



# Environment

Cherishing people and the environment

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Disclosures on Management Approach

# Environmental DMA



Pantech envisions a future with eco-friendly products

Pantech cherishes people and the environment. Eco-friendliness is considered throughout all the processes from product procurement to development and disposal through the green procurement system and eco-friendly design process. Pantech strives to offer green products to customers by minimizing the environmental footprint. Pantech will take the lead in conserving the earth for a happy future for everyone.



## 1.60

2020 GHG Reduction Target Rate  
(Unit: %)

Pantech does the utmost to reduce GHG emissions by establishing the GHG inventory systems and GHG reduction target in 2012. Pantech will make pre-emptive responses to climate change by expanding the scope abroad.



## Renue

Launching eco-friendly messaging phones in North America

Eco-friendliness is considered throughout the whole product portfolios such as green UI and green packaging in order to make products that minimize the environmental impact



## 31

Recycling Rate  
(Unit: %)

Pantech manages emissions to minimize various pollutants that might occur in production, and applies and practices diverse ideas to its processes.



# 1. Response to Climate Change



## Pantech's Commitment

Under the leadership of the Environmental Safety Division in charge of environmental management, Pantech will seek for various climate change response strategies by declaring the environmental management guideline, setting climate change response strategies and establishing the GHG inventory for locations of operation, thus growing into an eco-friendly company that cherishes people and the environment.



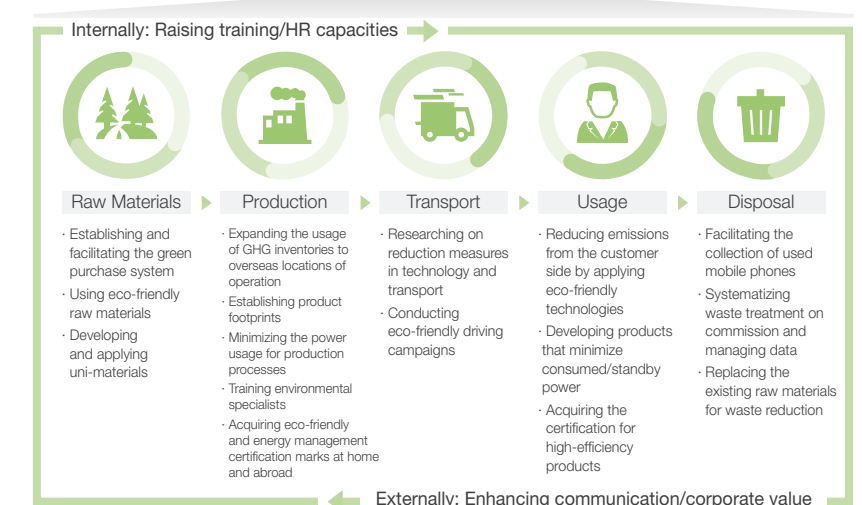
## 1.1 Environmental Management

Pantech cherishes people and the environment, applying this vision to all activities, products and services, thus minimizing the environmental impact. Pantech has devised the Environmental Management Guideline and practice it. Starting with the declaration of the Environmental Management Guideline in 2001, Pantech strives to minimize the environmental impact in all production processes from corporate activities to products and services. Moreover, regular evaluation on potential reductions is underway by establishing inventories for voluntary GHG management to become an eco-friendly company.

### 1.1.1 Strategies for Response to Climate Change

Pantech sets the vision to respond to climate change, that is, 'leaping into an eco-friendly company that cherishes people and the environment' in 2012, under which Pantech strives to manage risks in advance. To this end, Pantech has designated specific tasks from raw materials to disposal, and does the utmost to practice them.

Making a leap forward as an eco-friendly company that cherishes people and the environment



### 1.1.2 Environmental Management Organization

Pantech's Environmental Safety Division supervises environmental management, and practices it in conjunction with Product Environment Division. Since 2005, Pantech has set eco-friendly policies, responded to environmental regulations and maintained environmental management systems under the leadership of the Product Environment Division. Along with the Environmental Safety Division, Pantech has reviewed specific action measures on environmental responses by establishing GHG inventories. As such, Pantech has carried on systematic environmental management through cooperation with each team in each sector.

