

Taiwan's Golf Club Head Industry Its Internationality and Future

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Application in the sporting goods

There are a great number of sporting and leisure equipment, containing all kinds of sports and cycling products. They also include golf equipment, bicycles, rackets, roller skaters, fitness equipment, fishing tools, table tennis, water sports, billiard and bowling equipment, etc. Since 1970, Taiwan's sporting goods industry has entered the international markets as the Original Equipment Manufacturers (OEM) and also has created remarkable export records for Taiwan. From the consumer's viewpoint, people like to do sports with good products. Therefore, there is endless demand of consumers who always look for the best sporting and leisure equipment. Thus, the materials are also changing with the technological inventions. From the early age, the sporting goods were mainly made of wood and steel; nowadays the major materials are aluminum alloy, carbon fiber, titanium alloy, magnesium alloy and so on. Moreover, because of the progressive producing technology and enlarging production scale, consumers have better chances to buy light, strong and durable sporting and leisure equipment at a lower price. In the future, considering the lightness, safety and durability, light alloy materials are replacing the commonly-used steel products. They have become trendy for the next generation of sporting and leisure equipment. As to the applications of the light metals, please check Chart I.

Based on the advantages that light alloy materials are light, strong with the easy fabrication technology, aluminum alloy has become the major material applied in the industries of building, transportation, packaging, household electrical appliance as well as mechanics, etc. Titanium alloy, featuring lightness, high strength and corrosion resistance, is widely used in many sporting and leisure equipment. Especially with the progress of fabrication progress, titanium has a great position in the future development. Among the light alloy materials, magnesium alloy is the lightest with excellent shock-absorbing performance. It has been

applied to quite a few of new sporting and leisure equipment in the recent years. Obvious, it obtains great attention in the new material application in developing new products. Viewing the development of Taiwan's light metal industry, aluminum alloy industry has entered a stable and mature stage. The upper, middle and lower stream is compact enough. As to magnesium alloy and titanium alloy also buildup a complete production system with the mass production of 3C products and club heads.

Bicycle / Bike	Sports Balls	Skiing & Skating	Leisure Goods	Others Sporting Goods
<ul style="list-style-type: none"> • Other Bikes • Folding Bike • Mountain Bike • Normal Bike • Road Racing Bike 	<ul style="list-style-type: none"> • Badminton Racket • Tennis • Composite Tennis Racket • Caron Fiber Tennis Racket • Aluminum Tennis Racket • Baseball • Basketball 	<ul style="list-style-type: none"> • Skiing equipment • Scooter Skate • Roller Skates , Ice Skates 	<ul style="list-style-type: none"> • Fishing Tools • Bowling Equipment • Pooling Equipment 	<ul style="list-style-type: none"> • Other Sporting Products • Indoor Fitness Equipment • Golf Club and other Equipment • Golf Ball

