


# Lona Cling Micro bubble system

 (주) M E C  
MAXIMUM ENGINEERING CO., LTD.

Mail : [mec1@daum.net](mailto:mec1@daum.net)

[www.lona.kr](http://www.lona.kr)

 (주) M E C  
MAXIMUM ENGINEERING CO., LTD.

# What is micro bubble?

Micro bubble means **extremely tiny bubble with size less than 50 um.**

Micro bubble is eco-friendly energy source using only water and air, providing a great sterilization effect.

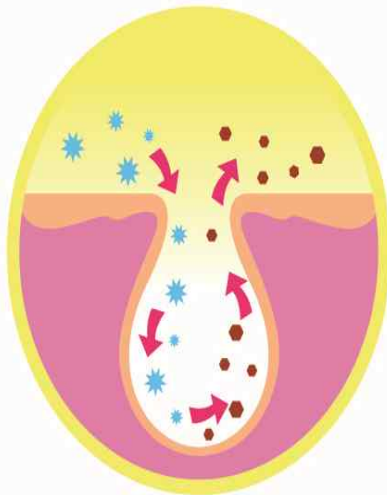
## Features of Micro bubble

- 1** Instant high heat generation (Approx. 5,500℃)
- 2** Ultrasonic waves generation when bubbles burst (Approx. 400km/h)
- 3** 10~20 times more generation than an amount of near the waterfall (Anions)
- 4** Absorbing pollutants by superfine bubbles



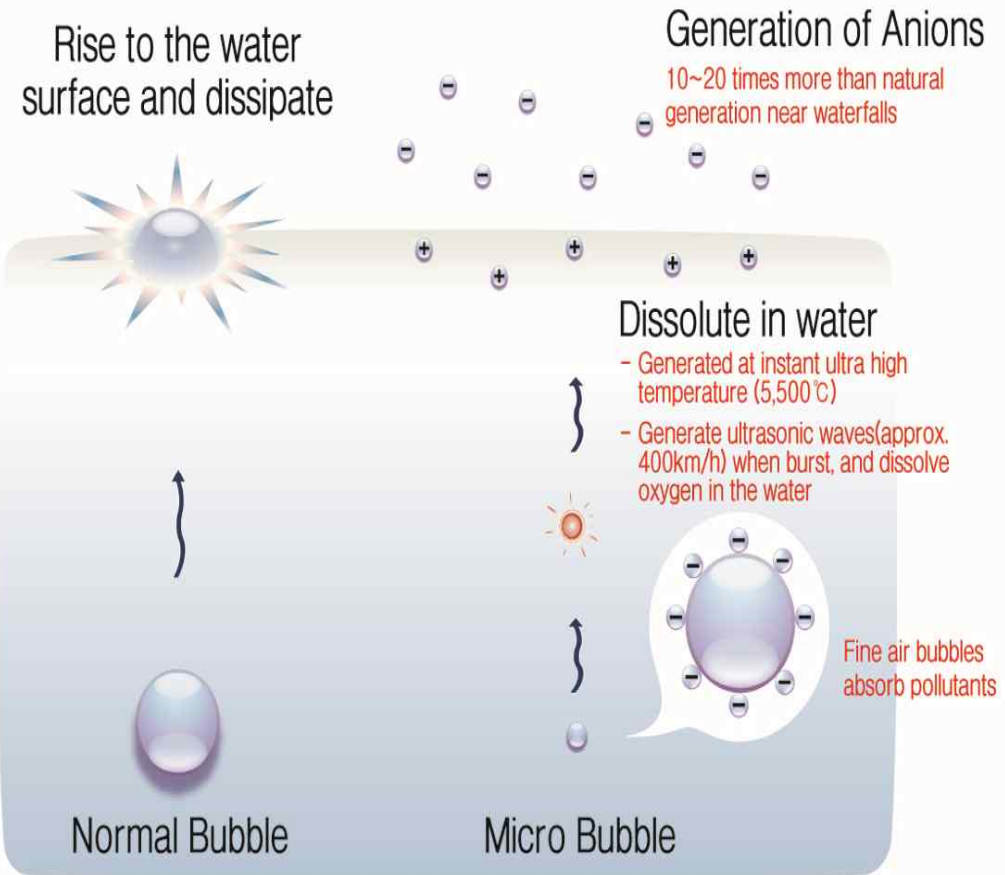
## ☑ Micro bubble ?

### Micro Bubble



The micro bubbles deeply pass throughout the pores and then remove waste.

