

※ DO NOT COPY WITHOUT PERMISSION

MAX NANO BUBBLE

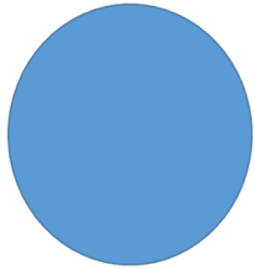
-Make a sustainable city-

YAMAGEN MT & T (S) PTE. LTD.

MAX NANO BUBBLE can minimize water bubble

The Nano bubble is invisible, non-floatable, non-breakable and change water's nature around the bubble.

Water bubble's floating speed
(The time to float 1m)



Normal bubble
(Diameter 0.5mm or more)
About 8sec

Micro bubble
 $1 \mu\text{m} =$
 $1/1,000\text{mm}$



Micro bubble
(Diameter 10-100 μm)
About 12min

Ultra fine bubble
 $1\text{nm} =$
 $1/1,000,000\text{mm}$



Ultra fine bubble
(Diameter 50-500nm)
About 2years



Non-floatable

Ultra-fine seepage water is

Huge amount of tiny bubbles are generated, water gets to enable bacteria and creatures to take oxygen efficiently.

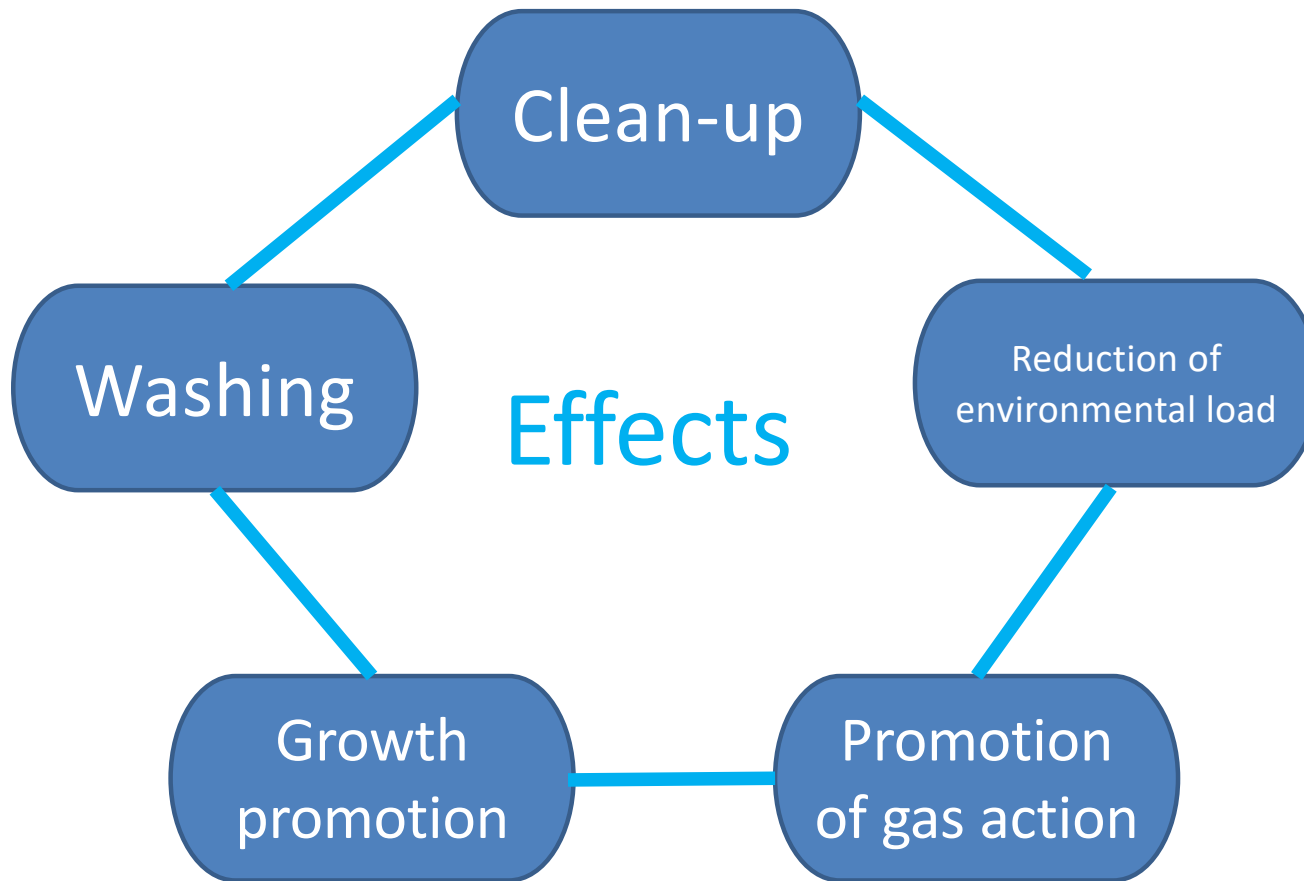
The effect does not change even if bubbles cannot be observed over time.

Ultra fine bubble enhances water's functions






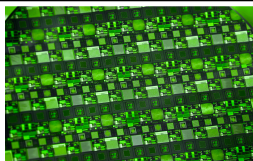


『Dissolve + Penetrate + Peel + Flow』

Electrical effect	Bubbles' surface is negative. Most of dirt are positive, thus, bubbles absorb them.
Impact pressure effect	The smaller the bubble size, the higher the internal pressure and the larger the shock wave associated with the bubble collapse.
Surfactant effect	It is more permeable and allows liquids and air bubbles to spread to every corner.
Sustainable effect	Nano-sized bubbles are stable and stay in the liquid for a long period of time, so that the effect of the gas lasts.

Uses of Ultra fine bubble



Uses of Ultra fine bubble examples

Environment	Agriculture	Foods	Fisheries
 <ul style="list-style-type: none"> - Soil purification - Ground water purification - Waste water treatment - Sludge volume reduction - Decomposition of harmful substances - Algae removal 	 <ul style="list-style-type: none"> - Agricultural products' <ul style="list-style-type: none"> ✓ Promotion of growth ✓ Increase of yield ✓ Improvement of quality - Preservation of freshness - Liquid fertilizer 	 <ul style="list-style-type: none"> - Improvement of quality - Prevention of oxidation - Adding flavor - Adding texture - Adding fragrance 	 <ul style="list-style-type: none"> - Marine products' <ul style="list-style-type: none"> ✓ Promotion of growth ✓ Increase of yield ✓ Improvement of quality - Improvement of aquaculture environment - Preservation of freshness
Clean-up	Industrial area	Beauty	Others
 <ul style="list-style-type: none"> - Cleaning toilet - Cleaning production lines - Salt damages' measures - Piping dirt removal - Washing machine - Vegetable and fruits 	 <ul style="list-style-type: none"> - Precision peeling - Thin film separation of Silicon wafer 	 <ul style="list-style-type: none"> - Spa - Face and head washing - Nano-technology cosmetics - Showerheads 	 <ul style="list-style-type: none"> - Medical care - Pharmaceuticals - Ships - Papermaking - Daily necessities - Energy - Aquarium

Ultra fine bubble is environmentally friendly and can clean and wash without using chemicals.

