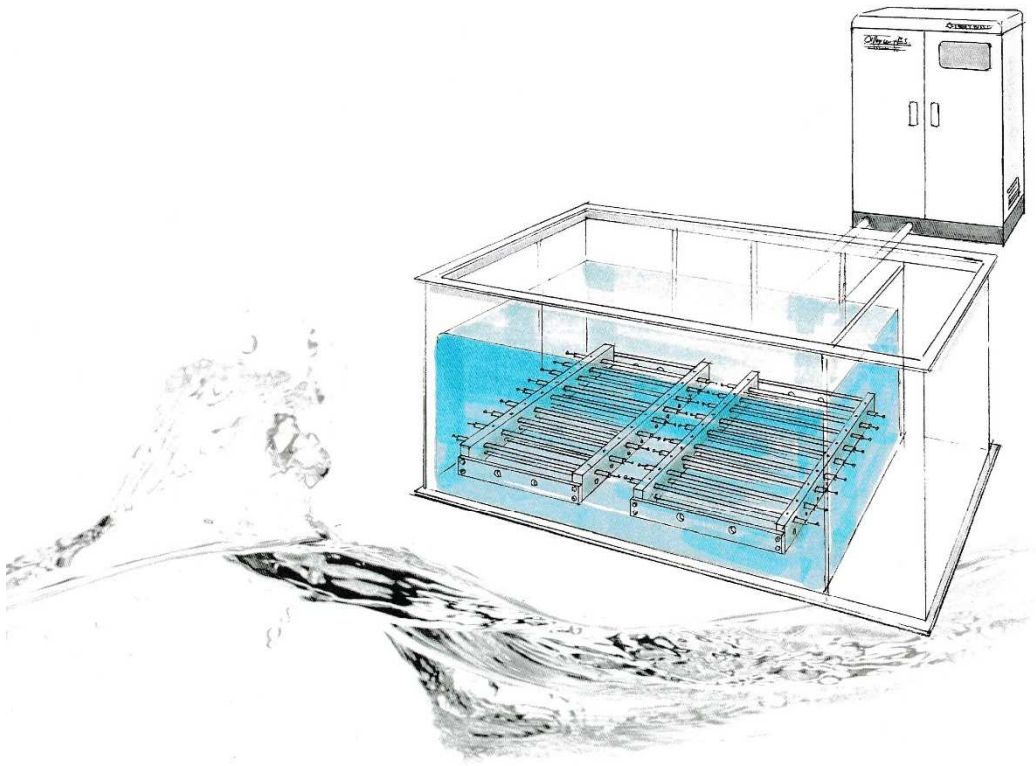
AOP2.00WE,S(Hybrid Type)
Advanced Oxidation Process

AOP+ AOP plus Hybrid Type

LIGHT SOURCE ,INC.



LIVINGENERGIES & Co.

■What is AOP2.0?

AOP 2.0 is a system which can degrade non-biodegradable components by free radicals generated by key technology of nanobubble combined with other technologies such as UV（ultraviolet ray）, O3,electrolysis, photo catalyst and pressurization.

■Oily water E,S(Oil-water electrical separation device)is a device to separate the oil and water by electricity ,even though chemicals are usually used in usual method . Sulfuric acid band is used to assist when machining oil is treated.

■Hybrid Type is the system which can control the electrodes of OWES by the controller of AOP^{+}.

Especially, waste water which contains variety type of components is effectively treated by Hybrid Type.

