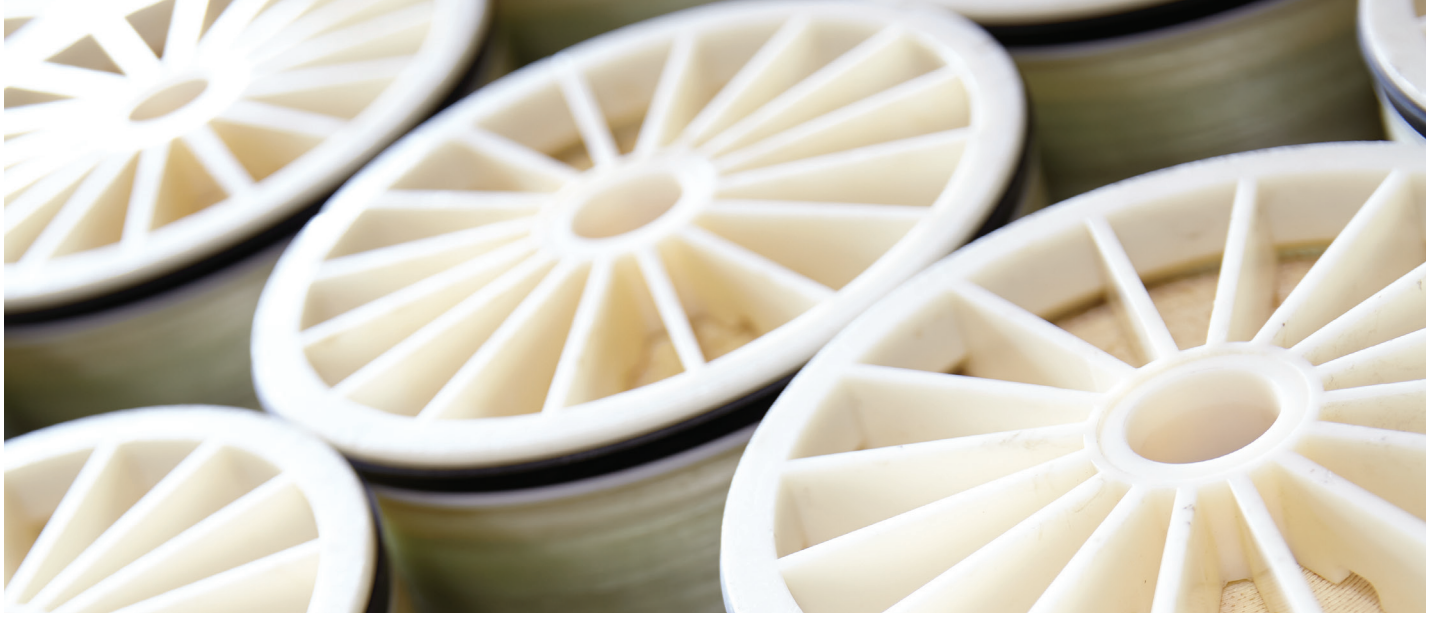
AVISTA™ MEMBRANE CHEMICALS

LATIN AMERICA / CARIBBEAN

All Avista membrane chemicals are fully supported by Avista services and programs, including:

- Avista Advisor™Ci software
- Avista Black Box
- Avista Membrane Autopsy
- Avista OSCAR
- Avista Center of Excellence (CoE)



In this overview we will review Avista membrane chemicals available across Latin America and the Caribbean. These products are designated as **Global Products** and are manufactured by Kurita blending facilities worldwide.

You will also find information on **Regional Products** formulated to meet local challenges and regulatory restrictions. Please check with your local Avista chemical representative for product availability.

All products are color coded for easy identification: GLOBAL PRODUCTS REGIONAL PRODUCTS

INTRODUCTION

Avista™ is a global brand of Kurita focused on membrane treatment solutions for reverse osmosis (RO) systems, microfiltration/ultrafiltration (MF/UF), and multimedia filtration (MMF).