Realize a sustainable city with MAX NANO BUBBLE

MAX NANO BUBBLE can be used in several industries.

<All industries>

- Treat waste water
- Reduce consumption of detergent
- Maintain cleanliness of toilets

<Parks, fish farms and aquariums>

- Improve water condition where aquatic lives

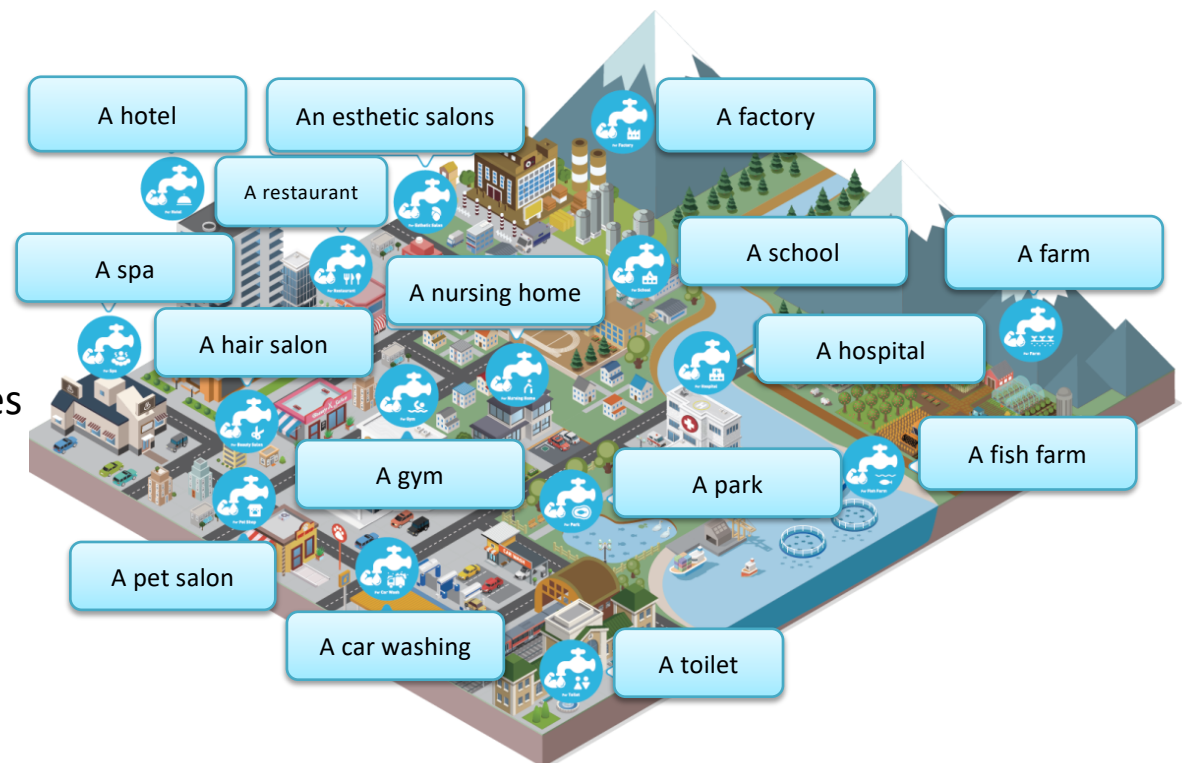
<Agriculture>

- Improve harvest

<Hair Salons>

- Improve hair condition

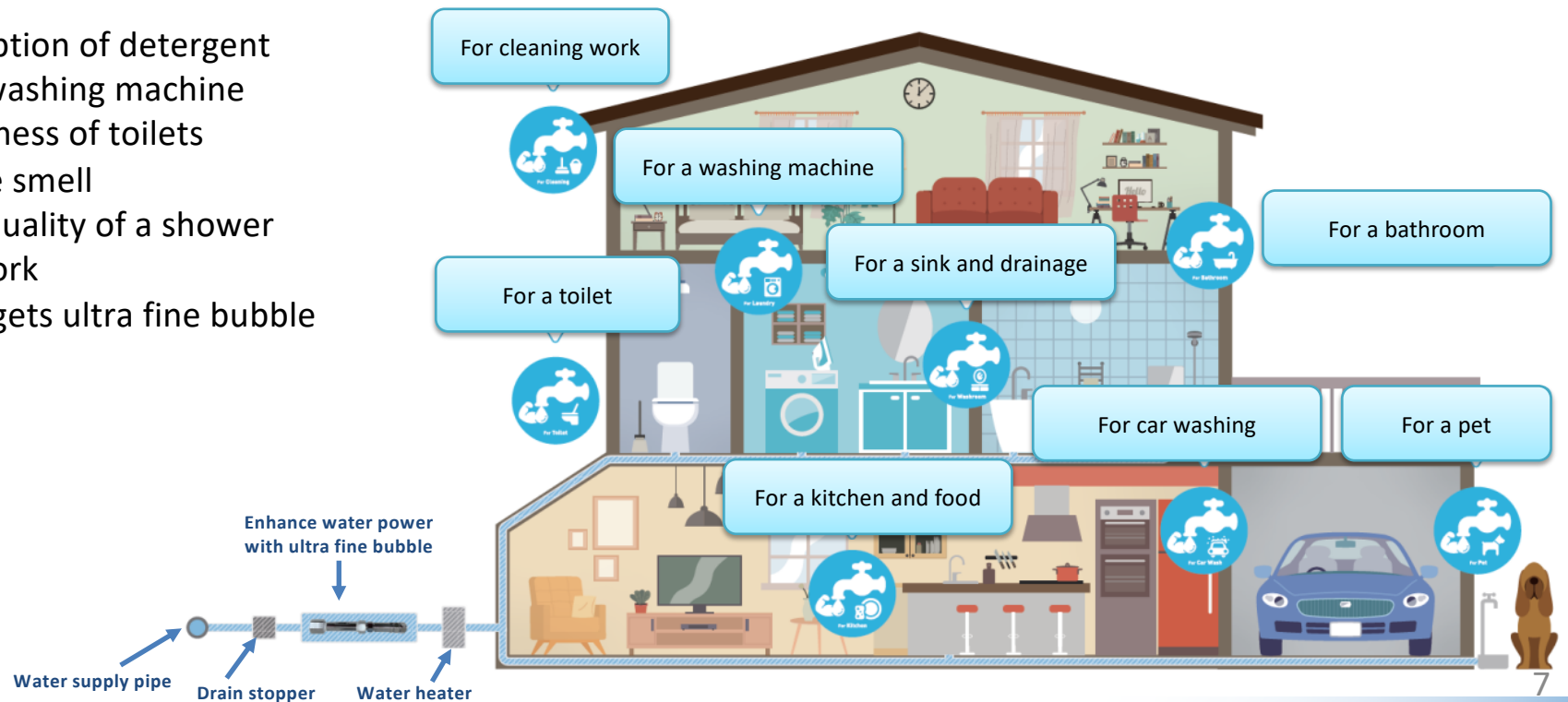
The water containing ultra fine bubble goes to sewage and



