

CHINA 華牌 BRAND®

# RESEARCH AND ANALYSIS OF CHINESE PATENTS

Challenges and Chances

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## Executive Summary

China's innovational capabilities have gained pace. Chinese businesses are no longer limited to copying Western products, but are increasingly becoming innovative and have started to register a growing number of high-quality patents – even abroad.

The *Made in China 2025 Plan* and the ambitious *New Silk Road Initiative* boost and accelerate this development towards innovation and globalization. Western companies should take notice of the new challenges and act decisively.

The research and analysis of Chinese patents plays an essential role, as it can yield information on the strategies and tactics of significant competitors within international markets. Here, the quality of patent research is crucial, because only professional and systematic analysis can provide a solid foundation for Western companies to take actions and defend or even strengthen their market position.

## Chinese Companies on the Rise

China is developing a new and powerful potential for innovation within various industries – a development that is still far from slowing down. It took Western companies a while to accept this new challenge they are being faced with.

The global champions Lenovo, Huawei and ZTE are today's role models for many Chinese businesses. Not only do these global players register high-quality patents for cell phones and computers, but moreover for frugal machines, digital medical technology, 3D printers and nanotechnology. Currently, companies focus especially on digital technologies such as artificial intelligence or speech and face recognition. Chinese enterprises are at remarkable pace within these industries and have raised the bar for their international competitors. Other industries include medical technology, robotics and automation, 3D printing or aerospace. Electro-mobility in cars and digitally upgraded trains, smart home technologies and the *Internet of Things* are central topics of the country's innovation offensive.

Chinese companies and research institutes are even entering areas that were once considered domains of the West. Within only a few years, Chinese scientists have acquired the knowledge which is necessary for the development of a supercomputer. Ever since the development of the *Tianshe 2*, China quickly joined the ranks of the computer industry's innovation elite.

What is behind this development and how can Western companies brace themselves for these new challengers? The first step is to achieve an in-depth understanding.

## The Chinese Government as Driving Force

The Chinese Central Government is the key driver of the new innovation offensive and has ambitious plans: it aims to turn the country into an innovation-driven society by 2020, while by 2050 China is even supposed to become one of the world's leading innovation economies. In order to achieve these visionary goals, the country invests heavily in research and development. Taking the share of R&D spending to the gross domestic product as a benchmark, the People's Republic of China recently ranks among the global top 25. The government even plans to increase the expenditure on R&D to a rate of 2.5% of its GDP by 2020. The expected economic growth rate of approx. 7% will result in large investments.

In order to further strengthen China's innovational strength and accelerate the commercialization of those outcomes, the government has committed itself to foster the sustainable development of a competitive Chinese innovation landscape. The state promotes R&D centers through generous subsidies, affordable loans, tax breaks and the development of a modern infrastructure. Small businesses benefit from such state subsidies, as well. The Chinese Patent Office SIPO announced its support of technology-based SMEs with their innovational progress. The planned funding includes consulting services for start-ups to identify their innovation potential, IP management, accelerated patent application processes and cost reductions.

The results of research and development are being consistently protected by industrial property rights. This policy becomes obvious in the current wave of patents which is flooding the world's

biggest patent offices. China's goal is to increase the country's strategic industries' share of GDP by 15% by the year of 2020.

The new strategic plan *Made in China 2025* has at its goal the modernization and massive upgrade of China's industry. Here, priority is given to the industries of IT, aerospace, robotics and medical technology. This strategy shall be regarded as a wake-up call for Western companies and their governments to prepare for the long-planned Chinese challenge. Chinese companies have a strategy, while many Western companies still lack one.

## Case Study: BYD Company Limited

*Within a few years, the Chinese group BYD managed to turn into a global player in the key industry of electro-mobility. Founded in 1995, BYD today claims to employ 220,000 employees. Originally known as a producer of rechargeable batteries, BYD today has made a name for itself as the manufacturer of the innovative "eBus". The unrivaled electric bus, powered by powerful lithium-iron-phosphate batteries, is the world's best-selling electric bus. The World Intellectual Property Organization (WIPO) honored BYD for its innovativeness.*



Source: BYD

## Industrialization of Innovation

China's research and development has its very own ways to drive innovation. In order to accelerate progress, Chinese companies divide each process into many individual steps, each of which is supervised by large teams. The teams work highly focused on clearly defined tasks to then merge the results.

When teams are in charge of one respective development step, it allows a narrow focus and bundles the power of innovation. Within their area, each innovation team is given a great amount of freedom, operates independently and is only required to complete a project on time.

