

9. Plastics

The plastic products industry encompasses a wide range of products, including bags, films, pipes, bottles, coverings, foam products, and more. In the United States alone, the value of shipments for the plastic products industry in 2006 totaled almost \$175 billion, and in 2007 the industry provided over 700,000 jobs. Typical firms range from large high-volume manufacturers of standard products, to small-volume contract manufacturers.

a) Representative Operation – Plastic Product Manufacturing

The representative operation modeled is an independent plastic products manufacturer. As illustrated in Exhibit 3.34, this operation is characterized by:

- Substantial land and building requirements, with moderate equipment requirements
- A workforce mix weighted toward skilled operators
- Relatively high energy requirements.

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

b) International Results

International results are illustrated in Exhibit 3.35. 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 3.36.

c) Selected Cities

Exhibit 3.37 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 3.34 – PLASTICS | |
|---|---|
| Plastic Product Manufacturing – Summary of Operating Parameters | |
| Facilities Requirements | |
| Leased industrial facility | 6 acres (24,281 m ²) |
| Size of factory built | 100,000 ft ² (9,290 m ²) |
| Other Initial Investment Requirements | |
| Machinery and equipment – US \$'000 | \$17,750 |
| Office equipment – US \$'000 | \$250 |
| R&D equipment – US \$'000 | – |
| Inventory – US \$'000 | \$2,000 |
| Equity financing – % of project costs | 50% |
| Workforce | |
| Management | 3 |
| Sales and administration | 11 |
| Production/non-dedicated product development | |
| - Professional, technical | 9 |
| - Operators | 46 |
| - Unskilled laborers | 18 |
| Other | 3 |
| Total employees | 90 |
| Energy Requirements | |
| Electricity monthly consumption/peak demand | 400,000 kWh and 1,350 kW |
| Gas monthly consumption | 8,900 CCF (25,212 m ³) |
| Other Annual Operating Characteristics | |
| Sales at full production – US \$'000 | \$24,000 |
| Materials and other direct costs – % of sales | 33% |
| Other operating costs – % of sales | 2% |
| Investment in tax-eligible R&D – % of sales | – |

