



ENVIRONMENTAL REPORT 2017

DIGEST VERSION

For the year ended February 28, 2017

STAR MICRONICS CO., LTD.

FOREWORD

Environmental Protection Activities

My name is Mamoru Sato and I was appointed the Representative Director, President and CEO of the Company on March 1 of this year. With intensification of climate changes in our era of global warming, to make our society sustainable on the global scale, business enterprises also need to do their share implementing continuous measures to combat global warming, measures that are now just as vital for survival and development of companies as they are for the society at large. Our Company sees activities to reduce greenhouse effect gases, compliance with stricter regulations for environmental conservation, and other environmental protection measures as managerial issues of utmost importance.

The final target year of the current Medium-Term Management Plan is the term ending February, 2021, four years from now, which incidentally is also the year we will be celebrating the 70th anniversary of our establishment. In the Plan, we set the following medium-term vision: "as a global niche company, our goal is to enhance prosperity and well-being of all stakeholders by distributing the added-value created through efforts aimed at combining the strengths of advanced software and precision processing technologies that help maximize customer satisfaction." We are currently implementing various measures to achieve this vision, and, to contribute to creation of a sustainable society, shall continue to ensure that our manufacturing methods are environmentally friendly while also actively engaging in a number of environment management activities.

I hope that our stakeholders will continue to support us in the future.

June 2017 MAMORU SATO Representative Director, President and CEO





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Range Covered:

Period:

Domestic Company offices (total of 4 locations), Subsidiaries (total of 2 companies)

Production Subcontracting Company (1 company), Sales agent (1 company)

Overseas Subsidiaries (3 key production sites)

Coverage centered on Company activities, with some affiliates such as subsidiaries/sales agent also included.

The year "2017" represents the period March 1, 2016 to February 28, 2017.

ENVIRONMENTAL MANAGEMENT

Progress toward ISO 14001 Certification

We have acquired ISO 14001 certification for all three of our domestic factories, all two domestic subsidiaries, one production subcontracting company, one domestic sales agent and three key production sites at our overseas subsidiaries.

In conjunction with our affiliates, we will continue activities to strengthen our overall promotion of environmental activities.

Company Factories	/ Offices		
Special Products		Ihara Factory	Acquired March 2001
Precision Products		Fujimi Factory	Acquired February 2002
Machine Tools		Kikugawa Factory	Acquired March 2002
General Administration Headquarters R & D Center		Head Office / Quality Technical Center	Acquired September 2001 (Self-conformance declaration: September 2010)
Subsidiaries			
Charles Comment	Manufacturing Division	Kikugawa Factory	Acquired April 2006
Star Metal Company	Plating Division		Acquired March 2007
Micro Sapporo Compa	iny		Acquired March 2007
Production Subcont	tracting Company		
Effetto		Ihara Factory	Acquired October 2006
Sales Agent			
Move Company			Acquired January 2006

OVERSEAS

Subsidiaries (Key Production Sites)	
Star Micronics Manufacturing Dalian Co., Ltd. (Dalian, China)	Acquired May 2002
Shanghai S&E Precision Co., Ltd. (Shanghai, China)	Acquired February 2003
Star Micronics Precision (Thailand) Co.,Ltd. (Ayutthaya, Thailand)	Acquired February 2009

Self-Conformance Declaration

At our Head Office and Quality Technical Center, we have instilled activities performed via through Environmental Management Systems and have eliminated almost all environmental load. Accordingly, we issued an ISO14001 self-conformance declaration in September 2010.

Since issuing the self-conformance declaration, we have promoted environmentally-friendly business activities based on environmental policy.

Environmental Audits

Internal Environmental Audits

Internal environmental audits are conducted regularly each year at domestic factories and affiliates 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.

External Environmental Audits

Domestic factories and affiliates 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.



Training for auditors



Conducting an environmental audit

Emergency Response

Every year, Star Micronics and its domestic affiliates 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 and our domestic affiliates 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 2017 (domestic), we conducted events such as an introductory environmental seminar, a seminar on the cultivation of internal auditors.