■Proper positon

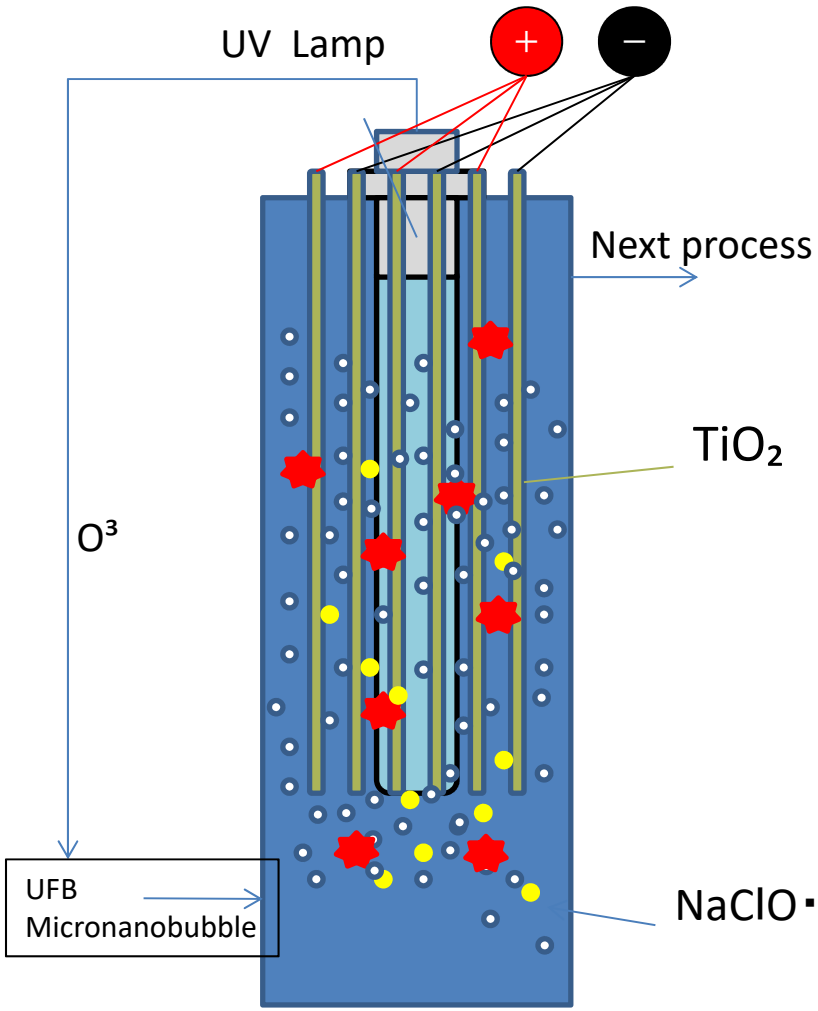
It is ideal if there are neutralization tank or biological treatment tank.

When it is used by itself, neutralization tank and aggregation tank should be put after tanks of AOP^{+} and OWES.

■Capacity to treat

Approximately 5 tons can be treated . We propose the best solution to each clients.

■AOP⁺Sylinder



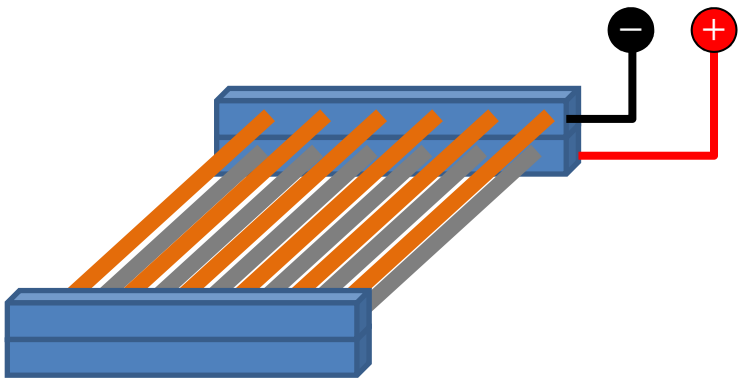
AOP⁺ has been designed to generate active fee radicals (・OH) and attack targets effectively as
Ultra Fine Bubble put pressure to the water and electricity excite reactions of photocatalyst.
Those are the reason why chemical reaction are much improved.

- Active free radicals
- O_3UFB(Ultra Fine Bubble= Nanobubble)
- $NaClO・H_2O_2$

There are more than 100,000,000(1hundred million) nano-sized bubbles per ml.
These enhance effectiveness of treatment.

NaClO and H_2O_2 are used for the purpose of promoting reaction in AOP.
They might not be used depends on conditions of waste water as we usually decide it according to the result of pre test.

