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The role of China in the development of the LED screen market

Xin Wang

Graduate Student,
Peoples' Friendship University of Russia,
117198, 10/2, Miklukho-Maklaya str., Moscow, Russian Federation;
e-mail: 1032218948@rudn.ru

Tat'yana V. Samuseva

PhD in Economics, Associate Professor,
Peoples' Friendship University of Russia,
117198, 10/2, Miklukho-Maklaya str., Moscow, Russian Federation;
e-mail: samuseva-tv@rudn.ru

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Abstract

Today, China has filled the world with its goods. The Chinese government is actively promoting the development of energy-saving industries. Among modern technical solutions there are also LED screens. Such screens can be both high-level performance and cheap, it all depends on price and quality. Back in 2010, 25,000 patents were issued for Chinese companies producing LED products. This is 1/5 of the world's number of patents. At the same time, there are not so many truly innovative solutions and developments. Today, China's LED industry is developing dynamically, LED lighting occupies one-fourth share of the entire lighting market. Whatever the world's LED screen brands say, in 90% of cases their products are assembled in China. But the specialists of this country are ready not only to help create high-quality products with a well-known name, but also to establish and develop their own production, which has been happening for the past 15-25 years. Therefore, it is not necessary to speak only about the fact of Chinese low-quality products. In some cases, this information turns into a myth. The reason is that in China there are already a lot of productions that can boast of high quality, low price and at the same time a true warranty period. China is actively and steadily entering the world stage, conquering more and more countries where they value, love and wait for LED screens produced by Chinese manufacturers. The future outlook for the Chinese market and global market share should be positive.

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Keywords

LED screens, display, LED industry, world market, China, patents, innovative solutions, competitors.

Introduction

Today it is hardly possible to imagine various television shows, sports competitions, concert programs and many other events without the use of LED screens. The most advanced technologies are used in the process of their production, which allows such screens to function effectively in any weather and any lighting conditions. LED screens are often referred to as LED screens or displays. This abbreviation (Light Emitting Diode) translates as "LED" [Great prospects for small LEDs, www].

A light-emitting diode (LED) is a semiconductor device (diode) that emits light when an electric current flow through it [Schubert, 2018].

There are cluster and matrix types of screens. In cluster screens, each cluster (a set of several LEDs in a separate housing) is connected separately to the board corresponding to it. In matrix screens, clusters and the control board are combined into a matrix, hence the name. Recently, matrix screens are beginning to displace cluster screens from the market, thanks to more advanced technologies.

Let's take a closer look at the main types of LED screens and panels and their optimal use.

- High definition screen. As you know, in the past, TVs and projectors were superior in clarity to LED screens, this was especially noticeable at close range. However, high-definition LED screens (China) have fundamentally changed the balance of power, so in the near future the demand for them will only increase. High-definition LED panels (China) are ideal for conferences, traffic monitoring, television projects, etc.

- Screens for sports. As you might guess, such screens are widely used for broadcasting sports competitions, advertising, text placement and other functions that accompany the general sports atmosphere. Sports ice screens (China) are characterized by improved color reproduction, viewing angle and image brightness.

- Advertising screens. Now you can advertise your advertisement both inside and outside the premises. Advertising LED ice panels (China) will last for many years without fear of even major changes in weather conditions.

- Architectural LED screens. Such screens are large and are usually located on buildings of the appropriate size. These can be shopping centers, high-rise buildings, sports facilities, etc.

- Screens for rental/stage. LED screens (China) for rent or stages have recently become increasingly popular. They are quite practical, do not require any special maintenance, they are easy to install and transport. In addition, their resistance to external and internal damage and durability should be mentioned. LED panels (China) of this type are most often used for large-scale public events [LED innovations transform SSL market prospects over two decades, www].

To create an LED display, one must understand all the processes in a multi-component mechanism. To create such equipment of the Outdoor or Indoor system, the manufacturer must have a special set of theoretical and practical knowledge and no right to make a mistake [Energy in China..., www].