Kurita established the Avista Center of Excellence (CoE), a leadership team located in the United States, Japan, Malaysia, and the United Kingdom to support each region's technical centers and global sales network. The Avista CoE evaluated membrane formulations from both Kurita and Avista Technologies for performance, cost, and dose.

Based on this evaluation, a global line of membrane treatment chemicals was selected to be manufactured worldwide, covering a full spectrum of foulants and scales. This global line of Avista membrane chemicals includes Vitec™ antiscalants, RoClean™ membrane cleaners, Kuriverter™ IK biocides, Kuriverter™ AC chlorine scavengers, and RoQuest™ coagulants.

A regional line of Avista chemicals is available, including AvistaClean™ MF cleaners, RoCide™ biocides, and AntiChlor chlorine scavengers, among others.

All Avista membrane chemicals are compatibility tested in accordance with key protocols accepted by the industry's leading manufacturers. Our globally expanded technical support and laboratory capabilities include Avista™ Advisor™Ci chemical dosing software, the Avista™ Black Box monitoring device, the Avista™ Membrane Autopsy with Chromatic Elemental Imaging℠, and Avista™ OSCAR off-site cleaning and restoration.

Avista membrane treatment solutions help to determine the right membrane chemicals to achieve peak system performance and operator confidence.

VITEC™ ANTISCALANTS

The Avista™ Vitec™ antiscalant line inhibits scale while also dispersing colloidal particles. The inhibition and dispersant properties of Vitec products help extend system run times, reduce cleaning frequency, and increase the productive life of RO elements. Vitec antiscalants are also highly effective at low dose rates. All formulations are NSF approved.

Vitec Antiscalant Capabilities

	WIDE SPECTRUM	CARBONATE SCALE	SULFATE SCALE	SILICA SCALE	ALUMINUM SILICATES	PHOSPHATE SCALE	FLUORIDE SCALE	SEAWATER	HIGH METALS IN FEED	SULFATE AND SILICA SCALE	MUNICIPAL WATER	AGRICULTURE	COAGULANT COMPATIBLE
VITEC 1070								●			●		✓
VITEC 1141	■	■	■	▲	▲	■							
*VITEC 1200	▲							▲			▲		
VITEC 3000	●	●	▲				●	■	■		▲		✓
VITEC 4000				●	●	●			●				
VITEC 7000		▲	●				■		▲				✓
VITEC 1400	■	■						■			●		
VITEC 1500				■	●	■							
VITEC 3025	▲											●	✓
VITEC 5100	■	▲						■	●		●		
VITEC 7400			●	●						●			✓
*VITEC 8200	■												✓

▲ GOOD ■ BETTER ● OPTIMAL ✓ YES

* PHOSPHORUS FREE

ANTISCALANT

Vitec 1070*

- Efficient product for seawater desalination, waters with low metals and scaling potential, and municipal applications.
- Compatible with pretreatment coagulants.

ANTISCALANT

Vitec 1141*

- Wide range antiscalant .
- Efficient product for industrial, oil and gas, food and beverage, wastewater, and pharmaceutical applications.
- Higher calcium sulfate and silica inhibition than Vitec 3000.
- Good for systems with high particulates in feedwater.

ANTISCALANT

Vitec 1200*

- Phosphorus-free antiscalant.
- Efficient product for municipal and well waters with low metals.

ANTISCALANT

Vitec 3000

- Wide range antiscalant.
- Efficient product for semiconductor, power, food and beverage, and oil and gas applications.
- Contains high and low molecular weight components that are proven to handle a variety of applications.
- Compatible with pretreatment coagulants.
- Complies with EN 15040 standards.

ANTISCALANT

Vitec 4000

- Effective antiscalant to inhibit silica scale, aluminum silicate scaling, and calcium phosphate.
- Effective on waters containing high metals such as iron, aluminum, or manganese.
- Compatible with polyamide membranes from all major manufacturers.
- Highly effective in a wide variety of feedwaters and pH ranges.

