



## The Tool and Die Industry in the Philippines

The Philippine tool and die industry holds a potential haven for investors looking for business ventures in the metals and engineering industries. This sector is an essential component of the manufacturing industry particularly in the production of components and parts for the local automotive and electronics industries.

### Why promote the tool and die industry?

The Philippines' heavy manufacturing industries, such as the automotive and electronics & semiconductor industries, in order to be globally-competitive, need to have a reliable and cost-efficient source of production inputs, and one vital component of parts manufacturing among these industries is tool and die.

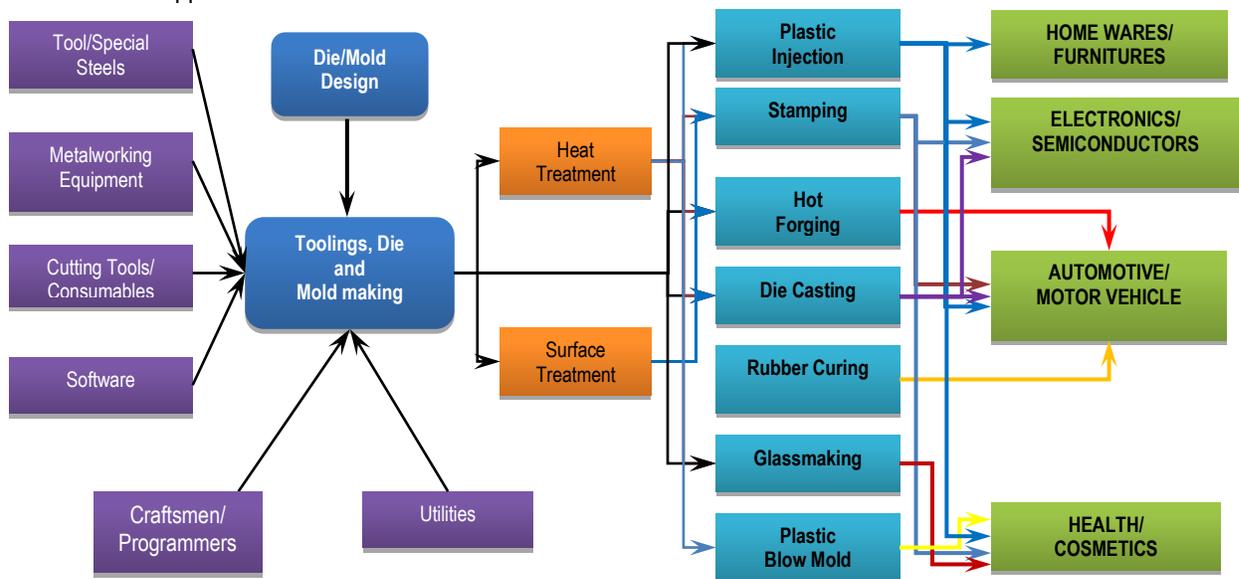
The tool and die industry, being a key niche of Filipino SME metalworking companies, is a priority strategic sector for localization, as this industry's competitiveness can contribute to manufacturing cost efficiency of the heavy industries.

### Industry Coverage

The tool and die industry is an industry that uses general and specialized metal cutting technology to fabricate dies, molds and toolings employed to convert raw materials into a desired shape. The common products of this sector include dies (simple, compound and progressive), molds (for forging, plastics injection or blow molding, die casting, glass blow molding) and tools, such as jigs and fixtures used for cutting and shaping different materials.

The products of the industry are typically made by mold and die makers using general, conventional and specialized metal cutting technology, like computer numerically controlled (CNC) cutting machines, employing special tool steel materials which are either pre-hardened or which undergoes heat treatment after the desired tool has been cut to shape. After the desired shapes and cavities are formed for the mold, dies and toolings, postcutting treatments may be required to impart improve performance like heat treatment, such as vacuum heat treatment, normalizing, and surface treatment, such as TiN coating and Nitriding, among others. It is only recently that these technologies became available in the country through the establishment of vacuum heat treatment and Physical Vapor Deposition (PVD) facilities.

The tool and die industry's unique characteristic is that it is a unique support industry to the manufacturing sector, as it makes possible rapid mass production of various durable products. The tool and die industry also is a key niche of the metalworking SMEs, as it exhibits vital links to the Philippine automotive, electronics & semiconductor, furniture, housewares and appliances industries.



## Industry Players

The Philippine tool and die industry serves a large manufacturing sector. In a study made by the DOST Metals Industry Research and Development Center (MIRDC), there are one hundred seventy (170) identified tool and die firms in the Philippines in 2006. The number of tool and die firms had dramatically increased during the early part of the 1990's, coincident with the Asian economic boom.

