# MARKET STUDY ON THE MEXICAN MARKET

# FOR INSTRUMENTS AND LABORATORY EQUIPMENT

## INDEX

## 1. BACKGROUND

The Mexican market for instruments and other laboratory equipment has increased very rapidly in the past few years. Three events have been determinant in this growth: On the one hand, Mexico's trade liberalization policies, which have made the importation easier and relatively cheaper through the reduction in import tariffs and the elimination of prior import permits; secondly, the negotiations for the North American Free Trade Agreement (NAFTA), which will require the local industry to be more efficient in order to lower costs and improve the quality of its products, to be able to compete with suppliers of industrial products from abroad, both domestically and internationally; and finally, the growth of domestic consumption as a result of Mexico's economic recovery. These three factors, in particular the last two, will continue to be influential in shaping the Mexican market for instruments, and translate into future growth.

In 1992, some 1.5% of the country's Gross Domestic Product (GDP) was assigned to research and development and this share is expected to continue growing as a result of the pressing need for modernization and increased competitiveness of the Mexican industry. At the same time, an increased awareness of and a regulatory framework regarding pollution control will also continue to translate into investments in measuring and controlling instruments and equipment.

Imports have traditionally played an important role in this market. In 1986, they represented approximately 75% of total apparent consumption. At present, they are estimated to cover 95% of the market. This has been the result of a trend towards an increasing preference for electronic or high technology instruments, replacing manual instruments and equipment, together with a decrease in the use of non-specific instruments in favor of more integrated and readily identifiable systems. This again, will represent increased sales for foreign companies based in Mexico or wishing to enter or expand their participation in the Mexican market.

## 2. ECONOMIC ENVIRONMENT

With the objective of reducing the inflation rate, the Mexican authorities implemented a stabilization program in 1988, called the Economic Solidarity Pact, which features traditional austerity measures, entailing tight fiscal and monetary policies and unorthodox measures, such as price, wage and exchange rate controls. This program has been the cornerstone of Mexico's economic policy over the past four years, and has been extended throughout 1993 under the name of Pact for Stability, Competitiveness and Employment. It has resulted in a drastic reduction of the inflation rate, from an annual rate of 159% in 1987 to 19.7% in 1989. Inflation rebounded to 29.9% in 1990 but was brought down to 18.8% in 1991 and 11.9% in 1992. At the same time, interest rates have increased again to the present 20%, and

the peso-dollar devaluation rate has recently been increased to Mex$0.40 pesos a day or 4.6% per annum.

Along with the objective of consolidating the progress made in price stabilization with a 7% inflation goal through tight monetary and fiscal policies, Mexico's macroeconomic policy in 1993 aims to promote employment, reaffirm gradual and sustained economic recuperation with an estimated GDP growth of 2.5%-3%, basically by establishing the necessary conditions to encourage national and foreign investment and by promoting increased efficiency and competitiveness, and to promote social development and the improvement in living standards of the poorest segment of society through direct government action.

Domestic economic activity recovered for the third consecutive year in 1989, after the 1986 recession, with a gross domestic product (GDP) growth rate of 3.3%. In 1990 it grew 4.4% another 3.6% in 1991 and 2.6% in 1992 to reach $287.6 billion (1). With an 83 million population, per capita GDP was estimated at $3,465 in 1992. Additionally, manufacturing output grew by 5.8% in 1990, 3.7% in 1991 and 2.3% in 1992 in real terms, private investment and consumption expanded 13.6% and 5.2% respectively in 1990 and 1991 and public investment was up 12.8%. During the 1992-1994 period, the GDP is expected to maintain an average annual growth rate of 4%-5%, although preliminary figures place GDP growth at 2.7% for 1992 pointing towards a reduction in GDP growth in response to reduced economic activity worldwide and the need for inflation control.

In an effort to revitalize and open the Mexican economy, the Mexican Government undertook a series of structural changes, including the accession to the General Agreement on Tariffs and Trade (GATT) on August 24, 1986 leading to an extensive trade liberalization process: import permits were eliminated on all but 325 of the total 11,950 tariff items based on the Harmonized System adopted in 1989. Official import prices are no longer applicable, nor the 5% export development tax, and import duties were lowered from a maximum of 100% in 1982 to 20% in January 1988. The weighted average tariff rate is now 10.4%. The automotive and computer industries have also been liberalized, through the elimination of prior import permits, to allow free entry of products in these industries. The approval of the North American Free Trade Agreement will further strengthen trade between Canada, the United States and Mexico.

According to official data from the Mexican Secretariat of Commerce and Industrial Development (SECOFI), Mexico's trade balance dropped once again in 1992 to a $19.8 billion deficit from -$11.1 billion in 1991, when it had already increased by 145.6%. Exports increased by 3.8% in 1992, from $27.1 billion to

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1. Note: All values in this report, unless otherwise stated (Mexican pesos, Mex$, Canadian dollars, Cdn$, etc) are quoted in United States dollar equivalents.

$28.1 billion, while imports grew 25.6%, from $38.2 billion to $48 billion in 1992, having already increased 22.8% in 1991. January-March data for 1993, place total exports at $7.4 billion and imports at $12.9 for the first quarter, reflecting a 10.3% and 18.3% growth rate respectively as compared to the same period the previous year.

## 3. MARKET ASSESSMENT

The total market for instruments as analyzed in this report includes:

microscopes;
low weight balances (under 5cg);
machines and appliances for testing the hardness, strength, compressibility, elasticity and other mechanical properties of materials;
hydrometers and similar floating instruments;
thermometers;
pyrometers;
barometers;
hygrometers;
psychrometers;
instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases;
instruments and apparatus for physical or chemical analysis;
instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like;
instruments and apparatus for measuring or checking quantities of heat, sound or light;
microtomes;
gas, liquid or electricity supply or production meters;
revolution counters;
production counters;
tachometers;
pedometers;
speed indicators;
stroboscopes;
oscilloscopes;
spectrum analyzers;
instruments and apparatus for checking or measuring electrical quantities;
instruments and apparatus for measuring and checking alpha, beta, gamma, X-ray, cosmic or other ionising radiations;
automatic regulating and controlling instruments and apparatus.

Excluded are instruments and apparatus used for automobiles or airplanes, or those used in household consumer goods.

The total market for instruments and apparatus as defined above was valued at $216.2 million in 1989 and increased by 20.3% in 1990 to $260.1 million. In 1991, the market grew by 50.7% to $392.1 million and increased again in 1992 by 27.2% based on preliminary January-October data. Two main factors have brought

about this growth: Mexican economic and trade policies, as undelined in Section 2, and an increase in capital investments made by the largest end user sectors. The present administration's commitment to Mexico's modernization is based on trade liberaliaztion, the curbing of inflation, the reduction in interest rates and the stability of the peso-dollar exchange rate. These policies have translated already into a greater availability of investment capital, both national and foreign, and will continue to do so. In conjunction with this, the need for improved efficiency by the local industry in order to compete both in the domestic and international markets in response to the NAFTA negotiations, has also encouraged investments in new equipment and instruments to modernize existing operations. Total apparent consumption is therefore expected to grow at an average annual rate of 8% between 1991 and 1995 to reach a total of $641.4 million in 1995. Table 1 shows total apparent consumption of instruments andf equipment.

