

SmartFeed™



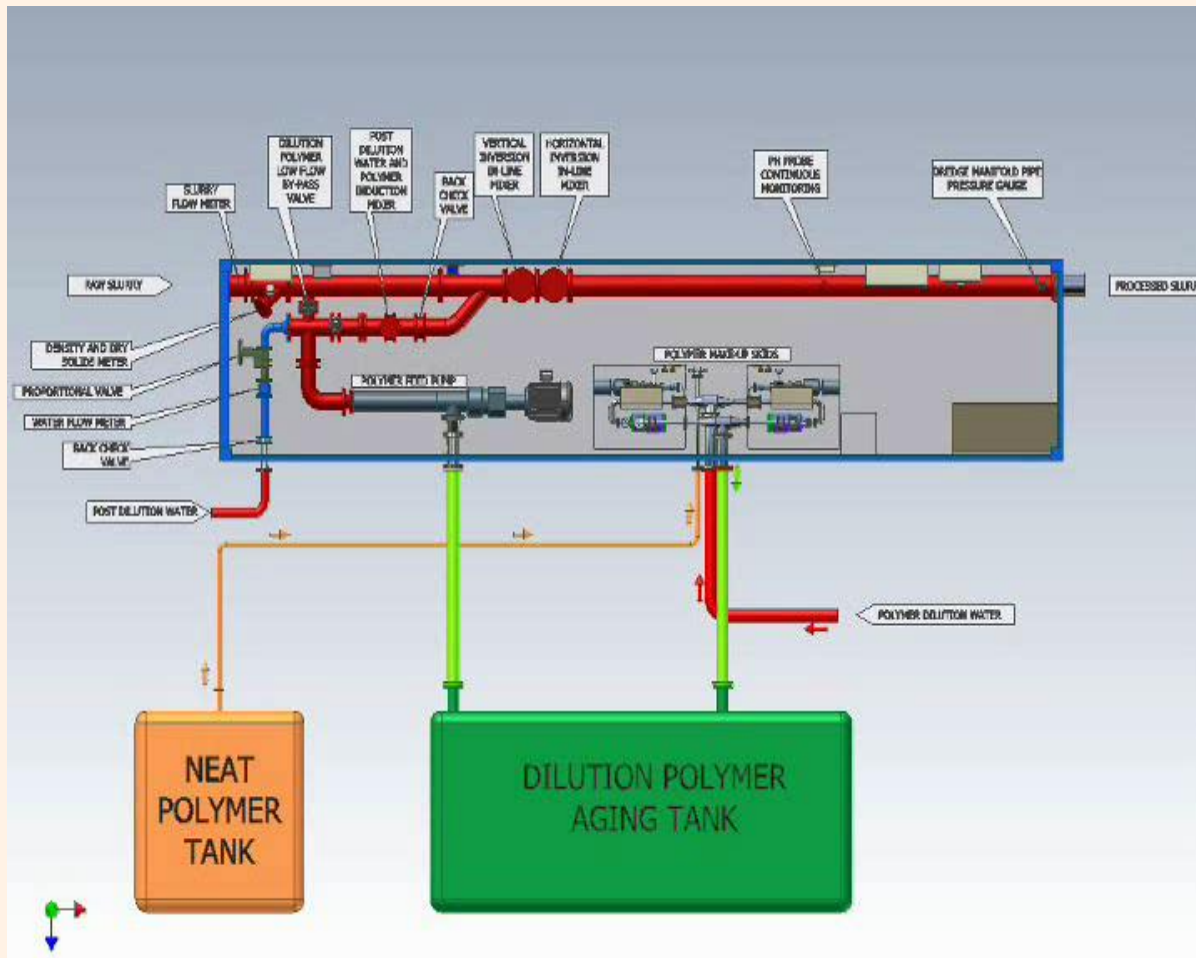
Chemical Conditioning System For Geotube® Dewatering Applications

SmartFeed™ system

General Description:

- Smartfeed™ design solves chemical conditioning applications problems for various geotextile containment applications
- Technology was designed to be compatible with dredging and diver operations, variability of flow and solids mass in the slurry
- Technology is comprised of chemical makedown equipment, chemical-to-slurry mixing technology and on-board computer mass-balance reporting
- Technology samples the slurry parameters every 15 seconds and recalculates the chemical dosage rate based on changes

