

3. Product Testing

Product testing, for both functionality and safety, is an essential component of bringing new products to market. In addition to the safety testing performed by regulatory agencies, many labs and testing agencies perform product testing on behalf of manufacturers. These entities may be independent labs or, alternately, may be in-house testing operations of a larger parent firm.

a) Representative Operation – Electronic Systems Development and Testing

The representative operation modeled develops and tests electronic systems and devices, such as computer components or systems, telecommunications equipment, and electronic systems for automotive or aerospace applications.

As illustrated in Exhibit 3.66, this operation is characterized by:

- A leased office/laboratory facility with significant investment in R&D equipment
- A non-management workforce consisting almost entirely of professional and technical staff
- A significant level of tax-eligible R&D activities.

The business is assumed to operate as a fully-owned subsidiary of a parent firm, with revenue allocated to the business on a "cost-plus-10 percent" basis.

b) International Results

International results are illustrated in Exhibit 3.67. 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 3.68.

c) Selected Cities

Exhibit 3.69 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 3.66 – PRODUCT TESTING		
Electronic Systems Development and Testing – Summary of Operating Parameters		
Facilities Requirements		
Class A office space leased	45,000 ft ²	(4,181 m ²)
Other Initial Investment Requirements		
Machinery and equipment – US \$'000	\$500	
Office equipment – US \$'000	\$500	
R&D equipment – US \$'000	\$4,000	
Inventory – US \$'000	–	
Equity financing – % of project costs	100%	
Workforce		
Management	5	
Sales and administration	12	
Dedicated product development	53	
Other	–	
Total employees	70	
Energy Requirements		
Electricity monthly consumption/peak demand	112,600 kWh	and 280 kW
Annual operating characteristics		
Sales at full production – US \$'000	– ¹	
Operating costs – US \$'000	\$1,325	
Investment in tax-eligible R&D – % of sales	21%	

¹ This operation represents a cost center. For taxation purposes, corporate revenue allocated to the operation is assumed to be cost-of-operation, plus 10 percent markup.

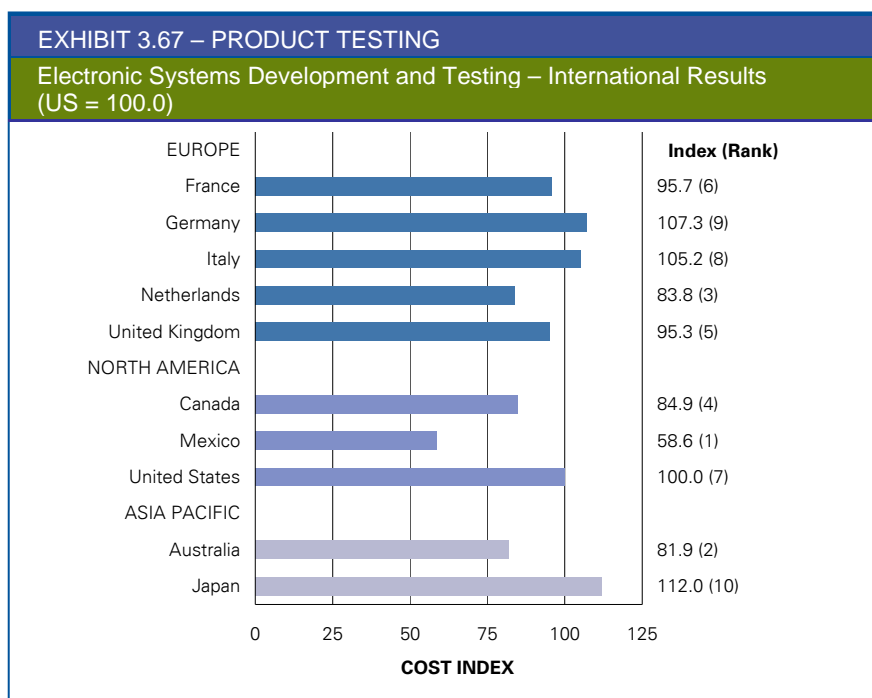


EXHIBIT 3.68 – PRODUCT TESTING

Electronic Systems Development and Testing – Costs, by Major Component, US \$'000

	Europe					North America			Asia Pacific	
	France	Germany	Italy	Netherlands	UK	Canada	Mexico	US	Australia	Japan
Revenues	14,131	14,363	13,820	11,302	13,293	11,822	7,796	13,547	12,555	14,918
Costs										
- Salaries & Wages	5,237	7,255	6,045	5,928	5,486	5,551	3,208	6,041	6,016	6,628
- Statutory Plans	2,271	971	1,308	633	543	393	204	631	769	648
- Other Benefits	1,103	1,630	1,821	1,895	1,822	1,419	869	2,347	1,478	1,581
- Total Labor & Benefits	8,611	9,857	9,174	8,456	7,852	7,363	4,281	9,019	8,264	8,857
- Facility Lease	2,184	1,269	1,230	907	2,338	1,433	848	1,165	1,482	2,624
- Transportation	-	-	-	-	-	-	-	-	-	-
- Utilities	91	138	231	135	142	106	175	115	161	135
- Interest & Depreciation	500	536	561	545	495	577	462	578	249	604
- Non-Income Taxes	203	-	112	14	-	9	63	179	-	80
- Location-Insensitive Costs	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259
Profit Before Income Tax	1,284	1,305	1,255	(14)	1,208	1,075	708	1,232	1,142	1,359
- Income Taxes ¹	(815)	430	652	(782)	(106)	(74)	272	253	(1,117)	515
Effective Rate	(63.5%)	33.0%	51.9%	n/a	(8.8%)	(6.8%)	38.4%	20.5%	(97.9%)	38.0%
After-Tax Profit	2,100	875	604	769	1,315	1,149	436	980	2,259	843
Total Annual Costs	12,032	13,489	13,217	10,533	11,979	10,673	7,360	12,567	10,297	14,075
Index (US=100.0)	95.7	107.3	105.2	83.8	95.3	84.9	58.6	100.0	81.9	112.0
Rank	6	9	8	3	5	4	1	7	2	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 3.69 – PRODUCT TESTING

Electronic Systems Development and Testing – 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	77.1	12	JP Osaka	106.8	90	CA Edmonton, AB	82.5	25
Brisbane	78.8	13	Tokyo	117.1	95	Quebec City, QC	74.4	9
Melbourne	79.0	15			Toronto, ON	87.7	41	
Sydney	84.8	33	MX Mexico City	59.1	2	Vancouver, BC	81.8	19
			Monterrey	58.1	1			
FR Lyon	82.0	22			US Albuquerque, NM	89.2	51	
Paris	109.5	92	NL Amsterdam	86.5	37	Dallas-Fort Worth, TX	92.9	63
			Brabant Stad	82.5	24	Denver, CO	95.4	72
GE Berlin	104.5	86	The Hague	81.1	18	Phoenix, AZ	92.0	61
Frankfurt	110.2	93	Utrecht	81.9	21	Portland, OR	93.3	66
IT Milan	101.6	84	UK London	106.2	89	Raleigh, NC	89.5	53
Rome	108.7	91	Manchester	84.4	31	Salt Lake City, UT	90.8	58
					San Diego, CA	101.3	83	

1 Rank among 95 cities.