

Environmental Report 2016



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UNION TOOL CO.

CEO Takao Katayama

President & COO Hiroshi Odaira

The motto of UNION TOOL is "Contribute to the society by providing excellent products".

For continuously providing excellent products, it is important to accurately grasp the needs of individual customers by building trusted relationships with them, and to ensure quick response to the customer needs through close communications among in-house departments. Even if the information is correct, the value may degrade depending on the time and method of envying it. For that reason, the continuous enhancement of cooperative organizational system is indispensable.

What the manufacturing industry is required to do varies depending on the times and viewpoints. The same can be said about PCB drill, which is a main product of UNION TOOL. Customer requirements are changing over time. We always seriously think about the changing customer needs and try to quickly respond to them. One of our important issues, which is also regarded as a strategic target for growth, is further extension of service life of drills. For PCB drills, the previous "small diameters" have become standard, extending the service life while ensuring both sufficient strength and performance was not easy. However, we have achieved this difficult task by originally developing a coating material for the drill surface.

One of our advantages in providing such "excellent products" is the capability to develop original production equipment. It enables us to flexibly change the equipment specifications or the number of equipment, allowing reliable supply and quick response to the customer requests to change the shape of PCB drills.

To secure a reliable supply of products offering higher quality than expected, we always enhance cooperation among departments. Such efforts contribute not only to the quality improvement of products and production equipment, but also to the reduction of environmental burden. Longer service life of PCB drills can be used by customers for a longer period of time, leading to saving of resource (cemented carbide) and the reduction of waste. Also, manufacturing time reduction due to original equipment results in energy saving.

Thus, we would like to contribute to further industrial development by reducing environmental burden throughout the product life cycle (material procurement, production and product disposal).

Under the diversity promotion project, we have also promoted the activities for female and young staff members, as well as for training managerial staff. We will continue to upgrade our in-house environment to foster and utilize diverse human resources having various capacities. Also, for improvement of working conditions for female staff, we will further promote support to the employees raising children.

It has been 16 years since the first Environment Report was issued. We sincerely hope that this report will help you understand our corporate efforts. Your further support to us will be highly appreciated.

April 2016

Company Profile



Amount

Company Profile

Company name: UNION TOOL CO. Head office: 6-17-1 Minami-Ohi, Shinagawa-ku, Tokyo 140-0013, JAPAN Capital: 2,998.5 million yen Accounting term: December 31 Number of employees: 746 persons (as of December 2015) Group-wide: 1,397 persons Factories: Nagaoka Factory (Nagaoka-shi, Niigata Prefecture) Mitsuke Factory (Mitsuke-shi, Niigata Prefecture) Laboratory: Mishima Laboratory (Sunto-gun, Shizuoka Prefecture) Sales offices: Nagaoka Sales Office **Osaka Sales Office** Nagoya Sales Office Anjyo Sales Office Kita Kanto Sales Office ISO14001: Nagaoka Factory (acquired it in March 2000) Mitsuke Factory

Changes in sales and ordinary profits (consolidated)



Major businesses

Cutting tool business Carbide drills for printed-circuit boards (PCB Drill) Carbide end mills

(expanded the applicable range in August 2007)

◆Other businesses Linear motion bearings, rolling dies, rolling machines, other rolling-related products, special-purpose machines, measuring equipment, biosensors, etc. Affiliate subsidiaries

- ■TAIWAN UNION TOOL CORP.
- ■UNION TOOL EUROPE S.A
- ■U.S. UNION TOOL, INC.
- ■UNION TOOL (SHANGHAI) CO., LTD. ☆Acquired ISO14001
- ■UNION TOOL (WAIGAOQIAO SHANGHAI) CO., LTD.
- ■UNION TOOL HONG KONG LTD.
- ■UNION TOOL SINGAPORE PTE LTD.
- ■DONGGUAN UNION TOOL LTD. ☆Acquired ISO14001

Greeting from the Managing Director

Now, we are aggressively introducing new production equipment in our major manufacturing factories: Nagaoka and Mitsuke Factories. There are two major reasons. One is to increase our production capacity for our coated drills and end mills, for the rapidly increasing market demand. Another reason is to upgrade and enhance our production lines for production rationalization. Newly introduced production machines and systems enable not only higher speed and higher accuracy, but also flexible response to higher value-added, complex-shape products.

