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Responsible Care

Issue No. 31

Built for Performance

Special The Government-Industry Negotiation on GHG Emission Reduction Goals for 2014: Results and Improvements

Issue Enforcement Situation of K-REACH Legislation and Corporate Corresponding Strategies

Green Life Prevent stomach Cancer! Hazardous Foods versus Beneficial Foods

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Responsible Care® involves voluntary activity for the chemical companies; the chemical industry makes constant efforts to promote activity for the improvement of the environment and for the safety and health of the people. It begins with management and implements the whole process of chemical products beginning with their development and manufacture, sales, distribution, use, and culminating with waste treatment and disposal.

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+ Issue No.31



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The Government-Industry Negotiation on GHG Emission Reduction Goals for 2014:Results and Improvements

The government-industry negotiation on GHG emissions for 2014 faces some challenging obstacles, as the realities of the industry are not being adequately considered.

Korea Petrochemical Industry Association (KPIA)

Consultations on setting greenhouse gas and energy reduction goals for the industrial development sector for 2014, to reconcile opinions between the Korean government and companies that are subject to reduce greenhouse gases (GHG) and energy use, have been held twice this year.

Having been held for the third time, the third consultation held this year was unlike the previous ones; the Korea Energy Management Corporation (KOMCO) had projected greenhouse gas emissions of each company for 2014 through conducting on-site inspections, checking questionnaire sheets, and reviewing anticipating goals and relevant basis of the companies by conducting surveys with them on their intended goals.

***First consultation : from August 28, 2013 (Wednesday) to August 29 (Thursday), second consultation : from September 4 (Wednesday) to September 5 (Thursday)
Venue : Grand Ballroom, Mayfield Hotel (near Gimpo International Hotel in Seoul)**

The industry projection against the government's projection of GHG emissions was significantly low: the shipbuilding sector (70.0%), nonferrous metals sector (78.1%), oil refining sector (83.0%), cement (86.1%), and petrochemicals (87.4%). In addition, companies with large GHG emissions have shown big differences in the projection with the government forecasts, which indicates that the government has made impractical projections: Petrochemical companies (7,296,000 CO2 tons), cement companies (6,627,000 CO2 tons), and oil refining companies (6,074,000 CO2 tons).

*** Petrochemistry: refers to petrochemical, fine chemistry, fertilizer, and tire companies that are sub-contractors. A total of 106 out of 489 companies in 15 industrial sectors are classified as petrochemical companies as of 2013.**

< Total GHG emissions projected by the government and each sector (unit: 1,000 CO2 tons) >

Industrial sector	Petro-chemicals	Cement	Oil refining	Paper manufacturing	Nonferrous metals	Textile	Auto-mobile	Ship-building	Total
Government projection	50,485	41,028	29,615	7,669	6,707	4,820	4,413	2,342	147,079
Industry projection	57,781	47,655	35,689	8,489	8,586	5,266	5,022	3,368	171,856
Percentage (%)	87.4	86.1	83.0	90.3	78.1	91.5	87.8	70.0	85.6

*Government projection: BAU of the industry, Industry projection: bottom-up forecasting

It was noteworthy that the government has said that it would offer incentives if companies agree to the government's projection amount at the first consultation and set the projection amount as their target allowance while further reducing the projection amount at the second consultation for companies that did not reach a settlement at the first consultation. Rather than projecting GHG emissions by taking account of growth rates and enlargement of businesses and adjusting the gap between projections of the government and the industry, the government has decided to proceed without taking those aspects into consideration; it would only restrain business activity of companies in the manufacturing industry.

Having had those conditions, companies with relatively low GHG emissions reached a settlement with the government's recommended emission goals by raising the goals while companies with high GHG emissions were put in the situation where they had to determine whether or not to accept the recommended emission goals at the first consultation: it was a notification rather than consultation. It was a method that KOMCO, the negotiation group dispatched, had chosen to increase the agreement rate. Companies in the textile sector have eventually shown an agreement rate of 87.5% followed by the paper manufacturing sector of 77.8%, the petrochemical sector of 72.7%, and the cement sector of 72.0%. Companies in the sectors with high GHG emissions including the sector of oil refining (33.3% and shipbuilding (30.0%) have shown relatively low agreement rates.

<Agreement status based on the number of companies that settled (unit: company)>

Industrial sector	Petro-chemicals	Cement	Oil refining	Paper manufacturing	Nonferrous	Textile	Auto-mobile	Ship-building	Total
No. of companies	88	25	6	45	24	16	26	10	240
No. of companies settled	64	18	2	35	12	14	21	3	169
Agreement rate	72.7%	72.0%	33.3%	77.8%	50.0%	87.5%	80.7%	30.0%	70.4%





< Agreement status based on the amount of GHG emissions (unit: 1,000 CO2 tons) >

Industrial sector	Petro-chemicals	Cement	Oil refining	Paper manufacturing	Nonferrous	Textile	Auto-mobile	Ship-building	Total
Total amount of GHG emitted by the companies (2012)	48,313	43,149	28,849	7,948	6,458	4,608	4,247	2,618	146,190
Total amount of GHG emitted by the companies that agreed to the projection (2012)	20,927	2,583	209	4,752	539	2,099	1,130	62	32,301
Agreement rate	43.3%	6.0%	0.7%	59.8%	8.3%	45.6%	26.6%	2.4%	22.1%

*Source: Greenhouse Gas Inventory & Research Center of Korea

The agreement rates based on the amount of GHG emissions in 2012 have been even lower; 0.7% (209,000 CO2 tons) of the oil refining sector has settled to the projection amount followed by 2.4% of the shipbuilding sector (62,000 CO2 tons), 6.0% of the cement sector (2,583,000 CO2 tons), and 8.3% of the nonferrous metals sector (539,000 CO2 tons). Most of the companies with high GHG emissions have not reached a settlement with the government.

- Top seven companies in the cement sector (40,567,000 CO2 tons), top four companies in the oil refining industry (28,640,000 CO2 tons), top eight companies in the petrochemicals sector (923,685,000 CO2 tons), and top seven shipbuilding companies (2,556,000 CO2 tons) have not yet reached an agreement.

The industry has heavily participated in GHG and energy use reduction activity such as signing mandatory and voluntary greenhouse gas reduction agreements, and taking part in the greenhouse gas reduction record registry to join the government's policy on GHG reduction. With these endeavors, companies with large energy consumption in Korea have shown a world-class level of energy efficiency.

< Energy efficiency of companies with large energy consumption in Korea >

Sector	Description
Petrochemicals	Four Korean companies took first to fourth places among 117 companies worldwide, as a result of an analysis of their core equipment
Oil refining	Compared energy efficiencies (the lower the better) Korea 100, Japan 109, Europe 111, North America 118
Cement, automobile, shipbuilding	Achieved the world's highest energy efficiency through investing in high-efficiency facilities and adopting the latest equipment

Although the consultations taken place for setting GHG and energy use reduction goals for 2014 were formalized with such formats as the survey on GHG goals and other validations, they have made an error of not taking account of the international competitiveness of the industry, enlargement of the companies, and eventually, proposed unreasonably low emission projections. The goals proposed by the government cannot be reached just by the endeavors of the companies alone; they can only be reached by ceasing all the operations of the companies. Although everyone agrees that GHG emissions need to be reduced, certain systems that do not hinder the competitiveness of the national infrastructural industry in a rapidly changing setting would need to be paralleled with the reduction activity. In addition, more resources need to be input to the development of green technology rather than imposing heavy legal controls to resolve the following issues in setting GHG emission reduction goals.

