



Tungaloy Environmental Report 2017



Tungaloy Corporation

Message

In September 2015, an international standard on environmental management system, the ISO14001 was revised and the revised ISO14001 has been encouraging the environmental conservation activities to be more integrated with the business activities and achieve actual results. Tungaloy has been identifying and promoting not only the activities to reduce environmental toxins but also the activities beneficial to the environment through normal businesses from a few years ago. Through our efforts to organize and clarify the linkage between our conventional activities and the environmental management system, we made a successful shift to the new standard in October 2016. Although small issues still remain, we will continuously improve and implement the activities to make them fruitful.

In 2016, various disasters occurred. In the Kumamoto Earthquakes which registered 7 on the Japanese seismic scale two times, we faced the merciless and enormity of natural power when we looked at the ground clearly showing that it was moved. Earthquakes with the intensity of lower 6 on the Japanese seismic scale also occurred in Hokkaido, Tottori and Ibaraki, and in an earthquake off the coast of Fukushima whose intensity was lower 5; however, a tsunami of over 1m was observed. Typhoons took unprecedented paths and some typhoons consecutively hit Hokkaido to wash away several bridges. In other countries, massive earthquakes and abnormally high temperatures occurred. We send our condolences to people who lost necessities of life and bereaved families by the disasters and pray for them to recover peaceful days without a moment's delay.

According to the report issued by a UN body last year, the highest global warming, greenhouse effect gas concentration and sea level in the observation history was recorded. Under the circumstances, the Paris Agreement, a new international framework to fight global warming, came into force in November. The early achieving of the number of ratifying countries required

for the effectuation and the effectuation less than a year after the adoption represent the sense of danger felt by people who acknowledge that the current situation has to be changed. As we have been receiving inquiries not only in Japan but also from overseas about the management status of business activities across our supply chain and about the business continuity in the event of a disaster, we have recognized that people have been increasingly more conscious that they should cooperate each other and protect the society even in a tough time. We have been preparing by launching the Tungaloy Business Continuity Plan to protect our business and employment and contribute to the reconstruction in the region.

Our company acquired ISO14001 in 1997, an industry first for the cemented carbide tool manufacturing industry in Japan, and this year marks the 20th anniversary. As a company existing in the globe and for always being Tungaloy brand which can respond to customer's expectations and safety, we will continue and promote our environmental conservation activities within the Tungaloy group including domestic offices, sales offices and affiliated companies in overseas.

This report outlines the environmental conservation activities carried out by the Tungaloy group in 2016. Your kind understanding and honest opinion would be very much appreciated.

April 2017
President & CEO
Tungaloy Corporation
Satoshi Kinoshita



Tungaloy's Policy (Quality / Environment)

Tungaloy is an international company that contributes to the development of industry, local communities and society by producing cemented carbide tools as well as by providing technical service based on excellent material technology.

Tungaloy develops new state-of-the-art products and technology with consideration for environment and provides a high quality product with short delivery time in order to contribute to the manufacturing of customers.

Tungaloy operates business activities based on law-abiding spirit and preservation of global environment and aims for enhancing the company's value while continued growth.

Tungaloy regards the workplace as a place for personal growth and each employee strives for self-sustaining growth with pride and responsibility.

Tungaloy will fully stand behind its commitments in the communication between Tungaloy and customers.

Tungaloy is committed to continually improve the effectiveness of both the quality control system and the environmental control system according to AS 9100, ISO 9001 and ISO 14001, while upholding all international standards, laws, regulations and agreements regarding quality control & environmental control subjects.

Tungaloy views product quality and environmental protection as important as ensuring company's success and profit.

Tungaloy will convey the policy to the employees and to the relevant factors.

