



ENVIRONMENTAL REPORT 2019

DIGEST VERSION

For the year ended December 31, 2019

Foreword

Environmental protection activities

The Star Micronics Group fuses advanced software with precision processing technologies to maximize customer satisfaction. By distributing the added value so created, the Group strives to become a global niche enterprise that serves the interests of all stakeholders.

The environment surrounding the Group is changing rapidly due to advances in digital technology and changes in global conditions. In such an environment, the Star Micronics Group contributes to society through innovative actions with the aim of improving profitability, based on the premise of having unshakeable respect for people and always placing the customer first. To achieve our goals, the Group focuses on health and strives to create a safe, hygienic, and comfortable work environment so that employees can fully utilize their abilities.

Environmental concerns grow more serious with each passing year. The Star Micronics Group regards these concerns as a management issue of great significance. By creating new value in step with today's needs, we believe that we can contribute to efforts to protect the global environment. Accordingly, the Group is working hard to establish environmentally friendly manufacturing to support a sustainable society.

The Group will continually strive to realize a sustainable society. We look forward to your continued support.



April 2020
Mamoru Sato
Representative Director,
President and CEO



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Range covered: Domestic Company offices (total of 3 locations), Subsidiaries (total of 2 companies).
Overseas Subsidiary (1 key production site).

Period: The year "2019" represents period from January 1, 2019 to December 31, 2019.

Environmental management

Correspondence to ISO14001

While promoting the acquisition of ISO14001 certification, we moved some of our sites to self-declaration. We will continue to promote environment-friendly business activities based on our environmental policy, including our affiliates sites that have shifted to a self-conformance declaration.

Domestic

Company factories / Offices

General Administration Headquarters Technical Center	Head Office	Acquired September 2001 (Self-conformance declaration: September 2010)
Special Products Division	Head Office / Quality Technical Center	Acquired March 2001 (Self-conformance declaration: September 2018)
Precision Products Division	Fujimi Factory	Acquired February 2002
Machine Tools Division	Kikugawa Factory	Acquired March 2002

Subsidiaries

Star Metal Company	Manufacturing Department	Kikugawa Factory	Acquired April 2006
	Sheet Metal Department		Acquired March 2007
Micro Sapporo Company			Acquired March 2007

Overseas

Subsidiary (Key production site)

Star Micronics Manufacturing Dalian Co., Ltd. (Dalian, China)	Acquired May 2002
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Environmental audits

Internal environmental audits

Internal environmental audits are conducted regularly each year at domestic factories to confirm that environmental management systems are adequate and effective, and that environmental management programs are appropriate and legally compliant.

We also conduct skills enhancement seminars for internal environmental auditors to improve the expertise of people conducting internal audits.

A comprehensive environmental audit report is created listing items that fall below the expected standards, and the report is submitted to management as data for use in compiling the end-of-year environmental review. Thus audits contribute to improvements in the following year.



Training for auditors

External environmental audits

Domestic factories that have acquired ISO14001 certification are subject to environmental audits (environmental management system inspection) by an external inspection authority. Certification maintenance inspections take place once a year, while renewal inspections are conducted every three years.

The results of these inspections are submitted to management as data for use in compiling the end-of-year environmental review, thereby contributing to improvements in the following year.



Conducting an environmental audit

Emergency response

Every year, We plan and conduct emergency-related training of relevant parties and disaster prevention drills, as well as simulation-based drills for individuals and entire facilities based on manuals, which are evaluated as part of the process. These drills anticipate every conceivable accident or emergency (earthquake, typhoon, explosion, fire, blackout, chemicals leak, and airborne hazard, etc.).



Firefighting drill

Environmental training

We believe that to maintain, and further improve, the level of our environmental activities, we need to change the mindset of every single employee. We therefore offer training opportunities for all employees from new hires to management. Training comprises four core categories: general, rank-based, leader-oriented, and specialist.

In 2019 (domestic), we conducted events such as an introductory environmental seminar, a seminar on the cultivation of internal auditors.

