

Description

In today's environment, companies are continuously striving to enhance safety, reliability, profitability and efficiency, while trying to improve overall sustainability performance, including environmental performance.

Sludge is produced at every step of the wastewater operation. Dewatering of sludge is an essential step in meeting environmental and total cost to operate (TCO) goals. Poor dewatering leads to high water content of the sludge, which has a great impact on the sludge volume, disposal route and cost.

Nalco Flocmaster Mixing Technology is an innovative and unique package designed to deliver quantifiable sustainability performance and operational efficiency in sludge dewatering applications.

Nalco Flocmaster Mixing Technology integrates all your chemical and equipment needs for an optimum sludge management operation.

The equipment offering includes:

1. Polymer preparation station for both liquid and dry Nalco polymers with HMI* control
2. Buffer tank for polymer ageing

3. Dosing system of polymer solution into the sludge process flow
4. Dynamic Flocmaster Inline Mixer
5. Automation of chemical dosage based on Flocsensor Technology.

The polymer preparation systems allow active polymer solutions to be prepared based on liquids or powder products from 0.1% up to 2.0%, depending on the polymer type.

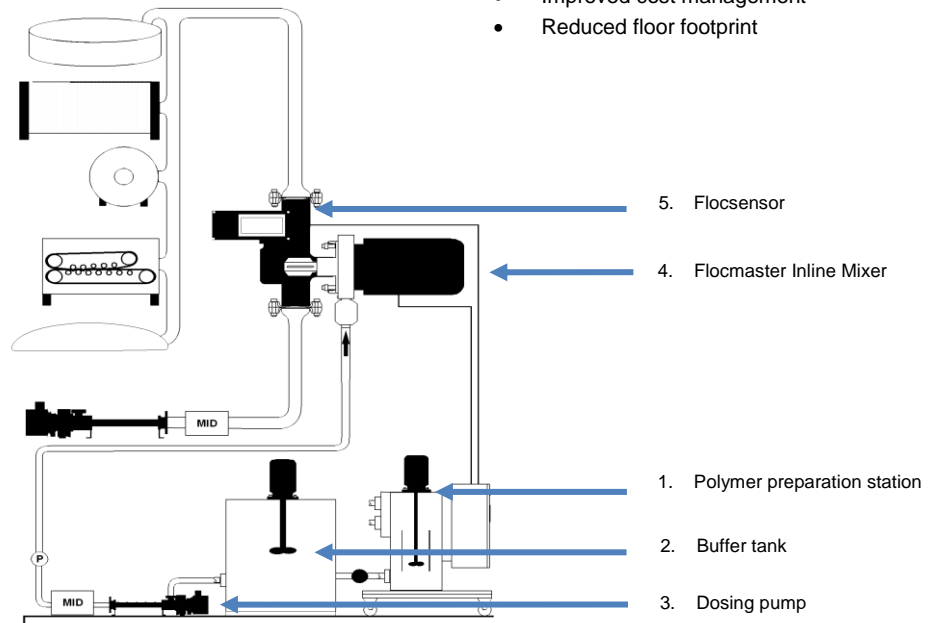
The heart of the Nalco unique Flocmaster Technology is the dynamic Inline Mixer. The polymer solution is fed into the sludge stream through a hollow shaft opening in the rotating paddle. As the speed of the paddle rotation can be controlled, variation of the mixing energy used is possible.

The Nalco Flocmaster Inline Mixer allows optimal distribution of concentrated flocculant solution into the customer's process without the need for 'post dilution distribution water'.

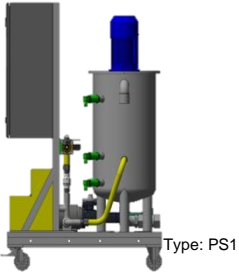
This patented technology, in combination with best-class flocculants, continuously responds to changes in sludge quantity. The result is:

- Continuity and stability of the sludge production process
- Improved hydraulic load of the dewatering equipment
- Improved cake solids
- Reduced water consumption
- Improved cost management
- Reduced floor footprint

Typical Installation



*HMI= Human Machine Interface



Type: PS1



Type: PS3



Type: PS4



1. Polymer preparation station (PS)

The polymer preparation stations are compact devices for producing highly effective stock polymer solution. The stations combine three functions:

- The preparation and maturing of polymer solutions from 0.1 up to 2.0% (Dry) or 4.0% (Liquid) concentration
- The proportional dosing of the solution into a sludge line or an intermediate buffer tank
- The control of the mixing energy in combination with the Inline Mixer.

