MICRO NANO BUBBLE

GENERATOR

MV SPA
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What is Micro Nano Bubble?
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What is Micro Nano Bubble?

**Definition**
Air or oxygen bubbles with the size less than 50μm in diameter are called Nano Bubbles or Micro Bubbles.

**Characteristics**
- Micro Nano bubbles float to the water surface at a very slow speed of 0.1cm/sec. Many bubbles burst before reaching the water surface.

During the burst of Micro Nano bubbles, 40 KHz supersonic waves, sound pressure at 140db, and instant heat of 4,000 ~ 6,000°C are generated.

**Effect (Function)**
- Firstly the supply of dissolved oxygen,
- Secondly the promotion of physiologic activities
- Thirdly the removal of bacterial virus.

- Removing hard skin cells around pores
- Removing Demodex
- Supplying oxygen to the inside of pores
- Removing sebum inside pores
- Supplying nutrient to the inside of pores
Effects of Micro Nano Bubble

Principle of Function 1. Increased contact area to oxygen for sterilization

All living things consist of proteins. Virus, the lowest form of life consist of protective coats of protein. When protein consisting of links of C and H meets O2, the aerobic bacteria consume O2 and grow while the anaerobic bacteria die by oxidation into CO2 and H2O. Such oxidation is the basic principle in sterilization. O3 is more active in oxidation than O2 due to its unstable nature. Most of harmful bacteria are anaerobic and the oxidation by O2 is the most efficient method for sterilization.

Based on the simple comparison of the surface area, Micro Nano bubble has the contact area 100 times larger than the milli bubble raising the probability of contacting bacteria at the same rate.

Milli bubble : surface area 1 (based on one particle)
Micro bubble: 10 times the surface area of milli bubble (1,000 particles)
Nano bubble : 100 times the surface area of milli bubble (1,000,000 particles)

Comparison of magnification of surface areas between milli and micro using a cube
Principle of Function 2. Increased oxygen dissolving time due to slow floatation

Floating speed of a Micro Nano bubble to the surface water is relative slow, which is 1/100 of a Milli bubble.

While floating to the surface, a significant number of Micro Nano bubbles bursts before reaching the surface releasing oxygen particles into the water which are contained in the bubble.

In other word, conversion of the oxygen bubbles into the form of Micro Nano in the water plays the key role in increasing the oxidation effects for sterilization and cleansing.

During the bursting process of Micro Nano bubbles in the water, high pressure and heat is generated inside the bubbles creating super energy.
Principle of Function 3. Effect of anion

Principle of Anion Generation

When water falls and hits the ground, the fine water bubbles contain negative charges, while large water bubbles or water deposited on the ground contain positive charges. When the negative charges stuck to fine water bubbles in the air and collide with dusts or particles, they produce anion dusts or anion oxygen molecules.

• **Blood Purification**
  Anion purifies blood through alkalization by raising the ionization rate of minerals in the blood (such as calcium, natrium and kalium). It helps purify blood, recover from fatigue and strengthen the body by increasing the ionization rate of calcium and natrium in the sera through generation of substances called endorphin and encephalin. It also releases severe pain by vitalizing cells around the pain area.

• **Improving Resistibility**
  It raises the resistibility by increasing Globulin which is the immune element contained in the serum.

• **Controlling the Autonomic Nerve System**
  Anion provides vitality to all human organs, the nerve system, blood and cells fortifying and vitalizing the impaired functions

• **Air Purification, Dust Removal and Sterilization**
  Air pollutants such as cigarette smoke, sulfurous acid gas, nitrogen oxides, carbon monoxide, ozone and other organic matters form positive ion. Anion removes the positive ion by hardening and precipitating the positive ion. X and R rays, ionizing radiation and UV rays emitted from electronic goods such as TV, PC, mobile phones and home appliances have a lot of energy which causes ion generation in the air. Anions neutralize ions.

