Productivity in primary processing of structural steel has been improved by more than double by "3BC-300"

Achieves reliability with high quality and short delivery time

Located in Ishinomaki-city, Miyagi Prefecture, Takeda Tekkosho Co., Ltd. is an M-grade structural steel fabricator that deals with primary processing (drilling and cutting), welding, assembling and construction of structural steels for local general contractors and for big plant construction companies in other prefectures. It has a good reputation for high quality material processing and short delivery time and is praised for high reliability from customers in and outside of Miyagi Prefecture.

The company sticks to quality among other attributes of a good manufacturing company. It introduced CAD in 1990s as one of the fastest companies in the steel industry. In the company, they also have been addressing improvements in accuracy of their drawings as well as in efficiency of dimensional inspection by using electronic measuring instruments. Since it started to deal with structural steels for plants, jobs outside the prefecture increased and it became difficult to take prompt actions against defects and therefore, it enhanced quality control by deploying its own dedicated inspectors. Also, as structural steel for plants need to be painted with a specific color, all materials are subjected to a shot blast treatment at the time of material arrival. For the shot blast treatment process, just maintaining the cost of the machine takes 700,000 to 800,000 yen per year but it is regarded as an indispensable process to improve paint quality.

Many years of these efforts earned us the respect of our customers as a reliable vendor which has resulted in repeat
orders and continuous business with our customers.

Supported by family members, the company became a fabricator representing the local community

The company was founded in 1975 by the predecessor, Mr. Shinichi Takeda by building a factory of 590 tsubos on the site next to his own house. At that time there were five employees. They started a business manufacturing residential verandas by cutting and bending flat bars and immediately after that, they entered the structural steel industry by purchasing AMADA’s bandsaw, model H-650HD.

The current president, Shinya Takeda recalls, “I assisted in the family business during my summer holidays since I was a schoolboy. But my father (Mr. Shinichi Takeda) who knew well about the extreme ups and downs and volatility of the steel industry seemed to have no intention to make me succeed his company.”

“Then I got cosmetology license at a vocational school and found a job at a beauty parlor in Sendai City. But when I assisted in the family business in the New Year’s holidays in 1990, I decided to help my father and entered my father’s company. After that I acquired various qualifications such as welding engineer, structural steel production control engineer, and structural steel ultrasonic inspection engineer and have been involved in practical work of structural steel processing,” (President Takeda).

Knowing that his son had intention to succeed his business, Mr. Shinichi Takeda made his mind and built the Kanan Plant in 1992. At first, there were only an office building and a factory building there but he built additional factory buildings one after another to enhance production capability. Thereafter the company acquired M-grade qualification and has expanded its building area to 2,600 tsubos and numbers of employees are now 30 persons.

President Takeda assumed the presidency in January

Company Profile

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<tr>
<th>Company name:</th>
<th>Takeda Tekkosho Co., Ltd.</th>
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<tr>
<td>Representative director:</td>
<td>Shinya Takeda</td>
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<td>Managing director:</td>
<td>Nobuo Takeda</td>
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<tr>
<td>Location:</td>
<td>23 Yamashitanishi, Kanomata, Ishinomaki-city, Miyagi (Kanan Plant)</td>
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<td>Telephone:</td>
<td>0225-75-2864</td>
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<td>Business Outline:</td>
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<td>URL:</td>
<td><a href="http://www.takeda-st.co.jp/">http://www.takeda-st.co.jp/</a></td>
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Main Facilities

- Small drilling and cutting combination machine for shaped steel: 3BC-300 (with plane loading system and ink jet device)
2013. He is showing leadership as a young manager representing the steel industry in Miyagi Prefecture as he served as a chairman of Youth Group of Miyagi Prefecture Steel Fabricators Association by 2013 including the years of his managing director and now is one of directors of the Association. In 2014, he was approved by Minister of Land, Infrastructure and Transport as a "Construction Master" that was to praise an excellent construction engineer.