Several versions are available to prepare all polymer types and volumes:

Type	Polymer Type	Tank volume (L)	Polymer preparation capacity up to*
PS1	Liquid only	60	60 L/h
PS3L	Liquid only	750	160 L/h
PS3LD	Liquid and Dry	750	160 L/h or 30 Kg/h
PS4L	Liquid only	1000	160 L/h
PS4LD	Liquid and Dry	1000	160 L/h or 40 Kg/h

*Depending on polymer type

Features:

- Fitted with stainless steel switching / control cabinet for control of the unit using PLC control and touch panel operating device for overall system management
- Fully enclosed mixing chambers for the preparation of polymer solution with a permanently mounted system for dosing of polymer and separate automatic solution pump
- Patented Floccmaster polymer/water mixing technology allows to prepare custom-made blends of multiple polymers
- Water flow controls for solution water and stock polymer.

2. Buffer tank

If required, the stock polymer solution prepared in the PS station can be aged in compact storage tanks before dosing into the process. Agitated buffer tanks are available in two sizes: 1000 litres and 2000 litres.

3. Dosing System

Dosing systems enable the feeding of stock polymer solution into the customer's process with optimal mixing without the need of additional distribution water. Progressive cavity pumps with PID control are available to meet all process demands. Volume flow sensors in the sludge line and in the polymer solution line allow to maintain a constant ratio of polymer to sludge volume for optimum system performance.

4. Mixing technology

To realise an optimal mixing process of polymer solution into the sludge, an adjustable mixing energy is applied. This is realised through the Inline Mixer which is rotary speed-controlled in a sludge-volume-dependent manner. A continuously ejected polymer film is mixed into the sludge stream over a hollow shaft paddle.

The Inline Mixer is available in 3 sizes that can handle sludge volumes from 2 to 400 m³/hour, ensuring wide range of applicability. The rotary speed of the Inline Mixer can be controlled allowing automatic adjustment of the mixing energy required to the sludge flow and the concentration of the flocculation agent.

The package of mixer, dosing pump and control panel allows external interface connection from the customer allowing optimal performance of this unique technology.

5. Floccensor

The Floccensor allows for an assessment of the polymer settlement and the subsequent mixture process with the aid of an optical evaluation system. In this process, the emerging floc and the filtration centrate water is assessed and used as correction signal for the dosage of the polymer solution.

Requirements

- Installation footprint for polymer preparation station: about 3 m² close to the application (<10 m)
- Electricity: 400 V / 32 A -63 A depending on configuration (3 ph/N/PE)
- Water supply line to polymer station: minimum 2 m³/h, diameter 1 inch
- Water pressure: 2-16 bar
- Connections: For the Inline mixer: DN100 or DN150, Length 500mm, close to the inlet of the dewatering application
- Signals from the Customer:
 - Sludge flow signal (4-20 mA) to polymer dosing station.
 - A start/stop signal (dry contact).
 - A polymer dosing station ready signal to customer control system (dry contact)

Installation Process

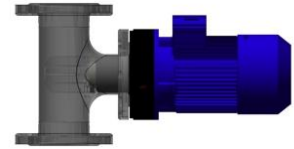
Survey (Nalco & Customer)

Survey the system for process connections, installation locations, water and electrical connections and layout.

Installation (Customer)

Create process connections; bring water and electrical cabling to specified location.

The insertion flange is the mechanical coupling of the Flocmaster system to the sludge line. It consists of a VA-pipe, which is available in two designs (DN 100 and DN150). The Inline mixer and the Flocsensor are installed on the flange.



Installation is done by Customer or third party as agreed in proposal, in either case, the installation is supervised by the Nalco Service Organisation or appointed contractor.

Start-up (Nalco & Customer)

The programming and operating of the Flocmaster Mixing Technology is handled via the display (HMI) at the control cabinet.

