

microbiological control

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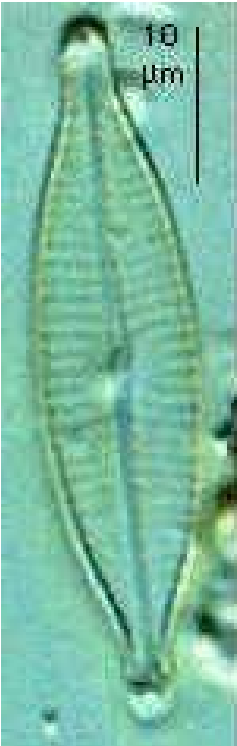
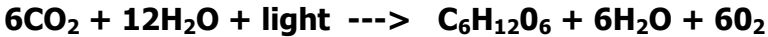
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algae



Algae contain chlorophyll pigments, unique structures which are vital to their process of energy production called photosynthesis. The chlorophyll pigments absorb sun

light which is then transformed by the cell into chemical energy needed for the synthesis of carbohydrates. In its simplest form, photosynthesis occurs as follows:



As a result of photosynthesis, there are three basic requirements for algal growth: air, water and sunlight. Elimination of any one of these three factors will hamper growth. The distribution decks and sidewalls of a cooling tower provide all three requirements and therefore represent an excellent growth environment for algae.

For this reason, algae are all too often seen floating as free green masses on the top deck, or attached to the cooling tower structure itself.

Table below shows some common algal groups found in cooling water systems and their temperature and pH requirements for continued growth.

		Conditions for growth	
Algae grouping	Examples	Temperature	pH
Green	Chlorella (common unicellular.) Ulothrix (filamentous) Spirogyra (filamentous)	86 to 95°F	5.5 to 8.9
Blue-green (contain blue pigment)	Anacystis (unicellular slime former) Phormidium (filamentous) Oscillatoria (filamentous)"	95 to 104° F	6.0 to 8.9
Diatoms (contain brown pigment and silica in cell walls)	Flagilaria (long and thin in series) Cyclotella (wheel shaped) Diatoma (larger-rectangular or tapered)	64 to 96°F	5.5 to 8.9

Because the temperature characteristics and pH considerations are both within the ranges of basic cooling water systems, it is not surprising that they often produce prolific algae blooms.

Green algae exist either as unicellular or multicellular colonies. The blue-green strains such as ***Oscillatoria*** are filamentous strands with cells arranged end-to-end in chains; such colonies can reach a length of several feet. **Diatoms** consist of two half-cells and contain a brown pigment and silica in their cell walls.

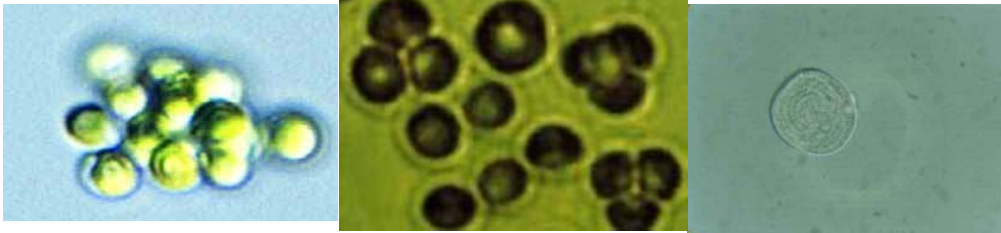
All algae produce oxygen which can depolarize the corrosion reaction and accelerate system destruction. Blue-green algae such as ***Nostoc***, ***Anabaena*** and ***Calothrix*** can fix (extract and convert) nitrogen from the air to organic nitrogen compounds.

These nitrogen-fixing algae are responsible for the accelerated deterioration of nitrite-base'd corrosion inhibitors.

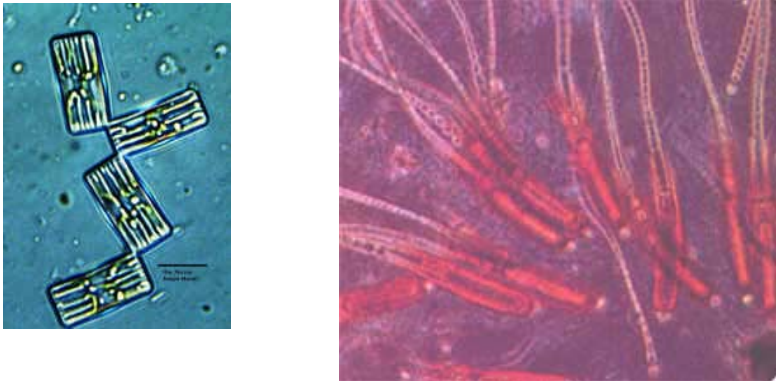
Diatoms have been known to cause silica fouling because their cell wall is impregnated with polymerized opaline silica.

