



aspenONE[®] Engineering

Integrated Solution for Chemicals

Business Challenge

The VP of Manufacturing at a Chemical company is looking to invest in a new methylamines manufacturing plant to effectively compete in a global commoditized market. Historically, the company used point products to design and optimize various unit operations. For this project, they chose aspenONE Engineering to model the plant in one integrated environment. Key objectives include:

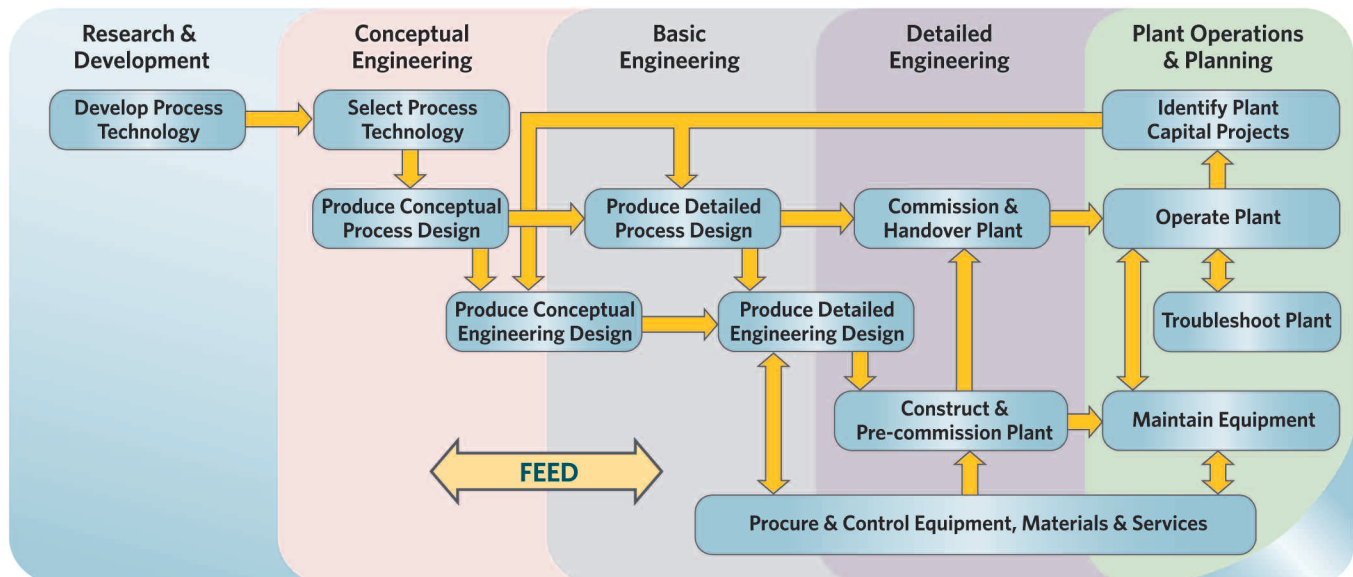
- Optimize the conceptual design of the plant
 - Design an energy-efficient plant
 - Determine the net cost to produce dimethylamine
 - Maximize yield of the desired dimethylamine, and reduce less desirable by-products monomethylamine & triethylamine
- Produce a detailed process and equipment design
 - Lower capital costs
- Leverage models for plant operation and troubleshooting
 - Lower operating costs

Benefits

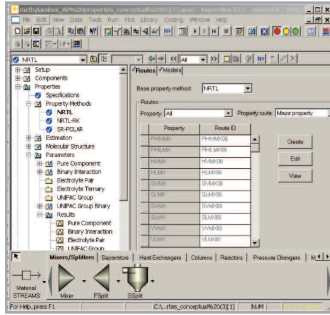
- **More Efficient Process Engineering & Design**
 - Accelerate screening of design options
 - Lower capital costs by 5%
 - Reduce energy requirements by 50%
 - Achieve operating cost savings of \$6.25M/year
 - Execute Front End Engineering & Design faster, more efficiently
- **Better Support for Plant Operations**
 - Reuse process knowledge via models
 - Save energy, increase plant reliability and safety
 - Increase capacity (de-bottleneck critical equipment)
- **Flexible Access to Technology at Lower Cost**