<table>
<thead>
<tr>
<th>Number of anions generated:</th>
</tr>
</thead>
<tbody>
<tr>
<td>General forest          500개 ～ 800개 /㎤</td>
</tr>
<tr>
<td>Near waterfalls       5,000개 ～ 10,000개 /㎤</td>
</tr>
<tr>
<td>Micro Nano Bubble    100,000개 ～ 200,000개 /㎤</td>
</tr>
</tbody>
</table>
The Air Vitamin, Anion

Air is divided into anions and ions. Anion is usually generated in woodlands, at sea-sides or near waterfalls, while dust and contaminated air contains ions. This is why anion is much valued today.

While the number of anions in forest is 1,000/cc, the bubbler generates more than 210,000 anions per cc.

Characteristics of Anion

- Purifies polluted air (ions) and removes odor
- Purifies blood (alkalization) and improves physical constitution
- Vitalizes cells and prevents aging
- Fortifies immunity, extends life and promotes growth
- Controls the autonomic nerves and encourages faster recovery from fatigue

Testing Institute: Korea Far Infrared Association
Test Result: 211,800 ions/cc
Test Condition: 10cm above the water surface, 39% humidity, 23°C indoor temperature
The average life expectancy is 50 years in the equatorial region, 70 years in temperate regions and 85 in cold regions. Atmospheric temperature in the equatorial region is relatively high with scarce anion and oxygen whereas the cold region is rich in anion and concentrated oxygen.

One of the ways to retain youthfulness is by sufficient anion and oxygen.

**In a healthy state,**

the internal body is anionized and the external body is ionized. It is quite opposite when the body is in an unhealthy state; the internal body is ionized and the external body is anionized. In this case the external body (skin) attracts ion from the air and acidifies the physical constitution which causes health problems.

**If anion is plentiful:**

1. Human cells are vitalized to improve immunity, prevent aging and improve the physical constitution and metabolism and tranquilizing.

2. Air Purification maintains a pleasant room atmosphere by neutralizing ions in the dust and pollutants in the air.

3. Mental Health is promoted by easing depression, calming stress and soothing irritability.

**About Ion**

- Strong energy from electronic products such as television causes anions in the air to change to ions.

- Ion is particularly rich in dust, pollen, mould, cigarette smoke, sulfurous acid gas, carbon dioxide and organic matters.

- If ion is rich in the room air it is the likely cause of dermatitis, asthma, bronchitis, headache, shoulder ache, visual handicap, back ache, hypersensitivity, tiredness, depression or chronic fatigue.

- Ion is rife: in smoking rooms, subway station, crowds, near home appliances, high pollen-count days and polluted areas like factories.
Principle of Function 4. Ultrasonic waves and heat generated during the bubble burst

Micro Nano bubbles float to the water surface at a very slow speed of 0.1 cm/sec. Many bubbles burst before reaching the water surface.

During the burst of Micro Nano bubbles,
40 KHz supersonic waves,
sound pressure at 140db, and
instant heat of 4,000 ~ 6,000ºC are generated.

Utilizing such characteristics, Micro Nano bubbles can be used in the following applications.

Sterilization
Anion oxygen being excellent in absorption, easily binds with pollution sources in the water. During oxidation it bursts bubbles and the energy generated during burst removes the pollution sources quickly.

Cleansing
Slight ultrasonic and high sound pressure vibrates and gives impact on the hard skin cells and sebum in the pores with cleansing effects.

Fat Burning
Slight ultrasonic and heat works directly on the skin by burning the fat layers.

Pain Relief and Fatigue Recovery
Slight ultrasonic reaches instantly into the body at the speed of 400Km/h releasing pain in the nerve, skeletal and muscular structures.
Heat and ultrasonic generated when ultra fine particles of Micro bubbles burst

**Ultrasonic:**
- Causes the vibrating sound wave to generate heat energy by contraction, expansion and friction.
- Increases the temperature of cell structure
- Increases the quantity of blood stream
- Expands blood vessels
- Relieves pain and removes inflammation
- Heals fractures
- Sterilizes
- Heals rheumatoid arthritis and degenerative arthritis
- Heals neuralgia and back pain
- Reduces body fat

**Micro Bubbles:**
1. Generate instant heat of 5,500°C at the time they burst
2. Generate ultrasonic wave of 40 kHz providing exercising effects, relieving fatigue and muscle fatigue, cleansing the skin and promoting blood circulation.