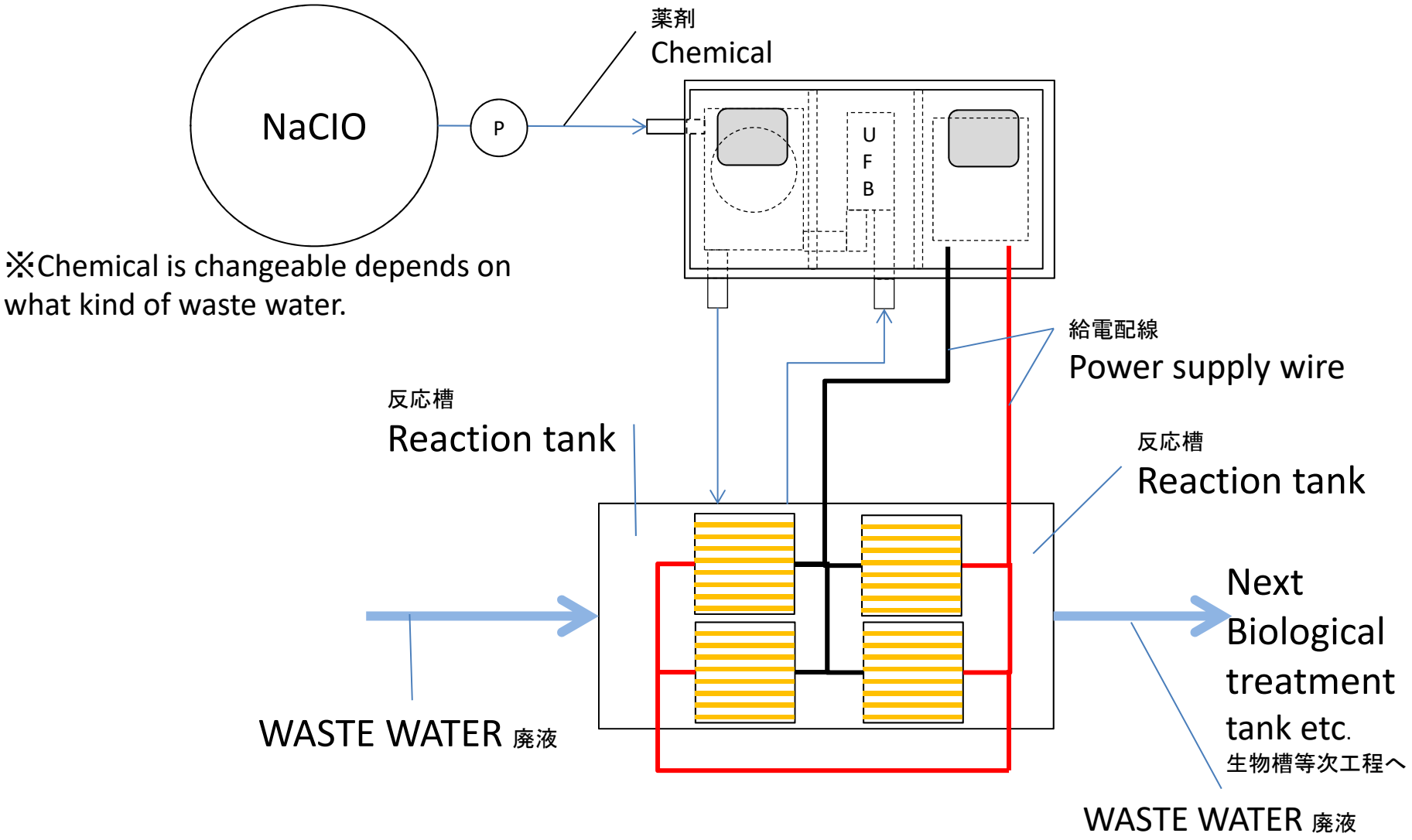
■電極Electrode



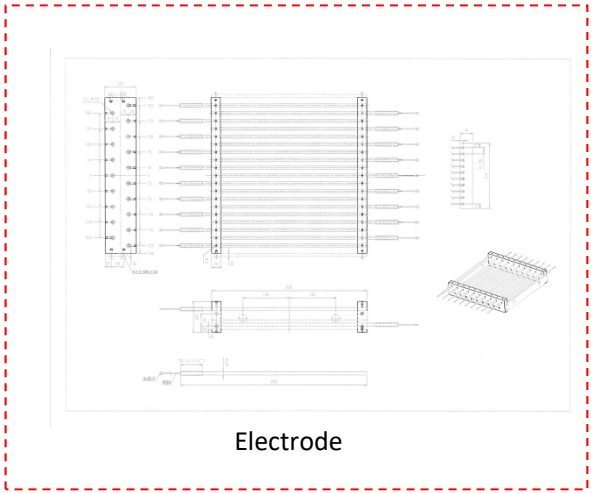
NaClO and H_2O_2 are used for the purpose of promoting reaction in AOP. They might not be used depends on conditions of waste water as we usually decide it according to the result of pre test.