Make a sustainable house

Ultra fine bubble enhances water's power and gives lots of benefits to make sustainable.

- Reduce consumption of detergent
- Clean inside of washing machine
- Maintain cleanliness of toilets
- Reduce drainage smell
- Improve water quality of a shower
- Ease cleaning work
- The bath water gets ultra fine bubble



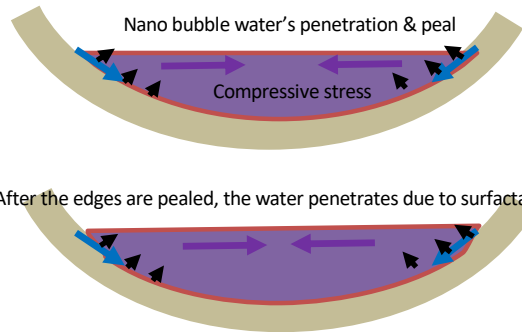
Unity calculus removal test with MAX NANO BUBBLE



Run water overall



Fully peeled



After the edges are peeled, the water penetrates due to surfactant effect.

After ultrafine bubble water flow on the surface, unity calculus collapses slowly.

Normal water can't break unity calculus.

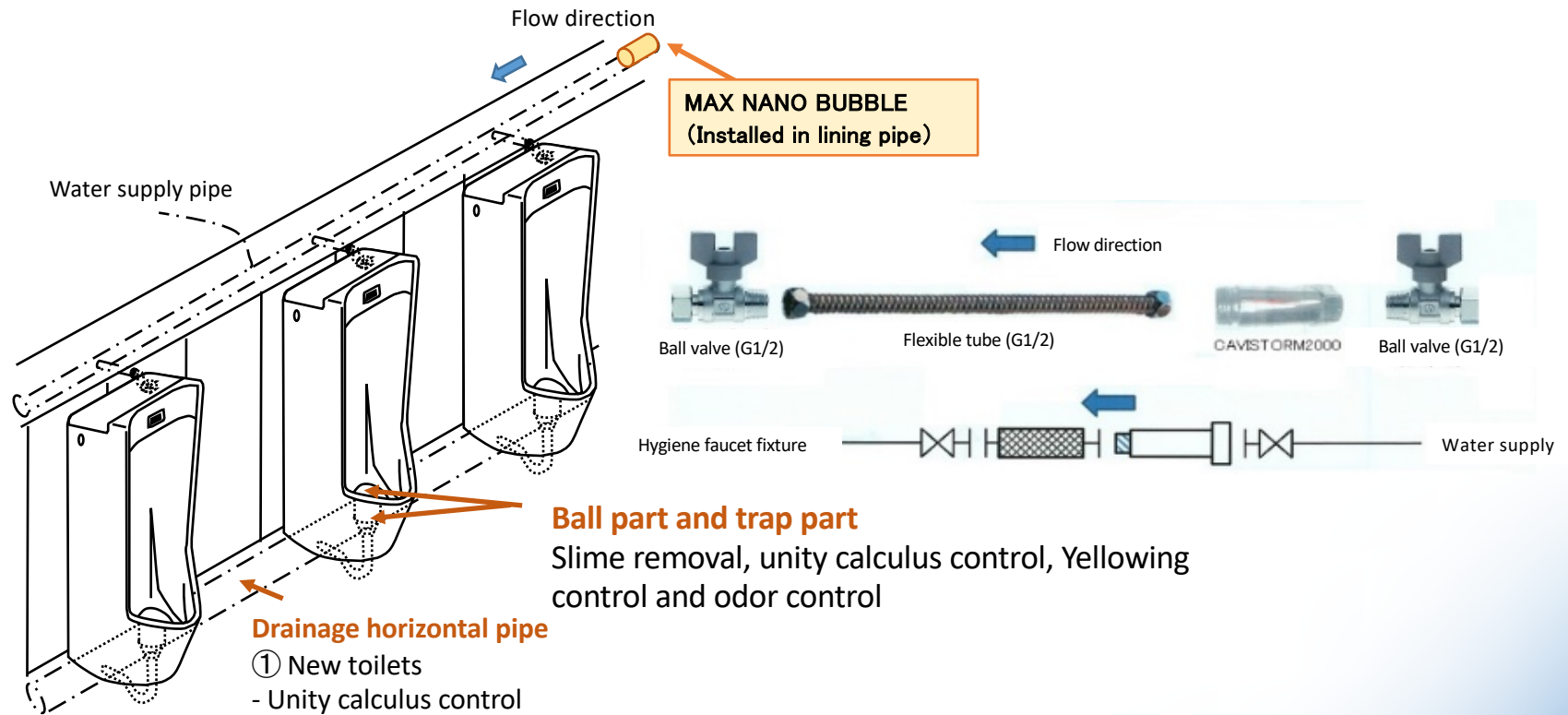
6L/min of water flow for 100hours peeled the layer of unity calculus from PVC piping.

* Even the piled layer of unity calculus is peeled, it doesn't choke drain pipes because the slope of horizontal pipe is small.

* The growth of unity calculus is caused by bacteria staying on the surface. The source of odor is also caused from the surface.

