



For Better Chemically Yours  
Chemical Management  
Expert Group, TO21



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*TO21's a No.1 expert Chemical Material Management Solution provider, servicing for more than 15 years to government and companies worldwide, we add value to customers by our long term experience, self-developed chemical material managing solution and data base, expert consultants.*

# Chemical Management Services

01 Diagnosis & Improvement of Chemical Management Process

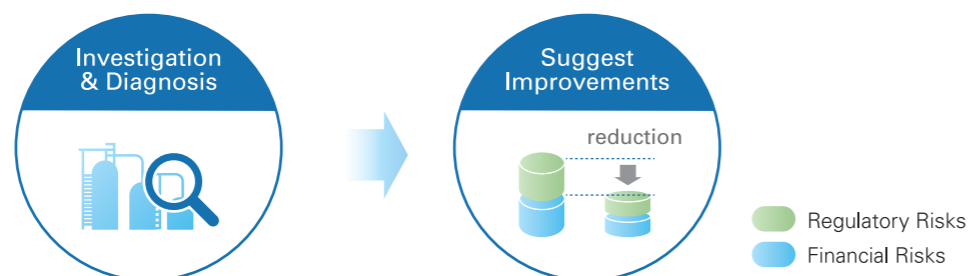
02 Procurement/Supply Services of Green Materials

01

## Diagnosis & Improvement of Chemical Management Process

We propose improvement ways to reduce regulatory and financial risks by analyzing chemical information and lifecycle of chemical management.

- Inventorization/Verification for chemical management
  - Material/Product Information, Supply Chains(Supplier/Manufacturer), Chemical Ingredients, Regulations
- Optimization of chemical management process
- Baseline Analysis
  - Procurement/Usage/Disposal Amount
  - Chemical Management Cost(Hard Cost/Soft Cost)
- Informatization strategy for Chemical management services



02

## Procurement/Supply Services of Green Materials

We propose green products for you to use safer and less hazardous chemicals by analyzing hazard and regulatory information.

- Green Material Analysis
  - Review/Evaluation of health and environmental hazards, regulations, etc
- Recommendations on substitute chemicals

# Chemical Safety Management Services

01 Diagnosis of Chemical Emission(PRTR)

02 Leak Detection And Repair(LDAR)

03 Diagnosis of Chemical Safety



## 01

### Diagnosis of Chemical Emission(PRTR)

We provide Pollutant Release and Transfer Registers(PRTR) program and reduction plans to keep safe and reasonable emission levels for human health and environment.



Diagnosing the status of chemical emissions/ Representing PRTR legal reporting



Establishing emission reduction plans



Developing Chemical Emission Factors



Reporting Risk Communication

## 02

### Leak Detection And Repair(LDAR)

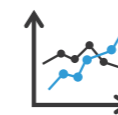
We provide Leak Detection And Repair(LDAR) program to reduce hazardous chemical emissions, improve working environment, prevent safety accidents, etc from regular inspection and repair.



Construction of LDAR21™ (LDAR system)



Fugitive emission analysis /Leakage Repair



Investigating cause of leaks and calculating core data for process improvement

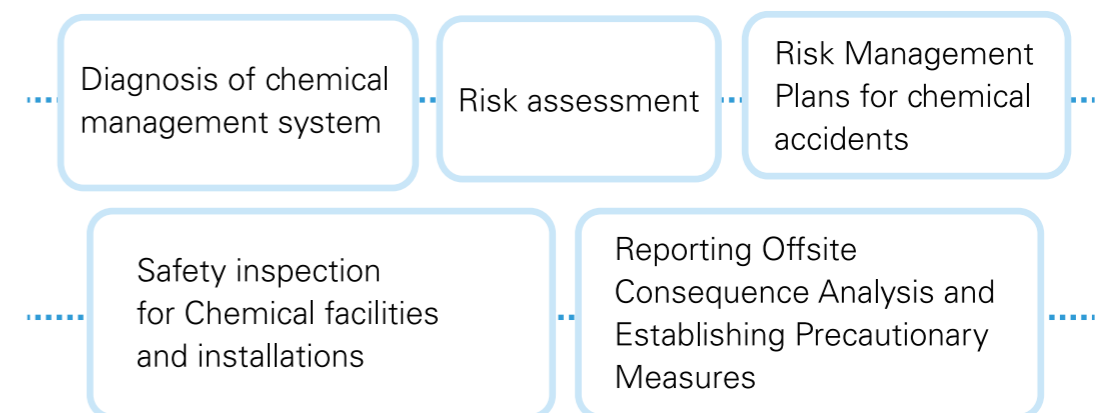


Performance reporting for PRTR/ HAPs regulations

## 03

### Diagnosis of Chemical Safety

We detect internal risks of chemical accidents and help you to prevent leakages of toxic chemicals by analyzing safety management status and providing improvement and management plans.