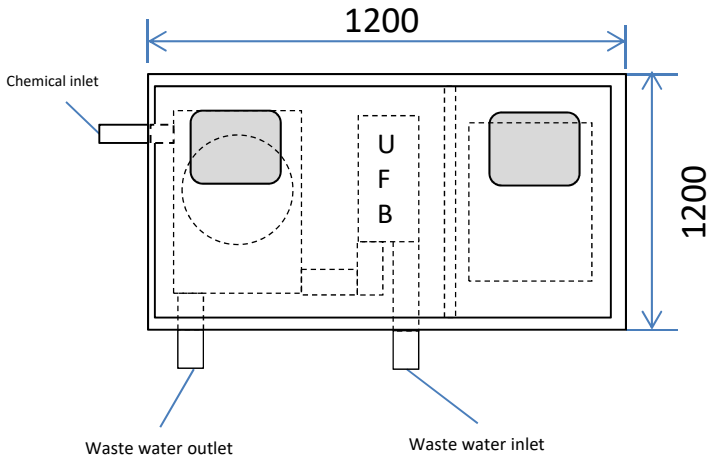
This electrode is the type to sink in water. Unitized electrode is less power consumption.
Electrode of cylinder shape can electrolysis efficiently as its surface area is wide.
Since electrode is independent, material of electrode can be chosen by condition of waste water.
Further more, there is enough space to set up sludge removal device on the top space of the tank inside.