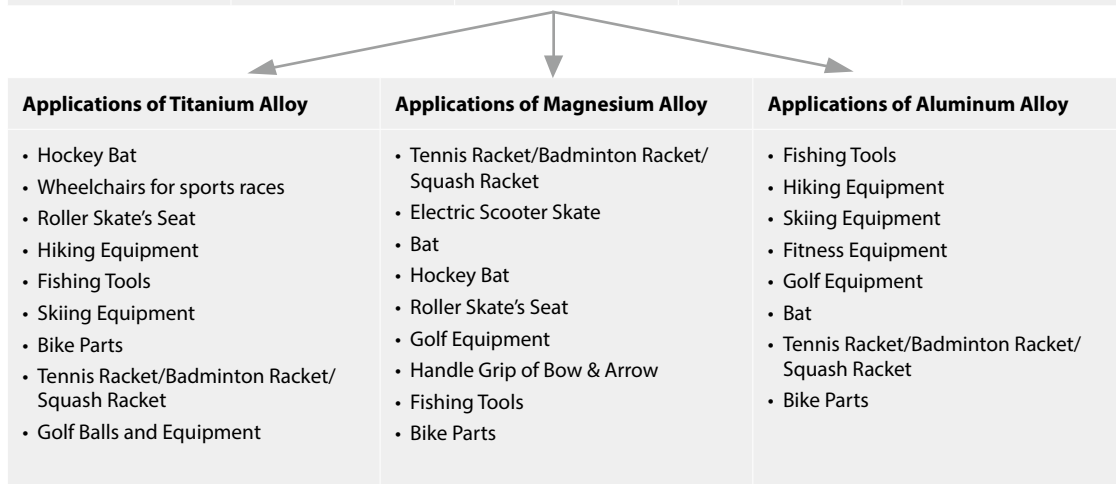


Chart 1 - Applications of Light Metal in the Sporting & Leisure Equipment

Source: Metal Industries Research & Development Centre / MII

2. Definition of Golf Club Head and Scope

In March of 1990, the Japanese company, JOY, for the first time started to sell titanium-made golf club heads. Since then, titanium has started its story in the production of club heads. JOY mainly cooperates with JFE Advantech Co., Ltd. and use Ti-6Al-4V Alloy as the material of club heads. Additionally, Mizuno works with Mitsubishi Material. They use the material of Ti-6Al-4V Alloy above club head and striking face. As to the bottom and neck of club head, they use pure titanium. The shaft which is made of titanium alloy has excellent stability and flexibility. Thus titanium-made golf club head has gradually led the fashion. Golf equipment is mainly composed of 3 parts: club head, shaft and grip. Club head is the most important part. Each golf head has a face which touches the golf ball during the strike. And it is usually classified into Iron Head, Metal Wood, and Putter. Usually, the materials of iron head and metal wood are forging stainless steel, titanium alloy and multi-material iron head and metal wood. Normally, there are 13 clubs in one bag, including three metal woods, 9 iron head and 1 putter. Depending on the angle of the golf head and different weight, metal wood is classified into 5 models: Nos. 1, 3, 4, 5, and 7; iron head, 9 models, including nos. 3~9 and putter, 3 models, C, P, and T.

3. Taiwan's Golf Club Head on the World's Top 3

The industry of gold club head is already a mature and slowly-growing industry at the global markets. Taiwan's golf manufactures have controlled the winning factors: clients' relationship, R&D process ability, and economies of scale; thus, this position is irreplaceable. According to the output, 70%~80% of global golf shaft and club head orders are taken by Taiwanese manufacturers, ranked as number one in the world. However, facing the rising China, the competitive Chinese manufacturers as well as Thai companies, Taiwan's golf club head industry slowly goes down. The status quo of golf club head shows that the global annual demand of is about 40 million club heads. Taiwan's golf club head together with overseas production (mainly in China) still counts 80% of the global market. Taiwan's golf club head industry still takes the lead.

Table 1: 2009~2011 Taiwan's Output of Golf Club Head in the Global Ranking List

Unit: 10,000 clubs-

	2009			2010			2011		
	Country	Output	Global Market Share (%)	Country	Output	Global Market Share (%)	Country	Output	Global Market Share (%)
1 st	Taiwan	3,080	75.1%	Taiwan	3,475	79.8%	Taiwan	3,925	78.7%
2 nd	China	168	4.1%	China	210	4.2%	China	230	4.7%
3 rd	Thailand	160	3.9%	Thailand	170	3.5%	Thailand	140	3.2%

Source: Metal Industries Research & Development Centre MII (2012 / 04)

4. Background of Taiwan's Golf Club Head Industry

The history of Taiwan's golf club head-production dates back to more than 3 decades. The earliest record, Dayu Machine Co. started the production in Qianzhen Dist., Kaohsiung City, Taiwan. In the early days, Dayu become the largest OEM in the world mainly depending on Japan's orders as an OEM. However, in 1995 a fire brought down the whole factory. Later on, Fusheng, O-TA, Dynamic, and Advanced became the top 4 OEMs in Taiwan. Until now, Taiwan's golf equipment has well-developed towards internationality. The manufacturers' R&D ability and producing technology have reached the international standards. Nevertheless, their production rather focuses on club heads and carbon clubs. Most of them are OEMs or ODMs for international brands. The largest market is America and the next is Japan.