Common Algae gallery found in Cooling water systems

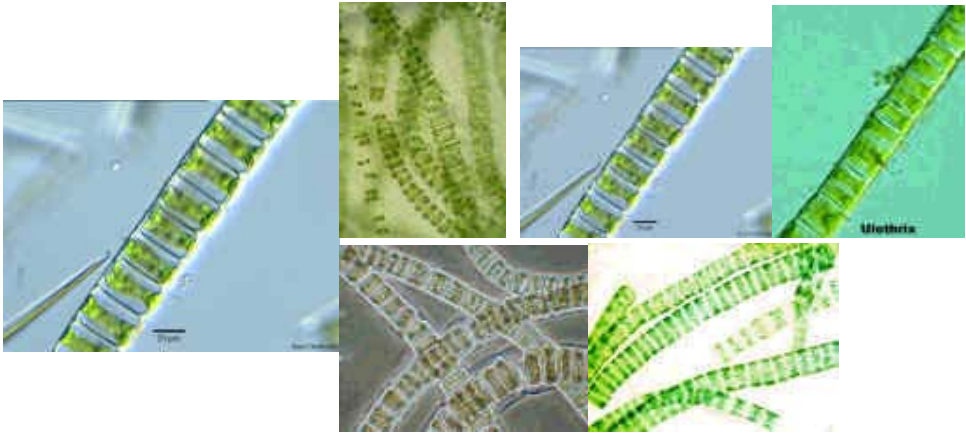
Chlorella



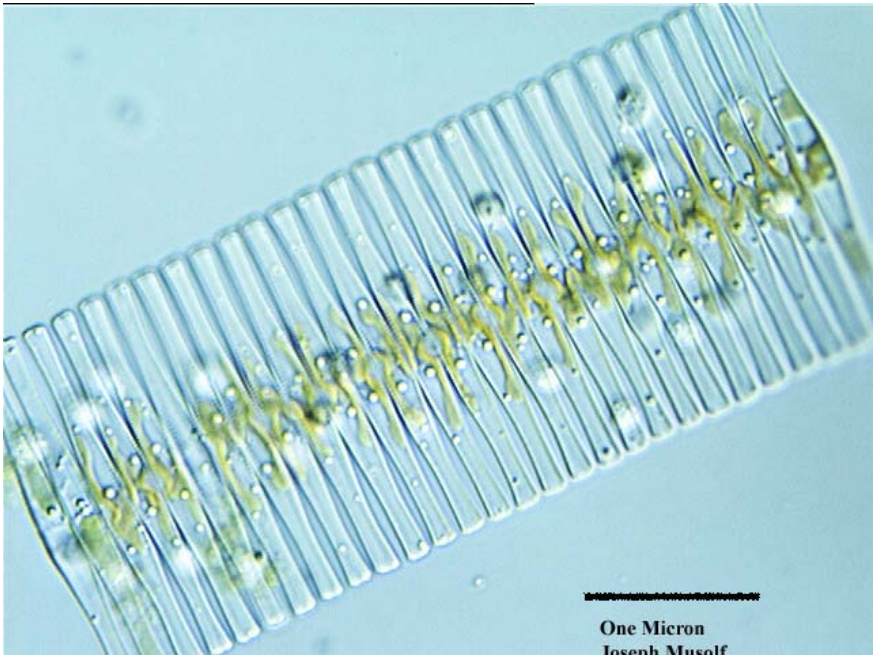
Blue Algae