Effect of Micro-Bubble



Characteristics of Micro-Bubble

☑ **Micro bubble Shower head !**



**Keratin exfoliation**

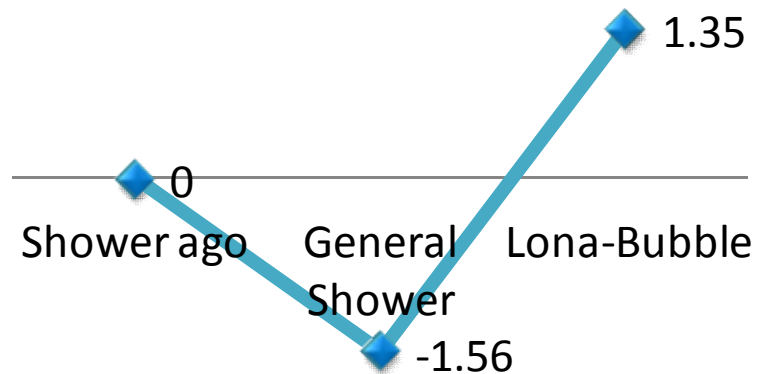


**Moisturizing effect**

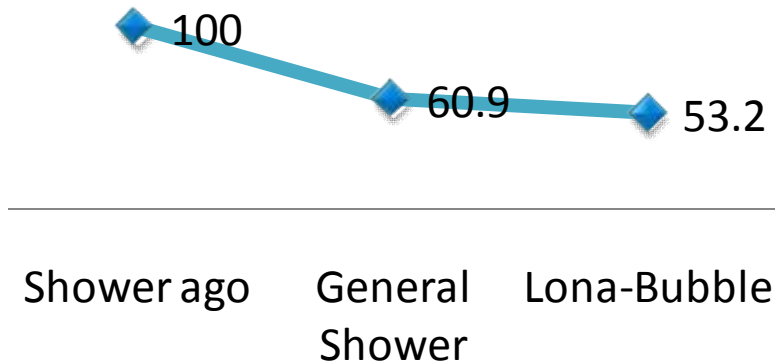


**Skin cleansing**

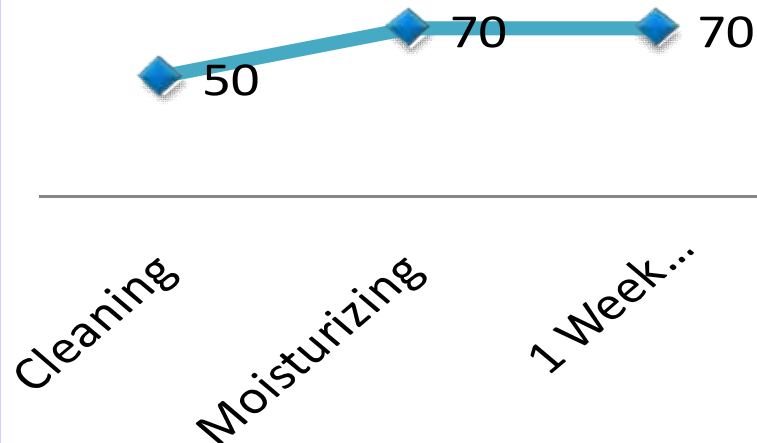
### Moisturizing effect



### Lipstick cleaning



### Satisfaction



### Clinical Trials

– DERMAPRO

(KFDA Clinical testing and certification agencies)



## ☑ Clinical Trial I

### 5-2-2. 피부 수분량 분석

분석 결과, 마이크로 버블 샤워기가(1.35%) 일반 샤워기(-1.56%)에 비해 보습 효과가 더 높았다(Table 4, Fig. 3).

Table 4. Results of skin water content obtained from two products

Product	Time Point	N	Mean <sup>1</sup>	SD	SEM	p-value <sup>2</sup>	Decrement (%) <sup>1</sup>
버블 샤워기	Before	10	41.97	3.04	0.96	-	-
	IA	10	42.54	3.25	1.03	0.367	1.35▲
일반 샤워기	Before	10	40.67	5.07	1.60	-	-
	IA	10	40.03	4.06	1.29	0.457	1.56▼

<sup>1</sup> Increment of the mean value represents improvement of skin water content(▲)

<sup>2</sup> Significantly different at  $p < 0.05$  compared with before cleansing



Fig. 3 Changes in skin water content following application of products  
(Means+SEM. \* $p < 0.05$  vs. before cleansing)

### 5-2-3. 세정력 평가

#### 5-2-3-1. BB크림 세정력 평가 (안면)

분석 결과, 사용 직후 시점에서 두 기기 모두 유의한 세정 효과를 보였으나 ( $p < 0.05$ ), 개선율로 보면 마이크로 버블 샤워기가(42.00%) 일반 샤워기에 (38.00%) 비해 다소 높았다(Table 5, Fig. 4, 5).