On the whole, the golf club head industry is declining, due to the recessions, consumers are less willing to change their clubs. Besides, the labor cost in China continues to increase. And nowadays there are more options of club heads for clients, for example, carbon composite material, stainless shaft with titanium-composite striking face. Plus, there is high price pressure from the final-end markets, and under the impacts of the appreciating RMB. Moreover, the environmental rules and regulations are also getting much stricter day by day. Based on the above-mentioned reasons, there are rather fewer orders than before. Taiwanese manufacturers facing the increasing labor and personnel cost have slowly moved their factories to China. So do the satellite factories. In order to lower cost so as to increase the whole competitiveness, Taiwan's major large golf manufacturers such as Fusheng, Advanced, O-TA, Dynamic, etc. move their factories to China or Vietnam for finalizing the production stage such as processing, polishing and packaging. Still they leave the major tasks in Taiwan: taking order, R&D, developing molds, making samples, etc. As to the development of Taiwan's major club head producers, it is briefed as followed.

In 1994, Fusheng Precision Co. Ltd. established Zhongshan Worldmark Sporting Goods Co., Ltd. in China to produce stainless

club head and to finalize the last stage of production. As to its Taoyuan factory mainly produces titanium and stainless metal wood club head. Advanced International Multitech Co., Ltd. established Advanced Sporting Goods (Dong Guan) Co., Ltd. in 2001 and Plating Facility (Yi Sha Tian, Dong Guan) in 1993 in China, producing golf club head, club assembly and club surface processing work. It continues its efforts on product development, production technology, and enhances development technologies for enlarging ODM work. What's more, Dynamic also take greening measures to save energy and cut carbon emission; meanwhile, it strengthens its CSR (Corporate Social Responsibility) so as to enhance the company's image. O-TA Precision Industry Co., Ltd. established three factories in Shenzhen, China: O-TA Golf Products (Shenzhen) Co. Ltd. (2000), DIA Composite (Shenzhen) Co. Ltd., INDA Composite (Shenzhen) Co., Ltd. with mass production and transfer the production of its factory in Shantou. Now O-TA unifies and standardizes its producing process. Now most of its production is shifted to China and continues specifying in CNC, precision casting ability and to carry out an overall automation of the machines. Dynamic Precision Industry Corporation builds a golf club head factory which also undertakes mass production now. The total production of the above-mentioned four manufacturers including their overseas production covers 80% of the global market share: Fusheng covers 50%; O-TA, 12%; Advanced, 12% and, Dynamic, 6%.

Table 2 Taiwan's leading OEMs of golf club heads - Overseas development

Country	Fusheng Precision Co. Ltd.	Advanced International Multitech Co., Ltd.	O-TA Precision Industry Co., Ltd.	Dynamic Precision Industry Corporation
China	Zhongshan Worldmark Sporting Goods Co., Ltd. (1994)	Advanced Sporting Goods Co. Ltd. (1998) Advanced Int'l Multitech (VN) Corporation Ltd. (2007)	O-TA Golf Products (Shenzhen) Co. Ltd. (2000) DIA Composite (Shenzhen) Co. Ltd. (2003) INDA Composite (Shenzhen) Co., Ltd. (2003)	Dynamic Co. Ltd. (Guangzhou) (1994)
Vietnam	Vision International Co., Ltd. (2002).	--	--	--

Source: Metal Industries Research & Development Centre MII (2012 / 06)

4. General Conditions of Taiwan's Major Competing Countries and Manufacturers

The up-and-coming Chinese golf club head manufacturers pose as the largest competitors for Taiwan's manufacturers now. Among them, both Baimtec Material Co., Ltd. (Baimtec) and Baoji Ouya Chemical Equipment Manufactory are the most competitive Chinese manufacturers and get direct orders from brands.

Baimtec produces casting titanium-alloy club heads. Because of its modern technologies, stable quality, timely delivery, fair prices and other advantages, it has earned a good reputation internationally. Its club head is the core competitive product and Baimtec has become a significant supplier for the casting global titanium alloy club heads. Baoji Ouya Chemical Equipment Manufactory located in Baoji City of Shaangxi Province next to Baoji Titanium Industry Co., Ltd.

