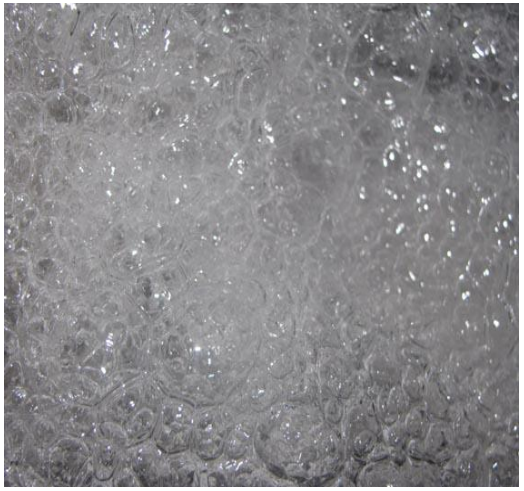
F.BT-50W
Liquid Thin Film Nozzle

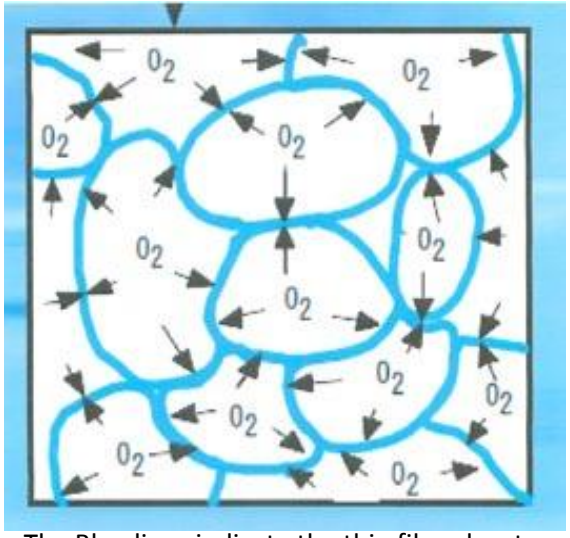
F.BT-50
Hybrid Nozzle
(Liquid Thin Film + Micro-Bubble)

Low power gas transfer nozzle for aquaculture, agriculture etc

Retail Price of F.BT-50 is $300 and F.BT-50W is $350.
The standard material is ABS. PVDF version is available at $600 and $650.
Please ask for quantity pricing and distribution pricing.

