

Shining in the Niche Market with Luminous Pigment and IPRs Strategy

Interviewer: Takamasu Kanji

SINCE it was founded in 1941, Nemoto & Co., Ltd., has always been focused on the production of phosphorescent substances. The company began by adding radium to the phosphorescent coatings for watch and clock hands. In the early days, it was mainly engaged in the production of parts for luminous watches and clocks, and gradually expanded its production into such fields as sensors with its radiological technology. Later, in response to the need to completely eliminate radioactive luminescent substances from watches and clocks, the company successfully developed the LumiNova, phosphorescent pigments that incorporate no radioisotopes. This allowed the company to expand the business areas in which such products could be used. The company has been fighting continuously to protect the patents it has acquired. We interviewed Nemoto Ikuyoshi, the company's second-generation president, who leads this small development-oriented manufacturing sector and promotes its global operations.



Can you explain what LumiNova is?

Nemoto: There are many kind of substances that luminesce. As opposed to the type that reflects light from external sources, it was thought that only luminous substances which included radium or other radioactive elements were able to glow for extended periods. We too started out with a radium-based pigment that was used to coat watch hands and dials. Later, as the effects of radiation on people and the environment were starting to be recognized, we began to develop relatively safe phosphorescent paints using the beta rays from isotopes of promethium.

In 1993, we developed a new group of compounds, which we market under the LumiNova brand name, with alumina as key constituents. These compounds broke all the previous preconceptions, offering 10 times the brightness of conventional phosphorescent substances. In addition, they have the ability to glow all night long when exposed to fluorescent light for 10 minutes. Other distinguishing features to mention are that they are chemically stable, and their performance does not deteriorate even when they are used outdoors.

In the past, only watch hands and time scale markers had been coated with luminous substances, but the new materials made it possible to have the entire watch dials glow in the dark. Currently, LumiNova is used in nearly all of the luminous watches produced by Japanese



and Swiss makers. LumiNova is a fine powder, so it can be mixed with plastics and the products can be freely molded. Because it does not emit any radiation, there is no need for special handling for its disposal.

Due to its special characteristics, such as the fact that it does not require an external energy source, or its ability to continuously glow for a long period, it is used on emergency markers in buildings, underground streets, subway stations and the aisles of aircraft cabins. It was recently taken up for use in the Pentagon. Other applications include mobile phone display panels, stationery,

and music CD jackets. We are looking forward to seeing the development of an even wider range of applications.

LumiNova has revolutionary function and product safety. Tell us how it was developed.

Nemoto: Nemoto Kenzo, the founder and my father-in-law, developed the phosphorescent paint distribution business for military purposes due to the start of World War II.

Before he commenced the business, he worked as a newspaper reporter and as an editor of a children's science magazine. He wanted to live his life differently from everyone else, and he became fascinated by luminous paints. After the war, many businesses in the luminous coatings industry were closing down, but Kenzo went around buying up the depleted radium that had been used in the war and recycled it. For sales promotion, I have heard that he even visited department stores in distant cities, demonstrating this product by painting a phosphorescent coating on watch hands. He got orders for coating the dials of alarm clocks, boosted the number of employees and hired engineers.

Murayama Yoshihiko, our current Technical Advisor, was our first engineer at the company. He spent many years leading technical development. He developed automated coating equipment, and adopted the use of isotopes of nickel and promethium in place of radi-

um, since they emit less radiation and commenced metal printing operations. As a result, he took the company down the road as a parts manufacturer which produced watch and clock dials.

However, in 1991, our biggest client, a large watch manufacturer, announced that it would stop using radioactive components within five years. Since luminous coatings for watches had been produced ever since the company was established, and they were one of the key products contributing to our sales results, this announcement was a great shock. However, the engineering team, centered on the current Managing Director Matsuzawa Takashi, worked really hard and developed LumiNova in 1993. For this, we received the Okochi Memorial Technology Award in 1996.

It is quite rare for a small-sized enterprise like yours, to maintain the technical ability to produce a new product in the face of such crisis. What kind of development team do you have?

Nemoto: Our founder's favorite saying was "No matter how superior a product may be, its life won't last for 30 years." With this way of thinking as a premise, the company continued to deliberately invest in technical development to allow research into new products, and we have always aimed to devote more than 5% of our sales to R&D. We established our first research center in 1978, in the midst of the peak sales of luminous watches and clocks. We are planning to expand our research capabilities by opening a second R&D Center this year. We have 52 research staff, who account for over 40% of the total staff of 117.