GHG Management System



1.2 GHG Inventory Management System

Legal requirements have increased as clients of home and abroad require information on GHG and the GHG energy target management system is underway to comply with the Basic Act on Green Growth. In order to better respond to this trend, Pantech has sought to provide more systematic and accurate information, Pantech established the GHG inventory systems as Pantech calculated GHG emissions that comply with standards of home and abroad and established electronic systems for HQ in Sangam and Gimpo Plant for five months from November in 2012.

Moreover, Pantech secured reliability on data by completing the third-party assurance. Environmental performance is managed by identifying emission facilities through GHG inventory systems, collecting operational data and calculating GHG emissions. This scope of application will be applied to its overseas subsidiaries.

1.2.1 Establishing GHG Management Systems

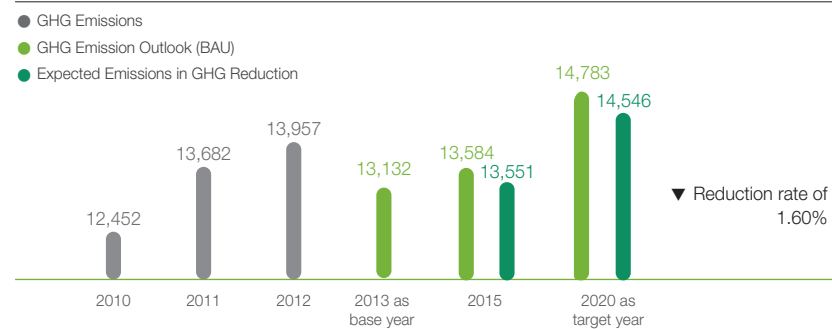
Pantech established GHG management systems for effective management and analysis of GHG emissions and efficient responses to the GHG target management system in Korea. The system consists of six categories: energy management, GHG management, reduction task management, verification management and regulatory compliance and overall. With this system, efficient integrated management will be made possible. Consistent improvement and upgrades will be made for the system for overseas subsidiaries.

1.2.2 GHG Emission and Reduction Target

Pantech established reduction targets for emissions by establishing GHG inventories for domestic locations of operation. Starting with the replacement of small boilers in 2015, Pantech plans to reduce GHG emissions by 1.60%, that is, 237.2tCO<sub>2</sub>e by 2020 against the 2020 BAU<sup>1)</sup> by replacing fluorescent lights, revising steam pressure downward and adopting low-temperature outside air.

Mid-to Long-term GHG Reduction Target

(Unit: tCO<sub>2</sub>e)



<sup>1)</sup>BAU: Business As Usual, Emission Prospects

Pantech's Energy Saving Campaign

- Saving electricity for cooling and heating**
  - Banning the usage of individual heaters and fans
  - Maintaining an appropriate office temperature
- Saving electricity for lighting**
  - Turning off light in office during lunch time and after employees work
  - Selecting the electricity saving mode for PC monitors
  - Turning off unnecessary lights in leaving work
- Saving electricity for production lines**
  - Turning off unnecessary lights during lunch time and work shifts
  - Shutting off the power of unnecessary production line equipment and measuring instruments
- Saving electricity in others**
  - Discouraging the usage of freight elevators and encouraging the usage of stairs



1.3 GHG Reduction on Sites

1.3.1 Energy Saving Campaign

Since December 2012, Pantech has implemented the energy saving campaign for cooling/heating, lighting, production lines and the like in order to cut unnecessary waste of energy and actively take part in the government's energy saving regulations. For instance, the power of measuring instruments and light in off hours are shut off in labs and offices, and the temperature of air conditioners and heaters is adjusted by two degrees Celsius in dormitory warehouses and facilities to drop the power consumption. Gimpo Plant saves power by selecting areas for intensive management to reduce the power by 10%. Moreover, monthly monitoring takes place to enhance employees' execution capability, and energy managers in each team are appointed, thus contributing to preventing global warming through continued guidance and promotion.

