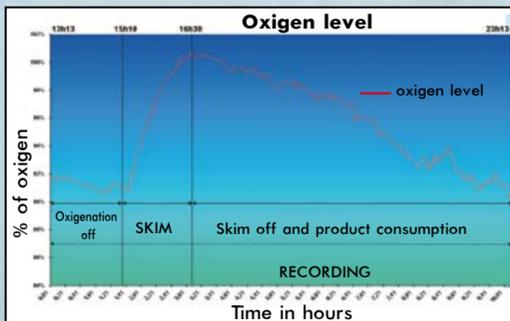


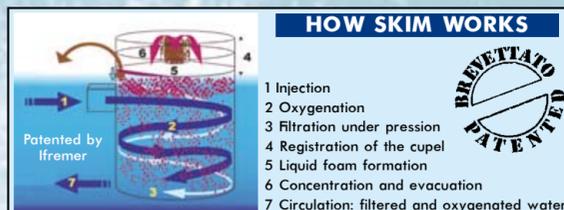
# SKIM



MODELS	Water flow mc/h	Air flow mc/h	Aerator power HP	Overall dimensions AxBxH cm	Unit weight kg	Water volume l
SKIM 80	80	35	1,0	112x146x205h	97	(785)
SKIM 100	100	45	1,5	112x146x205h	98	(785)
SKIM 150	150	35	2,0	112x146x205h	100	(785)

**Oxygenation:** oxygen is mixed by pressure, turbulence and water flow

**Extremely efficient for Ozone injection and dissolution**



The foam produced is directed to a reaction chamber, is liquefied and is evacuated far from the pond by pumping. The water, well filtered and oxygenated, goes out of the system circulating through the pond. The foam mounts through an adjustable chimney and falls into the condensation cupel. This accumulated foam is condensated and liquefied. When reaching the level, the liquid foam clicks on the switch to start the extraction pump to evacuate the condensate.



MODELS	Water flow mc/h	Air flow mc/h	Aerator power HP	Overall dimensions AxBxH cm	Unit weight kg	Water volume l
SKIM PLUS/AUTO	100	45	1,5	112x146x220h	119	(785)
SKIM ONE 300	300	80	3,0	199x350x338h	500	7000
SKIM ONE 500	500	120	5,0	199x350x338h	550	7000

## SKIM One

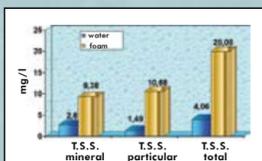
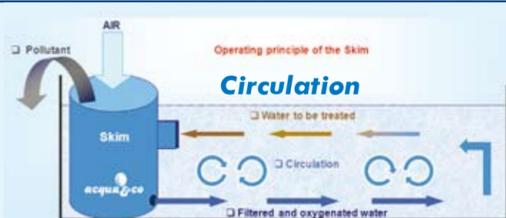


# FOAM FRACTIONATION



### INTRODUCTION TO THE SKIM

Skim is the turning to a new technology and innovative technique in water treatment. It simply works by injection of micro-bubbles under pressure. Atmospheric air is injected to filtrate and provide gaseous exchange air-water (water oxygenation). The most important feature is related to its filtration capability on macro particles, dissolved matter and microscopical organic and inorganic matter. The air skimmer development IFREMER confirms a water treatment capacity of 100 meters per hour. Filtration, oxygenation and circulation are the synchronized and coordinated functions of the SKIM for the water treatment. The system is placed directly in the pond or inside other water stocking facilities of water to be treated. This feature offers an easy installation and operation (closed circuit in the pond itself).



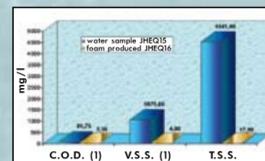
Concentration of suspended material in the water and in the foam in the test at sea bass hatchery



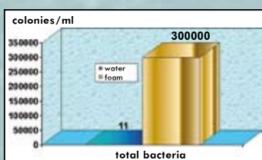
Concentration of total bacteria in the water and in the foam at sea bass hatchery with Skim



Concentration of Escherichia coli.