Even the most budget option cannot cost less than \$7,400 per model. Therefore, a literate consumer from any country will not be tempted by low cost (less than the specified minimum price), if he understands that the technical characteristics of the product may suffer [Shantong Li, Sanmang Wu, Jianwu He, www].

At the moment, there are already more than 100 LED screen productions in China. They occupy almost $\frac{1}{4}$ of the total world market. Offering their products at a very low price, most often for government agencies, they do not "reveal the cards" that most of their products are subject to repair after the end of the warranty period, and spare parts will have to wait from Chinese production. Therefore, when choosing LED products from China, you should know for sure that this plant is

confidently on its feet, has the appropriate patents, equipment, and, most importantly, qualified personnel.

The production experience and its own "niche" in the LED market remain important, so that the next day the plant is not retrained to another enterprise, and the client is not left with an LED video screen that cannot be repaired. The following problems may also arise [Sheng Bin, 2021]:

- unscrupulous manufacturing company;
- lack of technical knowledge of the required level among employees;
- originality or difficulties with the supply, configuration and installation of equipment;
- specifics or lack of warranty and post-warranty service;
- inadequate level of assurance of the production process.

But there is another side: even the most talented Chinese developers keep production costs low. For the same reason, many OEMs are partnering with factories in China, offering end-users branded products with spare parts from Asia.

To avoid the above problems, it is possible to solve all issues at the same time. In each country, there are experienced dealers of leading Chinese LED display companies. And this means that the products offered by them will be of high quality, corresponding to the declared parameters, and the client will always have someone to contact. At the same time, non-core costs are reduced, dealers have highly qualified training in installation and repair work with equipment from this Chinese manufacturer, various spare parts for LED video screens should be available in the warehouse [China and the Prospects for a Global Ecological Civilization, www].

Methods

In the study, the authors used some methods such as analysis and synthesis, induction and deduction, historical and logical, abstraction and concretization.

Results

The modern market is saturated with various offers for the supply of LED screens. A special, leading place is occupied by screens made in China. Moreover, their quality and reliability is growing every year. That is why many global brands that are OEM manufacturers of LED screens receive modules on the basis of agreements from Chinese suppliers. And this is not surprising, because talented Chinese developers managed to keep the cost of components low and at the same time significantly increase the quality of the manufactured video screen.

Given that the scope of LED video screens has become diverse (advertising, sports and mass events, presentations, conferences, concerts and competitions), as well as the fact that Chinese products account for almost 25%, you should know the best manufacturers from this country. There is a real race-competition between them for a larger number of consumers, because every head of a successful company wants to get new leads and strengthen his position through the use of LED screens [LED Lights Manufacturing Expert in China, www].

Sanan Optoelectronics

With the rapid development of new displays and 3rd generation semiconductor industry, San'an Optoelectronics has attracted a lot of attention in the industry for its mini/micro LED projects and 3rd generation semiconductor projects in Guedian and Changsha in Hubei and Hunan, respectively. Recently, the company has made progress on these two projects.

In fact, an impeccable leader among Chinese products. Has been working in the LED technology industry for a long time. It is not surprising that at the moment this production is in the lead, based on the output of diode screens. Positions of Sanan Optoelectronics are so successfully consolidated that this manufacturer is among the top ten industries in the world with a large turnover of products (the turnover of funds per year is from 1,000 to 5,000 million c.u.) [Top 100 LED Lighting Companies and Manufacturers in China, [www](#)].

San'an spent a total of 12 billion yuan (US\$1.85 billion) on its Hubei project, planning to establish a research, development and production base for its three flagship product series, namely Mini/Micro LED GaN, Mini/ Micro LED GaAs. chips and 4K display [Top 10 LED Manufacturers Ranking in China..., [www](#)].