Tungaloy will address the following in order to realize the policy:

- Educating and qualifying employees as necessary to meet product quality standards and environmental standards.
- Supervising inspection method, production method and control method in all stages of processes in order to continue the improvement.
- Not only trying our best to improve business activities that affect environment but also preventing an accident and contamination for a new change, aiming to improve our environmental performance.
- In addition to working on energy and resource saving, promoting Reduce, Reuse and Recycle to create recycling society and continuing zero-emission, aiming to utilize sustainable resources.
- For substances that burden environment, applying alternate technology and switching to alternative substance as much as possible. Thoroughly controlling substances that cannot be switched to alternative substance for its use.
- Creating among employees a strong sense of recognition that each employee is responsible for the process/product he/she is in charge of as well as Tungaloy owes preservation of global environment as corporate responsibility.
- Tungaloy's management will provide the necessary human resources and equipment and will make them available.
- Tungaloy's management will place objectives in areas of quality and environmental control accompanied by measurable criteria, will monitor them to evaluate their level of success and will audit/evaluate regularly.

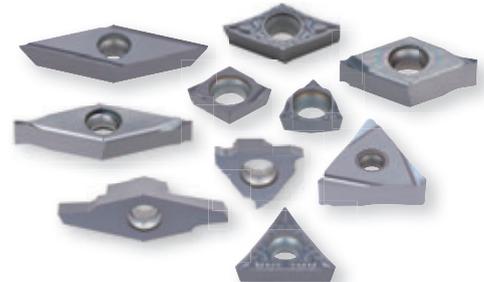
Introduction of Environment-conscious Products

Tungaloy develops and releases many new products every year. We implement evaluation based on the industry standard, “the Japan Cutting & Wear-resistant Tool Association Standard for Environment-Conscious Products” for all of our products and we well the products that comply with the standard.

AH8000 SERIES



SH725



DEEPT^{RI} DRILL



T515



Environment-conscious Products approved by the Japan Cutting & Wear-resistant Tool Association

Approved products of Tungaloy Corporation	Evaluation result	Approval No.	Features
New PVD grade for heat-resistant alloy turning: AH8000 series	★★	2016-014	The multi-layered coating with high Al content provided by the new PVD coating technology has ensured strong wear resistance. The new series cover a wider application range in heat-resistant alloy turning from finishing to medium cutting, providing stability and longer tool life.
New PVD grade for small-part machining: SH725	★★	2016-013	The adhesion strength of coating layer has been significantly improved to ensure both hardness of layer and cutting edge sharpness. Even with the sharp edge, the new general-purpose grade can prevent abrasion and ensure superior wear resistance for many cutting materials in small-part machining.
Indexable gundrill: DeepTri-Drill	★★★	2015-028	The same level of roundness, straightness and finished surface roughness as brazed gun drills are provided because of the optimized positioning of the cutting edge and the guide pad. The insert is coated and has the three-corner specification with chip splitters, and this allows longer life and high-feed and high-efficiency processing.
New CVD-coated grade for cast iron turning: T515	★★	2015-026	The adhesion strength between the substrate and coating layer has been improved by adopting new substrate and new coating. Also, with the coating thickness as it is, the thickness of Al ₂ O ₃ layer has been increased by 1.7 times. Furthermore, with the special surface treatment technology, it provides excellent wear resistance and strong resistance to chipping to fully exercise its performance especially in the high-speed machining of cast iron.
HOLDERS for high pressure coolant: TungTurn-Jet	★★★	2015-025	It supplies high pressure coolant from two directions and provides excellent chip control. It is particularly effective for titanium materials and other heat-resistant alloys that easily cause winding of chips. The excellent cooling effect allows an increase in the machining speed and a longer insert life even under normal coolant pressure.
New general-purpose PVD grade for milling operations: AH3135	★★★	2015-021	The special multi-layered coating and the unique substrate has reduced the progress of cracks inside the coating and thermal cracks that can cause damage and also significantly improved chipping resistance and fracture resistance. The new general-purpose grade achieves stable long tool life for steel and stainless steel machining.

