

Electrostatic applied !

ECO Friendly!

SUPRION®

WATER TREATMENT DEVICE

- Not Magnetic ! No Elec.Power, No Chemicals
- Epoch-making self-generating static electricity applied
- Enhance hydrating between water molecules and dissolved things
- Suppress Lime-Scale, Corrosion and Slime in the system
- For good Heat Exchange and stable Productivity
- Result in high Energy-saving and less Chemical emission



 **SUNWARD CO., LTD.**

Japanese Patent No. 3,097,813 and Patents pending
US Patent No. 5,480,522, 6,165,339 and Patents pending
European Patent No. 0661237, 0773191 and Patents pending
Also patented in Asian countries
Japan Water Works Association certified registry No. Z-84



SUNWARD ^{ECO Friendly!} SUPRION® WATER TREATMENT DEVICE



«INVENTOR of SUPRION»

Mr. J. K. Ibbott (1921~2004) was a scientist born in Australia. After graduation from Hobert University in Australia, he learned electric engineering and mechanical engineering and made a large number of inventions as a production method of piezoelectric crystal. From 1980th, he took an interest in water field and set to develop more perfect water treatment device. After constant efforts of thousand of examinations, in 1995, finally he developed the water tretment device SUPRION applied with static electricity.

Electrostatic applied Water Treatment Device ^{ECO Friendly!} SUPRION®

Scale deposition is a serious problem in water-cooled systems; it reduces efficiency and shortens service life of equipments. Further, scale removal work and shutdown period add unexpected overall system cost. Suprion is a remarkably advanced water treatment device with enhancement of hydrating between water molecules and dissolved materials. It prevents even silica scale along with calcium and magnesium scales which are formed on the heat exchanging equipments, and inhibits corrosion and slimes in the water system.

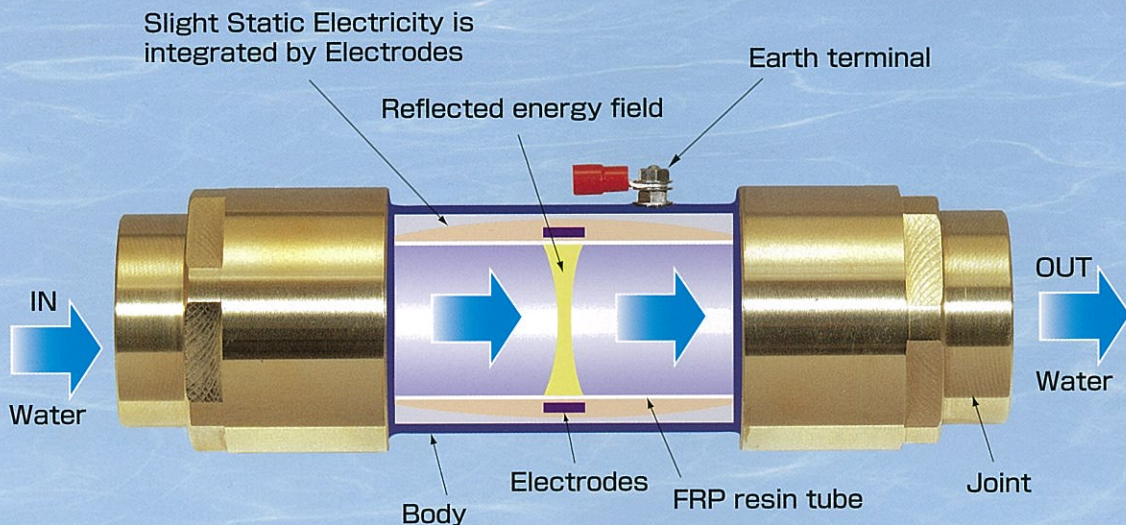
SUPRION is a self-generating electrostatic water treatment device. Slight static electricity by the frictional electrification between the water and plastic tube is integrated by electrodes and certain electrostatic field is provided outside of electrodes, then the energy field is reflected inside of the tube where the all of water pass through.

