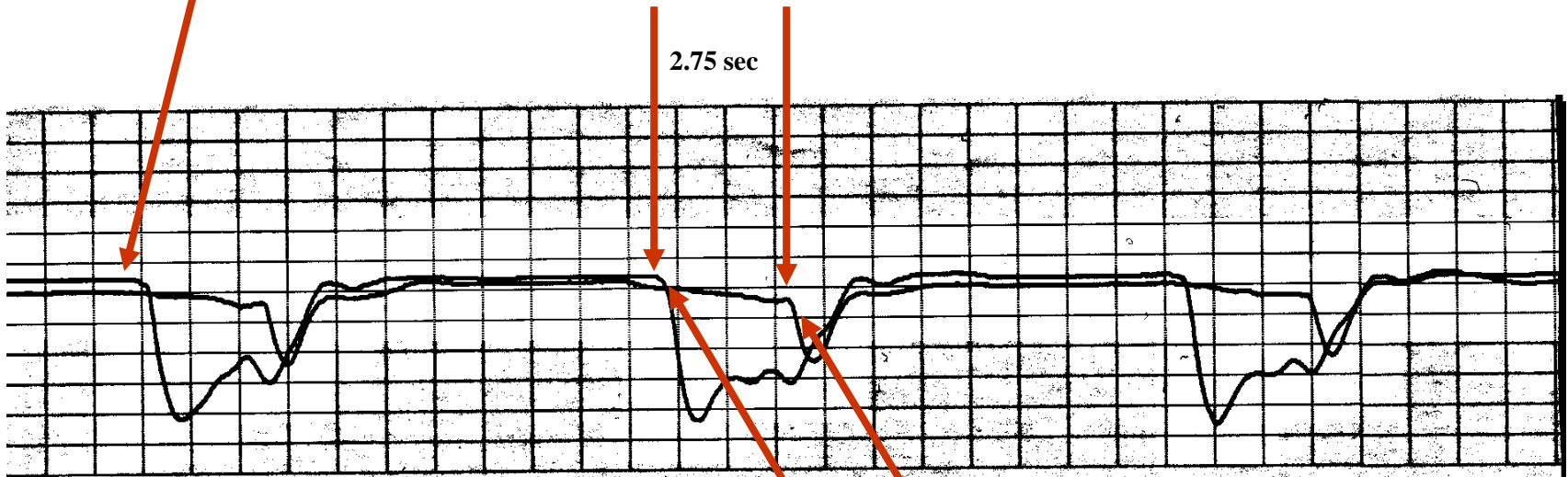
- Pre-Rinse Cycle starts at 95-110° F (**90 seconds**)
- Wash Cycle starts at 160° F (7 -10 minutes)
ends at 120° F or above
- Acid Cycle starts at 95-110° F (3 - 5 minutes)
- Sanitize Cycle (**recommended by the PMO**) starts at 95-100° F (30 minutes)

- Air Injector Timing
- Velocity of Solution
- Solution Flow Rates
- Milk Pump Capacity
- Total Solution Volume
- Ability for Drainage
- Slug Volume and Size