**TABLE 1**
**APPARENT CONSUMPTION OF INSTRUMENTS**
(US$million)

| | 1989 | 1990 | 1991 | 1992e | 1995p |
|---|---|---|---|---|---|
| Production | 35.8 | 41.2 | 50.6 | 58.9 | 68.2 |
| + Imports | 188.1 | 229.9 | 368.6 | 475.3 | 615.5 |
| - Exports | 7.7 | 11.0 | 27.1 | 35.5 | 42.3 |
| **TOTAL** | **216.2** | **260.1** | **392.1** | **498.7** | **641.4** |

**Source:** Import-export data by SECOFI; author's estimates

### 3.1 IMPORTS

Imports have traditionally played a major role in apparent consumption of laboratory instruments and equipment. In many segments of the market, imports actually cover total demand, since there is no domestic production. This is the case particularly with state-of-the-art technology and highly sophisticated instruments, such as chromatographers, spectrophotometers, spectrometers and the like. In 1992, imports represented 95% of total supply. The following table shows total imports of laboratory instruments and equipment by category.

**TABLE 2**
**IMPORTS OF LABORATORY INSTRUMENTS AND EQUIPMENT**
(US$000)

| CATEGORY | 1989 | 1990 | 1991 | 1992 JAN-OCT |
|---|---|---|---|---|
| **INSTRUMENTS AND EQUIPMENT** | | | | |
| Optical & other microscopes | 3,120 | 4,235 | 7,490 | 8,155 |
| Scales under 5 cg | 3,029 | 2,883 | 3,359 | 2,721 |
| Appliances to test metals | 3,151 | 2,573 | 4,494 | 3,611 |
| Other appl. to test materials | 3,772 | 4,966 | 6,958 | 6,979 |
| Thermometers | 4,114 | 4,832 | 6,813 | 6,229 |
| Barometers | 70 | 97 | 90 | 75 |
| Aerom./densitom./hygrom./pyrom. | 1,672 | 1,999 | 2,218 | 1,980 |
| Other instruments | 1,204 | 1,163 | 1,817 | 1,551 |
| I to measure flow/level of liq | 9,402 | 12,478 | 23,055 | 19,341 |
| I to measure pressure | 10,944 | 13,468 | 22,290 | 72,350 |
| Other measuring liquid/gas | 6,379 | 6,516 | 8,086 | 9,503 |
| Gas & smoke analysis apparatus | 6,906 | 8,729 | 13,577 | 25,222 |
| Chromatographs/electrophoresis | 6,621 | 5,185 | 6,980 | 6,793 |
| Spectrom/spectrophotom/spectogr | 8,909 | 9,866 | 13,664 | 15,989 |
| Ins. using optical radiations | 1,633 | 1,258 | 9,036 | 5,101 |
| Other phys/chem analysis inst | 20,032 | 18,464 | 31,531 | 39,777 |
| Gas meters | 962 | 782 | 3,433 | 1,749 |
| Liquid meters | 3,418 | 4,997 | 5,858 | 5,936 |
| Electricity meters | 1,398 | 4,116 | 3,542 | 6,403 |
| Revolution & other counters | 3,690 | 5,338 | 4,238 | 5,205 |
| Speed indicators/tachometers | 3,262 | 2,985 | 3,935 | 5,388 |
| Ap. detect ionising radiation | 1,530 | 1,620 | 3,462 | 4,515 |
| Oscilloscopes/oscillographs | 5,028 | 4,168 | 7,102 | 5,786 |
| Multimeters | 3,547 | 3,877 | 5,452 | 5,310 |
| Other to check electrical quant (volt/ohm/watt/am/varometers) | 8,662 | 7,802 | 35,030 | 10,992 |
| Other (frequency meters/power factor ind./testing devices...) | 10,593 | 20,144 | 36,894 | 23,734 |
| Thermostats | 5,307 | 6,877 | 10,383 | 11,629 |
| Manostats | 707 | 936 | 1,581 | 1,588 |
| Hydraulic/pneumatic regulators | 1,171 | 2,562 | 2,486 | 1,833 |
| Other regulators/controllers | 20,477 | 27,263 | 41,604 | 43,273 |
| **TOTAL INSTRUMENTS & EQUIPMT.** | **160,710** | **192,179** | **326,458** | **358,718** |
| **GROWTH** | | **19.6%** | **69.9%** | **9.9%** |
| **PARTS** | | | | |
| for appl. to test materials | 533 | 556 | 1,303 | 834 |
| for thermom/hygrom/pyrom/etc. | 608 | 760 | 1,111 | 835 |
| for liquid/gas measuring inst. | 3,900 | 5,380 | 6,552 | 5,284 |
| for phys/chem analysis inst. | 5,859 | 6,944 | 10,717 | 10,907 |
| for gas/liquids/electr meters | 2,385 | 7,600 | 4,349 | 3,148 |
| f. revolution count./speed ind. | 952 | 2,313 | 1,778 | 1,608 |
| for. ap. to check electrical q. | 2,746 | 2,666 | 3,137 | 3,958 |
| for autom controls/regulators | 10,439 | 11,504 | 13,161 | 10,799 |
| **TOTAL PARTS** | **27,422** | **37,723** | **42,108** | **37,373** |
| **GROWTH** | | **37.6%** | **11.6%** | **(11.2%)** |

| CATEGORY | 1989 | 1990 | 1991 | 1992 JAN-OCT |
|---|---|---|---|---|
| GRAND TOTAL | 188,132 | 229,902 | 368,566 | 396,091 |
| GROWTH | | 22.2% | 60.3% | 7.5% |
| PARTS/TOTAL | 14.6% | 16.4% | 11.4% | 9.4% |

**Source:** Import data published by SECOFI

As can be seen in this table, total imports of instruments and equipment have increased at a very fast pace in the past few years, averaging 37.1% between 1989 and 1992 on an annual basis. While total imports were valued at $188.1 million in 1989, by 1992 they are estimated at $475.3 million. During 1991 alone, imports grew by 60.3% to $368.6 million, from $229.9 million the previous year. Instrument and equipment imports have grown more rapidly than imports of parts, which were formerly imported in large volumes in order to keep existing equipment going. At present, they no longer represent such a high percentage of sales (this dropped from 16.4% in 1990 to 9.4% in 1992), since end users are replacing rather than overhauling their instruments and equipment as the economy keeps growing and investment funds are more available.

In the years to come, imports are expected to grow at a faster pace than local production, because end users are increasingly buying high technology, sophisticated and state-of-the-art instruments and equipment, which will enable them to maximize and optimize their production capacity. Domestic production has been concentrated in manual, low technology, commodity instruments and equipment, while the more sophisticated, electronic and automated equipment has been sourced abroad. The latter is now in higher demand because it is more accurate, includes leading edge technology and is of a higher quality. Its benefits are presently also better known and sought after, particularly in response to an increased emphasis on quality control. At the same time, the sale of imported non-specific instruments is decreasing in favor of more integrated, readily identifiable and job-specific items, which are not made in Mexico because the low volumes sold locally by product do not justify the major investments needed to manufacture them, in particular in the face of international competition.