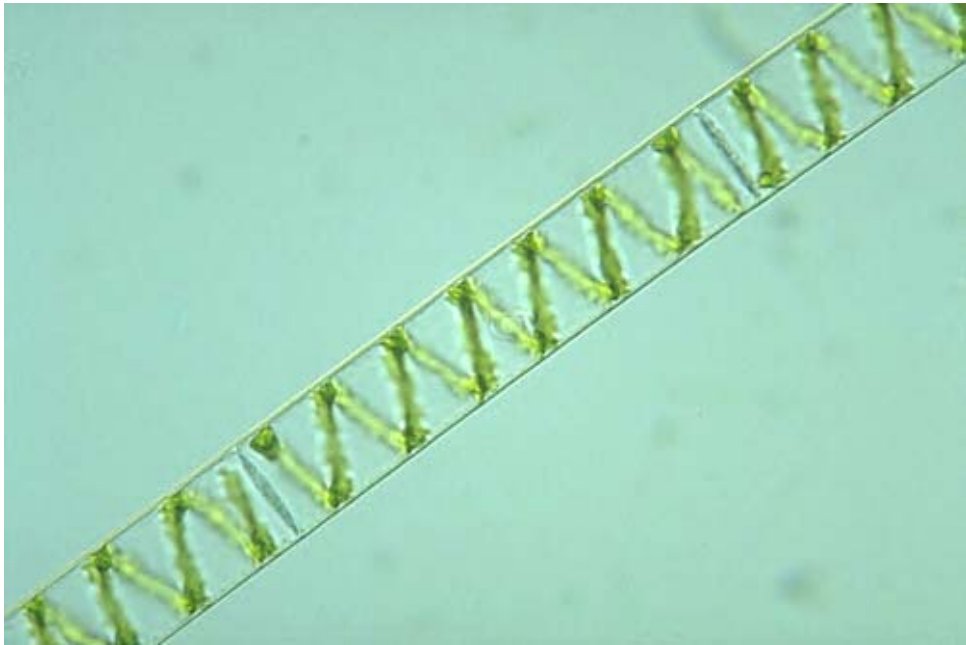
Ulothrix



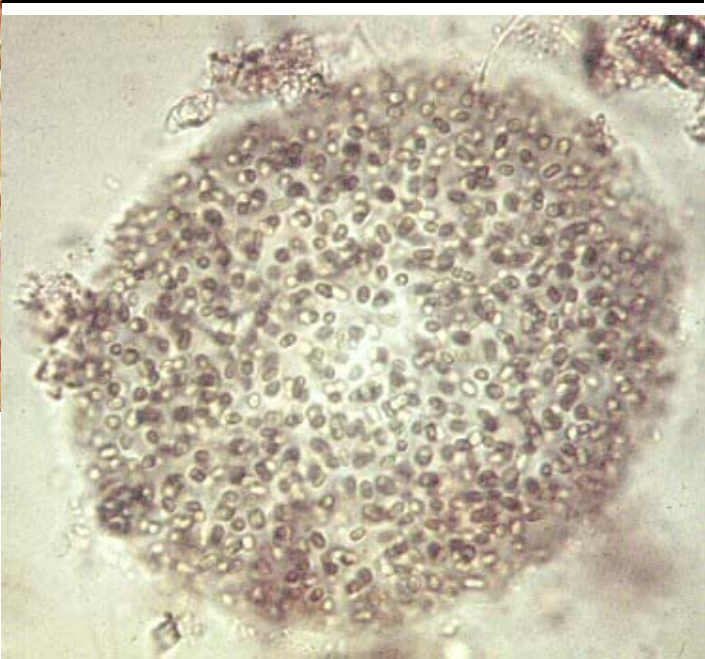
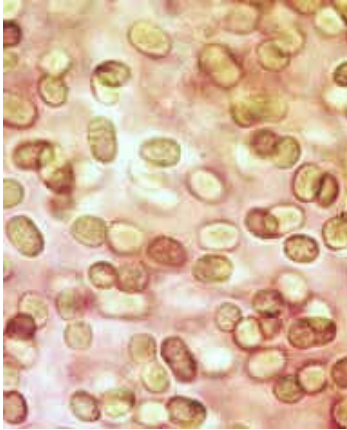
Flagilaria



