

A. Manufacturing

1. Aerospace

The aerospace industry produces commercial and military aircraft and parts, military weapons, space rockets, and satellites. The Aerospace Industries Association of America estimates that revenues for the US aerospace industry totaled \$240 billion in 2008.

a) Representative Operation – Aircraft Parts

The membership of the Aerospace Industries Association of America (excluding aircraft assemblers and service providers) comprises approximately 45 percent precision metal component manufacturers, 40 percent electronic assemblers, and 15 percent plastics producers. The representative operation modeled, a manufacturer of aircraft parts, is based on this mix of production.

As outlined in Exhibit 3.2, this type of operation is characterized by:

- Moderate land and building requirements, and relatively low equipment requirements
- A workforce consisting primarily of skilled technicians and 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 3.3. 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 3.4.

c) Selected Cities

Exhibit 3.5 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 3.2 – AEROSPACE	
Aircraft Parts Manufacturing – Summary of Operating Parameters	
Facilities Requirements	
Leased industrial facility	5 acres (20,234 m2)
Size of factory built	76,500 ft2 (7,107 m2)
Other Initial Investment Requirements	
Machinery and equipment – US \$'000	\$7,000
Office equipment – US \$'000	\$250
R&D equipment – US \$'000	\$300
Inventory – US \$'000	\$8,000
Equity financing – % of project costs	50%
Workforce	
Management	4
Sales and administration	10
Production/non-dedicated product development	
- Professional, technical	36
- Operators	27
- Unskilled laborers	5
Other	3
Total employees	85
Energy Requirements	
Electricity monthly consumption/peak demand	177,000 kWh and 675 kW
Gas monthly consumption	7,250 CCF (20,538 m3)
Other Annual Operating Characteristics	
Sales at full production – US \$'000	\$31,000
Materials and other direct costs – % of sales	48%
Other operating costs – % of sales	4%
Investment in tax-eligible R&D – % of sales	1.8%

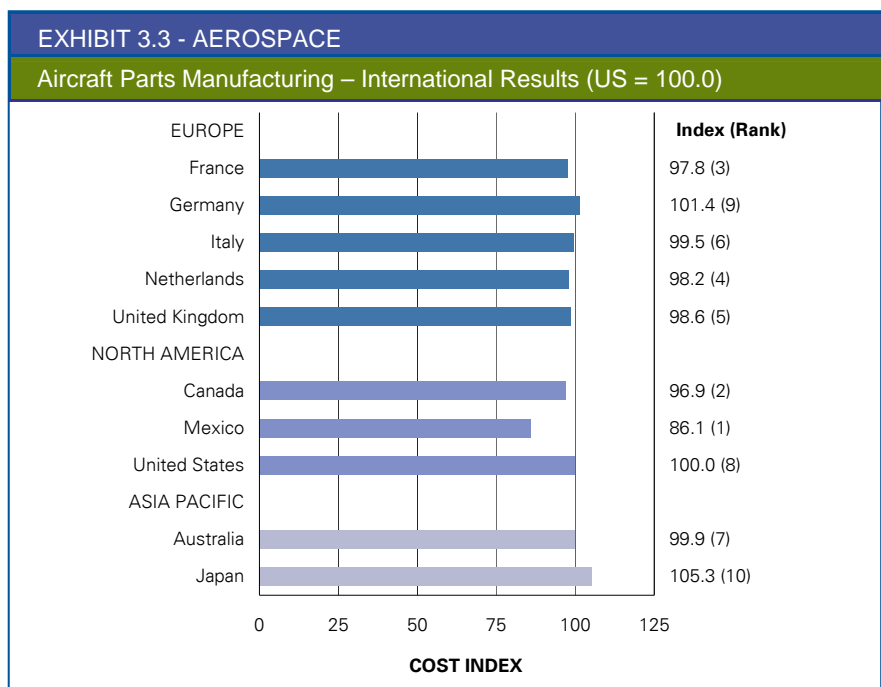


EXHIBIT 3.4 – AEROSPACE

Aircraft Parts Manufacturing – Costs by Major Component, US '\$'000

	Europe					North America			Asia Pacific	
	France	Germany	Italy	Netherlands	UK	Canada	Mexico	US	Australia	Japan
Revenues	29,800	29,800	29,800	29,800	29,800	29,800	29,800	29,800	29,800	29,800
Costs										
- Salaries & Wages	4,289	5,951	4,714	5,146	4,658	4,913	2,074	5,109	5,118	6,341
- Statutory Plans	1,938	1,003	1,001	671	447	498	147	485	662	610
- Other Benefits	900	1,281	1,371	1,447	1,564	1,256	601	1,985	1,157	1,579
- Total Labor & Benefits	7,127	8,235	7,086	7,264	6,669	6,668	2,821	7,579	6,938	8,529
- Facility Lease	523	653	627	696	1,066	406	369	387	549	1,212
- Transportation	1,907	1,850	2,086	2,164	1,784	2,540	2,573	2,278	3,196	1,914
- Utilities	334	448	648	419	414	272	264	261	420	423
- Interest & Depreciation	1,463	1,559	1,506	1,485	1,536	1,462	916	1,483	1,400	1,607
- Non-Income Taxes	431	203	47	43	615	352	52	423	167	763
- Location-Insensitive Costs	15,421	15,421	15,421	15,421	15,421	15,421	15,421	15,421	15,421	15,421
Profit Before Income Tax	2,595	1,433	2,379	2,310	2,296	2,680	7,385	1,968	1,711	(69)
- Income Taxes ¹	611	457	877	419	524	443	2,053	602	327	63
Effective Rate	23.5%	31.9%	36.9%	18.1%	22.8%	16.5%	27.8%	30.6%	19.1%	n/a
After-Tax Profit	1,984	975	1,502	1,891	1,772	2,237	5,331	1,366	1,384	(133)
Total Annual Costs	27,816	28,825	28,297	27,909	28,028	27,562	24,469	28,435	28,417	29,931
Index (US=100.0)	97.8	101.4	99.5	98.2	98.6	96.9	86.1	100.0	99.9	105.3
Rank	3	9	6	4	5	2	1	8	7	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 3.5 – AEROSPACE

Aircraft Parts 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 – Selected Cluster Cities		
AU Adelaide	100.5	83	JP Osaka	104.2	92	CA Montreal, QC	96.8	16
Brisbane	100.5	82	Tokyo	106.3	93	Toronto, ON	97.1	23
Melbourne	99.1	64			Winnipeg, MB	95.5	6	
Sydney	100.8	86	MX Mexico City	86.3	2	Vancouver, BC	97.1	24
			Monterrey	85.9	1			
FR Lyon	97.4	28			US Atlanta, GA	97.5	31	
Paris	98.2	51	NL Amsterdam	98.1	44	Hartford, CT	100.2	81
			Brabant Stad	97.8	40	Indianapolis, IN	98.1	46
GE Berlin	100.6	85	The Hague	98.2	50	Oklahoma City, OK	97.0	21
Frankfurt	102.1	90	Utrecht	98.2	47	Phoenix, AZ	99.5	71
					Seattle, WA	100.0	77	
IT Milan	98.8	62	UK London	101.5	88	St. Louis, MO	98.6	58
Rome	100.2	79	Manchester	95.7	7	Wichita, KS	98.2	49

¹ Rank among 95 cities.