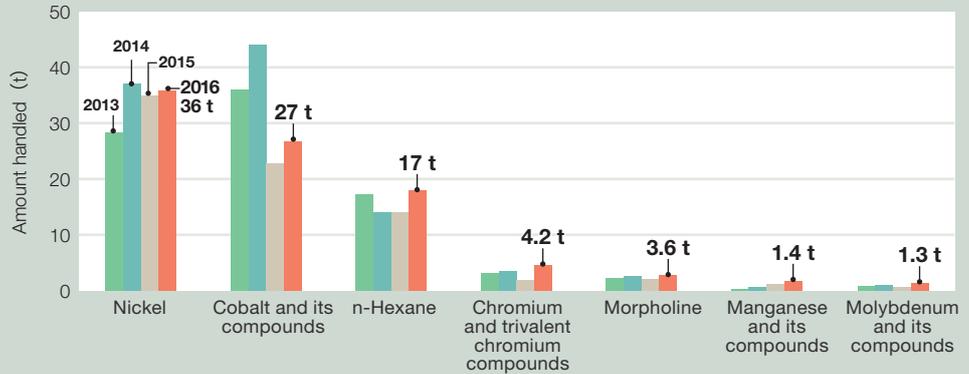
Environmental Conservation Activities by Tungaloy

Management of Chemical Substances

Chemical substances may cause harmful effects on the ecosystem and the human race. To prevent the leakage of these chemical substances to the environment, we aim to totally abolish the use of the harmful substances or replace them with alternatives, while implementing thorough management of the specified harmful substances.

Status of handling of PRTR Law-related substances

In 2016, we handled 9 substances more than 0.1 t in the year, among the 462 substances specified by the PRTR Law. Substance more than 1 t is the seven substances shown in the graph. n-Hexane and morpholine are solvent and others are raw materials.



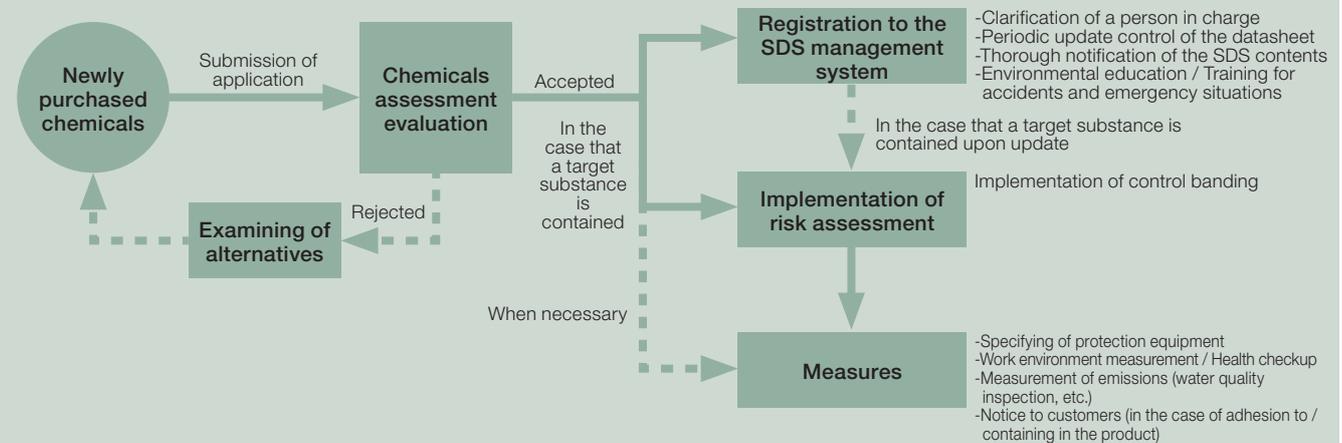
Assessment

We have been continually performing assessments for new buildings, facilities, and chemical substances prior to the implementation to avoid risks.

As for newly purchased chemicals, we implement measures and call attentions as needed in addition to the periodic collection of datasheets after assessment evaluations. We reject the adoption

according to the risk level and the difficulty of the measure and examine alternatives in some cases.

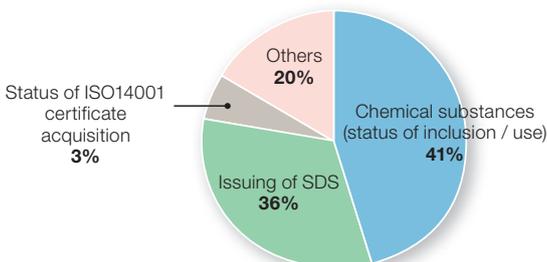
We have established and have been operating a new management system for the risk assessment on chemical substances under the revised Industrial Safety and Health Act which entered into force in June 2016.