ANTISCALANT

Vitec 7000

- Controls high levels of sulfate.
- Efficient product for well water, mining wastewater, brine concentrator and recovery RO applications.
- Prevents calcium sulfate ($CaSO_4$) scale precipitation, allowing up to 6 times saturation.
- Compatible with pretreatment coagulants.
- Complies with EN 15040 standards.

VITEC™ ANTISCALANTS CONTINUED

ANTISCALANT

Vitec 1400

- Efficient product for municipal and well waters with low metals but elevated silica scale potential.
- Wide range antiscalant.

ANTISCALANT

Vitec 1500

- Highly concentrated antiscalant that can be used at very low doses to prevent silica scale, aluminum silicates and calcium phosphate.
- Good for wastewater and well water high in silica.

ANTISCALANT

Vitec 3025

- Very effective in agriculture and farming applications.
- Full spectrum antiscalant for high organic and silt waters that have a lower potential for carbonate, sulfate, or silica scale.
- Compatible with pretreatment coagulants.

ANTISCALANT

Vitec 5100

- Effective antiscalant for seawater and municipal applications.
- Wide spectrum antiscalant.
- Very effective in high iron and organic waters.
- Compatible with pretreatment coagulants.

ANTISCALANT

Vitec 8200

- Phosphonate-free all-polymer blend antiscalant for systems with brine disposal limitations.
- Effective on surface and well waters with high organics.

**Vitec 1070, 1141, and 1200 are previously named Osmotech products. These products have been renamed to Vitec to create a globally trademarked antiscalant line. There has been no formulation change.*
In Argentina, Vitec is offered under the trade name Avista™VT.

ROCLEAN™ CLEANERS

Avista™ RoClean™ cleaners provide efficient and cost-effective removal of many different foulants and scales. All products are low foaming and membrane compatible. These products come in a variety of pH ranges, and the line contains a liquid and powder product for most foulants and scales. RoClean cleaners are highly buffered and contain a unique blend of ingredients that wet and break up the foulant, suspend the foulant in solution, and disperse the foulant to prevent redeposition. All formulations are NSF approved.

High pH Cleaners

CLEANER | HIGH PH | POWDER

RoClean P111

- Efficient product for the removal of biological fouling, organic fouling from humic and fulvic acid and colloidal fouling.
- Contains chelating agents to remove residual metals on the membrane while removing organics.

CLEANER | HIGH PH | POWDER

RoClean P112

- Efficient product for the removal of silica scale, aluminum silicate scale, and stubborn organics.
- Unique formulation that eliminates the need to clean with hydrofluoric acid and ammonium bifluoride solutions, which are potentially hazardous.

CLEANER | HIGH PH | POWDER

RoClean P192

- Superior results in the removal of organics, silica scale, aluminum silicate clay and carbon fines that can cause high differential pressure.
- Highly buffered to resist pH changes during the cleaning process.
- Compatible with polyamide membranes from all major manufacturers.

CLEANER | HIGH PH | LIQUID

RoClean L211

- Efficient product for the removal of mild biological fouling.
- Most commonly used high pH cleaner for maintenance cleans.

CLEANER | HIGH PH | LIQUID

RoClean L212

- Efficient product for the removal of humic and fulvic acids, high colloidal fouling, and aluminum silicate scale.
- Unique formulation that reduces differential pressure by removing foulant from feed spacer material.

CLEANER | HIGH PH | LIQUID

RoClean L811

- Efficient product for the removal of sulfate scale, carbonate scale, phosphate scale, and calcium complexes.
- Unique formulation that is the preferred cleaner to remove sulfate scale.

High pH Cleaners CONTINUED

HIGH PH LIQUID CLEANER

RoClean L011

- Formulated to remove oil and grease that may be found in RO systems used in wastewater reuse applications.

HIGH PH POWDER CLEANER

RoClean P312

- Formulated to remove particulates and reduce high differential pressure.
- Contains dispersants that are effective in removing silt and clay as well as components to dissolve colloidal silica.
- EDTA free and highly buffered to resist pH changes.

