Fruit & Vegetable Decontamination

The natural alternative to synthetic biocides for decontamination of fruits and vegetables
Introduction

- Farmers and fresh produce processors use every year thousands of tonnes of chemicals to treat their fruit and vegetable produce.
- Inevitably some of the chemicals remain on the food as undesirable residues.
- In addition to the chemical residues problem, the risk of contamination is increased because the produce is repeatedly handled during preparation packing and transport. It has been estimated that as many as twenty people may have handled produce before it reaches the consumer.
- Even where produce has been organically grown it can be exposed to deposits from vehicle exhaust fumes, atmospheric grime and insects.
- In many establishments preparing produce, the treatment given is no more than a water wash, and this has little effect since the substances applied during farming are designed not to be washed off by rainfall.
- Clearly a more powerful and more effective washing agent is needed to remove these harmful, and potentially toxic, residues.
Citrox range

- **Citrox** technology incorporates a truly holistic approach designed to increase the effectiveness and profitability of production processes.
- It includes “organic approved” systems using extremely safe and environmentally benign formulations.
- **Citrox** can offer systems applicable across the whole logistical operation from growing through processing and storage, to end-use. The care and protection of peripheral equipment can also be supported.
- **Citrox** extensive international field experience is available to support design of tailored trials ensuring you achieve the most cost effective package.
Figure 1: A holistic approach to the control of harmful pathogens in the food processing industry.
Mission statement

- Citrox decontamination products are designed for:
  - Increasing the **shelf-life** of fresh cut and open-structured produce
  - Improving the **quality of produce** at the retail level
  - Supplying produce to the consumer which **tastes and looks good**
  - Providing an approach which is both **safe and environmentally sustainable**
  - Utilising systems which are simple, effective and predominantly “organic”
ProGarda™ Range

- ProGarda™ products have been specifically formulated for the decontamination of fruit and vegetables.

- These products are viable alternatives to the use of chlorine for decontaminating fresh fruit and vegetables. When applied at the correct dilutions, they will give (in accordance with BS EN1276) a guaranteed pathogenic $10^5$ reduction.

- ProGarda™ Fruit & Vegetable Decontaminant (ref. 14WP) is specifically designed for the decontamination of fresh cut and open structured fruit and vegetables. It can be applied via dipping, spraying or fogging techniques. The ingredients all comply to EU Regulation 2092/91.

- ProGarda™ Skinned Fruit & Vegetable (ref 14T) is specifically designed for the decontamination of skinned fruit and vegetables and is particularly effective when applied to produce with high organic/biofilm loadings.
Pathogens tested to date

Bacteria
- Campylobacter jejuni
- Dipiodia natalensis
- Escherichia coli
- Geotrichum candidium
- Klebsiella pneumoniae
- Lactobacillus pentoaceticus
- Legionella pneumophila (NCTC 11192)
- Listeria monocytogenes
- MRSA (clinical strain)
- Mycobacterium fortutium (NCTC 8573)
- Proteus vulgaris
- Pseudomonas aeruginosa (ATCC 15442)
- Salmonella cholerasuis
- Salmonella typhimurium (DT004)
- Staphylococcus aureus (NCTC 6571)
- Staphylococcus pyogenes
- Staphylococcus sp.
- Streptococcus faecalis

Yeast and Fungi
- Aspergillus flavus
- Aspergillus niger
- Aspergillus terreus
- Botrytis cinerea
- Candida albicans
- Candida glabrata
- Chaetonium globosum
- Cladosporium
- Collectotricum sp.
- Fusarium sp.
- Geotrichum candidium
- Mucor sp
- Penicillium sp.
- Penicillium digitatum
- Penicillium funiculosum
- Penicillium italicum
- Penicillium roqueforti
- Phomopsis orbis
- Pullularia pullulans
- Pythium sp.
- Trichophyton interdigitale
- Trichophyton mentagrophytes

All of the pathogens/viruses are tested at independent laboratories. Certificates & reports available on request.
Pathogens tested to date

