

PRESENT SITUATION AND DEVELOPMENT OF CHINESE CLEANING INDUSTRY

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ABSTRACT

In the early 80s, 20 century, the establishment of a group of professional cleaning company as the representative of "Blue Star," which marks the cleaning industry production; After about ten years of country "spark plan" promotion, After nearly 30 years of freestyle development, China's industrial cleaning technology by a single chemical cleaning, through continuous absorption, introduction, gradually formed a chemical cleaning, high pressure water jet cleaning, dry ice cleaning, electronic facilities clean and PIG cleaning and so on a series of industrial technology, and widely used in China, successfully resolved the petroleum, petrochemical, chemical, shipbuilding, electric power, transportation, aviation, machinery manufacturing and other areas of all kinds of actual production problems, give play to the energy saving, consumption reduction, stable production, improve product quality, increase production efficiency, prolong the service life of equipment and function. There are still technology development is not balanced, the industrial structure is not reasonable, the independent innovation ability is not strong, environmental constraints, such as increasing problem, at the same time, as an industry, the business has not yet fully accepted in industrial field.

In 2011, a certain industry management function of national social organizations - "The Industry Cleaning Association of China" (see appendix) was founded in Beijing, mark China's industrial cleaning industry structure establishment, so that the formal formation of Chinese cleaning industry into specialty standardized development stage; In 2012, The Industry Cleaning Association of China under the leadership of the relevant ministries and commissions and the industry launched "self-discipline, standardizing management" as the theme of the series of activities, and promote the development of China's industrial cleaning

industry began to self-discipline and industry standardization road, and has 387 members, for more than fifty enterprises training nearly 600 skilled operator.

This report according to China's industrial economic development trend and country requirements of petroleum, chemical industry, steel, metallurgy and infrastructure, environmental protection and so on industry or field and according to the 2010-2012 years of cleaning market share change, forecasted analysis of China's industrial cleaning industry development prospect; And put forward prospective suggestions of the application prospect of cleaning technology, and points out that the environmental friendly industrial clean are the technology development trend in future.

Cleaning is a kind of activity closely related with people's life practices. In China, it has been a kind of human activities since ancient times. As the traditional cleaning process is simple, or just as one step attached to the whole production process, it did not arouse widespread concern. With China's reform and opening, the economy in China develops fast and the social divisions of labor become more and more sophisticated. "Cleaning," as a type of technology, both old and young, and develops rapidly in China. The related industries become more and more familiar with "cleaning" service and are willing to accept it, which lifts the curtain on the development of China's cleaning industry.

Industrial cleaning plays an important role in energy saving, consumption reducing, stable yield, quality improvement, increasing production efficiency, extending working life of equipments, reducing environmental pollution, beautifying products appearances and enhance human health and hygiene. The development of industrial cleaning not only provides effective technical service for social energy saving, but also is a significant indicator of the safe and civilized production in companies and the civilization level of human material life. Over the past ten years, cleaning papers and articles became more and more in China, and some experts and scholars discussed the development status and future trends of Chinese cleaning industry from different angles. After summarizing those papers and articles, combining with the surveys and researches from the national cleaning information center and "Cleaning World" magazine in the past few years, this paper made the following discussions on the industrial cleaning status and development in China.

Key words: industrial cleaning; petroleum; chemical; chemical cleaning; high pressure water jet; development; association; environment friendly