HIGH PH POWDER CLEANER

RoClean P611

- Phosphate and EDTA free.
- Formulated to dissolve organic foulants such as humic acids, fatty acids, siloxane compounds, fungicides, pesticides, and pharmaceutical compounds often found in wastewater and leachate applications.

RoClean Cleaners Capabilities

	METALS	COLLOIDAL MATERIAL	NON-BIOLOGICAL ORGANICS	BIOLOGICAL ORGANICS	SILICA SCALE	ALUMINUM SILICATES	CARBONATE SCALE	SULFATE SCALE	PHOSPHATE SCALE	CALCIUM COMPLEXES	OIL/GREASE	PRETREATMENT CHEMICAL OVERFEED	LEACHATE/ INDUSTRIAL WASTEWATER APPLICATIONS
ROCLEAN P111		●	■	●									
ROCLEAN P112		●	●	■	●	●							
ROCLEAN P192		●		●	●	●							
ROCLEAN L211		■	■	▲									
*†ROCLEAN L212		●	●	■	■	●							
ROCLEAN L811							■	●	●	▲			
ROCLEAN P303	▲						●		▲	●			
†ROCLEAN P903	●						▲		●	●			
ROCLEAN L403	▲						●		▲	●			
ROCLEAN L011											●		●
†ROCLEAN P312						●							
*†ROCLEAN P611		●		●									●
ROCLEAN P911												●	

▲ MILD ■ MODERATE ● SEVERE

* PHOSPHORUS FREE †EDTA FREE

	LOW pH	HIGH pH	LIQUID	POWDER
ROCLEAN P111		●		●
ROCLEAN P112		●		●
ROCLEAN P192		●		●
ROCLEAN L211		●	●	
ROCLEAN L212		●	●	
ROCLEAN L811		●	●	
ROCLEAN P303	●			●
ROCLEAN P903	●			●
ROCLEAN L403	●		●	
ROCLEAN L011		●	●	
ROCLEAN P312		●		●
ROCLEAN P611		●		●
ROCLEAN P911		●		●

High pH Cleaners CONTINUED

HIGH PH POWDER CLEANER

RoClean P911

- Formulated to remove particularly high levels of humic and fulvic acids.
- Effective in removing pretreatment chemicals such as coagulant and antiscalant from overfeeds.

Low pH Cleaners

CLEANER | LOW PH | POWDER

RoClean P303

- Efficient product for the removal of severe calcium carbonate scale, calcium phosphate scale, and moderate metal fouling.
- Synergy between chelating agents and low pH removes metals from the membrane.

CLEANER | LOW PH | POWDER

RoClean P903

- Efficient product for the removal of significant metal fouling and phosphate scale.
- Unique formulation that includes a non-odorous reducing agent to remove high concentrations of iron and manganese.

CLEANER | LOW PH | LIQUID

RoClean L403

- Efficient product for the removal of mild metal fouling, calcium carbonate scale and calcium phosphate scale.
- Most commonly used low pH cleaner for maintenance cleans.

In Mexico and Peru, RoClean is offered under the trade name Avista™ RC.

BIOCIDES

Our biocides may be applied intermittently, via continuous injection, or as a periodic addition to your clean-in-place (CIP) system.

BIOCIDE

Stabilized Halogen Biocides

These agents are effective in treating a wide range of bacteria and make it possible for activated carbon filters to be used for slime control, thus keeping the membrane from deteriorating and reducing the frequency at which membranes require cleaning.

- Unique formulation of stabilized combined halogen.
- Can be used continuously or intermittently.
- Penetrates the biofilm layer deeply to inactivate bacteria, slowly break up foulant, and prevent additional biogrowth.
- Biocides offered may vary. Please contact your sales representative for the product offered in your area.

BIOCIDE

DBPNA

DBNPA is a broad spectrum biocide used to control bacteria, yeast, and algae in water treatment, pulp and paper, reverse osmosis (RO), oil and gas, and metalworking fluid applications.

RoCide DB20

- Concentrated, fast-acting, non-oxidizing liquid biocide that provides instant antimicrobial activity.
- Used intermittently as „shock treatment“ and before cleaning to kill microorganisms for easier removal.

