Research on the development of DIE STEEL Industry in Huangshi based on SWOT analysis

TANG Min, LIU Sheng
Party School of Huangshi Committee of C.P.C., Huangshi Hubei, China, 435002
273821663@qq.com, LIU Sheng

Abstract. DIE STEEL Industry is one of the most characteristic industries in Huangshi City. With the development of recent years, a relatively large industrial group has been initially formed. The number, industrial scale and market share of enterprises are all the first in China. In this paper, the SWOT analysis method is used to study the advantages, disadvantages, opportunities and threats of the development of Huangshi Die steel industry, analyze the problems existing in the industrial scale, product grade, innovation ability, ecological environment protection and other aspects of Huangshi Die steel industry, and put forward development countermeasures and suggestions to promote the high-quality development of Huangshi Die steel industry.

1. Introduction
Mold is an indispensable special basic equipment in the manufacturing industry. The level of mold production technology is an important indicator to measure the level of product manufacturing in a country. Die steel is an important raw material for die manufacturing, which belongs to special purpose steel in steel products. Die steel industry directly affects the die industry. The quality of die steel determines the quality, benefit and development ability of new products. At present, die steel is mainly produced in more than 10 special steel enterprises in China, among which Huangshi is one of the important bases for die steel production in China.

2. SWOT analysis of mold industry development in Huangshi City
SWOT analysis, i.e. s (strengths), w (weaknesses), O (opportunities) opportunities, t (threads) threat analysis, is based on the situation analysis under the internal and external competitive environment and competitive conditions. Through the systematic analysis of the advantages, disadvantages, opportunities and threats of die steel industry development in Huangshi City, the way of high quality development of die steel in Huangshi City is explored.

2.1 Advantage analysis
Huangshi City is an old industrial base, in which the mold steel industry is one of the most characteristic industries. Huangshi die steel industry started in the 1980s. After the reform of Daye Special Steel Co., Ltd., many small-scale die factories were built in the suburb of Huangshi City by combining the distribution of workers and social capital. After years of development, Huangshi has initially formed a relatively large industrial group, with the number of enterprises, industrial scale and market share ranking first among peers in China. In 2012, Huangshi City was awarded the title of "China's extrusion die capital".
2.1.1 Good industrial foundation
Huangshi City has three mature mold steel production parks, namely, Xisaishan Industrial Park, Daye Lingcheng Industrial Park and Tieshan Industrial Park. Among them, Xisaishan Industrial Park is a provincial industrial park, which gathers many mold steel enterprises; Daye Lingcheng Industrial Park is mainly engaged in special steel mold equipment manufacturing industry, and was awarded "Hubei Mold Industrial Park" by Hubei development and Reform Commission and Hubei Mold Steel Association in 2010; the scale of Tieshan Industrial Park is relatively small. There are 207 mould steel production enterprises in the three parks, including 100 mould steel enterprises with smelting equipment and 107 forging enterprises. Mould steel enterprises with smelting equipment have 4 electric furnaces and 221 medium frequency furnaces, with a total smelting capacity of about 1.12 million tons / year. In addition, as one of the largest pure and special steel production enterprises in China, Hubei Xinye Steel Co., Ltd. (hereinafter referred to as "Xinye steel") has a good brand effect in the production and R & D of die steel. Especially in recent years, Xinye steel seizes the policy guidance of the state to solve the excess capacity of steel, which adjusts the structure of steel products, and uses its technical advantages and industrial status to develop new products Varieties, increases production, and gradually occupies a leading position in the market. In addition, Huangshi's extrusion die is also in the leading position in China. There are more than 50 large and medium-sized extrusion die backbone enterprises in the city, for that the 20% have entered the top 10 in the same industry in China.