External Communication

To enhance mutual understanding with stakeholders surrounding Tungaloy (local residents, employees, customers, suppliers, stock-holders, etc.), we are carrying out the activities to coexist with local communities.

Inquiries from stakeholders



2016



Iwaki Head Quarter

We carry out volunteer activities to organize street trees in the industrial park.



Nagoya Campus

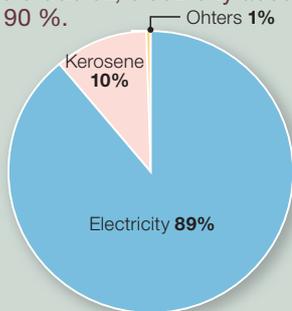
We participated in the garbage cleanup campaign in Nishshin city.

Energy Conservation Activities

Energy used by Tungaloy consists of electricity (about 90 %), kerosene (about 10 %).

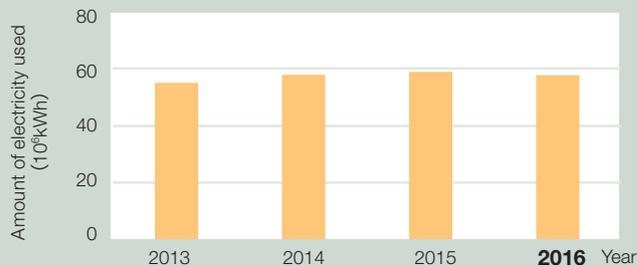
Ratio of energy used

When energy used is compared by the type by converting the amount into crude oil, electricity accounts for approximately 90 %.



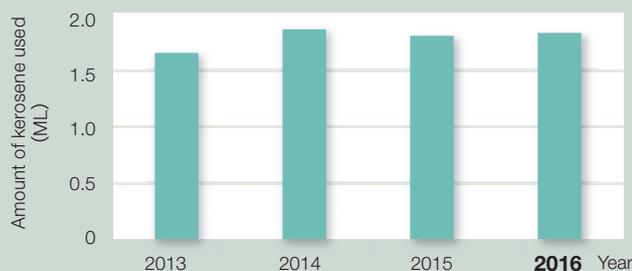
Amount of electricity used (at plants)

Compared with 2015, it decreased about 3 %.



Amount of kerosene used

Compared with 2015, it increased about 2 %.



Promotion of the conversion to LED lighting

The ratio of amount of electricity used for lighting out of the total amount of electricity used in Tungaloy is not big; however, we have fully converted the mercury lamps in the Buildings No.8 to 10 of Iwaki Head Quarter to LED lighting as a energy conservation promotion measure and a response to the concern over the future restriction on the use under "the Minamata Convention on Mercury". The amount of electricity used for lighting at the buildings after the conversion has reduced by approximately 50%. We have a plan to implement the conversion in remaining buildings and other plants, and also implement the conversion of fluorescent lamps in the future.

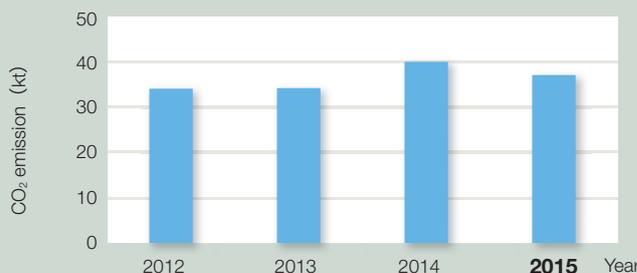


Global Warming Prevention

Tungaloy too aims to prevent the global warming by reducing CO₂ emissions through energy-saving activity.

CO₂ emission

Compared with 2014, it decreased about 4%. As the emission reduction in consumption rate has been achieved consecutively since 2012, we received the Environmental Special Award from Japan Cutting & Wear-resistant Tool Association which is an industrial association.



Yamato Campus

We participated in the preparation for the Nakayama gland Japanese wisteria flower festival in Yanagawa city.



Nagoya Campus

We participated in the exhibition at the Nisshin Wai-Wai Festival held by Nisshin city.