Viruses
- Human Rhinovirus - Retroscreen Virology
- Influenza A - Retroscreen Virology
- Human Immunodeficiency Virus (HIV) - Retroscreen Virology
- Urbani SARS - Retroscreen Virology
- African swine fever
- Avian influenza
- Foot & mouth disease
- Gumboro virus
- Herpes virus type 1 & type 2
- Herpes zoster
- Hepatitis A & B
- Newcastle disease
- Severe Acute Respiratory Syndrome (SARS)

Protozoa
- Histomonas meleagradis
- Giardia lamblia
- Entamoeba histolytica
- Blastocystis hominis

All of the pathogens/viruses are tested at independent laboratories. Certificates & reports available on request.
Benefits – ProGarda™

- Conforms to Organic Farming EU Regulation 2092/91
- Manufactured from completely renewable sources
- Effective in the presence of organic matter
- Breaks down biofilm
- Extends shelf-life and reduces pathogenic attack
- Non-toxic, hypo-allergenic, non-mutagenic, non-tainting, non-carcinogenic, non-hazardous to humans
- Conforms to BS EN 1276 (European Suspension Test) giving a guaranteed 5 log reduction
The biofilm effect

- **The problem**
  - The growth of biofilms on foods and food preparation surfaces is a potential health risk.
  - Attached micro-organisms are more resistant to conventional treatments than mobile material.
  - By way of example benzalkonium chloride destroys free *Listeria* cells in 30 seconds but attached colonies (biofilm) survive 20 minutes.

- **The solution**
  - Only Citrox products are powerful enough to remove the biofilm, kill the contained bacteria and provide residual effect to prevent further infection.
  - Build up of attached bacteria can develop substantial resistance to cleaning and sanitisation if allowed to develop over many hours.
  - Cleaning programmes MUST take the build up of biofilms into account when cleaning schedules are being determined, particularly over weekends.
Biodegradability

- **ProGarda™** Fruits & Vegetable Decontaminant products (14WP and 14T) are amongst the most readily biodegradable decontaminants commercially available.

**Test method**

![Graph showing Carbon Dioxide Emissions over 8 weeks](image)
## Toxicity data

<table>
<thead>
<tr>
<th>Tests Performed</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ProGarda™ “14WP”</strong></td>
<td><strong>ProGarda™ “14T”</strong></td>
</tr>
<tr>
<td>Acute oral toxicity</td>
<td>LD50 &gt;5,000 mg/kg on live weight</td>
</tr>
<tr>
<td>Chronic toxicity (Acute oral with</td>
<td>LD50 2,500 mg/kg (rats)</td>
</tr>
<tr>
<td>continuous feeding &amp; reproduction</td>
<td>LD50 2,250 mg/kg (rats)</td>
</tr>
<tr>
<td>study over 2 months)</td>
<td></td>
</tr>
<tr>
<td>Dermal toxicity</td>
<td>Not primary skin irritant, not corrosive</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Hep G liver and human RKO colon cells, both products non-carcinogenic</td>
</tr>
<tr>
<td>Mutagenicity tests</td>
<td>Liver and colon cells, both products non-mutagenic</td>
</tr>
<tr>
<td>Eye irritation</td>
<td>Full strength - severe irritation, slight corneal iris injury 1% and 5%</td>
</tr>
<tr>
<td></td>
<td>solutions - irritation and moderate erythema</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Closed chamber, 8 hrs/day, 5 day week, period 120 days</td>
</tr>
<tr>
<td></td>
<td>No effects at concentrations of 150 mg/m³ air</td>
</tr>
<tr>
<td>Human patch studies</td>
<td>1% and 5% solutions produced no irritation or skin sensitisation</td>
</tr>
</tbody>
</table>
Toxicity comparison

- A comparison has been made to demonstrate the difference between ProGarda™ natural active compounds and synthetic quaternaries.