1.3.2 Minimizing GHG Emissions through Video Conference

Pantech adopted the video conferencing system connecting HQ in Sangam to Gimpo Plant in 2011. The system enables prompt responses to management issues and efficient communication, while contributing to lowering GHG emissions since energy consumption resulting from mobility is not needed. In 2012, about 40 video conferences were held, reducing GHG emissions of 701 kgCO<sub>2</sub>e. Communication using video conferencing systems with other companies and institutions will be enabled and expanded.

1.3.3 Increasing energy efficiency by replacing obsolete facilities

Periodic checks on obsolete facilities are underway for their replacement, if necessary to address the energy efficiency reduction resulting from obsolete facilities. Pantech could save KRW 2.767 million and KRW 43.8 million each year, respectively, if the replacement of air compressors in 2011 is converted into the amount of money. In 2012, Pantech could save KRW 12.228 million every year by adopting high-efficiency transformers and replacing old air conditioners. In particular, replacement of heat exchangers for hot water in the dormitory at Gimpo Plant enhanced the efficiency of heat exchange, and employees at the dormitory no longer had complaints on the lack of hot water.



## 2. Development of Eco-friendly Products



### Pantech's Commitment

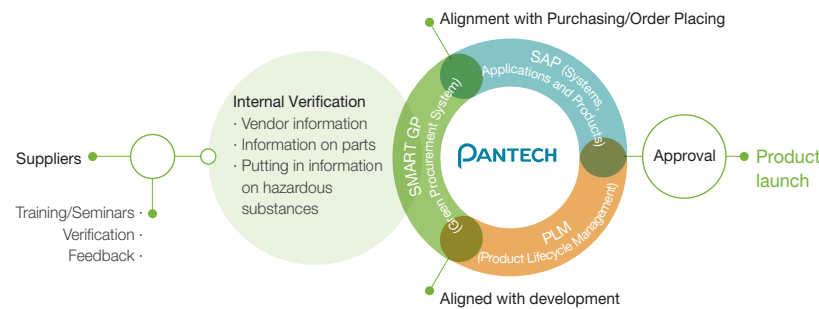
Pantech perceives that providing safe and eco-friendly products to customers is essential for sustainable growth. To this end, Pantech formed regulations and processes for designing eco-friendly products and strives to provide such products on multiple fronts.

### 2.1 Management of Hazardous Materials for the Supply Chain

#### 2.1.1 Smart GP system

Environmental regulations such as RoHS and REACH and requirements for eco-friendliness for business operators are strengthened at home and abroad. Against this backdrop, in order to effectively manage hazardous substances in all components for suppliers Pantech transacts with, Pantech has established the Smart Green Procurement System (the electronic Smart GP System) since 2005, and conduct hazardous substance analysis for all components supplied from suppliers. Moreover, in case the approval, adequacy and effectiveness on the information of hazardous substances are not verified, Pantech ensures that such components are not to be used. Pantech also raises awareness on hazardous substances for suppliers by providing manuals, conducting user training and holding seminars upon system changes. Pantech will continue to improve its eco-friendliness of products through the Smart GP System.

#### Management Flow for Hazardous Materials



### Hazardous Substance Analysis Laboratory

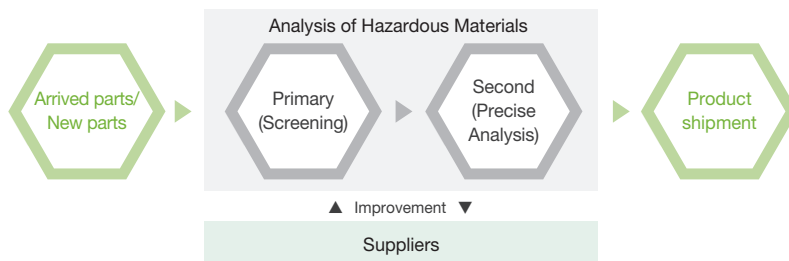


#### Major tasks:

- Applying analysis testing methods according to IEC specifications
- Verifying the presence of hazardous substances using precision analytic equipment including XRF, ICP, GC/MS and UV-VIS
- Precisely analyzing hazardous substances for raw/side materials, and analyzing hazardous substances for development models
- Analyzing hazardous substances for loaded products for mass production

#### 2.1.2 Operation of the Analysis Laboratory for Hazardous Substances

Seeking to effectively manage hazardous substances and supply eco-friendly products to operators and customers, Pantech operates the in-house analysis laboratory, a self-verification system. Hazardous substance content rate is measured and measured for actual products through self-verification on new components.