The United States has traditionally been the number one supplier of laboratory instruments and equipment to Mexico with a 59% market share in 1992, followed by Japan, Germany and the United Kingdom. The United States is percieved to be a technological leader in the industry. Also, the quality of U.S. products and the close proximity to Mexico, which has allowed easy availability of parts and service, have payed an influential role in this relationship. Last but not least has been the association of Mexican and U.S. companies through licensing and joint venture agreements. Japanese manufacturers can be considered the most

aggressive after U.S. ones. Their marketing efforts include extending more liberal credit terms and, at the same time, their instruments and equipment are usually priced below comparable third country products, but are generally less sophisticated. West German instruments have a very good reputation for reliability and high quality in the Mexican market. The United Kingdom and France also sell a substantial amout of instruments to the government.

Some of the most important firms in the local market include:

American Instrument Company
Applied Color Systems
Asea Brown Bovery (AAB)
Atlas Copco
Bacon, FRank Machinery Sales
Bailey
Baird Corp.
Barnes Engineering
Beckmann Instruments
Berkeley Industries
Bristol
Buchi
Buehler
Cecile Instruments
COIMSA
Cole Palmer Instruments
Croll-Reynolds
Crystalite Corp.
Dionex Corp.
Erichsen Instruments
Engelhard Corp.
Fisher Scientific Co.
Fisher and Porter
Foxboro
Gardner
Hewlett-Packard
Hitachi
Honeywell Industrial Controls
Hotpack Corp.
Hunter Associates Laboratory
Ionics
Instron Corp.
Instrument Technology Inc.
Irvine Optical Corp.
Jarrett Metallographic Product
Krautkramer-Branson
Leeds & Northrup
LDC
LKB
Labindustries
Labtest Equipment
LECO Corp.
MTS Systems
Malvern Instruments
Mettler Instrument Corp.
Millipore Corp.
Milton Roy Co.
Mitsubishi
Mitutoyo
Neles Jamesbury
Neslab Instruments
Nicolet Instrument Corp.
Nikon
Nusonics
Ohaus
Olympus
Orion Research
Pacific Scientific Co.
Perkin Elmer
Philips Electronic Instruments
Precision Scientific
Reliance Electric
Rosemount
Sartorius
Schenck
Sharples-Stokes
Shimadzu Scientific Instrument
Siemens
SIMCA
Spectra Services
Spectro
Stangert
Stanton Redcroft
Struers
Telemecanique
Texas Instruments
Thwing Albert Instruments
Tracor Instruments
Unitron
Varian
Veeco Instruments
Veeder-Root
Whatman
Wilson Instruments

Masonelian
Measurex
Milltronics
Zeiss
Zeta-Meter
ZYGO Corp.

Canada has not played an influential role in the Mexican market for laboratory instruments and equipment although exports have shown an increasing trend. Total Canadian exports to Mexico amounted to Cdn$1.1 million in 1988, Cdn$2.1 million in 1989, Cdn$2.9 million in 1990 and Cdn$4.6 million in 1991, but fell again to Cdn$2.2 million in 1992 with the decrease of exports of gas, liquids and electricity supply and production meters (see Table 3).

**TABLE 3**
**TOTAL CANADIAN TRADE OF LABORATORY INSTRUMENTS AND EQUIPMENT WITH MEXICO**
(Cdn$000)

**CANADIAN EXPORTS TO MEXICO**

| **CATEGORY** | **1988** | **1989** | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Microscopes | 0 | 2 | 0 | 0 | 0 |
| Mechanical properties test eq. for materials | 2 | 55 | 7 | 8 | 8 |
| Thermometers, , pyrometers, etc. | 20 | 16 | 51 | 7 | 18 |
| Measuring instr. for liquids or gases | 14 | 163 | 525 | 168 | 74 |
| Physical or chemical analysis instr. | 75 | 215 | 657 | 39 | 425 |
| Gas/liquids/electricity supply/prod. meters | 488 | 534 | 28 | 2201 | 40 |
| Speed/revolution/prod. counters & meters | 23 | 2 | 45 | 29 | 391 |
| Electrical quantity measuring instr. | 29 | 121 | 285 | 1116 | 416 |
| Other measure & check instr. & appliances | 101 | 104 | 111 | 472 | 439 |
| Automatic regulating & controlling instr. | 364 | 922 | 1163 | 578 | 431 |
| **TOTAL** | **1114** | **2134** | **2872** | **4618** | **2242** |

**CANADIAN IMPORTS FROM MEXICO**

| CATEGORY | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Microscopes | 0 | 34 | 19 | 12 | 15 |
| Thermometers, , pyrometers, etc. | 554 | 922 | 607 | 968 | 819 |
| Measuring instr. for liquids or gases | 1 | 5 | 72 | 383 | 496 |
| Physical or chemical analysis instr. | 2 | 132 | 4 | 15 | 131 |
| Speed/revolution/prod. counters & meters | 2 | 54 | 3 | 253 | 439 |
| Electrical quantity measuring instr. | 0 | 788 | 0 | 28 | 1 |
| Other measure & check instr. & appliances | 38 | 50 | 44 | 117 | 451 |
| Automatic regulating & controlling instr. | 510 | 1860 | 3218 | 4093 | 3735 |
| **TOTAL** | **1107** | **3845** | **3967** | **5869** | **6087** |

**Source:** Statistics Canada - International Trade Division

Mexican exports to Canada, on the other hand, were valued at Cdn$1.1 million in 1988 and grew to Cdn$6.1 million by 1992. These are concentrated in automatic regulating and controlling instruments, but of very simple manufacture, such as thermostats.

The most important competitive factors affecting instrument sales in Mexico are leading edge technology and quality, as mentioned earlier. Price and promotion, as well as availability of spare parts, teachnical support and service, are also important and will differentiate one company from another. Linking products to strategy and value, as well as to environmental control, are key factors to selling in the present market, since they are easily identifiable as being related to improved competitiveness and efficiency, important goals of the Mexican industry. Promotion of Canadian products can be made through participation in trade shows, technical symposiums, advertising in specialized magazines, direct mail campaigns and personal visits to key buyers and distributors.

## 3.2 DOMESTIC PRODUCTION

Local manufcature of instruments and equipment is limited to the more manual and less sophisticated type of instruments and equipment, such as thermometers, manometers and other instruments to measure water, temperature and pressure variables. Many of these are also frequently used for domestic appliances or in the automoble industry and are not for industrial or scientific use. High technology instruments, in particular electronic instruments, are practically not produced locally and if they

are, they tend to be non-specific and manufactured with U.S. or other technology from abroad, by subsidiaries of foreign companies.

## 4. END USERS

Scientific and industrial laboratory instruments and equipment are used in a very wide range of industries. Based on trade interviews, the largest user sectors were identified and are summarily described below (2).

The government is the number one buyer of instruments and laboratory equipment in Mexico if its state-owned companies and universities and research centers are included.

