

# Pursuing Innovation in Shot Peening

An Interview with Dr. Yoshihiro Watanabe, President & CEO of Toyo Seiko Co. Ltd.



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The Ministry of Economy, Trade and Industry (METI), in collaboration with some academic business management experts, announced on March 17, 2014 its “Global Niche Top Companies Selection 100”. The definition of a GNT company is as follows:

In the case of large companies, in the global market for a specific product or service which has a scale of 10-100 billion yen, the company's share has exceeded 20% in at least one of the previous three years; in the case of mid-sized companies with annual sales of less than 100 billion yen, the company's share of the global market has exceeded 10% in at least one of the previous three years; and in the case of SMEs, in at least one of the previous three years, the company's global market share has totaled more than 10%.

METI has recognized these GNT companies in order to show Japanese businesses how important it is in global competition today for a company to produce invaluable products that cannot be easily replaced by any other. Having such unique value in their products would help to restore Japanese firms' competitiveness.

Toyo Seiko is one of the GNT companies recognized by METI. *Japan SPOTLIGHT* held an interview with Dr. Yoshihiro Watanabe, president & CEO of Toyo Seiko, to learn how the company qualified for GNT status.

## Business History of Toyo Seiko

**Haraoka:** First of all, could you give us an outline of the company's history and business, as well as your own profile?

**Watanabe:** Our company was established in 1975. We have a subsidiary in Thailand and founded a sales subsidiary in the United States on April 3 this year. So we now have two subsidiaries in addition to our main company. We specialize in a technology called shot peening to enhance the durability of the parts and components of automobiles and aircraft. This is done by the use of small steel cut wire shot for shot peening (*Photo 1*).

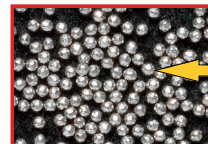
Our domestic market share in Japan is now almost 95% and we make a product called special Conditioned Cut Wire shot with high durability. We export this to 27 countries from Japan and our subsidiary in Thailand and its global market share is around 30%. Most of the springs or gear wheels used for transmissions in automobiles need this, since we cannot achieve fuel efficiency without making cars much lighter. Aircraft also use our product to increase their durability (*Photos 2 & 3*).

When our firm was founded, we were a subcontractor of our parent company, Miyazaki Seiko, and expected to provide cut wire shot to be used in machinery produced by their company. Therefore we were producing exactly what was requested by our parent company's customers. However, after Toyota asked us to produce a special one, hard and round, we came to believe that demand for peening would increase, especially after having learned about peening technology and

PHOTO 1



Cut Wire



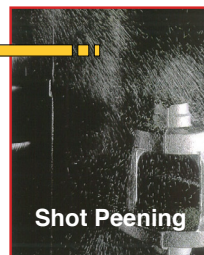
Conditioned Cut Wire



X-ray Measurement



Shot Peening Job Contract



Shot Peening

Photos: Toyo Seiko Ltd.

What is shot peening?

mastered it. We started our own unique R&D, such as development of high hardness conditioned cut wire shot for shot peening.

After having worked for Miyazaki Seiko for five years, being engaged in different work rather than shot peening, I joined Toyo Seiko, which was founded by my father. As soon as I joined this company, I started to study about shot peening, and after seven years at university I got a PhD. When I became CEO of this company in 2000, I decided to specialize in shot peening as our main business strategy, and we accordingly sold off some unnecessary real estate assets which we had been investing in at that time.

We now have three main businesses. Initially, we produce steel cut wire shot, and secondly we have a shot peening processing service. The best example of this processing service is shot peening for aircraft parts and components. Thirdly, in collaboration with other companies

overseas to develop shot peening equipment, we play the role of agents for such companies, or ask them to be our agents, and thus actively promote our global business expansion.