| Species                  | Characteristic                                                                 |
|--------------------------|------------------------------------------------------------------------------|
| Plastic die steel        | Heat treatment is difficult and easy to be processed. It has been developed and applied to various fields. |
| Hot working die steel    | Having good heat conduction, hardness, wear resistance and other properties, because of thermal expansion cold contraction, but also easy to crack. |
| Cold working die steel   | With high wear resistance, the production of products for the punch, scissors and other cutting tools. |

2.1.2 Large market share
At present, with Xinye steel as the leader, Huangshi City has initially formed an industrial chain of smelting, rolling, rough processing and mold manufacturing, with thousands of material specifications, mainly hot-working mold steel, cold-working mold steel and plastic mold steel, as well as rough parts of shaft, ring and pie parts in machinery, metallurgy, electric power and other equipment manufacturing industries. There are more than 200 sales outlets in China, and the extrusion die products account for 65% of the national market. The products are exported to more than 30 countries and regions such as Western Europe and ASEAN, with a good reputation.

2.1.3 Huge talent team
As an old industrial base, Huangshi has trained a large number of skilled manufacturing industry workers, which is also the biggest advantage of Huangshi mold steel industry development. After more than 30 years of development, Huangshi mould steel industry now has more than 50000 employees and a large number of professional and technical talents, which provides strong support for industrial development. In addition, there are 4 universities (including 1 higher vocational college) and 6 secondary vocational schools in Huangshi City. In the process of deepening the integration of industry and education, which have cultivated a large number of talents for the development of enterprises.

2.2 Disadvantage analysis

2.2.1 Smelting equipment does not meet the requirements of national industrial policy
First, smelting equipment has no capacity index. According to the guidance catalogue for industrial structure adjustment (2011 version) (2013 Revision), die steel is a kind of steel used to produce dies, belonging to steel products, and die steel industry also clearly belongs to steel industry. But for a long time, Huangshi mold steel industry has been managed in accordance with the foundry industry, and all production capacity has not been reported, which listed in the national steel production capacity list. In addition, most of the production enterprises do not do a good job of that lacking environmental assessment and other procedures, for which the filing documents are vague, and the equipment and capacity are not clearly described. In accordance with the spirit of the inter ministerial joint working conference of national iron and Steel Co., Ltd. on overcapacity reduction, local governments will list the capacity that has not been reported to the national iron and steel production capacity bottom list and give priority to reducing it. Second, the existing medium frequency furnace does not meet the policy requirements. According to the document "opinions on supporting and cracking down on" Di Tiao steel "and defining the use scope of power frequency and medium frequency induction furnaces", only one mould steel production enterprise in Huangshi City has the qualification of provincial technology center, and other enterprises do not have the national, provincial and ministerial Enterprise Technology Center, which does not meet the legal use requirements of medium frequency furnaces. Third, all electric furnaces belong to elimination equipment. According to the relevant provisions of the guidance catalogue for industrial structure adjustment (2011 version) (2013 Revision), the 30 ton and below steel-making converter, 30 ton and below steel-making electric furnace are backward production equipment, and the mold steel enterprises using electric furnace smelting in Huangshi have the capacity of 30 tons and below, which are backward production equipment.

2.2.2 Low industrial concentration
First, the industrial layout is scattered and the concentration is low. The seven counties (cities) under the jurisdiction of Huangshi have the distribution of mould enterprises, and the industrial layout is scattered, showing the characteristics of "small, scattered and disorderly". Second, "family workshop" type of small and medium-sized enterprises, lack of leading enterprises. By the end of 2019, there are 100 enterprises smelting with electric furnace and medium frequency furnace in Huangshi City, with smelting capacity of 1.24 million tons / year. Among them, there is only one enterprise with a production capacity of 180000 tons / year, two enterprises with a production capacity of 50000 tons to 100000 tons, 23 enterprises with a production capacity of 10000 tons to 50000 tons, and the rest are all under 10000 tons.