Environmental training structure

Training category	Personnel eligible	Internal / External seminars offered
General training	Regular employees	Introductory seminar, general seminar, waste products separation seminar
Rank-based training	Managers	Managers' seminar
	Top management	Top management seminar
Leader-oriented training	Environmental leaders	Environmental manual seminar (Including document management)
Specialist training	Environmental survey team	Environmental impact evaluation seminar
	Internal environmental auditors	Internal auditor development seminar (Internal/External) *
	Personnel in charge of environmental law	Environmental law seminar*
	Public-sector environmental experts	Qualification seminar/Test based on laws and regulations
	Personnel in charge of procurement	Green procurement seminar
	Personnel in charge of waste products	Waste products seminar
	Harmful substance handler	OJT by personnel with public-sector environmental qualifications
	Noise measurement personnel	OJT by certified internal environmental experts

*For the certified internal environmental experts

Public, environmental qualified person related to environment

Name of qualification	Number of persons qualified (Number of persons qualified in 2019)
Safety manager	5 (0)
Public health manager	15 (0)
Pollution prevention manager	5 (0)
Manager in charge of industrial waste requiring special management	14 (0)
Fire prevention manager	9 (0)
Promoter of energy management and planning	1 (0)
Dangerous substance handler	81 (0)
Manager in charge of handling of toxic and harmful substances	3 (0)
Manager in charge of X-ray operations	1 (0)
Manager in charge of organic solvent operations	27 (0)
Manager in charge of specific chemical substance operations	6 (0)

Status of legal compliance

Star Micronics have stipulated internal regulations for the application of environment-related laws, and compliance with these laws is evaluated in accordance with a list of specific items to be monitored and measured.

Legal compliance is confirmed by checking that results measured are in line with management figures, and the data is stored as an environmental record. When installing, introducing, changing, or disposing of facilities and equipment, we conduct an assessment of the facilities and equipment to evaluate legal compliance.

Environmental load associated with business activities

We use a variety of resources and energy during the process of conducting business activities. This results in the emission of CO₂ and the generation of waste products. We assess the environmental load associated with our activities and promotes activities to decrease environmental load by reducing the amount of energy consumed, waste products generated and decreasing the amount of hazardous materials used.

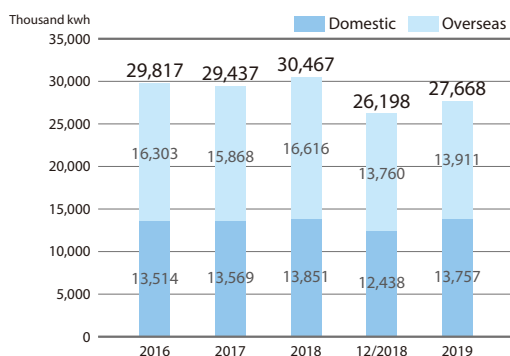
*Scope of analysis: Domestic (Star Micronics Co., Ltd.),

Overseas (Star Micronics Manufacturing Dalian Co., Ltd.; Star Micronics Manufacturing (Thailand) Co., Ltd.)

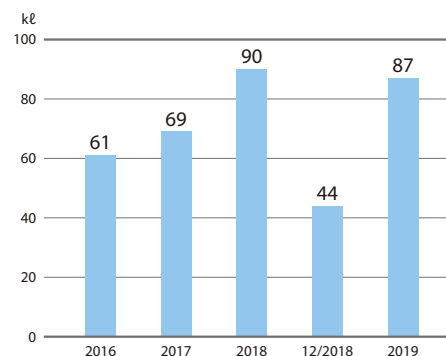
Note: 12/2018 is a 10-month summary from March to December.

Change in input amount (Major items)

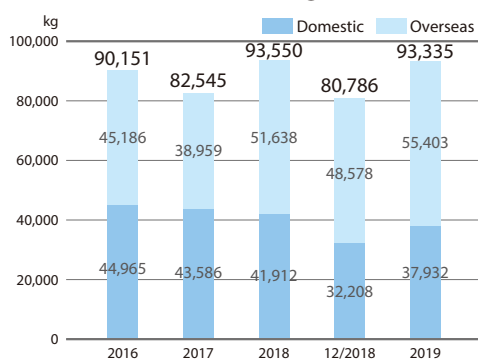
Electricity usage



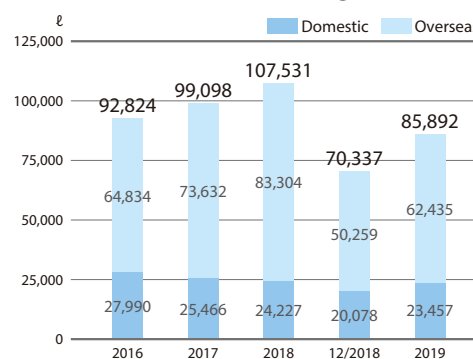
Heavy Oil usage (Domestic)