1. THE EMERGING AND DEVELOPMENT OF CHINESE CLEANING INDUSTRY

1.1. A Professional Technology Gave Birth to a Cleaning Company

In September 1984, in a famous Chinese western city, Lanzhou, a young man named Jianxin Ren, with other seven co-founders, established the first well documented chemical cleaning company in China - "Blue Star." With the application and development of "Lan-826 multipurpose pickling inhibitor" being the main cut, Blue Star company seized the opportunity in the rapid development of petrochemical industry in China in the 1980s and 1990s through providing cleaning technical services, cleaning products production and sales, gained a great chance for expansion, and for one time its market share reached more than 80% in China's petroleum and Chemical cleaning industry. Meanwhile, with the purpose of promoting industrial production civilization, energy saving and environmental protection, Blue star company positively worked with the relevant ministries, nurturing and expanding the cleaning market through technology promotion and technology transferring. The National "Spark Scientific promotion Plan" (the year from 1986-1995 national key scientific achievements promotion project) cultivated many backbones for the enterprises, and more than 300 service oriented companies gained benefits from Blue Star cleaning technology. Led by "Blue Star" and with nearly three decades' efforts, "the industrial cleaning" has been widely accepted and well known in the field of industrial service in China.

Developed by National Chemical Machinery Research Institute affiliated with Ministry of Chemical Industry, "Lan-826 multipurpose pickling" technology is a kind of inhibitor used in chemical metal pickling process, winning the third-class State Science and Technology Invention Award. It is used to reduce the acid liquid corrosion of the metal substrate and has good corrosion inhibition in a variety of chemical pickling processes. Under normal use, it can greatly lower the metal corrosion rate, has excellent ability to prevent the steel from absorbing hydrogen in pickling process, and then avoid the steel from "embrittlement." At the same time, it can prevent the metal from being corroded by Fe^{3+} and make sure the metal has no capitation in the pickling process. "Lan-826 multipurpose pickling inhibitor" is suitable for a variety of acids used in pickling process like inorganic acids, organic acids, mixed acids, EDTA, NTA, HEDP and so on.

The Chinese industrial enterprises began to realize the mystery of chemical cleaning power from the promotion of Lan-826 pickling corrosion technology and the radiation of Blue star company's development. They gradually accepted the "industrial cleaning" as an emerging industry, which means that China's cleaning industry has been initially formed.

1.2. New Cleaning Technologies are Emerging and Combined Applications Lead the Trend

In the 1980s, it was the use of corrosion technology in chemical cleaning that pushed forward the rapid development of China's cleaning industry; in the 1990s, represented by

high-pressure water jetting, the physical cleaning technologies and equipments were gradually applied; in the 21st century, with various cleaning techniques coming into being, cleaning robots, biological cleaning, laser cleaning were gradually developed and began to be used in engineering practices. From the earliest hand scrubbing to gas (steam) cleaning, chemical cleaning, high pressure water cleaning, PIG cleaning, blasting cleaning, polishing, ultrasonic cleaning, air pulse cleaning, air blasting cleaning, high pressure electromagnetic pulse cleaning, electrolytic cleaning, plasma cleaning, dry ice cleaning, then to the robots cleaning, biological cleaning, laser cleaning, now more and more cleaning methods and means are available.

There are so many cleaning methods. Which one is the most common one, or which one will inevitably replace the others? Each cleaning method has its own advantages and also has its limitations. There is no one that can solve all cleaning problems. We need to select suitable equipments and inhibitors (one kind or several kinds of) according to the features of the objects to be cleaned, fully consider the personnel (the specific cleaning operators and recipient of cleaning services) and then clean in accordance with the appropriate process control. This is a set of sophisticated cleaning process and is also a kind of truly environmentally friendly cleaning technology. (The model of reference factors in industrial cleaning indicated in Figure 1.)

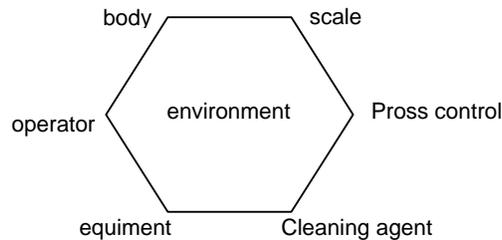


Figure 1. The factors that a perfect cleaning model should consider

After years of development, cleaning is not only an emerging industry which requires professional skills and equipments, but also has developed into a cleaning industry system taking advantage of chemical, physical, mechanical or biological combination process from initial chemical cleaning. The combined application of various cleaning methods is the key to solve all kinds of difficult cleaning puzzles, and has become the development direction of cleaning industry technology.