### Six Strategies for Designing Eco-friendliness



### 2.2 Eco-friendly Design

#### 2.2.1 Strategies for Eco-design

Pantech put in place strategies for eco-design to meet needs of stakeholders including customers and operators for eco-friendly products, and raise the corporate image through stronger competitiveness for eco-products. Six tasks for eco-friendliness strategies are: recycling resources; efficiently using resources; reducing the energy usage; limiting the usage of hazardous substances; using eco-friendly packaging; acquiring eco-friendly certification.

#### 2.2.2 Eco-design Process

Pantech established the eco-friendly product development process in 2008 in order to systematically manage eco-friendliness in all development processes. Stage-specific eco-design checklists are available from product planning to launching of products, enabling us to evaluate and improve product eco-friendliness. Moreover, Pantech provides more specific eco-friendly design information by producing an eco-design manual and distributing it to relevant departments.

#### Eco-design Process



### Product Eco-Declaration for the M-U570K Model

| List of Material type |  | Weight (g)     |
|-----------------------|--|----------------|
| PAPER (BOOK)          |  | 128.0 g        |
| PI (BOARD)            |  | 4.8 g          |
| EMV                   |  | 0.2 g          |
| <b>Total Wt. (g)</b>  |  | <b>133.0 g</b> |

※ Product eco-declaration for other models is available on the website. (<http://www.pantech.co.kr/pantech/pantechEcoDeclarations.do>)

#### 2.2.3 Providing Eco-friendliness Information: Eco-Declaration

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## 2.3 Efficient Resources Usage

### 2.3.1 Product Recycling

The Extended Producer Responsibility that began in 2005 was designed to conserve the environment through the domestic product recycling. Pantech has actively participated in the initiative to recover used mobile phones and treat them in an eco-friendly way. Since 2005, Pantech has collected used mobile phones by subscribing to an association (i.e., Korea Association of Electronics Environment) that collects and recycles used mobile phones. Pantech has spread the culture of collecting and recycling mobile phones by encouraging employees to take part in the collection by nation-wide campaign. Collection can be done in 87 customer service centers nationwide where collection boxes are available for easy access to participants.

Pantech also conducts a voluntary in-house campaign to collect used mobile phones. Rewards are given to teams and individuals with strong performance, and the collected ones are recycled in an eco-friendly way through a recycling company.

**Number of used mobile phones collected in the company** (Unit: Number)

|         | 2010 | 2011 |
|---------|------|------|
| Device  | 600  | 912  |
| Battery | 590  | 744  |

※ Our in-house campaign to collect used mobile phones that began in 2010, takes place every two years from 2011.

### 2.3.2 Recycling Program

Pantech is committed to making sure that electronic devices are recycled in a way that protects human health and the environment. The Pantech Recycling Program in US gives consumers a way to easily recycle their used or unwanted electronic devices and accessories such as smartphones, tablets, adaptors and batteries. Simply use easy mail-in shipping program or drop them off directly at one of our participating recycling centers.

## #Special Case \_ Renue

The shipping amount of eco-friendly mobile phones has skyrocketed worldwide, and by 2017, it would amount to 392 million units, that is, 10 times more than the shipments in 2012<sup>1)</sup>. Jumping on this trend, Pantech launched 'Renue', a messaging phone with the eco-friendly certification (UL SPC<sup>2)</sup>) in North America in 2012. The model was made of recycled components to minimize the environmental impact, and the green UI and packaging were applied to all products, considering eco-friendliness in mind all the way through.