Based on the principle of “huddle and act”, the project teams use round table discussions to solve problems. The flow of information crosses the boundaries of the departments on a short route, which makes it fast and non-bureaucratic. Henceforth, R&D departments in China are always close to the production.

The final product does not have to be perfect in the first place - improvements are usually made subsequently based on customer reviews.

The benefits of this innovational industrialization are quite obvious: Chinese institutes and companies can shorten their time for development and keep project costs low. Products can be imported quickly and sold on a big scale.

In the fast-paced technological markets across the globe, Chinese companies are gaining clear competitive advantage through the industrialization of innovation. They can fast and flexibly react to changing market conditions and are comparatively quick in entering new markets.

Western companies are urged to accept this challenge and react accordingly. It is important now in many industries to closely observe, analyze and evaluate Chinese innovations.

Such valuable knowledge can be accessed through patent research based on original sources and in Chinese. Paying attention to important details is the key.

## Risks Due to Unclear Property Rights

Many companies today are exposed to a growing competition and innovation pressure. Industrial property rights can significantly influence both the company's own position and the activities of other companies. Experts have commented upon the fact that the People's Republic of China protects fields of technology, in which it aims to hold a leading position, with a "Chines wall of patents". In terms of competitive strategy, this involves the occupation of terrain and the narrowing of available brand space.

Therefore, patent research should take high priority especially to companies dealing with technical development. Studies have shown that intensive patent research can cut development costs by up to 30% and reduce development time by up to 25%.

Western companies that strive to compete in the market on a long-term run are advised to screen the tactics and strategies of Chinese companies carefully. Chinese patents offer good insights as their analysis can give answers to the following questions:

- Which Chinese companies operate in the same field of technology or use identical designs?  
Which relevant Chinese innovations exist?
- Which trends and sudden changes can be noticed?
- Which technologies do Chinese companies own?
- What do Chinese companies protect?
- What are the strengths and weaknesses of Chinese companies?
- Does the *freedom-to-operate* still exist in China and international markets?
- Are infringement or nullity proceedings to be expected when entering the market?

Especially the last two questions are of great importance to Western manufacturers.

The global wave of patents makes it difficult to determine if one's invention is truly new or if a Chinese applicant already has the respective intellectual property rights. However, skipping appropriate research can be very dangerous. In the early stages of development, especially innovative Western companies should take Chinese patents into account and examine their competition.

## Security through Patent Research and Analysis

Timely research and analysis of Chinese patents in Chinese can oftentimes provide deep insights into Chinese competitors' strategies. It can solve the issue of *freedom-to-operate* in international markets as well as the strategic orientation of Chinese competitors.

Professional research can evaluate diverse sources, including the databases of the Chinese or European patent office and the WIPO, private Chinese IP and corporate databases, commercial systems and public sources free of charge.

Chinese patents can deliver Western companies important information, such as date of filing, scope of protection, breadth and depth of patent claims and gaps that can be exploited. This can display innovations and trends as well as weaknesses and risks of a company's own patent portfolio. Furthermore, patent analysis can identify those responsible for innovation – valuable information in the war for talent.

Intelligent research strategy and Chinese language proficiency are crucial for conducting successful patent analysis, as decisive information is often hard to find and search engines cannot provide decisive results. The perfect patent search engine does not exist.

## Recommendations for Successful Research

- When it comes to the research and analysis of Chinese patents, experienced patent researchers should cooperate closely with Chinese IP and industry experts. This is the only way to ensure the recognition and evaluation of relevant patent claims.
- First, choose the tool commensurate with your research goals.
- Make sure to identify all technology-specific Chinese synonyms and link them with proximity operators.
- Start with a wide-ranging research:
  - Combine multiple search tools, including Chinese tools that have been optimized for the use of Chinese search terms. You can find new registrations much earlier here than in Western databases.
  - Use automated translations in order to gain first insights and a general overview.
  - Narrow the result in a funnel shape by using iterative research cycles.
- If dangerous Chinese invention patents or registered designs were detected, the legal status needs to be reviewed. The website of the Chinese patent office SIPO provides you with the most current information (State Intellectual Property Office, [www.sipo.gov.cn/sipo/](http://www.sipo.gov.cn/sipo/)). The system

includes applications of Chinese patents, utility models and designs which have been submitted since February 10, 2010.

- Before proceeding against a design, get validity opinions from SIPO – fast and anonymous.
- Subsequently, conduct further and more precise research on Chinese companies or initiate invalidity proceedings in case of obvious patent infringement.

## The Challenge of Keyword Research

When researching Chinese patents, the language is an obvious hurdle: the majority of property rights are only registered in China and hence, only available in Chinese. English search phrases provide very vague results as they are only applicable to automated translations of Chinese patents. Computer-based translations might offer a very broad perspective, but when it comes to long Chinese sentences, they fail. Why? The structure of the Chinese language differs completely from European languages. Characters do not represent letters, but whole syllables. Unlike in English, the truncation of Chinese search terms is impossible.