Principle of Liquid Thin Film gas transfer method

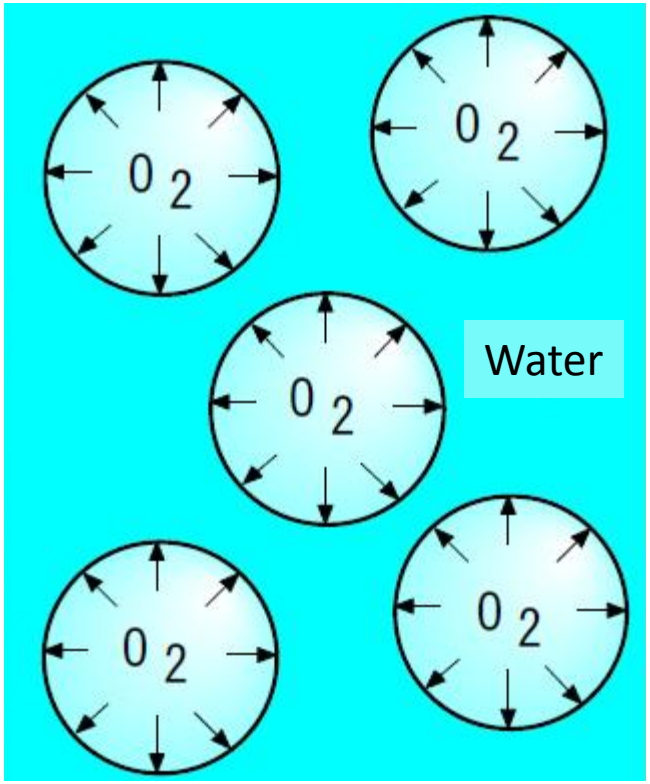




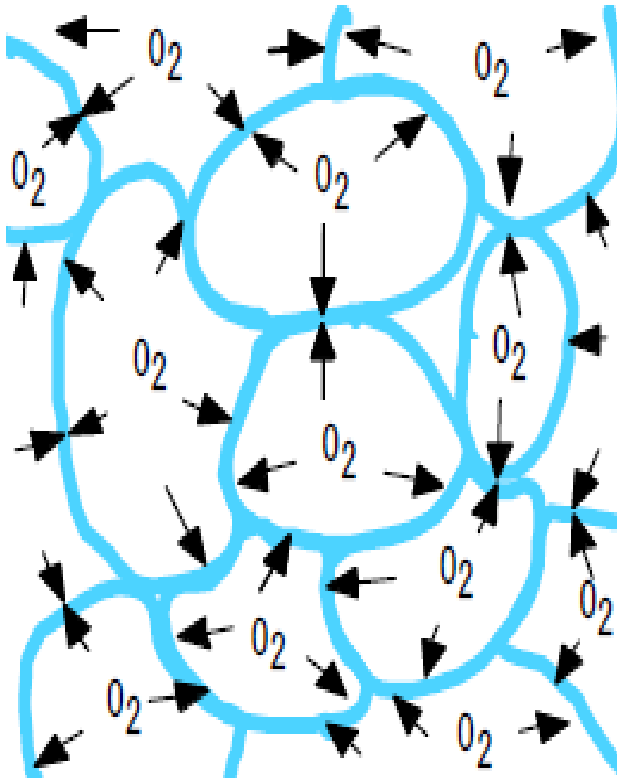
The Blue lines indicate the thin filmed water.

By making liquid thin film (like soap bubbles), the surface boundary between gas and liquid is greatly increased for effective gas transfer in and out of liquid.
The picture is just showing oxygen but the same thing can be said to nitrogen and carbon dioxide.
The method balances dissolved gas ratio in the water the same as ambient air. For example if oxygen is overly consumed in the water, this method removes other gasses to make room for oxygen.

How does LTF work ?



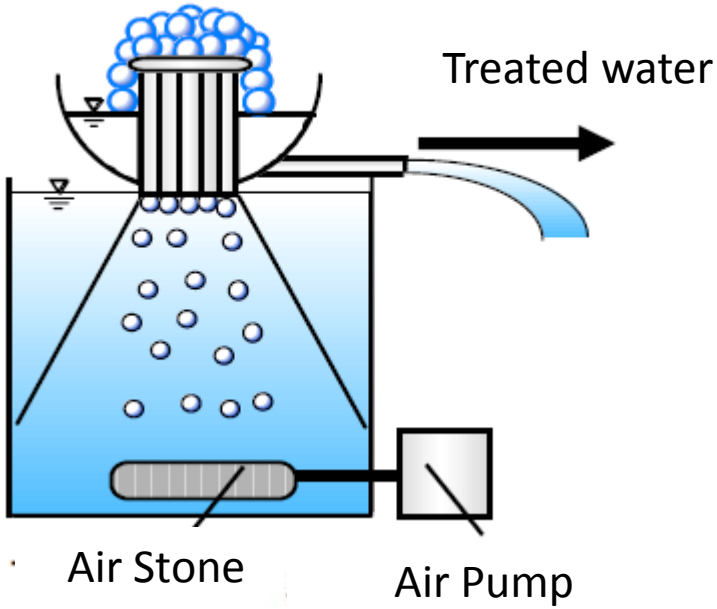
Conventional aeration
Making bubbles small
to increase boundary area



LTF
Making water thin film
to increase boundary area

LTF conceptual structure

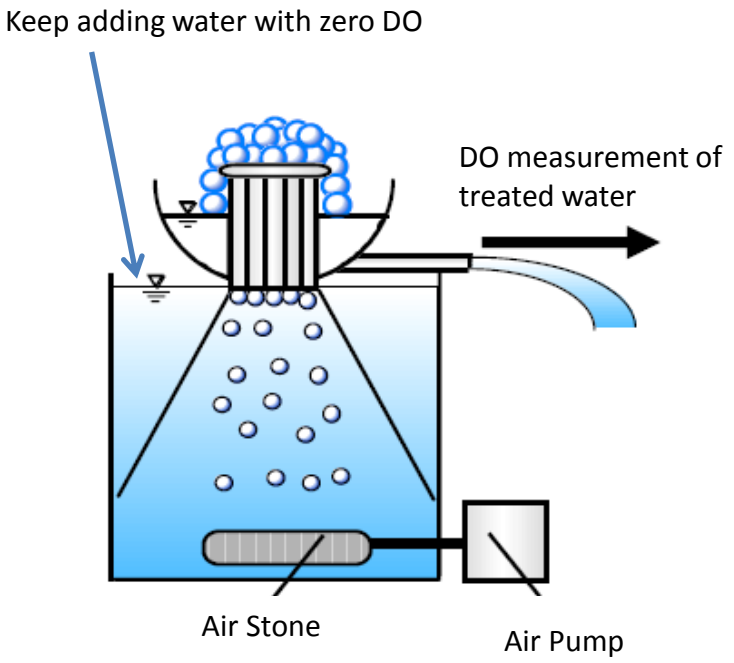
Continuously producing and breaking numerous number of bubbles to increase Water/air boundary area for extremely effective gas transfer in and out.
Water flow is generated by air-lift pumping action.