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

Environmental Training Structure

*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 2017)
Safety manager	5 (0)
Public health manager	18 (2)
Pollution prevention manager	7 (0)
Manager in charge of industrial waste requiring special management	16 (0)
Fire prevention manager	13 (0)
Promoter of energy management and planning	2 (0)
Dangerous substance handler	84 (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	30 (0)
Manager in charge of specific chemical substance operations	8 (0)

Status of Legal Compliance

Star Micronics and its domestic affiliates 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 item s 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 assesse 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. and affiliated domestic companies),

overseas (Star Micronics Manufacturing Dalian Co., Ltd.; Shanghai S&E Precision Co., Ltd.; Star Micronics Precision (Thailand) Co., Ltd.; Star Micronics Manufacturing (Thailand) Co., Ltd. : from 2014)

Change in Input Amount (Major Items)





Light Oil Usage





Gasoline Usage









Water Usage m³ Domestic Overseas 150,000 112,627 107,309 109,167 100,000 91,860 92,599 91,56<mark>6</mark> 88,906 86,027 67,444 68,507 50,000 24,416 24,092 21,061 21,282 20.26 0 2014 2015 2013 2016 2017



Change in Discharge Amount (Major Items)





ENVIRONMENTAL ACCOUNTING

Environmental Protection Costs (thousands of yen)						
Category Initiatives		Domestic		Overseas		
		initiatives	Investment	Expenses	Investment	Expenses
Costs	Pollution Prevention Cost	Prevention of air/water/ground contamination	9,636	10,253	0	5,509
within Business	Environmental Preservation Cost	Energy conservation		1,964	0	360
Area	Resource Recycling Cost	Treatment/disposal of waste	0	8,545	0	1,560
Upstream/Downstream Cost		Green procurement difference	0	153	0	199
Management Activity Cost		EMS operation, Education, On-site planting	0	29,187	0	2,725
Research & Development Cost		R&D, WEEE/RoHS measures	0	15,793	0	123
Social Contribution Cost		Donations, Financial support	0	197	0	0
Environmental Damage Response Cost Repairs for ground/water contamination		0	0	0	0	
	Total				0	10,476

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	29,807	12,470		
Expense Reductions (Year on Year)	Total energy expense (electricity/heavy oil/LPG/gasoline/light oil) reductions	34,316	39,462		
	Reductions in water/well water usage expense	378	606		
	Reductions in copy paper purchase expense	298	307		
	Reductions in waste disposal expense	90	48		
	Others	0	0		
	Total	64,889	52,893		

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



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 9 to the end of October
- 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 1 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 450 thousand kilowatt-hours in 2017. An amount equivalent to the power consumed by about 125 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)

Heat shielding using roof shades

We have installed roof shades on Kikugawa South Factory and Ihara Factory. These roof shades alleviate the drastic temperature increases associated with summer and reduce the amount of energy used for air conditioning. As a result, Ihara Factory has reduced energy consumption in summer by 28%.



Roof shades (Kikugawa South Factory)



Roof shades (Ihara Factory)

Efficient and power-saving outside light

We replaced mercury-vapor lamps in Micro Sapporo Company with metal halide lamps which feature high-brightness, power-saving and a long lifespan. Replacement with these new lamps realized a reduction in energy consumption of approximately 50%. Also, at our Head Office we installed LED lighting which consumes one-tenth of the power of conventional mercury-vapor lamps.



Metal halide lamp (Micro Sapporo Company)



LED light (Head Office)

• The number of company cars owned

In order to reduce the amount of CO_2 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	
	2014	31	10	9	50	
	2015	30	10	9	49	
	2016	30	10	9	49	
	2017	29	10	9	48	

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	May 16 - 27, October 17 - 28, 2016
Participants	81 Individuals
Eco-commute distance	2,865Km
CO ₂ reduced	$640Kg$ (Calculated based on fuel consumption of 10 km/ $\!\ell$)



Lights-Down Campaign

This year, we once again participated in the Lights-Down Campaign held by the Ministry of the Environment. The rooftop neon logo signs at our Head Office, Ihara Factory and Fujimi Factory were turned off at 8:00 PM for 2 days from July 6th (Wednesday) to July 7th (Thursday) of 2016. As a result, the amount of power used during this period decreased by 278 Kilo-watt hours.