Authorized capital – 260 million USD. The number of employees is more than 850 people. In 2009 alone, this brand sold products worth 590,000,000 yuan [*ibid.*].

Hangzhou Silan Azure Co., Ltd.

This company tops the list of enterprises producing LED displays. Its production volumes are equal to 70% of the total number of screens.

At the same time, among the manufacturers of multi-format LED products, this company occupies the 2nd place in the country. The plant is located on 50,000m². The brand has imported equipment in the amount of 200 sets. This helps to create products for indoor and outdoor use.

Absen

The company, which, with not very much experience (since 2000), has relied on the speed of development and now confidently occupies a position in the top five manufacturers of the People's Republic of China. Absen has to maintain the proper level of manufacturing LED video screens all the time.

At the same time, the plant does not just assemble displays, but creates full-cycle products.

All this became possible due to the presence of high-precision equipment at the plant, conveyor assembly, sorting of products at the encapsulation stage. These factors affect the increase in the service life of the equipment. As a result, LED displays from this Chinese brand can work for 15 years.

The company is working on the production of LED video screens applicable in shopping malls, TV studios, centers, control rooms, conference halls, sports venues and commercial advertising. Therefore, in the assortment at an affordable price, you can find media facades, street and interior screens. It has 8 foreign representations.

Unilumin

The equipment used at the plant corresponds to the latest technology. It has a good research and production and testing base. The brand was founded in 2004. Now it is known in more than 40 countries. The reason for the demand for their LED displays is that each product has a 100% quality guarantee. And you should also know this production because it was here that they developed a model with a pixel pitch of 0.8 mm. This brand has the largest research and development staff. Therefore, quality at an affordable price is valued by customers in more than 40 world countries [LEDs' Lighting Market in China is booming, [www](#)].

LEDman

This production is known as an excellent supplier of SMD screens. It has been operating in China for 15 years. Any module before being sent for sale goes through a testing system in several stages. This allows this plant to maintain the brand of a reliable supplier of high-quality LED enclosures and video screens. When purchasing products from LEDman, there is no doubt: all of them meet the stringent requirements for standards and quality at the world level. The company has patents for design, usefulness of models and innovations introduced in the production of LED displays. Honing his skills,

he is engaged in the production of equipment applicable at stadiums, concert venues and indoors.

Dicolor

The production was founded in 2006. LED screens of its production are in demand in Europe, because they meet all European standards. Production volumes for 1 month are 7,000 m², which is achieved thanks to the experience of highly qualified personnel and a large selection of high-quality, modern and reliable equipment. The range of models of this production covers different types and types of LED products, from stage huge video screens to small information displays. Export is carried out not only to Russia, but also to other countries of the world [The Best LED Lights Manufacturers A Comprehensive Guide in 2021, www].

Liantronics

Manufactures high quality LED displays. The production is located on the basis of huge workshops, about 8,000 m². Every month it is possible to produce about 10,000 m² of outdoor and indoor modification diode screens [ibid.].

In this production, the facts of manufacturing screens with housing deformation during production or over 10 years of use are excluded. The main reason for having this advantage is that the assembly of products is automatic.

Therefore, Liantronics brand products can be seen not only in a concert hall, in a sports arena or stadium, but also inside retail premises, as well as on the streets.

Thus, most of the manufacturing companies involved in the lighting industry are looking to carve out a niche in the general lighting market, as the LED business is expected to gain weight and solidity in the near future. This trend has become even more important after the stagnation of the production of LED backlights in LCD TVs, and the production capacity for the manufacture of substrate chips and components was reconfigured to the general lighting market sector. And now the participants in this market sector are benefiting, since the production of high-power LEDs requires more complex technologies and special applications than backlighting.

Recommendations and conclusions

LED lighting is actively penetrating into all spheres of human activity. Even 30 years ago, only engineers knew about it. Today, LED lamps are used in offices, shopping centers, museums, restaurants and residential buildings. They are used as an advertising tool, an element of architectural and landscape ensembles, traffic control systems, etc.