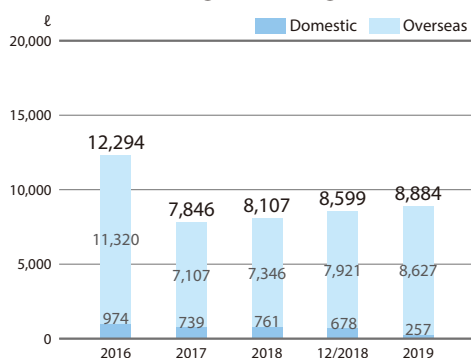
LPG usage



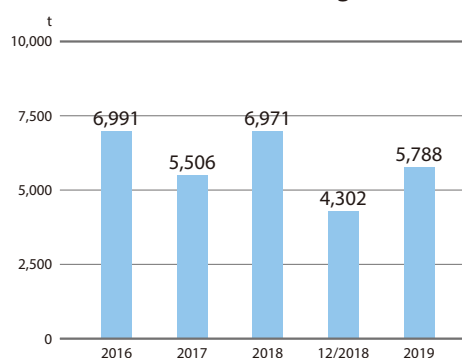
Gasoline usage



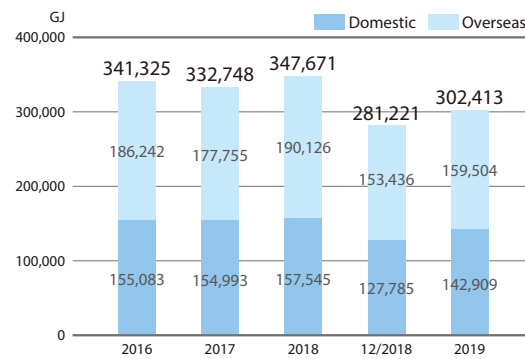
Light Oil usage



Amount of Steam usage (Overseas)

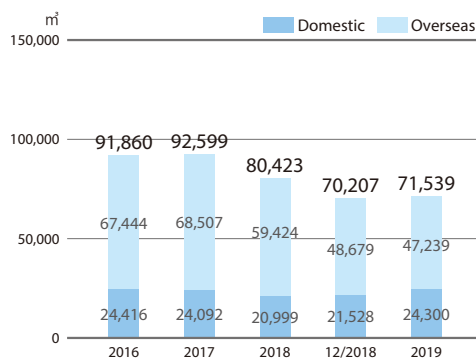


Total amount of energy used

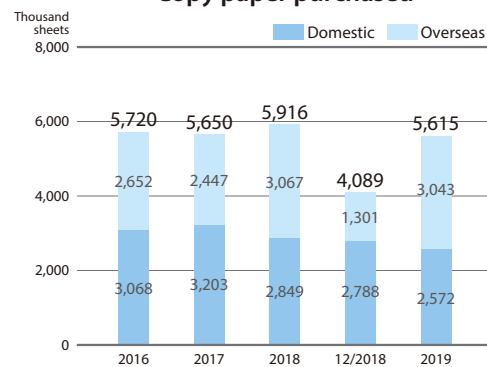


Note: Domestic conversion factors are used when calculating overseas energy.

Water usage

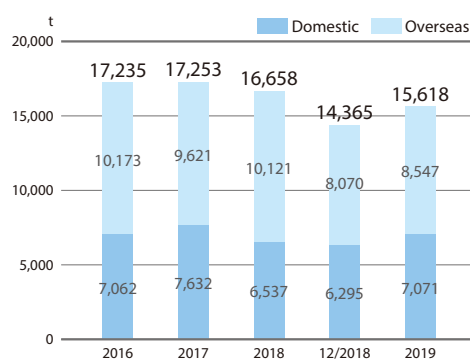


Copy paper purchased

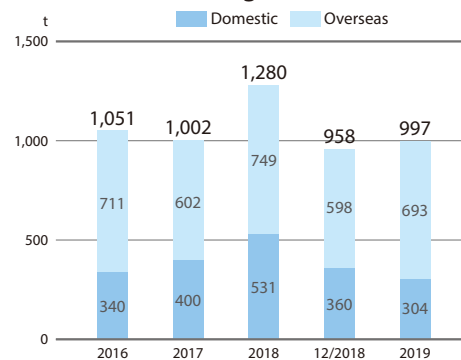


Change in discharge amount (Major items)

CO₂ emissions



Waste generated



Environmental accounting

Environmental protection costs

(Thousands of yen)