1) Juniper Research

2) The Underwriters Laboratories of the U.S.' certification for eco-friendliness, comprehensively evaluating prohibition on hazardous substances, high energy efficiency in products, recyclability of products and packaging and CSR activities

### Packaging

For the Renue, environmental hazardousness has been minimized by applying eco-friendly recycled paper 95%, and using non-VOC and non-petroleum-based eco-friendly UV ink. Moreover, it is assembled by folding with no adhesive, minimizing the rate of space to cut the amount of packaging materials. The package design for the Renue had its eco-friendliness recognized, receiving the Grand Prize presented by the Minister of Environment at the Green Packaging Contest.

### Material & Energy

The Renue consists of materials that can be recycled by 67%. Post-consumer recycled plastic is used, while PVC, phthalate (DEHP, DBP, BBP) and halogen (Cl, Br)-free materials are used to enhance eco-friendliness. An adaptor also complies with ENERGY STAR 2.0, thus minimizing their standby power and maximizing the energy efficiency.

### UI (User Interface)

Pantech enables users to use their mobile phone in an eco-friendly way by applying the green UI. Pantech offers a function to set the bookmark on the home screen and directly access a certain app in a locked state to minimize the power consumption. Pantech provides the power save button as the main menu so that they can conveniently set the eco-functions. Moreover, as the Eco-Calendar is installed which indicates special days for the environment by date, Pantech encourages users to have a higher awareness about their environment and become more environmentally friendly.







## 3. Management of Eco-friendly Sites



### Pantech's Commitment

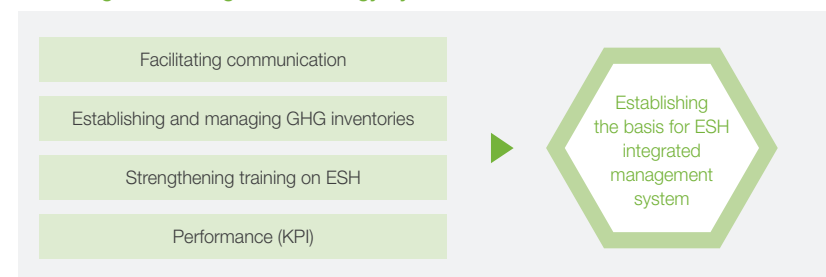
Pantech established an eco-friendly site operation scheme through the ESH<sup>1)</sup> integrated management system. Pantech strives to create safe and sound working conditions for employees who work on locations of operation, while improving environmental management activities in production processes.

### 3.1 Operation System for Eco-friendly Sites

Pantech has continuously strived to enhance the environment of locations of operation through the eco-friendly site operation system. The system has been applied to all locations of operation by acquiring the certification for the Environmental Management System (ISO 14001) in 2001. Accordingly, specific goals to measure the environmental impact that might occur on locations of operation and minimize them are in place, thus systematically improving the processes. Improvements are monitored by auditing the internal environmental management, while compliance with regulations and other environmental requirements is evaluated. As such, Pantech's efforts will continue on to make the locations of operation environmentally friendly.

Pantech plans to finalize the operation of the ESH<sup>1)</sup> integrated management by 2015, paving the way for integrated management in operating eco-friendly locations of operation. The ESH integrated management system will enable the unification of the ESH system for a decent and stable working environment, while continuously making improvement and conducting monitoring. Under the three-year roadmap from 2013 to 2015, Pantech plans to make improvement in three directions: active communication, ESH integrated management and GHG management.

#### ESH Integrated Management Strategy System



#### ESH Roadmap

| Directions                | Improvement Strategies (KPI)                 | Phase 1(2013)  | Phase 2(2014)  | Phase 3(2015)   |
|---------------------------|--|--|--|---|
| Active communication      | Campaigns against climate change             | Waging a campaign on each site   | Expanding innovation activities enterprise-wide (self-sufficiency in making improvement) | Establishing the impact assessment processes for locations of operation (related to production) |
| ESH integrated management | Introducing ESH integrated management system | Setting ESH policies and strategies (reviewing the application of KPI in 2014)               | Applying ESH strategies to KPI in 2014, reviewing the ESH integrated management system   | Establishing a permanent ESH unit, adopting the ESH integrated management system                |
| GHG management            | Reducing GHG emissions                       | Establishing inventories and reducing emissions of GHG Setting strategies for climate change | Managing GHG reduction targets   | Conducting GHG reduction activities and achieving targets                                       |