We develop production equipment by ourselves. And in the development phase, a Design Review is conducted by a team of experts assembled from individual departments. At the Design Review, respective experts in charge of design and development, parts procurement, product assembly, and environment & safety get together to express their views, which lead to new ideas to be incorporated in new production equipment.

In addition, before introducing new production equipment, we conduct an installation assessment to minimize the environmental load to be caused by the equipment, as well as to comply with the relevant regulations and eliminate risk factors. Some of newly introduced equipment may be greatly differ in shape from conventional one. Therefore, we review the facility layout for proper arrangement of new equipment to allow for not only easy operation, but also smooth and efficient flow of parts and products.

Thus, we always pay attention to both the product quality and the overall working environment and safety to ensure sustainable production, and for that purpose, we look around the factories on a regular basis for risk prediction and avoidance.

Various kinds of our environmental activities promoted in our factories are summarized in this Environmental Report. Your frank opinions would be helpful for better communications with you April 2016 and further improvement of our environmental activities.

UNION TOOL CO.

Managing Director

Hideo Wakui

Products



PCB Drills

These tools are designed to make electrical conduction holes on electronic circuit boards. Some of the mass-produceable drills have a very small diameter of 0.05 mm, which is smaller than a human hair diameter.

Rolling Dies

These are designed to manufacture screws and other mechanical parts with two or more dies, which pressurize a rotating bar stock.





Digital Measuring Instruments Measuring instruments designed for tool runout measuring and high-precision tool diameter measuring are available.

On-demand Coating Services

Various coating services are available with our DLC coating and diamond coating techniques effectively utilized.





Carbide End Mills

These are used in manufacturing of the molds of automobile parts and cellular phones and other precision product parts. A wide range of small-diameter types are also available.

Linear Motion Products

These are mechanical parts designed to accurately and smoothly guide an object to a predetermined position. They are used in optical measuring devices and medical equipment.

Coating Bars

These products have been developed with the use of our thread rolling machines and rolling dies. They are used in coating paint on film surfaces, etc.

Wearable Heartbeat Sensor

The sensors allow for measurement of not only heart rate, heartbeat period and waveform, but also body surface temperature and triaxial acceleration at the same time. Also, they can be used for checking daily stress.



UNION TOOL CO. Environmental Policy

Basic Philosophy

To contribute to the clean global environment through the cooperate activities based on love for nature and human beings

Basic Policy

In order to maintain a harmonious balance among cooperate activities, regional society, and global environment Nagaoka Factory and Mitsuke Factory (hereafter called "our factories") shall conduct environmental conservation activities based on the environmental management system conforming to ISO 14001 under the following policies.

- 1. With environmental impacts from activities, products and services of our factories accurately analyzed and grasped, proper environment protection activities shall be conducted according to a definite plan, in which objectives and goals are set within our technical and economical capabilities.
- 2. Continuous improvement of the environmental management system and environmental performance shall be assured through periodic review of the environmental objectives and goals.
- 3. Efforts shall be made to prevent environmental pollution not only in compliance with environmental laws and regulations, as well as requirements from interested parties whom our factories acknowledge, but also according to our voluntary standards set within our capabilities.
- 4. To minimize the environmental impacts from activities, products and services of our factories, the following important themes shall be promoted.
 - 1) Energy saving
 - 2) Green procurement
 - 3) Recycling
 - 4) Resource saving
- 5. The environment policy shall be implemented and maintained through the environmental management system, and also it shall be informed by the corporate management to all employees working at our factories.
- 6. The environment policy is open to public.

February 25, 2014 Hiroshi Odaira, President & COO



b Business Related Environmental Load

We are making efforts for effectively reducing our business related environmental load by carefully monitoring and controlling the input and output of such load occurring throughout our business activities. In the input phase, we pay attention to electric power, which accounts for more than 90% of the total CO2 emission, and are aggressively reducing the CO2 emission through company-wide energy saving activities.



 \ddagger The above data were collected in a period from December 2014 to December 2015.