Vacuum Levels Equal on both channels

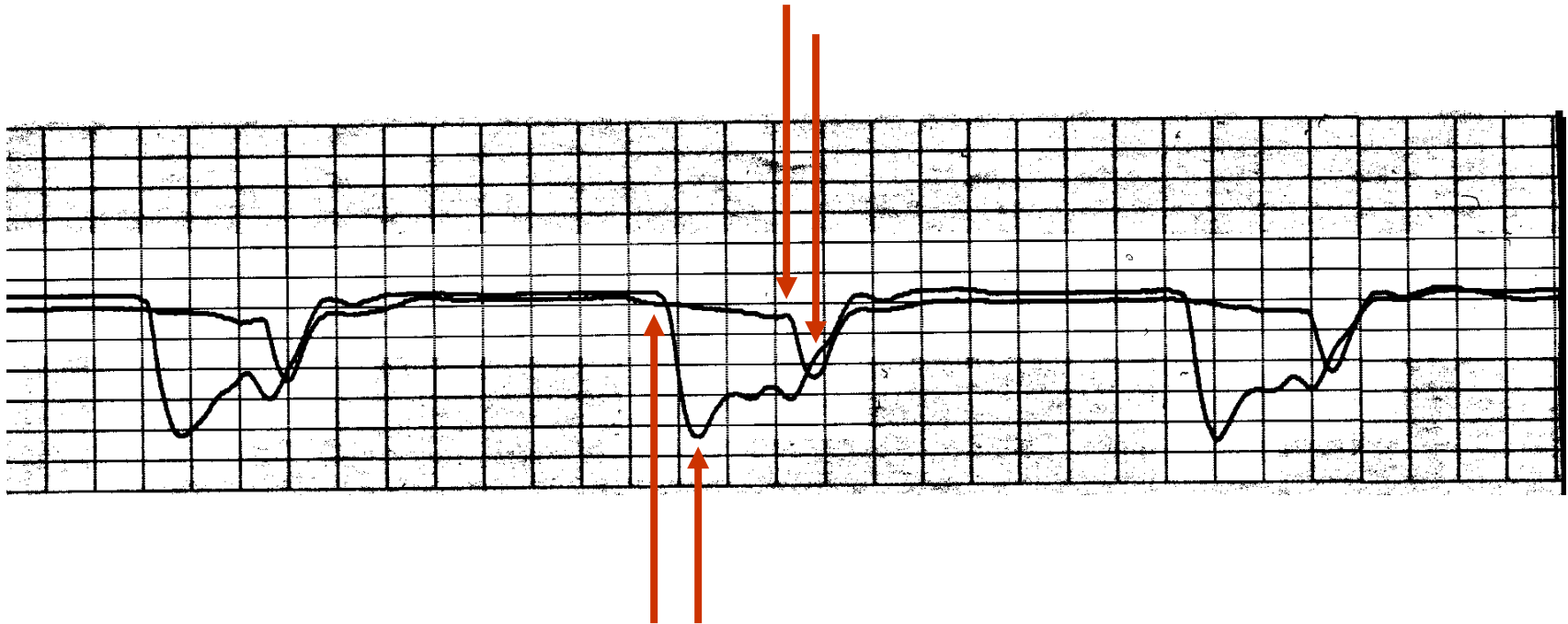
80 feet (24 Meters) divided by 2.75 seconds equals 29 feet/second (8.8 Meters)



Travel Distance divided by time equals feet/meters per second

One vertical division on graph equals one second

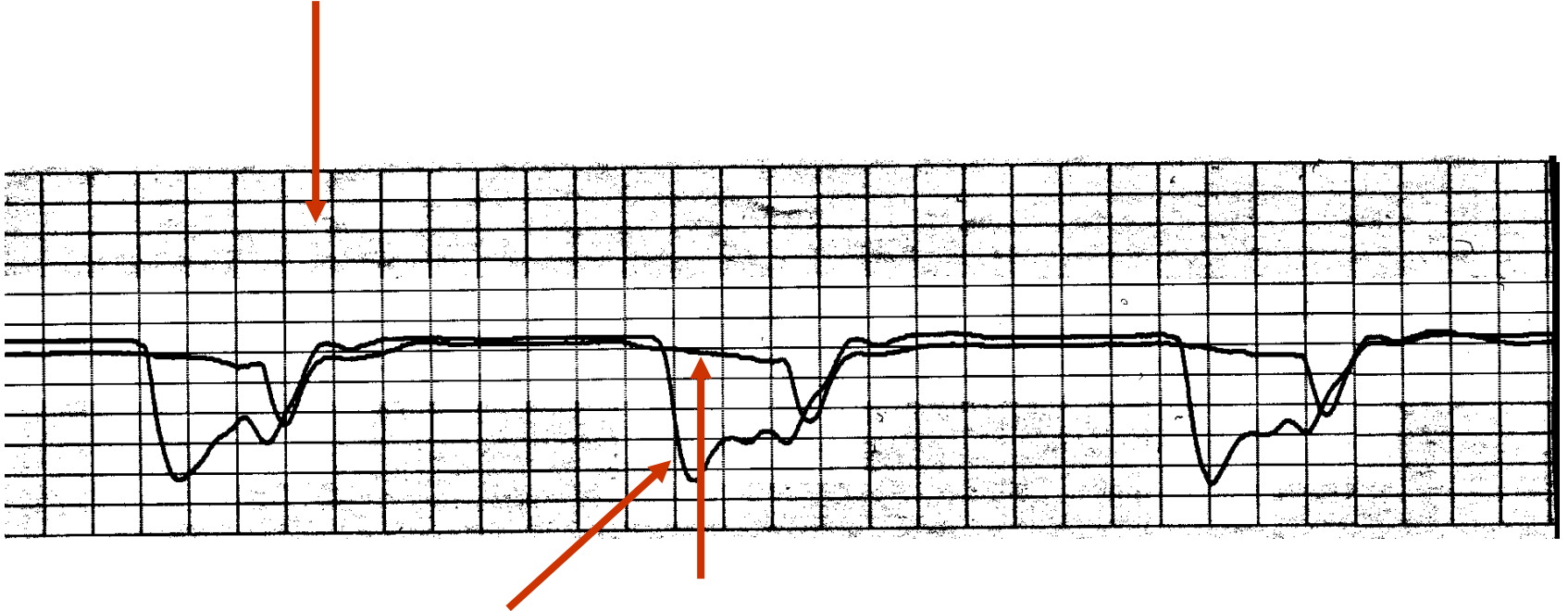
3/4 of a second equals a 24 foot (7.3 Meters) slug