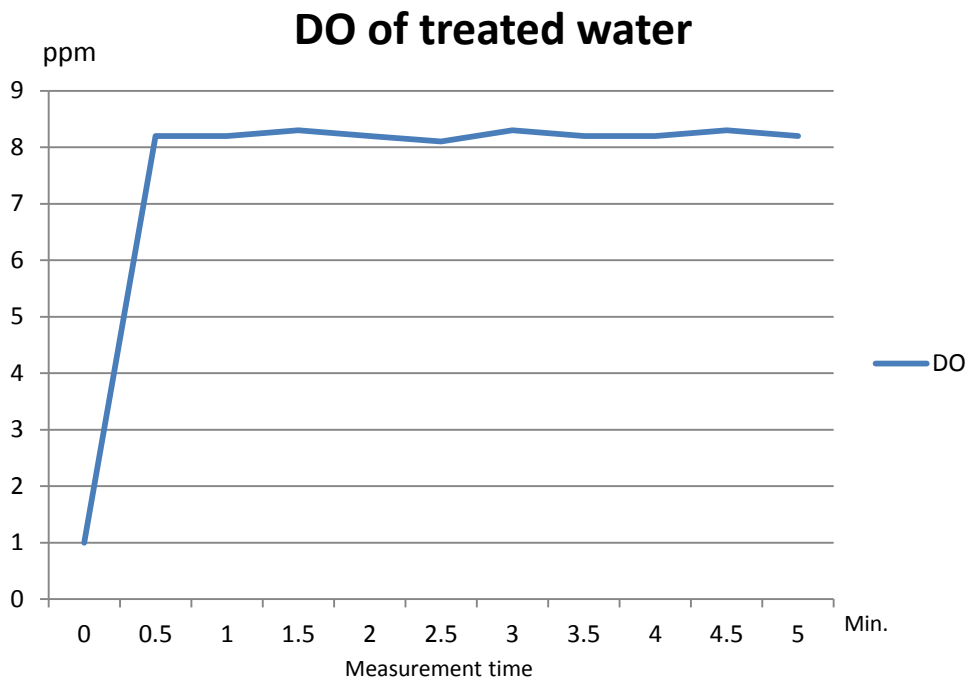


Liquid Thin Film

LTF Oxygen transfer capability

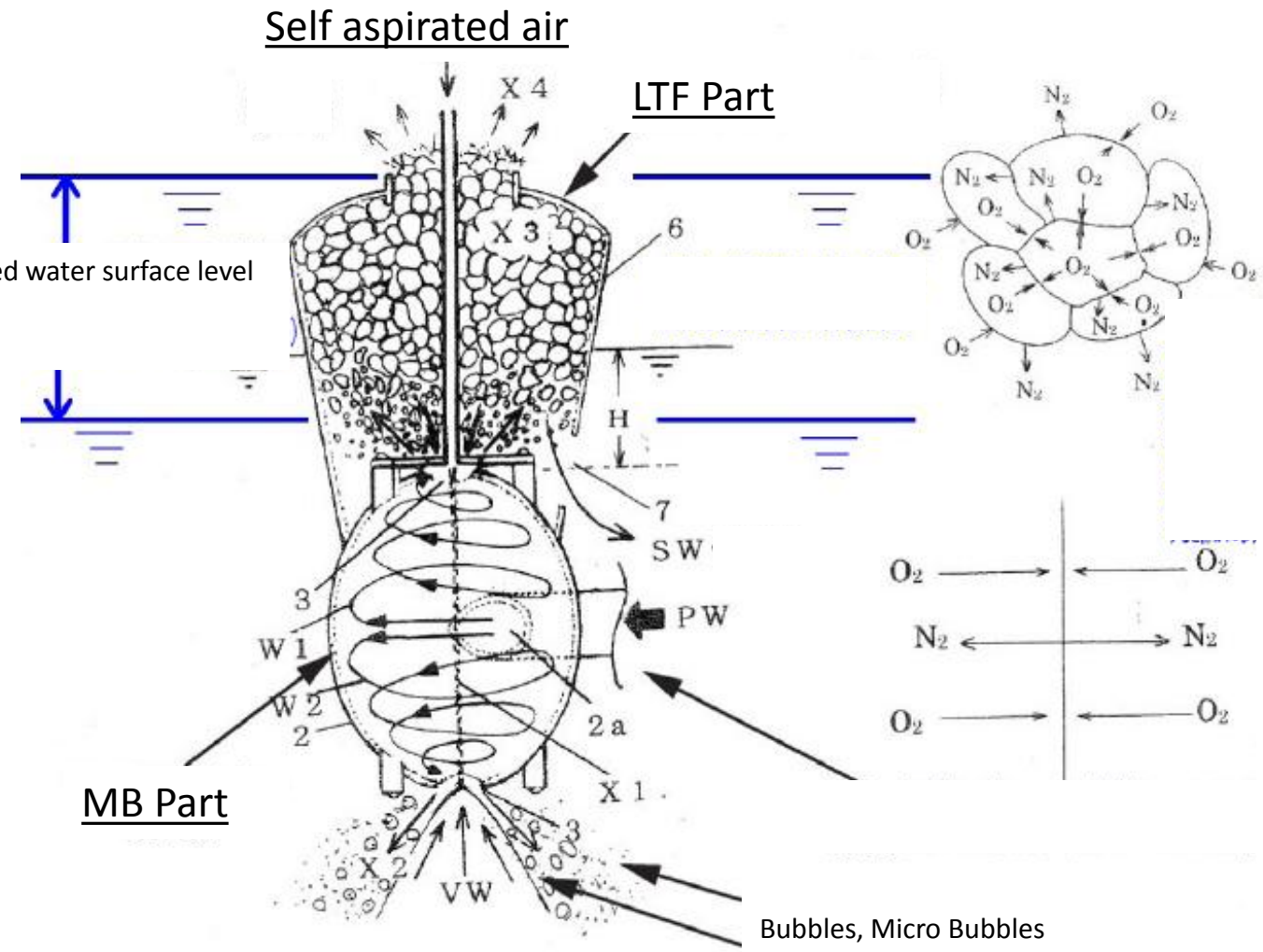
-Single pass through the device-





The water passed through LTF system have saturated DO level.

F.BT-50 LTF/MB Nozzle



Unbalanced Nitrogen, CO2, Ammonia etc. are removed and keep oxygen level consistent.