One more thing we paid attention to is the careful storage of all research data. When Matsuzawa and the other excellent development staff worked on the development of LumiNova, they were able to refer to the accumulated records of past research, and that made it possible to speed up its development time frame to a mere three years. An accu-

mulation of research findings is an especially important factor in the development of new chemical substances because there are a limitless number of substance combinations and there is no formula for quickly reaching a resolution to a problem.

We have had twice yearly occasions to present research results among company members for more than 30 years to share the entire intellectual property of the company. Such meetings are held every spring and fall, and enable all of our employees to know that diligent and steady effort is important for R&D. Development staff from our overseas offices also participate.

I assume many companies tend to struggle when directing their R&D and manufacturing new products. How do you overcome such difficulties?

Nemoto: We possess three core technologies. Firstly we have the production technology for luminescent substances. We have developed not only LumiNova but also a wide variety of other luminescent substances. These are used as security markings to prevent forgeries of bank notes and valuable securities, and they are also used in fluorescent lamps. We also make phosphors used in electronic parts such as plasma display panels and electroluminescence.

Secondly, we have radioisotope handling technology. We used radium as a raw material, so we have obtained the necessary licenses for its handling and storing. Using the accumulated technologies, we have developed the technology of coating and sealing nickel and promethium iso-

topes in the plating of fluorescent glow lamps. We have also developed ionizing type smoke and gas sensors. The company has also carried out animal studies and metabolism tests for new drugs using radioisotopes.

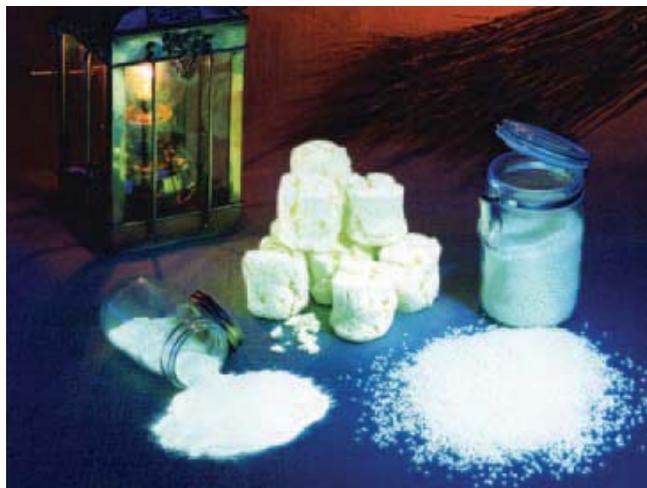
Thirdly, we have metal printing technology. Early in our history, we developed machinery for printing on watch dial plates. Applying this technology, we have since then commercialized such products as plastic panels using offset printing, and low cost color filters for LCD using glass-plate printing.

These core technologies are the result of development based on a policy of not wasting any of the technologies that we have amassed since our founding. Because they are our true strength, we aim to develop new products with core technologies.

You certainly have a varied product lineup. What is your main business policy?

Nemoto: Nemoto Kenzo used to say "Our company is not suited to the kind of business where products are carried by trucks. Rather, we should produce goods that may be carried in trunks; in other words, pursue niche markets." That is why we have developed our busi-

Photo: Nemoto & Co., Ltd.



LumiNova: new phosphorescent pigments developed in 1993, by a team led by the current Managing Director Matsuzawa Takashi



Products using LumiNova (left & right)

ness within the small luminous paints market, which the large players are not interested in. The total global demand for luminous coatings is only around 700 tons annually, so we must produce a large number of specialized products. In this respect, we have to orient ourselves towards the entire global market – not just Japan. Therefore, specialization, diversification and internationalization are our fundamental business policies.

In 1978, because a Japanese watch maker launched overseas production, we also decided to establish an international production base, firstly through a joint venture in Hong Kong with a local businessman. In 1982, we built a plant in Portugal in cooperation with a Japanese trading house. After that, we built plants in Shanghai, Shenzhen and Dalian in China. In addition to those three bases, we have sales bases in Hong Kong, South Korea, the Netherlands and Switzerland. Annual sales are around ¥9 billion. Japanese sales account for 40% of the total sales, and overseas sales make up the rest.

How many people do you employ?

Nemoto: As of January this year, there were 117 permanent employees at our headquarters, and a further 168 in five affiliated companies in Japan. In the five overseas production facilities (in China and Portugal) and in the six overseas sales offices, there are 711 staff, so that makes a total of 996 employees.

How many patents do you hold?

Nemoto: We have about 100 patents in 16 countries, including Japan, China, the United States, and 10 EU countries. Obtaining and securing patents is quite an onerous responsibility for a small-scaled manufacturer like us.

