

### 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 3.54, 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 3.55. These results reflect the combined impact of 27 location-sensitive cost components applied to the modeled operation. Detailed results, by key cost component, are presented in Exhibit 3.56.

#### c) Selected Cities

Exhibit 3.57 profiles results for selected cities, by country, from among the 102 cities featured in this report. Results for all other featured cities can be found in Chapter 4, Exhibit 4.10.

#### EXHIBIT 3.54 – PRODUCT TESTING

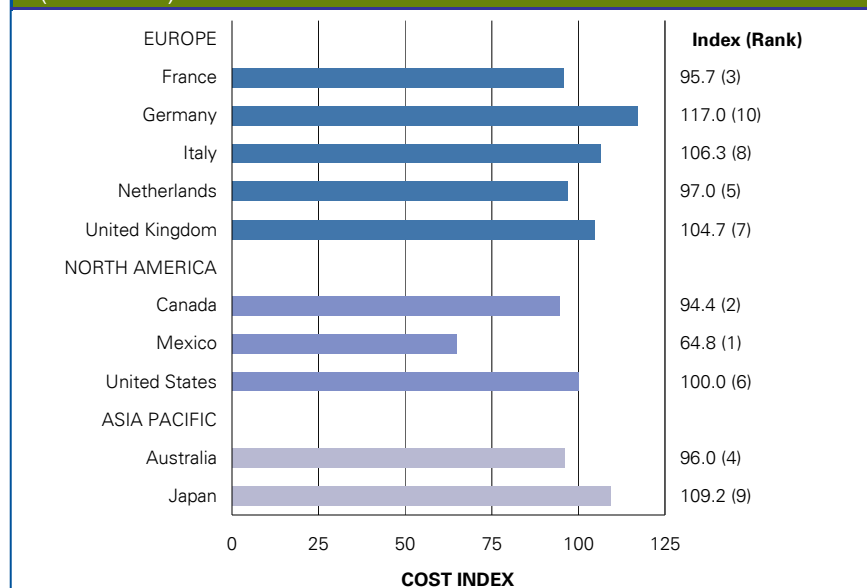
##### Electronic Systems Development and Testing – Summary of Operating Parameters

Facilities Requirements	
Class A office space leased	45,000 ft <sup>2</sup> (4,181 m <sup>2</sup> )
Other Initial Investment Requirements	
Machinery and equipment – US \$'000	\$180
Office equipment – US \$'000	\$850
R&D equipment – US \$'000	\$2,600
Inventory – US \$'000	–
Equity financing - % of project costs	100%
Workforce	
Management	2
Sales and administration	12
Dedicated product development	56
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	– <sup>1</sup>
Operating costs – US \$'000	1,325
Investment in tax-eligible R&D - % of sales	25%

<sup>1</sup> 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 3.55 – PRODUCT TESTING

##### Electronic Systems Development and Testing – International Results (US = 100.0)



## EXHIBIT 3.56 – 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
<b>Revenues</b>	11,251	12,969	11,588	10,832	12,176	10,863	7,178	11,048	10,889	12,044
<b>Costs</b>										
- Salaries & Wages	4,502	6,846	4,989	5,658	5,877	5,507	3,117	5,311	5,108	5,251
- Statutory Plans	1,971	960	1,578	592	697	318	373	545	655	512
- Other Benefits	890	1,461	1,470	1,957	1,666	1,174	643	1,478	1,159	1,504
- Total Labor & Benefits	7,362	9,266	8,037	8,207	8,240	6,998	4,133	7,333	6,921	7,267
- Facility Lease	1,271	873	529	861	1,425	1,267	693	993	1,534	1,682
- Transportation	-	-	-	-	-	-	-	-	-	-
- Utilities	139	197	283	178	168	122	279	98	153	272
- Interest & Depreciation	153	193	232	202	(23)	132	126	225	30	410
- Non-income Taxes	45	-	194	14	-	95	35	143	-	63
- Location-insensitive Costs	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259	1,259
<b>Profit Before Income Tax</b>	1,023	1,180	1,053	985	1,107	988	653	1,005	991	1,092
- Income Taxes <sup>1</sup>	(271)	395	529	(623)	(171)	(50)	220	358	98	413
Effective Rate	(26.5%)	33.4%	50.3%	25.5%	(15.5%)	(5.1%)	33.7%	36.4%	9.9%	37.8%
<b>After-tax Profit</b>	1,293	786	524	734	1,278	1,039	433	639	893	679
<b>Total Annual Costs</b>	9,958	12,183	11,064	10,098	10,898	9,824	6,745	10,409	9,996	11,365
<b>Index (US=100.0)</b>	<b>95.7</b>	<b>117.0</b>	<b>106.3</b>	<b>97.0</b>	<b>104.7</b>	<b>94.4</b>	<b>64.8</b>	<b>100.0</b>	<b>96.0</b>	<b>109.2</b>
<b>Rank</b>	<b>3</b>	<b>10</b>	<b>8</b>	<b>5</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>4</b>	<b>9</b>

<sup>1</sup> 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 3.57 – PRODUCT TESTING

## Electronic Systems Development and Testing – Results for Selected Cities, by Country

Country	City	Index	Rank Among 102 Cities	Country	City	Index	Rank Among 102 Cities
France	Paris	106.6	78	Canada	Calgary	103.3	69
	Toulouse	91.3	25		Ottawa	96.5	41
Germany	Erlangen	114.1	95	Vancouver	102.9	67	
	Halle	110.3	87	Waterloo Region	92.0	30	
Italy	Naples	104.8	74	Mexico	Aguascalientes	63.6	2
	Vicenza	107.6	82	Guadalajara	70.1	4	
Netherlands	Utrecht	97.0	45	United States	Albuquerque	101.7	61
United Kingdom	London	145.7	102		Dallas-Fort Worth	97.5	47
	Plymouth	102.0	62		Denver	111.4	91
Australia	Melbourne	94.8	37		Phoenix	103.4	70
	Sydney	99.1	57		Portland	98.8	53
Japan	Fukuoka	110.9	88		Raleigh	96.6	42
	Yokohama	111.0	89		Salt Lake City	102.2	63
				San Jose	120.0	99	
			San Juan	81.3	8		