

POLYPACK

Continuous and automatic preparation of polymers

POLYMER DOSING SYSTEM

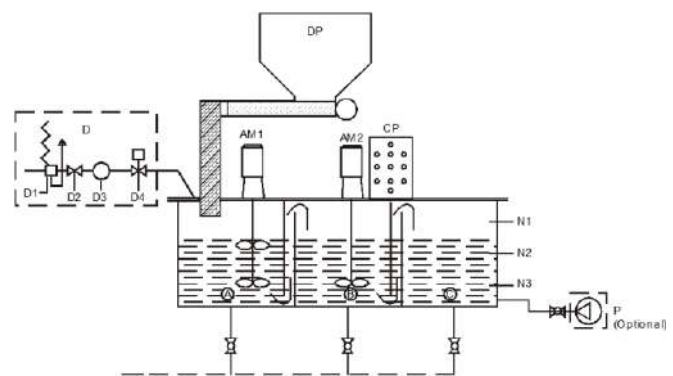
Introduction

The use of polymers or flocculants considerably improves the separation process between the solid/liquid phases for applications in:

- Water treatment (flocculation of industrial and potable water)
- Waste water treatment (physico-Chemical treatment)
- Sludge treatment (centrifuges, filter press to improve dewatering)
- Paper industry (retention agent)
- Various other industries (chemical, petrochemical, quarry etc.)

These flocculants, in powder and emulsion form, are very high molecular weight polymers. To ensure efficiency of the separation process, the preparation of the usable dilute polymer solution (2 to 5 g/l) is critical. The PolyPack employs rigorous technical standards and features which ensure optimum and consistent flocculant preparation.

Operating Diagram



- | | |
|-------------------------------|-----------------------------------|
| D: Water Feed | P: Pump (Optional) |
| D1: Pressure reducer | AM1: Agitator (2 Impeller) |
| D2: Control Valve | AM2: Agitator (1 Impeller) |
| D3: Contact Flow meter | N1: High Level |
| D4: Solenoid Valve | N2: Low Level |
| DP: Powder Feeder | N3: Very Low Level |
| CP: Control panel | A: Preparation Tank |
| | B: Maturation Tank |
| | C: Extraction/dosing tank |

Operating Principle

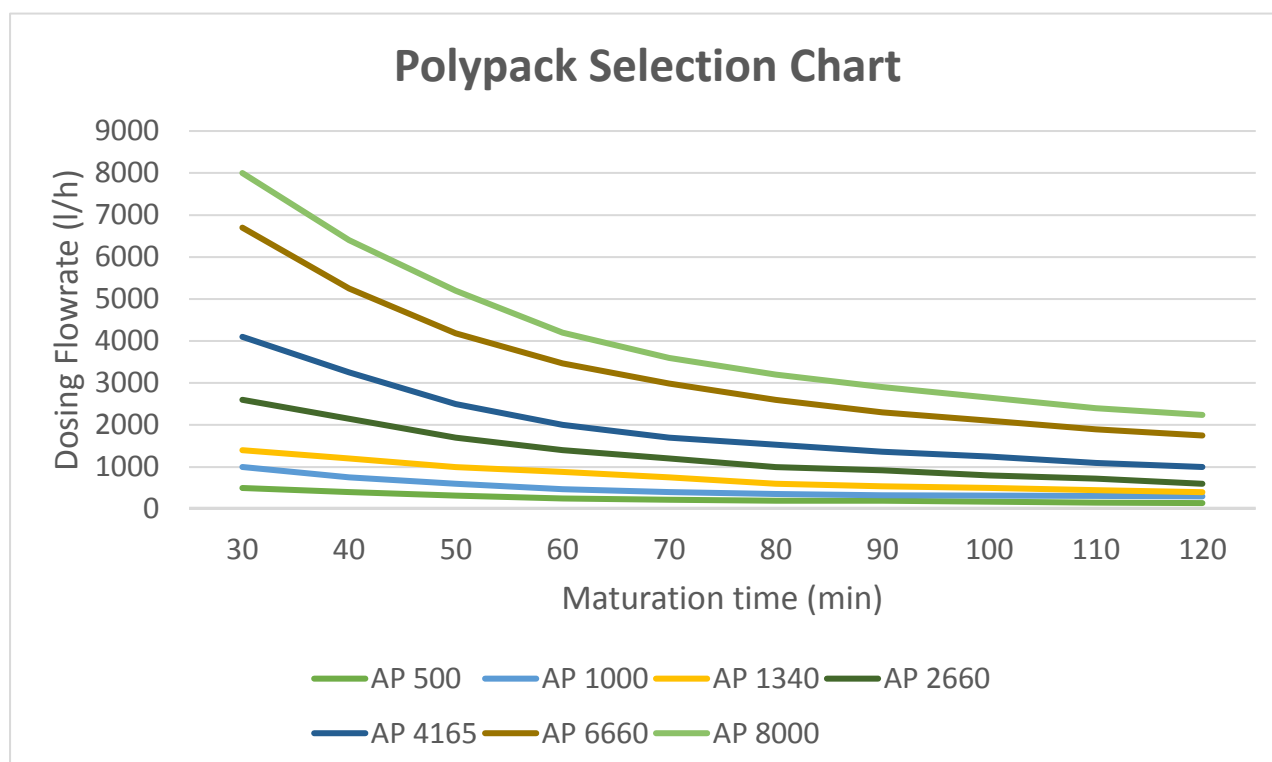
The circulation of the polymer preparation is routed through the compartments, which are separated by baffles. In the preparation chamber, powder is uniformly mixed with water. The polypack is designed to allow a maturation time of 30 minutes to 120 minutes. The dosing chamber is fitted with three level switches. These level switches control the logic of the Automatic preparation cycle. The Logic of level switches are listed in the table. The PolyPack is fitted with the powder screw feeder with a 60L hopper as standard. The powder screw feeder has a screw connected to a gear box and motor. The rate of powder feeding can be adjusted using a Variable frequency drive provided in the control panel. The water feed line is fitted with a pressure reducer, a control valve to control the water input rate, a flow meter to measure the water flow rate and a solenoid valve.