RoCide DB5

- Instantaneous antimicrobial activity as a non-oxidising slimicide and bactericide.
- Powerful against bacteria, fungi and algae.
- Degrades rapidly to comply with strict environmental discharge regulations.
- Suitable for use with polyamide and cellulose acetate membranes from all major manufacturers.
- Compatible with other Avista™ cleaners.

BIOCIDE

Isothiazolinone

Isothiazolinone is an antimicrobial preservative that is commonly used to control bacteria, fungi, and algae.

RoCide IS2

- Stable biocide for continuous or intermittent injection that kills a wide range of microorganisms.
- Certified by the U.S. Environmental Protection Agency for use in RO systems.
- Degrades rapidly and naturally to comply with strict environmental discharge regulations.
- Compatible with polyamide and cellulose acetate membranes.
- Can be used with other applicable Avista™ chemicals.
- Can be used on waters with high sulfites/bisulfites.
- Can be used to preserve polyamide membranes.

AVISTACLEAN™ MF CLEANERS

The AvistaClean™ MF line is formulated to remove common organic and particulate foulants.

HIGH PH POWDER CLEANER

AvistaClean MF 1000

- Cleaner formulated to remove organic and particulate foulants from MF and UF membrane surfaces.

HIGH PH POWDER CLEANER

AvistaClean MF 1000A

- Synergistic cleaner blend formulated to remove organic and particulate foulants from chlorine tolerant MF and UF membrane surfaces.

LOW PH POWDER CLEANER

AvistaClean MF 3000

- Cleaner formulated to remove metal and carbonate foulants from MF and UF membrane surfaces.

KURIVERTER™ AC CHLORINE SCAVENGER

The Kuriverter™ AC Chlorine Scavenger line offers extremely economical options for chlorine removal compared to other methods.

CHLORINE SCAVENGER

Kuriverter AC-427*

- Efficient product to remove free and combined chlorine from RO feedwaters.
- Unique odorless formulation that eliminates the pungent off-gassing of regular bisulfite solutions.
- Certified for use in systems producing potable water.

**Kuriverter AC-427 was previously named AntiChlor 427. This product has been renamed to Kuriverter to create a globally trademarked chlorine scavenger line. There has been no formulation change.*

ANTICHLOR CHLORINE SCAVENGER

The AntiChlor Chlorine Scavenger line offers extremely economical options for chlorine removal compared to other methods.

CHLORINE SCAVENGER

AntiChlor 30

- Injected into RO feedwaters to protect polyamide membranes from permanent damage caused by free and combined chlorine.
- Membrane preservative for long-term storage.

Multimedia Filtration

ROQUEST™ COAGULANTS

Avista™ RoQuest™ coagulants are membrane compatible and improve the efficiency of MMF equipment. Studies show that MMF equipment without coagulant addition will remove approximately 35% – 50% of particulates. A nominal dosage of a RoQuest coagulant may allow MMF equipment to remove over 97% of particulates.

COAGULANT

RoQuest 3000

- Unique formulation that is a proprietary blend of organic polymers.
- Injected into the feedstream of multimedia or sand filters, where it enhances filter performance by reducing turbidity and color.
- Produces an improved filtrate that reduces RO and nanofiltration (NF) membrane fouling downstream, decreasing cleaning frequencies and increasing system run times.
- Compatible with polyamide RO membranes and many Avista antiscalants.

In Mexico, RoQuest is offered under the trade name Avista™RQ.

COAGULANT

RoQuest 4000

- Organic polymer and ferric sulfate blend used to enhance the removal of a broad spectrum of silt, organics, and colloids in multimedia filters.
- Formulated for waters with high organics and turbidities higher than 2.0 NTU.

COAGULANT

RoQuest 6000

- Blend of organic coagulants and ferric sulfate used to reduce turbidity and remove humic and fulvic acids in multimedia filters.
- Formulated for waters with high color and turbidities higher than 2.0 NTU.

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