

Frequently Asked Questions (FAQs)

1. Compared to other products on the market, why GOLDTON™ products are the favorable choice of so many users?

- 1) GOLDTON™ produces a total of 21 products of which 11 are antiscalant, 2 are coagulant, 3 biocides and 5 types of cleaner. Each type of products complements one another during RO system treatment.
- 2) The benefit of such a variety of products lies in each product's pertinence and suitability for different feedwater qualities of RO system. In addition, each type of GOLDTON™ products is compatible with most other brands available on the market. Such compatibility offers users flexibility in their choice of products mix.

2. What are the main characteristics of GOLDTON™ products?

- 1) Goldton™ not only offers users a great variety of antiscalants but also antiscalants that possess qualities such as high dispersing capability, extensive compatibility and chemical stability. It is with no surprise that GOLDTON™ antiscalants are well received by RO system users.
- 2) Goldton™ coagulants can markedly remove membrane fouling caused by colloidal particulates and insoluble compounds. Used in conjunction with certain Goldton™ antiscalants, foulants can be removed even more effectively.
- 3) Goldton™ biocides effectively sterilize the RO system and remove biological foulants. Moreover, the biocides are biologically degradable into environmentally-friendly substances.
- 4) Goldton™ cleaners can restore membranes to their pre-fouling conditions and extend the life of membranes.

3. What is the difference between GOLDTON™GTC™-P100 antiscalant GOLDTON™GTC™-P200, GOLDTON™GTC™-P300?

Depending on the source of feedwater, users select different product.

GOLDTON™GTC™-P100, GOLDTON™GTC™-P300 are used primarily to treat calcium carbonate, calcium sulfate scales and effective in dispersing iron, aluminum and silica colloids. GOLDTON™GTC™-P100 is alkaline with relative high pH while GOLDTON™GTC™-P300 is acidic with relative low pH. GOLDTON™GTC™-200 is particularly effective in treating barium, strontium and iron in water. If you need any help and advice on the selection of suitable product, researchers at Goldton can make recommendations based on the water analysis.

4. What are the characteristics of GOLDTON™GTC™-P2100 and P2200?

GOLDTON™GTC™-2100 is a newly developed product of GOLDTON CHEM. Its special molecule structure will not damage membrane surface and its overall performance is superior to most existing antiscalants.

GOLDTON™GTC™-2200 is a world-leading 12 times super concentrate antiscalant. Its extraordinary foulant-dispersing capability is suitable for all types of feedwater, especially groundwater.

5. What is dosage of antiscalant?

Exact dosage is calculated with Goldton's special software by professionals. The usual dosage is 3ppm. However, the amount varies depending on the quality of feedwater. You can always fax us your water analysis based on which we can give recommended dosage. The dosage calculated by software is usually the lower estimate. It is recommended that users add **0.5-1ppm** to the value calculated by software.

6. Can Goldton™ antiscalant be used on RO systems of pharmaceutical, beverage and food industries?

GOLDTON™ GTCTM series antiscalant has passed ANSI/NSF 60 drinking water standard, thus suitable to be used on RO systems of pharmaceutical, beverage and food industries.

7. How should Goldton™ antiscalant be applied to RO system?

1) Feed point

For maximum effectiveness, antiscalant should be added prior to the static mixer or cartridge filter housing. Feed pump should be calibrated. Antiscalant should be added continuously and directly proportional to feed water flow.

For specific questions, please consult GOLDTON™ CHEM. local technician.

2) Dosing

Typical dosage is the amount of standard liquid product needed for per unit of feed water flow.

GOLDTON™ CHEM. can provide Dosage Projection Software, which can calculate the recommended dosage required based on the salt content, temperature and other aspects of feed water quality as well as on the operating conditions of RO system and types of membranes used.

3) Preparation of treatment solution

Antiscalant can be fed neat or diluted. Maximum dilution is 10% with RO permeate or DI water.

The following methods can be used to help decide exact dosage.

- Method 1

Calibrate and ascertain feed pump rate. The first step is to calculate the concentration of treatment solution based on recommended dosage and feed flow. Based on the volume of the treatment solution, calculate the amount of antiscalant required.

$$\text{Concentration of treatment solution (g/L)} = \frac{\text{antiscalant required per unit time (g/h)}}{\text{feed pump rate (L/h)}}$$

$$\text{Where antiscalant required per unit time (g/h)} = \text{feed flow (T/h)} * \text{desired ppm of antiscalant (g/T, ppm)}$$

$$\text{Total amount of antiscalant needed per treatment (kg)} = \frac{\text{solution concentration (g/L)} * \text{solution volume (L)}}{1000 \text{ (g/kg)}}$$

- Method 2 How to calculate feed pump rate

$$\text{Treatment solution concentration (g/L)} = \frac{\text{total amount of antiscalant/per treatment (kg)}}{\text{solution volume (L)} * 1000 \text{ (g/kg)}}$$

$$\text{Feed pump rate (L/h)} = \frac{\text{antiscalant required per unit time (g/h)}}{\text{solution concentration (g/L)}}$$

$$\text{Where antiscalant required per unit time (g/h)} = \text{feed flow (T/h)} * \text{desired ppm of antiscalant (g/T, ppm)}$$

GOLDTON™ RO System Pretreatment Chemicals *FAQs*

Example:

Assume a RO system of 100T/h with a recovery ratio of 75%. Then the system has a feed flow of 133.33T/h. Assume the recommended dosage is 3ppm. Therefore, antiscalant required per unit time= $133.33T/h * 3(g/T) = 400g/h$.

