

# FLOCCULATOR PIPE



CHEMICALS DOSING  
SYSTEM.  
INCREASES PERFORMANCE IN  
DISSOLVED AIR FLOTATION SYSTEM.



# Flocculator pipe | Process description

TORO EQUIPMENT

The flotation process is normally helped by adding certain chemical compounds. Most of these chemical reagents function by creating a surface or structure that allows the air bubbles to be easily absorbed or trapped. The inorganic chemical reagents, such as iron or aluminium salts and live silica, are added to solid particles in such a way as to create a structure that facilitates the absorption of the air bubbles. Several organic polymers can also be used to modify the nature of the air-liquid, solid-liquid interfaces, or both of them at the same time. In general, these compounds act by placing themselves on the interface to produce the desired changes.

The degree of purification obtained when reagents are added to the waste water depends on the quantity of reagents used and on the care taken over their control and operation. Using chemical precipitation, it is possible to eliminate between 80 and 90% of the solids in suspension, between 70 and 80% of the DBO5 and between 80 and 90% of the bacteria. The comparable elimination values for primary sedimentation tanks, correctly designed and operated, without the addition of reagents is between 50 and 70% for solids in suspension, between 25 and 40% for the DBO5 and between 25 and 75% for bacteria. Given that the characteristics of the waste water are variable, the necessary dosage of reagents should be determined by laboratory tests (jar test) or with a pilot plant. FLOTATOR.



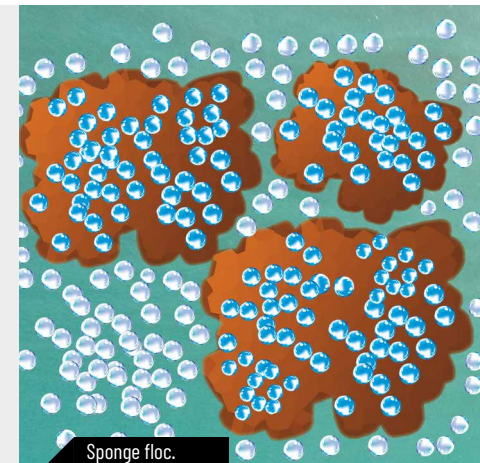
## THE GREAT ADVANTAGE EXCLUSIVE AIR INJECTION SYSTEM

It is integrated system in the flocculator pipe. Improves the performance of Dissolved Air Flotation System by injecting micro air bubbles into de floc.

Innovation developed by Toro Equipment. It's allows achieving a higher bubble density than a conventional systems, thus increasing the separation speed.

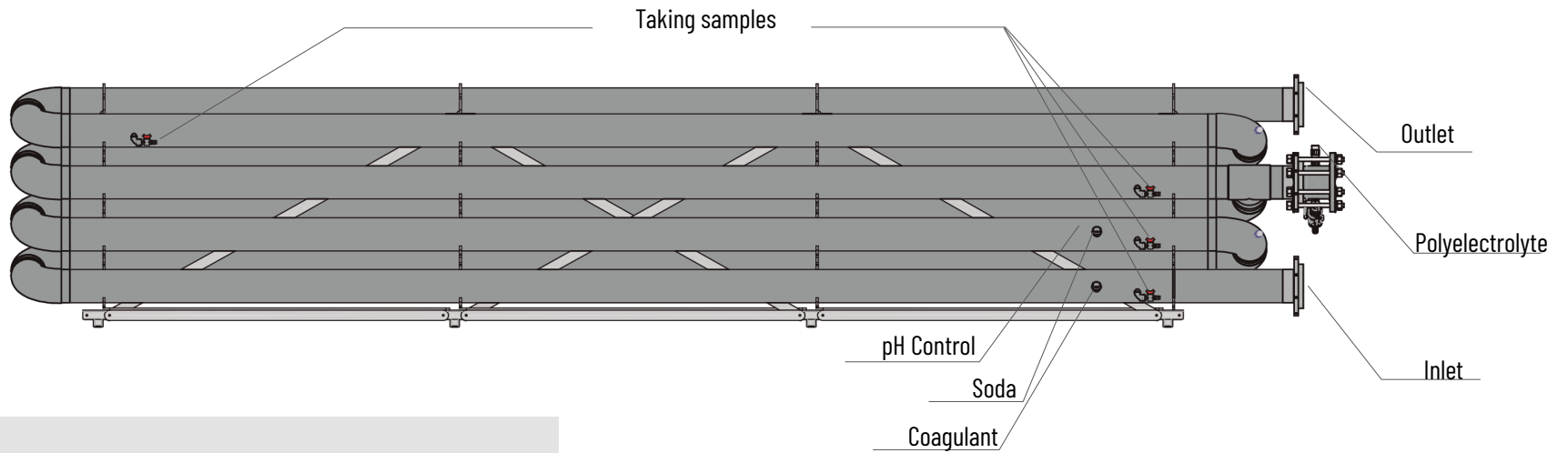
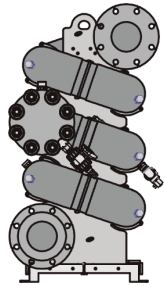
### How must be the bubbles?