⇒ **MAX NANO BUBBLE can prevent odor and growth of unity calculus by removing the surface.**

Toilet cleaning's effect with MAX NANO BUBBLE WATER (JR EAST)

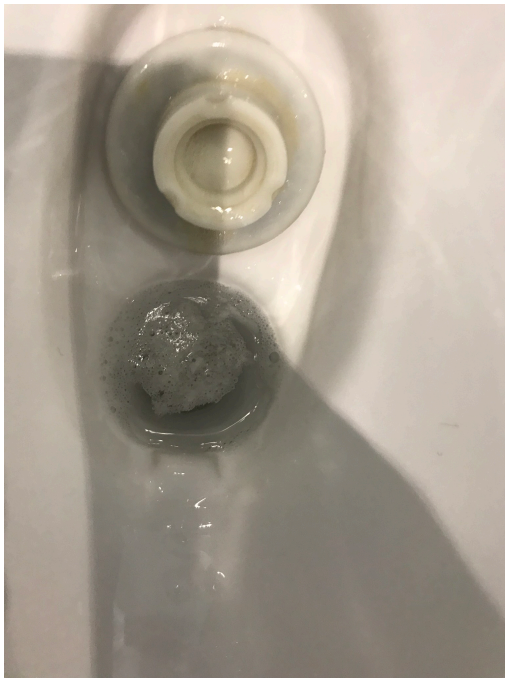


① New toilets
- Unity calculus control

② Existing toilets
 • Peel and removal of piled unity calculus
 • Slime on the surface of unity calculus → Odor control

Result of toilets in Kawasaki station of JR EAST

Without Nano bubble



After 18months with Nano bubble
(Photo taken in May 2019)



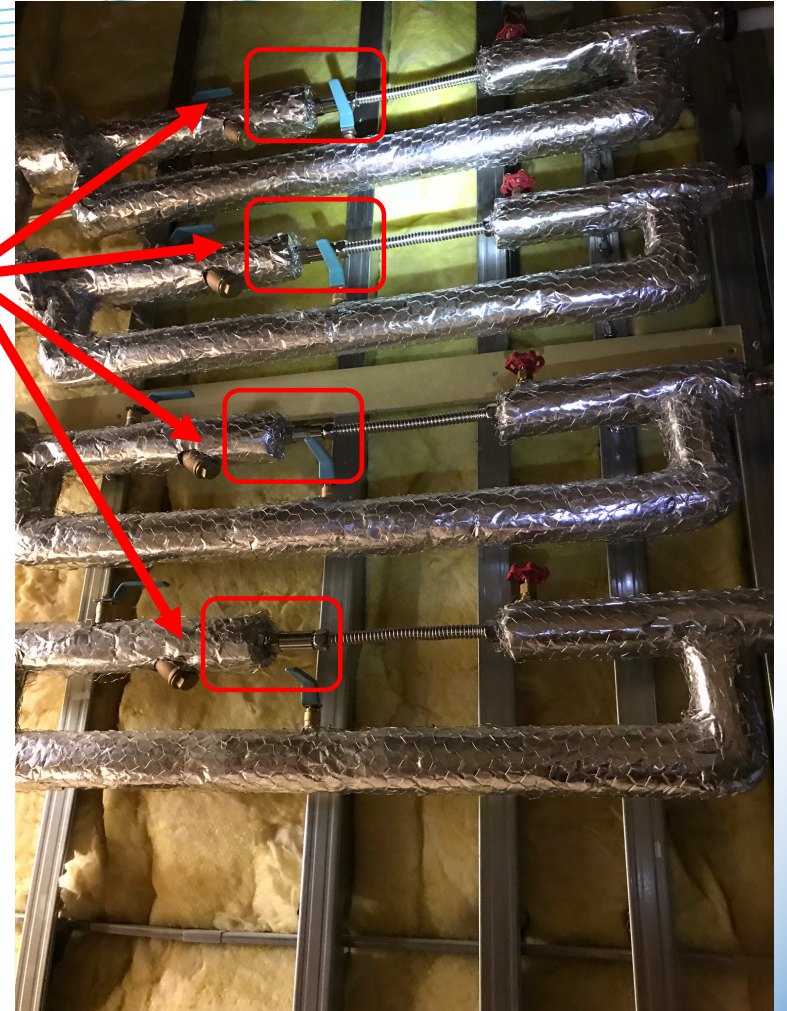
MAX NANO BUBBLE was installed in Nov 2017

Checked the condition in May 2019
No dirt, No yellowing

JR EAST MAX NANO BUBBLE



Nano bubble nozzle



MAX NANO BUBBLE was installed in new toilet of Kawasaki station in Nov 2017

- 1pc for 1 closet bowl
- 1pc for 5 urinals (→water flow is low)

Improvement with MAX NANO BUBBLE



Shikinaen in Okinawa



Improvement with MAX NANO BUBBLE

Pond condition changed about 1.5 months after nanobubble operation

On-site investigation
in June 2019

Oxygen concentration : 2PPM

Black beard algae
destroyed the scenery



Shikinaen in Okinawa

Nov 2019 – Feb 2020
No black beard algae

Improvement with MAX NANO BUBBLE

Installed in a farm for improvement of Dissolved oxygen amount and measures against sterilization.

Before and after of MAX NANO BUBBLE installation : Seawater pool (Volume: 50t, 5m*10m, Depth 1m)



The water is muddy.



After MAX NANO BUBBLE installation, the water transparency improved.

Improvement with MAX NANO BUBBLE

Installed in Okinawa Kodomonokuni

Before and after of MAX NANO BUBBLE installation in a pond (Volume: about 73,000m³)



On-site investigation
Oxygen concentration : 3.8PPM



After MAX NANO BUBBLE installation, water condition improved in about 2months.
Transparency improved so that the bottom of the pond got visible.
Oxygen concentration : 8.2PPM

Ozone water & Ultra fine bubble collaboration

Using MAX NANO BUBBLE with Ozone water, these effect is available.

1. Prevention of biofilm adhesion in piping

> By flowing ozone water inside piping, adhesion of rust and bacteria can be controlled.

2. Reduce of industrial waste (sludge)

> Nano bubble water is so effective that sludge volume can be reduced.

EX) Mayonnaise manufacturing plant

Sludge volume before and after installation of Nano bubble system

Before : 1200kg

After : 900kg

* Reduction of industrial waste disposal costs (JPY20/kg)

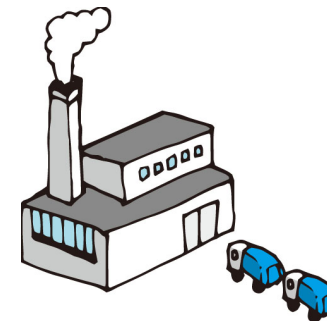
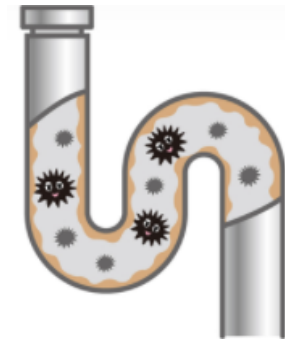
3. Hygiene measures

> Hand wash with ozone water prevents rough hands.

Water and sanitizer cost is reduced (Alcohol sanitizer is not necessary).