Disclosure of the calculation basis for the government's projection: distrust has been growing among negotiators as the calculation basis for reasonable GHG emission allowances has not been disclosed. Many companies have not been able to accept the allowances and have thus not yet reached a settlement.

- The government has not applied the calculation formula specified by the applicable laws (such as GHG and Energy Target Management System Operating Guidelines) in calculating the GHG emission allowances for each sector, which has caused it to lose trust in the industry

Adjustment of the goals with taking account of changes and expansion of businesses: when companies build additional facilities, their GHG emissions inevitably increase. The government has not counted that aspect of business when computing GHG emission allowances, which has discouraged new investment.

- The current guidelines (Article 33 Clause 2 (Reset of Goals)) only give consideration to the amount to be decreased due to such reasons as delay of business plans, not the amount to be increased due to additional installment of facilities when re-calculating GHG emission allowances.

It is unfortunate that the circumstances do not allow members committed to Responsible Care to voluntarily participate in environmental improvement activity. The government would better form an environment where companies can voluntarily and actively take part in environmental improvement and preservation activity rather than applying unreasonable regulations, to leave a good image of the chemical industry to the next generation. 🌱





Enforcement Situation of K-REACH Legislation and Corporate Corresponding Strategies

Korea Institute of Industrial Technology
Center Director Lee Han-wung

The Environmental Kuznets Curve hypothesizes the relationship between economic growth and the environment; it argues that environmental degradation tends to get worse as economic growth occurs until average income reaches a certain point over the course of development, and then it decreases as investments in environmental projects increase. It explains that the environment can be improved through economic growth, which will form an environmentally friendly industrial structure that can contribute to sustainable growth.

Korea is now ranked eighth in world trade, growing in stature as one of the G20 countries, and it saw a GDP of USD 23,679 in 2012; it has been the one and only country that has entered the top 15 GDP countries among 147 new nations that have developed post-World War II. Nevertheless, Korea has suffered from many leakage accidents of hazardous chemicals including the leakage accident of toxic hydrogen fluoride (HF) gas that occurred in September 2012 in Gumi, Gyeongsangbuk-do. Humidifier germicide incidents (April 2011) have so far caused 100 deaths.

The Act on the Registration and Evaluation of Chemicals (Korea REACH) and Chemicals Control Act (CCA), a revision of the Toxic Chemical Control Act (TCCA), have passed the National Assembly in April this year and will come into force on Jan. 1, 2015. However, the industry has continually raised its concerns over issues on hazardous chemicals, and many of them have not been satisfactorily resolved.

In fact, Korean companies have focused on and achieved glowing economic growth for over fifty years after World War II. Meanwhile, some of countries with a high happiness index including Germany, Switzerland, Denmark, and Norway have practiced policies that take both economic growth and environmental preservation into account; companies in those countries have continually managed both aspects, which have contributed to enactment and revision of appropriate environmental regulations. In order to implement environmental laws in Korea, similar to those regulations of the advanced countries, companies in Korea may need an adequate amount of time and budget.

This Special Issue will take a look at issues of Korea REACH and CCA, which will come into effect on January 1, 2015 and how companies can successfully respond to the new regulations.

▶ Key Issues of Korea REACH

Most of what has been discussed between companies and the Ministry of Environment, the Ministry of Trade, Industry and Energy, and the Ministry of Employment and Labor in the past two years since 2011 have not been applied to the current Korea REACH as shown in <Table 1>.

IIII Background and Purpose of Korea REACH

- (Background) to procure information required for safety management of chemicals imported and/or manufactured in Korea containing hazardous and toxic substances to reduce such incidents as the humidifier germicide accidents in 2011
- (Purpose) to identify hazardous and toxic chemical substances contained in products for as safe distribution and use of them
- (Use) Establishment of policies on chemical substance control by securing information on chemical substances, exchanging information on safe control of chemical substances among companies, and understanding current uses of chemical substances

IIII Enactment progression of Korea REACH

<Table1> Enactment of Korea REACH and joint confrontation of related ministries

Korea REACH Proposals		Key Points
Proposed by the government	September 28 2012	<ul style="list-style-type: none"> o Those obliged to report (Article 8) : manufacturers, importers o New or existing chemical substances of 1 ton or more shall be reported to the Ministry of Environment o If the amount of such substances exceeds 100 tons per year, a hazardous test shall be conducted
Proposed by assembly	April 8 2013	<ul style="list-style-type: none"> o Those obliged to report: manufacturers, importers, sellers, users o All new chemical substances or existing chemical substances of 0.5 tons or more shall be reported to the Ministry of Environment o If the amount of such substances exceeds 10 tons per year, a hazardous test shall be conducted o A separate hazardous test by item shall be conducted for hazardous products (including detergent, air freshener)
Legislation promulgated	May 22 2013	<ul style="list-style-type: none"> o Those obliged to report: manufacturers, importers, sellers o All new chemical substances or existing chemical substances of 1 ton or more shall be reported to the Ministry of Environment o If the amount of such substances exceeds 10 tons per year, a hazardous test shall be conducted. However, the amount shall gradually increase to 10 tons by 2020.
Private-public joint council discussion	September to November 2013	<ul style="list-style-type: none"> o Those obliged to report: manufacturers, importers, sellers o 0.1 or less of chemical substances for R&D purposes are exempted from registration o 0.1 or less of new chemical substances shall be registered with a simplified process



IIII Key arguments on Korea REACH brought by the council

- Increase of administrative expenses due to the obligation of the annual report of new chemical substances and existing chemical substances of 1 ton or more manufactured or imported per year (Article 8 Report of Manufacturing of Chemical Substance, etc.)
- Increase of registration expenses due to the obligation of the registration of new chemical substances (Article 10 Registration of Chemical Substance)-Increase of registration expenses and concerns over the possibility of a halt of new substance development due to the deletion of an item for the exemption for chemical substances of 1 ton or less (Article 11 Exemption from Registration of Chemical Substance)
- Concerns over worsening of corporate competitiveness due to the deletion of an item for the exemption for chemical substances for R&D purposes (Article 11 Exemption from Registration of Chemical Substance)
- Concerns over business secrets to be disclosed due to the obligation to provide information on chemical substances between manufacturers and importers, and sellers and users (Article 29 Provision of Information relating to Chemical Substance, Article 35 Information Provision on Chemical Substance Contained in Product)
- Obligation to notify products imported or manufactured containing hazardous substances of 1 ton or more per year (Article 32 Notification of Product Containing Hazardous Substance)

▶ Responding to Korea REACH

Unlike the Toxic Chemical Control Act (TCCA), all new chemical substances and existing chemical substances that are highly hazardous are subject to be registered to the Ministry of Environment under Korea REACH. However, Korean companies seldom manage data of existing chemical substances, which are subject to be reported; small and medium-sized companies are expected to suffer from registration expenses more so than conglomerates.