2.2.3 The product grade is not high
One is the lack of high value-added products. Huangshi mold steel products are mainly plastic mold steel and H13 series universal hot work mold steel, the product homogeneity competition is serious, for that the special die-casting die, hot forging die and die steel for hot extrusion die with different use requirements and working conditions and other high value-added products are less, which the varieties and specifications are not complete.(Table 1) Second, the product quality needs to be improved. The whole automation level of die steel industry in Huangshi City is low, which leads to low product precision and quality stability. Third, the ability of deep processing is insufficient. The follow-up finishing processes of die steel production, such as annealing, tempering, ultrasonic flaw detection, peeling and other supporting facilities, which are not perfect, there are many rough processed products, most of the products produced by enterprises are electroslag ingots, some of them are equipped with follow-up forging equipment and machining equipment, but they are still basically supplied in the state of annealing or hot rolling, the degree of productization is not high, and the supply cycle is long. In general, Huangshi mold steel industry products are not high-grade and lack of brand products with high market recognition.
2.2.4 Outstanding environmental protection problems
First, the supporting facilities for dedusting are not complete and the dedusting capacity is insufficient. Most of the mould steel enterprises do not have complete dedusting facilities, or even no dedusting facilities. Even the enterprises with complete dedusting facilities have the problem of insufficient dedusting capacity in varying degrees, and the smoke and dust produced in smelting cannot be effectively collected, resulting in unqualified discharge. Second, the environmental protection facilities of some die steel enterprises are aging seriously and the actual operation effect is poor. Some enterprises seldom invest in the environmental protection facilities since they are built. The operation time of environmental protection facilities is long, the appearance of facilities is seriously corroded, and some enterprises' environmental protection facilities are damaged, which leads to the failure of environmental protection facilities to achieve the proper pollution control effect. Third, the problem of unorganized emissions is prominent. Most of the smelting plants of mould steel enterprises are not completely closed, the refining equipment is not equipped with dust removal facilities, the raw materials, recycled materials and waste materials are stored in the open air, and the unclosed, National IV and below emission standard automobiles are used for the transportation in the plant. There are exposed ground without hardening or greening in the plant, low green space rate, more unorganized emissions, and large improvement space for the plant appearance.

2.2.5 Lack of innovation ability
First, most enterprises lack of R & D capability. The technological R & D and innovation ability of Huangshi mould steel industry is mainly concentrated in a few large enterprises, such as Xinyegang, Nantian technology, SMCC heavy industry…., most of which can only meet the production and sales of existing products, and have no ability to research and develop new products to improve the product grade, and the R & D level is uneven. Second, the research and development of enterprises are independent. At present, several powerful enterprises' technological innovation shows the state of decentralized R & D, without joint efforts. The unclear product R & D orientation and division of labor lead to a certain degree of homogeneous competition, repeated investment of funds, waste of human resources and other issues, which can not meet the needs of high-quality development of Huangshi die steel industry. On the whole, Huangshi die steel industry is lack of independent innovation ability, innovation investment is not high, innovation talents are short, production, learning, research and use are not well coordinated, which does not match the status of the important production base of die steel in China.

Table 2. Trend chart of average price of main die steel varieties in 2019.

| Year | Price (Yuan / ton) |
|------|-------------------|
| 2019-01-01 | 18000 |
| 2019-02-01 | 16500 |
| 2019-03-01 | 15000 |
| 2019-04-01 | 13500 |
| 2019-05-01 | 12000 |
| 2019-06-01 | 10500 |
| 2019-07-01 | 9000 |
| 2019-08-01 | 7500 |
| 2019-09-01 | 6000 |
| 2019-10-01 | 4500 |
| 2019-11-01 | 3000 |
| 2019-12-01 | 1500 |

(Yuan / ton)
2.3 Opportunity analysis

2.3.1 Strong market demand
The largest users of the mold industry are concentrated in the four major industries of automobile, home appliances, machinery and electronics. The market demand keeps growing rapidly. (Table 2) In recent years, about 20% of China's medium and high-end mold steel needs to be imported from abroad every year. In recent years, the automobile and parts, optoelectronics and equipment manufacturing and other pillar industries in Hubei Province have developed rapidly, especially the automobile industry has a strong development momentum. The mold demand in Hubei Province ranks the third in China, while the mold production in Hubei Province only accounts for 15-20% of the market demand, and the mold steel market has a good development prospect.