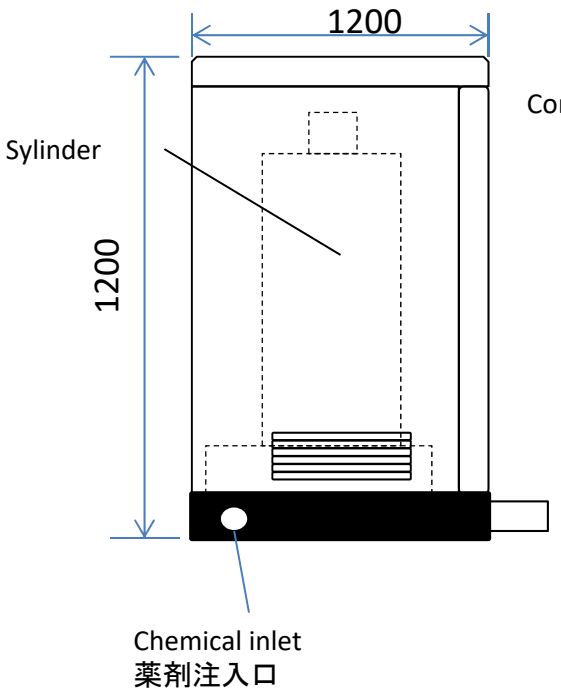
AOP2.0　Hybrid Type

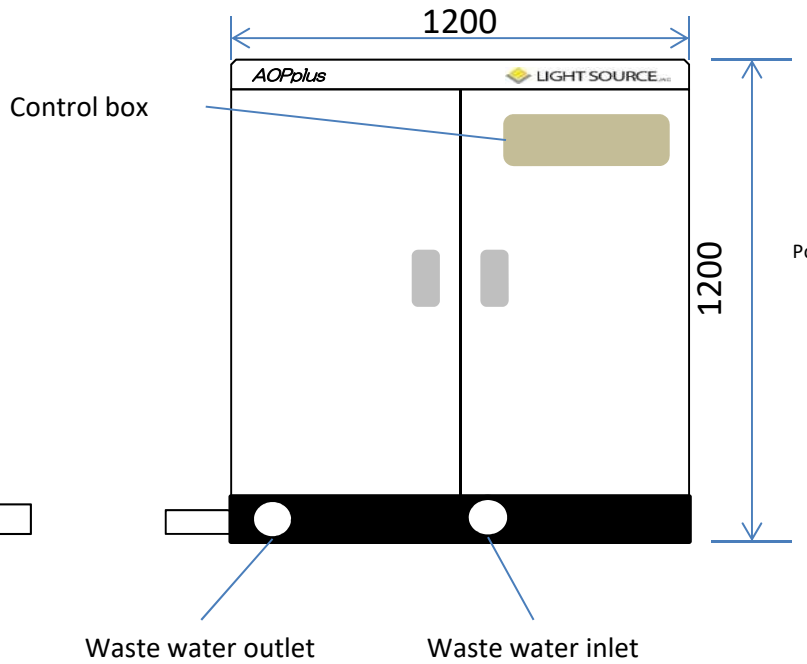


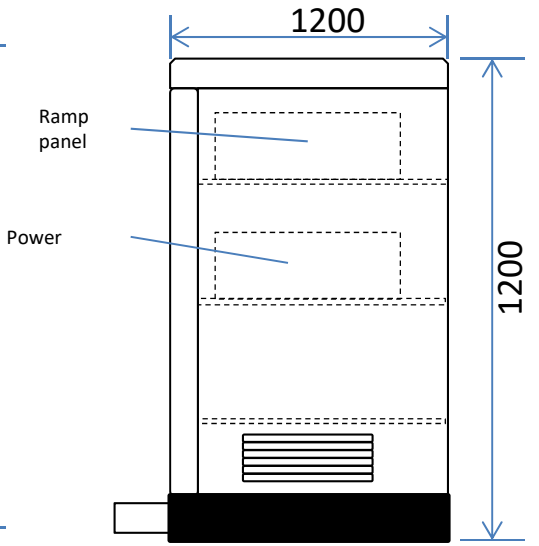
AOP+ Hybrid Type Appearance











■AOP2.0 Specifications

AOP⁺		Reference
Size	800(W)×800(D)×1200(H)	
Method	AOP(Accelerate oxidation methed促進酸化法)・Photocatalyst・O3 oxidation method etc.	
Conponents	AOP⁺(Controler)・AOP⁺Sylinder・Photocatalyst excited power・Power supply for electrolysis・UV ramp controler・pH meter・pH electrode・UFB GENETATOR ※Pump for chemical injecton(30mℓ/min)	※Pump for chemical injection might not be used depends on conditions.
Capacity	※3000m³/h Suspended solids(SS)of dye effluent reduce to under 20mg/L from 100mg/L .	染色排水 SS100mg/LをSS20mg/L以下にする時の能力となります。

Pump ,piping materials and electric materials are not including in the list below.

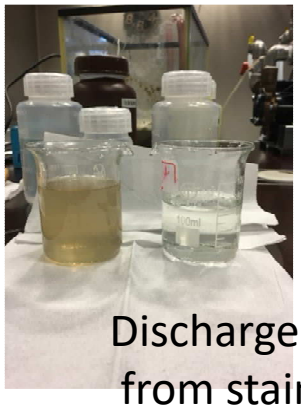
Electrode・Reactin tank		Reference
Size of electrolysis unit	700(W)×700(D)×150(H)	※4sets for tank of 5000m3
Electrode	Cu:ϕ10㎜×10sets AL:ϕ10㎜×10sets ※4sets	
Reaction tank	5000m³	2000(W)×2000(D)×1600(H)

AOPplus　OWES

Wast oil before treatment

廃油

AOPplus処理後凝集沈殿



Discharge liquir from staining factory染色排水

Waste solution from factor

Before teatment

After treatment of aggregation by AOPPlus.