Table 5. Results of cleansing effect obtained from two products

Product	Time Point	N	Mean <sup>1</sup>	SD	SEM	p-value <sup>2</sup>	Decrement (%) <sup>1</sup>
버블 샤워기	Before	10	5.00	0.00	0.00	-	-
	IA	10	2.90	0.66	0.21	0.000*	42.00▲
일반 샤워기	Before	10	5.00	0.00	0.00	-	-
	IA	10	3.10	0.52	0.16	0.000*	38.00▲

<sup>1</sup> Increment of the mean value represents improvement of cleansing effect (▲)

<sup>2</sup> Significantly different at  $p < 0.05$  compared with before cleansing

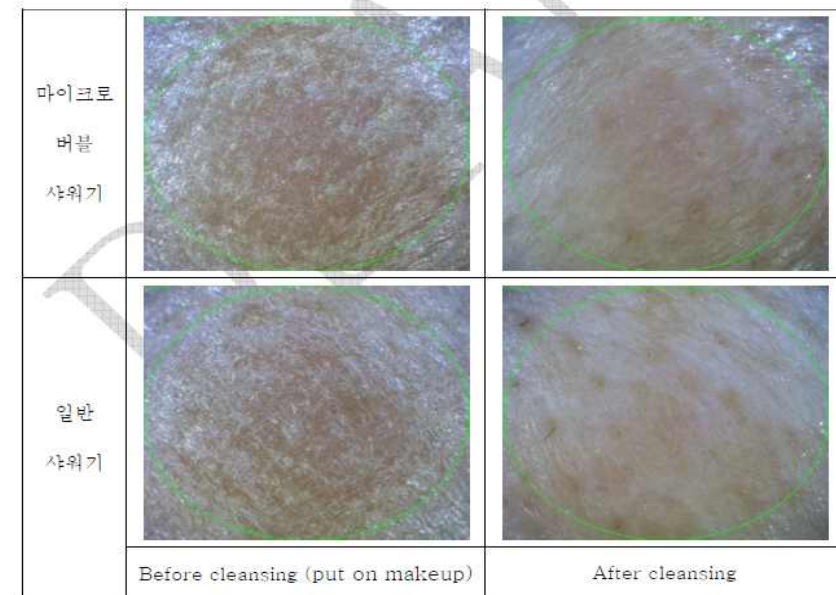
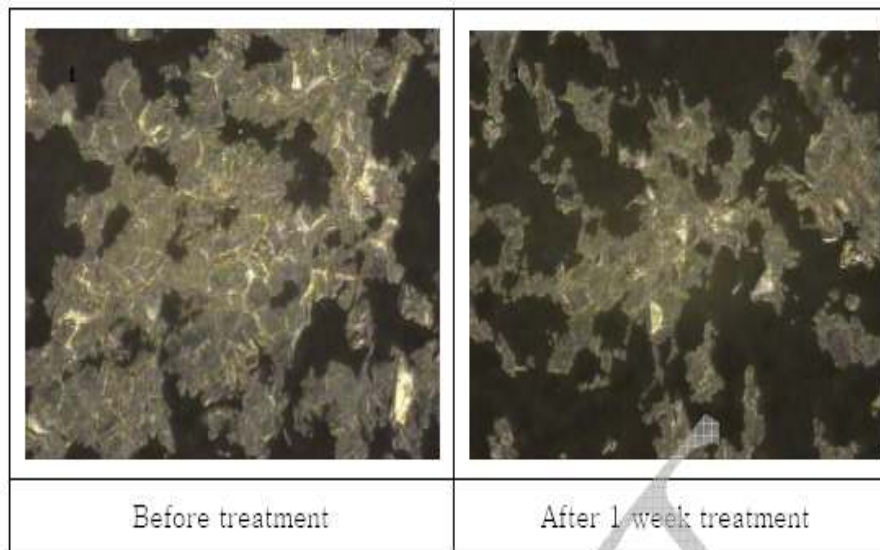


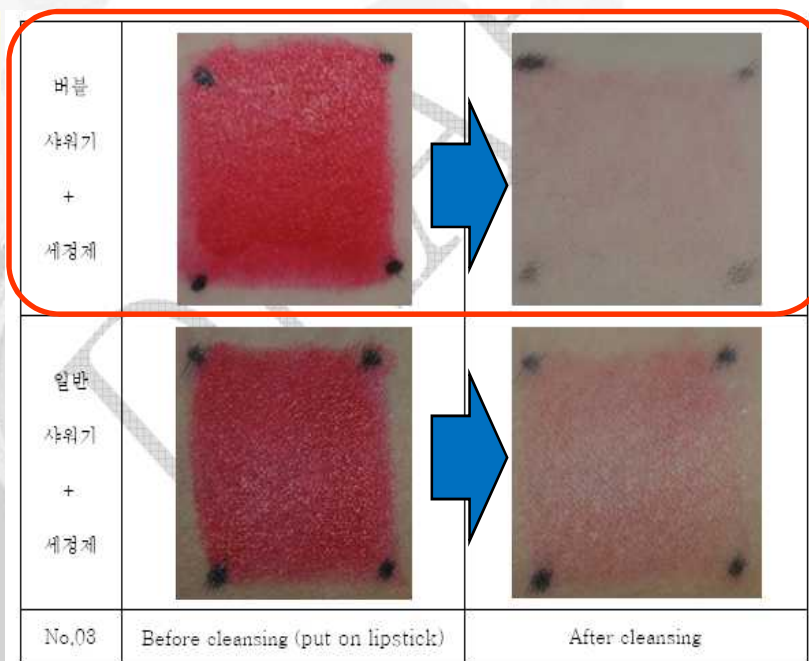
Fig. 4 Images of cleansing effect before and after treatment  
(Folliscope® 2.8, 50X, Subject No. 02)