Method 1: Adjust feed pump rate to 2L/h. Total antiscalant required for 1000L treatment solution:

Treatment solution concentration= $400 (g/h)/2(L/h) = 200g/L$

Total antiscalant required= $200g/L * 1000L / (1000g/kg) = 200kg$.

Method 2: To get 1000L treatment solution with 200kg of antiscalant, calculate the feed pump rate:

Treatment solution concentration = $200kg/1000L * 1000g/kg = 200g/L$

Feed pump rate (L/h) = $400 (g/h)/200(g/L) = 2L/h$

Note: The above-mentioned calculation methods are for standard liquid. For concentrated liquid, the calculations can be adjusted according to the extent of concentration. For example, for 8-times concentrated liquid, such as GOLDTON™ GTC™-P1800, the amount of antiscalant needed is 25kg (which is equivalent to 200kg of standard liquid).

*Professional Advices

- I. High content of salt and iron oxides in feed water will cause scales on membrane surface. Periodic removal of scales is necessary or else scales will result in high pressure differential in the RO system which can damage membrane surface.
- II. Please make sure that the compatibility of antiscalant with coagulant. Incompatibility will blind the membrane.
- III. Over and under-dosing may cause membrane fouling.
- IV. When storage temperature falls below specified freezing point, antiscalant will be frozen. In such a case, it should be unfrozen completely and stirred uniformly so as to ensure the accuracy of dosage.

*Safety Precautions

Before use, please read carefully product's label and Material Safety Data Sheet (MSDS) which contain detailed information about the products.

8. How should antiscalant be stored?

Antiscalant is physically and chemically stable and can be stored up to 2 years. It should be stored in a cool place with good ventilation. Avoid contact with clothes and skin.

9. What is the lowest storage temperature?

The freezing point for most antiscalants is **-15°C**. In case of freezing, please allow it to melt completely and mix thoroughly for maximum effectiveness and accurate dosage.

10. Can GOLDTON™ antiscalants be used as a replacement of ion exchange?

Yes. GOLDTON™ antiscalants effectively prevent the precipitation of fluoride, calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, iron oxide, ferric hydroxide, aluminum hydroxide and silica in membrane separation systems. The cleaning cycle of RO, UF and NF systems as well as the life of membranes are extended as a result. As a replacement of ion exchange, the operation cost is reduced markedly.

GOLDTON™ RO System Pretreatment Chemicals *FAQs*

11. What are the recommended dosages of GOLDTON™GTC™—B100,B1400 and B200?

- 1) GOLDTON™GTC™—B100 is **standard liquid** and the recommended dosage is **400ppm**.
- 2) GOLDTON™GTC™—B1400 is **4 times concentrated liquid** whose dosage is **100ppm**.
- 3) GOLDTON™GTC™—B200 is **standard liquid** with a recommended dosage of **1-2 ppm**.

12. What are the differences and similarities of GOLDTON™GTC™—B100, B1400 and B200?

1) Similarities:

- They all can be used to control the growth of microorganisms. They are biologically degradable to environmentally-friendly substances. High pH and temperature can speed up this process.
- Corrosion-resistant materials such as PVC should be used in the preparation and storage of these products. The contact area of biocide and pump should also be protected by corrosion-resistant materials.
- For maximum effective, do not dilute standard liquid.

2) Differences:

- GOLDTON™GTC™—B100/B1400 satisfies ANSI/NSF 60 Standard and can be used in RO system that produces drinking water.
- GOLDTON™GTC™—B200 should be used only in RO system that produces water for industrial purposes. It is not suitable for drinking water production and should not be injected into human/animal body.
- GOLDTON™GTC™—B200 should be used in conjunction with reducing agent (sodium bisulphate). The dosage of reducing agent should be 3 times of B200 dosage.

13. How should GOLDTON™GTC™-B100/GOLDTON™GTC™-B1400 biocide be applied to RO system?

Depending on the degree of fouling, different treatment programs can be performed.