Taking LumiNova as an example: it was developed in 1993, and when we recognized its superlative characteristics, we immediately lodged production patent applications on a grand scale, not only in Japan, but also in the United States and the EU where we anticipated great demand. The fastest approval came from the United States, but it took more than two years from when we submitted the application. Japan and the EU took over three years.

However, when you lodge a patent application, it is the same as showing your cards to everyone. In the case of chemical substances, because you make public the molecular formula, if someone is able to secure the necessary raw materials, it is relatively easy to copy the technique. In Japan, during the two years of our lodging the applications, three companies had commenced sales of similar products. Once the patents were approved, those companies lodged objections, and we ended up fighting one company in court. At the end of last year, an amicable settlement was recommended by the High Court, and the other party paid us an indemnity. However, the amount did not adequate-

ly cover the loss that we had suffered. Court expenses add up to a considerable sum.

The most serious blow is the fact that when an imitator appears, the market price for the product falls. Because chemical substances need to be tested for environmental safety, etc., development requires a lot of time and expense before we can at last bring the product to the market. Since the other parties could save themselves such trouble, they may expect a profit even if they sell at a low price but we may suffer a huge loss.

For this reason, there are a large number of small businesses which decide not to apply for patents, or to give up fighting legal actions. Also, one has to think about the time factor: if the matter goes to higher courts, more than half of the 20 year patent term might be used up just in legal battles. This is why the smaller the company, the greater is its burden.

I have heard that there is quite a deal of difference in the operation of patent systems around the world.

Nemoto: We lodged the LumiNova patent application in China in 1994 and it took 10 years to be approved. During that time more than 40 imitators appeared in China alone and the market price collapsed to one-third. On the other hand, in relation to the EU application, the US firm Honeywell

Photos: Nemoto & Co., LTD.



Intellectual Property Award from METI. (left) Nemoto Ikuyoshi, President & CEO with Prime Minister Koizumi at the award ceremony. (right)

Technology submitted an objection in 1997. However, in 2000, the objection was dismissed. After that, negotiations with Honeywell continued for over a year. On the advice of our lawyers, we entered into a royalty agreement with Honeywell in order to secure their cooperation in eliminating many imitators in China. In other words, we attacked the Chinese imitators from the rear, by having them recognize our patent and encouraging them to conclude a royalty agreement. By granting license to other companies, we increased the number of LumiNova suppliers, and expanded the market.

We lodged a patent application with the China Patent Office (CPO) in 1994, but were turned down because even though there was no patent, similar products had been produced in the country from some time before. We continued to present counterarguments and requested a review, but the investigation was halted halfway through. However, the cooperation with Honeywell accomplished a successful outcome when our patent was finally granted in China in 2004, a year after we escalated the CPO to expedite the case.

The Koizumi administration views the establishment of Intellectual Property Rights (IPRs), as a matter of concern, and it has established a large-scale panel to tackle the issue, right?

Nemoto: In 2005, we received the Intellectual Property Award from the Ministry of Economy, Trade and Industry (METI) in recognition of our positive contribution to the establishment of IPRs. We are extremely proud that our tenacious efforts to protect those rights were recognized in public. Last year, I was invited as a witness to the Prime Minister's Strategic Council on Intellectual Property, and I presented the same material that I am discussing now.

Because intellectual property is an intangible right, it will not have any practical effect unless the idea to respect such rights becomes widespread. That is why I expect to see a fundamental improvement as a result of the government's approach, in which the concept of intellectual property should be taught in the context of school education. However, at the same time, we hope the government will proceed with prompt systemic reforms.

In what areas would you like to see improvements as a system?

Nemoto: I believe that a common international patent system would suit today's globalized economic activity. I acknowledge that international efforts in this direction are under way, but as a member of the development industry, I am most keen to see the time frame shortened between lodgment and approval of patent applications. I also feel that acts that infringe on intellectual

property could be punished more severely. Another point is that small enterprises bear a particularly heavy burden in the current situation where trials take a long time. In the past, private insurance companies offered patent insurance as a service, and that was a great help to us. However, such service probably did not make a profit, and this kind of insurance is no longer available. It would be a big help if some kind of public patent insurance system was set up.

Is Nemoto thinking of going public?

Nemoto: All I can say is we are currently looking at all options when considering our future. Going public would be one possible option. Another option may be to have the headquarters as a holding company with each business under its umbrella. This would give each subsidiary and affiliate an even greater degree of independence.

I will be repeating myself here, but we want to stay focused on specialized markets, develop small businesses in multifaceted areas and remain focused in international markets. We would like to strive continuously to build a business structure that will allow us to be "the only company" in the world in each specialized field. **JS**

Takamasu Kanji is an editor and biographer. He is also a senior advisor to the foreign editor of the New York Times.