<sup>1)</sup> Environment, Safety and Health

### 3.2 Environmental Management of Sites

#### 3.2.1 Air Pollution Management

Pantech maintains a standard to manage air pollutants more stringently than the average standard on air pollutants to manage the air environment on locations of operation. Moreover, in order to minimize air pollutants by operating heat generating facilities, Pantech shortened the cycle to clean up the coils and filters for heat exchange of air handling units from once a month to once a week in 2012, thus intensifying the management of air pollutants. Pantech continues to manage the emission density by measuring it twice a year on commission.

#### 3.2.2 Management of Water Resources and Sewage

Pantech operates water treatment facilities, and manages the water quality to minimize the density of discharge water through biological treatment. Monthly water density is measured to be maintained below 10% vis-à-vis the legal standard, and the emission density is managed by measuring the discharge water once a month on commission.

In order to comply with the Sewage Act that has become stringent since 2012, Pantech has conducted a project to enhance effluent treatment facilities in October 2012. Specifically, construction of three effluent treatment facilities including the plant building and dormitory enhanced the BOD<sup>1)</sup> and SS<sup>2)</sup> from 20ppm to 10ppm. The BOD and SS has been under 10ppm since January 2013. Water used at the Gimpo Plant and dormitory was managed on a monthly basis, thus analyzing and managing the amount of change in the water usage and the corresponding reasons. Moreover, water saving activities took place including adjusting the water supply for toilets and toilet bowls, controlling the water flow for tap water and attaching water saving stickers. Pantech continues to promote such a campaign using the internal bulletin board.

#### 3.2.3 Waste Management

Pantech strives to manage waste by expanding the recycling rate of waste to minimize waste generated from Gimpo Plant. Pantech set the waste recycling and treatment process in 2012 so that waste is efficiently managed by selecting five types of recycled waste separation units, that is, mobile phones, batteries, adaptors and holders, housing and PCB boards (including CHIP type). Our HQ in Sangam designated a day to collect waste for recycling every month, collecting the whole amount to Gimpo Plant and treating it in an integrated way. In particular, in 2012, its targeted recycling rate of 23%, that is, 3% higher than the 2011 target of 20% was over-achieved with 31%.

Besides, various ideas have been applied to production processes: managing designated disposal areas within Brain Tissue Room upon the generation of glycol environmental waste; minimizing the amount of injecting solder used in production from 500g to 300g; recycling waste stencils and vacuum jigs generated in production; and minimizing the amount of waste by reducing the hand paper size from 150\*150 to 120\*120.

<sup>1)</sup> Biochemical Oxygen Demand

<sup>2)</sup> Suspended Solid

Emergency Response Training

1. Fire safety training broadcasting



2. Fire site simulation



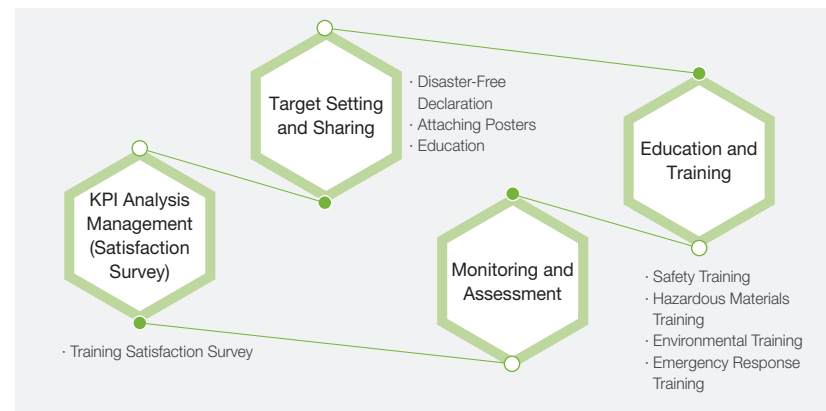
2.1 Fire site simulation



3.3 Guaranteeing Safety and Health for Sites

In a bid to create safe and sound working conditions for employees on locations of operation, Pantech established safety management and accident-free targets befitting production locations of operation, and its employees share them. Pantech conducts education/training, monitoring and evaluation on safety, hazardous substances and the environment, and manage them for employees to practice them in their production activities.