Category		Initiatives	Domestic		Overseas	
			Investment	Expenses	Investment	Expenses
Costs within business area	Pollution prevention cost	Prevention of air/water/ground contamination	0	6,423	0	1,445
	Environmental preservation cost	Energy conservation	0	1,291	0	414
	Resource recycling cost	Treatment/disposal of waste	0	20,087	0	4,406
Upstream/downstream cost		Green procurement difference	0	159	0	0
Management activity cost		EMS operation, education, on-site planting	0	22,938	0	2,598
Research & development cost		R&D, WEEE/RoHS measures	0	252	0	0
Social contribution cost		Donations, financial support	0	171	0	38
Environmental damage response cost		Repairs for ground/water contamination	0	0	0	0
Total			0	51,321	0	8,901

Note: Excludes depreciation expense.

Financial impact resulting from environmental protection measures

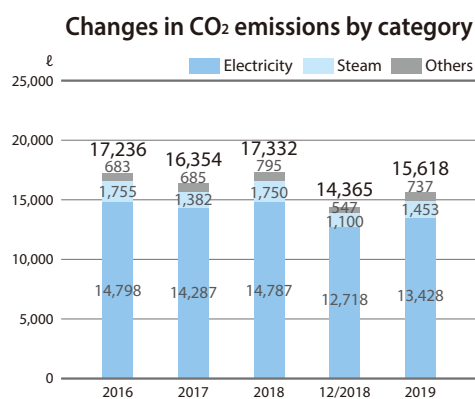
(Thousands of yen)

Category		Domestic	Overseas
Earnings	Gains from sales of marketable waste from business activities	7,213	16,983
Expense reductions (Year on year)	Total energy expense (electricity/heavy oil/LPG/gasoline/light oil) reductions	6,920	31,765
	Reductions in water/well water usage expense	- 1,072	711
	Reductions in copy paper purchase expense	498	253
	Reductions in waste disposal expense	8	- 2,618
	Others	0	0
Total		6,354	30,111

Energy saving actions to prevent global warming

We are taking a variety of actions to reduce the amount of energy consumed and is working to reduce CO₂ emissions amount.

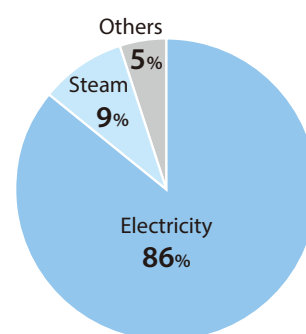
Changes in CO₂ emissions amount



Note: 12/2018 is a 10-month summary from March to December.

Breakdown of CO₂ emissions by category

(2019, domestic and overseas factories)



Less air conditioning

We lengthened our Cool Biz Campaign in accordance with lengthening of the period at the Ministry of the Environment.

Cool Biz Campaign

1. Period conducted: May 7 to the end of October
2. Air conditioning temperature: Set to 28°C
(Although the campaign does not apply to manufacturing and reception areas, these are included as much as possible.)
3. Attire: No neckties or uniforms are worn

Warm Biz Campaign

1. Period conducted: December 2 to the end of March
2. Heating temperature: Set to 22°C
3. Attire: Employees are encouraged to wear warm clothes

Information is posted at the entrances to each office and visitors are urged to cooperate.



Installation of solar power facilities

As part of environmental conservation actions, we installed solar power facilities on roofs of Kikugawa Factory and the factory at Star Metal Company. The two facilities provide a total output of 350 kilowatts. It has power generated 460 thousand kilowatt-hours in 2019. An amount equivalent to the power consumed by about 130 average households. All of the generated electricity is sold to Chubu Electric Power Co., Inc.



Solar power facility of Kikugawa Factory (Red flame)



Solar power facility of Star Metal Company (Red flame)

Efficient and power-saving light

At the Kikugawa Factory, the use of LEDs for mercury lamps has reduced power consumption by a factor of ten. At the Fujimi Factory, the power consumption is reduced to one-third by replacing the fluorescent lamps on the manufacturing site with LEDs.



LED lighting (Kikugawa Factory)



LED lighting (Fujimi Factory)

The number of company cars owned

In order to reduce the amount of CO₂ emissions by company cars, we have implemented the use of lightweight cars and hybrid cars.

(Number)				
Year \ Type of car	Ordinary cars	Mini cars	Hybrid cars	Total
2015	30	10	9	49
2016	29	10	9	48
2017	25	8	9	42
2018	19	5	8	32
2019	22	3	12	37

* The above number as of the end of December

No-Car Campaign

Every year, we hold a No-Car Campaign for employees who commute by car or motorcycle to offices within Shizuoka City. We implemented a 2-week No-Car Campaign in both spring and autumn of this year.