SUPRION is granted patents in the US, Europe and Asian countries along with Japan. This device can achieve even or higher performance than conventional chemical treatment without any utilities. Less chemicals at upper part provide also less chemicals at lower part for emission. This makes SUPRION an environmentally friendly water treatment device.

There is no direct contact between water and electrode in the construction; thereby it can be operated stable without any performance declining for a long period.

SUPRION, as a reliable water treatment device, is the best choice for your water issues.

Structure



●Nonconductor Resin Tube (Epoxy FRP)

Smooth contact between the tube and water does not impair flow. The resin tube has excellent resistance to corrosion and pressure, and can be operated for a long term with wiping out of grim.

●Electrode

Combined electrode rings with carbon and aluminum are placed around the outer periphery of the resin tube. Because the electrode does not contact with water, the effect can be maintained for long term without any damage or corrosion.

●Body

The body is provided so as to completely seal the electrode chamber from an outside electric field and humidity. Therefore the body/flange is one-size larger than pipe size.

●Joint

Various types as male/female screw type and flange type, depending on the diameter.

●Earth terminal

It is required to release static electricity generated in body. The grounding is not necessary when SUPRION is connected to metallic pipe at either or both joints. The earth terminal is provided on the downstream side of SUPRION, thereby it can be used as a reference of installation, when the arrow label is missing or illegible.

Higher productivity and lower energy loss ! SUPRION for Lime-Scale problems

ADVANTAGEOUS FEATURES OF SUPRION

- Outstanding performance for both high-hardness and -silica water
- Wide range of diameter sizes from 10mm to 450mm (ID, A-size)
- Compact body for In-line installation
- No flow resistance arose for the water path
- Durable against turbulent flow
- Excellent resistance to chemicals and heat (generally usable at 100°C or lower)
- Proof of superior result (scale prevention) even at hot water (90°C) device
- No restriction on flow rate (effective from very low speed to high speed)
- Good results in wide range of applications (see page 4.)
- Free from harmful things for human body like radiation and etc.
- Relatively higher condensation available for Cooling Tower use, without power and chemicals
- Even at the condition where excessive condensation is unavoidable, Scale become porous and easy to be removed.
- Less maintenance work. Only wiping-out or flushing-out of internal stains if necessary.



APPLICABLE FIELD ; as countermeasure for scale, slime, rust

- **Cooling Tower application** ; high concentration available without water issues, without chemicals
 - **Excessive concentration unavoidable** ; Reduce maintenance cost for Boilers, Humidifiers, etc.
 - **No concentration, closed loop circulation** ; Chilling water supply for production facilities, etc.
 - **Hot water boilers** ; One-pass application like gas/heater boilers, etc
 - **Slime issue where bacteria breed widely** ; Pool, Grease trap, Washing water drain, etc.
- ※ large scale Air conditioning facilities, Cooling/Process water in Factories, Restaurants, Home etc.

PROPER HANDLING of SUPRION

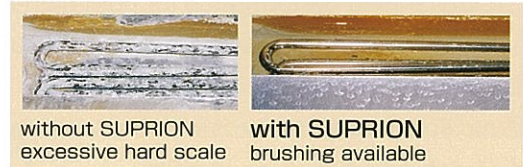
※ Preliminary analysis of supply and circulating water is essential to determine controlling criterion with Suprion.

- 1 Open type Cooling Tower** ; Practical concentration degree is controlled by an automatic blow system.
- 2 Cold and Warm water supply system for Air conditioning** ; Dilute turbidity of system water (like rusty water) with supply water.
- 3 Maintenance of SUPRION** ; It is expected that inside of Suprion is kept always clean and smooth. If stains and dirt are stuck on, they must be removed by chemical cleaning or brushing carefully. Do not use any metal brushes.
- 4 Remarks on handling** ; Secure the earth/grounding connection from earth terminal of SUPRION. No impactive shock and damage to SUPRION.
- 5 SUPRION** is not effective for Algae and Legionella.
- 6 Do not install a SUPRION** in a strong magnetic field like induction coil used equipments. However, the water pass through SUPRION is effective even in such field.