*1 The CO2 emission was calculated according to "Enforcement Regulation of Act on the Rational Use of Energy".

*2 The amount of industrial waste was based on "Report on Industrial Waste Management Slip and Diffusion of Electrical Manifest" (Industrial waste environmental report No. 061227006) In FY2015, we made strenuous efforts to achieve the following targets on energy saving, recycling and resource saving, which are major themes of our environmental policy.

For the energy saving, we set a goal of reducing energy consumption by 1% from the previous fiscal year and achieved that goal in both Nagaoka and Mitsuke factories.

For the recycling, we promoted the use of returnable containers for domestic delivery of cutting tools, and also promoted the reuse of end mill cases, which had been started in the previous fiscal year.

For the resource saving, we further developed and improved the eco-friendly tools and longer service life tools through the development of our manufacturing systems to meet the needs of a larger number of customers.

FY2015 Targets and Achievements

Item	Actions	FY2015 Targets	FY2015 Results	Evaluations	Pages			
Energy Saving	Cut 5% of electrical power consumption rate (*1) by FY2019 from that of FY2014. [Nagaoka Factory]	Cut 1% of electrical power consumption rate from that of FY2014.	Cut 1.46% of electrical power consumption rate from that of FY2014.	0	8			
	Cut 5% of per-product energy consumption (*2) by FY2019 from that of FY2014. [Mitsuke Factory]	Cut 1% of energy consumption rate from that of FY2014.	Cut 1.68% of energy consumption rate from that of FY2014.	0	8			
Recycling	Promote recycling of packaging materials.	100% use of returnable containers for cutting tool shipments to specific users	100% use of returnable containers for cutting tool shipments to specific users	0	9			
	Promote recycling of end mill cases.	Check and control the state of case return and the number of collected cases.	30,000 cases were collected.	0	9			
	Promote recycling of cases for overseas shipments.	Continuous collection and monitoring of cases from existing partners	Continuous collection and monitoring	0	9			
Resource Saving	Develop longer service life tools.	Development of two types of new long life tools	Development of two types of new long life tools	0	-			
		Development of one type of new coating material for cutting tools	Development of one type of new coating material for cutting tools	0	-			
		Development and improvement of one type of manufacturing system for long life tools	Development and improvement of one type of manufacturing system for long life tools	0	-			
[Ev	[Evaluation] \textcircled{O} : Exceeded the target. \bigcirc : Achieved the target. \triangle : Almost achieved the target. \times : Not achieved the target.							

*1: "Electrical power consumption rate (kWh per 1,000 pieces)"

= "Electrical power consumption (kWh)" / "Number of cutting tools produced (1,000 pieces)"

*2: "Per-product energy consumption (kL/piece)"

= "Crude oil equivalent energy usage (kL)" / "Number of cutting tools produced (pieces)"

Energy Saving

In FY2015, each factory promoted energy saving activities by setting the goal of reducing electric power consumption rate by 1% from FY2014. As a result, Nagaoka Factory achieved about 1.5% reduction of electric power consumption from FY2014. Also, Mitsuke Factory reduced it by about 1.7% compared with the previous year. Thus, the goal has been achieved in both factories.

As a measure improvement, the lighting apparatuses used in both factories have been divided by area and replaced with LED lights. This replacement has brought about 16,000 kWh of electric power saving. Other measures include introduction of high-efficiency compressors, which resulted in great reduction of energy consumption.

In addition, the heat barrier films have been attached to some west windows in factory buildings, where manufacturing equipment is installed. That is effective in preventing the rise in temperature inside the factory, which was greatly affected by the late afternoon sun.

Since the heat barrier films have proven to be effective, we will more widely use them at necessary places.

Also, we will continue various kinds of energy saving activities, ranging from small-scale measures taken by each group to such a larger-scale measures as renewal of manufacturing equipment that will greatly contribute to energy saving in factories.