1.3. Cleaning-related Changes in the Number of Scientific Papers and Patents

Going through China journal full-text database formal public scientific papers about cleaning from 2003-2012 (with nature in statistics) and State Intellectual Property Office of the People's Republic of China officially released about cleaning patents (with nature in statistics), we have drew the development trend curve about the cleaning-related scientific papers and patents from 2003-2012, see figure 2. We can see that the two curves generally

show a trend of rising, it shows that more and more people pay more attention to the cleaning industry, and have put into particular time and effort to study cleaning and have achieved some results.

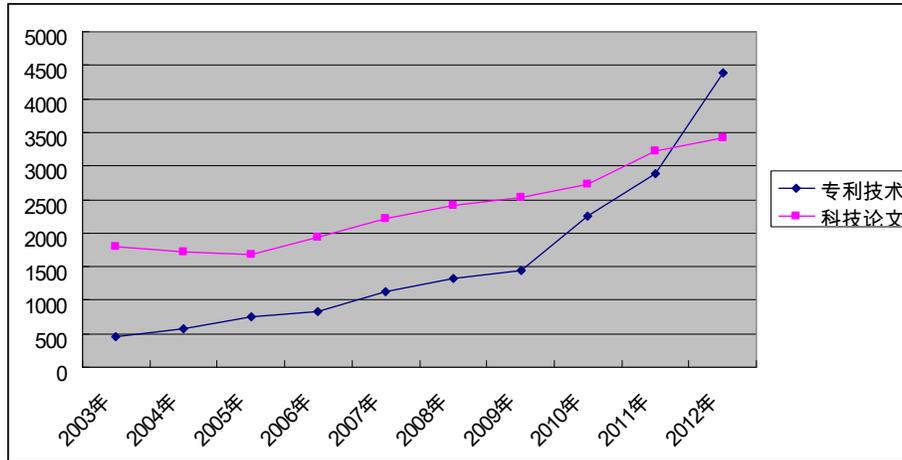


Figure 2. Cleaning related scientific papers and patents

1.4. Increasing Overall Revenue of Cleaning Industry, Market Prospects Enormous

With the corresponding situation of China's industrialization and increasing living standard, the cleaning market also shows a breakdown trend with the subdivision of industrial sectors. To view from the cleaning objects, it includes a single part and equipments' cleaning as well as a large complete equipment's cleaning; to view from the cleaning measures, there are regular maintenance and affordable cleaning or intermittent shut down for maintenance or equipment cleaning; to view from cleaning methods, there are chemical cleaning, physical cleaning and special wash; there are cleaning companies specializing in product production and equipment manufacturing, also comprehensive enterprises specializing in production and technical services. The cleaning market's segmentation makes strengthen to the cleaning techniques and services, and has formed comparatively cleaning industry system to establish a whole market basis for the cleaning industry's sustainable development. Meanwhile, on the basis of close association with some related industries, cleaning industry has formed the socialized production. All these marked that we have already formed a broad cleaning industry market.

Because the clients have various characteristics in different industries, the service object of each cleaning company is very different. In 2011, a survey to 100 cleaning companies done by the cleaning industry information center showed that the average annual cleaning special income in nationwide in 2001 is 1 million, the highest is 50 million; the average annual cleaning special income in nationwide in 2011 is 3 million, the highest is 150 million; in 2001, those companies whose annual cleaning special income came to or exceeded 1 million were about 500; in 2011, those companies whose annual cleaning special income came to or exceeded 1 million were about 1000; in 2001, the general income was about 5 billion, the

macroscopic income was around 20 billion, in 2011, the general income was about 20 billion, the macroscopic income was around 100 billion. In the same period, China's GDP in 2011 was 4.3 times that of 2001. Deduction of incremental factors such as infrastructure construction, it could be seen that whether it is a special industry growth in industrial cleaning or general cleaning industry macro growth, cleaning industry had made considerable progress. But we should also see that the China cleaning industry in the national economy proportion is relatively low (even if analyzed according to the industry growth, also accounts for only 0.1%- 0.2% of GDP), in other words, the contribution rate of industry cleaning is quite low compared to other related service, the industry penetration and participation remains to be strengthened, China cleaning industry's market prospects and technology application space is very big.