The major players in the Philippines operate their tool and die making facilities for purposes of supporting their in-house manufacturing and production. There are only a few independent die and mold makers that serve the requirements of others. Some of the major die and mold makers produce die and mold both for local and possibly export. As a result, these in-house die and mold makers have expanded their production.



The **Philippine Die and Mold Association, Inc. (PDMA)** was formed in August 1995 to represent the interest of companies in the Philippines whose businesses relate to the tool and die industry. The membership to PDMA constitutes the following subsectors: die casting and forging, electronics and semiconductor tooling, metal stamping, plastic, rubber and packaging, and technological resources. The PDMA also has honorary members from the government, such as the Department of Science and Technology – Metals Industry Research and Development Center (DOST-MIRDC), and the Department of Trade and Industry – Board of Investments (DTI-BOI).

The PDMA is also an active member of the Federation of Asian Die and Mold Association (FADMA), an international organization of countries active in the tool and die business. This association boasts of country members coming from the Asian tool and die powerhouses such as Japan, China, Korea and Taiwan to name a few. Finally, the FADMA serves as the Asian arm of the International Special Tooling & Machining Association (ISTMA), a global association of tool and die makers with membership spread across the Americas, Europe and Asia.

## Market Opportunities

The Philippine motor vehicle industry has optimistic prospects due to the country's consistent GDP growth and the market opportunities that may abound in the ASEAN integration. As the Philippines may very well ride the third wave of rapid motorization in ASEAN within the next five years, investment opportunities abound in tool and die for the manufacture of motor vehicle parts and components.

## Motor Vehicle Industry

The Philippine motor vehicle industry is principally dominated by Japanese automobile manufacturers such as Toyota Motor Phils. Corp. (TMPC), Mitsubishi Motor Phils. Corp. (MMPC), Honda Cars Phils., Inc. (HCPI), Nissan Motor Phils., Inc. (NMPI) and Isuzu Phils., Inc. (IPC). Pilipinas Hino, Inc (Hino) and Columbian Motors Corp. (Nissan Diesel) dominate the trucks and buses category. Other vehicle assemblers carry German and Chinese brands: Man Automotive Concessionaires Corp. (MAN buses-rear engine), Dreamco Automobile Co., Inc. (JMC light trucks), Transport Equipment Automotive Components, Inc. (KAMA and Dongfeng light trucks), IKK Ichigan, Inc. (Jinbei light trucks), JAC Automobile (JAC Motors) and Statemotor (Great Wall).

There are 4 passenger cars assemblers, 20 commercial vehicle assemblers (of which 4 are also passenger car assemblers) and 23 motorcycle assemblers that are active participants under the Motor Vehicle Development Program with a **total plant capacity of 2,570,008 / year**.

Classification	No. of Participants	Total Capacity
Passenger Car	4	200,000 units/year
Commercial Vehicle	20	146,022 units/year
Motorcycle	23	2,570,008 units/year

In terms of production and sale, the motorcycle industry is likewise dominated by Japanese manufacturers: Honda Phils., Inc. (HPI), Kawasaki Motor Phils. Corp., Suzuki Phils., Inc. and Yamaha Motor Phils., Inc. (YMPI). Most of the other motorcycle assemblers' are carrying Chinese brands such as Sinski, Lifan, Skygo, Shineray, Loncin, Zongshen and others. Others participating motorcycle brands are Taiwanese (SYM and Kymco), Thai (Tiger), Malaysian (Demak) and Indian (Granstar).

### **Opportunities for the Philippine Motor Vehicle Industry: Breaching the GDP Per Capita Threshold for Rapid Motorization**

The anticipated third wave of rapid motorization growth may very possibly take place in the Philippines after Thailand and Indonesia rode the first two waves. Based on the ASEAN experience, when a country achieves a GDP per capita of approximately US\$ 2,600, its local automotive market is expected to expand remarkably. A third wave is expected to occur between 2015 to 2022. In that time span, ASEAN may expand to a market of 3 million to 6 million units over the target period. ASEAN is expected to be the world's 8th largest automotive market around that time.

The third wave of high motorization growth could take place in the Philippines, where GDP per capita is expected to breach the US\$2,600 level towards 2013-2016. The local automotive market is seen to grow 150% to 500,000 units in 2022. The forecast is based on observed stable trends of 5%-6% GDP growth delivering 12% growth in vehicle sales. This vibrant outlook is also supported by latent markets such as are presented by the need to re-fleet the 1.7 million registered vehicles 10 years or more of age.

### **Electronics Industry in the Philippines**

The Philippines is also actively integrated into the electronics and semiconductor global value chains. Integrated circuits (IC) and semiconductor devices are the Philippines' export winners.