2.3.2 Strong policy support
The State Council's "plan for the adjustment and revitalization of the iron and steel industry" points out that "key steel varieties such as high-speed railway steel, high-strength car steel, high-grade electric power steel and die steel, special large forging material, etc. shall be focused on". There are 9 articles in the first encouraged category of the national catalogue of industrial structure adjustment (2011 version) concerning mold materials. The Ministry of industry and information technology of the people's Republic of China (MIIT) has specified that specialized enterprises such as high-speed steel and tool steel with alloy steel ratio of 100% are not limited by production scale. Moreover, in order to realize the upgrading from a manufacturing power to a manufacturing power, the state reduced the tax revenue of manufacturing industry from the previous 17% to 13%. Huangshi Municipal government has issued the implementation opinions on accelerating the transformation and upgrading of Huangshi mould manufacturing industry, and the implementation measures for supporting mould manufacturing enterprises to accelerate the cluster development of mould manufacturing park in Xisai mountain area, which support the development of mould steel industry from national to local policies.

2.3.3 Local support for development
In 2018, the Sixth Plenary Session of the 13th Huangshi Municipal Committee of the Communist Party of China proposed "five cities construction", which aims to build Huangshi into a city of innovation and vitality, advanced manufacturing, modern port city, livable city with mountains and rivers, and famous

Table 3. Total sales of mould in China.
historical and cultural city. The “five cities construction” has become a new blueprint for Huangshi's high-quality development, transformation and upgrading. Among them, Huangshi will focus on the development of nine leading industrial clusters: new materials, electronic information, intelligent equipment, industrial Internet, life and health, energy conservation and environmental protection, new energy vehicles, modern clothing industry, and productive service industry. It is proposed to build a mold City, which is an important raw material industrial base in Central China, an open city along the river, and a Yangtze River economic belt. The important fulcrum cities need to realize the high quality and sustainable development of economy and society.

2.4 Threat analysis

2.4.1 Fierce market competition
In recent years, with the rapid development of China's mold industry, the market scale of mold industry continues to expand, and the main business income of mold enterprises is also increasing. In such a good situation, there are also many areas in China that are mainly engaged in mold manufacturing and development of mold steel industry. In addition to Huangshi, Zhejiang Ningbo, Zhejiang Taizhou Huangyan, Anhui Wuhu, automobile mold industry base, Jiangsu Suzhou, new mold force, etc., there are many "mold capital" in China. In addition to new metallurgical steel, there are more than ten leading enterprises in die steel industry, including Baosteel, Xining Special Steel, Shanxi Taigang, Fushun Special Steel, Dalian special steel, etc., with fierce market competition.

2.4.2 Product substitution threat
With the development of China's mold industry, the demand for mold steel is getting higher and higher. The high-performance mold steel will gradually replace the traditional mold steel. However, most of the products in Huangshi mold steel industry are produced with poor technology and testing standards, resulting in low quality and weak bargaining power in the market.

3. Suggestions on speeding up the development of die steel enterprises in our city
Die steel industry is the most characteristic industry of Huangshi, but at the same time, the problems and threats faced by Huangshi die steel industry cannot be underestimated. In order to solve the problems in the development of Huangshi die steel industry and promote the upgrading of Huangshi die steel industry, we should speed up the transformation and upgrading of Huangshi die steel industry in accordance with the idea of "standardization, ecology, science and technology, and branding", so as to achieve legal, compliant and high-quality development.