## ☑ Clinical Trial II

### Keratin exfoliation



### Skin cleansing



### Tester Evaluation

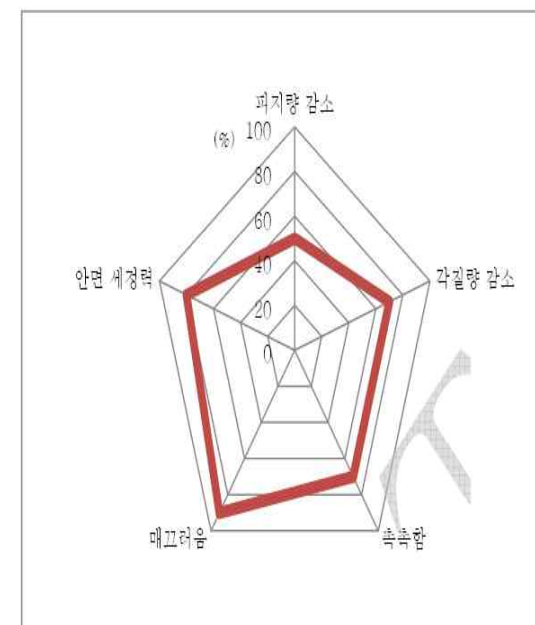


Fig. 14 Comparative sensorial profile of the micro-bubble shower after 1 week

## ☑ Clinical Trial II

### 5-2-3-2. 립스틱 세정력 평가 (전박)

기기 사용 결과, 사용 직후 시점에서 두 기기 모두 유의한 세정 효과를 보였으나( $p < 0.05$ ), 개선율로 보면 마이크로 버블 샤워기가(46.67%) 일반 샤워기에(39.17%) 비해 다소 높았다(Table 6, Fig. 6, 7).

Table 6. Results of cleansing effect obtained from two products

Product	Time Point	N	Mean <sup>1</sup>	SD	SEM	p-value <sup>2</sup>	Decrement (%) <sup>1</sup>
버블 샤워기	Before	10	6.00	0.00	0.00	-	-
	IA	10	3.20	0.54	0.17	0.000*	46.67▲
일반 샤워기	Before	10	6.00	0.00	0.00	-	-
	IA	10	3.65	0.47	0.15	0.000*	39.17▲

<sup>1</sup> Increment of the mean value represents improvement of cleansing effect (▲)

<sup>2</sup> Significantly different at  $p < 0.05$  compared with before cleansing

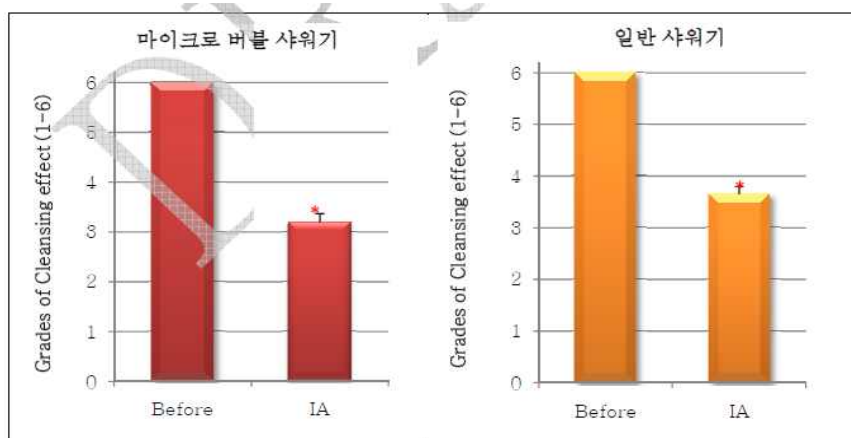


Fig. 7 Changes in cleansing effect level following application of products  
(Means+ SEM. \* $p < 0.05$  vs. before cleansing)

또한, 기기와 세정제를 동시에 사용한 결과, 사용 직후 시점에서 두 기기 모두 유의한 세정 효과를 보였으나( $p < 0.05$ ), 개선율로 보면 마이크로 버블 샤워기가(73.33%) 일반 샤워기에(65.83%) 비해 다소 높았다(Table 7, Fig. 8, 9).