# K-REACH

01 Notification of Manufactured/Imported Chemicals

02 Joint Submission

03 Risk Assessment

04 Notification of Articles w/ Hazardous Chemicals

05 Chemical Information Sharing within Supply Chain

## 01

### Notification of Manufactured/Imported Chemicals

Manufacturer, importer or seller, who deals with new chemicals or existing chemicals ( $\geq 1$  ton/yr), has to annually notify, report and save the result of its use and amount to the Ministry of Environment.

- Chemical inventory and the reporting on behalf of manufacturer(s) /importer(s).

## 02

### Joint Submission

New chemicals or existing chemicals ( $\geq 1$  ton/yr) have to be registered before manufacture · import. When submitting required forms for the same substance, you need to decide the representative and co-register. However, if it includes confidential information or takes more costs for co-registration, then you can submit individually with verification of Ministry of Environment.

- Consortia formation and management.
- Chemical registration and the only representative service.
- GHS/MSDS preparation with local regulation.
- Implementation testing strategy and GLP testing agency.
- Data sharing and CBI protection legal advisory.



## 03

### Risk Assessment

For New chemicals or existing chemicals (manufactured or imported  $\geq 10$  ton/yr) which needs hazard evaluation results or further assessment, the report of risk assessment has to be submitted as well.

- Chemical safety report required under K-REACH.
- Chemical risk assessment and documentation.

## 04

### Notification of Articles w/ Hazardous Chemicals

When each hazardous chemical within the article exceed 1 ton/yr, you need to notify, report and save the result of chemical name, content and hazard information before manufacture or import.

- Chemical inventory and the notification on behalf of manufacturer(s) /importer(s).

## 05

### Chemical Information Sharing within Supply Chain

The person who transfers registered chemical or a mixture has to provide registration number, chemical name, hazard and risk information, safety usage information, etc to the person who receives it.

When manufacturer or importer asks for chemical usage, exposure information, usage or sales amount, safety usage information, etc, the downstream user or seller has to provide these information (vice versa).

When consumer asks for the chemical name, usage, conditions, etc that contains in the article, the person who transfers this article has to provide these information.

- Information management and communication through chemical management system (e-CMS™).



# Global Regulatory Affairs

01 Chemical Registration

02 Notification of Food Contact Materials

03 Biocides

04 GHS & (M)SDS Authoring

## 01

### Chemical Registration

We represent your obligations under local regulations(registration, evaluation, authorization, restriction, prohibition) for manufactured or imported chemicals

- EU REACH Registration
- Registration of new chemicals in US (TSCA)
- Registration of new chemical s in China (IECSC)
- Registration of new chemicals in Japan (ENCS)

## 02

### Notification of Food Contact Materials

We help you to prepare all matters relating chemicals with food contact when exporting to US, EU, Japan, Canada, etc.

- EU FCN Approval
- US FDA Approval
- Registration of food contact materials in Canada, Japan, China, etc

## 03

### Biocides

We help you to prepare all matters relating biocide ingredient, product and treated articles when exporting to US, EU, Japan, Canada, etc.

- US FIFRA Registration
- EU BPR Registration
- Biocide Registration in Japan, Canada, etc.

## 04

### GHS & (M)SDS Authoring

We author and handle (M)SDS under GHS and various international regulations and consult on chemical classification and labeling from the beginning of manufacture.