**Ultrasonic wave is the sound wave energy with the following effects:**
1. **Heating Effect:** Ultrasonic waves penetrate deep inside the skin and increase the body temperature promoting metabolism.
2. **Dispersion and Cleansing Effect:** Body waste is removed from the skin surface and the pores.
3. **Pain Relief Effect:** Its diathermia effect increases the body temperature around a pain area and eases pain.

**Change in Body**
Principle of Function 5. Increased sterilization effects due to micro and nano characteristics

During puberty the sebaceous glands generate a lot of sebum inside pores. Combined with dust, the sebum blocks pores causing acne and demodex mites which lead to an inflammation.

As Micro Nano bubbles are smaller than pores, pores are cleansed effectively.

Bath or shower with Micro Nano bubbles helps remove sebum from pores and also supply moisture to pores keeping the skin healthy and moisturized.
• **Micro bubble** (5\(\mu\)m) is a fine air particle as small as 1/2,000\(^{th}\) of a normal bubble and smaller than a skin pore (25\(\mu\)m).

• When the ultra fine air bubble penetrates the pore, it removes hard skin cells, body waste and bacteria (such as Demodex) **keeping the skin clean**.

• When the ultra fine air bubble bursts it generates ultrasonic wave and heat which then **breaks down body fat**.

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**Pore Cleansing Process by Micro Bubbles**

- Removing hard skin cells around pores
- Removing Demodex
- Removing sebum inside pores
- Supplying nutrient to the inside of pores
- Supplying oxygen to the inside of pores

**Bubble Generation**

- Size of Pore (25\(\mu\)m)
- Size of Micro Bubble (5\(\mu\)m)
Effects of MV SPA the Micro Nano Bubble for Home

- Diet
- Negative ion
- Atopy
- Cleansing

Detox
Effect 1: Anion effect

- Anion: the Vitamin in the air

When measured at the distance of 10 cm from the bath, anions were generated 10 ~ 50 times more than those at the waterfalls where the largest amount of anion is generated. **MV Spa generates more than 500,000 anions per cm².**

- Anion has the following functions:
  - blood purification
  - controlling the autonomic nerve systems in a beneficial manner
  - cell recovery
  - improving resistibility

- When the above functions are applied in the daily life we can enjoy the following benefits:
  - Sterilization and cleansing
  - enhanced immunity
  - air purification
  - joint pain relief
  - cholesterol inhibited and adult diseases prevented
  - improving asthma and respiratory ailments
  - improving depression
  - relief from fatigue and stress
Effect 2: Improving skin diseases

- By removing bacillus from pores and hard skin cells and also supplying fresh oxygen
  Micro Nano bubbles are very effective in:
  - Improving atopy
  - Improving acne
  - Improving athlete’s foot
  - Improving eczema

Test on atopic dermatitis

Week 1

Without use of a soap, the Micro Nano bubble bath removes dry skin cells and body wastes.

Week 2

Body wastes are considerably reduced compared to Week 1 but still more wastes are shown than in the normal skin.

Week 3

Amount of body wastes is considerably reduced.
The word Atopy originates from a Greek term meaning ‘abnormal reaction’ or ‘unknown’. Although Atopy is known as a skin disease the more general and accepted opinion is that it is a disease caused by abnormality in the immune system.

**What is Atopy?**

1. Prevent secondary infection associated with scratching itchy blemishes
2. Fortify the immune system

**Micro bubbles** mitigate chronic itchiness by removing body wastes and foreign matters from the skin.

**It removes bacteria from the pores and hard skin and supply oxygen**

**It recovers cells to the vitalized condition by promoting blood streams.**

**It increases the body’s immune system by increasing the quantity of globulin (the immune factor)**

**Two Effective Ways to Fight Atopy**

**Cleansing**

**Sterilization**

**Ultrasonic wave**

**Anion**

**Effect of Micro Bubble**
Atopy is a disease generally associated with decrease in the core temperature of the body due to genetic inheritance, physical constitution, diet, drugs, environmental pollution, air pollution or aging. As a result the blood vessels contract and blood streams decrease resulting in a lack of oxygen supply to the body.