Table 7. Results of cleansing effect obtained from two products with cleanser

Product	Time Point	N	Mean <sup>1</sup>	SD	SEM	p-value <sup>2</sup>	Decrement (%) <sup>1</sup>
버블 샤워기 + 세정제	Before	10	6.00	0.00	0.00	-	-
	IA	10	1.60	0.66	0.21	0.000*	73.33▲
일반 샤워기 + 세정제	Before	10	6.00	0.00	0.00	-	-
	IA	10	2.05	0.55	0.17	0.000*	65.83▲

<sup>1</sup> Increment of the mean value represents improvement of cleansing effect (▲)

<sup>2</sup> Significantly different at  $p < 0.05$  compared with before cleansing

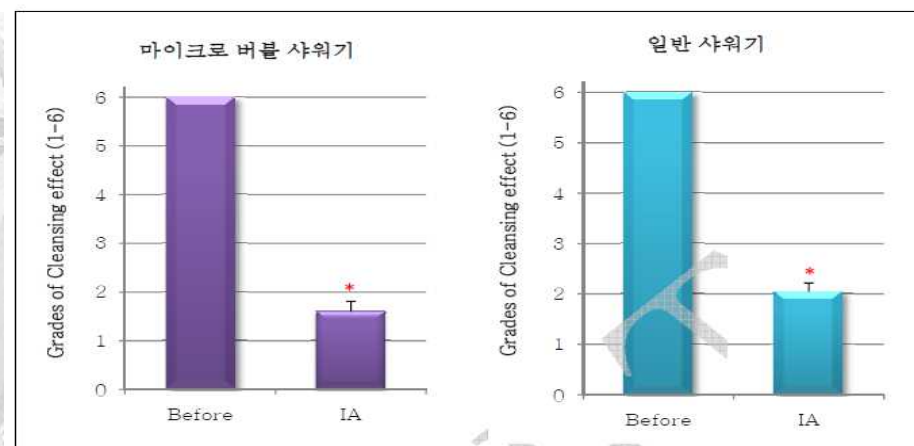


Fig. 9 Changes in cleansing effect level following application of products  
(Means+ SEM. \* $p < 0.05$  vs. before cleansing)



## ☑ Clinical Trial II

### 5-3-1. 피부 각질량 분석

분석 결과, 마이크로 버블 샤워기는 사용 전에 비해 사용 1주 후 시점에서 각질량이 유의하게 감소하였다( $p < 0.05$ , Table 8, Fig 10, 11).

Table 8. Analysis of skin scaling in product of the micro-bubble shower

Time Point	N	Mean <sup>1</sup>	SD	SEM	p-value <sup>2</sup>	Decrement (%) <sup>1</sup>
Before	10	20.38	3.99	1.26	-	-
1W	10	14.30	3.21	1.02	0.000*	29.81▼

<sup>1</sup>Decrement of the mean value represents improvement of skin scaling (▼)

<sup>2</sup>Significantly different at  $p < 0.05$  compared with before treatment

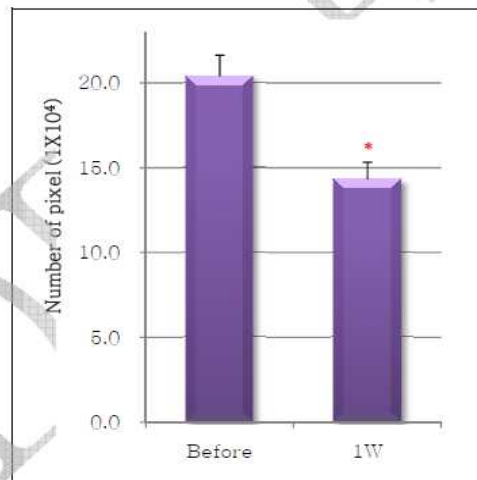


Fig. 11 Changes in skin scaling following application of the micro-bubble show (Means+SEM, \* $p < 0.05$  vs. before treatment)

### 5-4. 피험자에 의한 설문 평가

평가 결과, 사용 직후 시점에서 '세정력' 항목에서 피험자의 50% 이상이, '촉촉함', '매끄러움', 항목에서는 피험자의 70% 이상이 긍정적인 답변을 하였다. 사용 1주 후 시점에서는 '각질량 감소', '촉촉함', '매끄러움', '만족도' 항목에서 피험자의 70%가 긍정적으로 평가하였다(Table 10, Fig 13, 14).