To guarantee an in-depth research, appropriate keywords have to be translated properly into Chinese. However, the special characteristics of the Chinese language make it oftentimes very difficult to translate Chinese terms into English without any errors. For instance, the Chinese word 底座 (*di zuo*) can be translated as *base*, *foot*, *pan*, *subpanel* or *underlay*. The word *assembling machine* can be translated as 安装机 (*anzhuang ji*) or 装配机械 (*zhuangpei jixie*).

Context is the key when choosing the right character. In case of uncertainty, images should serve as a guideline and comparison. Besides, word groups and classification codes can be a useful supplement for the search terms. The combination of Chinese and English keywords helps to secure the result of a research.

The consideration of synonyms is a crucial part for the analysis of Chinese documents, as several characters can synonymously describe one component or function in Chinese. When selecting keywords, one should not only pay attention to the synonyms of the characters, but also to their pronunciation. The words 副 (*fu*), 复 (*fu*) and 负 (*fu*) are pronounced equally, but are used to describe completely different things. 副 (*fu*) means *auxiliary*, e.g. as used for *auxiliary hook*, *auxiliary drum* or *auxiliary girder*. 复 (*fu*) can be translated with *compound*, e.g. *compound valve*, *compound table* or *compound winding*. 负 (*fu*) means *negative*, e.g. *negative angle*, *negative force* or *negative deviation*. General machine translations are doomed to fail here.

Once appropriate keywords have been identified, they are combined for preliminary search in a logical order. It is recommended to choose and test different combinations. Understanding the Boolean operators and the abbreviation of search terms (truncation) is essential. Experience can make a difference. Within the search process, search terms should be corrected and elaborated. One should check if broad and insufficiently differentiating words, such as *technology* or *process*, were used during preliminary search, if synonyms or keywords were left out, or if there are any relevant abbreviations of keywords. 附件 (*fujian*), for instance, is short for 附加零件 (*fujia lingjian*),

meaning *supplementary parts*. Another example is 注塑成型机 (*zhusuchengxingji*), abbreviated 注塑机 (*zhusuji*) and translated with *injection molding machine*.

When using keywords for one's research, a funnel-shaped approach can be helpful in achieving results. Chinese keywords are constantly being corrected and updated, new keywords are being further used for research, while results are regularly reviewed. This cycle can improve the analysis results significantly. It is important to collect such keywords in Chinese characters and to summarize them in a list of search terms.

It is most important to see the bigger picture and look beyond a certain industry or technology – relevant patents for laser bundling for machine tools can be found in the field of medical technology, as well.

Content can be checked and selected if the collected information is considered sufficient. Results can be selected and sorted according to specific keywords and subcategories of the International Patent Classification (IPC). The further use of data can benefit from good patent classification. One option is to rely on public or commercial classifications, for instance, IPC, ECLA (CPC) or classifications used by commercial providers. It should be noted that patent offices can use different IPCs. Another option is to develop one's own in-house classification system. Selected and classified information should always be stored in a database.

### **Guidance for Your Keyword Research**

- Determine IPC categories
- Create a keyword list of the inventive features
- List other potential inventors/applicants
- Search synonyms and/or possible generic terms of the characterizing keywords
- Translate keywords and synonyms into English
- Combine search strings with operators and truncations
- Search obtained documents for references (*reference hunting*)

## Searching for Hidden Patents and Content

Chinese companies often purposely disguise the contents of their patents. Even though such tactics are not illegal, they can nonetheless complicate the overall search massively. Solid results are most likely to be achieved if the search for hidden patents and content adapt to these circumstances.

Chinese patent applicants and their varied tricks and twists:

- Before beginning the actual IP search, it is advisable to examine the company's organizational structure. Many Chinese companies conduct research in the guise of their subsidiaries or set up new companies for product development. It is not an uncommon practice to use the name of an inventor or a family member as the company name and the company registered as an agency. This makes it difficult to detect the origin of a patent at first glance.
- Keeping titles and abstracts deliberately short are designed to prevent competitors from getting decisive patents from a large pool of data. Therefore, the search must also include claims and descriptions, because that is where contents are explained precisely, as it is the only way to protect a patent.
- Chinese companies like to use Hong Kong as a tactical second pillar of their patent policy. In the event of nullity in Mainland China, patent infringers can move on to Kong Kong and keep their intellectual property rights valid. It is therefore necessary to include the Special Administrative Region in the patent search.
- Language and cultural differences between Mainland China, Taiwan and Hong Kong can be a relevant aspect when searching patents. Taiwan, for instance, has a different calendar. Yearly counting started with the founding of the Republic of China on January 1, 1912. The year 2009 in the Minguo calendar marks the 98<sup>th</sup> Year of the Republic of China. This shift can result in misunderstandings when interpreting Taiwanese patents.