EFFECTS of SUPRION

1 Prevention of scale formation

Hard scale is normally formed when the concentration of water is progressed. SUPRION provides enhancement of hydrating between water molecules and dissolved contents, therefore scale formation can be prevented until relatively higher concentration degree than normal. Concentrated dissolved (scale) contents is discharged by blow control. Operating under higher concentration degree can result in decreasing supply water consumption.



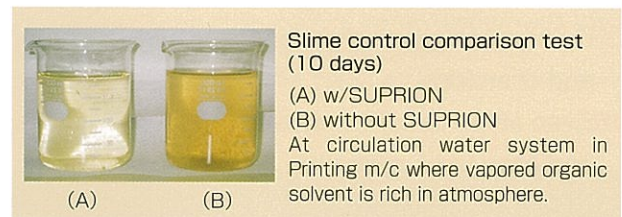
Heater in humidifier unit

2 Corrosion control

The enhancement of hydrating of water molecule provide blockade effect against dissolved oxygen, thereby the activity of oxygen is restrained. As a result, the relations among iron, water and dissolved oxygen are inhibited and the formation of rust is controlled.

3 Slime control

The enhancement of hydrating between water molecule and dissolved oxygen also inhibits bacteria's respiration, which can provide controls of slime multiplication by self-detergent and exfoliation effects.

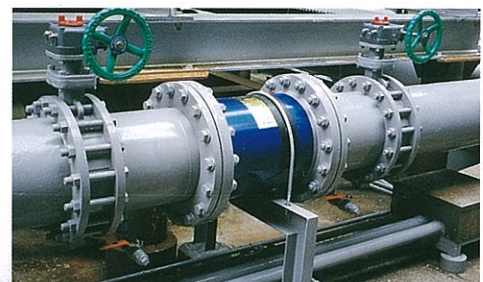


PRECAUTION on INSTALLATION

- 1 Install SUPRION following the arrow point which indicates the water flow direction.
- 2 SUPRION can be installed in both vertical and horizontal direction. Also SUPRION can be installed at bent pipe section.
- 3 When SUPRION is connected to plastic pipes (e.g. PVC) both side, the grounding from the earth terminal is required.
- 4 When SUPRION is connected to stainless steel pipes, use welding flanges made of stainless steel. In addition, apply insulating sleeves and washers to insulate the body electrically free from stainless steel pipes.



Treatment of sprinkling water in a closed cooling tower



Treatment of cyclic water in an opened cooling tower



CO2 refrigerant applied Hot water boiler

Example application of SUPRION to plate-type heat exchanger (silica-rich cooling water)



(left) 10 months after installation of SUPRION
Soft sludge
(Readily removed by brush cleaning)

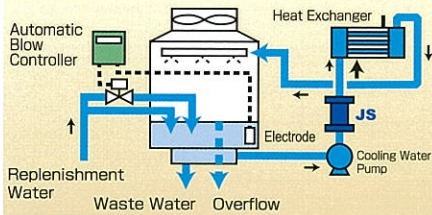


(right) 3 months after chemical treatment
Hard white encrustation of hard scale
(Can be removed by chemical cleaning only.)