Table 10. Result of self-questionnaires for efficacy (positive answer) (n=10)

Item	1A		1W	
	N <sup>1</sup>	% <sup>2</sup>	N <sup>1</sup>	% <sup>2</sup>
피지량 감소 (Decrease of sebum)	4	40	5	50
각질량 감소 (Decrease of scale)	3	30	7	70
촉촉함 (Moisture)	7	70	7	70
매끄러움 (Improvement of slip)	8	80	9	90
세정력 (Cleansing effect)	5	50	-	-
만족도 (Satisfaction)	-	-	8	80

<sup>1</sup>, N(Frequency) <sup>2</sup>, %(Percentage)

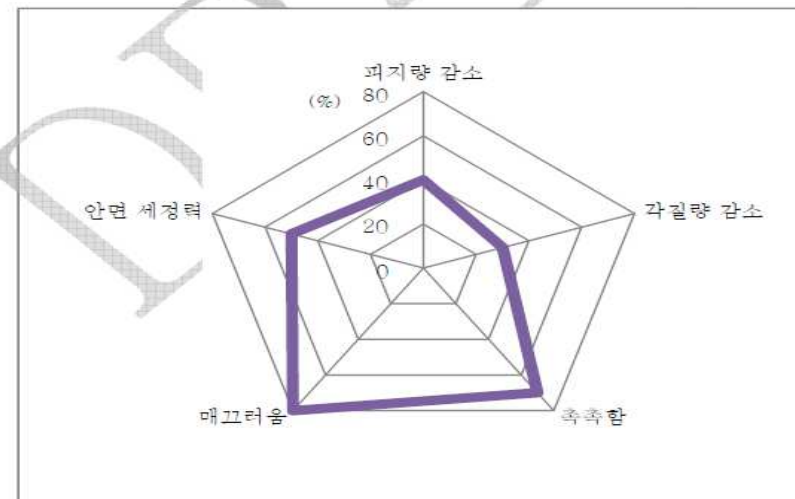


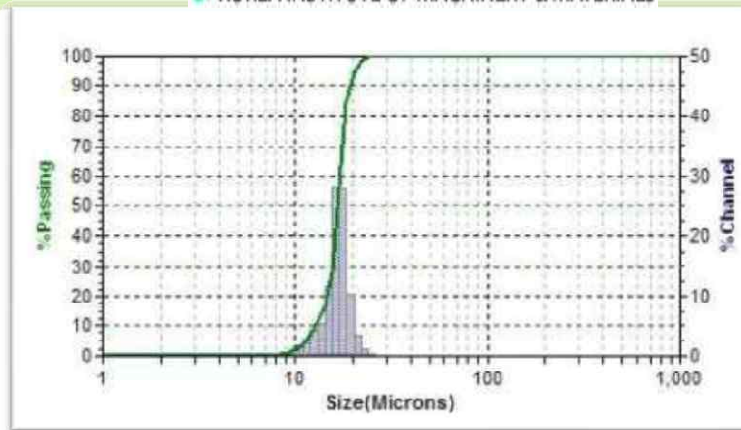
Fig. 13 Comparative sensorial profile of the micro-bubble shower immediately after treatment

## ☑ Micro Bubble Size / Amount

KOREA INSTITUTE OF MACHINERY & MATERIALS



%Tile	Size (um)
10.00	12.83
20.00	14.76
30.00	15.65
40.00	16.19
50.00	16.65
60.00	17.13
70.00	17.62
80.00	18.22
90.00	19.19
95.00	20.18

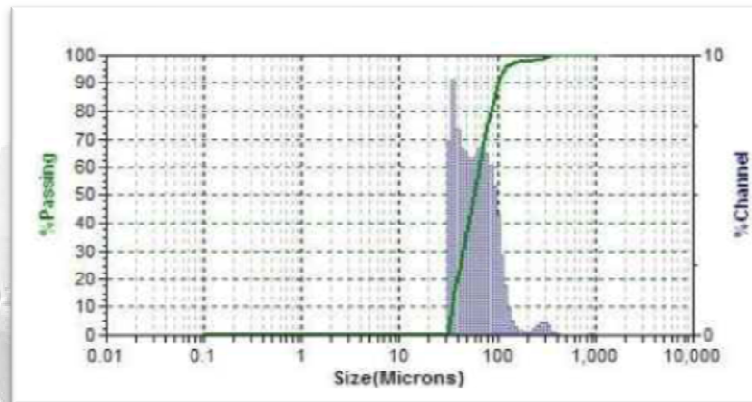


Generation amount : 95%

A



%Tile	Size (um)
10.00	34.94
20.00	38.70
30.00	43.94
40.00	50.20
50.00	57.64
60.00	65.91
70.00	75.01
80.00	86.03
90.00	102.1
95.00	119.1

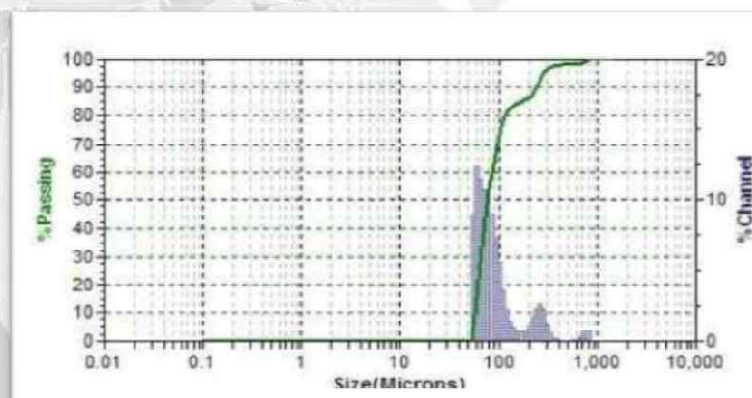


Generation amount : 40%

B



%Tile	Size (um)
10.00	57.48
20.00	61.62
30.00	66.39
40.00	71.85
50.00	78.05
60.00	85.55
70.00	95.71
80.00	116.6
90.00	239.1
95.00	283.1