We are also working hard on industry-academy cooperative research. I began studying at university in 1990 and since completing my PhD I have attempted to apply academic ideas to our corporate business. In the aircraft industry, there is an international conference on shot peening which is a niche one focusing on a very specific area. I have been attending this academic conference every three years since 1990. This year, there will be a conference in Germany that will provide me with a useful business opportunity as well, since I will meet with a number of important business people there, such as a key person for peening at Boeing with whom I have already made friends. This conference has been very helpful in forming good relationships with aircraft industry customers.

Another merit of such international conferences is that the conventions which are held in most cases at the same time as the conferences provide us with opportunities to conclude business contracts through talks in our exhibition booths. We have taken advantage of such occasions to start alliances with a few overseas companies, ending up by signing agent contracts or joint R&D contracts with them. To be more specific, we were successful in achieving a business alliance with the French company SONATS and selling their special equipment for ultrasonic shot peening (Table).

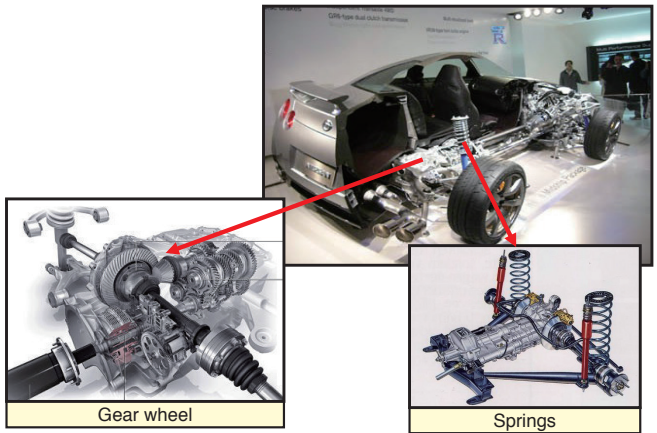
As I said, we have been specializing in shot peening. However, we consider all those who are eager to improve the durability of their parts and components as our customers, not only those interested in shot peening. Of course, we need those customers to choose shot peening, our specialty, otherwise we would lose our business. We need to refine our technology and make it more user friendly, so we are aiming to turn anti-peening customers into customers in favor of shot peening by our R&D efforts to enhance the quality and reliability of our products. This is the final mission of our technological development. We are now developing new processing equipment or shot peening quality inspection equipment to support the shot peening process for enhancing the reliability of shot peening effects at the cheapest cost.

**Haraoka:** What do you think are the merits and risks of specializing in shot peening? How do you assess potential profits, given the possibility of losing potential customers?

**Watanabe:** There is such a risk of customers preferring something other than shot peening, so we should always consider the possibility of replacing shot peening technology in our technological development efforts. We are now pursuing a technology without using steel cut wire shot. Shot peening is commonly used for automobiles and aircraft. However, large building structures — bridges made out of steel, construction machinery, large pressing machines, etc. — are products made by welding and these are susceptible to cracks after the process of welding by heat. We are producing new peening equipment without using cut wire shot in accordance with a proposal by the Ministry of Construction and Transportation to prevent such

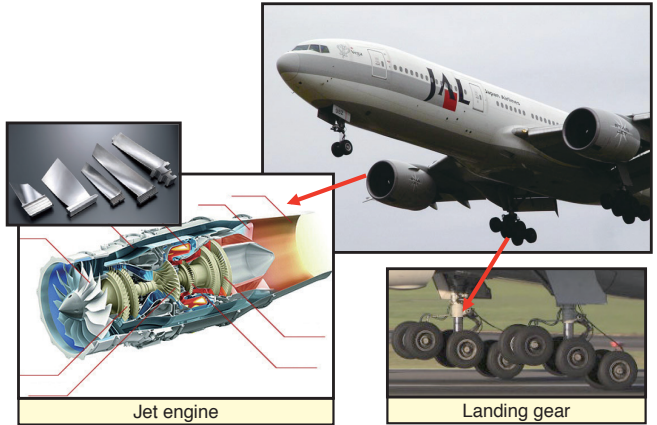
PHOTO 2

Photos: Toyo Seiko Ltd.