<Table 2> Estimated expenses for responding to Korea REACH by company size

Classification		Minimum (%)	Maximum (%)
Expenses against manufacturing cost (%)	Small and medium-sized companies	1.0	6.6
	Conglomerates	0.1	0.4
Expenses against net profit (%)	Small and medium-sized companies	11.3	78.4
	Conglomerates	0.7	4.9

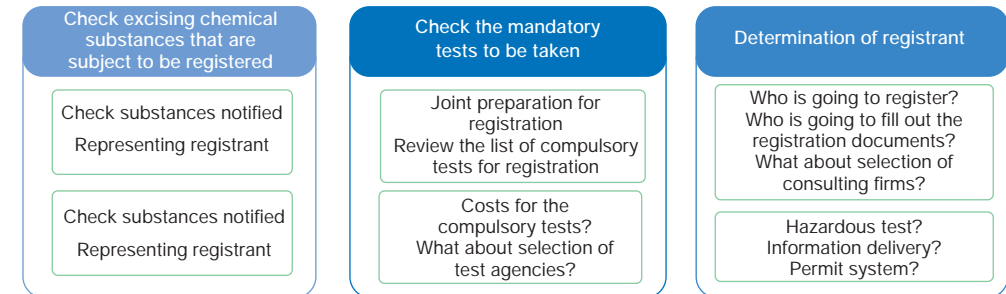
Source : Korea Institute for Industrial Economics & Trade (KIET), An Analysis of Industry Effects on Enactment of Korea REACH, The 3rd Report on Distribution Amount of Chemical Substances (2007)

Therefore, Korean companies are advised to prepare the following matters to respond to Korea REACH.

IIII Proactive actions to respond to Korea REACH

Manufacturers and importers of chemical substances will need to take account of the following before the registration in order to minimize registration expenses.

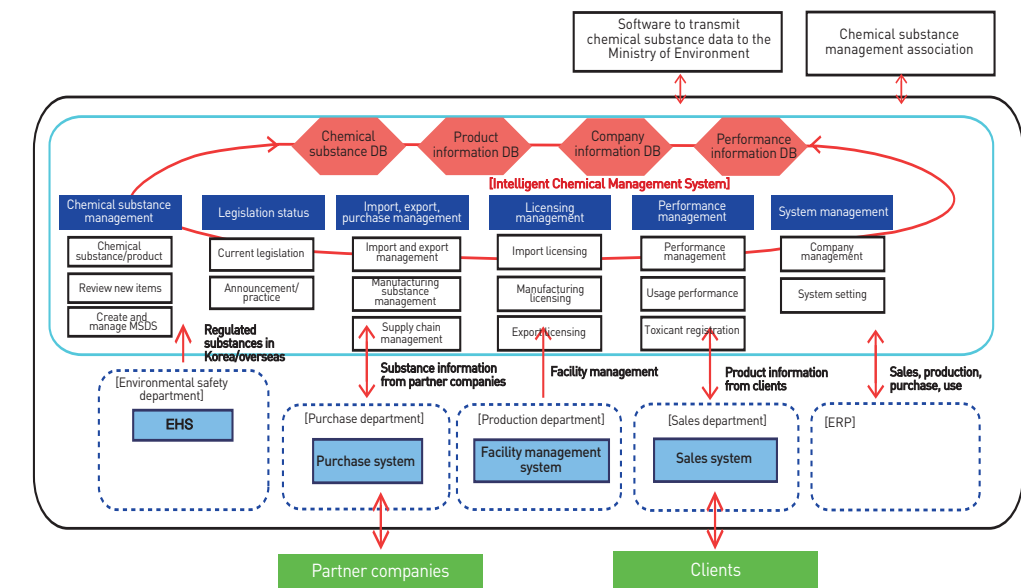
<Figure 1> Considering factors to preemptively respond to Korea REACH



IIII Establishment a chemical substance management system

Companies that deal with chemical substances will need a system that manages chemical substances and hazardous chemical substances. It is advised to share the system with partner companies to not only manage chemical substances but also to build a foundation to deliver information on the chemical substances. By doing so, such processes as identification of chemical substances subject to be reported, registration of hazardous chemical substances, verification of substances allowed and limited will be managed systemically.

<Figure 2> A management system and structure for chemical substance and product within companies (proposal)





▶ Key Issues in CCA

CCA includes imposition of penalty surcharges of not exceeding 5% of revenue upon the occurrence of a chemical accident, submission of offsite impact assessment of chemical accidents, a risk management plan, and test results on chemical handling facilities, all of which require approval from the government. As these new items are expected to impose significant burdens on the relevant industry, a private-public joint council with the Ministry of Environment and the Ministry of Industry has been formed to gather opinions from companies, private organizations, and experts as provided in <Table 2> below.

IIII Background and Purpose of CCA

- (Background) As chemical accidents, such as the Hydrofluoric acid gas accident in Gumi, have recently increased, Korea has begun to recognize the need to amend the Toxic Chemicals Control Act to improve environmental safety of the nation with respect to handling of chemical substances
- (Purpose) To appropriately manage chemical substances and protect public health and environment from chemical accidents
 - To minimize damages in case of chemical accidents and prevent such accidents with taking business areas and their surroundings into consideration
- (Use) Establishment of policies on chemical substance control by securing information on chemical substances, exchanging information on safe control of chemical substances among companies, and understanding current uses of chemical substances

IIII CCA legislation progression

<Table2> CCA legislation progression and joint response of the related ministries

CCA Proposed		Key Points
Proposed by assembly	April 5 2013	<ul style="list-style-type: none"> o Companies that deal with hazardous chemical substances shall submit (a) offsite impact assessment of chemical accidents, (b) test results on chemical handling facilities, and (c) a risk management plan and be approved by the government o Companies that handle substances requiring such precautionary action in excess of the quantity shall prepare and submit a risk management plan every five years and inform nearby communities (local residents around the business locations) at least once a year o Toxic chemical business operators' violation of the regulations shall extend to their subcontractors yet penalties shall not be applied to the subcontractors o A fine of 10% of revenues may be imposed in lieu of an order to suspend business operation
Legislation promulgated	June 4 2013	<ul style="list-style-type: none"> o Companies that deal with hazardous chemical substances shall submit (a) offsite impact assessment of chemical accidents, (b) test results on chemical handling facilities, and (c) a risk management plan and be approved by the government o Companies that handle substances requiring such precautionary action in excess of the quantity shall prepare and submit a risk management plan every five years and inform nearby communities (local residents around the business locations) at least once a year o Toxic chemical business operators' violation of the regulations shall extend to their subcontractors yet penalties shall not be applied to the subcontractors o A fine of 5% of revenues may be imposed in lieu of an order to suspend business operation
Private-public joint council with the MOE and MOI operated	September 2013 present	<ul style="list-style-type: none"> o Revised CCA and discussed to establish subsidiary legislations <ul style="list-style-type: none"> - Eased the amount of the fine in lieu of the suspension of operation and penalty regulations - Reduced the range of companies that are subject to submit offsite impact assessment of chemical accidents, discussed overlap articles in a risk management plan with other laws - Rationalized the regulation on joint responsibility of a contractor and a subcontractor

IIII Key arguments on CCA brought by the council

- Uncertain definition for "immediate report" of the occurrence of a chemical accident
- Burdens on the industries by excessive level of punishment and overlapped regulations
- An increase in expenses for making offsite impact assessment of chemical accidents, which is mandatory
- Overlapped reports: risk management plan and process safety report stated in other laws
- Unclear demarcation between subcontract and sub-subcontract

▶ Responding to CCA

CCA plans to supplement and strengthen the overall structure of the Korean chemical substance management system. Its subsidiary legislations will be enacted this year, and CCA is slated to be enforced as of January 1, 2015.

The amended law has adopted a permit system for conducting toxic chemical business and states that such business also requires to submit offsite impact assessment of chemical accidents, a risk management plan, and test results on chemical handling facilities.

As direct expenses for conducting the offsite impact assessment of chemical accidents per substance are expected to be around KRW 30 to 40 million (based on the expenses for the American offsite impact assessment), it is certain that it will impose significant burdens on companies that deal with chemical substances. Many concerns have been especially raised over the imposition of penalty surcharges not exceeding 5% of revenue (2.5% for a company with a single business operation) in lieu of the suspension of business upon the occurrence of a chemical accident. Therefore, Korean companies are advised to take account of the following in operating business before the new Act comes into effect.