- The National Council for Science and Technology (CONACYT) promotes, directs and coordinates the scientific programs of the country, it supervises the development of scientists through recruitment and scholarships, assigns new projects to the appropriate institution for investigation and study and controls resources dedicated to research. The budget assigned to science and technology represented 2.13% of the total federal budget and 0.38% of total GDP in 1992. Total resources assigned by the federal government to promote science and technology has been increasing year to year in the past decade, from an equivalent of $836 million in 1980 to $1,195 million in 1992, an increase of 24.7% as compared to the previous year. This total was distributed as follows: 49% to public intitutions, including public agencies, associations, funds and trust-funds, 24% to public universities, 23% to the central administration and 4% to public firms. In terms of objectives, the total budget was assigned to: scientific and technologucal activities within the academic environment (30%), the production, saving and distribution of electricity (19.2%), the promotion and regulation of the National Science and Technology System (SINCYT) (15.6%), social development and other socio-economic services (10.5%), the development of agricultural, forestry and fishing production (8.4%), the exploration, registration and/or evaluation of natural resources, or phenomena (7.1%), ondustrial development (4.5%), development of public health and social security (3.3%), development of transportation and communications (0.8%) and environmental protection (0.4%). In 1992, the SEP-CONACYT System supported 1,360 scientific research programs and 89,091 technological development programs, mostly concentrated in technical and egineering assistance services. The total number of researchers registered with CONACYT in 1992 was of 4,017 in addition to 2,960 candidates.

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2. Individual company names and addresses can be obtained from the industrial chambers or associations listed in Appendix I, which usually have a directory of their members for sale. Legally, all Mexican companies have to be registered with a chamber or association.

- The National Ecology Institue (INE), formerly included in the Secretariat for Urban Development and Ecology (SEDUE) is the national body in charge of research, legal aspects and enforcement of environmental problems. The 1989-1994 National Development Program has stressed the high priority of scientific and technological activities in general, but with a special emphasis on ecology and environment in order to develop instruments to save and maintain ecological balance, to more effectively use natural resources and to develop advanced methods of air and water pollution and the appropriate disposal of industrial and municipal wastes. Coupled with this, the INE is developing a national education, research and training system related to the environment and its problems.

- Petroleos Mexicanos (PEMEX) is the national oil company, a decentralized agency owned directly by the State. Its activities include the exploration, production and distribution of crude oil; refining and distribution of gasoline and oil products; production and distribution of petrochemicals, and research and development related to the petroleum industry. PEMEX has estimated it will need a total of $18.5 billion during the 1993-1997 period for capital expenditures, 59% of which will be for exploration and production, 32% for refining, and 9% for gas and petrochemicals. PEMEX's purchases of measuring and analytical instruments are budgeted at $62.3 million in 1993, of which $21.7 million are planned to be sourced from the Houston office. Instruments of imported origin are nevertheless higher, since many instruments are purchased in Mexico City from local distributors.

- PEMEX also includes the Mexican Petroleum Institute (IMP) which was established in 1965 as a research, training and engineering consulting organization. It employs close to 3,500 engineers and technicians who conduct most of PEMEX's projected engineering work. Through the IMP, Mexico has established a distinguished research and development record in the petroleum industry worldwide. PEMEX also heavily relies on the IMP for technical advice and testing in Mexico before it buys products of new technologies or from new suppliers. Its is involved in all aspects of the petroleum industry, including to satisfy technological and equipment needs, to improve the interpretation capacity of the information gathered in exploration fields, to identify the physio-chemical conditions of development fields to increase the extraction of identified reserves, to apply more efficient secondary recovery methods, to design methods to improve the quality of refined products, in particular as related to environmental protection, and to design different systems and equipment for the transportation, distribution and storage of hydrocarbons.

- The Comisión Federal de Electricidad (CFE) is the country's sole generator of electricity and is the second largest government owned company after PEMEX and it employs 126,000 people. It has an installed capacity of 25,300 MW, a gross generation of electric energy of 107,000 GWH and electric energy sales of 85,000 GWH. Steam plants account for 45% of total installed capacity, hydroelectric plants for 30%, and coal electric plants for 5%, while combined cycle, nuclear and turbogas plants account for the balance.

- The Institute for Electrical Research (Instituto de Investigaciones Eléctricas - IIE) is a public decentralized agency, which directly depends from CFE, created in 1975 to improve the scientific and technological level of the electrical sector, to improve services of the sector, to increase the supply of locally manufactured products and services, to develop better methods for electrical energy transmission and distribution to increase efficiency of this industry, to improve the design of electricity generation systems, to increase the efficiency in the use of hydrocarbons, to reduce the emission of polluting into air and water, to develop alternate energy sources and to design their prototypes. CFE also has a large laboratory located in Irapuato, Guanajuato to conduct testing activities;

- The National Institute for Nuclear Research (Instituto Nacional de Investigaciones Nucleares (ININ) was created in 1971 to cover all aspects related to the national activities related to the use of nuclear energy for pacific purposes, such as the integral development of nuclear fuels, the development and activities related to the design, engineering and construction of nuclear installations, to promote activities related to the design deposits for radioactive materials, to develop security and inspection aspects of nuclear installations, to develop nuclear techniques to apply in the health, agricultural and industrial sectors, and to coordinate other nuclear research activities in the academic environment;

- The Instituto Mexicano del Seguro Social (IMSS), the Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSTE) are the two social security organisms in the country. Together, they have close to 60,000 members. Both also have research activities. Other public agencies that provide health services include the Health Secretariat (SS), the Naval Hospital, the National Defense Secretariat, PEMEX, the Federal District Department (DDF) and the National System for Integral Family Development (DIF), although to a lesser degree than the former ones.

- The Universidad Nacional Autónoma de México (UNAM) is the country's largest university and the most important center of higher education and research. It has a student population of some 200,000 students and its faculties cover all scientific specialties. It is estimated to purchase approximately $400

million a year of laboratory facilities, equipment, apparatus and instruments. Following is a list of the scientific research centers within the UNAM:

- The Technical Council for Scientific Research and the Coordination of Scientific Research were created in 1945 to plan, form and promote scientific research and to coordinate and give impulse to the activities of the research institutes within the UNAM;
- The Astronomy Institute dates back to 1878, when the National Observatory was put into operation. In 1929 it became a part of UNAM and in 1967 the Institute was created as such, including the Observatory, to develop research related to the better comprehension of the universe in reference to its origin, evolution and dynamics, and to deppen the knowledge related to astronomy, astrophysics and astronomic instrumentation;
- The Biology Institute was originally created in 1825 but became a part of UNAM in 1929. It employs 155 people to develop research in the areas of biological diversity in Mexico, taxonomy and systematics of plants and animals, studies on the vegetation, animal world, algae, mushrooms, entomology, helmintology, carcinology, mastozoology, herpetology, ictiology, evalauation, detection and development of species in danger of extinction, evolution, anatomy, reproductory biology, biochemistry, agriculture, biotechnology and ecology among the most significant;
- The Institute for Sciences of the Sea and Limnology dates back to 1939 and was restructured as it is now in 1980 to carry out research in the following areas: climatic changes in the ocean, physical and geophysical oceanography, marine chemistry, coastal dynamics, pollution, marine geology and geochemistry, micropaleontology, fishing and coral ecology, marine pharmacology, ictiology, malacology, protozoology, zooplancton and limnology, to name a few.
- The Institute for Nuclear Sciences was created as such in 1988, although its activities date back to 1967. It has 44 members to carry out basic and applied research in the areas of field theory,fundamental interaction, gravitational theory, nuclear physics and of the plasma, interaction of radiation with matter, radiochemistry and applied mathematics in these fields;
-- The Institute of Physics was created in 1934 and presently has 122 researchers, the largest number within any UNAM institute in addition to 59 people in the academic field. It carries out research on experimental nuclear physics and several other projects related to nuclear energy and radiation, mass spectrometry, transportation, catalysis, magnetism, optical properties and electronic phenomena of interfaces and disorderly systems, electromagnetic properties, anatomic and molecular physics, particle physics, field theory and high energy, quantum mechanics, x-ray chrystalography, chrystal growth, complex system physics, scientific instrumentation, etc.;
- The Institute for Celular Physiology was created in 1979 and made Institute in 1985. It has 77 members doing research on

areas such as alelopathy, brain mechanisms, neurophysiology, bacterial respiratory systems, digital signal processing, hormonal action mechanisms, biochemical studies of mitocondriae and bio-energetics, environmental factor evaluation on celular tissue and biological membrane studies;