Shot peening for automobiles

PHOTO 3



Shot peening for aircraft

TABLE  
**Toyo Seiko's overseas business partners through international conferences**

2000	SONATS (France) President Patrick Cheppe
2004	EI (US) President Jack Champaign
2006	KSA (Germany) President Frank Wuestefeld = resigned
2008	Shockform (Canada) President Sylvain Forges
2009	Positron (US) President Steven Yano = resigned
2013	NanoSteel (US) Director Rob Parker

Source: Toyo Seiko Ltd.

cracks. Thus we are trying to promote understanding of the merits of shot peening by such new technology without using cut wire shot among people who do not know about shot peening, such as those engaged in such construction business.

We are doing our best to expand our market by developing such new technology as well as minimizing the cost of shot peening, our original strength. Thus I believe we can expand our overseas market

as well by diversifying our users from automobiles and aircraft to other industries. As for shot peening itself, whether it uses cut wire shot or not, I believe there will be much more need for it in various industries, even though it is true that demand for it is becoming saturated in some areas. For more expansive use of peening, customers will need good inspection equipment to check the durability of the components, and so there will be more business opportunities for us since we are producing a new machine called a “coverage checker” for measuring shot peening areas that has never been produced anywhere else in the world.

**Haraoka:** Would it be possible for peening to be applied to more high-technology sectors?

**Watanabe:** Yes. You can apply it to a high-technology sector like the space industry. You can also apply it to a wide range of sectors, not necessarily high-tech ones, whether they use cut wire shot or not. Our most important job is to find the best process of shot peening in terms of cost and reliability for each sector that needs to enhance the durability of parts and components.

**Haraoka:** In that case, you would need marketing research to find the best match between your clients' needs and your provision of technology.

**Watanabe:** Yes, that is true. The international conferences that I mentioned are one of the best opportunities to get market information about the users, since they are meetings of the suppliers and the users of shot peening. I organize a sub-committee on Surface Enhancement, which focuses on shot peening for aircraft and meets regularly in the United States. I can get the most updated information of those customers' needs at this venue.

**Haraoka:** Your PhD research has been transplanted well into your company's work.

**Watanabe:** Yes. My father knew what shot peening was but he was mainly doing other business operations. After taking over the company, I decided to concentrate on shot peening as our business strategy by eliminating the other business lines adopted by my father. We have now been focusing on shot peening for seven years. My involvement in international conferences as an academic has also been helpful in determining our business orientation.

**Haraoka:** How do you maintain market share and profitability at the same time?

**Watanabe:** We have been successful in developing highly durable steel cut wire shot. Our customers needed tons of shot for shot peening every month since normal shot is soon broken by shot peening. Having considered this need, we created highly durable shot in 2007 by adding a special process to shot production. With this we were successful in halving our customers' costs, since they now need only half the shot originally used for shot peening. We could enhance

our market share in many countries thanks to this new technology and at the same time this new product with higher added value ensured our profitability. Thus we could achieve a large market share and high profitability simultaneously.

In addition, we started production of this new product in Thailand where we could take advantage of cheap labor costs. This is instrumental as well in achieving both large market share and high profitability.

**Haraoka:** How do you achieve good team work in your company? I imagine that awareness of your need to find the best match between your customers' needs and your technology is basically shared by all your employees.

**Watanabe:** Our company's strength is that all the employees are knowledgeable about shot peening, not only engineers but also sales people, since we specialize in shot peening. All of us can think about the possible applications of new technology based upon our knowledge and experience of shot peening.

**Haraoka:** So you do not have to be concerned about employing high-quality human resources or doing human resources development inside your company? You can get the human resources you need simply by on-the-job training?

**Watanabe:** Not exactly. Of course it is true that we can pass down knowledge of shot peening through on-the-job training. Actually, our sales people know quite a bit about shot peening having worked together with engineers. However, aircraft business that requires English ability is increasing substantially. Therefore, I'm taking care to hire staff that have good English ability.