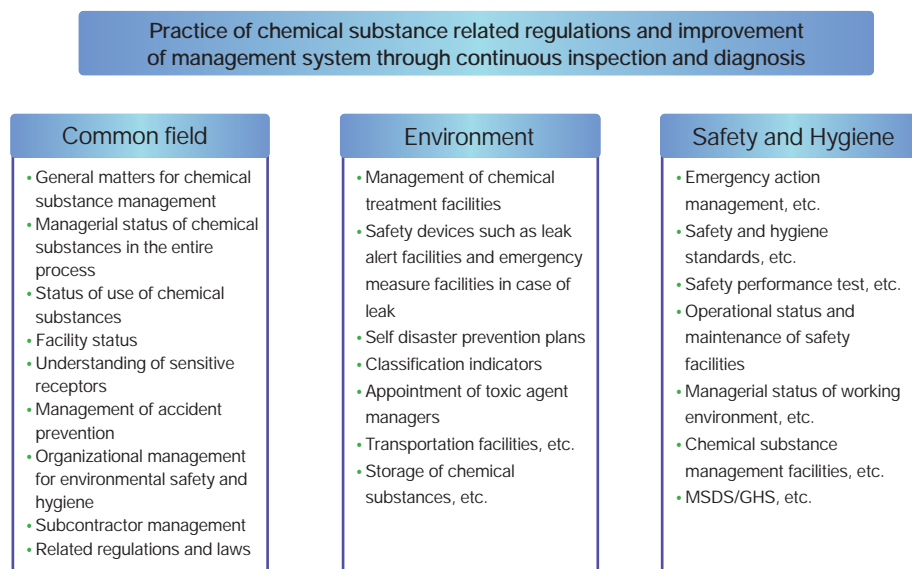
IIII Considering factors to respond to CCA

Companies that handle chemical substances are advised to conduct regular inspections and reviews of environmental safety for in-house management of chemical substances. Educational programs on chemical substance management would also need to be conducted with respect to prevention of chemical accidents.





<Figure 3> Continuous inspection and diagnosis of environmental safety for chemical substances management

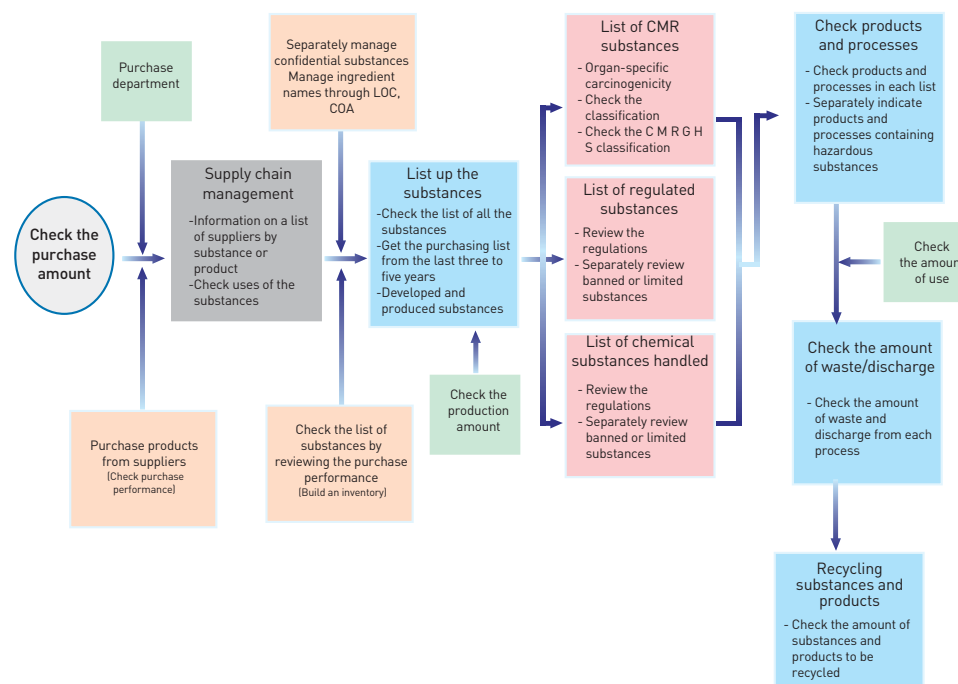


IIII Reinforcement of management through building chemical inventory

In order to systemically manage all chemical substances throughout their life cycle, from purchase to use and to disposal, companies would need to build a chemical inventory system that regularly inspects and controls any aspect of the life cycle of chemical substances.

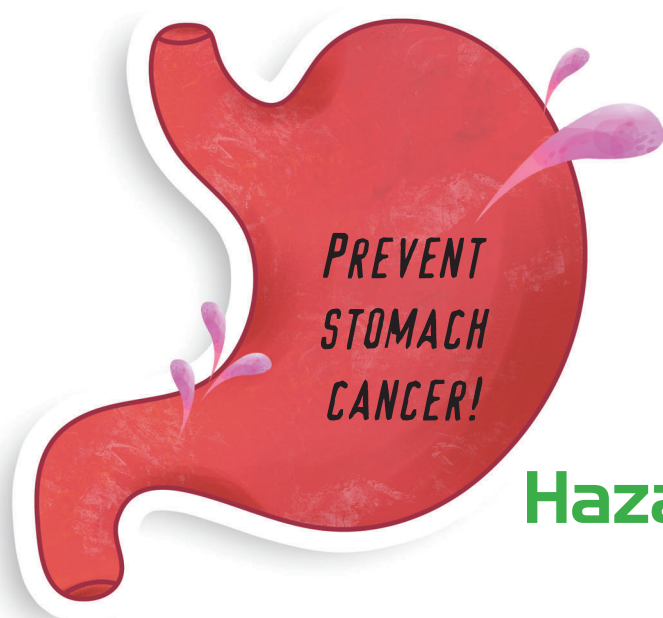
Although this Special Issue has covered the key issues of Korea REACH and CCA, which have been discussed by the council, and proposed measures to respond to the revised Acts, Korea has not yet established a foundation that enables the nation to enact environmental regulations that are similar to those enforced in advanced countries. The nation lacks consulting firms and experts specialized in such regulations while small and medium-sized companies have no working-level employees that are capable of handling relevant work. Moreover, the number of test agencies that are capable of conducting the tests required under the new regulations is insufficient; 17 tests cannot currently be conducted in Korea. In addition, there are certainly limited numbers of institutes and experts required to handle registration documentations, to be submitted by many companies, within a short period of time and to conduct hazardous tests.

<Figure 4> Regular inspection of lifecycle of chemical substances from purchase and use to discharge



Therefore, the relevant government bodies including the Ministry of Environment and the Ministry of Trade, Industry and Energy, need to establish a joint corporate group in responding to Korea REACH (tentatively named) for the newly revised regulations, which may affect economic growth, to settle down successfully.

In addition, relevant policies need to be built for companies to smoothly fulfill the regulatory requirements and to improve public health, protect environment, and strengthen the competitiveness of the companies. Working-level cooperation between the Ministry of Environment and the Ministry of Trade, Industry and Energy is also needed for the council for the new regulations to function adequately to revise the regulations, and enact the subsidiary legislations, which will be gradually performed by the relevant companies.