Instrument Logic Execution

LOGIC EXECUTION		
	CAUSE	EFFECT
Dosing Tank	TANK LEVEL LOW (Level Alarm Low - LAL)	a) SOV energized, water starts to flow in preparation tank. b) Powder feeder OFF for timer T=300sec. After timer T, Complete powder feeder turned ON. c) Agitator 1 & 2 either turned ON or slowed down using VFD. After T=300sec, agitator turned ON.
	TANK LEVEL LOW LOW (Level Alarm Low Low – LALL)	a) Dosing Pump will Trip
	TANK LEVEL HIGH (Level Alarm High – LAH)	a) Powder feeder turned OFF. b) SOV degenderized, water inlet valve closed. c) Agitator remains ON as there is no interlock between agitator and tank
	TANK LEVEL HIGH HIGH (Level Alarm High High – LAHH)	a) Powder feeder turned OFF. b) SOV degenderized, water inlet valve closed.
Water Inlet Flow	FLOW LEVEL LOW (Flow Alarm Low – FAL)	a) SOV energized, water inlet valve open. b) Powder feeder turned OFF for timer T(300sec), After Timer T, powder feeder turned ON.
Hopper	HOPPER LEVEL LOW LOW (Level Alarm Low Low – LALL)	a) Powder feeder turned OFF. b) SOV degenderized, water inlet valve closed.

How to select the Polypack

Hypothesis	Volume of water to be treated	: 1000 m ³ /hr
	Treatment Level	: 5ppm (in weight)
	Diluted polymer concentration	: 0.5% (5g/L)
	Maturation Time	: 30 min.
Mass flow rate of polymer Powder	: $(1000 \times 10^3) \times (5 \times 10^{-6}) = 5 \text{ kg/hr}$	
Extraction/Dosing Flowrate	: $5 \text{ kg/hr} \times (1/0.005) \text{ l/kg} = 1000 \text{ l/hr}$	
The model to select is the:	Polypack AP 1000	



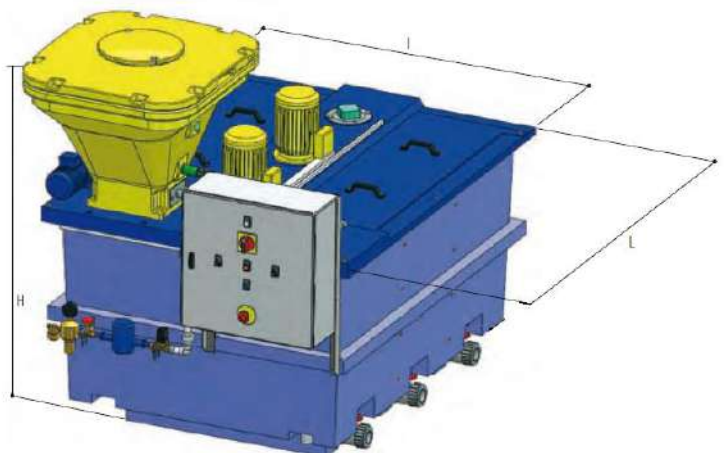
Dimensions

Model		AP - 500	AP -1000	AP -1340	AP -2660	AP -4165	AP -6660	AP -8000
		FRP POLYPACK						
Dimensions (mm)	Length L	1415	1740	1740	1740	2710	3370	4100
	Width I	810	1340	1340	1550	1650	1700	1700
	Height H	1380	1500	1700	2250	2250	2135	2130
	Weight Kg (Unfilled)	225	320	500	550	570	600	680
		SS POLYPACK						
Dimensions (mm)	Length L	1415	1710	1710	1990	2600	3350	4110
	Width I	810	1500	1500	1555	1550	1860	1860
	Height H	1380	1350	1450	1850	1950	2050	2050
	Weight Kg (Unfilled)	750	900	925	1195	1430	1730	1930

Characteristics

Model		AP - 500	AP -1000	AP -1340	AP -2660	AP -4165	AP -6660	AP -8000
Extraction/dosing flow (l/h)	Maturing time (1/2 h)	500	1000	1400	2600	4100	6700	8000
	Maturing time (1 h)	250	470	900	1400	2000	3450	4100
Tank volume (l)	Total	800	1330	1550	2900	4340	6750	8310
	Permanent	620	885	1220	2370	3610	5700	7050
Water supply flow (l/h)		800-1500	800-1500	800-2000	1000-4000	1500-6200	2500-10000	3000-12000
Agitator Motor power (hp)		0.5	0.5	0.5	0.5	0.5	0.5	0.5

Powder Feeder	
Powder flowrate (kg/hr)	0.2 to 30
Capacity (L)	60 (Standard), Other sizes on request.
Motor power (hp)	0.5



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