<table>
<thead>
<tr>
<th>LC50 measurement</th>
<th>ProGarda™</th>
<th>Benzalkonium chloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>in Hep. G liver cells</td>
<td>0.0025%</td>
<td>0.0006%</td>
</tr>
<tr>
<td>in RKO human colon cells</td>
<td>0.002%</td>
<td>0.0004%</td>
</tr>
</tbody>
</table>

- Based on the above tests Benzalkonium Chloride, tested at equivalent cationic concentrations (25% w/w), is up to five times more toxic per concentration level, for the cells tested than ProGarda™.
# Benefits – ProGarda™ vs Chlorine

<table>
<thead>
<tr>
<th>COMMON DISINFECTANT PROPERTIES</th>
<th>CHLORINE GAS</th>
<th>SODIUM OR CALCIUM HYPOCHLORITE</th>
<th>CHLORINE DIOXIDE</th>
<th>ProGarda™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinfection Action</td>
<td>High</td>
<td>High</td>
<td>High, better than chlorine</td>
<td>High, as good as chlorine dioxide</td>
</tr>
<tr>
<td>Specificity</td>
<td>Generally effective, including viruses; reference sanitizer. Limited practical effect on parasitic spores (i.e. Cryptosporidium). Oxidizer and metabolic poison.</td>
<td>Generally effective, including viruses; reference sanitizer. Limited practical effect on parasitic spores (i.e. Cryptosporidium). Oxidizer and metabolic poison.</td>
<td>Generally effective. Recognized for biofilm penetration. Oxidizer.</td>
<td>Highly effective against viruses, gram+ and gram- bacteria, yeasts, moulds, fungi and sporicidal activity</td>
</tr>
<tr>
<td>Speed</td>
<td>fastest</td>
<td>fastest</td>
<td>fast-acting</td>
<td>fast-acting</td>
</tr>
<tr>
<td>Form</td>
<td>Compressed gas. On-site injection.</td>
<td>Concentrated hypochlorite solution or powder</td>
<td>On-site generation from precursors, or sodium chlorate and hypochlorite solutions. Some stabilized forms released on acidification.</td>
<td>Non-Toxic, Non-Corrosive, Non-Mutagenic, Non-Carcinogenic, Non-Tainting, Hypoallergenic liquid concentrate</td>
</tr>
<tr>
<td>Stability</td>
<td>Good</td>
<td>Good as powder, fair as liquid</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Preparation</td>
<td>Easy</td>
<td>Easy</td>
<td>Complex equipment or procedure</td>
<td>Easy-User Friendly</td>
</tr>
</tbody>
</table>

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## Benefits – ProGarda™ vs Chlorine

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<th>CHLORINE DIOXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Good</td>
<td>Good</td>
<td>Moderate</td>
</tr>
<tr>
<td>Irritancy</td>
<td>Low</td>
<td>Low</td>
<td>Very irritating vapors</td>
</tr>
<tr>
<td>Vapors</td>
<td>None at correct pH</td>
<td>None at correct pH</td>
<td>Typical odor, yellow-green, dangerous</td>
</tr>
<tr>
<td>pH impact</td>
<td>Most active at pH of 6-7.5</td>
<td>Most active at pH of 6-7.5</td>
<td>Most active at pH, best at 8.5</td>
</tr>
<tr>
<td>Temperature</td>
<td>For produce, generally cold water, but heated water up to 52°C in use</td>
<td>For produce, generally cold water, but heated water up to 52°C in use</td>
<td>Use at low temp to minimize vaporization. Some use of gaseous forms on produce.</td>
</tr>
<tr>
<td>Conc.</td>
<td>25 to 200ppm</td>
<td>25 to 200ppm, 20,000ppm limited approval for sprout seed disinfection</td>
<td>3 to 5ppm</td>
</tr>
<tr>
<td>Penetration</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Hard Water</td>
<td>Activity decreases in very hard water(&gt;500 ppm)</td>
<td>Activity decreases in very hard water(&gt;500 ppm)</td>
<td>No effect</td>
</tr>
<tr>
<td>Organic Matter</td>
<td>Reacts to from chloramines</td>
<td>Reacts to from chloramines</td>
<td>Little influence, even at high organic load</td>
</tr>
</tbody>
</table>