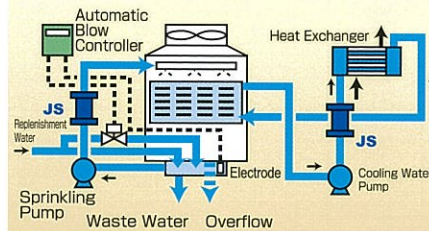
Fields of Application

Heat Exchanging ; Cooling Tower / Air-cooled chiller

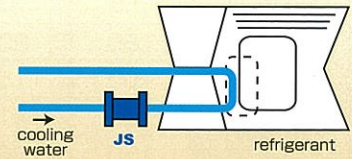
Open-type Cooling Tower



Closed-type Cooling Tower

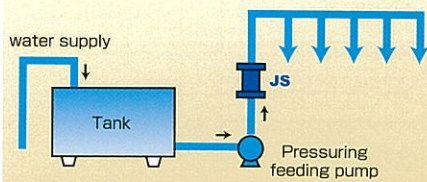


Air-cooled Chiller

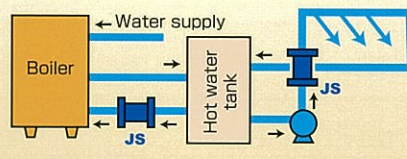


Water supply for facilities / Air-conditioning

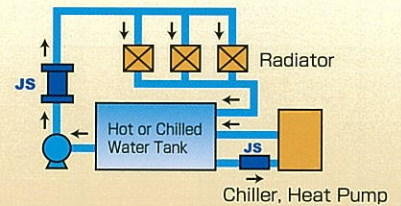
Hotel / Office / Apartment



Hot water boiler

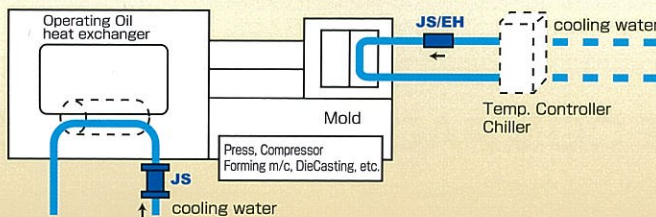


Cold & Hot water circuit

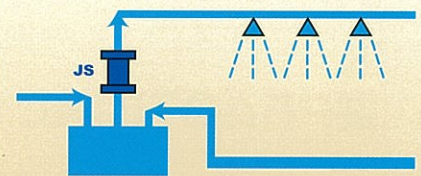


Cooling Water for production at Plant/Factory

Heat Exchange of Oil - Water ; Hydraulic, Mold, etc.



Washing / Showering

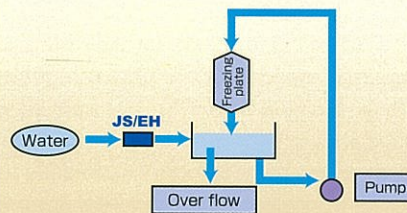


Commercial Applications

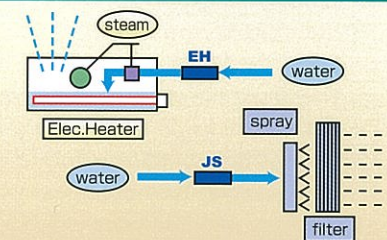
Washing / Cleaning



Kitchen / Ice Machine

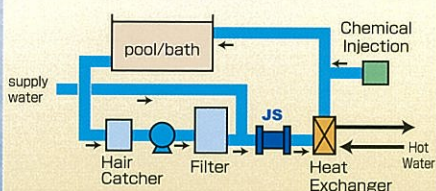


Humidifier for Air Conditioning

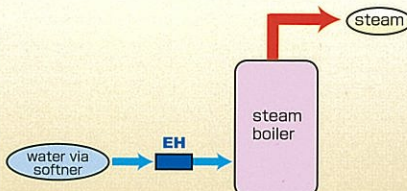


Other Applications

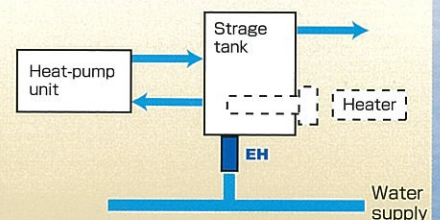
Pool / Spa facilities



Steam boiler users



Home use boilers



■ DIMENSIONS and WEIGHT of Coupling FLANGE (Withstand pressure: 1.0Mpa)