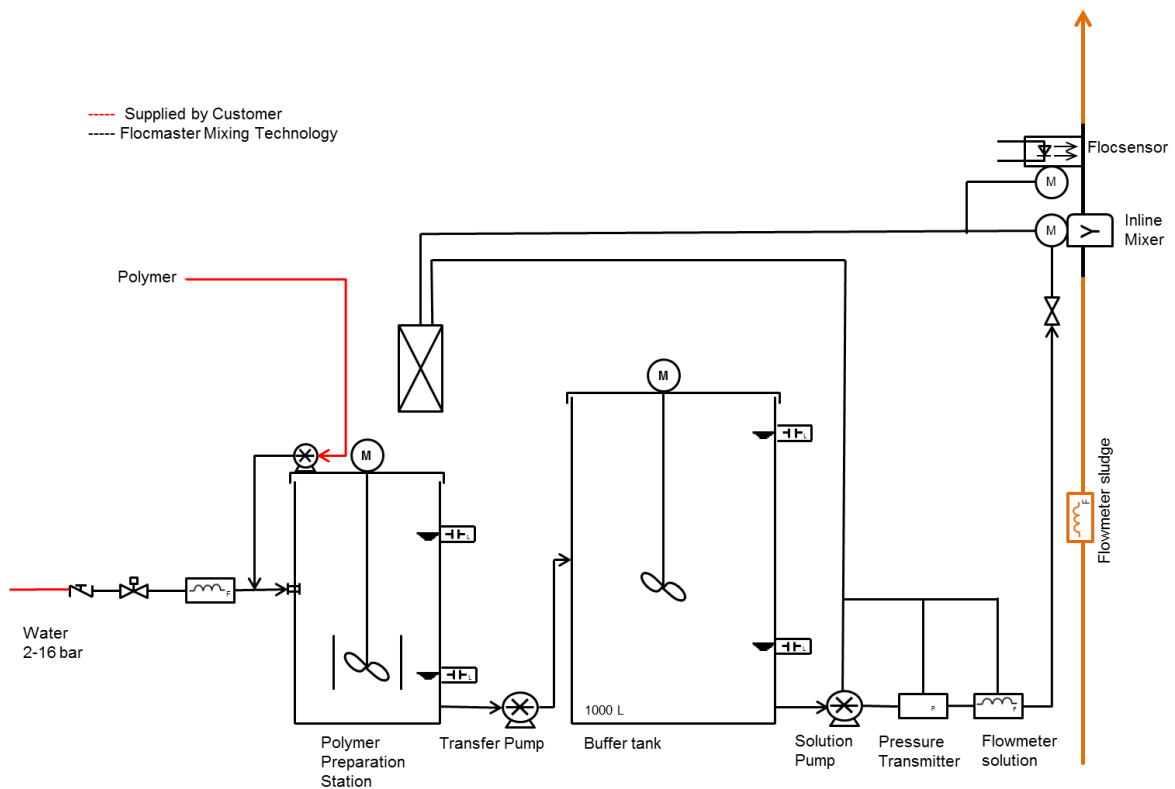
Commissioning (Nalco & Customer)

Proper flows through the equipment and safe connections of the system are checked.

At completion of the commissioning procedure, Installation & Commissioning checklist is signed by local Nalco sales representative and customer.

Instructions and training on the operation of the unit is given to customer.

