

4. Chemicals

The chemicals industry encompasses the production of basic organic and inorganic chemicals, synthetic rubber and fibers, pesticides and fertilizers, pharmaceuticals, paints and adhesives, soaps, and cleaning compounds. In the United States alone, the total value of shipments for the chemicals industry exceeded \$650 billion in 2006, and in 2007 the industry provided almost 800,000 jobs.

a) Representative Operation – Specialty Chemicals Manufacturing

The representative operation modeled is a smaller producer of specialty chemicals in limited volumes for niche markets, such as the production of industrial and consumer cleaning products, solvents, adhesives, and fragrances. As illustrated in Exhibit 3.14, this operation is characterized by:

- Modest land and building requirements
- Moderate initial machinery and equipment requirements
- A workforce consisting of predominantly professional and technical staff, and skilled operators.
- Moderate energy requirements.

The business is assumed to operate as a stand-alone profit center.

b) International Results

International results are illustrated in Exhibit 3.15. These results reflect the combined impact of 26 location-sensitive cost components applied to the modeled operation. Detailed results, by key cost component, are presented in Exhibit 3.16.

c) Selected Cities

Exhibit 3.17 profiles results for selected cities, by country, from among the 95 cities featured in this report. Results for all other featured cities can be found in Chapter 4, Exhibit 4.7.

EXHIBIT 3.14 – CHEMICALS	
Specialty Chemicals Manufacturing – Summary of Operating Parameters	
Facilities Requirements	
Leased industrial facility	3 acres (12,141 m2)
Size of factory built	50,000 ft2 (4,645 m2)
Other Initial Investment Requirements	
Machinery and equipment – US \$'000	\$14,000
Office equipment – US \$'000	\$500
R&D equipment – US \$'000	\$500
Inventory – US \$'000	\$5,000
Equity financing – % of project costs	50%
Workforce	
Management	5
Sales and administration	11
Customer support	5
Production/non-dedicated product development	
- Professional, technical	34
- Operators	33
- Unskilled laborers	10
Other	2
Total employees	100
Energy Requirements	
Electricity monthly consumption/peak demand	300,000 kWh and 1,080 kW
Gas monthly consumption	41,300 CCF (116,997 m3)
Other Annual Operating Characteristics	
Sales at full production – US \$'000	\$50,000
Materials and other direct costs – % of sales	53%
Other operating costs – % of sales	8%
Investment in tax-eligible R&D – % of sales	2.1%