Safety and Health Management System for Locations of operation



3.3.1 Operating the Industrial Safety and Health Committee

Pantech operates the internal Industrial Safety Committee. The Committee consists of 14 members, that is, 7 from the management side including safety managers and team directors, and 7 from the labor side including the head of the labor union, council and production employees. By holding quarterly council meetings once a month, Pantech discusses various topics including improving ventilation for the production and repair rooms and expanding the number of people for safety and health training. In 2012, 27 topics were handled such as complementing topical ventilation for SMT PCB clean-up rooms and installing safety blocks for forklift dockyards.

3.3.2 Operating the Safety and Health Program

Pantech conducts preventive training for employees such as safety training and hazardous substances training. Information on safety accidents and vocational diseases which might occur in carrying out operations, and safe operation know-how are informed at all times through training. Continuous monitoring and evaluation on training and satisfaction surveys are in place to make improvement. Training on hazardous substances and related operations is classified per job type, and stage-specific training takes place, which will be expanded to be conducted every quarter. In 2012, 886 people were trained for 3,864 hours. Moreover, fire drills are available every year to make prompt responses when fires occur.

ESH Training Status

| Title                                    | Targets   | No. of Hours                               | Form of Training | No. of Participants             |      |      | Remarks |  |
|--|---|--|------------------|---------------------------------|------|------|---------|--|
|  |   |  |                  | 2010                            | 2011 | 2012 |         |  |
| ESH Basic Training                       | ESH training on production locations of operation   | Staff on production locations of operation | 2HR/ Month       | Group training                  | 438  | 445  | 450     | Exclusively conducted by divisions on locations of operation |
|  | ESH training for clerical staff   | Clerical staff                             | 1HR/ Month       | Clerical employees              | 230  | 220  | 225     | Notified at the Health Management Room every day             |
|  | MSDS <sup>1)</sup> basic training   | Staff handling hazardous materials         | 2HR              | Group training                  | 75   | 80   | 85      | Exclusively conducted by divisions on locations of operation |
|  | Supervisor management training  | Supervisors in each team                   | 16HR             | External training               | 15   | 16   | 16      | Online training  |
| Health Training                          | Training on how to use AED(Automated External Defibrillator) and CPR(Cardiopulmonary resuscitation) | All employees                              | 1HR              | Group training / Bulletin board | 0    | 82   | 95      | Monitoring AED at the same time                              |
|  | Dangerous Goods Handling Procedure  | Dangerous goods handling and usage         |                  |                                 | 5    | 6    | 5       | Hazardous Materials Analysis Room Anechoic Chamber           |
| Dangerous goods storage and preservation |   | Relevant managers                          | 2HR              | Gathering/ Circulation          | 5    | 6    | 5       |  |
| Handling emergencies                     |   |  |                  |                                 | 5    | 6    | 5       |  |

1) Material Safety Data Sheet

Environmental Management Policy

1. Environmental impact generated during the life cycle processes of raw material procurement, product manufacturing, sales and disposal will be studied and continuously managed and improved. Prevention of pollution and the saving of resources are actively pursued by continuously improving the environmental management system, designing environment-friendly products.
2. Company standards and procedures based on the environmental laws of Korea and other countries and international environmental treaties will be established and strictly complied with.
3. All employees are provided with the education/ training needed to execute the duties related to being environment-friendly, and they are made aware of the assurances for rational environmental management activities and environmental management policy.
4. A company-wide cooperation system has been developed, and potential environmental problems are minimized by preventive measures.
5. A supply chain environment system has been developed with vendors to produce stable, environment-friendly products and preserve the global environment.
6. The environmental management issues of the group are open transparently to the stakeholders such as the customers and vendors in order to seek a win-win business model.

Environmental Management Policy