3/4 of a second equals a 24 foot (7.3 Meter) slug

1st arrow shows beginning of slug second arrow shows the end of the slug

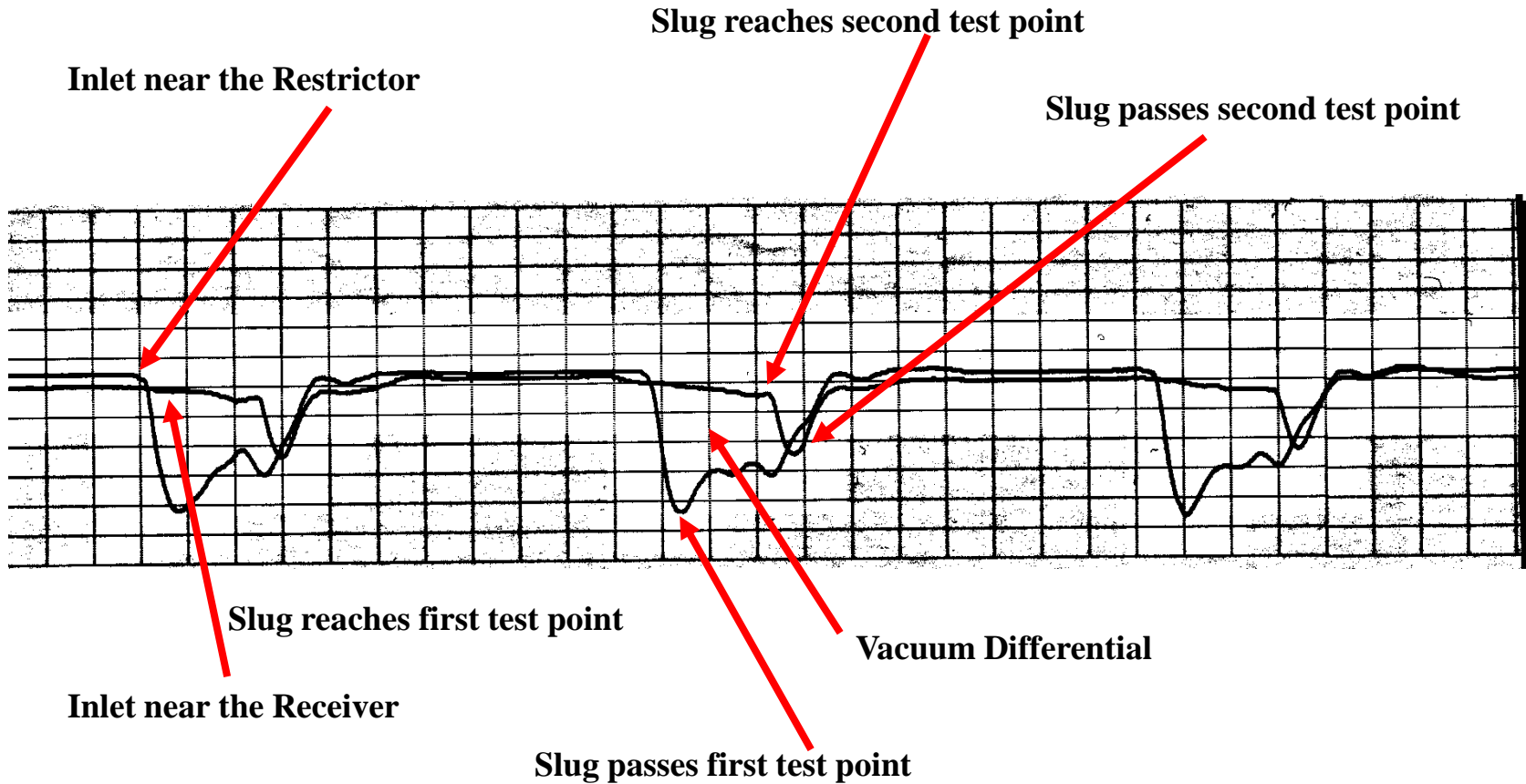
Each Horizontal line represents 2" Hg (7 kPa)