The Philippines possesses capabilities in diemaking for IC production. The dies and jigs for die attach and wirebonding at the start of the IC production process are 90% localized in the Philippines. Likewise, the dies for deflash/trim/form/ singulation (DTFS) for the end-of-line IC production are also 90% localized. Moulds for serial feed moulds or epoxy resin encapsulation are products that have potential for localization.

According to the PDMA report submitted to the Federation of Die and Mold Association (FADMA) in 2007, it was estimated that the Philippines tool and die industry produces 1,500 and 500 mold sets/year for the electronics and automotive industries, respectively.

### **The Philippine Advantage**

#### **Geographic Clustering of the Industry and Strategic Locations for Investments**

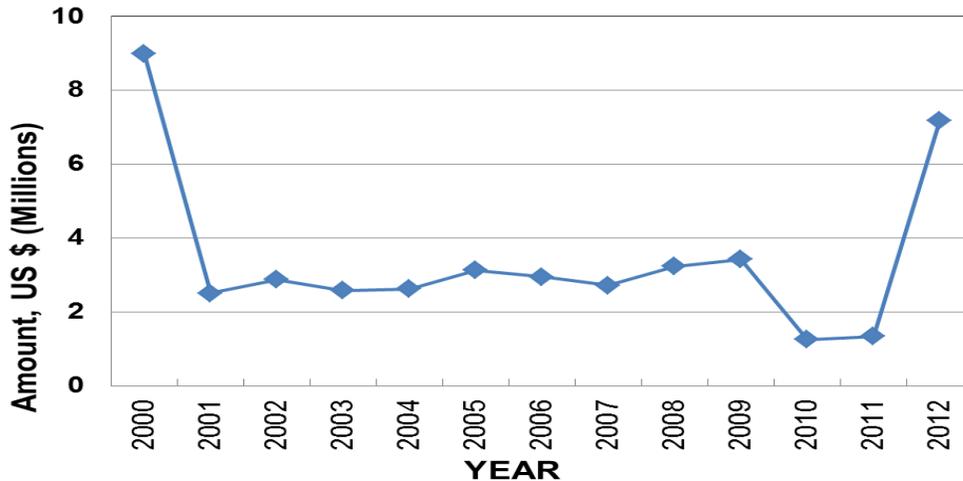
Tool and die firms are mostly located in regions where manufacturing industries are densely situated. Almost half of the companies are located in the National Capital Region, where most manufacturing firms are concentrated, and more than 80% are situated in the Luzon area, where economic zones in Laguna, Cavite, Bulacan and Pampanga exists. The rest can be found in the Visayas, particularly in Cebu and only a couple exists in Mindanao. There are 66 manufacturing economic zones for investments in the sector.



## Industry Potential

### Philippine Export of Tool and Die (2000 – 2012)

In 2012, the Philippine tool and die industry's export figures registered at around US\$ 7.18 million, significantly improving from the 2011 export earnings of US\$ 1.37 million.



### Net-Value Added

It is estimated that around **44.5%** is the Philippine value-adding for a plastic injection mould; specific cost components are basic manufacturing cost and die design fees.

Costing of a Plastic Injection Mould*		
Particulars	Percent to Total Cost	
Die Material Cost	15%	
Basic Manufacturing Cost	33.5%	« Philippine value-adding
Mould Base Cost	34.7%	
Secondary Elements	5.8%	
Die Design Fees	11%	« Philippine value-adding
* Source: Nagahanumaiah, B. Ravi and N.P. Mukherjee: "An Integrated Framework for Die and Mold Cost Estimation using Design Features and Tooling Parameters," Int J Advanced Manufacturing Technology (2005).		

### Industry Value Chain, Sourcing and Processing

The tool and die industry requires suppliers to provide the raw material which consists mainly of special steels and castings to make the product, and general and specialized metal machining equipment (such as lathes, milling machines, surface grinders, EDM, CNC) and software (CAD/CAM) for use in the fabrication of the tools, dies and molds. Consumables for this industry are likewise imported, such as cutting tools, and coolants. The raw materials are obtained from local supplier or foundries, or if special steels are required, they are purchased directly abroad.

Metallurgical engineering facilities useful to the tool and die industry are surface hard coating facilities. These facilities may employ current techniques such as physical vapor deposition (PVD), chemical vapor deposition (CVD)

and plasma-enhanced deposition. It is important to note that these facilities has just been recently made available in the country when Penta Technology, Inc. and Air Water Philippines offers technical services in vacuum air quench and nitriding starting in 2011. Hideyoshi Tool Services also offered PVD services capable of coating TiN, TiCN, TiAlCN and others also in 2011.