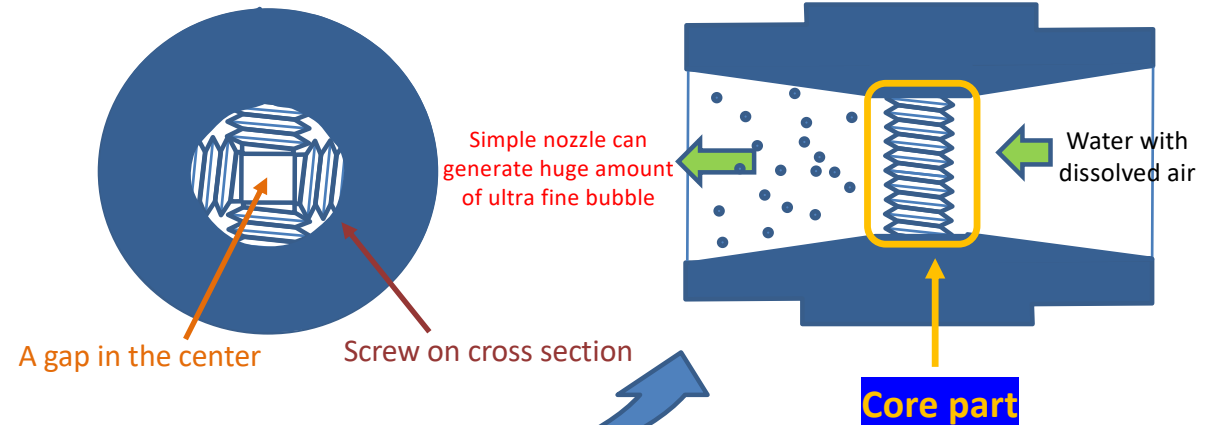
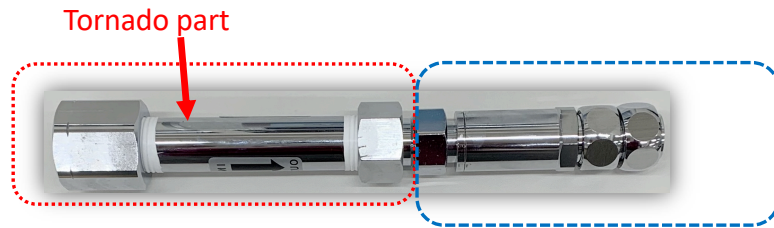
4. Pest control

> Ozone water can prevent the breeding of cockroaches by decomposing pheromones which are essential for their breeding activities.



MAX NANO BUBBLE is the smallest ultra fine bubble

The special nozzle generates huge amount of ultra fine bubbles.

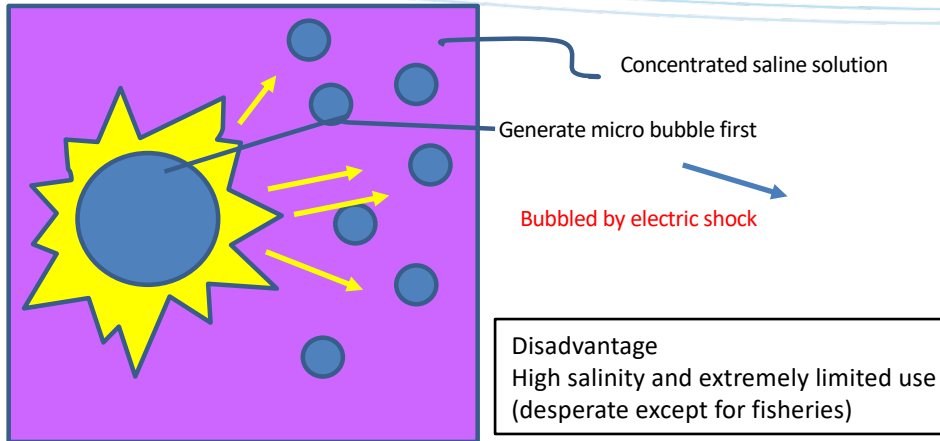


Built-in high quality core
Generating smaller bubble in tap water and adding speed to push into the pipe.
The inside of the nozzle is simply configured.
The mechanism is such that water flows smoothly. (Hard to get stuck).

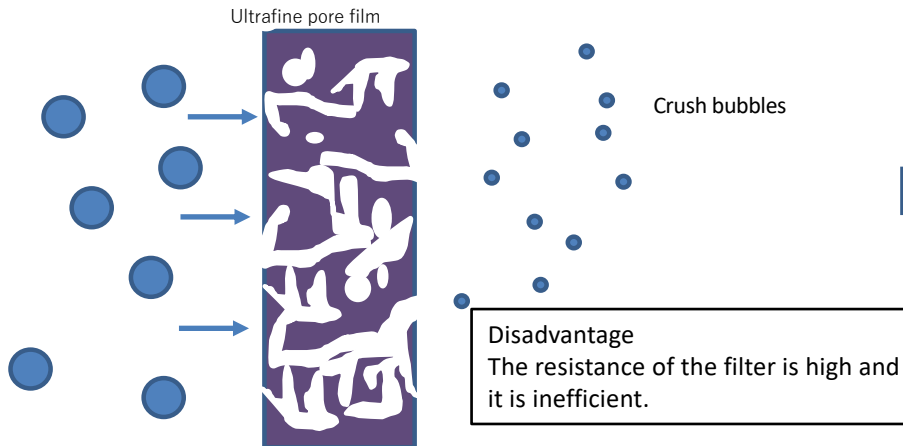
◆ Easy installation ◆ Compact and high performance ◆ Reasonable