▲ Replaced LED lights

Target "cutting 1% of electrical power consumption rate from that of FY2014" vs Achievements



Achievements compared with FY2014 electrical power consumption rate, which is regarded as 100%

♦Green Curtain

In Nagaoka Factory, the Green Curtain was made with bitter gourd)to prevent the rise in temperature inside the factory, which was greatly affected by the late afternoon sun especially in the summer. The 40 pieces of nursery plants of goya planted in the planter rapidly grew up to cover the 8 m high wall in three months, and the green leaves control the rise of temperature of the factory building walls even during daytime.

Despite the strong sunshine in the summer, goya grew up thrivingly to reach the roof of the building, providing not only the Green Curtain effect, but also dainty berries and comforting environment to the employees.



▲ Three months later

< bitter gourd growth process>



▲ First day



▲ One month later



▲ Two months later



▲ Collected berries of bitter gourd

Gaining our customers' kind cooperation, we have promoted recycling or reuse of drills, drill cases and packaging materials for the purposes of resource saving and waste reduction.

Promotion of recycling of packaging materials

For promoting recycling of packaging materials, we use returnable containers, instead of cardboard boxes, for shipments of some products. In FY2015, we made efforts to increase the returnable container usage rate to 100% for those products. By securing sufficient number of returnable containers, while developing and operating an inventory monitoring tool, we were able to maintain the 100% usage rate throughout the year. At the same time, the cardboard purchase cost has been continuously reduced since we first set the numerical goal of the increased use of returnable containers. We will continue to promote this activity to achieve the maximum levels of resource saving and waste reduction, which are our original objectives.





♦ Promotion of recycling of drill cases for overseas shipments

It has been more than 15 years since we started the drill case recycling activity. During expansion of the range of this activity also covering overseas shipments, there seems to be a possibility that too much emphasis on increasing the number of recycled cases in the conventional manner might increase the environmental burden. For that reason, we controlled and monitored the collection volume and frequency in the conventional manner in FY2015 to analyze the status quo. As a result, we have found that the activity can be improved. From now on, we will place more emphasis on the reduction of environmental burden, such as resource and energy, through more efficient recycling activities (also covering transportation) without sticking to the conventional way.

Promotion of recycling of end mill cases

Since FY2014, we have promoted the use of a wide variety of end mill cases and a 5-piece clear case. In FY2015, we checked and controlled the case return and the collection volume. For products delivered with those cases, we set numerical goals for further promotion of this activity more practically. We will continue to implement our action plan for widespread use of those cases.

Through close communications with customers, we will make efforts to promote those recycling activities.

Creen Procurement

In order to provide eco-friendly and less environmental load products to our customers, it is necessary to use eco-friendly materials and parts aggressively. For that purpose, while conforming to European RoHS Directive and other international chemical-related regulations, we have established our own Green Procurement Guideline, which we follow when conducting material procurement, to ensure the reliability of our products to customers.

For environmentally hazardous substances in our products, our Engineering Design and Material Purchase departments, as well as the relevant suppliers, have investigated and clarified the contents of those substances contained in the materials, parts and packaging materials for our cutting tools and linear motion bearings.



▲ ULF coated drills

And we have already eliminated the lead (Pb) contained in the conventional insertion type PCB Drills.

We will always try to minimize the environmental burden throughout the entire product life cycle from production, use and disposal. Therefore, kind understanding and cooperation of our customers and partners on this matter would be much appreciated.

Ecological education

Any business activities inevitably give some impacts on the environment. With this taken into account, the eco-management department in our factories provides the employees with the environment-related education and training to raise their awareness and knowledge level regarding environment.

For example, in a "specialized education" course, which is one the four categories of the environmental education, the eco-management department staff provides necessary knowledge about the relevant regulations and technologies to the workers who are engaged in the work that may cause environmental impacts in our factories. The participants of this training program take confirmation tests, and after a certain period of on-the-job training, they acquire an in-house qualification that allows them to perform the relevant operations.

Example: Washing operations and the related in-house qualification



♦AED Seminar

AED stands for Automated External Defibrillator.

We have installed AEDs since 2008. In FY2015, we held a seminar at Nagaoka and Mitsuke factories, to provide a skill practice to aid men of the in-house fire fighting team and representatives from respective departments. Nowadays AEDs are installed in various places, such as public and commercial facilities, where many people gather. Therefore, the participants took a training to prepare themselves for "unexpected situations" occurring not only in their workplaces, but also in any other places.