Polymer Make Down



SmartFeed™ system does the following:

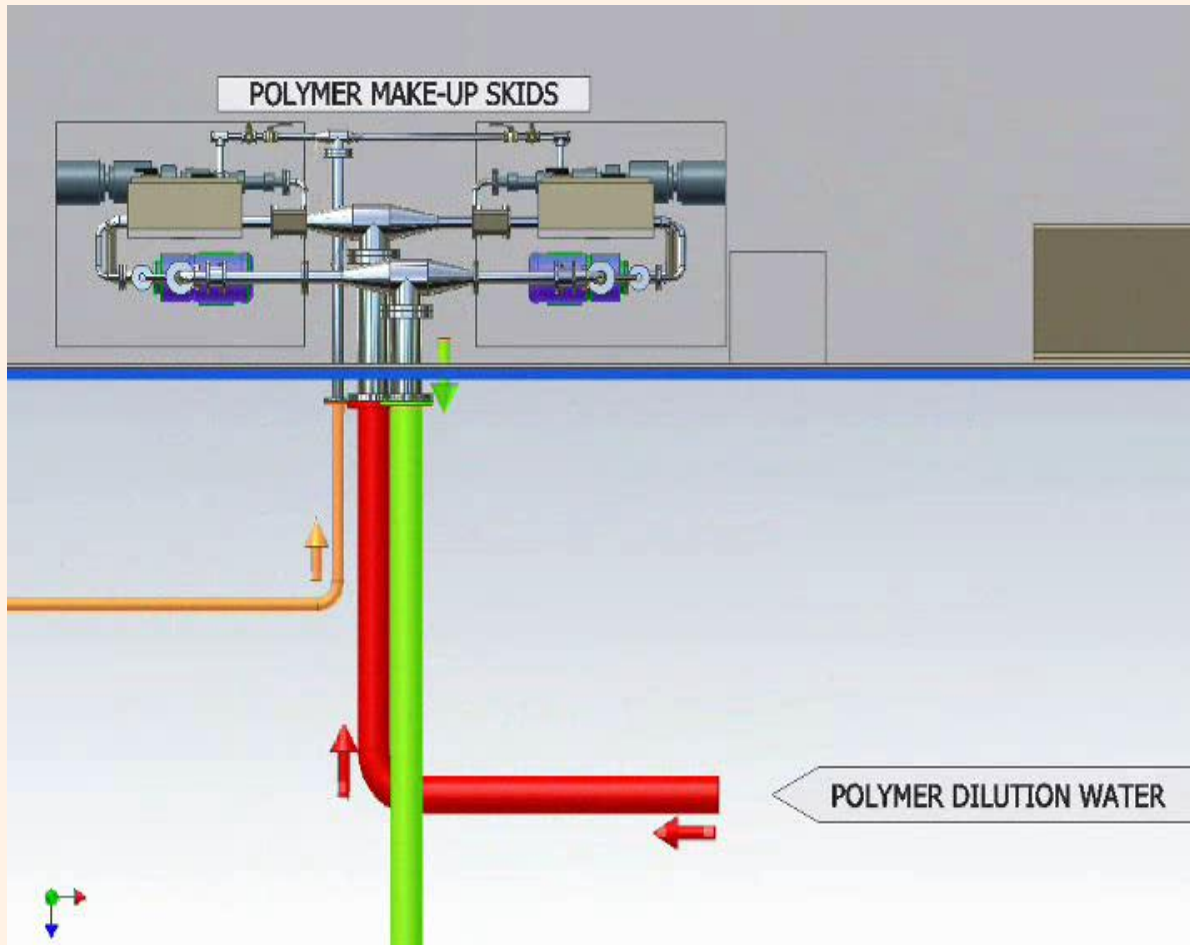
- Meters neat emulsion or solution polymers
- Mechanically mixes the product to begin proper activation
- Upgradable to ratio the neat product to the incoming water flow
- Transfers the solution to the application tank

