

TETRA GUARD CHEMICALS® ANTISCALANT for membrane applications



Introduction

More than 20 years ago, TETRA GUARD CHEMICALS® pioneered the development of antiscalants. TETRA GUARD CHEMICALS have been the product of choice for antiscalants/dispersants/corrosion inhibitors / chelants in various applications for many years.



Today TETRA GUARD CHEMICALS® offers a broad range of water management additives including, ANTISCALANT^{AND} biological polymers and tailor made products for specific applications.

TETRA GUARD CHEMICALS® are used worldwide in a broad spectrum of markets and applications, including industrial water treatment, household & industrial detergents, industrial cleaners, enhanced oil recovery operations and various industrial processes such as desalination, pulp production & bleaching of paper as well as textiles.

During the last decade, through our R&D, continuous improvement and practical experiences, we have developed a full range of ready-to-use RO antiscalants, cleaners and associated service for the desalination markets.

Our ready-to-use products for RO are based on water additives and cover the complete spectrum of functionalities required to control the formation of most of the scales on membranes effectively. Our ready-to-use RO antiscalants and cleaners range carry approval from major membrane manufacturers.

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Products

Antiscalants

Specific antiscalants were developed in order to control scale formation effectively under a wide range of RO operational conditions and to ensure compliance with local environmental legislation.

The antiscalants will inhibit scale and disperse solid particles.

Product range

The following table summarizes the antiscalant products and their specific performances towards potential foulants.

ANTISCALANT	CaCO ₃	CaSO ₄	BaSO ₄	CaPO ₄	CaF ₂	SrSO ₄	SILICA	METAL OXIDES
RO GUARD 209	✓	✓	✓	●	✓	✓	✓	●
RO GUARD 210	✓	✓			✓			●
RO GUARD 211	●		✓	✓	●	✓	✓	●
RO GUARD 212		●	✓	✓		✓	✓	✓
RO GUARD 213	✓	●		●	✓			●
RO GUARD 214	●	✓	✓		✓			✓
RO GUARD 215	✓	●	✓		✓		✓	✓





Cleaners

Cleaner formulations are provided in order to handle specific fouling and/or scaling in various cleaning programs and complying with the operating parameters and the local environmental legislation.

Product range

The following table summarizes the cleaners and their specific performances towards different foulants.

PRODUCTS	CaCO_3	CaSO_4	CaPO_4	SILICA	METAL OXIDES	ORGANICS	CLAYS
RO LPH	✓		✓		✓		
RO HPH		✓		✓		✓	✓

Packaging

TETRA GUARD CHEMICALS ready-to-use products for reverse osmosis are available in a wide range of packaging types. For details please refer to product fact sheet.



Services and support

We are continuously improving our range of products and the associated web based software in order to serve new requirements in the desalination market.

Selection and dosing calculation of antiscalant

The expert web based product selection software was developed specifically to assist operators or designers of membrane Systems in the selection of the most appropriate antiscalant for a specific system.

The software allows for the most appropriate antiscalant selection or optimum dose rate. Plant recovery rate or pretreatment acid injection can be optimised.

The software quantifies scaling tendencies for a wide variety of scale:

- Calcium carbonate (LSI- S&DI)
- Calcium phosphate
- Calcium sulphate
- Calcium fluoride
- Silica
- Barium sulphate
- Strontium sulphate
- Metal hydroxide

Product performance characterization

Our Arese Italy and Germany centres of expertise for desalination processes and membrane applications perform the following operations:

- Scale inhibitor comparative testing: based on synthetic water we are able to create all kinds of scaling potentials.

With this capability we can then evaluate and compare on the same basis specific scale inhibitor's performance.

- Membrane compatibility testing: two bench RO units (for 4" and 8" membranes) are available for membrane compatibility testing according to specific manufacturer's guidelines.

- Cleaning test and development of cleaning procedure on 8" or 4" membranes test rig.

The membrane is removed from the plant, laboratory cleaned and tested for flux and salt passage in a single element characterisation unit.

- Full membrane autopsies.

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Services and support



Membrane autopsies

Membrane autopsies are useful to identify the root causes of reduced operational performance. The results help us to identify the type of fouling, scaling, and damage to the membrane. It allows us to make detailed technical recommendations in order to improve operational performance of an RO system.

A full **TETRA GUARD CHEMICALS**. autopsy includes a wide range of activities or tests, as described below.

- Selection of the most representative element(s)
- External/Internal visual examination
- Chemical identification of surface foulants using:
 - FTIR spectrometer
 - Scanning electron microscope (SEM) equipped with Energy Dispersive X-Ray Spectrometer (EDX)
 - Microscopic examination with on-board camera
 - P-NMR for specific phosphate or phosphonate fouling identification
- Loss on ignition test
- Microbiological examination
- Fujiwara Test

An autopsy report is produced and contains relevant pictures of membranes and deposits to aid better understanding. Our philosophy is to recommend corrective steps to resolve the operational performance issues.



Start-up for commissioning

TETRA GUARD CHEMICALS experts can be present and assist you in defining:

- product dosage (dilution, injection system design & injection point)
- start-up and shutdown chemical treatment procedure
- elaboration of data collection and reporting protocol for product performance follow-up and parameter adjustment
- on-the-job training of operators
- operating manual development

Technical Recommendations

For specialised technical support, additional information on any of our products, or if you have a technical problem you would like to discuss with one of our experts, please contact your sales representative.

On-site technical support

TETRA GUARD CHEMICALS experts can provide a broad range of on-site technical support services, including system startups during the plant commissioning period, system trouble shooting, field cleaning and training.

System trouble shooting

When plant installations are requiring frequent cleaning or are having performance issues, we can perform on-site inspections. We assist in collecting relevant data and determine ways of achieving design performance.

Cleaning

Based on site evaluations (analysis results, autopsy conclusions, system trouble shooting) we can provide you with the optimal cleaning procedure. On request we can also assist you through on-site expert field cleaning services.

Training

TETRA GUARD CHEMICALS is committed to optimize production cost by the training of plant operators regarding membrane fundamentals, system pre-treatment, and operation and monitoring.

Private labelling

TETRA GUARD CHEMICALS offers its customers the required support for private labelling for its full range of antiscalant products, whilst also adapting the selection software to incorporate customer's product names.

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More information

If you would like to obtain more detailed information about our products or are interested in obtaining a sample for evaluation in your system, please contact your nearest TETRA GUARD CHEMICALS representative or visit our website.