**Atopy can be improved by supplying sufficient oxygen.** It can also be improved by the aid of Micro Bubble which provides far infrared, anion, ultrasonic wave, sterilization effects and oxygen.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereditary</td>
<td>• Birth in late maternal age</td>
</tr>
<tr>
<td></td>
<td>• Cold physical constitution, obesity, genetic inheritance</td>
</tr>
<tr>
<td></td>
<td>• Frequent use of birth control pills</td>
</tr>
<tr>
<td></td>
<td>• Drug taking during pregnancy</td>
</tr>
<tr>
<td></td>
<td>• Excessive intake of food and beverage containing artificial additives</td>
</tr>
<tr>
<td></td>
<td>• Pollutant containing heavy metal</td>
</tr>
<tr>
<td>Postnatal</td>
<td>• Polluted air</td>
</tr>
<tr>
<td></td>
<td>• Bottle feeding</td>
</tr>
<tr>
<td></td>
<td>• Living in cold environments</td>
</tr>
<tr>
<td></td>
<td>• Aftereffect of vaccinations</td>
</tr>
<tr>
<td></td>
<td>• Abuse of antibiotics and antipyretics</td>
</tr>
<tr>
<td></td>
<td>• Excessive intake of food and beverage containing artificial additives</td>
</tr>
<tr>
<td></td>
<td>• Pollutants such as agrichemicals</td>
</tr>
</tbody>
</table>

**Improvement Measures**

- Frequent room ventilation
- Supply of sufficient air (oxygen)
- Thorough washing of vegetables and fruits
- Suitable moisturizing
- Improving living environment (furniture, wall paper etc)
- Neutralization of ions by supplying anions

**Change in Atopy in 3 weeks with Micro Bubble Spa**

- Week 1
- Week 2
- Week 3
Effect 3 : Skin care effects (pore cleansing & dry skin cell removal)

• Pores and sebaceous gland
  – Excessive sebum production is released into the pores and hardens
  If not removed properly sebum remaining inside the pores causes pores to enlarge.
  – Bacillus inside the enlarged pores penetrate into the hair follicles causing skin diseases.
  – Therefore removal of hard skin cells and sebum around pores is essential in skin care.

• Principle of MV Spa for Skin Care
  – Slight ultrasonic wave and heat generated during bubble bursting
  – The bubble size of 5um smaller than the pore size of 25um

• Pore Cleansing with M.V Spa
  – Removal of hard skin cells around pores
  – Removal of sebum from pores
  – Removal of Demodex
  – Oxygen supply to pores - supplying nutrient to hair follicles
  – Pore contraction with final cold wash with M.V Spa
Principle in Micro Bubble’s Skincare Effect

- **Ultrafine bubbles no larger than 5μm** that is smaller than the pore (25μm) clean the pores
  - removing Demodex, sebum and hard skin cells

- **Emission of Far Infrared rays**: discharging body wastes and preventing aging (anti-wrinkle effect)

- **Anion**: removing acne, liver spots and dark spots

- **Oxygen Supply**: supplying oxygen to the skin cells to keep the skin youthful

Waste removal from the pores by Micro Nano Bubbles
Effect 4: Sliming effects (burning body fat)

- **Fat Burning**
  Ultrasonic generated during the bubble burst has the natural functions of heating and vibration which cause the body fat to be vulnerable to burning.