Baoji Ouya Chemical Equipment Manufactory is invested and built by Baoji Nonferrous Metals Processing Plant in 1994. Its major products include titanium golf club heads, titanium alloy bicycle frame and titanium chemical facilities as well as other titanium series of products. In 1996, Ouya with its 3-piece titanium club head obtained the Chinese national patent. In 1999, Ouya made a breakthrough from

the traditional material for the striking face, Ti-6Al-4V and successfully developed Ti-15-3-3-3, Ti-1023, and Ti-4Al-4V as new materials for producing metal woods. Now the company can produce 30,000 titanium metal woods and also able to produce according to clients' designs or designated models. They also services of processing semifinal products and providing materials.

In addition, the threshold to enter the golf club head industry such as technology or machine cost is rather low so that it is easy to make counterfeit products. Plus it is easy to get titanium material in China. Thus it is not difficult to get basics and enhance the technology easily. Indeed, this is a potential threat.

5. Strategies of Taiwan's Sporting & Leisure Goods Industry

Enhancing R&D ability and building Taiwan's brands is a better development strategy for Taiwan's sporting and leisure goods industry. Manufacturers in fact can make good use of Taiwan's light metal technology by applying the horizontal-oriented or vertical-oriented model of integration. On the horizontal integration, apart from continuing upgrading the technologies, manufacturers can try to expand product lines

to other sporting and leisure goods by using the light metal technology. Taking titanium alloy product as an example, Taiwan manufacturers have established advantageous production lines; they may consider the production of bicycle parts, such as bicycle frame, stems, pedals, gear, or the wheelchairs for different sport competitions, such as marathon, tennis, basketball and skiing-oriented wheelchairs, or hiking equipment, such as hiking pawls, hiking crawls, hammer, shovels, caps, cooking tools, knife, fork and spoon, or hockey bat, mask, roller skaters' frame, or fishing tools such as line guide for fishing rod, fishing reel cover, reel seat, final-end emboli of fishing rod, fishing rod seat and so on. As Chart 2 indicates, Taiwan's manufacturers might bring more development for the sporting and leisure goods industry.

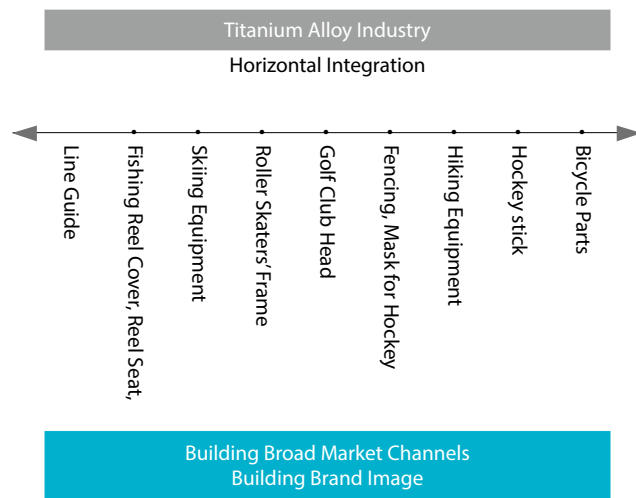


Chart 2
Development strategies of Taiwan's industry of the titanium-alloy-made sporting & leisure equipment
Source: Metal Industries Research & Development Centre / MII

6. The Future and Trends of Golf Club Head Industry

Corresponding to the global green movement to curb carbon emission, Taiwan's manufacturers start to develop greening material and environmental-friendly products, such as innovative designs and efficient logistics; besides, manufacturers also need to carry out the greening concept to enhance a company's competitiveness and good images so as to maintain sustainable development and business chances. Moreover, in combination with information technology, an overall e-Management, information technologies to improve management, to expand quality product sets, product development and design platform with clients and to provide a comprehensive service for clients. A high-quality club head must possess 4 good conditions: feeling easy to control, having a good physical shape, having a good feeling of striking and having a good sound while striking. To simultaneously achieve these 4 requirements, it is not an easy task. Taiwanese golf club head manufacturers have solid experiences of manufacturing. I would like to suggest overthrowing the traditional dark and deep colors to impress consumers with refreshing feelings; plus, producing the kind of club heads with adjustable striking face, and new titanium alloy on the bottom of club head. Moreover, as with carbon composite processing technology to conduct new product development and mass productions, it is expected that customers demand will be higher in the near future.