Mr. Shinichi Takeda who was appointed to chairman when his son became president suddenly died in February 2014. President Takeda printed his father’s encouraging words on a fan and always keeps it close to him. The words read "Business is important but money is more important. When will you come to this side (management side)? Never forget a bill!"

"He passed away when I was looking forward to learning what was most important for a manager from him. At least I wanted to keep close to me my father's words as a lesson for an young manager. Now, my brother is a managing director and my wife takes care of accounting. They both are supporting me. I am just doing my duty frantically” (president Takeda).

**Orders are growing because of restoration and reconstruction demand.**

Ishinomaki-city suffered substantial damage by the tsunami generated by the Great East Japan Earthquake in March 2011. The company, being located inland about 5 km away from the seashore, narrowly avoided damage from the tsunami. Employees were all safe but nearly half of them lost their families and houses. It took nearly one month to determine the safety of all employees.

President at that time, Mr. Shinichi Takeda built five temporary houses for employees on the site of president Takeda's (at that time, managing director) house to support employees who lost houses. For the plant itself, although some facilities were displaced little as an effect of the earthquake, they were restored soon. But it was about three months after that when the infrastructure such as electricity, gas and water were back, all employees gathered and full operation was possible.

Since the restart of business, there were many orders for restoration and reconstruction. Immediately after the earthquake, as the company has qualification for general and specific contractor's license, they received many orders not only for structural steel processing but also for small-sized construction work such as repair of a wall. Also, as nearly half of public schools in Ishinomaki-city suffered from damage by the tsunami, in 2013, there were many orders for reconstruction of gymnasiums at public schools that were places for evacuation in emergency. From the beginning of 2014, construction of houses for restoration has become full-fledged.

"Before the earthquake, we could forecast orders for as far as one or two months but now we have orders for..."
more than six-month ahead. In Miyagi Prefecture there are more RC construction (constructed with reinforced concrete) houses than S construction (constructed with structural steel) houses but for now, work of structural steel for construction has not been reduced. Besides, for work of structural steel for plants, conventional structural steel fabricators have been overwhelmed due to effects of Tokyo Olympic in 2020 and National Resilience project and local fabricators like us have come to receive inquiries” (president Takeda).

Introduced small drilling and cutting combination machine for shaped steel, model 3BC-300

Based on the increase of orders, the company introduced a small drilling and cutting combination machine for shaped steel, model 3BC-300 in November 2012. Model 3BC-300 is a combination machine that has 3-axes and is capable of simultaneous drilling operations and high speed cutting processes with a carbide circular saw blade. Improvement of productivity and space-saving are realized by integrating two processes in one machine.

In case of Takeda Tekkosho, until that time, all primary processing of structural steel was performed with an NC 6-axis high speed drilling machine for H steel, model 6BH-1000 that is compatible with a web length of up to 1,000 mm and the CNC Band saw for cutting shaped steel, model HK-1000CNC. By introducing the 3BC-300, two-line system, the H steels with a web length of more than 300 mm can be processed with the 6BH-1000 and the HK-1000CNC and H steels with a web length of 300 mm or shorter are processed with the 3BC-300. Productivity has been improved significantly.

"Once in a while, there are large-sized orders such as a shopping center in which the amount of S construction structural steel is 600 to 800 tons but almost all orders we receive are middle-sized ones of 200 to 300 tons. In case of middle-sized order, H shaped steel with a web length of 500 to 600 mm that is used for main pillars and beams occupy 60 to 70% in weight of the whole order. While H shaped steel of web length less than 300 mm that is used for small beams are, although they are 30 to 40% in weight are many in quantity. So, from before the earthquake, we had a request for a combined machine that deals with length measurement, drilling and cutting with one machine in order to improve efficiency of processing H shaped steel of web length of less than 300 mm which is many in quantity. When the initial influence of the earthquake ended we heard about the release of the combination machine 3BC-300 by AMADA and I decided to purchase it” (president Takeda).