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SMARTFEED™

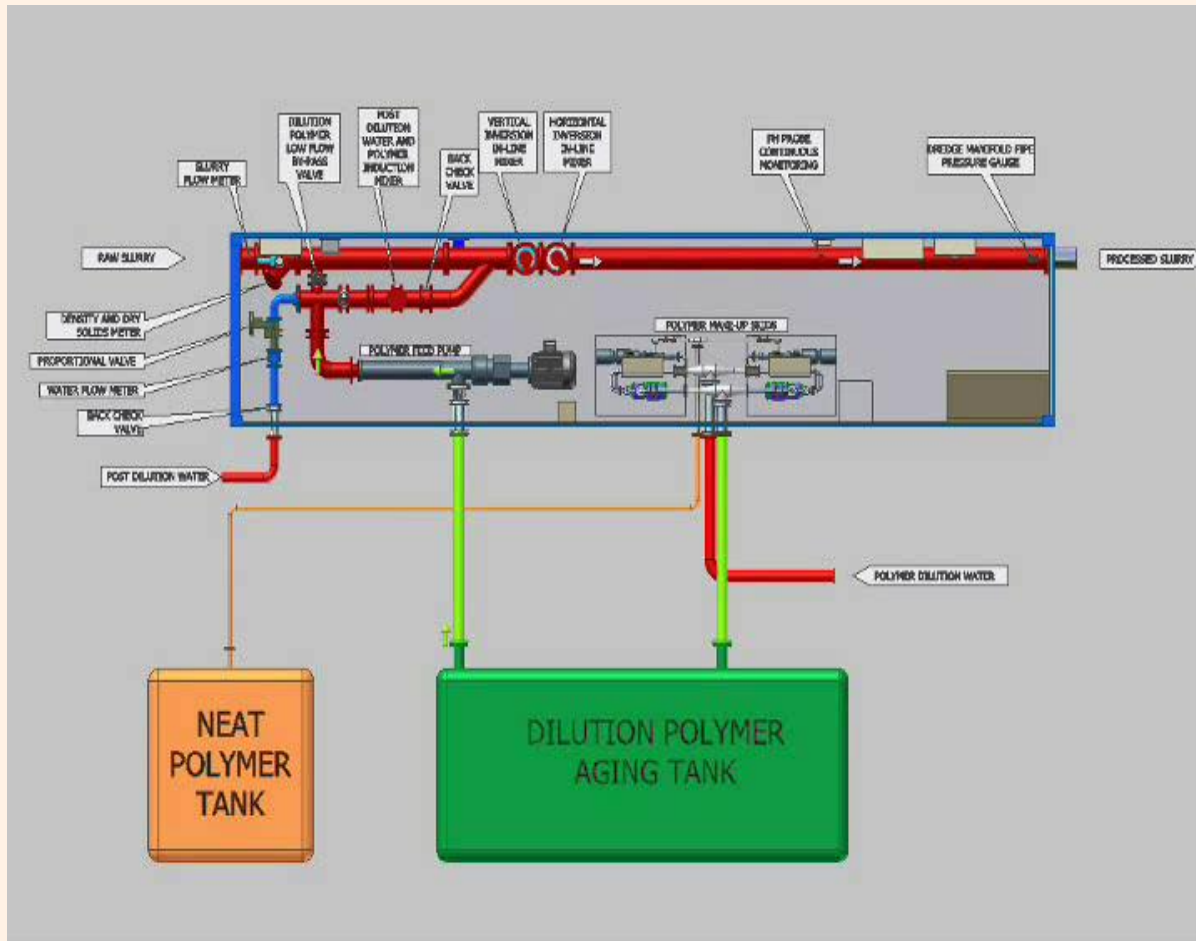
TENCATE
Geotube®

Polymer Make Up Skids



- Designed to prepare and store solutions of emulsion grade polymer for onward dosing at the point of application.
- Neat emulsion is metered through a progressive cavity pump and injected into the water flow, prior to passing through an inversion pump to ensure complete dissolution.
- The resultant solution is transferred to a storage tank, ready for dosing at the point of application.