## **Employment in the Industry**

An industry survey by the DOST-MIRDC in 2005 showed that the tool and die industry employ a total of 5,862 personnel. This total is classified into two categories: non-production personnel (32%) and production personnel (68%). Production personnel are those people participating in direct production of tool and dies such as engineers, machinists and specialists. Non production personnel are those participating in administrative work or non-production related work such as marketing, sales or financial accounting. The tool and die process may be considered labor-intensive as it is estimated that 23% of production cost is due to direct labor. This value would be higher if the cost of indirect or non-production labor is accounted.

## **Government Support to the Tool and Die Industry**

### **DOST's Die and Mould Solution Center**

The tool and die industry is one of the metalworking sectors that have been identified for accelerated development since it enables faster industrial growth and strengthen necessary linkages in the local manufacturing sector's value chain. The private sector, through the PDMA, has partnered with the DOST-MIRDC to craft their Competitiveness Roadmap in 2012 in response to the DTI-BOI's spearheading of its Industry Roadmapping Project. The Competitiveness Roadmap of the Tool and Die Industry outlined the state of the local tool and die sector, with specific recommendations on building competitiveness through definite strategies for the short-run (2015-2016), such as manpower improvement, technology upgrade and modernization, and indigenous sourcing of critical materials.

The government through the DOST-MIRDC has heavily invested in the establishment of the Die and Mould Solution Center (DMSC), a shared service facility meant to build internal capability of the local tool, die and mould making industry as support to the local automotive, electronics and heavy manufacturing sectors. The DMSC facility specifically aims to focus on the acquisition of the needed technology such as advanced CNC machines and design and simulation software (Computer-Aided Design/Computer-Aided Manufacturing) on plastic mould injection, blow moulds and stamping dies to support the industry's competitiveness by means of localization of currently imported dies and moulds. The DMSC can be considered as the centrepiece of the DOST's Makinarya at Teknolohiya para sa Bayan (MakiBayan) Program, the strategic focus of the collaborative relationship of government and the private metalworking sector.

More importantly, the DMSC facility also serves as a venue for training the existing manpower pool of the local tool and die industry. The MIRDC recently implemented the Pilot Die and Mould Making and Design Training Program which started in 2014. The Pilot Training Program is designed for six months for a batch of 20 trainees, mostly graduates of Tool and Die Engineering Technology course from the Technological University of the Philippines (TUP), or Mechanical Engineering graduates.

## **Inclusion in the Investment Priorities Plan**

Tool and Die projects and activities can qualify as a Preferred Manufacturing Activity under the Manufacturing Sector in the Investment Priorities Plan (IPP).

## Government Incentives

The Philippine government, through the Board of Investments (BOI), the Philippine Economic Zone Authority (PEZA) and the Clark Development Corporation (CDC) / Subic Bay Metropolitan Authority (SBMA) offers varied incentive schemes, fiscal and non-fiscal alike, that investors can choose from.

INCENTIVE	BOI (Executive Order No. 226, as amended)	PEZA (Republic Act No. 7916, as amended)	CDC / SBMA (Republic Act No. 7227 – Bases Conversion Development Authority)
Income Tax Holiday (ITH)	4 – 6 years (max of 8 years)		Exempted from all local and national taxes - value-added taxes, franchise taxes, excise and ad valorem taxes)
ITH Bonus	3 years provided the firm meets certain conditions		
Special Tax Rate of 5% on Gross Income		Special Tax Rate of 5% on Gross Income	
Importation of Capital Equipment, Spare Parts and Supplies	0% duty-free	Tax and Duty-Free	
Wharfage Dues and Export Tax, Duty, Impost and Fees	Exempted		None
Simplification of Customs Procedures	Available		
Employment of Foreign Nationals	<ul style="list-style-type: none"> <li>▪ Foreign nationals may be employed in supervisory, technical or advisory positions within 5 years from a project's registration, extendible for limited periods. The positions of president, general manager, and treasurer or their equivalents, of foreign-owned registered firms may be retained by foreign nationals for a longer period.</li> <li>▪ All foreign employees may bring with them their spouses and unmarried children under 21 years of age.</li> </ul>		

## Industry and Government Contacts



The Department of Trade and Industry through the Board of Investments is actively partnering and consulting with the Philippine Die and Mould Association Inc. for the crafting and implementation of the Competitiveness Roadmap of the Tool and Die Industry in line with its thrust for industry development and manufacturing resurgence.



The Metals Industry Research and Development Center (MIRDC) is an attached agency of the Department of Science and Technology (DOST) dedicated to provide research and technological services to support the growth of the metals, engineering and allied industries in the Philippines. The MIRDC has been a staunch and proactive partner of the metalworking and engineering industries; the Center has been continuously upgrading their facilities and services to improve the competitiveness of various manufacturing industries, a gradual shift from its past purely research and development thrust.

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