Hazardous Foods VS Beneficial Foods

It has become difficult to have meals regularly; having three meals a day just sounds like too much of a luxury for busy, modern people. Even having breakfast has been skipped by many people for a long time; instead, people drink a cup of coffee to calm down the hunger in the early morning.

Many people eat fast food for lunch in the midst of busy work schedules. With an excuse of "relieving stress," dinner frequently consists of some greasy food accompanied by alcoholic beverage with colleagues.

As a result of a combination of Korean's love for salty and spicy tastes and the bad eating habits of modern people, stomach cancer has become the most common type of cancer among Koreans.

+ Avoid POISONOUS foods

Although stomach cancer is a deadly disease, that has been number one or two causes of death among Koreans, the exact cause of stomach cancer is unknown. However, a number of factors including family history of stomach cancer, Helicobacter pylori (H. pylori) infection of the stomach, smoking, and stress that may be the cause of the disease have been reported.

Above of all, bad eating habits have been known as one of the main possible causes of the

disease. Consequently, one of the best ways to prevent stomach cancer is to avoid hazardous foods.

First, avoid spicy and salty foods. Foods containing lots of salt especially must be avoided. Foods that are high in salt include dried and salted fish and meat such as dried yellow corvina and jerky.

It is also recommended to refrain from soy sauce, any food soaked in brine, and smoked fish to prevent stomach cancer; studies have shown that polycyclic aromatic hydrocarbons (PAHs) are found in smoked food, which is known as carcinogenic.

Fast food and burned meat are not good as they contain nitric acid and nitrite that are used as a preservative. They react to bacteria and food in intestines, which creates nitrosamines, known as a carcinogen.



+ Eat BENEFICIAL foods

It is a common sense that fresh vegetables, fruit, and fiber are good for health. Eating a diet high in vitamin A and C can lower the risk of developing cancer by 30 to 50%. Fruit and green and yellow vegetables are rich in vitamin A and C; they are natural antioxidants, which are effective in slowing down aging processes. Vitamin C, in particular, prevents nitric acids contained in burned meat from becoming carcinogens.

Garlic is great for preventing stomach cancer. It also cleanses and purifies the blood by lowering blood pressure and cholesterol in the blood, which are the primary cause of adult diseases. It also helps ease the accumulated fatigue and calms down the body to release stresses.

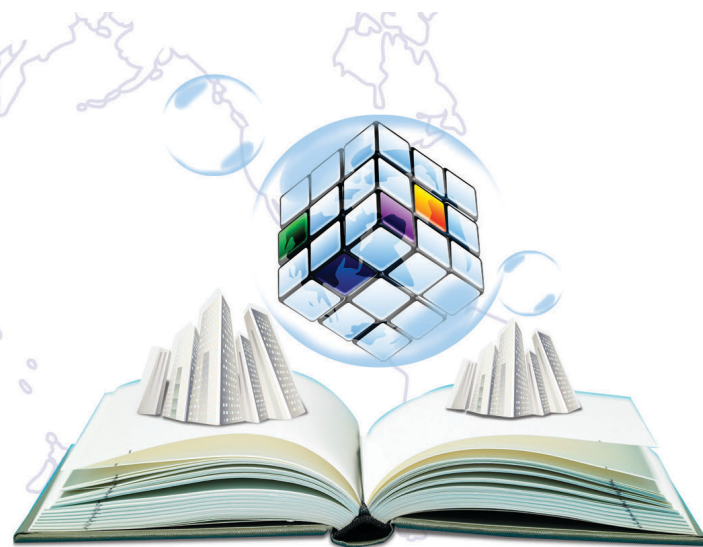
One of Korean traditional spices, doenjang (fermented soy bean paste) is effective in prevention of stomach cancer. It also helps to strengthen the features of the liver. As it helps to slow down aging and lower blood pressure, it is known that doenjang is especially good for seniors. Then, the question is, can stomach cancer be prevented by avoiding hazardous foods and eating beneficial foods? The answer is no. Improving eating habits will not be able to completely prevent cancer from occurring since food is not the only cause of stomach cancer.

The best way to prevent stomach cancer is, therefore, to have balanced eating habits and get checkups regularly. 🌱





Current News on the Members



SKC

SKC conducts volunteer activity with local communities to commemorate its founding day

In marking its 37th anniversary, SKC (CEO Park Jang-suk) participated in various community service activity on October 15. The volunteering activity organized to commemorate its anniversary were centered in the Suwon area, where SKC has been established. Unlike its previous activity, which had only involved the executives and staff members, SKC carried out the event designed to communicate and cooperate with the local community, while collaborating with local residents, non-governmental organizations, and local outreach organizations.

At one of the events, where people threw Effective Micro-organism (EM) mud balls into Seoho stream, local residents and NGO including the Suwon YWCA, Suwon River Area Network, and Seocho Stream Friends, set up an "Environmental experience booth" and held events for participants to make their own eco- friendly daily living goods, including EM deodorizers, EM fabric conditioners, and EM toothpaste, made out of EM-fermented liquid. The participants at the event worked together to practice the campaign for living an environmentally friendly daily life and making streams healthy.

SKC executives and staff members also performed volunteering activity aimed at preserving local cultural heritage sites by replacing window paper at Suwon's Hwaseong Haenggung Palace, a UNESCO World Cultural Heritage. Other employees of the Company visited the Suwon Nursing Home for Senior Citizens, and took the elderly on a day trip to the outskirts of Seoul while offering mask packs and massages to some of the seniors who were unable to move around. Some of the staff members visited the Suwon Welfare Center for the Disabled and the SK Cheongsol Nursing Home for Senior Citizens, facilities that they have regularly visited as part of their regular volunteer activity. SKC has been performing volunteer

Lanxess Korea

Lanxess Korea donates science experiment kits to promote chemical education for children in Busan

Lanxess Korea (CEO Ko Je-wong) donated three science experiment kits to the Amenity Science Research Group (Chemistry teachers' organization in Busan) at the '2013 Join Us to the Fund World of Chemistry!' an event organized by the Korea Responsible Care Council (KRCC) on September 14 in Busan.

As a part of its community service activity, Lanxess Korea gave away the experiment kits to raise children's interest in science through education. The experiment kits will also be used for classes of teachers in Amenity Science Research Group and other events of the 'Join Us to the Fund World of Chemistry' in Busan.

The Lanxess science experiment kits are designed for elementary school students to learn the fundamentals of chemistry by conducting basic experiments, consisting of 150 pieces of essential apparatus including beakers, test tubes, protection goggles, and thermometers.

Lanxess Korea, a member of the KRCC, has sponsored the Amazing World of Chemistry since 2008 to enhance chemistry education for children. The company has also annually participated in social outreach activity in Busan, which were recognized with <RC Awards> by the KRCC last year.

A message from Lanxess Korea CEO Ko Je-wong was delivered before the donation event of the Lanxess science experiment kits was held. "We're very happy to be able to provide these experiment kits to Korean students this year. We continue helping students in Busan to support their dreams to become scientists," he said. "Lanxess Korea will keep up the community service activity as a responsible corporate citizen," he added.



Daesung Industrial Gases Co.,Ltd.

Pororo Festival with Multicultural families

Daesung Industrial Gases (CEO Kim Hyung-tae) co-hosted the 2nd Daesung Industrial Gases Pororo Play Festival with Hwawon Community Welfare Center (Director Min Gyeong-seol) on September 13 for children from multicultural families and Korean families. The company invited 46 children and 31 parents from multicultural families, composed of diverse nationalities including Chinese, Mongolian, and Vietnamese, to enjoy



amusement facilities of popular cartoon characters. In welcoming Chuseok (Korean harvest festival), the event was specially organized to create a community culture that unifies families with different cultural backgrounds by understanding each other's differences. The event was especially meaningful for the society as it established a foundation for social integration by providing families with different cultural backgrounds to embrace and understand each other. Daesung Industrial Gases has invited 90 people from multicultural families to the amusement facilities earlier this year, while planning continuous community service activity for the community and the needy.