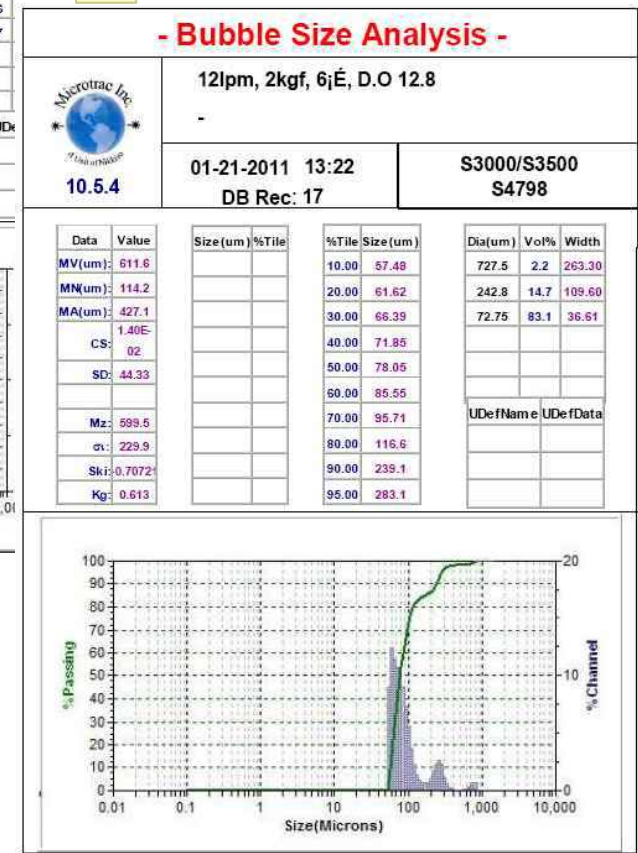
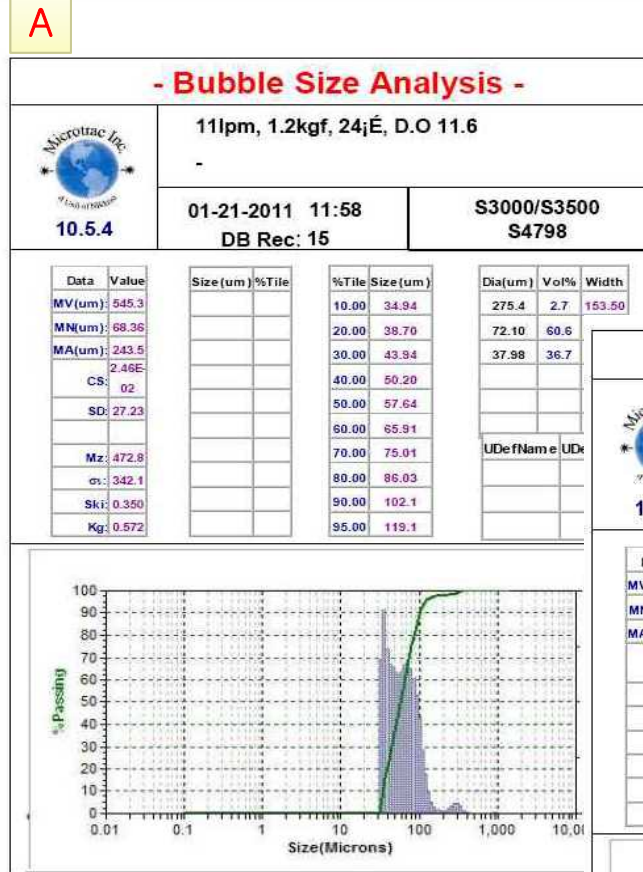
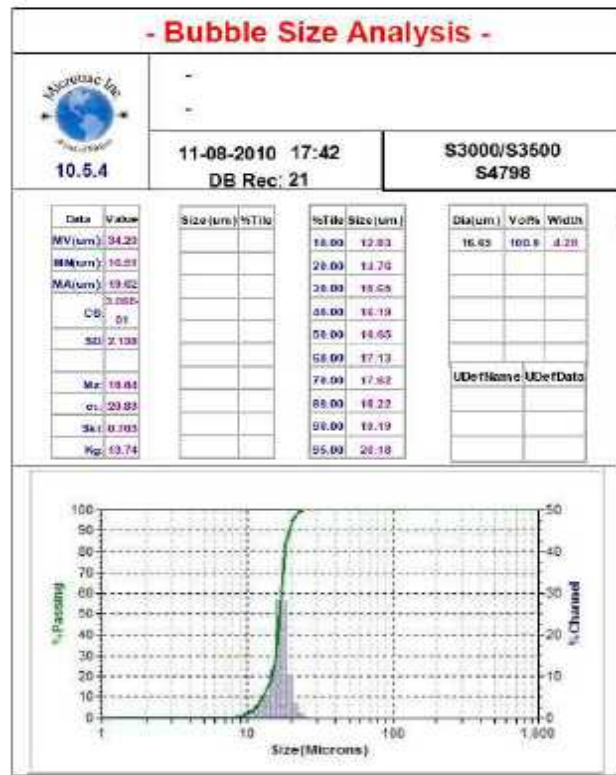
Generation amount : 0%