2. PROFILE OF CHINESE INDUSTRIAL CLEANING ASSOCIATION

Chinese Industrial Cleaning Association is the only national industry organization in China. Founded in 2011 by the China ministry of civil affairs official approval, belongs to the state-owned assets supervision and commission of the state council. That December 21, more than 300 industrial cleaning companies assembled in Beijing to attend the conference held by China industrial association, which was held once a year. The leaders of the Chinese government and the relevant departments in industry association attended the meeting.

Xiulian Gu, who is the vice chairman of the standing committee of the National People's Congress, former minister of ministry of chemical industry in China's industrial cleaning association, said that Chinese industrial cleaning has formed from the technical research and development, product manufacturing to service industry of the industrial system, for Chinese industrial development created the economic and social benefits, for Chinese energy conservation and emission reduction and cleaner production has made great contribution under the joint efforts of the establishment of the convention in the social from all walks of life. It marks the formal formation of Chinese industrial cleaning industry architecture, which makes Chinese cleaning industry has entered a stage from, standardization development.

The duty of industrial cleaning association is: specification operation reflects the industry calls, promote technological progress, promote industry development, social responsibility, service industry members.

The association of Chinese industrial cleaning was established by Blue Star (group) Co., LTD., China petroleum and chemical industry federation, China petroleum pipeline bureau. There are more than 387 registered members. It covered many fields of cleaning enterprises and related units, including big to mechanical equipment, locomotives, ships, aircraft, spacecraft, small to precision instrumentation components, clocks and watches, mechanical parts, collection of cultural relics and other enterprises engaged in cleaning service.

In 2012, under the guidance of relevant state ministries and commissions and the an associated client industry group, Chinese industrial cleaning association launched with "self-discipline, standardize operations" as the theme of a series of activities, promote the development of China's industrial cleaning industry, began to the road of industry self-discipline and industry standardization, professional workers in industrial cleaning companies in the standardization, standardization, cleaning equipment, cleaning process configuration cleaning liquid waste emissions, environmental protection, has made a good beginning.

In addition, in Chinese industrial cleaning industry, and the national information center is responsible for the cleaning industry to carry out technical exchanges information collection, organized by topic, "The Cleaning World" magazine is responsible for the national science and technology periodical editing and publication of the work, a professional skill appraisal station "of" chemical industry responsible for staff training and skill appraisal work, among them, 2012 for the industrial cleaning industry of more than 50 enterprises has trained more than 600 highly skilled talents.

Through these work, Chinese industrial cleaning industry organization jointly set up the industry technology progress and healthy development of the communication platform.

3. CHINA CLEANING INDUSTRY AND ENERGY CONSERVATION AND EMISSIONS REDUCTION

Industrial cleaning for the development of China's energy consumption to provide effective technical service, cleaning industry in energy saving, safe and stable yield, improve product quality, speed up the production speed and prolong the service life of equipment, reduce the pollution of the environment are playing an increasingly important role. According to China's "11th five-year plan" the ten major energy conservation project implementation opinions put forward energy-saving targets, the cleaning industry has contributed at least of "11th five-year plan" energy saving can reach 5%. Therefore, in this sense, "energy conservation and emission reduction" is also the most representative of China's industrial cleaning industry characteristics.

3.1. Boiler Cleaning and Energy Conservation and Emissions Reduction

In the 1980s, the Chinese academy of sciences "cleaning technology cooperation" compiled "boiler acid cleaning technology pilot test and technical and economic evaluation of" report, the "small and medium sized boiler chemical cleaning and energy saving," according to the cost spent on boiler chemical cleaning without scale operation in 10 ~50 days to save fuel can be retrieved. Energy saving effect that is brought by the boiler chemical cleaning expenses cost savings is cleaning in more than 5 times.