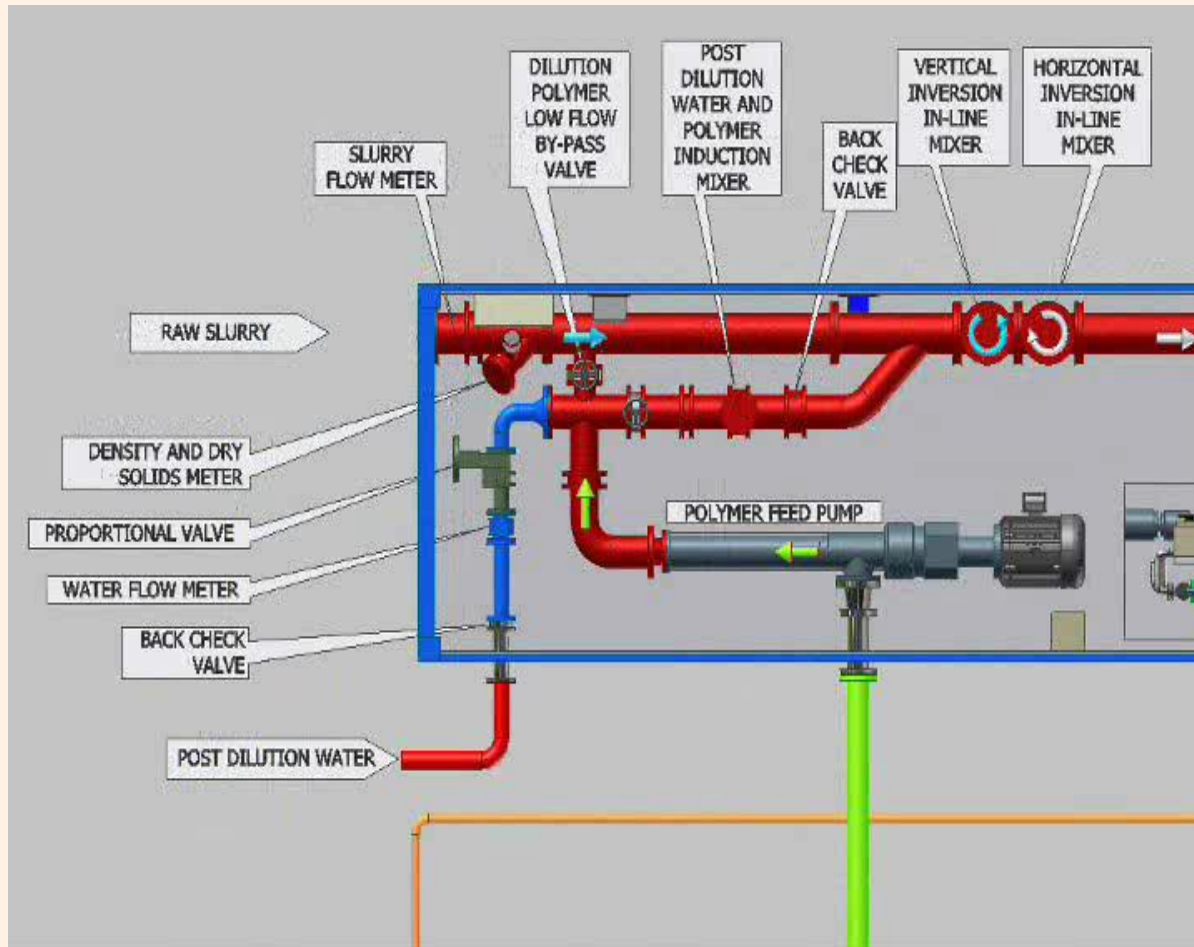
Polymer Addition (non-post dilution)



- Flocculation is the destabilization of a hydrophobic colloidal suspension by bonding between colloidal particles using long polymer chains of high molecular weight (greater than 1 million).
- The amount of polymer required to support continuous flocculation is dependent on the mass of dry solids entering the systems
- The various portable unit are capable of handling up to 600 gpm @ .5% dilution concentration
- This normally supports dredging projects in the 2000-3000 gallon per minute range



Polymer Addition (post-dilution)



- To reduce the need for fresh water when polymer demand is higher than 600 gpm @ .5% dilution
- Units can be provided with post-dilution systems that allows filtrate from dewatering and or marine water for dilution of polymer in ranges up to 1,200 gpm for a .5% dilution polymer range. This supports dredging projects in the 2,000 – 4,000 gallons per minute range.