# ☑ Micro Bubble Size / Amount

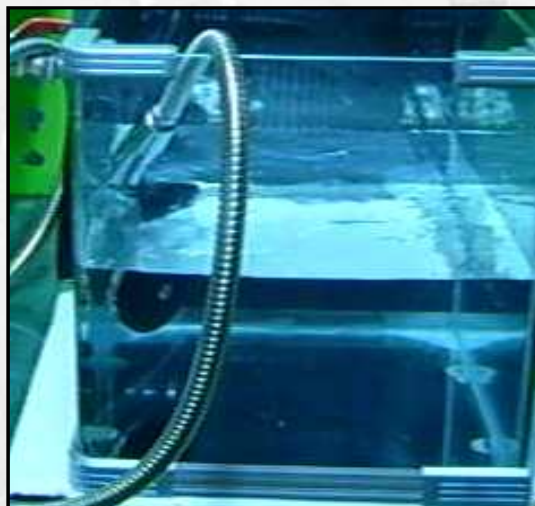


수압 2kgf/cm<sup>2</sup>, 유량 7 LPM, 수온 19℃,  
유입DO 농도 9.25 mg/l :



## ☑ Micro Bubble Test

Common Shower



Micro Bubble Shower



Before generating  
micro bubbles



When the water is  
collected using Micro  
Bubble Shower, micro  
bubbles are generated  
in mass quantity in the  
water and the water  
becomes milky color.



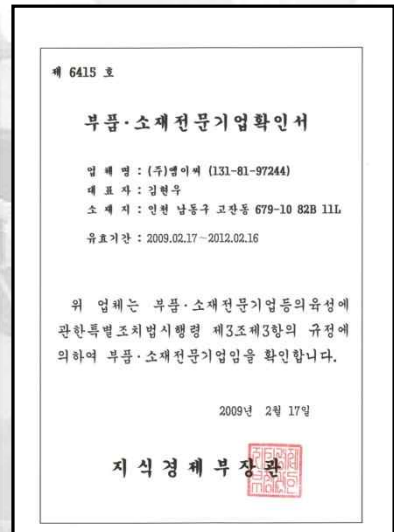
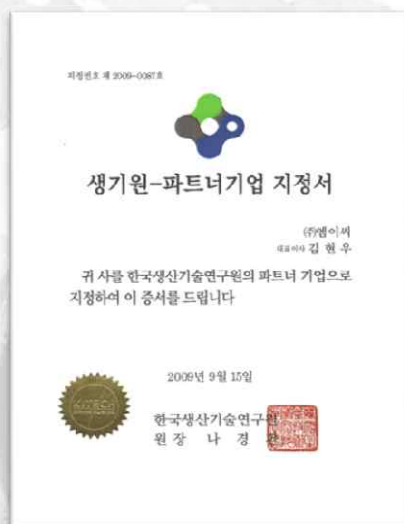
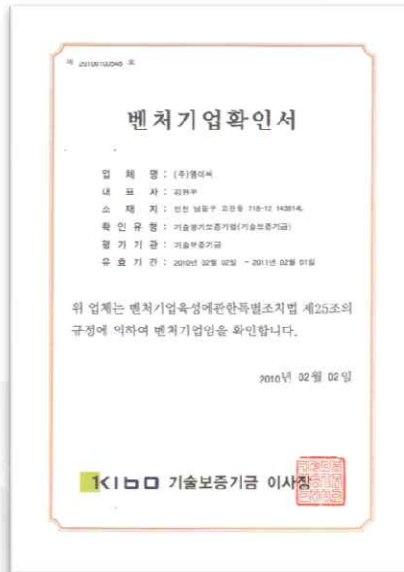
☑ 2010 Taipei , Seoul international invention Fair



# ☑ Certificate



# ☑ Certificate





## ☑ Products - Lona cling



### Product components



Lona Cling  
Water Softener



Lona shower

⊗ Rubber packing 4EA



Shower hose  
1.5m



Connection hose  
30cm