F.BT-50 LTF production

taken by high speed camera

You can see there are so many bubbles in the cup to make water very thin film enabling extremely effective gas transfer.

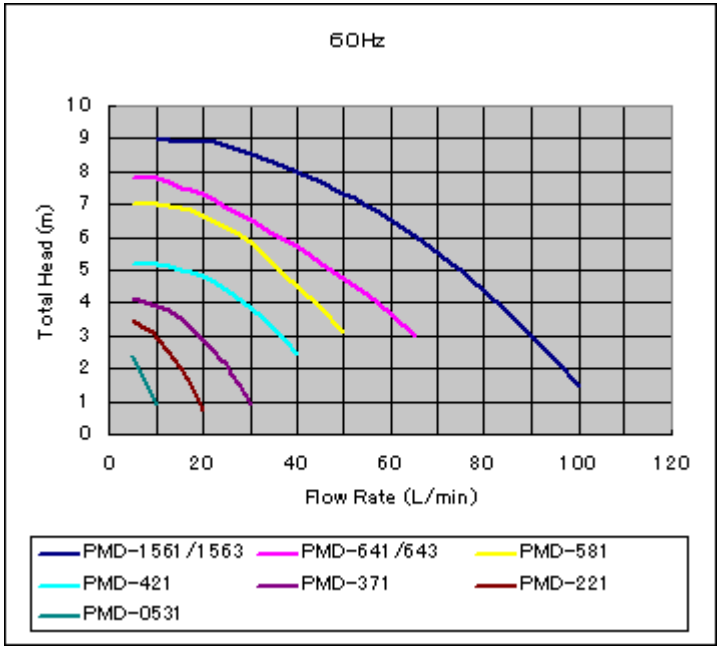
F.BT-50 Hybrid Nozzle (Liquid Thin Film + Micro-Bubble)

Low power gas transfer nozzle for aquaculture, agriculture etc.