Implementation report

Enforcement period	March 18 - 29, October 15 - 25, 2019
Participants	43 Individuals
Eco-commute distance	1,545Km
CO ₂ reduced	525Kg (Calculated based on fuel consumption of 10 km/ℓ)

Response to the revised energy conservation act

As a business which is subject to the revised energy conservation act, we must reduce our energy consumption rate every year in the mid- to long-term. In response to this law, we have appointed an Energy Management Supervisor and an Energy Management Planner who fulfill a central role in energy conservation activities. We have also established an Energy Conservation Task Force and formulated compliance rules for promoting energy conservation to serve as guidelines. Through such measures, we are actively working to conserve energy.

Environmentally friendly manufacturing

Special Products Division

We offer a lineup of environmentally-friendly printers that achieve low power consumption. Furthermore, we are implementing initiatives such as the AllReceipts, an electronic receipt service which digitizes receipt data on the cloud to enable storage and reuse. For packaging, we use paper molded products (pulp mold) made from recycled waste paper such as newspapers and cardboard. We also reduce the amount of receipt paper used by equipping printers with a backfeed function that removes margins.

We are also working to support thermal paper which complies with rules for BPA*-free paper in Europe.

*BPA: Bisphenol A



Machine Tools Division

Development of SX-38, the Swiss-Type Automatic Lathe

The Star Micronics Group has developed the SX-38 as a new model of Swiss-type automatic lathe. The SX-38 has a gang-type tool post with a B-axis and a turret positioned facing each other, and is capable of processing workpieces with complicated shapes with a maximum machining diameter of 38 mm. The turret uses a one-position driving method which drives only the power tool for the surface being processed. This method significantly increases the lifespan of workpieces. In addition, SX-38 can switch between guide bush mode and non-guide bush mode, thus enabling processing with optimal specifications that supports machining of long workpieces and lessening the length of stock waste. In terms of control, SX-38 uses Star Motion Control, which enables efficient axis movement and significantly reduce non-cutting time.



Pursuit of environmental performance

The company has established the following environmental standards, and models that meet the criteria are certified as environmentally friendly machine tools, and the ECO mark is listed as a "Star environmental standard compliant model".



Star environment standard compliant model

Star environmental conformity standard

Powder coated exterior cover

99% or more of RoHS parts correspondence rate

Design support by computer analysis

We actively introduce CAE (design support by computer analysis) methods such as linear / nonlinear analysis into product development.

This has made it possible to save energy and resources by reducing the number of prototypes at the development stage, and also to conserve resources by realizing functions with fewer materials at the product stage.



Structural improvement example by CAE

Lowering environmental contamination risk

Managing chemical substances

Star Micronics have created and implemented internal regulations for the management of harmful substances and dangerous materials handled by the company in order to ensure proper and safe management of chemical substances. These internal regulations, based on the relevant laws and statutory regulations, are designed to ensure that the environment is taken into account in the purchasing, storage, use and disposal of such substances.

Response to PRTR* Law

In accordance with the PRTR (Pollutant Release and Transfer Register) Law, we have continued to submit notification regarding the emission and transfer volume for Class 1 Designated Chemical Substances. The annual handling volume of such substances has decreased greatly due to the use of powder paints which do not contain organic solvents (including substance subject to PRTR) and to a change to alternative materials. As a result, since 2011 there are no longer any offices for which submission is required.

However, from the perspective of appropriate handling of chemical substances, we will continue to gather data on emission and transfer volume.

The emission/transfer amount of substances in 2019 was as follows.

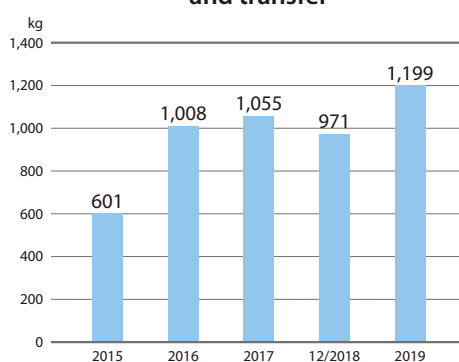
*The PRTR (Pollutant Release and Transfer Register) Law is a means of obtaining, collating and disclosing emission and transfer volume data for harmful chemical substances.