LG Chem

LG Chem conducts "Classroom of Home"

LG Chem (CEO Park Jin-su)'s volunteer members visited Banghwa 2 Welfare Center located in Banghwa-dong, Gangseo-gu on June 13 to conduct the 'Create a Classroom of Hope' activities. The 'Create a Classroom of Hope' is one of the key community service activity of LG Chem, which has been performed since 2008. It picks two community welfare centers every year to improve and renovate their facilities as well as the surrounding environments.

For the event, 40 employees had been selected out of a community service group and other social clubs of the company. They carried out environmental improvement activity for the welfare center, such as renovation of repair of halls in the center building and formation of a multi-use space, especially for performing a puppet show.

"Apart from the classroom remodeling program to help children and youth realize their dreams and hopes, LG Chem has continuously performed various community service activity including building libraries nationwide and providing educational support," LG Chem CHO Kim Min-hwan said.

To fulfill our social responsibility as a corporate citizen, we will continue expanding the community service programs that help our neediest neighbors. The 'Create a Classroom of Hope' activities started in 2008 and has been carried out at nine welfare centers including Seodaemun Welfare Center, Yeongdeungpo Welfare Center and Mazzarello Center for Youth with volunteer work of 500 employees and executives of LG Chem.



Cheil Industries' Yeosu Site

Foundation commemoration events are replaced by social outreach work

Ahead of the 39th foundation day of the company on October 15, Cheil Industries' Yeosu Site (Factory Manager Jo Sung-woo) conducted community

service activity in lieu of commemorative events on October 13. Starting from such events as making Songpyeon, Chuseok rice cakes and offering free lunch to seniors residing alone on October 13, the company carried out various outreach activity with its employees and executives.

Employees and executives of the company visited senior homes in the Yeosu region and provided lunch and sacks of rice to some 40 senior residents living alone. Previously on October 10, they held a donation event of 600 pieces of clothing manufactured by Cheil Industries at Beautiful Store's Hakdong branch. All the profits made on that day will be used to support neglected children and environmental education.

Cheil Industries has been conducting the event named 'Green World Bazaar Shaped by Sharing' for eight years. This year, the company has also delivered 100 sacks of rice to the needy neighbors in the Yeosu area and its sister towns in celebration of Chuseok.



Samnam Petrochemical

Samnam Petrochemical protects endangered species living in the mudflat

Samnam Petrochemical's Yeosu Plant (Plant Manager Lee Soo-heon) co-held various events with Citizens' Coalition for Economic Justice (CCEJ) Yeosu (CEO Kim Dong-chaee and Lee Sik) to project endangered species discovered in the coast of Yeosu on May 31. With local residents in the area, the company held such events as installation of informative sculpture on protected species, appointment of senior citizens as guardians of each endangered species, and support for making mementos.

The events started at 3 p.m. on May 31 with an ocarina concert at a mudflat stage attended by local residents, employees from Samnam Petrochemical, members of CCEJ Yeosu, and civil servants from Yeosu City.

After the concert, such events as appointing of senior citizens as guardians, offering mementos, and unveiling of the informative sculpture were followed. A small party with local residents was also held after the official events.

The events did not only show the participation of the company in environment protection activity of the local society but also its pursuit of sustainable environmental preservation activity through interaction and cooperation with the local residents; it is expected to become another good example for environmental contribution of Samnam Petrochemical and other local companies to the local community.





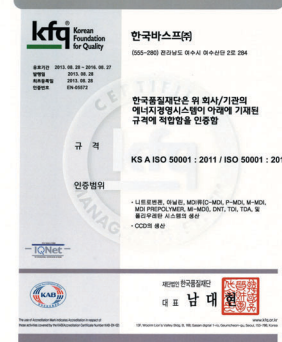
BASF Korea

BASF Korea obtains ISO50001 certificate

BASF Korea obtained ISO50001 certificate for Energy Management Standards (EnMS) from Korean Foundation for Quality (KFQ) on August 28, for the first time among chemical companies, after passing a two-step screening for EnMS in July. Enacted and promulgated by the International Organization for Standardization (ISO) in 2011, ISO50001 is an energy management standard that enables organizations to establish the plans and goals at company level that are necessary to improve energy efficiency and reduce energy use. (Korean Standards: AISO50001:2011 / ISO50001:2011) BASF Korea has obtained the certificate not just to secure an international certificate; the company's aim is to establish and operate the system that helps achieve sustainable growth through continuous interest and participation in such energy and environment related activity. The initial screening for EnMS was conducted by the Korea Accreditation Board (KAB), a national accreditation agency. At the screening process, the energy performance improvement activity, energy management improvements with GHG reduction projects, and sustainable energy reduction activity of BASK Korea were especially highly rated.

Having obtained the certificate for the headquarters and Yeosu Plant, the company is planning to apply for the certificate for all of its sites to be assessed for effectiveness and appropriateness of their existing energy management activity. BASF Korea aims to run ISO50001 energy management system proposing effective, systematic, and continuous performances and actively participate in national energy management activity, energy reduction activity, GHG target management program, and carbon emission trading.

에너지경영시스템 인증서



BASF Korea receives the Environment Minister's Award for the prevention of environmental accidents

BASF Korea (CEO Shin Woo-sung) has received the Environment Minister's Award, a grand prize, at the '2013Green Company Regular Assembly: Contest for Excellent Cases in the Prevention of Environmental Accidents' organized by the Green Company Council and sponsored by the Ministry of

Environment (MOE). The MOE has awarded excellent workplaces in each region out of 208 companies designated as 'Green Company.' BASF Korea was recognized with the 'Environment Minister's Award' for its excellent implementation of environmental protection and environmentally-friendly management.

"All BASF employees have actively and voluntarily participated in helping ensure work places are incident and disaster-free," BASF Korea CEO Shin Woo-sung said. "We will continue our efforts in maintaining and developing our top-notch environmental safety culture," he added.

The BASF site in Yeosu has been named a 'Green Company' since 1996. In addition, it has been re-designated a 'Green Wheel Company' by the MOE maintaining its environmentally friendly management. In leading the promotion of awareness of environmental safety with the community, BASF Korea has convened an Environmental Safety Council with local community's experts for over 10 years.



Hanwha Chemical

Hanwha Chemical conducts 'a series of volunteer works of love' with chemical companies in Ulsan

Continued from the volunteer work performed in September, the Ulsan plant of Hanwha Chemical held the seventh lecture of 'Energy Classroom of Tomorrow' with its employees and college volunteers on September 25 at Sinjeong Elementary School. The program aims to popularize science and encourage youth to become interested in science through solar photovoltaic, a key business of the company.

Many companies located in Ulsan have been active in community service activity to make the society better off; Ulsan City has signed an MOU with 22 companies in the city to carry out joint programs and conduct a serious of volunteer activity that suit each company's characteristics.

"Various volunteer activity that make the most of each company's characteristics along with an advanced corporate culture built in the city have helped Ulsan become a leading city in corporate outreach activity," an official from Hanwha Chemical said. 🌱



Introducing New Member Company



Axalta Coating Systems Korea (Inc.)

DuPont Performance Coatings, a world-renowned coatings company, has renamed the company as Axalta Coating Systems.