Setup Page

Mineral Processing Services, LLC 12:23 PM 2/14/2007

Enter Job Name **Job Name: This is a new job**

Enter Slurry Characteristic **Slurry Characteristic: None**

Enter Maximum GPM	Enter Polymer Solution
500	.25
1000	.50
1500	.75
2000	1.00
2500	1.25
3000	1.50
3500	

Enter Poly Solution Flow per Dry Ton Lab

Enter Lbs / Ton

Post Dilute On Post Dilute Off

Go To Manual Page

Shutdown Citect Job Complete

Current Conditions

Maximum Flow 0

Polymer Solution 0.00

Polymer Flow per Dry Ton in Lab 1.00

Lbs / Dry Ton 0.00

Post Dilute Off

Fill Page	Setup	Summary 1 - 25	Summary 26 - 50	Flow Trend	Polymer Trend	Solids Trend	pH Trend	Reports
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➤ SmartFeed™ system is a patent-pending technology for chemical dose management

➤ Specific project operational parameters -- flow, solids range, lbs of polymer per dry ton of solids – are specified on this page



Operational Page

Start Totalizing
Totalizing Stopped

% Solids 0.00 **Slurry Flow** 0.0
pH Level 0.00 **Manifold Pressure** 0.00
Polymer Flow 0.00

Tube 2	Tube 31	No Tube Selected!	Tube 50
Select New Tube	Select New Tube	Select New Tube	Select New Tube
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Last Fill Completed: 0	Last Fill Completed: 0	Last Fill Completed: 0	Last Fill Completed: 1
Fill Selected: 1st Fill	Fill Selected: 2nd Fill	Fill Selected: None	Fill Selected: 2nd Fill
Filling Time: 00:26:16	Filling Time: 00:13:50	Filling Time: 00:00:00	Filling Time: 00:13:50
Slurry Gallons: 96304	Slurry Gallons: 5192	Slurry Gallons: 0	Slurry Gallons: 5192
Avg Slurry GPM: 3666	Avg Slurry GPM: 375	Avg Slurry GPM: 0	Avg Slurry GPM: 375
Avg % Dry Solids: 11.74	Avg % Dry Solids: 10.72	Avg % Dry Solids: 0.00	Avg % Dry Solids: 10.72
Avg Polymer Flow: 1411	Avg Polymer Flow: 15	Avg Polymer Flow: 0	Avg Polymer Flow: 15
Fill Done	Fill Done	Fill Done	Fill Done

Fill Page **Setup** **Summary 1 - 25** **Summary 26 - 50** **Flow Trend** **Polymer Trend** **Solids Trend** **pH Trend** **Reports**

- The operational page allows operator to view, in real time, percent of dry solids, density, flow rate, pH and line pressure
- The operational page selects which tubes are receiving flow



Logging Page

	Current Fill		Fill 1 Total		Fill 2 Total		Fill 3 Total		Fill 4 Total		Fill 5 Total	
	Slurry	Polymer	Slurry	Polymer	Slurry	Polymer	Slurry	Polymer	Slurry	Polymer	Slurry	Polymer
1	37567	10608	0	0	0	0	0	0	0	0	0	0
2	96304	37067	0	0	0	0	0	0	0	0	0	0
3	63238	30567	0	0	0	0	0	0	0	0	0	0
4	4283	4092	0	0	0	0	0	0	0	0	0	0
5	30644	4925	0	0	0	0	0	0	0	0	0	0
6	5283	6025	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	22083	4625	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	11917	3575	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	42	2	1000	25	833	21	667	17	1983	48	0	0
18	0	0	1083	27	833	21	0	0	0	0	0	0
19	0	0	1917	48	0	0	0	0	0	0	0	0
20	0	0	1917	48	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	39744	6875	0	0	0	0	0	0	0	0	0	0
23	5250	1125	0	0	0	0	0	0	0	0	0	0
24	30644	4925	0	0	0	0	0	0	0	0	0	0
25	3167	158	0	0	0	0	0	0	0	0	0	0

Fill Page	Setup	Summary 1 - 25	Summary 26 - 50	Flow Trend	Polymer Trend	Solids Trend	pH Trend	Reports
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- Tube logging is updated at the end of each operational day.
- This will download which tubes in the project received how many gallons and dry ton solids that day



SmartFeed™

is a patent-pending technology of Mineral Processing Services LLC

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