Solution

aspenONE Provides One Integrated Environment

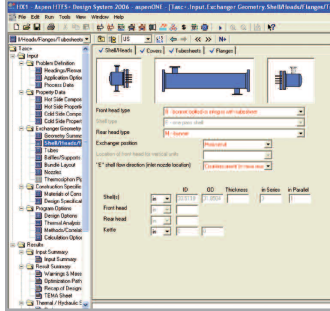


Aspen Properties



Validate properties and thermo

Aspen Shell & Tube Exchanger



Produce detailed heat exchanger design

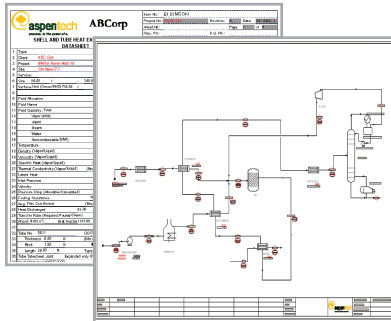
Aspen Process Economic Analyzer

CASHFLOWS (Cashflow)	YEAR	0	1	2
SP (Products Sales)	CostPeriod	-	-	180,833,000.000
Expenses	CostPeriod	-	-	-
COP (Capital Costs)	CostPeriod	-	15,308,600	13,913,400
Unallocated Cumulative Capital Cost	CostPeriod	-	13,913,400	13,913,400
Capital Cost	CostPeriod	-	14,899,100	-
Working Capital	CostPeriod	-	700,454	-
OP (Operating Costs)	CostPeriod	-	10,295,800.000	117,317,000.000
Raw Materials	CostPeriod	-	5,440,800.000	127,136,000.000
Operating Labor Cost	CostPeriod	-	72,862	876,028
Maintenance Cost	CostPeriod	-	27,697	362,000
Utilities	CostPeriod	-	916,879	6,921,000
Operating Charge	CostPeriod	-	18,223	246,007
Plant Overhead	CostPeriod	-	49,995	695,428
Subtotal Operating Costs	CostPeriod	-	9,440,800.000	127,145,000.000
O and A Costs	CostPeriod	-	795,972.000	10,979,600.000
R (Revenues)	CostPeriod	-	(10,221,000.000)	53,814,200.000
DDP (Depreciation Expense)	CostPeriod	-	1,113,070	1,113,070
E (Gearing Before Taxes)	CostPeriod	-	(10,222,100.000)	53,814,100.000
TAX (Taxes)	CostPeriod	-	-	21,440,200.000
NE (Net Earnings)	CostPeriod	-	(10,222,100.000)	32,389,000.000
TEI (Total Earnings)	CostPeriod	-	(10,221,000.000)	32,175,200.000
TIC (Total Expenses (Includes Taxes and Depreciation))	CostPeriod	-	(10,221,000.000)	117,317,000.000
CF (Cashflow for Project)	CostPeriod	-	(10,221,000.000)	32,175,200.000
NPV (Net Present Value)	CostPeriod	-	(5,517,400.000)	13,822,800.000
IRR (Internal Rate of Return)	Percent	-	42.959	-
MIRR (Modified Internal Rate of Return)	Percent	-	24.157	-

Analyze economics of different cases

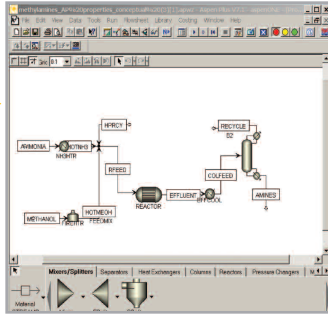
Data imported directly from the simulator

Aspen Basic Engineering



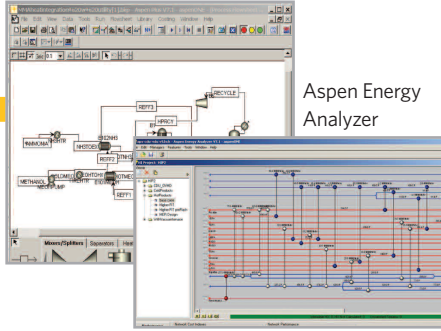
Support collaboration during the front-end engineering and design (FEED) process. Pull data from process simulation to develop equipment lists, preliminary P&IDs, equipment data sheets, etc.

Aspen Plus



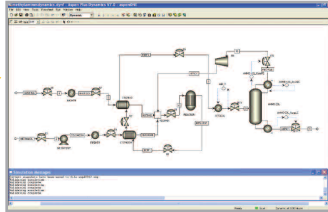
Develop conceptual design with Aspen Plus

Aspen Plus



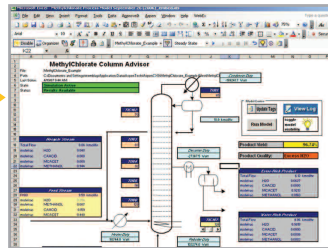
Analyze and optimize energy consumption then develop heat integrated case

Aspen Plus Dynamics



Verify safety and controllability

Aspen Simulation Workbook



Process models to support operations decisions



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