3.1 Adhere to standardized development
According to the requirements of national industrial policy, the development plan and Standard Guide of die steel industry in our city should be formulated. In accordance with the measures of "one batch of rectification and upgrading, one batch of integration into the park, one batch of transformation and upgrading, and one batch of shutdown and elimination", the transformation and development of die steel industry has been continuously promoted. First, we need to improve the quality of our products. Support the local leading die steel enterprises to become better and stronger. In accordance with the industrial chain of "mould steel - mould blank, mould frame - Mould Manufacturing - mould products - high-end equipment manufacturing", we are striving to introduce and develop a number of major extension projects of mould steel industrial chain, lengthen the industrial chain, and realize the transformation of Huangshi from a big mould steel production city to a strong mould steel manufacturing city. The second is to integrate a number of people into the park. Promote the cluster development of Huangshi mould steel industry. We will guide mould steel enterprises willing to be reorganized to form a group company and enter three mould steel professional parks in Huangshi for development; all newly introduced mould steel projects will be settled in the park for construction. The park implements centralized gas supply, coal to gas to electricity, and sewage collection and treatment. The smelting and forging of die steel
realize professional division, relative separation and cooperative production. Third, transformation and upgrading. Speed up the elimination of low-end products, focus on the development of medium and high-end products of mold steel, and promote the development of mold steel industry in terms of variety, quality and brand "three products". Fourth, shut down and eliminate a number of them. Mould steel enterprises below the scale, not meeting the requirements of planning and site selection, without legal land use procedures and environmental protection standards will be permanently shut down.

3.2 Adhere to ecological development
Adhere to the new path of high-quality development guided by ecological priority and green development, reduce the consumption of raw materials and energy, reduce the emission of pollutants and greenhouse gases as much as possible, and make green and ecological become the new driving force for the high-quality development of Huangshi mould steel industry. First, vigorously promote advanced production and management technology in die steel industry, develop and adopt new technology, process and equipment. Second, support mould steel enterprises to increase investment in environmental protection, upgrade environmental protection equipment, reduce energy consumption and pollution emissions, and promote green and ecological development of mould steel industry. Third, strictly supervise the environmental protection of die steel enterprises, and shut down the enterprises that fail to meet the environmental protection standards.

3.3 Adhere to the development of science and technology
We will make every effort to promote the transformation and upgrading of Huangshi die steel industry, and develop it to deep processing, end products and intelligence. First, we should strive to promote technological innovation, support key die steel backbone enterprises to establish or upgrade their technological centers, promote enterprises to become the main body of technological innovation, and enhance their core competitiveness. Second, we will speed up the upgrading of major equipment, attach importance to the processing, finishing and heat treatment of raw materials, and promote advanced equipment such as vacuum furnaces and hydraulic presses. Third, we will promote "integration of two technologies" and intelligent manufacturing, reduce production costs, and enhance the market competitiveness of enterprises. Fourth, increase the introduction of technology and talents. We will increase cooperation between enterprises and schools, train talents in all aspects of industrial development, and promote the interactive development of production, learning and research.

3.4 Adhere to brand development
Implement brand strategy, regard brand as the core competitiveness of Huangshi die steel industry. First, in accordance with the idea of "building brand and sharing development", guide and support die steel enterprises in the city to strengthen industry solidarity, develop a common brand, establish and improve quality assurance system, improve product standardization level, strengthen brand publicity, form Huangshi die steel brand with distinctive regional characteristics, and enhance market competitiveness. Second, we will focus on cracking down on "three no" products, put an end to vicious competition and imitation and plagiarism, and improve the living space of mold manufacturing enterprises.

From the above analysis, it can be seen that in view of the problems existing in Huangshi die steel industry in the aspects of industrial development, industrial scale, product grade, innovation ability, ecological and environmental protection, we must insist on standardized development and ecological development, adhere to the development of science and technology, adhere to the development of brand development road, which can ultimately promote the development of high-quality Huangshi die steel industry.

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