- Online cleaning: biocide is added to feed water of running RO system. Permeate must be let to the drain.
 - 1) Calculated the quantity of GOLDTON™ GTC™-B100/1400 needed per treatment.
 - 2) Before adding biocide, open feed water and RO water valves so that feed water and permeate can be to the drain.
 - 3) Add biocide to the RO system for 30 minutes according to the amount needed based on calculation.
 - 4) Clean system for another 15 minutes with feed water and RO water valves open so that water in the system can be let to drain.
 - 5) Check conductance. Clean until RO water's conductance until a satisfactory level. Put RO back to working mode.
- Off-line cleaning in case of heavy fouling. The system should be cleaned with GOLDTON™ GTC™-K100/K200/K300 cleaner before adding biocide to the system.

- 1) Secure the RO system and valve into the CIP mode.
- 2) Fill the cleaning tank to the desired level of water. Add calculated amount of biocide to the water based on 30-minute biocide feeding time.
- 3) If the pH of water is higher than 7, use citric acid or hydrochloric acid to adjust downward so as to extend the half life of GOLDTON™ GTC™-B100.
- 4) Circulate GOLDTON™ GTC™-B100/B1400 solution for 45-60 minutes.
- 5) Discontinue circulation and thoroughly rinse the system with RO product water until all GOLDTON™ GTC™-B100/B1400 is removed from system.

14. If GOLDTON™GTC™-P100 antiscalant and GOLDTON™GTC™-B100/GOLDTON™GTC™-B1400 biocide are used simultaneously, how should the preparation be made?

GOLDTON™GTC™-P100 and GOLDTON™GTC™-B100/GOLDTON™GTC™-B1400 are alkaline and acidic by pH. Therefore they should be prepared separately and their feed points should be 2-3 meters away so as to allow thorough mixing with feed water.

15. What is difference between GOLDTON™GTC™-B100/GOLDTON™GTC™-B1400 biocide and chlorine?

If chlorine is used as bactericide, dechlorination must be carried out before entering RO membrane, or else membrane will be damaged. Moreover, residual bacteria on the membrane can reproduce quickly and cause membrane fouling. GOLDTON™GTC™-B100/GOLDTON™GTC™-B1400 is non-oxidizing bactericide. It effectively controls bacteria growth during the entire RO process and does not cause any damage to membrane. In addition, it will remain on the membrane for a period of time, thus preventing the reproduction of bacteria.

16. How should GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 RO coagulant be used?

GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 is highly effective liquid coagulant designed for RO system. They could be used on their own or with combination with other coagulant such as PAC.

17. What is the dosage of GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 coagulant?

The dosage of GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 depends on the quality of water. A small scale test should be carried out. The dosage should be kept to a minimum provided the maximum effectiveness of coagulant is maintained. The usual dosage of GOLDTON™ GTC™-F100 is 0.5~5ppm while the usual dosage of GOLDTON™ GTC™-F1400 is 0.1~2ppm. The optimal dosage should be decided by the water sample before multimedia filter.

Engineers at GOLDTON™ CHEM. will recommend a dosage based on water analysis and RO system. You can provide us with 1 liter of water sample for researchers at GOLDTON™ to make analysis required.

18. Can GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 coagulant be used with antiscalant?

Most antiscalants/dispersants contain anion polymer that coagulate with GOLDTON™ GTC™-F100/GOLDTON™ GTC™-F1400, causing membrane blinding. As a result, GOLDTON™ GTC™-F100/GOLDTON™ GTC™-F1400 can only be used with GOLDTON™ GTC™-P100/P300/P400/P1400/P1500/P1800 antiscalant.

19. What are the advantages of GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 coagulant compared to other brands?

- 1)GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 are liquid and completely soluble in water.
- 2)GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 is physically and chemically stable and does not contain impurities and will not cause membrane fouling as a result. Moreover they are compatible with some of the antiscalants.
- 3)They are compatible with GOLDTON™ antiscalants and reduce the dosage of other coagulants, thus imposing a less burden on membrane surface.
- 4)They can increase membrane's resistance to break through.
- 5)They simplify pretreatment process and act as a remedy to deficient pretreatment process.

20. What are the advantages of GOLDTON™ membrane cleaner compared to other cleaner?

GOLDTON™ CHEM. cleaners are more membrane- and foulant-oriented. They target different types of fouling in RO system.

21. When should GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 coagulant be used ?

GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 is designed primarily for feed water with high SDI. It is particularly suitable for treating **surface water, treated municipal water and water with low turbidity**. It has been used widely in oil refinery, power plant, electronics and drinking water industry. GOLDTON™GTC™-F100/GOLDTON™GTC™-F1400 is effective in treating feed water whose **SDI is up to 6.0**. As a result, it can act as a remedy to pre-treatment.

22. In how many physical states do GOLDTON™ RO membrane cleaners exist? And what is the maximum working temperature?

GOLDTON™ GTC™-K100, K200 and K300 are in liquid state while GOLDTON™ GTC™ — KP100、KP300 are powder form. The highest working temperature is **40° C**.