The production rate is significantly improved by automation and off-line set-up

"I didn’t expect such an excellent performance improvement the 3BC-300 would provide. For H shaped steel with a web length of 300 mm or shorter which requires a lot of processing work, it is a great advantage to make drilling and cutting processes with one machine. With the 3BC-300, and by making a two-line system and enabling us to process webs of 300 mm or shorter doubled production over the old system,” president Takeda highly praised.

For introduction of the 3BC-300, an optional plane loading system (length: 5 m) was equipped to enable automatic loading of materials and by adding an automatic inkjet marking device, scribing and marking operations are automated. By adopting an automatic program the processing program can be made in the office, which improved efficiency rate of the machine greatly.

"Especially, we feel the improvement in the efficiency rate with the off-line set-up and processing data preparation which is giving us more advantage than the cost of it, " said president Takeda who had in his mind the result of diagnosis, "Preparation of work is great and the production of the machine is high” as a result of his request to AMADA MACHINE TOOL for analysis of his factory.

"Therefore, we feel the effect of the 3BC-300 is stronger. Just the operation time of the machine is longer than preparation time means greater productivity for
us. Processing speed and processing amount have been improved drastically while number of workers has not been changed. Workers who got to know the operation at the manufacturing site requested me to make it possible to prepare processing data for the beam in the office," (president Takeda).

**Contributed to improvement of processing quality and to expansion of processing region**

"After primary processing, joints are made by combining steel materials of various sizes. Workers cannot start temporal installation and welding work without finishing primary processing of at least half of the whole order. I imposed a lot of burden onto the workers at the manufacturing site at the peak times but after the introduction of 3BC-300, overtime was reduced substantially," (president Takeda).

The company processes about 300 tons of structural steel per month. As capacity of temporal installation and welding process has not changed, production amount itself has not been changed. But primary processing for one month (about 300 tons) is now completed in about two weeks with the introduction of 3BC-300. Therefore, at present, they undertake primary processing of more than 60 tons per month from other structural steel fabricators utilizing their surplus capacity. Also, when they place order for processing to a subcontract factory, since primary processing is completed by them, whole lead time can be shortened.

"Not only productivity, but also quality. The cutting plane with the circular saw of the 3BC-300 is so smooth and high quality that you can tell it at first glance compared to usual band saw cuts. Actually, such high quality is not required by the customers but the impression given to the customers is important. For making through holes for square pipes that are indispensable to buildings and drill holes for angle steels, previously, you had to make measurement using a scale but now it can be made automatically. Also, the fact that it can deal with small channels of width of 125 mm and H steels of 100 x 100 mm that the 6BH-1000 cannot handle is another advantage (150 mm or more for 6BH)," (president Takeda).

"Although satisfaction level is very high, if I'm forced to request new features, the limit of height the 3BC-300 can handle (width of flange of H steel) is 150 mm but it would be more convenient if it is 200 mm. If so, it can handle H steels of wide width sizes of 175 x 175 mm, and 250 x 175 mm that are in many plant applications and middle width of 300 x 200 mm, then it widens the range of applicable structural steels. For automatic marking, if it can use white paint it would be easier to read. And if it can deal with oblique cutting, it would make a dream machine," (president Takeda).

**Future prospects**

President Takeda said he was thinking about hiring fresh graduates, rebuilding an office building and the renewal of their web site for 2015.

"If you expand the range of business too much, you cannot maintain a good level of quality. To perform good work with dedication is No. 1." commented president Takeda. While he said, "To defend is important but defense only makes no good. If you don't have an offensive posture such as introducing state-of-the-art facilities, a company cannot develop. Actually, by introducing the 3BC-300 at this time, inquiries from other companies in the same industry and visit applicants have grown and it leads to orders for primary processing. I heard that approval of structural steel processing with laser by revising JASS6 is now being considered. If so, I would like to consider introducing facilities equipped with lasers."