With more than 145 years of experience in the coatings industry, the global company has operated 35 factories on four continents to supply its high-quality coatings to over 120,000 customers in 130 countries.

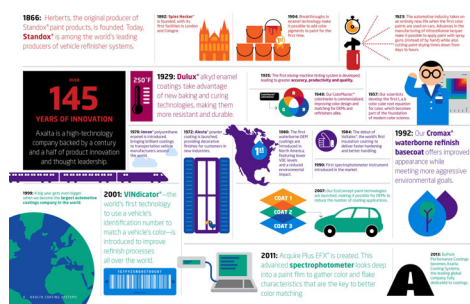
Axalta Coating Systems, a leading global supplier of coatings, has rolled out a new corporate brand identity in 2013. The new logo highlights the Axalta name as well as the characteristics of its products and services at a glance. Axalta Chairman and CEO Charles Shaver explained that the new look embodies its commitment to move ahead in the marketplace. "Our innovative tradition that has continued for over 145 years is a foundation on which to continue to innovate in the future and give our customers cutting edge resources and products," he added.



Developing coatings for a diverse customer base, Axalta holds leading positions in four core market segments. The company supplies paint to automotive original equipment manufacturers (OEMs) and has approvals for the use of its products from many leading OEMs.

In the refinish segment of the car market, its flagship brands including Standox®, Spies Hecker® and Cromax®, formerly named DuPont® Refinish, make Axalta the largest global supplier of paint to collision and body shops. The company's other brands include Imron®, Voltatex®, and Nap-Gard® that produce industrial paint and Alesta® that handles powder coatings.

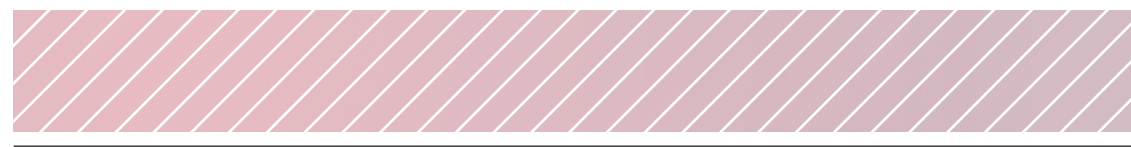
Axalta Coating Systems Korea runs its refinish training center in Icheon, Gyeonggi-do ((Tel.031-640-8766) and has its sales and marketing office in Seoul (Tel.02-2147-5400). Its products are available through a nationwide network of sales branches.



www.axaltacoatingsystems.com



RC Activities



Secretariat Activity

Composition and operation of an advisory group for the KRCC

The KRCC has composed and operated an advisory group to provide support for its member companies to improve their environmental safety and hygiene and voluntarily practice related activity. The RC advisory group has been formed by voluntary participation of officials of member companies who are responsible for environmental safety and hygiene. Focusing on the six codes of RC including process safety and environmental protection, advisers of the group, specialized in the applicable field, visit member companies that are experiencing difficulties, upon request.

Performances of the advisory group in 2013

Company name	Advisory date	Advisory content
Akzonobel PPC Korea	August 9 2013	Chemical substance legislation and transportation safety
Lotte Chemical	November 26 2013	Introduction to the safety culture of global companies

2013 2nd board of directors Meeting

The KRCC held the second board meeting (and for social gathering) on June 29 (Saturday) 2013 at Plaza CC, sponsored by Dongseo Petrochemical and Hanwha Chemical. At the meeting, matters related to Korea REACH, which has become an issue in the industry, CCA, and Act on the Liability for Environmental Pollution Damages were reported, requesting active response of representatives and executives of the council.



2013 Open! Fun World of Chemistry.

The KRCC has held '2013 Open! Fun World of Chemistry' for elementary school students (grade 4 and 5) to experience easy and fun chemistry experiments through experimental programs and games and for the community and the chemical industry to build a network. The event was held on



RC Activities

NEWS

August 31 in Seosan, September 14 in Busan, September 28 in Ulsan, and October 12 in Yeosu.

The event has successfully been held with over 1,400 enthusiastic students from 211 elementary schools in Yeosu, Busan, Ulsan, and Seosan. Marking its 11th year, the event has encouraged students to be interested in chemistry that is around us through providing experimental activity including chemistry experiments and featuring image materials from the chemical industry, while helping the students to play a leading role in the future of the chemical industry.

The KRCC has considered that to instill dreams in the minds of children, future clients who will be leading the chemical industry, as one of the important assignments given to the chemical industry. It will continue its efforts in developing the chemical industry through Responsible Care programs.



Industry (sponsorship from 28 companies of the KRCC)

Platinum : Tongsuh Petrochemical, Lotte Chemical, Samsung Total Petrochemicals, SK Global Chemical, LG Chem, Yeochun NCC, Hanwha Chemical

Gold : Kumho Mitsui Chemicals, Kumho Petrochemical, Kumho P&B Chemicals, Daelim Industrial, Daehan Oil Chemical, Dongwoo Fine-Chem, Dupont Korea, Lanxess Korea, Cheil Industries, Dow Chemical Korea, BASF Korea

Silver : Kumho Polychem, Samnam Petrochemical, Styron Korea, Aekyung Petrochemical, Evonik Korea, LGMMA, Isu Chemical, CAPRO, Kolon Industries, Styrolution Korea

Governments/Institutes

Ministry of Trade, Industry and Energy, Ministry of Environment, Busan Metropolitan Office of Education, Ulsan Metropolitan Office of Education, Yeosu Education Board, Seosan Office of Education, Korea Petrochemical Industry Association

Academia (100 teachers from 4 regions)

Seoul and Gyeonggi (Teacher's for Exciting Science) Busan (Amenity Science Research Group) Ulsan (Ulsan Science Research Group) South Jeolla (Chemistry Lover Group)

Seosan (8.31)

【 Experience 1】 Sing through pencils
【 Experience 2】 Make mysterious balls 'Fullerene'
【 Experience 3】 Make my own stamps
【 Experience 4】 Make plastic key chains
【 Play 1】 Coal becomes battery
【 Play 2】 Make environmentally friendly icepacks that consume no electricity

Busan (9.14)

【 Experience 1】 Everything about combustion
【 Experience 2】 Natural anti-mosquito spray
【 Experience 3】 Fist batteries
【 Experience 4】 Make plastic microscopes
【 Play 1】 Straw sprays
【 Play 2】 Air rockets

Ulsan (9.28)

【 Experience 1】 Graphite that conducts electricity
【 Experience 2】 Story about carbon family
【 Experience 3】 Fuel cell
【 Experience 4】 Where did ink go?
【 Play 1】 Fullerene soccer balls
【 Play 2】 Make carbonated water

Yeosu (10.12)

【 Experience 1】 New looks of milk
【 Experience 2】 Transformation of carbon
【 Experience 3】 Attributes of carbon
【 Experience 4】 Use of carbon
【 Play 1】 Make hydrogen rockets
【 Play 2】 Transformation of coal

□ 2013 APRO Meeting and APRCC

The 2013 APRO Meeting & Asia-Pacific RCC Conference (APRCC) was held from October 8 to 11, 2013 in Pattaya, Thailand. Over 20 people from 10 member companies of the Asia-Pacific RCC attended the meeting to discuss about current issues on Responsible Care.



