**FilteRx™ 5120** is a concentrated (2x) coagulant that was developed to improve the efficiency of direct filtration processes to increase the removal colloidal solids. Direct filtration processes include multi-media filter systems and micro-filters.

**Benefits**
- Concentrated (2x) solution to reduce freight and inventory costs
- Compatible with SpectraGuard™ 250 antiscalant and other phosphonate-based antiscalants
- Compatible with, and will not foul, polyamide membranes
- Minimizes backwash waste as compared to metal salts

**Uses**
- Proven to increase efficiency of colloidal removal
- Typical dose range 1.0 to 5.0 mg/l

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Straw colored liquid</td>
</tr>
<tr>
<td>pH</td>
<td>5.5 – 6.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.05 – 1.07</td>
</tr>
</tbody>
</table>

**Packaging**
- Pail: 5 gallon/18.9 liter
- Drum: 55 gallon/208 liter
- Tote: 275 gallon/1,040 liter
- Bulk: available upon request

*For special packaging options, please contact PWT or your local distributor.*
**Company Overview**

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.

**General Mixing & Application Instructions for FilteRx™ 5120**

1. Overdosing of coagulants may cause reduction in filtration efficiency.
2. Contact Professional Water Technologies™ for application and dosing recommendations.

**NOTE:** Use of incompatible antiscalants may cause a gelatinous foulant on the membrane. Please contact Professional Water Technologies™ on the proper chemical program across the entire membrane system.
FilteRx™ 6100 was developed to improve the efficiency of direct filtration processes to increase the removal colloidal solids and to remove dissolved organics. Direct filtration processes include clarifiers, multi-media filter systems and micro-filters.

Benefits

• Balanced blend of ferric sulfate and medium molecular weight organic polymer
• Effective when polymer-only formulations are ineffective
• Compatible with SpectraGuard™ 250 antiscalant and other phosphonate-based antiscalants
• Compatible with, and will not foul, polyamide membranes
• Effective over a wide pH range

Uses

• Proven to increase efficiency of colloidal removal in direct filtration systems
• To reduce turbidity, color, and colloidal constituents from a variety of process streams
• Typical dose range 2.0 to 20.0 mg/l

Specifications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Amber to dark brown liquid</td>
</tr>
<tr>
<td>pH</td>
<td>1.0 – 2.0</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.30 – 1.40</td>
</tr>
</tbody>
</table>

Packaging

Pail: 5 gallon/18.9 liter  
Drum: 55 gallon/208 liter  
Tote: 275 gallon/1,040 liter  
Bulk: available upon request

For special packaging options, please contact PWT or your local distributor.
General Mixing & Application Instructions for FilteRx™ 6100

1. Overdosing of coagulants may cause reduction in filtration efficiency.
2. Contact Professional Water Technologies™ for application and dosing recommendations.

**Note:** Inorganic coagulants such as FilteRx™ 6100 are dependent on pH and alkalinity and their addition alters that chemistry. Please refer to the following table for further application guidelines for FilteRx™ 6100.

**Illustration of addition of 1 mg/l ferric sulfate.**

<table>
<thead>
<tr>
<th>Formula</th>
<th>Mg/l alkalinity reduction</th>
<th>Mg/l SO(_4) increase</th>
<th>Mg/l Na(_2)SO(_4) increase</th>
<th>Mg/l CO(_2) increase</th>
<th>Mg/l total solids increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferric Sulfate</td>
<td>Fe(_2)(SO(_4))(_3)</td>
<td>0.76</td>
<td>0.76</td>
<td>1.07</td>
<td>0.64</td>
</tr>
</tbody>
</table>

**NOTE:** Use of incompatible antiscalants may cause a gelatinous foulant on the membrane. Please contact Professional Water Technologies™ on the proper chemical program across the entire membrane system.

Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.
Lavasol™ 1 is a low pH, low foaming liquid formulation that combines chelants and solubilizing agents designed specifically to remove metal hydroxides, calcium carbonate, and other similar scales. Used in a program that includes an alkaline cleaner for organics and particulate removal, this highly efficient product provides excellent foulant removal resulting in longer system run times and increased membrane life expectancy.