Other company's products

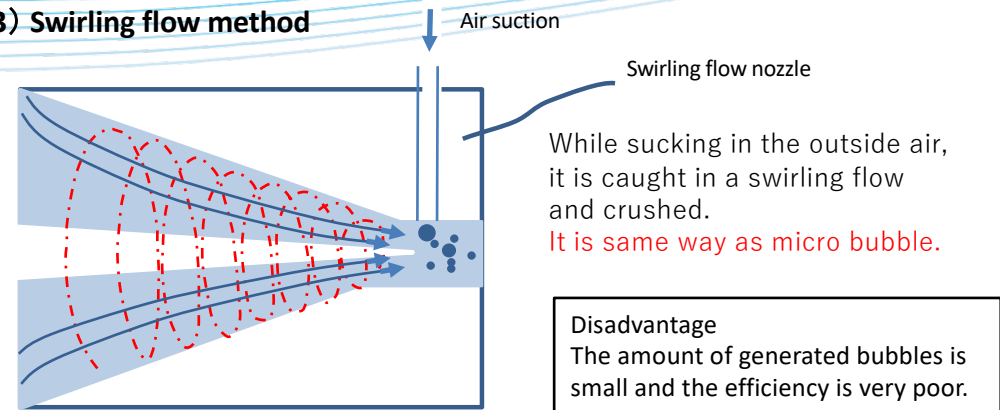
(1) Micro bubble crushing method



(2) Micropore crushing method



(3) Swirling flow method

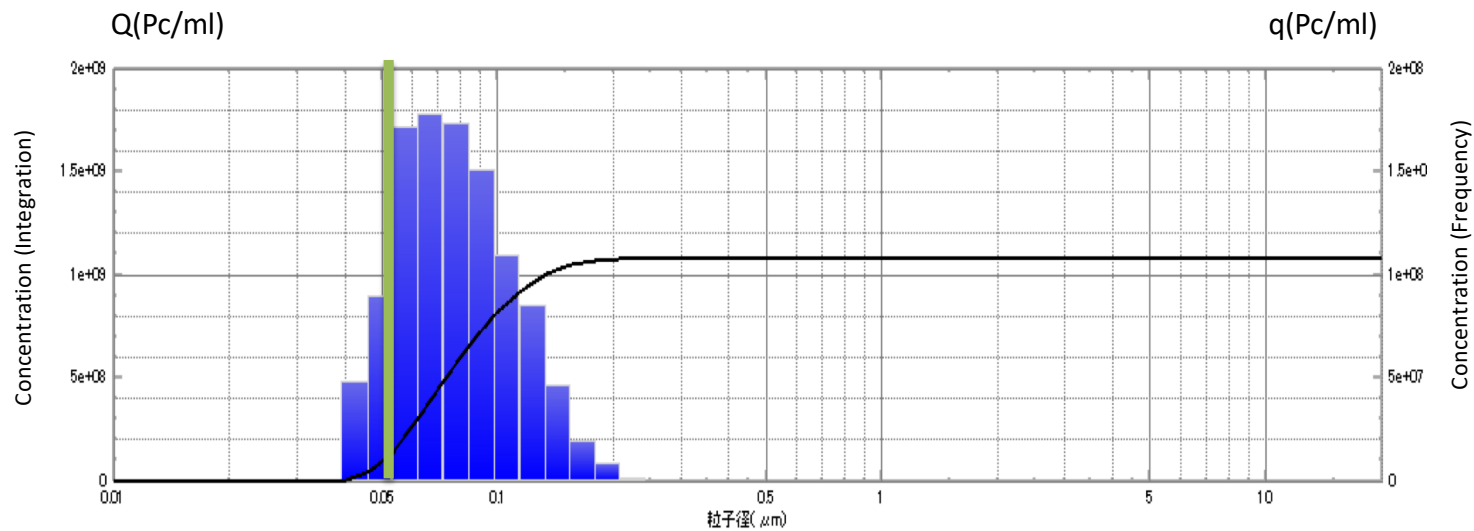


These machines are very expensive.

It is hard to provide water containing huge amount of ultrafine bubbles at low cost.

Measurement result of bubble size of MAX NANO BUBBLE No.1

Current measuring instruments cannot measure bubbles smaller than nano size.



	Particle size X (μm)	Integration Q (pc/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q (pc/ml)
1	20.000	1084226895	0	14	2.772	1084226895	0	27	0.384	1084226834	257	40	0.053	139806649	89978267
2	17.179	1084226895	0	15	2.381	1084226895	0	28	0.330	1084226577	46754	41	0.046	49828382	48576906
3	14.757	1084226895	0	16	2.045	1084226895	0	29	0.283	1084179823	374289	42	0.039	1251477	772781
4	12.676	1084226895	0	17	1.757	1084226895	0	30	0.243	1083805534	1474162	43	0.034	478695	408258
5	10.888	1084226895	0	18	1.509	1084226895	0	31	0.209	1082331371	8970996	44	0.029	70438	0
6	9.352	1084226895	0	19	1.296	1084226895	0	32	0.180	1073360376	19548793	45	0.025	70438	0
7	8.034	1084226895	0	20	1.113	1084226895	0	33	0.154	1053811583	46037460	46	0.021	70438	0
8	6.901	1084226895	0	21	0.956	1084226895	0	34	0.133	1007774123	84830383	47	0.018	70438	0
9	5.927	1084226895	0	22	0.821	1084226895	0	35	0.114	922943740	109065358	48	0.016	70438	0
10	5.091	1084226895	0	23	0.706	1084226895	0	36	0.098	813878382	151264426	49	0.014	70438	0
11	4.373	1084226895	0	24	0.606	1084226895	0	37	0.084	662613956	173040409	50	0.012	70438	0
12	3.757	1084226895	0	25	0.521	1084226895	0	38	0.072	489573548	177988722	51	0.010	70438	70438
13	3.227	1084226895	0	26	0.447	1084226895	61	39	0.062	311584825	171778176				

Niigata Prefectural Industrial Technology Research Institute from Shimadzu Corporation
Fine bubble diameter measurement system "SALD-7500"



Measurement condition
Water pressure : 0.1Mpa
Water type: Ultrapure water
Oxygen concentration : 5mg/l

Measurement result of bubble size of MAX NANO BUBBLE No.2

	Particle size X (μm)	Integration Q (pc/ml)	Frequency q(pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q(pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q(pc/ml)		Particle size X (μm)	Integration Q (pc/ml)	Frequency q(pc/ml)
1	20.000	1084226895	0	14	2.772	1084226895	0	27	0.384	1084226834	257	40	0.053	139806649	89978267
2	17.179	1084226895	0	15	2.381	1084226895	0	28	0.330	1084226577	46754	41	0.046	49828382	48576906
3	14.757	1084226895	0	16	2.045	1084226895	0	29	0.283	1084179823	374289	42	0.039	1251477	772781
4	12.676	1084226895	0	17	1.757	1084226895	0	30	0.243	1083805534	1474162	43	0.034	478695	408258
5	10.888	1084226895	0	18	1.509	1084226895	0	31	0.209	1082331371	8970996	44	0.029	70438	0
6	9.352	1084226895	0	19	1.296	1084226895	0	32	0.180	1073360376	19548793	45	0.025	70438	0
7	8.034	1084226895	0	20	1.113	1084226895	0	33	0.154	1053811583	46037460	46	0.021	70438	0
8	6.901	1084226895	0	21	0.956	1084226895	0	34	0.133	1007774123	84830383	47	0.018	70438	0
9	5.927	1084226895	0	22	0.821	1084226895	0	35	0.114	922943740	109065358	48	0.016	70438	0
10	5.091	1084226895	0	23	0.706	1084226895	0	36	0.098	813878382	151264426	49	0.014	70438	0
11	4.373	1084226895	0	24	0.606	1084226895	0	37	0.084	662613956	173040409	50	0.012	70438	0
12	3.757	1084226895	0	25	0.521	1084226895	0	38	0.072	489573548	177988722	51	0.010	70438	70438
13	3.227	1084226895	0	26	0.447	1084226895	61	39	0.062	311584825	171778176				

The chart shows that lots of bubbles are smaller than 100nano.