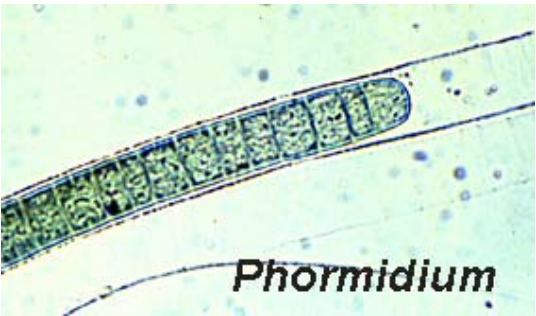
Spyrogyra



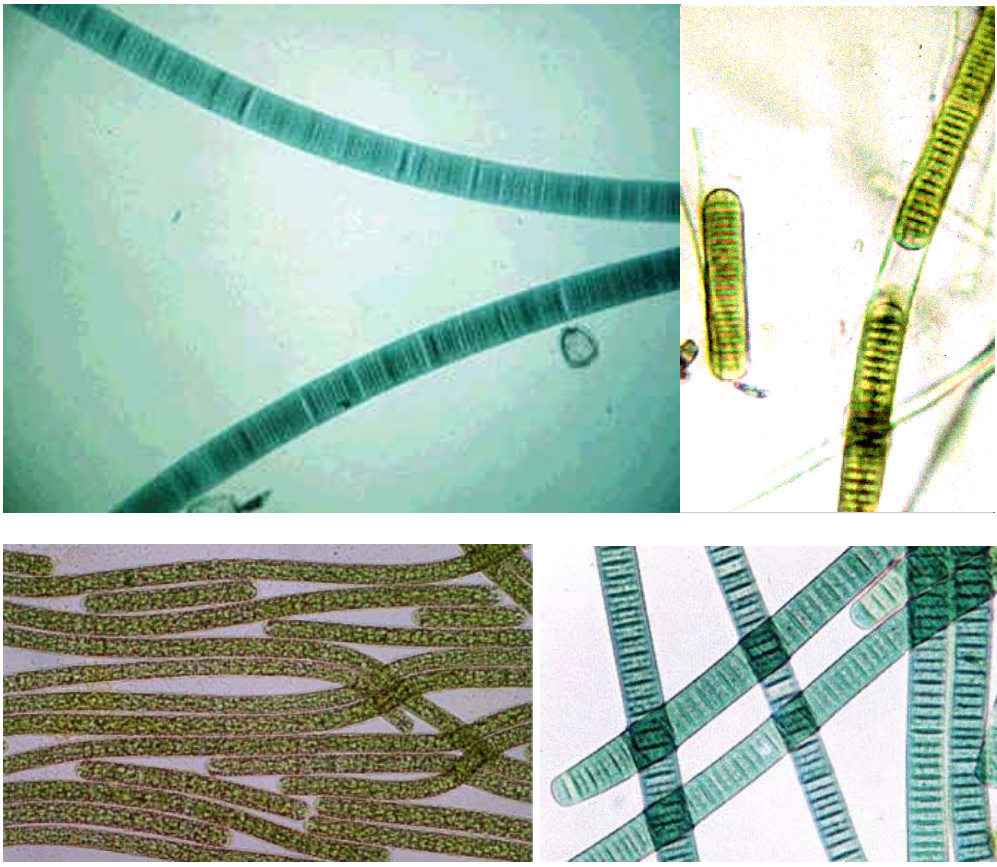
Anacystica



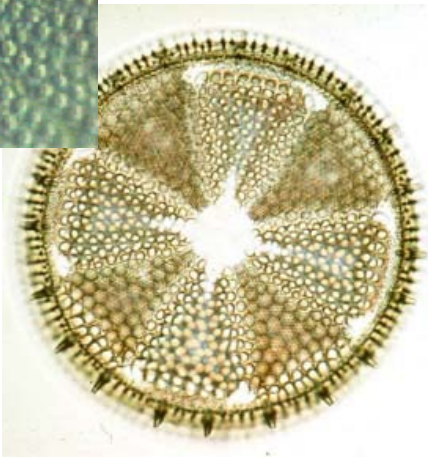
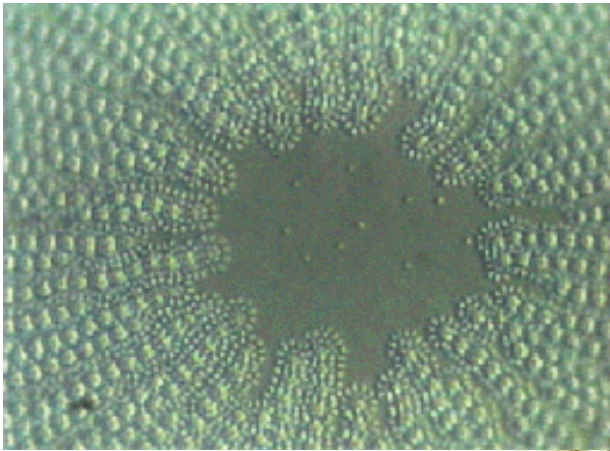
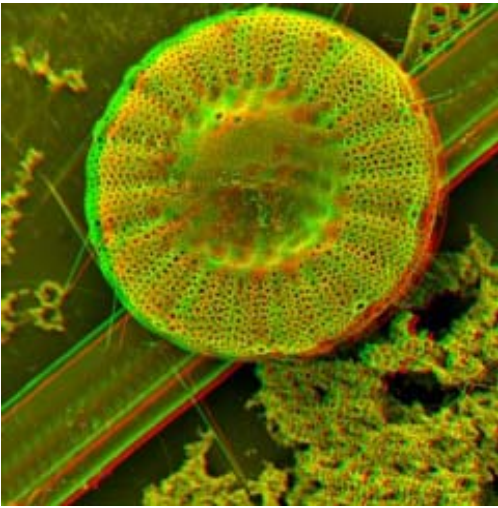
Phormidium