## Success through Intelligent Research Strategies

When it comes to analyzing patents, intelligent research strategies can clear any obstacle:

Obstacle	Problem	Solution
Overall flawed machine translations	<ul style="list-style-type: none"> <li>▪ Technical terms</li> <li>▪ Synonyms</li> <li>▪ Translation dependent on context</li> <li>▪ Characteristic features of the Chinese language</li> </ul>	<ul style="list-style-type: none"> <li>▪ No machine translations</li> <li>▪ Cooperation with Chinese experts</li> <li>▪ Investments in complex solutions to ensure reliable outcomes</li> </ul>
Blurred content	<ul style="list-style-type: none"> <li>▪ Short abstracts and titles</li> <li>▪ Company name disguised</li> <li>▪ Only few IPC categories</li> <li>▪ Complex corporate structure including subsidiaries, etc.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Awareness of claims and descriptions</li> <li>▪ Prior investigation of the corporate organization</li> <li>▪ Inclusion of subsidiaries, affiliated firms and family members</li> <li>▪ Awareness of new companies</li> </ul>
Amount of data	<ul style="list-style-type: none"> <li>▪ Quantitative search as focus</li> <li>▪ Need for translations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Use of own experienced-tested methods</li> <li>▪ Minimal reliance upon automated analytical tools</li> </ul>

Avoiding insufficient automated translations and cooperating with Chinese native speakers guarantees an intelligent research strategy.

In order to detect blurred content, it is rather helpful to use experienced-tested methods instead of commercial analytical tools.

After conducting extensive and in-depth manual research, a company's internal and external experts need to analyze the content of a patent. Due to huge differences between the Chinese and Western languages, a qualitative method is superior to quantitative measures. Quantitative methods require a lot of translation, reading of the whole document as well as the segmentation of the most important technical information into various clusters. This process can turn into a time-consuming and very costly task. As appealing as the colorful patent landscapes of commercial providers might be, they are nonetheless random and very inaccurate in depth, due to an unclear algorithm.

## Conclusion: Deep Data Instead of Big Data

By using the right methods, Western companies can extensively analyze their Chinese competitors at an early date. Chinese patents are good indicators for relevant or even threatening developments.

Chinese native speakers as well as IP and industry experts are essential in gaining significant research results. The evaluation of findings requires further professional know-how, as well.

Western companies can benefit from professional measures when preparing themselves for the Chinese and Far Eastern innovation offensive and protect their own interest on time.

## Further Information

Find further information on our services for the research and analysis of Chinese patents here:

**Flyer** Research and Analysis of Chinese Patents

<https://www.chinabrand.de/en/competencies/intellectual-property-and-know-how.html?file=files/content/en/competencies/intellectual-property-and-know-how/Research-and-Analysis-of-Chinese-Patents.pdf>

**Flyer** Intellectual Property Competitive Intelligence

<https://www.chinabrand.de/de/innovation-und-wettbewerb.html?file=files/content/de/kompetenzen/innovation-und-wettbewerb/Intellectual-Property-Competitive-Intelligence.pdf>

**Flyer** Investigations in China

<https://www.chinabrand.de/en/competencies/compliance-and-data-security.html?file=files/content/en/competencies/compliance-and-data-security/Investigation-in-China.pdf>

**Video** (in German language) Research and Analysis of Chinese Patents

<https://www.youtube.com/watch?v=7QOWvJsBEqQ&t=166s>

**Video** (in German language) Counterfeiting and Piracy in China – Trends und Counterfeiters' Strategies

<https://www.youtube.com/watch?v=wBwECsY60vg&t=3s>

**Video** (in German language) Combatting Counterfeiting and Piracy in China

<https://www.youtube.com/watch?v=f3EcR7bQq8Q&t=1s>

**Blog article** Blockchain is Revolutionizing Everything – Including the IP World

<https://en.blog.chinabrand.de/2018/01/18/blockchain-is-revolutionizing-everything-including-the-ip-world/>

**Blog article** Fourth Industrial Revolution: Asian Companies Leap Forward

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<https://en.blog.chinabrand.de/2017/08/08/will-china-further-strengthen-ipr-protection/>

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<https://en.blog.chinabrand.de/2016/12/13/beijing-ip-court-grants-50-million-rmb-in-damage-compensation/>

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