- The Institute of Geophysics was created in 1945 and now has 91 members doing basic applied research and work on technological development related to mathematic models of geophysical phenomena, geohydrology, sismology, geophysical exploration, vulcanology and thermal flow, geochronology, gravimetry, remote perception, geomagnetism, earth-sun relationship, etc;
- The Institute of Geography dates back to 1933 and, with 75 members, it conducts research in physical geography, social geography, historical geography and industrial geography, including several areas within each one;
- The Institute of Geology has evolved from centers created since 1886 into the Institute since 1929. It has a personnel of 102 developing research on regional geology, paleaontology, geo-chemistry and edafology. It has a widely recognized track record in geological research worldwide;
- The Engineering Institute was officially created as such in 1976 but its activities date back to 1936 as related to research in the areas of structures and materials, applied mechanics, sismology and sismical instrumentation, geothenics, communications, environmental systems, hydraulics and engineering, aero-spacial engineering, fluid mechanics, solar energy, automatization and control and instrumentation;
- The Institute of Mathematics was founded in 1942 and with its 48 researchers does work on algebra, anaysis, geometry, logics, applied mathematics, probabilities and topology;
- The Institute of Chemistry was founded in 1941 and now has 53 members doing research in natural secondary metabolites, organic synthesis, spectroscopy, heterocyclical chemistry, theoretical chemistry, coordination compounds, metal clusters, homogenous catalysis, organometalic chemistry and structural analysis through x-ray diffraction;
- The Institute of Biomedical Research first originated in 1941 and was restructured in 1967. With its 136 members it does research on more than 50 fields including inmunolodiagnosis, vaccines, chronic degenerative diagnosis and treatment, cisticercosis, leucemia, tuberculosis, Taenia, nytrogen metabolism, artificial inteligence, production of food and pharmaceutical-related compounds, drug evaluations, molecular evolution, pollution, experimental neurology, sleep, depression and metabolic mental defficiencies to name just a few;
- The Institute of Research on Materials was created in 1967 and now has 86 members doing research in areas such as properties of the copper and zinc compound, physical metallurgy and phase transformation, electrical and magnetic properties of materials, polymer synthesis, geology, silicones for medical use, natural fibre and polymer compounds, dynamic properties of liquid crystals, polydisperse systems, polymer physics and chemistry, properties of low temperature materials,

semiconductors, photovoltaic systems, energy and mass transfer, etc.;

- The Institute of Applied Mathematical and System Research dates back to 1955 and, with over 100 members, conducts research in computer theory, image processing, office automation, networks, oceanography instruments, digital signal processing, mathematical applications to biology, optimal control, functional analysis, numeric optimization, statistical models and time series, among others;
- The UNAM also has several research centers and institutes not located in Mexico City's univerity city but in regional centers, including the Research City located in Cuernavaca, Morelos, which includes the Institute of Biotechnology, the Research Center on Nytrogen Fixation, the laboratory of the Institute of Physics and installations of the Institute for Applied Mathematics and Systems, the laboratory of the Physics Institute located in Ensenada, Baja California Norte, several observatories, biological and marine research centers, and monitoring stations related to several Institutes.

- The Instituto Politécnico Nacional (IPN) is the largest technical university in Mexico. It also conducts research activities for several government agencies. The most advanced research center in the IPN is called Advanced Research and Studies Center (Centro de Investigación y de Estudios Avanzados - CINESTAV) created in 1961. At present, it develops research programs in the following areas: chemistry, physics, biochemistry, celular biology, pharmacology and toxicology, biophysic physiology and neuro-sciences, genetics and molecular biology, electrical engineering, bio-electronics, bio-tchnology and bio-engineering, computer sciences, communications, automatic control, metrology, solid state electronics, mathematics and experimental pathology, in addition to non ferrous metals, applied genetics and sciences of the sea in regional centers.

- The Scientific Research and Graduate Education Center (Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE) also conducts research in areas related to oceanography, geo-physics, computer sciences, optics, ecology, to name the more significant ones;

- The Universidad Autónoma Metropolitana (UAM) also has a broad based student population and conducts research activities.

The local industry is also a major buyer of instruments and equipment and many firms are now also installing laboratories at their facilities in order to improve their production processes and the quality of their final product. Most of the very large, usually multinational, firms already had such laboratories, but now medium to large firms have also identified the need to do so in order to be able to be competitive internationally.

- Mexico is the eleventh pharmaceutical industry in the world in terms of the size of its chemical/pharmaceutical market. Two

subsectors account for the basic productive chain to manufacture medicines: the pharmo-chemical subsector which deals with the synthesis of chemicals with curative properties; and the pharmaceutical subsector which produces the medicine in the form of pills, capsules and solutions. In Mexico there are 90 companies in the pharmo-chemical industry, of which 35 are international corporations. These firms produce approximately 63% of the drugs consumed in Mexico. In the pharmaceutical sector, there are 335 laboratories, 70% of which are subsidiaries of multinational companies. The chemical/pharmaceutical market is estimated at $2.1 billion.

- The Mexican chemicals industry supplies about 70% of the total local consumption of chemicals of $17.2 billion in 1992. Many large international firms are established in Mexico, such as Celanese with an installed capacity of over one million tons/year and a workforce of close to 9,000 people.

- The food and beverages industry accounts for 6.5% of the country's total GDP, or an estimated $15 billion. It is one of Mexico's most steadily growing sectors, since it satisfies the most basic needs of the country's growing population of over 80 million. This industry can be divided into the following large categories, listed in order of importance: Meat and dairy products, corn grinding, wheat grinding, soft drinks, coffee, beer and malt, tobacco, sugar, oils and fats, alcoholic beverages, preserved fruits and vegetables, and animal feed. The government participates in the production, purchase and industrial transformation of food products, as well as in distribution, transportation and storage through the National Company for Popular Subsistence (CONASUPO).

- The ceramics and glass industry is dominated by Vitro, a major industrial group from Monterrey, the second largest group after TELMEX, with sales of over $3 billion in 1990. It recently made a takeover of Anchor Glass and associated with Corning Inc. through the purchase of 49% of its U.S. and world operation, while Corning acquired 49% of Vitro's Mexico and world operation in the area of kitchen and table articles, through the creation of Corning Vitro Inc. and Vitro Corning SA de CV.

- The Mexican plastics and rubber industry comprises 3,400 companies, which together have 140,000 employees. Of these, 3000 are plastics processors and the remainder includes a variety of related companies. By type of process, there are 1,050 in injection, 900 in extrusion, 450 in blowing, 180 in laminating, 105 in rotational molding, 90 in foaming, 60 in compression, 45 in thermoforming, 45 in coating and 120 in other processes. Together, they haver an installed capacity of 1.6 million tons.