National industrial boilers in service at present ownership of more than 50, ten thousand, about 1.8 million t/h evaporate, industrial boiler coal consumption each year about 400 million t, per 1 mm scale, boiler heat efficiency to reduce 5%. In computing, industrial boiler cleaning only a year can save \$20 million t BiaoMei, reduce carbon emissions 13.4 million t.

3.2. Central Air Conditioning Cleaning and Energy Conservation and Emissions Reduction

Concentration of two typical mall in Shanghai after cleaning the central air conditioning system air conditioning box puts forward energy-saving situation assessment as an example, according to the market of central air conditioning clean before and after two years of 7 ~ 9 months in the summer the central air conditioning system is the actual power consumption (electricity price is RMB 0.85 / (kW/h) calculation, and puts forward the cleaning cost an average of 2000 yuan per set (air volume of 36000 m³ /h or more units will need to increase fees), puts forward the central air conditioning cleaning due to the heat transfer effect after improving, the ventilation resistance decreases, the air volume significantly increased (increase 70.0% and 50.2% respectively), under the condition of achieve the same indoor temperature and humidity, central air conditioning refrigerating machine open sets or open time to reduce (reduced by 28.6% and 28.6% respectively), the central air conditioning system power consumption significantly lower (down by 22.4% and 5.0% respectively), effectively save the energy consumption of central air conditioning. After cleaning the central air-conditioning system costs significantly decrease (reduce 603000 yuan and 208000 yuan respectively).

Our country has more than 5 million kinds of central air-conditioning cleaning and maintenance, and is increasing at a rate of 10% a year, to do the work of cleaning the central air conditioning, for China's energy conservation and emissions reduction work contribution will be very huge.

3.3. Oil and Chemical Industry in Energy Efficiency and Clean

China petroleum and chemical industrial gross output value of 2013 is expected to reach about \$14.25 trillion, compared with 2012 will grow by 16%. Is the guarantee petrochemical industrial cleaning device is stable and reliable operation of one of the essential means and way. Its annual predictable routine maintenance class cleaning work is 20-2.5 billion yuan.

Oil and chemical industry are widely used in a variety of heat transfer and reaction, synthesis equipment, its surface of the material residues, rust, scale and adhere to, will be on the efficiency of equipment and energy consumption of direct impact.

Can make the petrochemical industrial cleaning requirement of reach full load production process design, and ensure the smooth progress of driving feeding and production, improve product percent of pass; Cleaning of the equipment in service can be restored equipment production capacity, ensure production continuous high load operation, effectively prolong

the service life of equipment, is conducive to saving energy and reducing consumption to increase efficiency, reduce emissions of carbon dioxide, sulfur dioxide.

3.4. Related to Clean Energy Conservation and Emission Reduction Policy

3.4.1. Cleaning and Contract Energy Management

On April 6, 2010, promulgated by the state council "about to speed up the implementation of contract energy management opinion" to promote the development of energy saving service industry hair [2010] no. 25 files (countries), according to 2012, will support cultivating a batch of professional energy saving service companies in China, and develop a batch of large comprehensive energy saving service companies. By 2015, the country will establish comparatively perfect energy saving service system, contract energy management become the energy-using units to implement one of the main energy-saving way.

Contract energy management (that is, Energy Performance Contracting, hereinafter referred to as EPC) is a new kind of market-oriented energy-saving mechanism. Its essence is to reduce energy costs to pay full cost of energy-saving energy-saving project business. This way of energy saving investment allows customers to use future earnings implementation project of energy conservation, energy conservation service contract between client and energy conservation service company, mainly divided into three types: energy-saving benefit sharing, energy saving, energy costs hosting type.

Cleaning has the role of saving energy and reducing consumption, but in public report, to combine the cleaning and contract energy management and instance: not yet. Combine cleaning and contract energy management and other work, in promoting the energy saving renovation, reduce energy consumption, and promote China's sound and rapid economic development make more contribution will be one of the Chinese cleaning industry a new task faced by colleagues, at the same time, it will become another economic growth point of China cleaning industry.