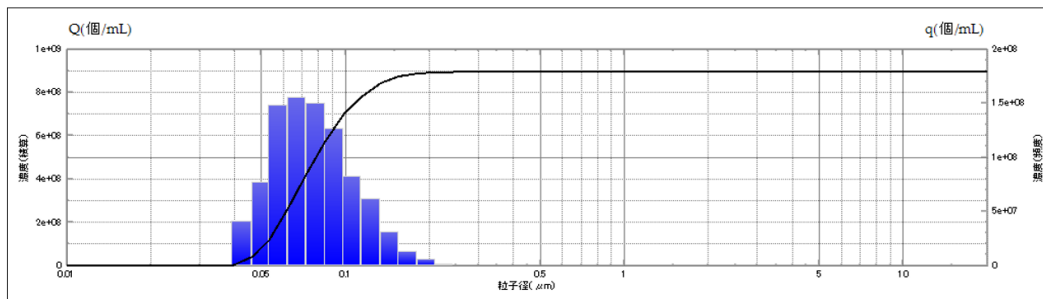
(Number of the small bubbles is about 800million)

(Number of measurable nano-sized bubble is about 1billion pcs/cc)

According to the achievement that unity calculus is peeled from PVC piping, we expect that pico-sized bubble which can't be measured work for this effect.

Measurement result of bubble size of MAX NANO BUBBLE No.2 (1week later)

Even 1week later, huge amount of ultra fine bubbles can be measured.



*Niigata Prefectural Industrial Technology Research Institute left MAX NANO BUBBLE water for 1week and measured.
Date : 22nd Dec 2021

	Particle size X (μm)	Integration Q (μm³/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (μm³/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (μm³/ml)	Frequency q (pc/ml)		Particle size X (μm)	Integration Q (μm³/ml)	Frequency q (pc/ml)
1	20.000	897200026	0	14	2.772	897200026	0	27	0.384	897056131	346	40	0.053	119822497	77375260
2	17.179	897200026	0	15	2.381	897200026	0	28	0.330	897055785	61003	41	0.046	42447237	41440403
3	14.757	897200026	0	16	2.045	897200026	1	29	0.283	896994782	357375	42	0.039	1006834	658795
4	12.676	897200026	0	17	1.757	897200025	65	30	0.243	896837407	1327761	43	0.034	348039	348039
5	10.888	897200026	0	18	1.509	897199960	200	31	0.209	895309647	6141164	44	0.029	0	0
6	9.352	897200026	0	19	1.296	897199760	4071	32	0.180	889168483	13156519	45	0.025	0	0
7	8.034	897200026	0	20	1.113	897195689	13334	33	0.154	876011963	30981728	46	0.021	0	0
8	6.901	897200026	0	21	0.956	897182355	33255	34	0.133	845030235	61788443	47	0.018	0	0
9	5.927	897200026	0	22	0.821	897149100	40286	35	0.114	783261793	82966090	48	0.016	0	0
10	5.091	897200026	0	23	0.706	897108814	35160	36	0.098	700395703	126887945	49	0.014	0	0
11	4.373	897200026	0	24	0.606	897073654	13602	37	0.084	573507757	149630057	50	0.012	0	0
12	3.757	897200026	0	25	0.521	897060052	3663	38	0.072	423877700	155785360	51	0.010	0	0
13	3.227	897200026	0	26	0.447	897056389	258	39	0.062	268092339	148269842				

In addition, the chart shows the number of ultra fine bubble increased from just after measurement

Why ultra fine bubble increased in 1week is ...

We expect that there are lots of minimum sized bubbles which can't be digitalized even with high-performance measurement system in MAX NANO BUBBLE and the measurable bubbles increase due to these bubbles' combination.

After water bubble is minimized

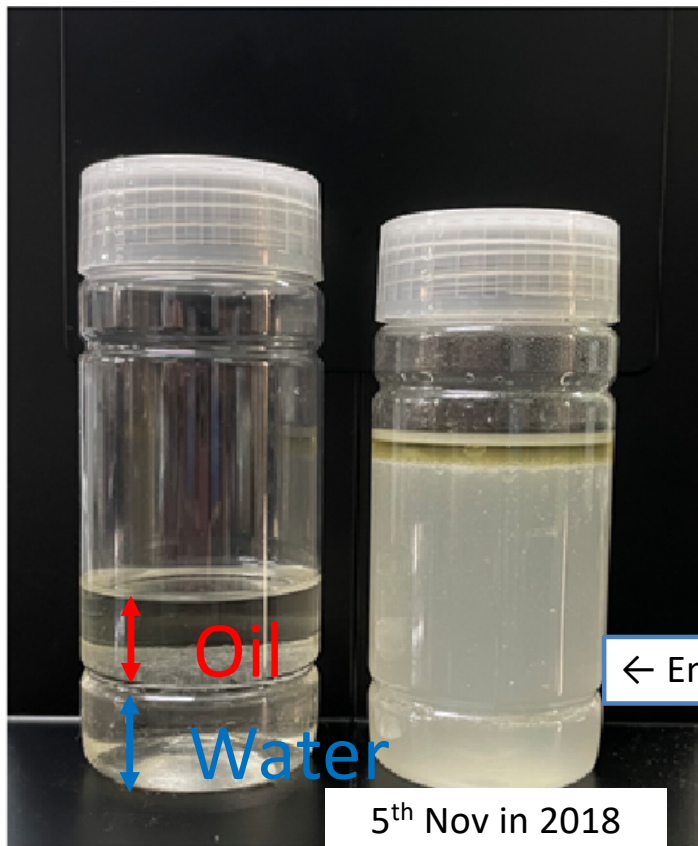
Excellent characteristic of our MAX NANO BUBBLE

Only Minimized
bubble can do

Generally, water and oil is separated quickly without surfactant and emulsifier.

However, in case of mixing MAX NANO BUBBLE water and oil, it is emulsified for long time.

(5th Nov in 2018)



5th Nov in 2018

← Emulsifying

Specification of MAX NANO BUBBLE

*We suggest proper type according to uses and environments

Dissolved air of tap water becomes cavitation. Cleaning effect improves without chemical.