Kyushu Campus

We participated in a local summer festival and interacted with local people.



Materials & Components Division

We provide plant tours for local schools.

Formulating of the T-BCP

The Great East Japan Earthquake in 2011 caused damage to Iwaki Head Quarter and other Tungaloy facilities and occasionally stopped or delayed the business activities; however, our business activities have recovered and significantly exceeded the former business activity scale. We hope that we will protect the employment and trust from our customers and contribute to the reconstruction and development in the region by protecting the lives and good

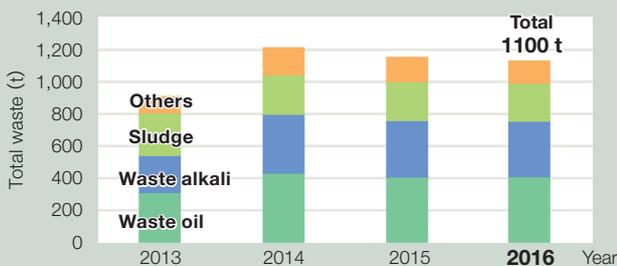
health of employees and their families and by continuing our business, even in a future disaster. In 2016, we have launched the Tungaloy Business Continuity Plan; T-BCP. To be able to continue our business in an emergency, we have been implementing measures for further promotion of disaster prevention activities including stocking of disaster supplies, first at Iwaki Head Quarter where the main plant is located.

Waste and Recycling

We promote proper segregation of waste and recycling. Since 2004, we have been keeping “the ratio of landfill disposal rate to the total waste less than 1 % (Zero Emission)”.

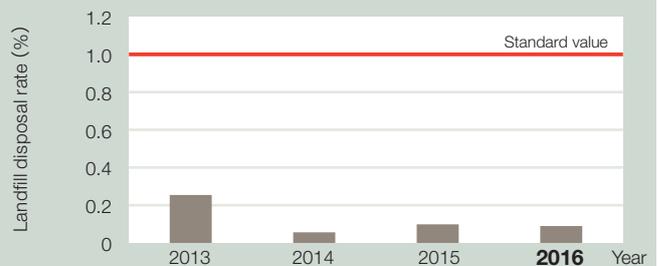
Total waste

Compared with 2015, total waste decreased about 1 %. Although total waste was increased in 2014 due to expansion of the scale of Kyushu Campus and the increased production at Iwaki Campus, it was slightly decreased in 2016.



Landfill disposal rate

It was 0.06 % in 2016.



Visit to our waste disposal contractor

We visit our waste disposal contractor on a regular basis to check the disposal status and ensure the compliance.



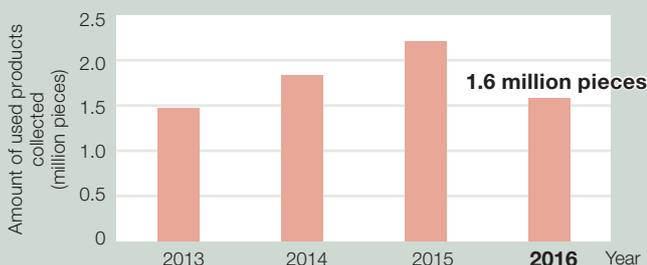
Collection of used products

Measures have been taken for the recycling of used products and packaging materials. The activities have been strengthened by the measures including opening of a special website for collecting products in November, 2014. (The collecting service of the used products is available only in Japan.)



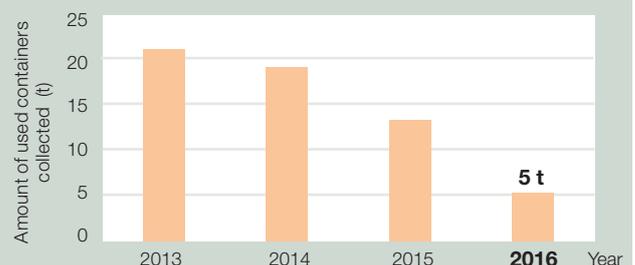
Recycling of used products

Compared with 2015, the amount of used products collected decreased about 26 %.