- GHS Labeling and (M)SDS authoring/verification under Chemical Substances Control Act, Occupational Health and Safety Act, Control of Dangerous Substances Act.
- GHS & (M)SDS Authoring under international regulation (EU CLP, China Chemical Inspection and Regulation Service(CIRS), Japan Industrial Safety and Health Law (ISHL), etc)
- Multilingual Services (English, Japanese, Chinese)
- SMART MSDS™ solution provisioning(TO21's self-developed)

# Regulatory DB Construction-Provisioning

01 National Chemical Database construction-provisioning

02 Customized Analysis for Environmental Regulatory Compliance

01

## National Chemical Database construction-provisioning

We construct and provide optimum database which needs for the government and company for chemical management and various environmental regulatory affairs.

- Database construction under announcement-legislation and provisioning of regulatory information
- Optimum DB construction strategies from various experiences

02

## Customized Analysis for Environmental Regulatory Compliance

This service is suitable for companies which needs in-depth analysis for environmental regulatory compliance, hazard substances monitoring, and chemical management strategies.

- Analysis for regulatory compliance with company-specific needs
- Customized advisory for domestic and international chemical registration, evaluation, authorisation, notification
- Provisioning of strategic services for global issues through training and seminars



# Chemical Risk Management

## 01 Risk Assessment of Chemical Substances



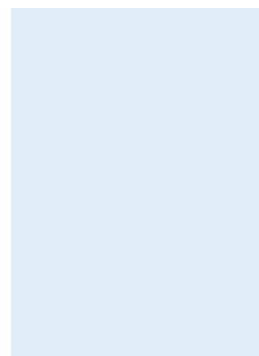
## 01

### Risk Assessment of Chemical Substances

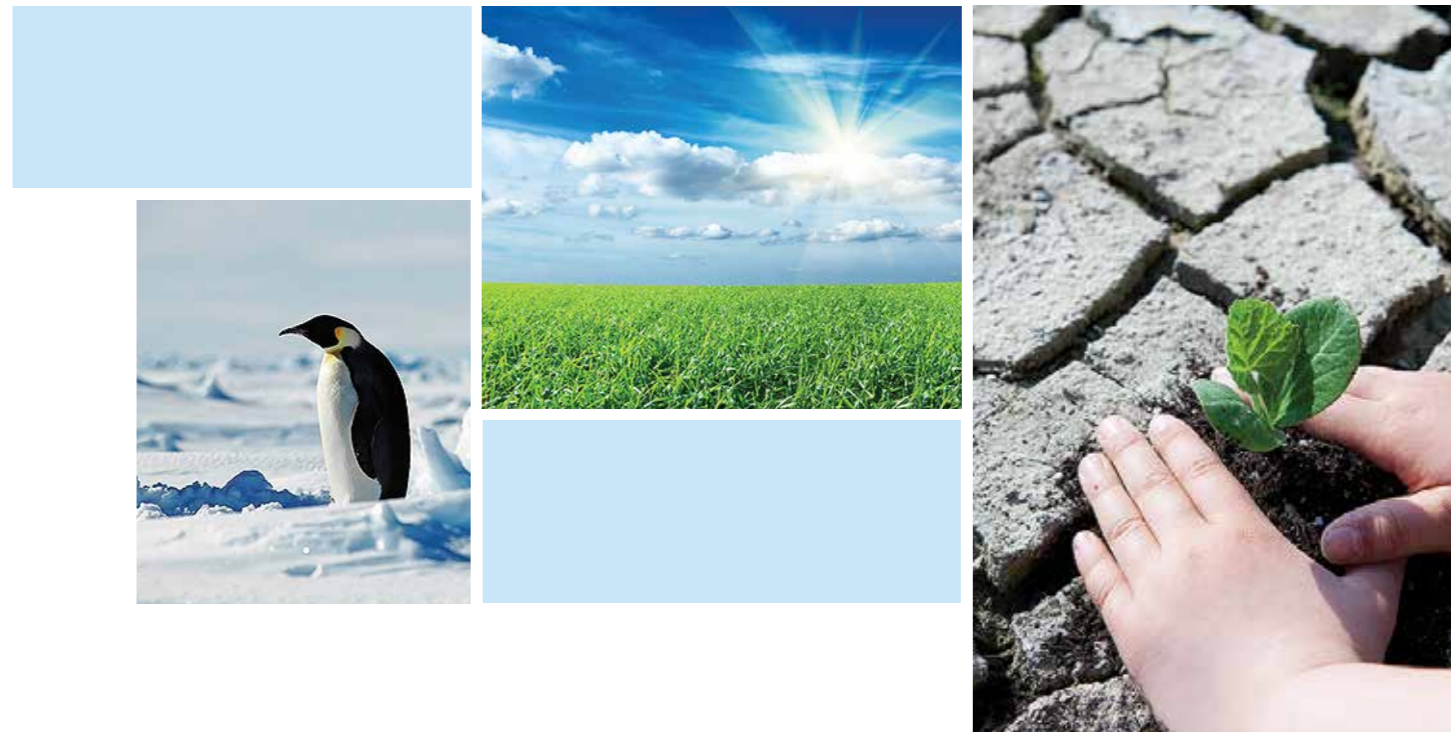
We provide risk management solutions based on how chemicals affects human health and environment.

