

Single Process Investment Report

Process: Dow's (Wolf, Bolnitz, 04) Prep of Alkali Cellulose Slurry, HP Ethn w/ MC & PO in Excess MC (MC/Cell=2) in 1 Train Autoclave Reactor, Steam/Water Stripping, 2 Hot Water Washings w/ Membrane Filtn Walocel HM F/P (DS=1.8, MS=0.15, AI=95%)

Product: Hydroxypropyl Methylcellulose (HPMC, Premium)
 [93.3-96.65%, DS=1.5-1.9, MS=0.25-0.3, Mw=0.8-0.9 MM]

Design Capacity: 50.60 MMlb/y

Utilization: 90.0 %

CE Index: 599

Battery Limit Equipment

	\$ MM
Reactors	4.062
Columns	0.770
Tanks and Vessels	6.255
Heat Exchangers	2.120
Pumps	0.641
Special Equipment (BLI)	12.732

Total Equipment	26.580
Battery Limit Investment	102.811
Allocated Battery Limit Investment 10%	116.176

Off-sites

Utilities	
Steam Generation(Oil/Gas)	2.428
Refrigeration	2.190
Cooling Tower	2.863
Process Water Treatment	0.385
Inert Gas Generation	0.086

Total Utilities	7.952
Waste Treatment	
Settling Lagoon	0.185
Thickener and Clarifier	0.110
Oil Separator	0.208
Neutralizer	0.282
Biological Oxidation Unit	12.164
Active Carbon Adsorber	8.157
Gas Redox Unit	0.564

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Total Waste Treatment	21.670
Tankage	3.491
Warehouse	1.116
Service Facilities, 20.0% (BLI + OFS)	30.081

Off-sites Investment	64.310
Total Fixed Capital, incl. 10.0% contingency	198.535
Start-up Costs, 7.0% FC	13.897
Working Capital, 30.0 days inv. 40 days rec.	30.872

Total Process Investment	243.304

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Utilization: 90.0 %

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Battery Limit Equipment

	\$ MM
Reactors	4.062
Columns	0.770
Tanks and Vessels	6.255
Heat Exchangers	2.120
Pumps	0.641
Special Equipment (BLI)	12.732

Total Equipment	26.580
Battery Limit Investment	102.811
Allocated Battery Limit Investment 1.5%	117.719

Off-sites

Utilities	
Steam Generation(Oil/Gas)	2.464
Refrigeration	2.190
Cooling Tower	2.863
Process Water Treatment	0.384
Inert Gas Generation	0.086

Total Utilities	7.987
Waste Treatment	
Settling Lagoon	0.185
Thickener and Clarifier	0.110
Oil Separator	0.208
Neutralizer	0.282
Biological Oxidation Unit	14.437
Active Carbon Adsorber	9.682
Gas Redox Unit	0.561

Single Process Investment Report

Total Waste Treatment	25.465
Tankage	3.491
Warehouse	1.116
Service Facilities, 20.0% (BLI + OFS)	31.156
	69.215
Off-sites Investment	69.215
Total Fixed Capital, incl. 10.0% contingency	205.627
Start-up Costs, 7.0% FC	14.394
Working Capital, 30.0 days inv. 40 days rec.	32.708
	252.729
Total Process Investment	252.729