**ProGarda™**

- Easy-User Friendly
- Excellent
- N/A Non-Irritant
- N/A Non-Volatile
- Most active at pH of 3-4 (weakly dissociated)
- Effective at all temperatures up to 100°C
- 2% w/w
- Excellent
- No effect
- Effective in the presence of organic matter
## Benefits – ProGarda™ vs Chlorine

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<thead>
<tr>
<th>COMMON DISINFECTANT PROPERTIES</th>
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<th>SODIUM OR CALCIUM HYPOCHLORITE</th>
<th>CHLORINE DIOXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Corrosiveness</td>
<td>Slight to moderate</td>
<td>Slight to moderate</td>
<td>Very Corrosive at low pH</td>
</tr>
<tr>
<td>Corrosive off-gassing</td>
<td>Possible, through condensation</td>
<td>Possible, through condensation</td>
<td>Slight corrosion</td>
</tr>
<tr>
<td>Other</td>
<td>Very corrosive below pH 6</td>
<td>Very corrosive below pH 6</td>
<td>Vapor space corrosion with high temp.</td>
</tr>
<tr>
<td>Best use</td>
<td>Food contact surfaces, water disinfection, smooth produce surfaces</td>
<td>Food contact surfaces, water disinfection, smooth produce surfaces</td>
<td>High organic load situations, smooth or complex produce surfaces, flume water disinfection</td>
</tr>
<tr>
<td>Disadvantages:</td>
<td>Requires tight pH and concentration control; highly corrosive, when improperly used; produces corrosive gas above 46°C.</td>
<td>Requires tight pH and concentration control; highly corrosive, when improperly used; produces corrosive gas above 46°C.</td>
<td>Complex preparation; corrosive in acid solution; very difficult to handle unless preparation is automated</td>
</tr>
</tbody>
</table>

**ProGarda™**

- N/A Non-Corrosive
- N/A Non-Volatile
- Non-Tainting, Non-Mutagenic, Non-Carcinogenic, Hypoallergenic
- Fresh produce decontamination, Food contact surfaces (anywhere where rinsing is not required).
- None.
Decontamination process

- Fresh produce enters the primary wash tank.
- Produce enters the secondary wash tank.
- The produce is discharged into trays for packaging.

Key components:
- ProGarda Solution Tank
- Citrox Top-Up Solution
- Aeration System
- Conductivity Probe

Primary wash tank: typically 7000 litres
Secondary wash tank: typically 1000 litres
Flow through the wash tanks is facilitated by pumps and re-circulation systems.
Decontamination process

- Soft fruit de-hulled
- Soft fruit feeds to conveyor belt
- Spinning disc atomiser
- 10% solution of Citrox feeds atomiser
- Hood
- Condensate collection tray (re-circulation optional)

10% Solution ProGarda 14WP
Microbiological activity

Tests have been carried out all over the world on ProGarda™ products, and have universally reported on their favourable characteristics for a wide range of uses.

However it is essential, for customers' reassurance and confidence, that tests should be carried out under the most rigorous, industry standard, conditions.

For this reason we have had ProGarda™ produce decontaminants tested under the Standard European Suspension Test system. Many commercial products, which were acceptable under earlier and less rigorous tests, have failed under this new, more severe, test schedule i.e. they can only achieve a $10^2$ reduction.

The European Suspension Test BS EN 1276: 1997

This test requires that the product be effective at pathogen loading levels of up to $10^7$, and to give 5-log reductions from this high level of initial contamination. Also, where the pathogen loading is not as initially severe (less than $10^7$), and hence a 5-log reduction requirement is not realistic, the test looks for a reduction to a very low final pathogen level of less than $10^2$.

The tests were all carried out by completely independent laboratories.

Tests for minimum inhibitory concentrations

These tests were conducted on a range of micro-organisms (bacteria & fungi) and established minimum inhibitory concentrations for the basic ProGarda™ actives.