▲ Training with a mannequin



▲ AED training

◆Traffic safety education

More than 90% of employees working at Nagaoka Factory use their private cars to go to work. In FY2015, we invited a local police officer as a lecturer to give a traffic safety seminar to all of the employees. At the lecture, they learned the importance of seat belts and the actual cases of accidents that often occur. And as an activity to increase the awareness of traffic accidents, they are instructed to check whether their colleagues properly use their seat belts when they come to work. Also, they experienced risk anticipation and driving fitness tests through driving simulator, with the cooperation of the local police office.



▲ Traffic safety seminar



▲ Driving simulator

♦Forklift training

In our factory site, workers sometimes perform forklift operations. Although those workers are qualified and well experienced through daily operations, there is a possibility that a dangerous situation will occur when they lose a sense of tension due to the routine operations. For that reason, we invited a lecturer from a forklift manufacturer to hold a seminar on safe and efficient operations of forklifts in FY2015. The seminar consisted of classroom lecture and skill practice. During the classroom lecture, participants learned the principles and systems based on the relevant regulation, as well as potential risks during operation. During the skill practice, they reconfirmed the basic operations and check procedure. Since some workers acquired the qualification many years ago, it was a good opportunity for them to renew the awareness of the importance of safe operations.



▲ Skill practice

Topics

Won JSME (Hokuriku Shin-etsu branch) Technology Award (Mar. 7, 2015)

UNION TOOL has received "(The 19th) Technology Award 2014" from The Japan Society of Mechanical Engineers (Hokuriku Shin-etsu branch) for the development of diamond coated end mills "UDCBF Series".

The flute design, improved coating material, and special cutting edge treatment have realized both longer tool life and higher milling quality. Its contribution to the industrial development through the achievements of low-cost milling of cemented carbide and quick delivery has been highly evaluated.



▲ Award plaque

Cleaning Campaign

We conduct "Cleaning Campaign" under the initiative of our employees & their families in Nagaoka and Mitsuke Factories. This is an activity to show our employees' and their families' gratitude toward the regional society by picking up garbage and cutting grass around the factories. This program is conducted every spring and autumn, but in FY2015, the spring program was canceled due to bad weather. Therefore, the children participated in the autumn program seemed to work harder than usual. This activity also contributes to the improvement of employees' awareness of environmental cleanliness.







Mitsuke Factory



▲ The truck is full of grass.



▲ Participants from Mitsuke Factory

▲ Participants from Nagaoka Factory

♦Illumination service

On Christmas, employees of Nagaoka Factory provide the illumination service based on their own design and decoration. In 2015, a phoenix flying in the winter sky was newly added to the regular decoration, such as a big tree, tunnel, and heart-shaped mascot character for our heartbeat sensor. Also, a heart picture-taking spot, lighting poles (showing various views at different angles), and other new items were added in the illumination layout design.

The illumination service was started for pleasure of our employees in 1995, and it was the 21th anniversary in 2015. Now it is also well appreciated by the local residents.

About 30,000 pieces of LEDs are used for decoration, with the environmental friendliness taken into account.



▲ Overview of illumination

▲ Heart-shaped mascot character

▲ Phoenix

◆Ikuyo Nakamichi Piano Recital

As part of our "MECENAT" program (corporate philanthropy) to support the promotion of artistic/cultural activities, we regularly hold a piano recital by inviting Ms. Ikuyo Nakamichi, whom we officially sponsor. Since 2002, we have organized "UNION TOOL Classic Program" every year in Nagaoka-shi (Niigata prefecture), where we have our main factory, and in 2015, it was the 18th recital. The 2015 program was "Duo Concert by Ikuyo Nakamichi & Tamaki Kawakubo", offering precious duo of international top artists, with the blissful harmony of piano and elegant violin.

The piano recital by Ms. Ikuyo Nakamichi is also held in Tokyo, where we have our head office. We hope we can show our gratitude to our customers through such a program.