The ubiquity of LED lighting is a reality. Experts are confident that the active use of LED technologies in the near future can make a real revolution in the field of energy saving.

Already today, the numerous advantages of LEDs are highly appreciated [LED bulbs..., www]:

- Durability. The average working life is 50,000 hours.
- Profitability. LED lamps require 10 times less energy to operate than incandescent lamps.
- Safety. LEDs practically do not heat up. The risk of fire is reduced to a minimum.
- Strength to mechanical influences. LED lamps do not break or burn out over time.
- Environmental friendliness. Glass, plastic and metal are used in the production of lighting elements. These materials are recyclable and easy to recycle.
- Comfort for the eyes. The light spectrum of LED lamps is close to natural light.
- No noise during operation. LED lamps do not emit any extraneous sounds during operation.

The only disadvantage of LED lamps is the higher cost compared to other light sources. However, if you evaluate their energy efficiency and working life, it becomes clear that Led systems are a really economical solution.

The Asian market share is the largest in the world in both the general lighting market and the LED sector. Thanks to strong government support, the lighting market turnover is equal to that of Europe and America. The lion's share of success belongs to China. It leads in two sectors: street and architectural lighting.

Whatever the world's LED screen brands say, in 90% of cases their products are assembled in China. But the specialists of this country are ready not only to help create high-quality products with a well-known name, but also to establish and develop their own production, which has been happening for the past 15-25 years. Therefore, it is not necessary to speak only about the fact of Chinese low-quality products. In some cases, this information turns into a myth.

The reason is that in China there are already a lot of productions that can boast of high quality, low price and at the same time a true warranty period. Innovations in technical solutions come not only from Japan and America. Some of them are written by the Chinese.

Thus, China is actively and steadily entering the world stage, conquering more and more countries where they value, love and wait for LED screens produced by Chinese manufacturers. The future outlook for the Chinese market and global market share should be positive.

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Роль Китая в развитии рынка светодиодных экранов

Ван Синь

Студент,

Российский университет дружбы народов,
117198, Российская Федерация, Москва, ул. Миклухо-Маклая, 10;
e-mail: 1032218948@rudn.ru

Самусева Татьяна Валентиновна

Кандидат экономических наук, доцент,
Российский университет дружбы народов,
117198, Российская Федерация, Москва, ул. Миклухо-Маклая, 10;
e-mail: samuseva-tv@rudn.ru

Аннотация

Сегодня Китай заполнил мир своими товарами. Китайское правительство активно способствует развитию энергосберегающих производств. Среди современных технических решений есть и светодиодные экраны. Такие экраны могут быть как высококлассными, так и дешевыми, все зависит от цены и качества. Еще в 2010 году китайским компаниям, производящим светодиодную продукцию, было выдано 25 000 патентов. Это 1/5 часть мирового количества патентов. В то же время действительно инновационных решений и разработок не так уж и много. Сегодня светодиодная индустрия Китая динамично развивается, светодиодное освещение занимает четвертую долю всего рынка освещения. Что бы ни говорили мировые бренды светодиодных экранов, в 90% случаев их продукция собирается в Китае. Но специалисты этой страны готовы не только помочь создать качественную продукцию с известным именем, но и наладить и развить собственное производство, что и происходит на протяжении последних 15-25 лет. В Китае уже есть много производств, которые могут похвастаться высоким качеством, низкой ценой и при этом настоящим гарантийным сроком. Китай активно и уверенно выходит на мировую арену, завоевывая все больше стран, где ценят, любят и ждут светодиодные экраны китайских производителей. Будущие перспективы китайского рынка и доли мирового рынка видятся положительными.

Для цитирования в научных исследованиях

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Ключевые слова

Светодиодные экраны, дисплей, светодиодная индустрия, мировой рынок, Китай, патенты, инновационные решения, конкуренты.

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