Other certifications

In addition to the above successful tests, ProGarda™ 14WP complies with the requirements of European Regulation 2092/91 and EC Directive 89/107/EEC.
Microbiological activity

ProGarda™ 14WP

- ProGarda™ 14WP is a highly effective, completely non-toxic, wash for fruits & vegetables.
- ProGarda™ range includes product for decontamination of poultry, fish and meat.
- The product has been used successfully by dipping, spraying and fogging techniques. Where large quantities of soft tissue produce (i.e. strawberries) have to be treated the use of a fogging technique has been found to give maximum utilisation efficiency (by factors of 3 to 5).

<table>
<thead>
<tr>
<th>Organism</th>
<th>% Kill under conditions described</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>&gt;99.99%</td>
<td>The product undergoes an efficacy screen based on the European suspension test. After five minutes contact time in dirty conditions at 25°C the kill rates are determined from the test dilution.</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
<tr>
<td>S. aureus</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
<tr>
<td>Candida albicans</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
<tr>
<td>Aspergillus niger</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
<tr>
<td>Salmonella typhi murium</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>&gt;99.99%</td>
<td></td>
</tr>
</tbody>
</table>
Microbiological activity
ProGarda™ 14T

- ProGarda™ 14T is a highly effective, completely non-toxic, wash for skinned fruits and vegetables.
- The product has been used successfully by dipping, spraying and fogging techniques.

<table>
<thead>
<tr>
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<th>% Kill under conditions described</th>
<th>Test Procedure</th>
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<tbody>
<tr>
<td>E. coli</td>
<td>&gt;99.999%</td>
<td>The product undergoes an efficacy screen based on the European suspension test. After five minutes contact time in dirty conditions at 25°C the kill rates are determined from the test dilution.</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
<tr>
<td>S. aureus</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
<tr>
<td>Candida albicans</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
<tr>
<td>Aspergillus niger</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
<tr>
<td>Salmonella typhi murium</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>&gt;99.999%</td>
<td></td>
</tr>
</tbody>
</table>
Sensory advantage

(Trialled Against Other Commercially Available Products)
Visual quality scores over a 5-day trial

Key benefits
1. No change
2. Slight edge or vein effects
3. Marked surface effects
4. Gross discolouration

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1% ProGarda™ 14WP</td>
<td>1</td>
</tr>
<tr>
<td>1% ProGarda™ 14T</td>
<td>1</td>
</tr>
<tr>
<td>Competitive product 1</td>
<td>1</td>
</tr>
<tr>
<td>Competitive product 2</td>
<td>1</td>
</tr>
</tbody>
</table>
### Estimation of residues

**ProGarda™ 14W Plus** has a total concentration value of 222g / 1000g (222mg/ml)

<table>
<thead>
<tr>
<th>14W Plus is used as a 0.5% wt/wt solution in water</th>
<th>Processing concentration: 222 x 0.5 = 1.11mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assume the produce is lettuce</td>
<td></td>
</tr>
<tr>
<td>→ a 2% wt/wt processing water is retained on leaves</td>
<td></td>
</tr>
<tr>
<td>(value supplied by the two largest salad wash</td>
<td></td>
</tr>
<tr>
<td>companies in the UK – Bakkavör and Natures Way)</td>
<td></td>
</tr>
<tr>
<td>Residual value (based on flavonoid content) = 22.2 x 0.054 = 1.2 ppm</td>
<td></td>
</tr>
</tbody>
</table>

1g of iceberg lettuce contains 34 ppm of flavonoids

...so there are 28 times more flavonoids inside the lettuce itself than there are Citrox residues on the surface.
Applications
Fruits & Vegetables Decontamination