Recycling of used containers

Compared with 2015, the amount of used containers collected decreased about 60 %. As common plastic or corrugated containers are used, it seems that recycling by customers has become a main stream.



Environmental Education

Environmental education and training for accidents and emergency situations are provided to all employees to continuously improve the environmental conservation activities.



Environmental education is provided to have each and every employee become aware of what influence is caused on the environment by Tungaloy's businesses and the employee's work, or of how the environmental change affects our business or work including the good and bad aspects.



Periodic education is provided to the Internal Environmental Auditor. After the revision of the ISO14001 in 2015, education to cover the differences was provided.



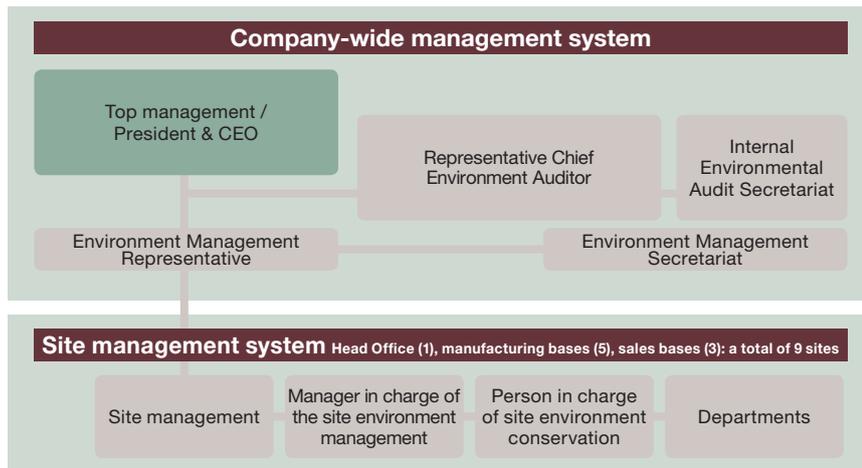
Trainings are held by setting accidents assumed for each facility and equipment owned. Procedures to stop or replace in case of malfunction of a valve of the wastewater treatment facilities are confirmed.



We also used actual measurement instruments and materials for collecting leaked substance as much as possible. After training, we discuss whether it was easy to take out, use, etc.

Environment Conservation System

Tungaloy has been promoting the management system for systematically improving and understanding the influence of our corporate activities and products on the environment.



Acquired the revised standard certification.

Tungaloy Corporation
EC97J1123
ISO 14001:2015 / JIS Q 14001:2015

	Site information	Business operations				Acquisition of ISO14001
		Headquarters function	Production control / Purchasing	Development / Design	Production Marketing / Sales	
Manufacturing bases	Headquarters 11-1 Yoshima-Kogyodanchi, Iwaki, Fukushima	●		●	●	Dec. 1999 Moved to Iwaki in Mar. 2010
	Iwaki Head Quarter 11-1 Yoshima-Kogyodanchi, Iwaki, Fukushima		●	●	●	Nov. 1997
	Materials & Components Division 114 Kamiyo-Higashiwari, Okusa-machi, Nirasaki, Yamanashi		●	●	●	Dec. 1998
	Nagoya Campus 77-1 Chaen, Asada-cho, Nisshin, Aichi		●		●	Dec. 1999
	Kyushu Campus 3-7-57 Miyanojin, Kurume, Fukuoka				●	Dec. 1999
Sales bases	Yamato Campus 193 Nakayama, Mitsuhashi-machi, Yanagawa, Fukuoka				●	Oct. 2005
	Shin-Yokohama Office (Tokyo Regional Branch) Yusen Shin-Yokohama 1Chome Bldg., 1-7-9 Shin-Yokohama, Kohoku-ku, Yokohama, Kanagawa				●	Dec. 1999
	Nagoya Regional Branch 77-1 Chaen, Asada-cho, Nisshin, Aichi				●	Dec. 1999
	Osaka Regional Branch 2-1-1 Edobori, Nishi-ku, Osaka				●	Dec. 1999



Iwaki Head Quarter



Nagoya Campus



Kyushu Campus



Tungaloy Corporation

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