Ikuyo Nakamichi official website: <u>http://www.ikuyo-nakamichi.com/</u> Nagaoka Lyric Hall website: <u>http://www.nagaoka-caf.or.jp/</u>



▲ Poster of Nagaoka Recital



In 2015, the UNION TOOL Classic Program was certified by Association for Corporate Support of the Arts as "This is MECENAT", which indicates an excellent artistic activity conducted by a private organization.

MECENAT is an activity to realize a richly creative society by promoting arts and culture.

"This is MECENAT" is a movement started in 2014 to deepen understanding and appreciation of activities that promote arts and culture in various places through the mechanisms focusing on support activities by corporations and other organizations.

Association for Corporate Support of the Arts website: <u>http://mecenat-mark.org/archives/252</u>

◆Academic support activities

Public interest incorporated foundation:

UNION TOOL Scholarship Foundation

We have established a scholarship program to foster high potential personnel. It is for science and engineering majored students in Niigata, where Nagaoka Factory is located. Also, we are running "Science and Technology Research Grant System" mainly for laboratories of universities of science and technology in Niigata Prefecture to support advanced technology research activities and contribute to the industrial development.

* We conduct this activity through UNION TOOL Scholarship Foundation. UNION TOOL Scholarship Foundation website: <u>http://www.uniontool.co.jp/scholarship/index.html</u>



With regard to the objectives and targets for FY2016, we will further promote energy saving in each factory based on the mid and long term goal, which is a 5% reduction of electricity (energy) consumption rate from the FY2014 results within five years.

For recycling, we will carefully analyze and improve the current state of drill case collection and reuse to find the most efficient and effective way of recycling.

For resource saving, we will continue to develop longer-life and higher-performance cutting tools not only to meet the customers' quality requirements, but also to contribute to environmental protection.

Item	Actions	FY2016 Targets	
Energy Souring	Cut 5% of electrical power consumption rate (*1) by FY2019 from that of FY2014. [Nagaoka Factory]	Cut 1% of electrical power consumption rate from that of FY2015.	
Energy Saving	Cut 5% of per-product energy consumption (*2) by FY2019 from that of FY2014. [Mitsuke Factory]	Cut 1% of electrical power consumption rate from that of FY2015.	
Degualing	Promote recycling of drill cases.	Optimize the drill case collection activity.	
Recycling	Promote recycling of end mill cases.	Check and control the collection volume of end mill cases.	
		Development of two types of new long life tools	
Resource Saving	Develop longer service life tools.	Development of one type of new coating material for cutting tools	
		Development and improvement of one type of manufacturing system for long life tools	

FY2016 Environmental Objectives & Targets

*1: "Electrical power consumption rate (kWh per 1,000 pieces)"

= "Electrical power consumption (kWh)" / "Number of cutting tools produced (1,000 pieces)"

*2: "Per-product energy consumption (kL/piece)"

= "Crude oil equivalent energy usage (kL)" / "Number of cutting tools produced (pieces)"

Environmental Accounting

FY2015 Environmental Accounting Results

- Scope: Nagaoka Factory and Mitsuke Factory of UNION TOOL CO.
- Accounting period: FY2015 (Dec. 2014 to Dec. 2015)
- * Due to alteration of accounting year, FY2015 is calculated to consist of 13 months.

Environment Protection Cost (Unit: million yen)



* The amount of investment is fully depreciated within the investment year because it is difficult to calculate the period in which the investment effect becomes apparent. (Also, the purchase costs of some components used in our originally developed manufacturing equipment are not included in the above.)

◆Economic Effect of Environment Prevention Activities (Unit: million yen)

Item	Amount	Major activities and effects
Profit	64.52	Sales profits of assets through recycling
Cost saving	-8.88	Reduction of case purchase cost through recycling of drill cases
Total	55.64	





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For any questions about this report, contact the following.

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Issue Date: April 2016 Next Issue: April 2017

* This report is mainly based on the data collected in FY2015 (Dec. 2014 to Dec. 2015).

- * Due to alteration of accounting year, FY2015 is calculated to consist of 13 months (from Dec. 2014 to Dec. 2015). Accordingly, some data may be based on the computation period of 13 months.
- * Also, some data indicate combined values of Nagaoka and Mitsuke factories.
 In addition, for the updating purpose, this report may contain information collected after December 2015.