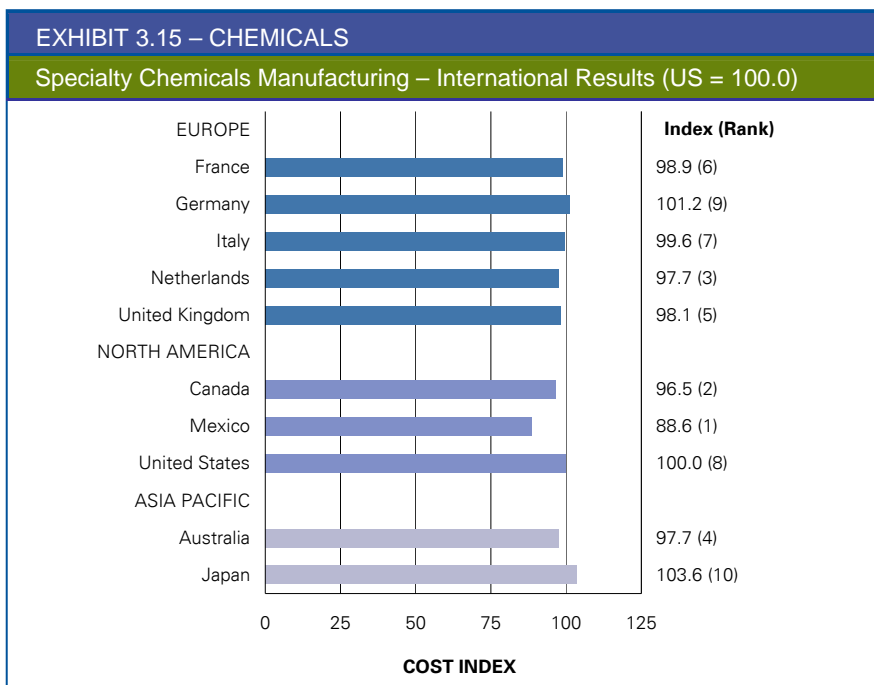


EXHIBIT 3.16 – CHEMICALS

Specialty Chemicals Manufacturing – Costs, by Major Component, US \$'000

	Europe					North America			Asia Pacific	
	France	Germany	Italy	Netherlands	UK	Canada	Mexico	US	Australia	Japan
Revenues	48,200	48,200	48,200	48,200	48,200	48,200	48,200	48,200	48,200	48,200
Costs										
- Salaries & Wages	4,872	6,758	5,341	5,849	5,301	5,573	2,316	5,706	5,870	7,261
- Statutory Plans	2,204	1,137	1,134	755	506	528	167	518	764	705
- Other Benefits	1,022	1,452	1,552	1,615	1,781	1,425	678	2,217	1,333	1,821
- Total Labor & Benefits	8,098	9,347	8,027	8,219	7,588	7,526	3,162	8,441	7,968	9,788
- Facility Lease	342	427	410	455	697	265	242	253	359	792
- Transportation	546	489	564	514	508	1,042	1,134	874	1,061	465
- Utilities	1,028	1,258	1,562	1,131	1,045	704	597	665	1,055	1,147
- Interest & Depreciation	2,328	2,437	2,357	2,312	2,375	2,371	1,386	2,409	1,937	2,547
- Non-Income Taxes	590	147	31	29	428	238	53	623	96	632
- Location-Insensitive Costs	29,402	29,402	29,402	29,402	29,402	29,402	29,402	29,402	29,402	29,402
Profit Before Income Tax	5,868	4,694	5,848	6,138	6,158	6,653	12,226	5,532	6,324	3,429
- Income Taxes ¹	1,588	1,443	1,856	1,317	1,496	1,279	3,383	1,736	1,503	1,249
Effective Rate	27.1%	30.7%	31.7%	21.5%	24.3%	19.2%	27.7%	31.4%	23.8%	36.4%
After-Tax Profit	4,281	3,251	3,992	4,821	4,663	5,375	8,843	3,797	4,821	2,181
Total Annual Costs	43,920	44,950	44,209	43,379	43,537	42,826	39,357	44,403	43,379	46,020
Index (US=100.0)	98.9	101.2	99.6	97.7	98.1	96.5	88.6	100.0	97.7	103.6
Rank	6	9	7	3	5	2	1	8	4	10

1 Income taxes may be either positive or negative, irrespective of whether profit before income tax is positive or negative, due to the impact of specific expense deduction rules, minimum taxes, and refundable income tax credits. Effective tax rates are not shown where results are not meaningful because of low profitability.

EXHIBIT 3.17 – CHEMICALS

Specialty Chemical Manufacturing – Results for Selected Cities, by Country

Country and City	Index	Rank ¹	Country and City	Index	Rank ¹	Country and City	Index	Rank ¹
International Locations – All Cities						North America – Lowest Cost Cities		
AU Adelaide	97.2	24	JP Osaka	103.4	93	CA Moncton, NB	94.2	3
Brisbane	97.9	38	Tokyo	103.9	94	Fredericton, NB	94.5	4
Melbourne	96.9	21	MX Mexico City	88.8	2	St. John's, NL	95.2	5
Sydney	98.5	54	Monterrey	88.5	1	Sherbrooke, QC	95.3	6
FR Lyon	98.5	52	NL Amsterdam	97.6	30	US Shreveport, LA	96.4	14
Paris	99.3	72	Brabant Stad	97.7	31	Cheyenne, WY	96.8	20
GE Berlin	100.7	86	The Hague	97.7	34	McAllen, TX	96.9	22
Frankfurt	101.8	90	Utrecht	97.7	33	Charleston, WV	97.1	23
IT Milan	99.1	68	UK London	99.5	74	Sioux Falls, SD	97.3	25
Rome	100.0	82	Manchester	96.6	18	Greenville-Spartanburg, SC	97.5	26
						Omaha, NE	97.5	27
						Youngstown, OH	97.6	28

1 Rank among 95 cities.