3.4.2. The Cleaning and Water Conservation

To guide water saving technology development and application, promote water saving technology progress, improve water use efficiency and benefit, promote the sustainable utilization of water resources, the national development and reform commission, ministry of science and technology jointly with the ministry of water resources, the ministry of construction and the ministry of agriculture organization developed the "outline of China's water-saving technology policy." Outline, should actively promote countercurrent rinsing and spray washing, soda washing, aerosol spray cleaning, high pressure water washing, washing, water saving technology and equipment such as high efficiency rotary oscillation, development equipped with water cleaning technology. Promote to recycle the detergent or multi-step combination of cleaning agents and cleaning technology; Promotion of dry ice cleaning, microbial pulse cleaning, spray cleaning, water cleaning, without a stop online

cleaning technology. Water-saving washing technology development environment, promote the use of recycled water and light catalytic air or self-cleaning coating technology.

3.5. Development of Environmentally Friendly Cleaning Technology

Environmentally friendly cleaning technology is to clean the dirt at the same time to the environment protection and governance. Is cleaning itself is in the governance environment, governance equipment, environment and production environment. Cleaning of waste generation and processing, is a key factor in restricting the environmental friendly.

Although cleaning industry is energy saving industry, but if we don't take positive measures also can produce pollution, must abide by the national related policy laws and regulations, must be in the actual implementation of the "environmentally friendly," waste liquid and waste residue of cleaning industry, gradually achieve "emissions, zero discharge," is the long-term goal of sustainable development of Chinese cleaning industry. Only constant development and use of new type environmental protection cleaning technology and products, through the environmental cleaning, reduce emissions, to constantly improve the enterprise competition ability, expand the scope of business, expanding living space. Reduce the use of chemical agents and development environment friendly products, optimize the cleaning process, and strict waste management is an urgent subject that we face, etc.

4. THE PROSPECTS OF CHINESE INDUSTRY CLEANING DEVELOPMENT

China's GDP of 2012 is the first time more than 50 trillion yuan, total economic output three consecutive years ranked the second position in the world, Now become the global attention economic market. 2013 is also an important year of the link between the past and the implementation of China's "Twelfth Five Year Plan," the labor and capital movements on industrial economic growth will weaken, The resources and environment constraints on industrial growth will be further enhanced, The technological progress on industrial economic growth will also be further enhanced.

China's economic structure in the "twelfth five" will have big adjustment, The economic growth is no longer in the first place, instead of upgrade the industrial structure, promote the steady growth of investment and structural optimization, continue to strictly control the "two high (high energy consumption, high pollution)" and the blind expansion of industry overcapacity, improve the quality of manufacturing industry as an important target for the development. 2012~2015 China's economy will keep rapid growth, The expectation of 2013 China's economic growth will rise about 8%,of which as an industrial cleaning services in key industries, China petroleum and chemical industry sector investment growth will reach or exceed 20%. And China's economic restructuring is moving forward to the expected direction, Technological transformation and upgrading of traditional industries, strategic emerging industries investment continued large growth-oriented policies is further implemented. "Twelve Five" period are likely to continue prudent monetary policy, Currently, the

construction of China's electric power, telecommunications, roads, steel and other industries have been invested over the peak, the investment growth decreased significantly in nearly two years, but there are urban facilities, water conservancy, railway, equipment manufacturing and many other infrastructure and the construction of basic industries still far from reaching a complete level, a number of industries, especially the Chinese petrochemical industry, oil reserves, oil and gas pipelines, new coal chemical industry and other large energy projects, investments have not yet entered the peak period of the whole society investment growth still have to maintain a certain period of rapid growth, which will promote the Chinese economy in the coming period to continue to maintain rapid growth, and are bound to Chinese industrial cleaning industry a tremendous business market.