- **Fat Discharging**
  Micro re-streaming accompanying the linear movement of molecules promotes circulation of blood and lymph discharging the burnt fat

- **Exercise Effect**
  Ultrasonic and heat generated during the bubble burst optimizes the body’s energy consumption giving the maximum exercise effects.
Reducing abdominal fat **10 times** more than **the general hot bath**

Findings of a clinical trial conducted by Korea University Guro Hospital (1 April ~ 30 June 2000)

- Subjects: 40 female adults
- Method: Subject had 20 Micro bubble baths in total, once a day each lasting for 30 minutes
- Diet Control: same as usual without any diet food/drug
- Result: Waist fat is reduced by half than the comparison group. While the visceral fat increased with the general hot bath, it decreased by 10 times with the subject group.

In terms of the leptin reduction rate, it increased for the comparison group while it decreased by 3 times for the subject group.

The protein hormone leptin which is generated in the fat tissues by obesity gene is used as an index in the obesity follow-up analysis. The leptin reduction is associated with fat reduction

Confirmation of body sliming effects by fat burn rather than by moisture/protein discharge (see the CT photos)
**Air Bubble Generation**

**Ultrasonic Wave and Heat Generation**

**Body Fat Breakdown**

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**Principle of Ultrasonic Wave and Heat Generation**

- While slowly floating to the surface of the water, Micro bubbles contract and burst before reaching the surface.

- During the bursting process of Micro bubbles, ultrasonic wave of 40KHz and heat of over 4,000ºC is generated.

- The ultrasonic wave penetrates deep into the body safely and harmlessly.

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**Body Fat Break-down Process**

- With its inherent functions of vibration and heating, ultrasonic wave changes the body fat to the state of being easy to break down.

- By the micro streaming accompanying linear movement of molecules, the bubbles help discharge broken down fat by promoting the blood and lymph circulation.

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**Destroyed adipose**
Effect 5: Other Effects

- **Sound Sleep Effect**
  Sedation and metabolism effects help sound sleep.

- **Coprostasis Removal**
  It helps with the regular bowel movement.

- **Pain Relief**
  According to the clinical trial by the Korea University Medical School, bubble spa helps ease the pain by 56%.

- **Improving Bodily Functions**
  It is effective in overall improvement in bodily functions through improved distal blood flow, endorphin secretion and oxygen supply.
Wide Application of Micro Bubbler

Changes after Bath

- Feeling refreshed.
- Sweating long after the bath: Fine air bubbles are working.
- Body heat is retained long after the bath
- Skin feels soft.
- Pain is reduced.
- Eye fatigue is relieved.
- Itchiness or dandruff is gone.
- Application of face make-up becomes easier with a natural look.
- Mind becomes clear.
- Body odor is gone.
To enjoy Half Bath with MV SPA

1. Effects of Half Bath

Half Bath speeds up the metabolism and blood circulation by letting the upper part of the body cool and the lower part of the body warm. Keep your head clear, and feet warm.

It was an advice given by Boerhaave, the great physician in Netherlands in the early 18th century. Have a Half Bath with warm water slightly higher than your body temperate at 37~38°C for 20~30 minutes filling the bath tub to the pit of the stomach leaving the shoulders and arms out of the water.

At first you may feel a bit chilly but your body gets gradually warm from the center of the body and you will start sweating a lot. Half Bath is known to be very effective for cold, insomnia, heart diseases, high blood pressure, back/shoulder pains and period pain. (When Nano bubbles are added to Half Bath, the effects multiply.)

According to a book titled “A cure-all Half Bath”, ‘warm head and cold feet’ is the root of all disease. Half Bath warms up the lower part of the body and removes the coldness in the body that inhibits the blood circulation. It leaves the body cool in the upper part and warm in the feet.

When the contracted blood vessels are opening up, it eases blood flow lowering the blood pressure. Toxins are excreted from the body through sweat improving the overall body condition.
2. Steps for Half Bath

1) Fill the bath tub with lukewarm water (37~38℃).

2) Let your feet feel the water first so as to fill the temperature gap between the upper and the lower part of the body.
   Sit waist-deep in the bath tub.

Leave the upper body (shoulders and arms) entirely out of the water.
If you feel too cold, lower down to the shoulder level for 20~30 seconds.
You will feel good as the body gets warmer from inside the body.

Once you start sweating in the head, face, chest and arms, your body feels hotter than having a general bath.