- Mexico's pulp and paper industry includes 65 large companies employing 32,500 workers, and covers a wide range of processes. Mexico's production of pulp amounted to 705,000

tons in 1991, while paper production amounted to 2.9 million tons and is growing steadily. The uses of paper in Mexico, in order of importance, are: packaging, writing and printing, other paper and cardboard, newspapers and free textbooks, sanitary and facial paper and finally, special applications.

- The mining industry consists of over 6,000 mining enterprises, of which 144 are considered large and account for 82% of Mexico's mining exports. The remainig companies are either small or medium sized and basically supply local demand. State majority owned companies still play a major role in this industry, but the massive sale of government owned companies will lead to state control of only five companies, mining minerals considered strategic: iron, coal, sulphur, phosphorous and potasium. Mexico holds first places in world production of several metals and minerals: first place in production of silver, bismuth, sodium sulphate and celestine; second in barite; third in antimony, fluorite, and graphite; fourth in mercury; and fifth in arsenic, cadmium and molybdenum. Mexico's production of non-ferrous industrial metals was 812,000 tons, that of steel related metals 12 million tons, and that of non-metallic minerals 15.4 million tons in 1990.

- Mexico's steel industry is composed of four large, fully integrated manufacturers, which cover all five basic production processes: concentration of iron ore and production of coke; production of primary iron or fusion; production of pig and sponge iron; production of steel; and production of final products. These companies are the government owned SIDERMEX complex (Altos Hornos de México AHMSA and Siderúrgica Lázaro Cárdenas - las Truchas SICARTSA), which is now in the process of being totally restructured, and the private owned Hojalata y Lámina (HYLSA) and Tubos de Acero de México (TAMSA). These together produced close to eight million tons of steel in 1991 and they account for 86% of total production by the industry and 65% of employment. Additionally, there are 23 semi-integrated firms and 44 mill rollers with a total installed capacity of 11.6 milion metric tons.

- The cement industry presently consists of over 30 plants concentrated in a relatively small number of large producers, ten of which are among the country's 500 largest companies: Cementos Mexicanos, Cementos Tolteca, Cementos Guadalajara, Cementos Apasco, Cementos de Veracruz, Cementos de Chihuahua, Concretos Apasco, Cementos Tolteca, Latinoamericana de Concretos and Tubos DYSA. These companies together reported sales of one billion dollars in 1990. Total installed capacity is estimated at 30 million tons and the cement companies have projects to expand this capacity by 35% in the next four years.

- The automotive industry is concentrated in a small number of large firms, which together operate 15 plants, 10 of which are American, three Japanese and two German. Total production of

cars reached 274,500 in 1989 and that of trucks 167,409. The largest car manufacturers are Volkswagen (28%), Nissan (25%), Chrysler (21%), Ford (17%) and General Motors (8%). These companies also manufacture trucks, in addition to Dina, Famsa, and Kenmex.

- Teléfonos de México (TELMEX) is Mexico's sole telephone company. It was recently privatized and the voting shares are held by Grupo Carso, a Mexican company, Southwestern Bell and Northern Telecom. Another 14% of total capital was placed in open stock houses. The state still holds 8.4% of shares. Sales of TELMEX in 1990 amounted to $4 billion with investments of $1.4 billion. TELMEX presently has 5.2 million lines and it plans to install another 2.3 million by 1993. During 1990 it processed 951 million local long distance calls and 160 million international long distance calls.

- Private schools and universities are also stressing the need for modern laboratories for experimentation and research in order to train students who will be prepared to face the technological and scientific challenges of the future. At the same time, many of the local universities have research departments and a large staff of highly qualified personnel, including the Instituto Tecnológico de Monterrey, the Universidad Iberoamericana and the Universidad Anáhuac.

## 5. MARKET ACCESS

As a result of Mexico's accession to GATT, the Mexican government has gradually opened the economy to international markets. Tariffs have been lowered from a maximum 100% in 1983, to 20% since December, 1988. The official price system has been totally eliminated and import permits are required on only 198 of the total 11,812 items in the Mexican Harmonized Tariff System.

The import climate for instruments and equipment has improved significantly as a result of this commercial liberalization. Maximum duty rates have been reduced to 20% and prior import permits are not required on imports of items in this study. As a result of NAFTA negotiations, import tariffs will be subject to a duty reduction schedule, whereby duties on non-duty-free items will be either totally eliminated or gradually reduced starting in 1994. This process is to end in 2008 with the total elimination of duties by then. At present, imports of instruments and equipment are subject to an ad valorem duty of maximum 20% assessed on the invoice value. In addition, a customs processing fee of 0.8% is assessed on the invoice value. A 10% value added tax (recently reduced from 15%) is then assessed on the cumulative value of both taxes in addition to the invoice value. Some manufacturers who use imported inputs for their products under a Mexican Government approved manufacturing plan may have the duty and/or VAT waived or rebated.

Formerly, in order to bid on tenders and sell to a government agency or decentralized company, foreign manufacturers required having a local resident agent and to have the foreign supplier registered and accepted by the Secretariat of Planning and Budgeting (Secretaría de Programación y Presupuesto - SPP). As of July 1991, the above requirement for prior registration with SPP has been eliminated.

The new procedures now in force require the foreign supplier to have a local agent or representative and it has to be registered through his local representative as an accepted supplier with each government ministry and/or decentralized agency according to the international tender requirements under review.

International tenders financed by the World Bank or the International Development Bank are open to all member countries of these institutions. More recently, the World Bank, where its credits are involved, has required that bid documents should also include an affidavit confirming that the Canadian company is a bona fide Canadian company with an official residence in Canada and that Canada is recognized as a contributing member to the World Bank.

There are no official metric requirements applicable to imports into Mexico. However, since the metric system of units is, by law, the official standard of weights and measures in Mexico, importers will usually require metric labeling for packaged goods, although the English system is also used. Dual labeling is acceptable. Imported products should be labeled in Spanish containing the following information: name of the product, trade name and address of the manufacturer, net contents, serial number of equipment, date of manufacture, electrical specifications, precautionary information on dangerous products, instructions for use, handling and/or product conservation and mandatory standards. Mexico adheres to the International System of Units (SI). Electric power is 60 cycles with normal voltage being 110, 220 and 400. Three phase and single phase 230 volt current is also available.

Prepared by:
Caroline Vérut for the
Canadian Embassy
Mexico City
Prepared March 1993

To call all telephone and fax numbers listed below from Canada, unless they are preceded by a different area code, dial 011-525 first, otherwise dial 011-52-(area) number.
NOTE: The information on companies not located in Mexico City was not confirmed.