処理後凝集沈殿

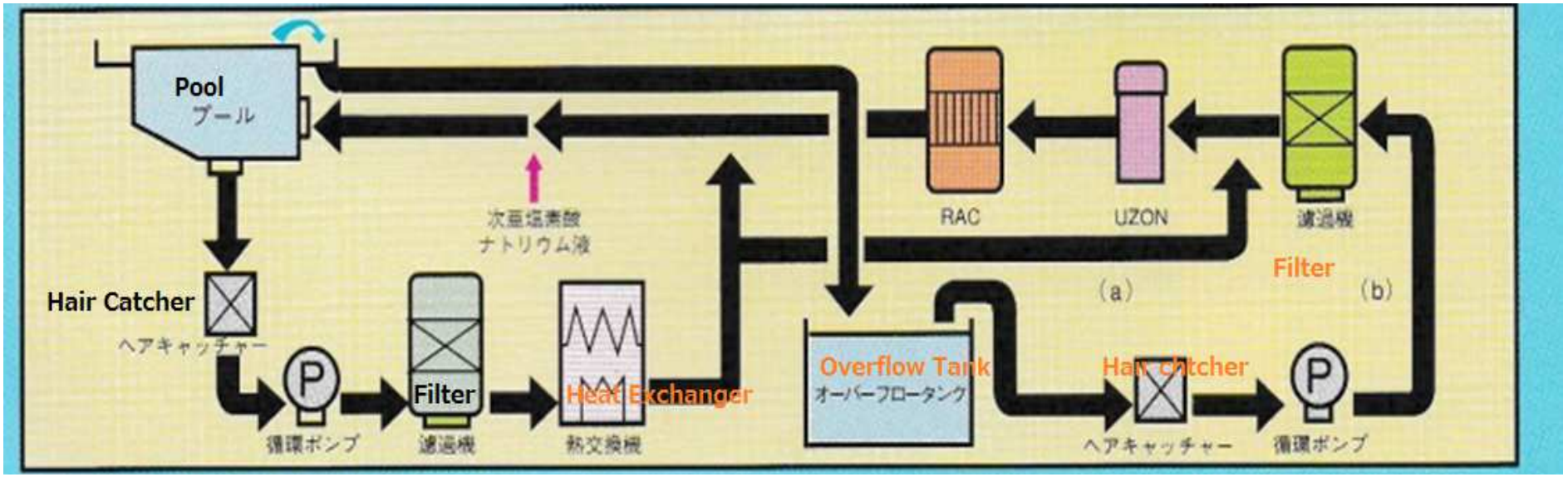
■ Treatment time(reference)

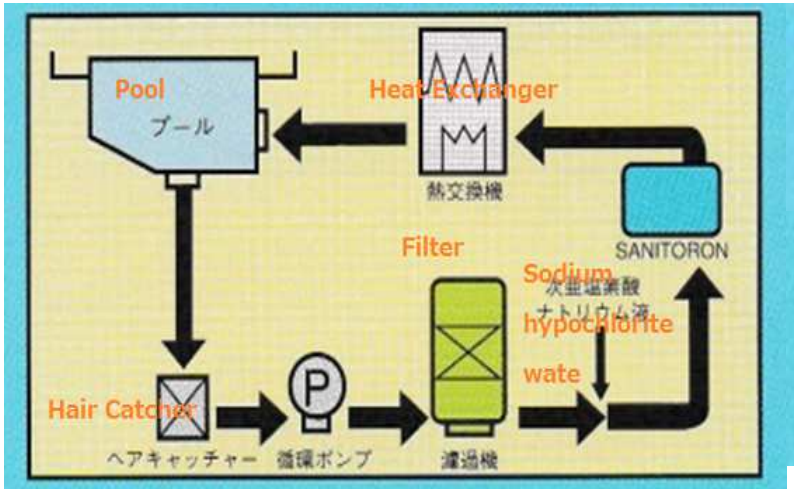
1 Batch ＝500L～1t　Reaction time is 30 minutes
Treatment time ＝45minuts to 60minutes including the time pouring water

■Consumables

Items	Purpose	Consumption Amount/time
Dilute sulfuric acid(H_2SO_4)	pH adjustment	Proper amount
Caustic soda(NaOH)	pH adjustment	Proper amount
Hypochlorous acid soda(NaClO)	Reaction	1.5L
Power consumption(Pump is not including	—	About 7000W/h
ElectrodeCu　700L　40sets	Electrolysis	3～6months
Electrode Al　700L　40sets	Electrolysis	3～6months
UV Lamp 80W	AOP^+	8,000h

■Process flow scheme of UV．紫外線を使用した水質維持フロー(Reference)