**Benefits**

- Concentrated cleaner for most efficient shipping and handling
- Phosphate-free formula to reduce negative impact on the environment
- Buffered pH to maintain optimum cleaning performance throughout cleaning cycle
- Best results when used in a program that includes either Lavasol™ 2 or OptiClean™ B

**Uses**

- For use on reverse osmosis (RO), nanofiltration (NF), ultrafiltration (UF) and micro-filtration (MF) membranes
- Formulated to dissolve inorganic precipitants from the membrane surface
- To chelate and remove oxides of iron and aluminum from the membrane surface

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>pH (2% solution)</td>
<td>2.0 – 2.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.08 – 1.10</td>
</tr>
</tbody>
</table>

**Packaging**

- Pail: 5 gallon/18.9 liter
- Drum: 55 gallon/208 liter
- Tote: 275 gallon/1,040 liter

For special packaging options, please contact PWT or your local distributor.
**General Mixing & Application Instructions for Lavasol™ 1**

1. Inspect all cleaning system components to include CIP tank, hoses, and cartridge filters. Flush or replace if necessary. Fill cleaning tank with RO permeate or DI water. Turn on agitator or tank recirculation pump.

2. Slowly add Lavasol™ to cleaning tank (1 gal [3.8 L] of Lavasol™ for every 50 gal [189 L] of water). Mix thoroughly. The solution pH should match product specification. If necessary, adjust pH with a membrane-approved chemical such as caustic, citric, sulfuric or hydrochloric acid. The solution should be heated up to 45°C to improve cleaning efficacy.

3. Circulate solution in the same direction as the feed flow. Typical circulation times are 30–90 minutes.* PWT recommends cleaning each stage of the system separately. Maximum flow rate per pressure vessel is 40 gpm (152 Lpm) for 8-inch elements and 10 gpm (38 Lpm) for 4-inch elements. Maximum pressure for cleaning is 60 psig (4.2 kg/cm²).

4. In cases of heavy fouling, divert the first 10-20% of cleaning solution to drain to prevent re-deposition of removed solids.

5. Rinse with RO permeate before returning system to service. When returning unit to service, divert product water to drain until any residual cleaning solution has been rinsed from system.

*Depending on the nature of the fouling, a soak period may be necessary for optimum results. Please contact PWT or your local distributor for custom cleaning procedure, or consult PWT’s Technical Bulletin 503 for further cleaning recommendations.

**Company Overview**

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.
Lavasol™ 2 is a high pH liquid formulation that combines solubilizing and dispersing agents, designed specifically to remove bacterial by-products, hydrocarbons, silt, and similar particulate foulants. Used in a program that includes an acidic cleaner for inorganic scale and metal hydroxides, this highly efficient product provides excellent foulant removal resulting in longer system run times and increased membrane life expectancy.

Benefits

- Concentrated cleaner for most efficient shipping and handling
- Phosphate-free formula to reduce negative impact on the environment
- Buffered pH to maintain optimum cleaning performance throughout cleaning cycle
- Optimal results when used in conjunction with either Lavasol™ 1 or OptiClean™ A

Uses

- For use on reverse osmosis (RO), nanofiltration (NF), ultrafiltration (UF) and micro-filtration (MF) membranes
- Formulated to dissolve organic foulants from the membrane surface
- Effective in removing biological slime and bacterial byproduct
- Includes an organic chelant to remove oxides of iron and aluminum
- Extremely effective in removing oils and other organic compounds

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>pH (2% solution)</td>
<td>10.5 – 11.0</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.08 – 1.10</td>
</tr>
</tbody>
</table>

Packaging

- Pail: 5 gallon/18.9 liter
- Drum: 55 gallon/208 liter
- Tote: 275 gallon/1,040 liter

For special packaging options, please contact PWT or your local distributor.
General Mixing & Application Instructions for Lavasol™ 2

1. Inspect all cleaning system components to include CIP tank, hoses, and cartridge filters. Flush or replace if necessary. Fill cleaning tank with RO permeate or DI water. Turn on agitator or tank recirculation pump.

2. Slowly add Lavasol™ to cleaning tank (1 gal [3.8 L] of Lavasol™ for every 50 gal [189 L] of water). Mix thoroughly. The solution pH should match product specification. If necessary, adjust pH with a membrane-approved chemical such as caustic, citric, sulfuric or hydrochloric acid. The solution should be heated up to 45°C to improve cleaning efficacy.