## APPENDIX I:
## INDUSTRIAL CHAMBERS AND ASSOCIATIONS

**ASOCIACION NACIONAL DE IMPORTADORES Y EXPORTADORES DE LA REPUBLICA MEXICANA (ANIERM)**
IMPORTERS AND EXPORTERS
Monterrey 130
Col. 06700 Roma
México D.F.
Phone: 564-86-18 584-95-22
Fax: 584-53-17
Contact: Sr Ernesto Warnholtz
Presidente

**CAMARA MINERA DE MEXICO**
MINING CHAMBER
Sierra Vertientes 369
Col. Lomas de Chapultepec
11000 México D.F.
Tel. 540-6788
540-6990
Fax 540-6061
Contact: Ing. Jaime Lomelín - President

**CAMARA NACIONAL DE LA INDUSTRIA DEL HIERRO Y DEL ACERO (CANACERO)**
IRON AND STEEL CHAMBER
Amores 338
Col. del Valle
03199 México D.F.
Tel. 543-4443
Fax 687-0517
Contact: Ing. Felipe Cortés - President

**CAMARA NACIONAL DE LA INDUSTRIA DE TRANSFORMACION (CANACINTRA)**
TRANSFORMATION INDUSTRY CHAMBER
Av. San Antonio 256
Col. Ampliación Nápoles
03849 México D.F.
Tel. 563-3400
Fax 598-9467
Contact: Roberto Sánchez de la Vara - President

## APPENDIX II:
## USEFUL MEXICAN GOVERNMENT DECENTRALIZED AGENCIES

**AHMSA INGENIERIA, S.A DE C.V.**
Kepler 59
Col.Nueva Anzures
11590 México D.F.
Phone: 531-22-45 531-19-580
Fax: 2-06-45-06

Ing. Luis Avila Martínez
Director General
Phone: 254-61-98

Sr. Ernesto Magaña
Responsable de Adquisiciones
Phone: 250-86-32

**PROCESADORA DE ACERO RASSINI, S.A. DE C.V.**
Prolg. Francisco I. Madero S.N.
Col. Zona Industrial
25680 Cd. Frontera, COAH.
Phone: (863) 53-213 53-220
Fax: (863) 53-224

Ing. Jesús Martínez Campos
Director División Tubería
Phone: (863) 51-833 50-369

Ing. Antonio Alegría Escamilla
Gerente Administrativo
(Responsable de Adquisiciones)
Poniente 140 No. 590
Col. Industrial Vallejo
02300 México D.F.
Phone: 390-06-59

**SECRETARIA DE ENERGIA, MINAS E INDUSTRIA PARAESTATAL (SEMIP)**
Av. Insurgentes Sur 552
Col. Roma Sur
06769 México D.F.

Ing. Fernando Hiriart Balderrama
Secretario de Energía, Minas
e Industria Paraestatal
Piso 3
Phone: 564-97-89 564-97-90

Ing. Alfredo Elías Ayub
Subsecretario de Minas e Industria Básica
Piso 4
Phone: 564-96-41 564-96-40

Lic. Javier Vega Camargo
Director General de Asuntos Internacionales
Phone: 553-38-15 553-27-02

Lic. Mauricio Toussaint Ribot
Director General de Operación
Minerometalurgica
Phone: 553-91-70 553-91-45

Lic. Pedro Guillermo Hoth Bon-Vermeden
Director de Negociaciones Internacionales
Phone: 553-90-29

Lic. Miguel Angel Ugalde Aponte
Director de Inversiones y Suministros
Phone: 553-91-43

**PRODUCTORA MEXICANA DE TUBERIA, S.A. DE C.V. (PMT)**
Luz Saviñón 17
Col. del Valle
03100 México D.F.
Phone: 523-04-90 587-69-86
Fax: 687-69-76

Lic. Julio Scherer Ibarra
Administrador General
Phone: 536-18-58 536-17-56

Ing. Rutilo Cuazitl Villalbaso
Gerente de Adquisiciones
Phone: 536-16-47 536-19-15

## APPENDIX III:
## DISTRIBUTORS AND REPRESENTATIVES

**ACEROS, FABRICACIONES Y MAQUILAS, S.A. DE C.V.**
Carr. Agricultura Km. 3
66070 Saltillo, Coah.
Phone: (84) 443-23
Ing. Ulises González V.
Director General

**ACEROS LOZANO, S.A.**
Madero Oriente 3901
Col. Fierro
64590 Monterrey, N.L.
Phone: (83) 37-04-01 37-04-02
Contact: Lic. Maritza Lozano Chapa
Gerente General

**ACEROS MONTERREY, S.A.**
Peña Guerra 150
Col. Peña Guerra
66490 San Nicolás de los Garza, N.L.
Phone: (83) 53-53-53
Contact: C.P. Ramiro H. Garza Villarreal
Director General

**ACEROS R.G.C., S.A.**
Av. López Mateos 502 Norte
Col. Lagrange
66490 Sn. Nicolás de los Garza, N.L.
Phone: (83) 53-44-44
Contact: Ing. Adrián G. González Lozano
Director General

**ACERO Y FLECHAS DEL CENTRO, S.A. DE C.V.**
Filiberto Gómez 259
Centro Industrial
54030 Tlalnepantla, Mex.
Phone: 390-22-33
Fax: 390-23-00
Contact: José Paredes Villareal
Director General

**ACERO ROLADO MEXICANO, S.A. DE C.V. (ACROMEX)**
Durango 263 Piso 8
Col. Roma
06700 México D.F.
Phone: 511-67-45 51175-81
Fax: 511-81-41
Contact: Sr. Sada
Director General

**CAMBRIDGE WIRE CLOTH COMPANY INTERNATIONAL, S.A. DE C.V.**
Vía López Portillo, Km. 29,8
Col. Guadalupe Inn
55010 Ecatepec, Mex.
Phone: 875-49-22
Fax: 875-47-98
Contact: Edward N. Evans
Presidente

**COMPAÑIA SIDERURGICA DE GUADALAJARA, S.A.**
Lázaro Cárdenas 601
44960 Guadalajara, Jal.
Phone: (36)12-26-75
Fax:
Contact: Ing. Jorge Martínez Buitrón
Presidente

**DELTA MEXICANA, S.A. DE C.V.**
Francisco I. Madero 1010
Parque Industrial El Carmen
Phone: (83) 600-21
Contact: Lic. Jorge Humberto Padilla
Director General

**DOFESA, S.A. DE C.V.**
Marina Nacional 205
Col. Tacuba
11410 México D.F.
Phone: 527-93-47
Fax: 399-74-56
Contact: Jesús Hernández
Director General

**FORDATH, S.A. DE C.V.**
Vasconcelos 650 Oriente
Fracc. Valle del Campestre
66265 San Pedro Garza García, N.L.
Phone: (83)35-02-75
Fax: (83)78-72-67
Contact: Ing. Claudio V. Ramírez
Director General

**FUNDICION DE FIERRO Y ACERO EUREKA, S.A.**
Ciprés y Violeta 3102
Col. Moderna
Phone: (83) 51-06-44
Contact: Federico Gutiérrez
Director General

**FUNDICION NARDO, S.A.**
Poniente 146 No. 519
Fracc. Industrial Vallejl
07710 México D.F.
Phone: 587-51-00
Fax: 567-73-51
Contact: Juan J. Molina Segundo
Director General

**FUNDICIONES PECOR, S.A. DE C.V.**
Callejón Sto. Domingo 1117
Col. Lagrange
66400 Sn. Nicolás de los Garza, N.L.
Phone: (83) 50-07-72
Contact: Ing. Ramón Pérez Córdova
Director General

**FUNDICIONES ALTZAIRU, S.A. DE C.V.**
Hermenegildo Galeano 3
Col. Sn. Juan Ixhuatepec
54180 Tlalnepantla, Mex.
Phone: 781-91-89
Fax: 393-98-71
Contact: Iñaki Ertze Encinas
Director General