Complete Installation Example



Ordering information

Part Number	Stage	Type	Polymer Type	Polymer Concentration	Polymer preparation capacity up to ¹
6046785		PS1	Liquid only	0.1-1.0 %	60 L/h
6046799		PS3L	Liquid only	0.1-3.0 %	160 L/h
6046800	Polymer preparation station	PS3LD	Liquid and Dry	0.1-1.5 % (D) 3.0 % (L)	160 L/h or 30 Kg/h Dry
6046801		PS4L	Liquid only	0.1- 4.0 % (L)	160 L/h
6046802		PS4LD	Liquid and Dry	0.1-2.0 % (D) 4.0 % (L)	160 L/h or 40 Kg/h Dry
		Volume	Agitator	Transfer Pump Capacity	
6046787	Buffer tank	1000 L	Yes	6 m ³ /h	
6046788		2000 L	Yes	6 m ³ /h	
		Type	Dosing Pump Capacity	Flowmeter	Control
6046790	Dosing Pump	Progressive Cavity Pump ²	1000 L/h	No	Manual
6046791		Progressive Cavity Pump	1000 L/h	Yes	Automatic
6046792		Progressive Cavity Pump	3000 L/h	Yes	Automatic
		Type	Sludge Flow	PN	DN
6046793	Flocmaster Inline Mixer	V1	2 to 50 m ³ /h	10	DN 100 500 mm
6046794		V3	2 to 100 m ³ /h	16	DN 100 500 mm
6046795		AT	2 to 400 m ³ /h	16	DN 150 500 mm
		Type	Camera resolution	PN	DN
6046796	Flocsensor	Compatible with V1, V3 mixers	352 x 288 pixel	16	100 mm
6046797		Compatible with AT mixers	352 x 288 pixel	16	150 mm

¹ Depending on product ² Compatible only with PS1 Polymer preparation station

Specifications

Part Number	Item Description	Material	Dimensions [mm] (h x w x l) or (d x h)	Weight ¹ [Kg]	Tank Volume [L]	Power [V/kW]	
6046785	Polymer Preparation Station PS1	SS 304	1200 x 800 x1550	350	60	400 / 1.5	
6046799	Polymer Preparation Station PS3L	SS 304	1550 x 1200 x 1950	500	750	400 / 11.0	
6046800	Polymer Preparation Station PS3LD	SS 304	1550 x 1200 x 1950	500	750	400 / 11.0	
	Powder tank		400 x 510	50	30		
6046801	Polymer Preparation Station PS4L	SS 304	1800 x 1480 x 2320	600	1000	400 / 15.0	
6046802	Polymer Preparation Station PS4LD	SS 304	1800 x 1480 x 2320	600	1000	400 / 15.0	
	Powder tank		400 x 510	50	30		
		Material	Dimensions [mm] (d x h)	Weight ² [Kg]	Tank Volume [L]		
6046787	Buffer tank with agitation and transfer pump	SS 304	1350 x 1420	180	1000		
6046788	Buffer tank with agitation and transfer pump	SS 304	1350 x 2120	230	2000		
		Capacity [L/h]	Frequency	Weight [Kg]	Pressure max. (bar)	Power [V/kW]	
6046790	Polymer Dosing Pump	1000	Manual	30	4	400 / 0.5	
6046791	Polymer Dosing Pump	1000	Automatic	30	4	400 / 0.5	
6046792	Polymer Dosing Pump	3000	Automatic	110	24	400 / 3.0	
		Material	Dimensions [mm]	Weight [Kg]	Pressure max. (bar)	RPM (max)	Power [V/kW]
6046793	Flocmaster Inline Mixer V1	SS304	500 x 620 x 250	23	10	2000	400 / 1.5
6046794	Flocmaster Inline Mixer V3	SS304, SS316	500 x 620 x 250	48	16	3000	400 / 4.0
6046795	Flocmaster Inline Mixer AT	SS304, SS303	500 x 920 x 235	85	16	2000	400 / 5.5
		Material	Dimensions [mm] ³	Weight [Kg]	Digital In-/Output	Analog output	Power [V/kW]
6046796	Flocsensor DN100	SS 303	500 x 760 x 390	23	24V DC, 2A	4-20 mA	400 / 0.06
6046797	Flocsensor DN150	SS 303	550 x 1296 x 390	38	24V DC, 2A	4-20 mA	400 / 0.06

¹ For the mixer on the polystation only. ² Empty. ³ Including Inline Mixer

NALCO COMPANY OPERATIONS

North America: 1601 West Diehl Road • Naperville, Illinois 60563-1198 • USA
Europe: A-One Business Center • Z.A. La Pièce 1 • Route de l'Etraz • 1180-Rolle • Switzerland
Asia Pacific: 2 International Business Park • #02-20 The Strategy Tower 2 • Singapore 609930
Latin America: Av. das Nações Unidas 17.891 • 6° Andar 04795-100 • Sao Paulo • SP • Brazil

www.nalco.com

FLOCMaster and NALCO the logo are Trademarks of Nalco Company
 ©2010 Nalco Company, all rights reserved