Through these years development, we should see that China industrial cleaning industry gradually expand the scale, and the enterprises in the industries are gradually growing and expanding, the clean technology development will be more quickly to popularize. The development of environmentally friendly, industrial cleanly is a technology trends in the future. As the new technologies, new products of the industry continue to emerge, there are a number of technical problems in the industry will be resolved, the overall technical level of the industry will also be greatly improved. The industry division of labor is more professional, detailed, industry standards and technical specifications will get promotion, popularization, organization and management of the industry will move toward standardized and orderly. Relying on 50 trillion total economic scale and the support of China industrial policy, The development prospects of China industrial cleaning industry, will be much better.

We thought that, along with China's sustained and rapid economic development, resource saving and environment-friendly as the establishment of national policies and the corresponding implementation of industrial policy, the industrial cleaning market growth will be higher than the growth rate of China's national economy. Meanwhile, in a number of industrial services area, we still have much to learn from their foreign counterparts and enterprise. For example: cleaning waste harmless treatment, improved efficiency of physical cleaning equipment, and the development of environmentally friendly cleaning agents, overall industry mechanization and automation, systematic urgent need to enhance the level and so on.

Currently, there are dozens of international companies and enterprises carry out technical and product promotion in China, and some well-known international companies have set up factories independently or cooperatively. Open China, welcome to the world enterprises experts, communicate, exchange, and cooperate with us and win-win. As the China's industrial cleaning industry organizations, in the era of global economic integration, we also sincerely hope that the global technology, products, equipment companies and industry organizations, to actively participate in China's sustained rapid economic development of the market, sincerely cooperation with China's industries and enterprises, mutual benefit and common development, promote Chinese industrial cleaning industry's technological progress and industrial upgrading.

Thanks to the conference to give Chinese industrial cleaning industry association team for the arrangements!

Welcome the world's industry colleagues to China, exchange and communication, cooperation and development together!

APPENDIX

A Brief Introduction of the Industry Cleaning Association of China

The Industry Cleaning Association of China (abbreviation: ICAC, hereinafter referred to as the "association") was established in December 21, 2011 in the Great Hall of People under the guidance of industry management office of SASAC and China Petroleum and Chemical Industry Federation. It is a national community organization to serve the Chinese cleaning industry with considerable management functions. As a national industry organization crossing various regions, branches and systems of ownership, the association consists of enterprises of production, construction and service in the industry, scientific research and design units based on the principle of equality, mutual benefit and voluntary formation. The association aims to unite all the members to implement the relevant national policies and laws, provide service for the government to strengthen macro-control, coordinate and promote the development of the industry, and at the same time reflect suggestions and requirements of members to provide services to guarantee the interests of the industry and the legitimate rights and interests of members.

At present, the Industry Cleaning Association of China has 368 member units, covering petroleum, petrochemical, chemical, metallurgy, coal, electric power, machinery manufacturing, electronic information industry as well as cleaning technology services, product production, equipment manufacturing, tertiary institutions, research institutes, project construction and other fields, representing all aspects of the cleaning industry in our country.

The association aims to extend contacts with industry and related enterprises, institutions and organizations, develop collection, processing and analysis of science and technology and economic information as well as coordination, consulting and service. It also aims to promote the information exchange, construct and optimize the information industry, develop and explore information market for members and enterprises so as to play a role of bridge and link between the government and enterprises and promote the efficient development of information in the industry.

The major work of the association at present:

- organize technology exchange activities of the industry;
- edit and publish the journal of cleaning industry - "Cleaning World;"
- edit and publish the publication inside the association - "Association Newsletter;"
- organize and edit the annual publication of the industry - "Yearbook of Cleaning in China;"
- provide services to guarantee the interests of industry and the legitimate rights and interests of members;
- organize declaration, acceptance and evaluation of new technology, new project processes in the industry;
- organize, monitor and evaluate the safety, quality, environmental protection

- technology of the industry;
- promote new technology of the industry, facilitate continuing education in the industry and edit and issue its textbooks;
 - manage and train the special work, occupation and practitioners in the industry and evaluate the technical qualification.

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