**FUNDICION Y MAQUINADO DE QUERETARO, S.A. DE C.V.**
Acceso II No. 18
Col. Industrial Benito Juárez
76130 Querétaro, Qro.
Phone: (463) 701-74
Fax: (463) 708-57
Contact: Eduardo Mainero Caballero
Director General

**FUNDIDORA DE ACEROS TEPEYAC, S.A. DE C.V.**
Vía Morelos 349
55400 Tulpetlac, Mex.
Phone: 569-30-22
Fax: 755-31-86
Contact: Ing. Oscar Michellod
Director General

**FUNDIDORA VOLCAN, S.A. DE C.V.**
Oriente 257 No. 86
Col. Agrícola Oriental
08500 México D.F.
Phone: 558-10-21
Fax: 558-04-75
Contact: Ing. Manuel Ruíz Ocejo
Director General

**FUNDIVAL, S.A. DE C.V.**
Jaime Balmes 11 - Edif.A - Plaza Polanco
Col. Chapultepec Morales
11510 México D.F.
Phone: 557-24-00
Fax: 557-59-60
Contact: Héctor Sánchez Madrid
Director General

**GRUPO SIDENA S.A.**
Homero 418-1
Col. Chapultepec Morales
11560 México D.F.
Phone: 203-78-41 203-77-57 2377-38
Fax: 203-78-77
Contact: Lic. Gonzálo Fernández
Director General

**IMSA SIGNODE, S.A. DE C.V. (MEXICO)**
Vía Dr. Gustavo Baz 43
Col. Xocoyohualco
54080 Tlalnepantla, Mex.
Phone: 562-21-90
Fax: 562-96-90
Contact: Ing. Vicente Marroquín Zepeda
Director General

**IMSA SIGNODE, S.A. DE C.V. (MONTERREY)**
Villagrán 1319 Norte
Col. Industrial
64440 Monterrey, N.L.
Phone: (83)74-33-11
Fax: (83)74-23-46
Contact: C.P. Homero Quiroga D.
Gerente General

**LA PALOMA, CIA. DE METALES, S.A. DE C.V.**
Sn. Luis Tlatilco 8
Parque Industrial Naucalpan
53370 Naucalpan, Mex.
Phone: 358-57-44
Fax: 576-36-45
Contact: Sr. José Nava Fuentes
Director General

**MAFUSA, S.A. DE C.V.**
Calz. del Valle 222 Poniente
Col. del Valle
66220 Monterrey, N.L.
Phone: (83)76-65-80 76-64-68
Fax:
Contact: Ing. Salvador Villamar Delgado
Gerente General

**MANUFACTURAS INTERNACIONALES, S.A. DE C.V.**
26 Norte 220
Cd. Industrial
20290 Aguascalientes, Ags.
Phone: (49)635-20 657-28
Fax: (49)676-65
Contact: Ing. Luis Francisco López Vázquez
Director General

**MANUFACTURAS Y AGENCIAS UNIDAS, S.A. DE C.V.**
Amores 1018
Col. del Valle
03100 México D.F.
Phone: 576-26-11
Fax: 358-50-27
Contact: Lic. Roberto Troop
Director General

**METALUR MEXICO, S.A. DE C.V.**
Eucken 16-302
Col. Anzures
11590 México D.F.
Phone: 531-68-21 250-42-63
Fax: 531-33-62
Contact: Lic. Carlos Núñez
Director General

**METALES AGUILA, S.A. DE C.V.**
Dr. Jiménez 268
Col. Doctores
06720 México D.F.
Phone: 538-65-20
Fax: 538-69-67
Contact: Ing. Hugo de Luca Monteverde
Director General

**METAPOL, S.A. DE C.V.**
Azahares 26-203
Col. Santa María Insurgentes
06430 México D.F.
Phone: 583-87-70
Fax: 583-05-57
Contact: Gregory Polak L.
Gerente General

***MEXINOX, S.A. DE C.V.**
Paseo de la Reforma 116 Piso 14
Col. Juárez
06600 México D.F.
Phone: 592-10-88
Fax:
Contact: Juan Autrique
Director General

**MINER Y MENDEZ DE MEXICO, S.A. DE C.V.**
Insurgentes Sur 2462
Col. Ermita Atizapán
01070 México D.F.
Phone: 548-94-70
Fax: 550-69-15
Contact: Lic. Felipe Zirión Quijano
Presidente

**NUTEC, S.A. DE C.V.**
Priv. San Jerónimo 225 Sur
Col. San Jerónimo
64650 Monterrey, N.L.
Phone: (83)48-88-88
Fax:
Contact: Geraro Cueva
Gerente General

**REPRESENTACIONES PFEIFER, S.A DE C.V.**
Vicente Suárez 13
Col. Condesa
06140 México D.F.
Phone: 553-90-39
Fax: 286-82-27
Contact: Enrique Kahn
Director General

**PRODUCTOS CROSBY S.A. DE C.V.**
Blvd. Manuel Avila Camacho 235-C
Col. Sn. Francisco Cuatlalpan
53370 Naucalpan, Mex.
Phone: 576-17-66
Fax: 576-51-74
Contact: Lic. Xavier Saavedra
Director General

***PRODUCTORA INDUSTRIAL, S.A. DE C.V.**
Ingenieros Militares 4
Col. Sn. Francisco Cuautlalpan
53560 Naucalpan, Mex.
Phone: 576-09-33
Fax: 358-63-62
Contact: Javier Lee Kim
Gerente General

***PRODUCTORA MEXICANA DE TUBERIA, S.A. DE C.V.**
Av. Insurgentes Sur 664, Piso 11
Col. del Valle
03100 México D.F.
Phone: 523-04-90
Fax:
Contact: Ing. Emilio Zorrilla V.
Director General

**PRODUCTOS ESPECIALES METALICOS, S.A. DE C.V.**
Vía José López Portillo 8A
Col. Lechería
54940 tultitlán, Mex.
Phone: 565-86-55
Fax: 872-31-39
Contact: Ing. Tony Martí
Director General

**RESCANDI, S.A. DE C.V.**
parque de los Remedios 6-301
Col. El Parque
53390 Naucalpan, Mex.
Phone: 576-39-61
Fax: 359-43-19
Contact: Ulf Bergstrom
Gerente General

**SERVICIOS INDUSTRIALES, S.A. DE C.V.**
Río de la Plata 48
Col. Cuauhtémoc
06500 México D.F.
Phone: 286-81-33
Fax: 286-71-47
Contact: Ing. Jaime Lomelín G.
Director General

**SIDERURGICA TULTITLAN, S.A. DE C.V.**
Av. Nuevo León 250-7
Col. Condesa
06100 México D.F.
Phone: 272-02-87
Fax: 272-62-97
Contact: Israel Feldman
Director General

**TROQUELADOS INDUSTRIALES DE PRECISION, S.A. (TIPSA)**
Blvd. Adolfo López Mateos 21
Col. México Nuevo
54500 López Mateos, Mex.
Phone: 397-35-66
Fax: 822-94-11
Contact: George Lauprecht
Director General

**TUBACERO, S.A.**
Av. Guerrero 3729 Nte.
Col. del Norte
64500 Monterrey, N.L.
Phone: (83) 51-81-00
Fax: (83) 51-35-50
Contact: Felipe Avila Marcue
Director General

**TUBERIA LAGUNA, S.A DE C.V.**
Valle del Guadiana 355
Parque Industrial
35070 Gómez Palacio, Dgo.
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