- Many. Increasing the concentration of the bubbles increase the likelihood of collision between the solid particles and the bubbles.
- Small-size.
- Of immediate formation.
- Well-spread at the cell flotation's surface.



Sponge floc.





## COMPOSITION FLOCCULATOR PIPE

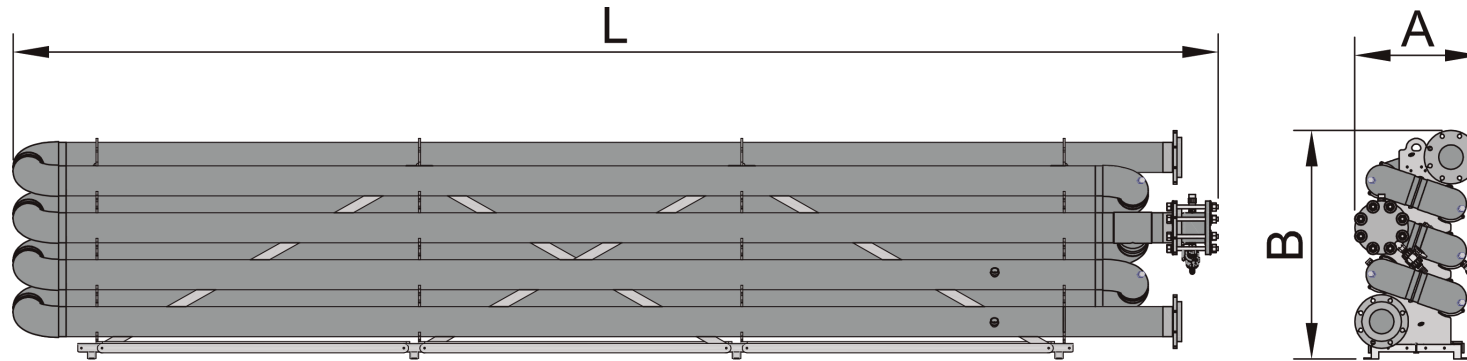
The flocculation pipe (FLH) is an option that complements the [Dissolved air flotation technology](#), increasing its efficiency and performance, thus facilitating the purification process.

### All models include:

- Reagent injection point.
- Polyelectrolyte injection point.
- Sample points.
- Pipe material in PEHD.
- Inlets for pressure cleaning.
- Structure material in GRP and AISI316.
- Cleaning y pH probe.



# Flocculator pipe | Technical specifications



Flocculator Pipe FLH - Standard Model							
Standard Model	FLH-2	FLH-5	FLH-10	FLH-20/ Ø90	FLH-30/ Ø110	FLH-60/ Ø160	FLH-90/ Ø160
Nominal flow (m <sup>3</sup> /h)	2	5	10	20	30	60	90
Length L (mm)	1.565	2.320	2.565	4.120	4.200	6.430	9.870
Height B (mm)	820	820	1.015	1.085	1.165	1.220	1.220
Width A (mm)	430	440	425	500	500	675	675
Pipe diameter	63	63	75	90	110	160	160
Injection points	3	3	3	3	3	3	3
Sample points	4	4	4	4	4	4	4
Pipe material	PEHD	PEHD	PEHD	PEHD	PEHD	PEHD	PEHD
Structure material	GRP+AISI316	GRP+AISI316	GRP+AISI316	GRP+AISI316	GRP+AISI316	GRP+AISI316	GRP+AISI316

**NOTES:**

- The dimensions and product specifications might vary slightly, due to the normal development of products by the engineering department of Toro Equipment S.L.
- At ordering, request specification drawing.