Oscillatoria



Cyclotella



Diatoms



THE DIATOMS

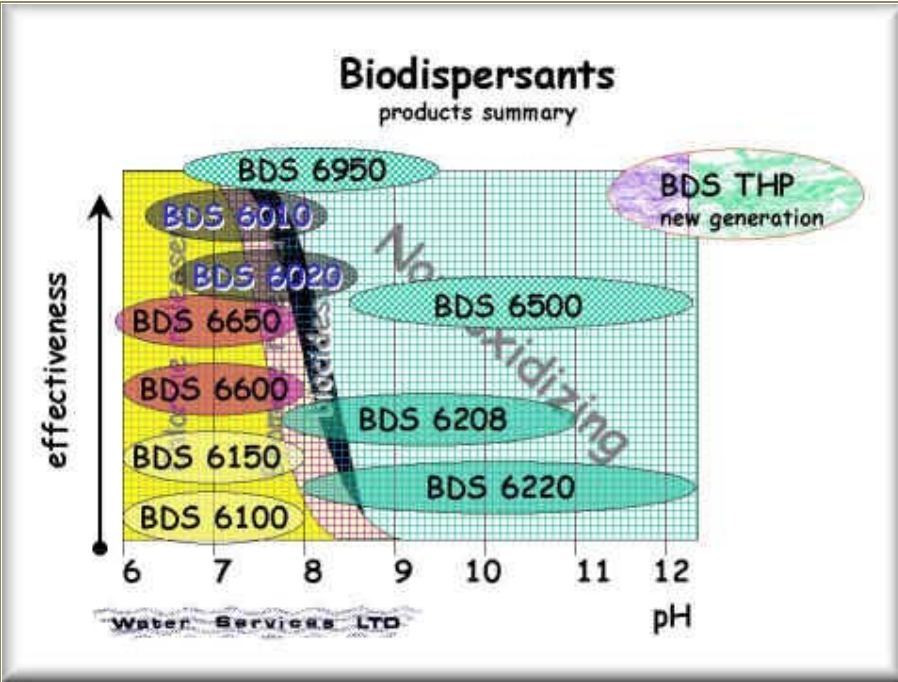
Life inside a glass box. . .

The Bacillariophyta are the diatoms. With their exquisitely beautiful silica shells, or **frustules** such as that of *Odontella* shown above at right, diatoms are among the loveliest microfossils. They are also among the most important aquatic microorganisms today: they are extremely abundant both in the plankton and in sediments in marine and freshwater ecosystems, and because they are **photosynthetic** they are an important food source for marine organisms. Some may even be found in soils or on moist mosses.

Diatoms have an extensive fossil record going back to the Cretaceous; some rocks are formed almost entirely of fossil diatoms, and are known as diatomite or **diatomaceous earth**. These deposits are mined commercially as abrasives and filtering aids. Analysis of fossil diatom assemblages may also provide important information on past environmental conditions



Product summary

Oxidizing biocides			Non oxidizing
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BDS 6150 slow releaser	BDS® 6650 BNPA technology	BDS BIOBROM Q form plus quats.	BDS® 6220 quats mixture
			BDS® 6500 glutaraldehyde
			BDS® 6950 isothiazoline
			To BDS® THP belongs to non oxidizing

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 <p>Iran</p>	<p>رَباتت اقسندنه</p> <p>PAKISTANI & CONSUL. CO. ADD. NO. 242 1ST FLOOR, SAIDMEHARLAND AVE. TIRHAK</p>
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