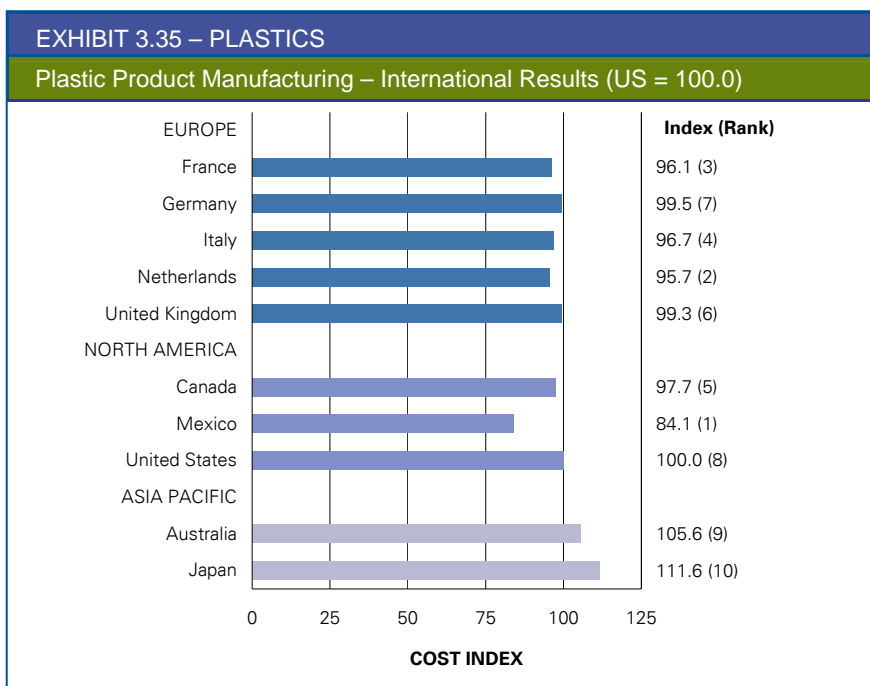


EXHIBIT 3.36 – PLASTICS

Plastic Product Manufacturing – Costs, by Major Component, US \$'000

| | Europe | | | | | North America | | | Asia Pacific | |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|--------------|--------------|--------------|
| | France | Germany | Italy | Netherlands | UK | Canada | Mexico | US | Australia | Japan |
| Revenues | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 | 23,000 |
| Costs | | | | | | | | | | |
| - Salaries & Wages | 3,610 | 4,980 | 3,842 | 4,454 | 4,041 | 4,357 | 1,487 | 4,309 | 4,469 | 5,819 |
| - Statutory Plans | 1,665 | 909 | 829 | 604 | 375 | 499 | 106 | 474 | 578 | 565 |
| - Other Benefits | 756 | 1,047 | 1,097 | 1,114 | 1,365 | 1,114 | 451 | 1,675 | 979 | 1,505 |
| - Total Labor & Benefits | 6,031 | 6,936 | 5,768 | 6,172 | 5,781 | 5,970 | 2,044 | 6,459 | 6,027 | 7,889 |
| - Transportation | 683 | 853 | 820 | 909 | 1,394 | 531 | 483 | 506 | 718 | 1,584 |
| - Utilities | 1,746 | 1,551 | 1,862 | 1,625 | 1,621 | 2,853 | 3,406 | 2,567 | 4,247 | 1,817 |
| - Interest & Depreciation | 577 | 804 | 1,221 | 761 | 771 | 494 | 537 | 483 | 858 | 768 |
| - Non-Income Taxes | 2,118 | 2,199 | 2,141 | 2,140 | 2,258 | 2,151 | 1,723 | 2,156 | 2,237 | 2,452 |
| - Location-Insensitive Costs | 464 | 261 | 59 | 56 | 796 | 449 | 43 | 591 | 217 | 1,123 |
| - Location-Insensitive Costs | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 |
| Profit Before Income Tax | 3,331 | 2,348 | 3,078 | 3,289 | 2,331 | 2,504 | 6,716 | 2,189 | 648 | (682) |
| - Income Taxes ¹ | 756 | 480 | 625 | 618 | 436 | 252 | 1,593 | 436 | 84 | 38 |
| Effective Rate | 22.7% | 20.5% | 20.3% | 18.8% | 18.7% | 10.1% | 23.7% | 19.9% | 13.0% | n/a |
| After-Tax Profit | 2,575 | 1,867 | 2,454 | 2,671 | 1,895 | 2,252 | 5,123 | 1,753 | 564 | (720) |
| Total Annual Costs | 20,424 | 21,134 | 20,546 | 20,329 | 21,106 | 20,748 | 17,878 | 21,247 | 22,437 | 23,720 |
| Index (US=100.0) | 96.1 | 99.5 | 96.7 | 95.7 | 99.3 | 97.7 | 84.1 | 100.0 | 105.6 | 111.6 |
| Rank | 3 | 7 | 4 | 2 | 6 | 5 | 1 | 8 | 9 | 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 3.37 – PLASTICS

Plastics Product 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 | 106.3 | 90 | JP Osaka | 109.3 | 92 | CA Sherbrooke, QC | 95.0 | 4 |
| Brisbane | 105.6 | 88 | Tokyo | 114.0 | 93 | Moncton, NB | 96.5 | 23 |
| Melbourne | 104.1 | 87 | | | Quebec City, QC | 96.6 | 27 | |
| Sydney | 107.1 | 91 | MX Mexico City | 85.3 | 2 | Montreal, QC | 96.8 | 30 |
| | | | Monterrey | 83.0 | 1 | | | |
| FR Lyon | 96.2 | 21 | | | US Youngstown, OH | 94.4 | 3 | |
| Paris | 96.0 | 19 | NL Amsterdam | 95.4 | 10 | Charleston, WV | 95.1 | 6 |
| | | | Brabant Stad | 95.3 | 8 | Shreveport, LA | 95.3 | 7 |
| GE Berlin | 98.5 | 54 | The Hague | 96.0 | 17 | Atlanta, GA | 95.3 | 9 |
| Frankfurt | 100.4 | 74 | Utrecht | 95.8 | 14 | Lexington, KY | 95.5 | 11 |
| | | | | | Greenville-Spartanburg, SC | 95.6 | 12 | |
| IT Milan | 96.0 | 18 | UK London | 103.6 | 85 | Raleigh, NC | 95.7 | 13 |
| Rome | 97.4 | 36 | Manchester | 95.0 | 5 | Baltimore, MD | 95.9 | 15 |

1 Rank among 95 cities.