## International Strategy

**Haraoka:** You are actively doing business in the US and Asia. Do you have any plan to target any other region?

**Watanabe:** Before setting up our subsidiary in Thailand, we were thinking about other candidates as a place to establish operations. But as we are producing all our products within our own group, we had to consider the question of possible leakage of our technological secrets as well as the availability of necessary materials. Having considered such questions, we chose Thailand as the place for our operations. We also founded our subsidiary in the US this April. This subsidiary is mainly in charge of sales promotion in the US, a big market for automobiles. As our next step, we are now thinking about founding a manufacturing operation there and considering business within North America as a whole, including Canada and Mexico. We have not yet thought about setting up operations in Europe.



## Achieving Creativity & Independence

**Haraoka:** How have you been successful in achieving creativity and independence?

**Watanabe:** When we got an order for shot peening from Toyota for the first time, we did not know anything about it and so we thought we should discuss it with our client after mastering the technology, in order to respond exactly to their needs. This was our starting point for independence from our parent company. We also thought we should make counterproposals about shot peening to our customers to make them feel happier with the products we provide. This has developed our creativity. Independence and creativity have been thus grown together in our company.

**Haraoka:** METI's recently announced industrial policy does seem to promote independent individuals or firms, whether they are large or not. What is your view of the current performance of Japanese business firms as regards creativity and independence?

**Watanabe:** Many Japanese SMEs are aiming to create new products independently and not produce only those products ordered by clients. However, most of them seem to have a lack of effort in pursuing new technology in collaboration with universities or national research institutes in order to achieve product differentiation for themselves. We ought to do more to create more added value and create more distinguished products. This would lead to greater independence for SMEs from their parent companies.

**Haraoka:** Apart from independence, what do you think about possible collaboration with large enterprises?

**Watanabe:** We are not thinking about business collaboration with large enterprises. Large enterprises are generally our customers, so we believe that our firm, as a professional shot peening expert, has a mission to develop the production or inspection equipment for shot peening that they need. We are keener on alliances with other SMEs, not only in Japan but also overseas, to explore further business opportunities for shot peening. We are doing joint R&D with other SMEs as well as public research institutes. Above all, we have been successful in R&D cooperation with academics ever since 1990 when I myself started collaborating with universities. We always allocate a certain percentage of profits for R&D expenditure to achieve such cooperation. Such relationships with academics certainly give us a competitive advantage.

## Coping with Business Risks

**Haraoka:** Regarding the possible risk of the emergence of any substitute for shot peening, how would you respond to it?

**Watanabe:** At this moment, we are not thinking about the possibility of the need for shot peening being zero, though we are aware of the risk. There are still lots of people who have never heard about shot peening yet. Therefore our company's strategy is to promote shot peening among those people. We believe in this regard we have a strong potential demand for shot peening.

**Haraoka:** What do you think should be done to maintain your market share?

**Watanabe:** We believe we are producing now what cannot be replaced by any other firm.

Therefore, if we continue to produce any of our products for our clients, including those overseas, we believe it will be possible to maintain our market share. If any new rival technology emerges, we should try to keep our market share by thinking about how to minimize production costs by improving our technology, because we believe it would be difficult to invent an alternative technology to shot peening at much lower cost than currently. We could win the competition against these possible rivals by cost cutting.

**Haraoka:** Finally, could you tell us about your future business strategy?

**Watanabe:** Our factory in Thailand can still increase production by 50%. As for our US subsidiary, in the light of its huge market for automobiles and aircraft, we will need to promote our sales activities there to increase our market share. In addition, considering the possibility of any "Buy American Goods" campaign in the US, our next step should be to set up a production subsidiary there. We have a 20-year business partner in Indiana and established our sales company in the US in cooperation with them. But I have not decided yet whether to set up production operations in Indiana. We may not be able to maintain our international competitiveness unless we establish a production line somewhere like Mexico, where cheap labor is available.

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