FLOCCULATOR PIPE

# Technical specifications | Flocculator pipe



Anaconda DAF FRL-200

## FLOCCULATOR PIPE MODELS

- Standard Model
- Superior Model
- FRL Model

Flocculator Pipe FLH - Superior Model				
Superior Model	FLH-20/ Ø110	FLH-30/ Ø160	FLH-60/ Ø200	FLH-90/ Ø200
Nominal flow (m <sup>3</sup> /h)	30	60	90	140
Length L (mm)	4.200	4.200	6.500	10.000
Height B (mm)	1.165	1.200	1.110	1.110
Width A (mm)	500	675	770	770
Pipe diameter	110	160	200	200
Injection points	3	3	3	3
Sample points	4	4	4	4
Pipe material	PEHD	PEHD	PEHD	PEHD
Structure material	GRP+AISI316	GRP+AISI316	GRP+AISI316	GRP+AISI316

Flocculator Pipe FLH - FRL Model			
FRL Model	FLH-200/Ø315	FLH-400/ Ø315	FLH-90/ Ø400
Nominal flow (m <sup>3</sup> /h)	200	400	600
Length L (mm)	6.820	11.800	12.000
Height B (mm)	1.960	1.960	2.320
Width A (mm)	1.290	1.290	1.500
Pipe diameter	315	315	400
Injection points	3	3	3
Sample points	4	4	4
Pipe material	PEHD	PEHD	PEHD
Structure material	GRP+AISI316	GRP+AISI316	GRP+AISI316

**NOTES:**

- The dimensions and product specifications might vary slightly, due to the normal development of products by the engineering department of Toro Equipment S.L.
- At ordering, request specification drawing

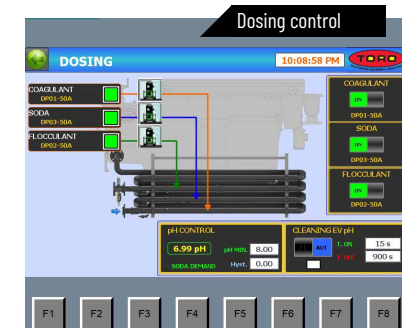
# Flocculator pipe | Optional extras

TORO EQUIPMENT

## EQUIPMENT

● Standard equipment ● Optinal equipment

Model	FQ-2	FQ-5	FQ-10	FQ-20	FQ-30	FQ-60	FQ-90
Nominal flow (m <sup>3</sup> /h)	2	5	10	20	30	60	90
<b>Coagulant Pump ●</b>							
Type	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage
Maximum flow (l/h)	12	26	42	64	84	120	260
Maximun pressure (bar)	7	7	7	4	4	4	3
<b>Soda Pumpa ●</b>							
Type	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage
Maximum flow ( l/h)	16	39	64	84	120	220	395
Maximun pressure (bar)	10	4	4	4	4	7	9
<b>pH Controler ●</b>							
Electrode holder probe	1	1	1	1	1	1	1
pH Transmitter	1	1	1	1	1	1	1
Converter	Digital	Digital	Digital	Digital	Digital	Digital	Digital
<b>Bomba de Polielectrolito ●</b>							
Type	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage	Dosage
Maximum flow (l/h)	63	120	120	220	220	350	660
Maximun pressure (bar)	4	4	4	7	7	4	3







Factory Villavaquerin - Valladolid

## WORLD LEADERS

- Algeria
- Costa Rica
- Guatemala
- Lebanon
- Peru
- Slovenia
- United Arab Emirates
- Argentina
- Croatia
- Holland
- Lithuania
- Philippines
- South Africa
- Australia
- Dominican Republic
- Hungary
- Luxembourg
- Poland
- Spain
- Austria
- Ecuador
- Indonesia
- Malaysia
- Portugal
- Switzerland
- Belgium
- Egypt
- Iran
- Mexico
- Qatar
- Thailand
- Brazil
- Finland
- Ireland
- Montenegro
- Romania
- Trinidad and Tobago
- Bulgaria
- Estonia
- Israel
- Morocco
- Russia
- Uruguay
- Canada
- France
- Italy
- Netherlands
- Saudi Arabia
- Tunisia
- China
- Germany
- Japan
- Nicaragua
- Serbia
- Turkey
- Colombia
- Greece
- Jordan
- Pakistan
- Seychelles
- UK
- Latvia
- Panama
- Singapore
- Ukraine

**FOUNDED**  
1989



+34 983 403 047  
toro@toroequipment.com  
toroequipment.com

### FACTORY

Ctra. Nacional VP-3302, km 11  
47329 Villavaquerin  
Valladolid (España)

### FACTORY AND OFFICES

C/ Sauce s/n  
47193 La Cistérniga  
Valladolid (España)



© TORO EQUIPMENT 2020  
Flocculator Pipe