3. Circulate solution in the same direction as the feed flow. Typical circulation times are 30–90 minutes.* PWT recommends cleaning each stage of the system separately. Maximum flow rate per pressure vessel is 40 gpm (152 Lpm) for 8-inch elements and 10 gpm (38 Lpm) for 4-inch elements. Maximum pressure for cleaning is 60 psig (4.2 kg/cm²).

4. In cases of heavy fouling, divert the first 10-20% of cleaning solution to drain to prevent re–deposition of removed solids.

5. Rinse with RO permeate before returning system to service. When returning unit to service, divert product water to drain until any residual cleaning solution has been rinsed from system.

*Depending on the nature of the fouling, a soak period may be necessary for optimum results. Please contact PWT or your local distributor for custom cleaning procedure, or consult PWT’s Technical Bulletin 503 for further cleaning recommendations.

Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.
Lavasol™ 5 is a low pH cleaner specially formulated to remove silica scale, silt, and inorganic foulants from polyamide thin-film composite, cellulose acetate and ultrafiltration membranes. Used in a program that includes an alkaline cleaner for organics and particulate removal, this highly efficient product provides excellent foulant removal resulting in longer system run times and increased membrane life expectancy.

Benefits

• Extremely effective silica specific cleaner
• Phosphate-free formula to reduce negative impact on the environment
• Can be mixed with other low-pH OptiClean™ products such as Lavasol™ 1 for a multifunction cleaning
• Buffered pH to maintain optimum cleaning performance throughout cleaning cycle
• Proven to efficiently remove silica scale

Uses

• For use on reverse osmosis (RO), nanofiltration (NF), ultrafiltration (UF) and microfiltration (MF) membranes
• For effective removal of silica fouling from polyamide membrane elements
• When simple alkaline cleaning will not maintain a clean membrane surface Lavasol™ 5 should be applied
• Will also dissolve inorganic scales as OptiClean™ S is an acidic formulation

Specifications

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Clear liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH (2% solution)</td>
<td>3.5 – 4.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.08 – 1.10</td>
</tr>
</tbody>
</table>

Packaging

Pail: 5 gallon/18.2 liter
Drum: 55 gallon/208 liter
Tote: 275 gallon/1,040 liter

For special packaging options, please contact PWT or your local distributor.
General Mixing & Application Instructions for Lavasol™ 5

1. Inspect all cleaning system components to include CIP tank, hoses, and cartridge filters. Flush or replace if necessary. Fill cleaning tank with RO permeate or DI water. Turn on agitator or tank recirculation pump.

2. Slowly add Lavasol™ to cleaning tank (1 gal [3.8 L] of Lavasol™ for every 50 gal [189 L] of water). Mix thoroughly. The solution pH should match product specification. If necessary, adjust pH with a membrane-approved chemical such as caustic, citric, sulfuric or hydrochloric acid. The solution should be heated up to 45°C to improve cleaning efficacy.

3. Circulate solution in the same direction as the feed flow. Typical circulation times are 30–90 minutes.* PWT recommends cleaning each stage of the system separately. Maximum flow rate per pressure vessel is 40 gpm (152 Lpm) for 8-inch elements and 10 gpm (38 Lpm) for 4-inch elements. Maximum pressure for cleaning is 60 psig (4.2 kg/cm²).

4. In cases of heavy fouling, divert the first 10-20% of cleaning solution to drain to prevent re-deposition of removed solids.

5. Rinse with RO permeate before returning system to service. When returning unit to service, divert product water to drain until any residual cleaning solution has been rinsed from system.

*Depending on the nature of the fouling, a soak period may be necessary for optimum results. Please contact PWT or your local distributor for custom cleaning procedure, or consult PWT’s Technical Bulletin 503 for further cleaning recommendations.

Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.
BioGuard ACS™ bio-dispersant is a high performance chemical pretreatment that reduces biological cell adhesion to the membrane surface. BioGuard ACS™ reduces cleaning requirements which results in longer system run times and increased membrane life expectancy.