| Type | Pipe Size I.D. mm | Flange Hole mm | Flange Thickness mm | Bolt hole mm | No of Bolt holes | Seal Packing Thickness mm | Bolt size | Weight kg | Type of connection |
|---------|-------------------------|----------------------|---------------------------|--------------------|------------------------|------------------------------------|--------------|--------------|-----------------------|
| JS-250 | 50 | 56.0 | 18 | 19 | 8 | 3 | M16×75 | 3.1 | Thread |
| | 65 | 72.0 | | | | | | 2.9 | |
| JS-400 | 80 | 90.0 | 20 | 23 | 8 | 3 | M20×80 | 6.1 | Welding |
| | 100 | 115.4 | | | | | | 5.4 | |
| JS-600 | 125 | 141.2 | 22 | 23 | 12 | 3 | M20×85 | 11.3 | Welding |
| | 150 | 166.6 | | | | | | 10.1 | |
| JS-800 | 200 | 218.0 | 24 | 25 | 12 | 3 | M22×90 | 15.5 | Welding |
| JS-1000 | 250 | 269.5 | 24 | 25 | 16 | 3 | M22×90 | 17.9 | Welding |
| JS-1200 | 300 | 321.0 | 26 | 25 | 16 | 3 | M22×95 | 20.1 | Welding |
| JS-1400 | 350 | 358.1 | 28 | 27 | 16 | 3 | M24×120 | 32.5 | Welding |
| JS-1600 | 400 | 409.0 | 30 | 27 | 20 | 3 | M24×120 | 37.6 | Welding |
| JS-1800 | 450 | 460.0 | 30 | 27 | 20 | 3 | M24×120 | 42.0 | Welding |

- Coupling flanges are delivered with bolts, nuts, packings.
- Two types of flange hole are available for each JS-250, JS-400 and JS-600. Please specify the proper hole type.
- Welding type flange for JS-250 and thread type flange for JS-400 and JS-600 are available. Please contact us.
- The material of the flanges is SS400. If SUPRION is connected with stainless steel pipes, please prepare stainless steel flanges at your side. Stainless steel flanges, insulation sleeves and washers are not included in the product set.

■ PRACTICAL USE of COMPACT-SIZE SUPRION

Plenty of SUPRIONS are used also for small bore size water supply systems, since SUPRION can be connected "in-line" very simply and compact. Furthermore, as water issues exist very close to our life scene, compact SUPRION is very useful and convenient for equipping to household appliances.



● Household Appliances

Good results for Gas Boilers in England, where is famous for very hard water area. The latest hot water boiler named Eco-Cute, applying CO2 Gas refrigerant developed in Japan, makes 90 °C hot water in midnight and strage it in the tank. Some SUPRIONS are applied with Eco-Cutes specifically for well water users which contains plenty of scale contents in general. 20% (weight) less detergent with supply water pass through SUPRION showed the same cleanliness by laundry machine with the water without SUPRION treatment. This test was done according to JIS test regulation.

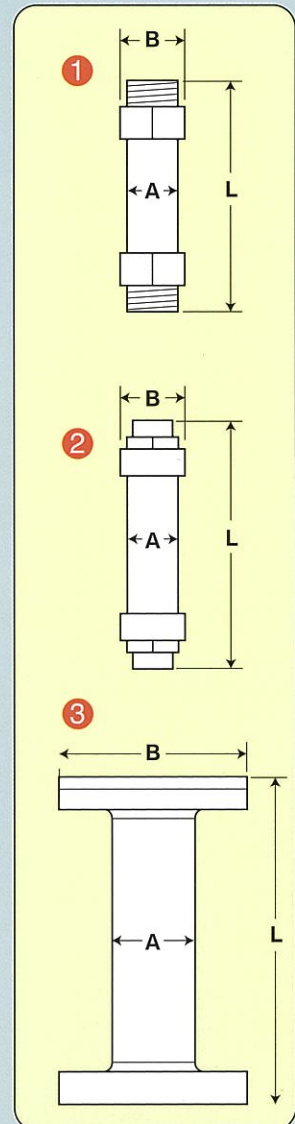
● Others

Water supply system for mouth rinsing water at Dental Clinik is kept very clean after installing SUPRION and now no-slime in the system.

Water spraying nozzle is sometime blocked by scale and spray does not perform expected pattern. SUPRION works effectively to keep the pattern correctly because of less scale forming and no blockade at the tip of nozzle. In the application of humidifier for air conditioning system, SUPRION can provide less maintenance work and time consumption. This is also the advantage in comparison with frequent replacement of heaters and/or whole unit.