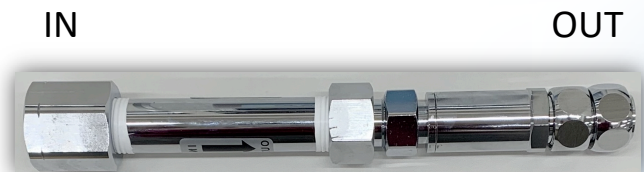
Item name	MAX NANO BUBBLE
Installation	Connecting with water piping
Water pressure	More than 0.1MPa
Water flow	6~25L/min
Temperature	0~40°C
Material	Brass POM SUS304
Connection diameter	Parallel screw for pipe
Size	Length: 22.7 cm
Weight	521g
Inspection	Passed leachability test
Lifespan	About 7years with tap water and once 2years maintenance * In case of about 23.1m ² /month. * It is changed depending on environments and conditions.

Main type is 13mm・20mm

Any sized pipe is connectable with an adapter.

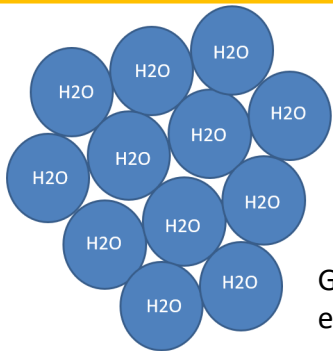
Characteristics

- Simple structure and reasonable (Core part is just 1pc of nozzle)
- Outside air is NOT required for generating ultra fine bubble.
- With normal water pressure can generate 1,000 to 10,000 times as the density of the conventional method of ultra fine bubble.
- Just one nozzle can treat up to 100L/min of water.

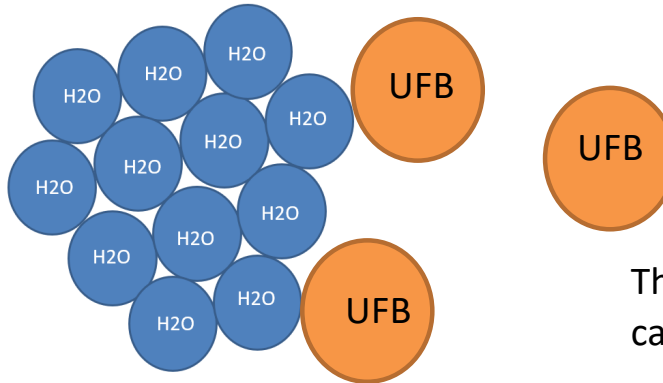


Difference between MAX NANO BUBBLE and other products

Other ultra fine bubble

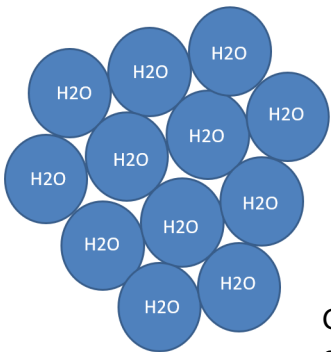


Generally, water is attached to each other.



The size of normal ultra fine bubble can't get in between water molecules.

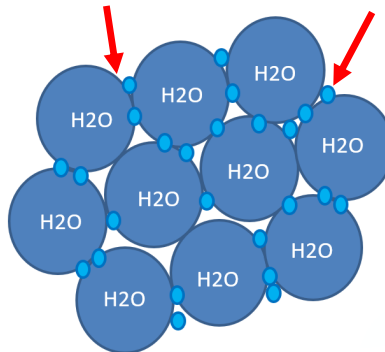
MAX NANO BUBBLE



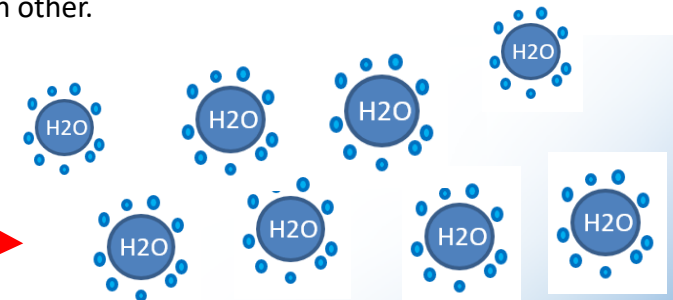
Generally, water is attached to each other.



Bubbles of MAX NANO BUBBLE is very small so they can get in between water molecules.



Bubbles of MAX NANO BUBBLE adhere around water molecules to prevent water molecules from sticking to each other.

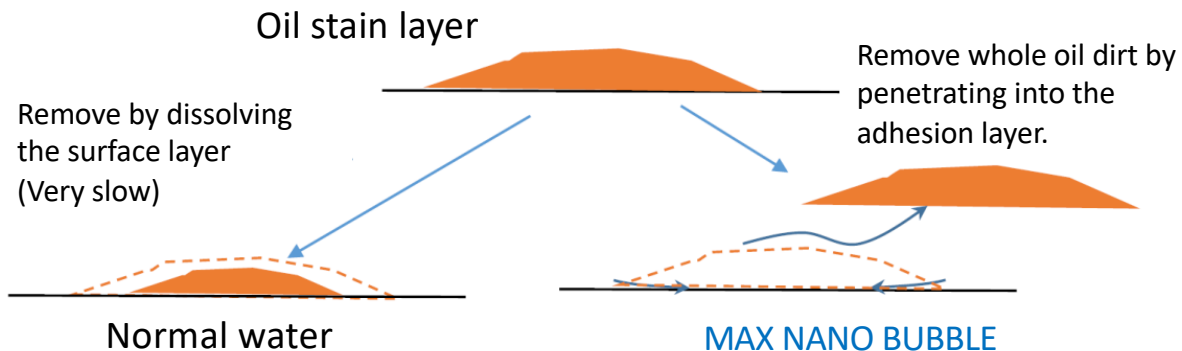


Only MAX NANO BUBBLE can settle some problems

MAX NANO BUBBLE can generate the smallest ultra fine bubble.

Bubble itself is tiny, thus, adhere around water molecules to prevent water molecules from sticking to each other.

That's why, it can not only clean surface of unity calculus but also completely remove whole unity calculus by penetrate in the adhering surface.



MAX NANO BUBBLE can enhance detergency

MAX NANO BUBBLE can enhance detergent's effect and save the consumption of detergent. Especially, Super Ionized Alkaline Water "JAQUAS" can work with MAX NANO BUBBLE very well and realize safe, economical and environmental friendly cleaning.





PRESENTED BY: **YAMAGEN MT & T (S) PTE. LTD.**

205 Balestier Road #02-06 The Mezzo
SINGAPORE 329682

E-mail: yamagasuke@icloud.com

Website: <http://www.j-wayves.com/>