Maintain a 6" to 8" Hg (20 to 28 kPa) vacuum drop

Off time of Air Injector equals 7 seconds





All GEA C.I.P. products are:

- **Batch coded** for tracking and inventory control
- Have **safety conscious labeling**
- **Precaution statements**
- 24-hour emergency **800 number** for spills or reactions
- Detailed **usage instructions**
- **NPE – Free Chemicals for CIP and Teat Dips**
- **100% Customer Satisfaction Guaranteed on GEA Products**

All GEA C.I.P. products are:

- Manufactured by GEA
- Made of high grade raw materials
- Have stable formulations with 5-day lead
- Subjected to stringent quality control checks

The Challengers:

- Water
 - Hardness minerals
 - Iron
 - Buffers
 - Barium, Manganese, Silica, Copper, Sulfides, Sulfur, Limestone,
 - Factory Soils
- Milk
 - Fats
 - Proteins
 - Bio-Films

Detergent Formulation Components



POWDERS

Sodium Hydroxide

Potassium Hydroxide

Sodium
Organic Chlorine

STPP or Polyacrylate

Soda Ash

ALKALINITY

CHLORINE

SEQUESTRATION

FILLER

LIQUIDS

Sodium Hydroxide

Potassium Hydroxide
Sodium Metasilicate

Hypochloride

STPP or SEQUESTRATION
Polyacrylate

Water

Salt

Factors Affecting C.I.P. Detergent Recommendations

- Water quality
- Size of system
- Water temperature characteristics
- Mechanical characteristics
- Type of dispenser
- Climate/storage conditions
- Type of buyer
- Testimonial from others



95% of Dairy Farms use liquid C.I.P.

- Easy to dispense automatically
- Easier to measure
- More economical – cost/use
- No dissolving problems

5% of Dairy Farms use powdered C.I.P. products

- More stable/up to year when the lid is applied to the container
- Can be made stronger/due to caustic – soda ash content
- No splashing , be careful of powder residue on floor
- Longer shelf life – typically - 1 year (liquids: 140 days)

Phosphoric	Mild acid used in such things as soft drinks, sodas, fruit drinks
Sulfuric	Drives pH down and brightens stainless steel
Citric	Good mineral sequestrate used in higher pH water
Nitric	Excellent for hard H ₂ O Passive Film protection
Percaetic	Excellent for control of bacteria, bio-films, removal of perafin/bismuth materials, and heavy mineral loads when combined with Nitric Acid

- Neutralizes chlorine and alkaline residues
- Prolongs life of rubber goods **when used daily**
- Prevents water spotting and staining
- No milkstone build-up
- Lowers pH
- Prevents growth of bacteria

Features

EPA approved hard sanitizer

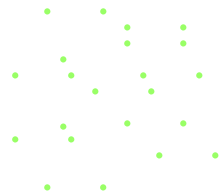
Non-foaming

Benefits

Provides 99.999% kill on a surface hard pre-cleaned surface within 30 sec.

Fast rinsing in C.I.P. systems

12.5% Sodium Hypochlorite reg. Sanitizer is equal to = 62,500 ppm in a full dose whether its tabs or liquid



Features

Contains Sodium Hydroxide
(Caustic Soda)

Economical Dilution Rate

1 oz. : 8 gals. = 140 ppm in

Benefits

Improves shelf life

Competitive on a cost/use basis

gpg of 10 grains or less

The GEA logo is rendered in a bold, black, sans-serif font. A thick, black, curved line sweeps across the middle of the letters, starting from the left side of the 'G', passing through the 'E', and ending at the top of the 'A'. The logo is centered horizontally and set against a bright, glowing white circular background that fades into the surrounding blue background.

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