UZON+RAC (a) 主循環水処理法　(b) オーバーフロー水処理法

(a)Main Flow　(b) Overflow water flow

SANITRON+塩素

Chlorine

(注) Note

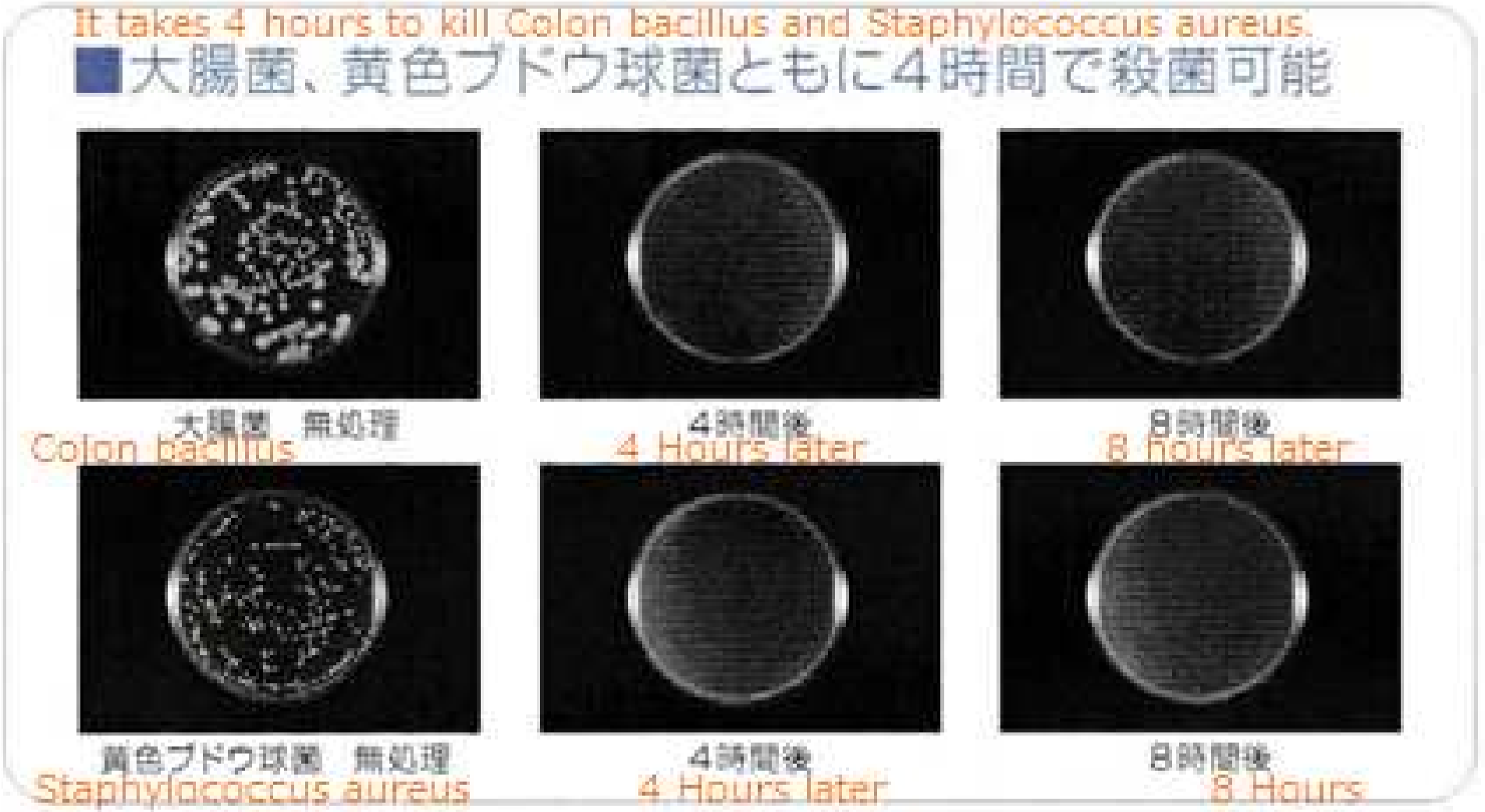
UZON :紫外線オゾン併用処理装置 UV and O3 terilizer

SANITRON(H) :紫外線流水殺菌装置 UV sterilizer

RAC 光分解装置 Photolysis equipment

■ Sterilization test Results of UV for bacillus 紫外線の菌類への効果

(Reference)



■ Steralization test Results of Light catalyst　for bacillus 光触媒の菌類への効果(Reference)