PRTR reports for all domestic factories

(kg/year)

Factory	Substance No.	Chemical substance name	Use	Emissions volume			Transfer volume			Total
				Air	Public drainage areas	Ground within factory	Landfill within factory	Washed into sewage	Waste within factory	
Micro Sapporo Company	309	Nickel compound	Chroming	0	0	0	0	1	71	72
Star Metal Company	300	Toluene	Coating	869	0	0	0	0	175	1,044
	80	Xylene	Coating	26	0	0	0	0	15	41
Fujimi Factory	300	Toluene	Parts cleaning	0	0	0	0	0	3	3
	384	Normal hexane extracts	Parts cleaning	0	0	0	0	0	38	38
	407	Poly(oxyethylene) alkyl ether	Parts cleaning	0	0	0	0	0	1	1
Total				895	0	0	0	1	303	1,199

Total volume of PRTR emission and transfer



Note: 12/2018 is a 10-month summary from March to December.

Response to air pollution

In order to maintain and monitor the standard values above, Star Metal is implementing weekly voluntary inspections using a simplified measuring method in the Machine Tools Division. Use of the powder coating method allows us to reduce environmental load at the manufacturing stage.

This new method has realized the environmental effect of cutting atmospheric pollutants (VOC) drastically and reducing industrial waste by one-third.



Powder coating



Response to EU environmental regulations

Environmental regulations in the European Union (EU) have had a significant impact not only within the EU region but also in various countries around the world, and many Japanese manufacturing industries have been forced to respond in some way.

For our products that fall under WEEE and RoHS directives, we are operating based on our internal regulations for management of substances that burden the environment and on green purchasing guidelines.

Also, for REACH Regulations, we are implementing sequential surveys in regards to whether our products include any SVHC, which are added every year.

Use of X-ray fluorescence spectrometers

We use X-ray fluorescence spectrometers to measure levels of chemical substances contained in components of our printers that fall under the WEEE and RoHS directives, as well as to conduct inspections on receipt of the components.

Our machine tools do not fall under these directives, but we have taken aggressive measures such as using X-ray fluorescence spectrometers to measure the composition of components with a view to reducing harmful substances. Components used in the actual machines in our key products are 99% RoHS compliant, excluding certain NC control equipment.

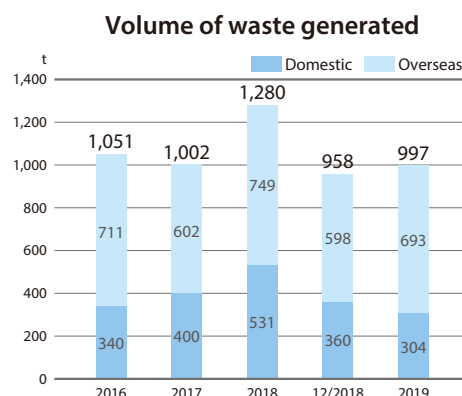


X-ray fluorescence spectrometer

Promotion of reduction and recycling activity of waste

We have created and implemented internal waste management regulations in order to properly dispose of waste produced from corporate activities in line with the requirements of the Waste Disposal Law and to promote voluntary activities.

Waste products generated in 2019 increased by 39 tons compared to the previous fiscal year. The recycling rate was 99.1%. We will continue to instruct group employees regarding the dismantling and separation of trash in order to improve our recycling rate.



Note: 12/2018 is a 10-month summary from March to December.

Social contribution activities related to the environment

Social contribution activities

Inviting participation of the employees and their families, we participate in voluntary cleanup campaigns organized by the municipal authorities of Shizuoka every year.

We organized cleanup campaigns in September. CSR activities at Star Micronics entail an active role in contributing to society with the cooperation of our employees.

Participation in voluntary cleanup campaigns in Shizuoka city

Date	Place	Participants
September 7 (Saturday), 2019	Okitsu River	10



China: Voluntary activity in Dalian

In Star Micronics Manufacturing Dalian Co., Ltd., one of the main production bases of the company overseas located in Dalian, China, we are annually organizing voluntary activities, in which employees give their support to the community. We participated in tree planting and cleanup activities.

Date	Place	Participants
April 13 (Saturday), 2019	Tree-planting activities (Jinzhou district, dalian city)	80
June 15 (Saturday), 2019	Cleanup activities (Jinzhou district, dalian city)	70



Publication of the environmental report

From the perspective of conserving the environment through such measures as reducing energy usage and saving resources, we don't publish its environmental report in paper form. Instead, the report is published on the Star Micronics website as a PDF-format file.

Environmental activities of Star Micronics <https://www.star-m.jp/eng/company/co05.html>

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