- Leaf salads
  - Lettuce, Leafy/flowery vegetables, Broccoli, Cauliflower, etc
- Vegetable fruits
  - Immature: cucumbers, peppers etc.
  - Mature: melons, tomatoes etc.
- Underground vegetables
  - Root vegetables: carrots etc.
  - Bulbs: onions etc.
  - Tubers: potatoes etc.
- Stone fruits
  - Apricots, plums etc.
- Vine fruits
  - Grapes etc
- Berries
  - Strawberries, blueberries, raspberries etc.
- Citrus fruits
  - Lemons, grapefruits, oranges etc.
- Tropical/exotic fruits
  - Pineapples, papayas etc.
# Key products: Pre- and Post-harvest

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProAlexin™ Phyto-Elicitor – Liquid</td>
<td>Phyto-Elicitor – All crops (fruits, vegetables, cereals,..). Complies with EC 2092/91 organic farming regulation.</td>
<td>Recommended dilution: approx. 0.075%.</td>
</tr>
<tr>
<td>ProGarda™ Fruit &amp; Vegetable Decontaminant</td>
<td>Decontaminant for soft fruits and open structured vegetables. Complies with EC 2092/91 organic regulation.</td>
<td>To be used in dip bath or as a spray at recommended dilution of approx. 0.5%.</td>
</tr>
<tr>
<td>ProGarda™ Skinned Fruit &amp; Vegetable Decontaminant</td>
<td>Decontaminant for skinned and non-porous fruits. Particularly recommended where organic residues and biofilm are a problem.</td>
<td>To be used in dip bath at recommended dilution of approx. 1% to 2%.</td>
</tr>
</tbody>
</table>
## Key products: Cleaning & Sanitising

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProSino™ Foaming Cleaner</td>
<td>Heavy-duty non-toxic, non-corrosive foaming cleaner &amp; sanitiser with excellent oil/soil detergency properties.</td>
<td>To be used at approx. 2%-5% dilution (depending on degree of soiling) for the cleaning of installations and equipment.</td>
</tr>
<tr>
<td>ProSino™ Non-foaming Cleaner</td>
<td>Heavy-duty non-toxic, non-corrosive, non-foaming cleaner &amp; sanitiser.</td>
<td>To be used at approx. 2%-5% (depending on degree of soiling) in C.I.P. systems and agitator machines.</td>
</tr>
</tbody>
</table>
| ProSino™ All-purpose Sanitiser | All-purpose non-toxic, non-allergenic, natural surface (facilities, floors, equipment, utensils,..) terminal rinse sanitiser. Conforms to EU Regulation 2092/91 | - To be used at approx. 0.5% dilution to sanitise installations, equipment and utensils in the farm (including foot dips).  
- 2% dilution rate for fogging of sheds/rooms. |
## Key products: Personal Care

<table>
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<tr>
<th>PRODUCT</th>
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<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ProCaro™ Industrial Hand Soap</strong></td>
<td>Naturally derived skin friendly <em>hand soap</em>.</td>
<td>Use neat via dispensing equipment; rub in and rinse with fresh water for hand cleaning.</td>
</tr>
<tr>
<td><strong>ProCaro™ Hand Scrub Soap</strong></td>
<td><strong>Natural scrubbing hand cleaner.</strong> Contains pumice. Cleans and sanitises the dirtiest hands and will exfoliate the skin.</td>
<td>Use neat via dispensing equipment; rub in and rinse with fresh water for hand cleaning.</td>
</tr>
<tr>
<td><strong>ProPharma™ Hand Sanitiser - Foam</strong></td>
<td><strong>Hand sanitising foam.</strong> Long lasting residual effect. Non-toxic and hypoallergenic. No alcohol.</td>
<td>Use neat via dispensing equipment. Install in wash rooms, lobbies,... Do <strong>NOT</strong> rinse off.</td>
</tr>
<tr>
<td><strong>ProPharma™ Hand Sanitiser - Gel</strong></td>
<td><strong>Hand sanitising gel.</strong> Long lasting residual effect. Non-toxic and hypoallergenic. No alcohol.</td>
<td>Use neat via dispensing equipment. Install in wash rooms, lobbies,... Do <strong>NOT</strong> rinse off.</td>
</tr>
</tbody>
</table>
“Nothing in the world is as powerful as an idea who’s time has come.”

Victor Hugo