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

R&D (Research and Development)

The Company develops products utilizing the technology of "energy harvesting". These products transform very small energy from the surrounding environment (such as vibration, light, heat, etc.), into

electric power. In recent years, this area of environmental power generation is attracting increased attention, and the Company is developing sensors and peripheral devices for use in such power generators. We shall strive to improve the electric generating capacity of the generators and contribute to conservation of resources through provision for the wireless sensor network, an area which is expected to grow substantially over the coming years, of devices that require no batteries or wiring.

Special Products

Complying with the most recent 2.0 version of the International ENRGY STAR® Program, which is a global system of energy conservation, we released our lineup of printers boasting low power

consumption, products aiming to reduce the environmental burden. Another eco-friendly initiative is our electronic receipt service "AllReceipts" offering Cloud storage and management for digitized receipt data.

We also use pulp mold created by recycling newspapers, carton, and other types of used paper for packaging, while our printers are equipped with back-feeding function to reduce blank space and reduced print function that helps to cut down on the paper used to print receipts.



Machine Tools

New Release of Swiss Type Automatic Lathe SV-20R

We have currently developed Swiss type automatic lathe SV-20R with maximum machining diameter of 20mm for use in a wide range of industries including the automobile- and medical-related areas. In order to respond to the increasing needs for more versatile component machining, we

created the lathe so as to enable switching from guide bush to non-guide bush operation to achieve optimum specifications according to respective machining parts and minimize scrap materials to be discarded. The lathe is equipped with a tool post on the rear side also, and by simultaneously machining on both sides it is possible to reduce the machining time, while our unique Star Motion Control System through numerical control minimizes non-cutting time needed for computing, tool selection, etc. achieving a shortened cycle time on the whole.



LOWERING ENVIRONMENTAL CONTAMINATION RISK

Managing Chemical Substances

Star Micronics and its domestic affiliates 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 I Designated Chemical Substances. The annual handing 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 or affiliated companies 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 2017 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.

(kg/year)										
			Emmi		mmissions Volume		Transfer Volume			
Factory	Substance No.	Chemical Substance Name	Use	Air	Public Drainage Areas	Ground within Factory	Landfill within Factory	Washed into Sewage	Waste within Factory	Total
Micro Sapporo Company	309	Nickel Compound	Chroming	0	0	0	0	1	37	38
Star Metal	300	Toluene	Coating	812	0	0	0	0	102	914
Company	80	Xylene	Coating	35	0	0	0	0	8	43
Fujimi	374	Hydrogen fluoride and water-soluble salt	Polishing	0	0	0	0	0	3	3
Factory	392	Normal hexane extracts	Parts Cleaning	10	0	0	0	0	0	10
	Total 857 0 0 1 150 1,008					1,008				

PRTR Reports for all Domestic Factories and Affiliates

Total Volume of PRTR Emission and Transfer



Response to Air Pollution

Furthermore, 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 and our domestic affiliates 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 2017 decreased by 49 tons compared to the previous fiscal year. The recycling rate was 99.3%. We will continue to instruct group employees regarding the dismantling and separation of trash in order to improve our recycling rate.



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 June and 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
June 4th (Saturday), 2016	Miho-Masaki Beach	15
September 3th (Saturday), 2016	Okitsu River	22



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 23th (Saturday), 2016	Dalian organized tree-planting activities	156
July 16th (Saturday), 2016	Golden Pebble Beach cleanup activities	95
September 10th (Saturday), 2016	Area around the factory cleanup activities	106



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	http://www.star-m.jp/eng/company/co05.html
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