Comparison of the concentration of the material in the water of a fish farm and in the condensate of the foam produced.



Concentration of total bacteria in the water and in the foam at sea bass hatchery with Skim

PARAMETERS	Particular matter			Dissolved matter			Bacteria	Foam
	TSS	VSS	COD	NH <sub>4</sub>	PO <sub>4</sub>	SiO <sub>2</sub>		
OYSTER CULTURE	181	72	21	56	52	76	84.10 <sup>9</sup>	209
FISH CULTURE	13755	2973	18	95	706	2941	172.10 <sup>9</sup>	319
UNITS	Grams per day			Number/day			Liter/day	

TSS: Total suspended solid  
VSS: Volatile suspended solid  
Bacteria: total aerobic flora at 22°C  
COD: Dissolved organic carbon  
NH<sub>4</sub>: Total ammonia nitrogen  
PO<sub>4</sub>: Phosphate g P/24h  
SiO<sub>2</sub>: Silicates g Si/24h

Comparison of the Alexandrium between the sea and a purification station of 600 cubic meters operating with a Skim.



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Eco Mix



MODELS	Water flow mc/h	Air flow mc/h	Water pressure bar	Overall dimensions AxBxH cm	Unit weight kg	Water volume l
ECOMIX 30	2,4	8	0,7-2,0	63x22x60h	8,5	15
ECOMIX 50	3,6	15	0,6-1,8	63x22x60h	8,5	15
ECOMIX 100	8	20	0,7-2,5	63x22x60h	8,5	15
ECOMIX 150	12	25	0,7-2,5	63x22x60h	8,5	15
ECOSKIM 30	2,4	8	0,7-2,0	72x22x162h	15	40
ECOSKIM 50	3,6	15	0,6-1,8	72x22x162h	15	40
ECOSKIM 100	8	20	0,7-2,5	72x22x162h	15	40
ECOSKIM 150	12	25	0,7-2,5	72x22x162h	15	40



Eco SKIM



PROTOS



MODELS	Water flow mc/h	Air flow mc/h	Aerator power HP	Overall dimensions AxBxH cm	Unit weight kg	Water volume l
PROTOS 0	5-15	27	0,5	91x155x115h	57	345
PROTOS 1	5-20	35	1,0	91x155x115h	58	345



**Foam fractionation: high volumes of foam are produced**

Oxygen biological demand is reduced by direct removal of proteins as well as bacteria found in the water column.



The injection of big volumes of air in the water, physically create the gas interchange condition.

**SKIM:** aspirated centrifugation. Does not use water and can liquefy high density and quality foam.



- CENTRIFUGAL LIQUIFER**
- 1 MOTOR
  - 2 MOTOR FLANGE
  - 3 FOAM LIQUEFIER CONE (inside the dome)
  - 4 FOAM CONVEYING DOME
  - 5 FASTENING SCREWS TO THE SKIM
  - 6 GASKET

**PROTEIN SKIMMER:** showering water spray on the foam. More water consumption and bigger volume of foam condensate to be removed.



**FOAM CENTRIFUGED AND LIQUIFIED**



**FOAM CONDENSATION**



**REMOVAL:** it is the system to remove from the water, organism, organic and inorganic matter.

**DE-GASSING TOWER:** a huge amount of air is self injected under pressure in form of micronize bubbles for highest oxygen transfer rate, CO<sub>2</sub> stripping and ammonia removal. The mass transfer of gas at the interface of the water and air, removes the acid forming carbon dioxide, nitrogen and sulphides residues.



Carbon dioxide CO<sub>2</sub> is introduced in the water through respiration of fishes, shellfish, algae and bacteria. Per each gram of oxygen produced, 1,38 grams of carbon dioxide are produced. It is a limiting factor to production if water exchange decreases or animal stocking density increases.

**Highest SAE and AAE**  
**Huge water flow.**  
**Strong turbulence longest retention time**  
**Break up water flow in cyclonic counter current**