■ Dimensions and weight of SUPRION (Withstand pressure: 1.0 MPa)

| Type | A mm | B mm | L mm | Pipe size | | Weight | Profile |
|---------------------|---------|---------|---------|-----------|-------|--------|---------|
| | | | | mm | inch | | |
| EH-38F JS-38F | 17.3 | 22.0 | 108 | 10 | 3/8 | 159g | ① |
| EH-12F *JS-12E15 | 21.7 | 25.0 | 116 | 15 | 1/2 | 194g | |
| *JS-75E22 | 34.0 | 44.0 | 142 | 20 | 3/4 | 725g | ② |
| *JS-100 | 42.7 | 50.0 | 165 | 25 | 1 | 1,004g | |
| *JS-125 | 48.6 | 60.0 | 211 | 32 | 1-1/4 | 1,777g | |
| *JS-150 | 60.5 | 70.0 | 248 | 40 | 1-1/2 | 2,450g | |
| *JS-250 | 89.0 | 185.0 | 229 | 50 | 2 | 10.6kg | ③ |
| *JS-400 | 139.8 | 250.0 | 193 | 65 | 2-1/2 | 18.4kg | |
| | | | | 80 | 3 | | |
| | | | | 100 | 4 | | |
| *JS-600 | 216.3 | 330.0 | 267 | 125 | 5 | 32.4kg | |
| | | | | 150 | 6 | | |
| JS-800 | 267.4 | 400.0 | 342 | 200 | 8 | 52kg | |
| JS-1000 | 318.5 | 445.0 | 415 | 250 | 10 | 64kg | |
| JS-1200 | 355.6 | 490.0 | 494 | 300 | 12 | 85kg | |
| JS-1400 | 406.4 | 560.0 | 387 | 350 | 14 | 120kg | |
| JS-1600 | 457.2 | 620.0 | 446 | 400 | 16 | 143kg | |
| JS-1800 | 508.0 | 675.0 | 494 | 450 | 18 | 170kg | |



③ Dimension L does not include coupling flanges

■ NOTE

- Specifications are subject to change without notice for the purpose of products improvement.
- Products of flange type ③ are delivered with corresponding welding flanges.
- EH models prevent scale formation on an immersion-type electric-heater of water.
- JS models are applicable for general water treatment phase.
- Withstand pressure of JS-38F and EH-38F is 0.5 MPa.
- Required lead time for large models (over JS-1200) is approximately 2 months.

■ Pipe size and flow rate per velocity (standard flow rate)

| Pipe | 3m/sec | | 2m/sec | |
|------|--------|--------------------|--------|--------------------|
| | ℓ/min | m ³ /hr | ℓ/min | m ³ /hr |
| ½B | 36.6 | 2.2 | 24.4 | 1.5 |
| ¾B | 65.9 | 4.0 | 43.9 | 2.6 |
| 1B | 108.0 | 6.5 | 72.0 | 4.3 |
| 1-¼B | 180.0 | 10.8 | 120.0 | 7.2 |
| 1-½B | 245.0 | 14.7 | 163.0 | 9.8 |
| 2B | 395.0 | 23.7 | 264.0 | 15.8 |
| 2-½B | 652.0 | 39.1 | 434.0 | 26.1 |

| Pipe | 3m/sec | | 2m/sec | |
|------|---------|--------------------|---------|--------------------|
| | ℓ/min | m ³ /hr | ℓ/min | m ³ /hr |
| 3B | 920.0 | 55.2 | 614.0 | 36.8 |
| 4B | 1,567.0 | 94.0 | 1,045.0 | 62.7 |
| 5B | 2,420.0 | 145.0 | 1,610.0 | 97.0 |
| 6B | 3,400.0 | 204.0 | 2,270.0 | 136.0 |
| 8B | — | — | 3,950.0 | 237.0 |
| 10B | — | — | 6,090.0 | 365.0 |
| 12B | — | — | 8,750.0 | 525.0 |



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