You won’t feel any coldness even outside the bathroom.
You may rest outside the bath tub for a while and return to the bath for a couple of times.
3) Application and Effect by Disease

If you suffer from shoulder pain, bend your upper body forward and backward in the bath. Apply a light hand massage from the back neck to the shoulders. Muscle tension is released for fatigue recovery. Rapid change in temperature is bad for the back. If you suffer from back pain do not force a movement.

Stay calm with your back arched as if bracing your feet. A hip bath is effective for piles. To ease the pain by hemorrhoids around the anus a warm hip bath can be effective. If however there is an abscess around the anus do not get the warm water in touch with the area. Patients who suffer from high blood pressure or heart disease can benefit from Half Bath as it will promote blood flow and lower the blood pressure. Half Bath is also effective for low blood pressure as it reduces the gap between the maximum and the minimum blood pressures.

Organ function in the lower part of the body is improved and thus it is effective for irregularity, period pain and menopausal disorder. Hot bath is not recommended when you caught a cold because you are exposed to a sudden coldness after getting out of the hot bath.

If you suffer from diarrhea or stomach pain a foot bath is effective. If you suffer from a bruise or a sprain especially in the lower part of the body, it is not recommend to warm up the pain area. A hot bath is not recommended right after a meal or a drink, but a Half Bath is recommendable as it promotes blood circulation and lowers the blood pressure slowly warming up the body.
CERTIFICATE OF TESTING RESULT

<table>
<thead>
<tr>
<th>TEST ITEM</th>
<th>SAMPLE</th>
<th>EARLY CONC. (CPU/ml)</th>
<th>AFTER 24 HOURS (CPU/ml)</th>
<th>REDUCTION RATE OF BACTERIA(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Bacterial Test for E. coli</td>
<td>MV BoBBle</td>
<td>1.8×10⁶</td>
<td>&lt; 1.0×10⁶</td>
<td>99.9</td>
</tr>
<tr>
<td>A Bacterial Test for P. aeruginosa</td>
<td>MV BoBBle</td>
<td>3.8×10⁶</td>
<td>&lt; 1.0×10⁶</td>
<td>99.9</td>
</tr>
</tbody>
</table>

Note: 1) The blank test was measured on non-test sample.
2) The bacteria number on the petri dish was detected by multiplication of dilution rate. End.

1) Test method: Client Offer (Sample Temp.: 48.6°C)
2) Inoculum: 1/10 Dilution Media (Media No. for cultivation -98)
3) Name of used bacteria:
   - Escherichia coli ATCC 25922
   - Pseudomonas aeruginosa ATCC 15442
4) Refer to the Enclosed (2-1, 2-2)
5) Usage: Quality control

This certificate of testing result shall be used within the purpose of its defined usage.

The director of Korea Institute of Far Infrared Applied Estimation
CERTIFICATE OF TESTING RESULT

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Anion (ION/cc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV BUBBLE</td>
<td>231,000</td>
</tr>
</tbody>
</table>

Note:
1) Test Method: KIFA-FI-1042
2) Test Condition: Distance 10cm
3) The above experiments were conducted using ION analyzer at the conditions of temperature 26°C, and humidity 30% and anion numbers 102/cc of the atmosphere. An anion from the sample was measured and the results were shown anion number per unit volume.
4) Usage: Quality control. End.

* This certificate of testing result shall be used within the purpose of its defined usage.

The director of Korea Institute of Far Infrared Applied Estimation
Sterilizing power Test

30 MIN LATER
30 MIN LATER
Patent for the Invention of Micro Bubble Generator

Nano Bubble for Industry

Nano Bubble for SPA

Nano Bubble for Shower

Patent Application

Design

Design

Trademark Right
Our Product

Nano Bubble Generator
Other Product

Shower
AFTER BATH

AFTER BATH, 5~10 MIN. LATER

waste product and dry flaky that in skin
Establishment example

Micro Bubble Generator
MV SPA
Micro Bubbles

MV SPA
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THANK YOU.