- Agenda 1> Process Safety Metrics (PSM)
- Agenda 2> Discussion about allowing new countries to join the APRO (Cambodia, Laos)
- Agenda 3> Selecting a hosting country for the 2015 APRCC
- Agenda 4> Introduction to the process safety culture of Japan

Member countries also discussed about their view on the submission of process safety metrics (PSM) that has recently become an issue among the countries. They agreed that the items in the PSM should be simplified as the standards required by Europe and the USA are too detailed. They also agreed that the burdens on the member countries should be eased by putting options in the items. At the meeting, it was decided that Philippines will host the 2015 APRCC.



The participants from such countries as Japan, China, Korea, and New Zealand also presented their cases in process safety and product responsible care at the APRCC. The presentation materials can be found on the homepage.

□ 2013 RCLG Meeting



The RCLG Meeting for the second half of the year was held from November 5 (Tuesday) to 6 (Wednesday) 2013 in Montreal, Canada. Over 40 people from member countries attended the meeting to discuss about pending issues on RC.

The discussions covered results of the TF discussion related to the research and submission of PSM, results of support for the 2013 Capacity Building, excellent cases of RC practice of major countries, and operation of RC Online Library. For more information, find the meeting minutes posted in the forums on the homepage.



NEWS

2013 RC annual workshop

The KRCC held the annual RC workshop from November 28 (Thursday) to 29 (Friday), 2013 at Seogwipo KAL Hotel in Jeju. Over 50 executives and employees of member companies including president of the KRCC Huh Jong-pil, BASF Korea CEO Shin woo-sung, Yeochun NCC Co-CEO Jeong Jin-won, and President of Hansu Heo In-hwan attended the workshop.

The workshop held various programs including a CEO lecture presented by BASF Korea CEO Shin woo-sung (vice president of the KRCC), and a briefing session on introduction to the safety culture of BASF Korea. It also featured presentations on the enforcement situation of chemical substance legislation and corporate corresponding strategies and changes in the industrial safety policies as well as countermeasures towards the changes for the chemical industry. For more information and the presentation materials, visit the homepage of the KRCC.



2nd implementation committee

The KRCC held 2nd implementation committee for 2013 on November 21 (Thursday) 2013 at a meeting room in the KRCC building. The meeting was attended by six members including committee chair Kim Kyung-ok (director of BASK Korea).

The meeting wrapped up making a RC checklist for the process safety code, one of the six RC codes, and discussed the next schedules for making checklists for the rest codes.

New member companies to the KRCC

Company name	CEO	Date joined	Key products
Daesan MMA	Lee Hong-yeol	September 4 2013	MMA, PMMA
Axalta Coating Systems Korea	Hong Tae-hwa	October 31 2013	Paint and industrial consumables

Key Events of the KRCC in the first half of 2014

2014 1st Board of Directors Meeting & The 14th Directors General Meeting

Date: February 7 (Friday) 2014
Venue: Plaza Hotel (119, Sogong-ro, Jung-gu, Seoul)

ACC (America Chemistry Council) RC Conference

Date: May 4-6, 2013
Place: Miami, USA

Responsible Care Leadership Group (RCLG) Meeting (first half of 2014)

Date: May 7 (Wednesday)-8 (Thursday) 2013
Venue: Miami, the USA (details scheduled to be announced later)

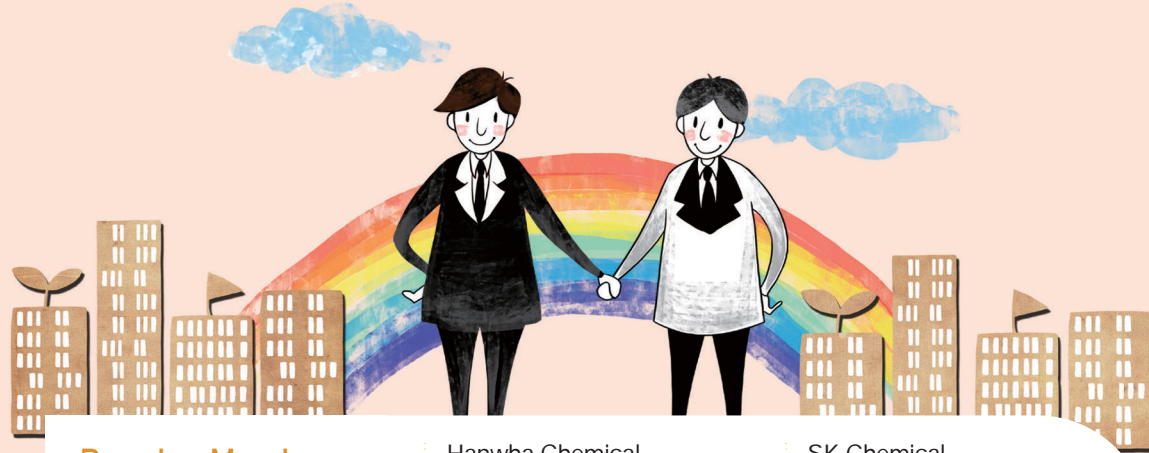
Other events for the first half

- Seminar on environmental policies
- Seminar on safety management of chemical substances
- Seminar on safety policies

※ We appreciate your participation and interest.



Members



Regular Members

Aekyung Petrochemical
 Air Liquid Korea
 Akzo Nobel Amides
 Akzo Nobel PPC Korea
 ARKEMA
 Ashland Korea
 ASK Chemicals Korea
 Axalta Coating Systems Korea
 BASF Korea
 Bayer Korea
 Capro
 Changshin Chemical
 Cheil Industries
 Connell Bros
 Daelim Industrial
 Daesan MMA
 Daesung Industrial Gases
 Deogyang
 Dongwoo Fine Chem
 Dow Chemical Korea
 Dowcorning Korea
 Dupont Korea
 Eastman Fiber Korea
 Evonik Korea
 GS Caltex
 Hanju
 Hansu

Hanwha Chemical
 Hyosung
 ISU chemical
 Kolon Industries
 Korea Alcohol Industrial
 Korea PetroChemical
 KPX Chemical
 KPX Fine Chemical
 KR Copolymer
 Kumho Mitsui Chemicals
 Kumho P&B Chem
 Kumho Petrochemical
 Kumho Poly Chem
 Lanxess Korea
 LG MMA
 LG Chem
 Lotte Chem
 Merck
 OCI
 Polymirae
 Samnam Petrochemical
 Samsung Petrochemical
 Samsung Fine Chemicals
 Samsung Total
 Sansung BP Chem
 Schenker Korea
 SH Energy Chemicals
 SKC

SK Chemical
 SK Global Chemical
 Styron Korea
 Styrolution Korea
 Tongsoh PetroChemical
 Toray BSF Korea
 Wacker Chemical Korea
 Yeochun NCC
 Yongsan Chemical

Associate Members

Korea Chemicals Management
 Association
 Korea Chloride Alkali Industry
 Association
 Korea Fertilizer Industry
 Association
 Korea Petrochemical Industry
 Association
 Korea Petroleum Association
 Korea Specialty Chemical
 Industry Association
 Korea Testing & Research
 Institute
 Metropolitan Process Safety
 Council

2014 1st Board of Directors Meeting & The 14th Directors General Meeting

The KRCC invites you to the 2014 1st Board of Directors Meeting & The 14th Directors General Meeting that will boost networking among officials responsible for environmental safety and promote exchanges of information in the field of environmental safety and sustainable development of the chemical industry.

Date: 11:00 a.m. February 7 (Friday) 2014
 Venue: Plaza Hotel (119, Sogong-ro, Jung-gu, Seoul)
 Invitee: Executives and employees
 of member companies and RC coordinators



The details of the event are schedule to be announced in due course
 Thank you in advance for your interest and participation in the meeting.