Pump Pressure		Water Flow Rate				Air Flow Rate	
		Fresh water		Salt water		Both type	
Mpa	psi	L/m	GPM	L/m	GPM	L/m	GPM
0.03	4.4	6.9	1.8	10.1	2.6	2.0	0.5
0.05	7.3	8.2	2.1	12.4	3.2	3.7	1.0
0.07	10.2	9.3	2.4	14.9	3.9	4.9	1.3
0.09	13.1	10.9	2.8	16.8	4.4	6.3	1.6
0.11	16.0	11.8	3.1	18.7	4.9	7.1	1.8

Pump spec for FBT50, FBT50W

Just examples. Choose similar performance pumps. The chart is for fish culture application.



Model	Diameter Hose A(mm)	Diameter Screw B(G-)	Maximum Flow Rate L/min	Maximum Head m	Rated Flow Rate 50Hz/60Hz m-L/min	Motor Rated Output W	Motor PowerConsumption W	Motor Voltage V	Weight kg
PMD-0531	14	–	10/12	1.7/2.5	1-6 / 1-9	4/6	18/20	100	0.7
PMD-221	14	3/4	15/20	2.5/3.6	1-13 / 2-13	10/15	22/30	100	1.7
PMD-371	17	3/4	25/28	3.0/4.2	2-18 / 3-19	15/20	32/43	100	1.7
PMD-421	20	3/4	35/42	3.5/5.1	3-21 / 4-26	35/45	55/75	100	3.4
PMD-581	20	3/4	43/48	5.1/6.8	3-35 / 5-35	40/60	70/110	100	3.4
PMD-641	26	1	62/72	5.7/8.0	3-50 / 5-50	65/100	105/155	100	4.8
PMD-643	26	1	62/72	5.7/8.0	3-50 / 5-50	65/100	100/150	200	4.7
PMD-1561	26	1	87/100	6.3/8.9	4-60 / 6-63	120/160	160/230	100	5.4
PMD-1563	26	1	87/100	6.3/8.9	4-64 / 6-70	120/160	160/240	200	5.0
PMD-2571(50Hz)	26.5	1	125/-	12.3/-	8-75 / -	250/-	430/-	100	8.0
PMD-2571(60Hz)	26.5	1	115/150	8.6/12	4-90 / 8-80	150/250	270/410	100	8.0
PMD-2573(50Hz)	26.5	1	125/-	12.3/-	8-75 / -	250/-	410/-	200	7.5
PMD-2573(60Hz)	26.5	1	115/150	8.6/12	4-90 / 8-80	150/250	260/400	200	7.5
PMD-4033(50Hz)	40	1・1/2	300/-	12.3/-	10-140 / -	400/-	540/-	200	17.0
PMD-4033(60Hz)	40	1・1/2	250/300	8.2/11.6	6-120 / 10-140	250/400	450/700	200	17.0
PMD-7533(50Hz)	40	1・1/2	380/-	18.2/-	12-210 / -	750/-	901/-	200	21.0
PMD-7533(60Hz)	40	1・1/2	330/380	13.4/19	7-220 / 12-225	450/750	601/1000	200	21.0

Conditions of liquids:Ambient Temp: 0 to 60℃ Viscosity:below 30mm²/s, Specific Gravity:below 1.1
Note (1)Slurry liquids reduce life of pump. (2)Pressure shall be less than 100kPa. (3)Indoor use.
(4)Shock pressure and abnormal pressure etc will damage the pump part.
(5)Voltage can be adjusted to customer's requirement.

For Fresh Water

Capacity	Pump Choice	Flow Rate/Number of units (l/m) 1	2	3	4
<200L	PMD-421	8.2	16.4	N/A	N/A
200-500L	PMD-581	N/A	18.6	26	N/A
500-1,000L	PMD-581	N/A	18.6	26	34
		Flow Rate/Number of units (GPM)			
<53 gallon	PMD-421	2.2	4.3	N/A	N/A
53-132 gallon	PMD-581	N/A	4.9	6.9	N/A
132-264 gallon	PMD-581	N/A	4.9	6.9	9.0

For Sea Water

Capacity	Pump Choice	Flow Rate/Number of units (l/m) 1	2	3	4
<200L	PMD-371	11.2	20	N/A	N/A
200-500L	PMD-421	N/A	27	38	N/A
500-1,000L	PMD-421	N/A	27	38	45
		Flow Rate/Number of units (GPM)			
<53 gallon	PMD-371	3.0	5.3	N/A	N/A
53-132 gallon	PMD-421	N/A	7.1	10.0	N/A
132-264 gallon	PMD-421	N/A	7.1	10.0	11.9