Benefits
- Phosphate-free formula reduces negative impact on the environment
- Stable molecular structure maintains integrity in high pH, high temperature and high salinity applications
- Carries the following drinking water approvals: NSF, Kosher, DWI, and Halal
- Reduces fouling from bacterial byproducts and cell fragments

Uses
- For use on reverse osmosis (RO) and nano-filtration (NF) membranes
- Can be blended with other pretreatment formulations from Professional Water Technologies™ to reduce chemical dosing equipment

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>pH</td>
<td>2.0 – 2.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.03 – 1.05</td>
</tr>
</tbody>
</table>

Packaging

<table>
<thead>
<tr>
<th>Container</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pail</td>
<td>5 gallon/18.9 liter</td>
</tr>
<tr>
<td>Drum</td>
<td>55 gallon/208 liter</td>
</tr>
<tr>
<td>Tote</td>
<td>275 gallon/1,040 liter</td>
</tr>
<tr>
<td>Bulk</td>
<td>available upon request</td>
</tr>
</tbody>
</table>

For special packaging options, please contact PWT or your local distributor.

© 2011 Professional Water Technologies™
Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.

General Mixing & Application Instructions for BioGuard ACS™

1. Typical dose rates are 2.0 to 6.0 mg/l.
2. Call Professional Water Technologies™ or your local distributor for custom chemical dosing recommendation.
SpectraGuard™ antiscalant/dispersant is a high performance chemical pretreatment that controls inorganic salts, metal hydroxides, and colloids in RO feedwater. Its unique performance characteristics provide users with more complete control of system feed water chemistry, reducing membrane fouling and minimizing cleaning requirements. SpectraGuard™ is compatible with all membrane types and system components.

**Benefits**
- Phosphate-free formula reduces negative impact on the environment
- Stable molecular structure maintains integrity in high pH, high temperature and high salinity applications
- Carries the following drinking water approvals: NSF, Kosher, DWI, and Halal

**Uses**
- Control of calcium carbonate, calcium sulfate, barium sulfate, calcium fluoride, silica, and hydroxides of iron and aluminum
- Can be blended with other pretreatment formulations from Professional Water Technologies to reduce chemical dosing equipment

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>pH</td>
<td>2.0 – 2.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.03 – 1.05</td>
</tr>
</tbody>
</table>

**Packaging**

- Pail: 5 gallon/18.9 liter
- Drum: 55 gallon/208 liter
- Tote: 275 gallon/1,040 liter
- Bulk: available upon request

For special packaging options, please contact PWT or your local distributor.
Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.

General Mixing & Application Instructions for SpectraGuard™

1. Typical dose rates are 2.0 to 6.0 mg/l
2. Contact Professional Water Technologies™ or your local distributor for custom chemical dosing report.
3. We use ProDose to determine your scaling potential and recommended chemical dosing levels.
Titan ASD™ 200 antiscalant/dispersant is a high performance chemical pretreatment that controls inorganic salts, metal hydroxides and colloids in RO feedwater. Its unique performance characteristics provide users with more complete control of system feed water chemistry, reducing membrane fouling and minimizing cleaning requirements. Titan ASD™ 200 is compatible with all membrane types and system components.

**Benefits**
- Phosphate-free formula reduces negative impact on the environment
- Stable molecular structure maintains integrity in high pH, high temperature and high salinity applications
- Carries the following drinking water approvals: NSF, Kosher, DWI, and Halal

**Uses**
- Control of calcium carbonate, calcium sulfate, barium sulfate, calcium fluoride, and hydroxides of iron and aluminum
- Can be blended with other pretreatment formulations from Professional Water Technologies™ to reduce chemical dosing equipment

**Specifications**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Clear liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>2.0 – 2.5</td>
</tr>
<tr>
<td>Density (kg/liter)</td>
<td>1.03 – 1.05</td>
</tr>
</tbody>
</table>

**Packaging**
- Pail: 5 gallon/18.9 liter
- Drum: 55 gallon/208 liter
- Tote: 275 gallon/1,040 liter
- Bulk: available upon request

For special packaging options, please contact PWT or your local distributor.
General Mixing & Application Instructions for Titan ASD™ 200

1. Typical dose rates are 2.0 to 6.0 mg/l
2. Call Professional Water Technologies™ or your local distributor for custom chemical dosing report.

Company Overview

Founded in 1996, Professional Water Technologies™ develops industry leading products and services for maintaining and operating industrial, commercial, and municipal reverse osmosis and MF/UF systems. With efficiency and high performance behind everything we do, Professional Water Technologies™ solutions surpass our client’s expectations by maximizing the operating efficiency, economy, and longevity of their systems. Solutions include super-concentrated phosphate-free antiscalants, membrane cleaners, membrane forensics services, and more.