

INTELLIGENT ANTISCALANT DOSING

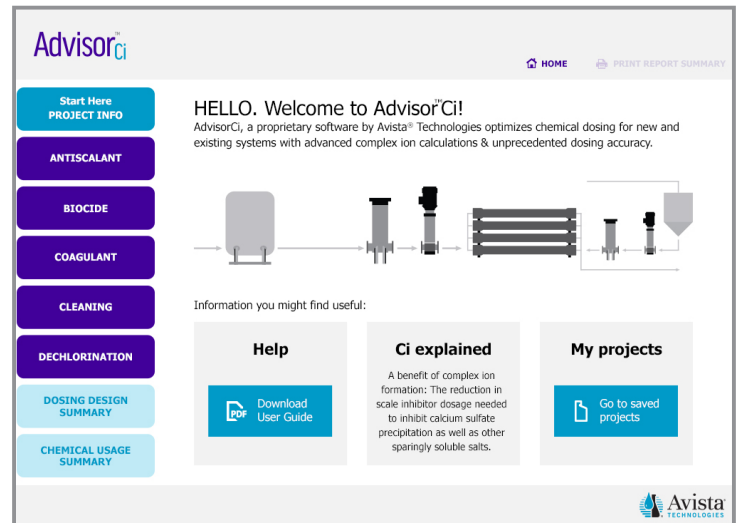
Advisor[™]Ci is a whole new way of looking at chemical dosing software. We have exceeded all industry standards relating to scale prediction by including complex ion formation and improved temperature correction factors to gain maximum RO system recovery for even the most stressed applications.

LEADING THE INDUSTRY IN COMPLEX ION (Ci) INTELLIGENCE

AdvisorCi calculates the saturation potential of a feed water based on the free concentration of ions, overcoming a critical weakness in contemporary indices that consider the total analytical value which typically includes ions that are bonded.

This propriety chemical dosing software considers more variables that affect antiscalant dosage calculations including precise solubility products (k_{sp}), updated temperature correction factors, improved individual ion product calculations, and new dosing curves that fully consider rate of reaction.

AdvisorCi allows our customers to forecast precise dosing and use rates for all of their membrane system chemical needs with high confidence.



ACCURATE

Precise dosing projections for the most complex waters and high recovery applications

RELIABLE

All calculations are based on published research and scientifically proven, industry accepted calculations

INNOVATIVE

Considers critical variables: solubility products (k_{sp}), temperature correction factors, individual ion product calculations and rates of reaction

EASY-TO-USE

Simply input raw water quality data and let AdvisorCi run the complex calculations to achieve optimized system performance

THE MOST ACCURATE CHEMICAL DOSING SOFTWARE

TO PREDICT SCALE FORMING COMPOUNDS IN REVERSE OSMOSIS SYSTEMS

Robust calculation engine

A proprietary combination of advanced calculations and scientifically validated saturation calculations accurately predicts the activity of all common scale forming compounds for membrane applications.

Metal dosing factor

Analyzes and adjusts for potential precipitation of metals based on their state of oxidation state.

Rate of reaction

Adjusts antiscalant dose according to the feed stream analysis and determines rate of precipitation.

High recovery applications

Applies precise calculations derived from on-site research of waters with high ionic strength to reduce the saturation potential of sparingly soluble salts.

PRACTICAL REPORTING

FROM DESIGN TO APPLICATION

Dosing Design Summary

The dosing design summary is an engineering page that allows you to size the chemical storage tank and dosing pumps. It provides a review of the required chemical flowrate for each chemical and the tank size needed for tank refill intervals. You can select your preferred dosing pump configuration and the software will advise the required flowrate per pump. This allows you to decide whether the required flow is 'practical' and determine if your pump meets the minimum flow or if you need to use a dilution of the product.

Chemical Usage Summary

The chemical usage summary page moves on to logistics, summarizing the chemical consumption over month / year so that an end user or engineer can make cost and chemical use estimates for all treatment chemicals required to run the RO. This page shows you how long a pail, drum or IBC will last—and allows the engineer to select the most practical package size for the plant. They can then design the access and offloading system for the planned package delivery.

Executive Summary

The Advisor™Ci Executive Summary rolls up all the calculations including your annual chemical consumption estimate. This gives you an 'at a glance' OPEX (operational expenditure) summary for your design along with all the details on chemical dose rates needed to allow the plant to function.

REQUEST ADVISORCi

Avista Customers have free access to AdvisorCi. If you would like to request AdvisorCi, visit www.avistatech.com/advisorci or contact your local sales representative or distributor and they will assist in software installation and training.

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AdvisorCi HOME PRIVATE REPORT SUMMARY

Dosing Design Summary Permeate Flowrate: **100.0 USGPM** Feed Flowrate: **133.3 USGPM**

Chemical	Coagulant	Antiscalant	Biocide	Dichlorination	pH Adjustment
Dose Rate	Not Selected	Vitac 3000	RuGlo DB20	Antichlor 427	Not Required
Product	0mg/l	1.0mg/l	50mg/l	5.5mg/l	0mg/l
Concentration	100%	100%	100%	100%	100%
Pump Rate	0.000 USGPD	0.15 USGPD	7.814 USGPD	1.132 USGPD	0.000 USGPD

Antiscalant

- One dosing pump and tank per train
- Common dosing set for the plant
- One dosing pump per membrane train, using a common chemical tank for all trains

Tank Concentration: 100% w/v

1 dosing pump each rated at 0.154 USGPD

Days	Gallons
1	0
7	1
30	5

Request Support **Done**

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Chemical Usage Summary

Online Chemicals

Chemical	Product	Dose Rate	Per Month	Per Year
Antiscalant	Vitac 3000	1.0mg/l	47.9 lb	583.3 lb
Coagulant	Not Selected	n/a	-	-
Biocide	RuGlo DB20	50mg/l	6.6 lb	80.3 lb
Dichlorination	Antichlor 427	5.5mg/l	282.9 lb	3441.5 lb
pH Adjustment	Not Required	n/a	-	-

Cleaning Chemicals

Chemical	Product	Application	Per Clean/Train	Per Year
Alkaline Cleaner	Not Calculated	-	-	-
Acidic Cleaner	Not Calculated	-	-	-
CIP Biocide	Not Calculated	-	-	-

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AdvisorCi HOME PRIVATE REPORT SUMMARY

Executive Summary

Project: Sample **Date:** 25-Sep-15
 Customer: Big OEM **Prepared by:** A.N. Engineer
 Engineer: R.A. Membrane **Water Analysis date:** 25-Sep-15

Membrane and Water Type

Feed Source: **Surface Water**
 Membrane Manufacturer: **Default**
 Membrane Type: **High Rejection Brackish**
 Water Analysis Date: **25-Sep-15**

Antiscalant Recommendations

Recommended Product	Recommended Dosage	System Recovery
Vitac 3000	2.0mg/l	79%
Dosed Strength	Usage Per Day	pH Correction
100%	10.69 lb	-

Saturation Indices

SBDI
 CaSO4
 BaSO4
 SrSO4
 Fe
 Mn
 CaF2
 Al
 SiO2
 CaPO4
 MgOH
 CaCO3

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% 110% 120%
 Percent of Product Limit

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*The images above are sample pages.