RA : Risk Assessment of chemical substances

- Risk Assessment for Worker·Consumer·Health and Environment
- Exposure Assessment via Modeling (EUSES, CALPUFF, ECETOC TRA, ConsExpo, etc.)
- Risk Assessment Report for public release of PRTR information
- REACH CSR Reporting







## 01 Inventorization of Greenhouse Gas

We help you to diagnose the status of greenhouse gas emission with a consideration of emission source and suggest reduction plans for you to keep reasonable emission levels.

- Diagnosis of greenhouse gas emission for each emission source
- Prediction of future greenhouse gas emission
- Evaluation of potential reduction and preparation of reduction scenario

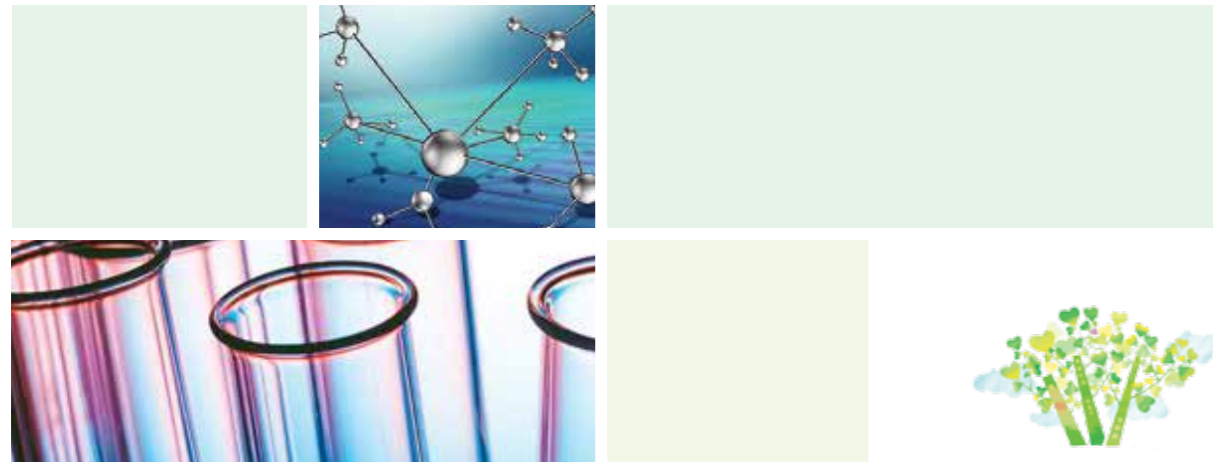


## 02 Approval of Carbon Reduction Label

We help you to convert overall greenhouse gas to CO2 emission level throughout its lifecycle (production, transport, use, disposal, etc) and obtain carbon reduction label for the product.

- Process and Data collection for carbon reduction labeling
- Estimation of overall emission of greenhouse gas (Manufacture ~ Disposal)
- Verification and Validation of greenhouse gas emission
- Preparation of certification and evaluation

# Chemical Management Solution



01

## e-CMS™ Chemical Management System

e-CMS™ is an integrated management system for controlling substances (raw materials, products, chemicals, etc.) over their lifecycle (procurement ~ disposal) and supervising various information (basic information, regulations, supply chains, influx/performance information, costs, etc.).

02

## SMART MSDS™ Automatic MSDS authoring tool

SMART MSDS™ is a comprehensive tool for providing GHS classification and labeling for single/mixtures and automatically authors MSDS according to GHS.

03

## SMART SCM™ Supply chain management system

SMART SCM™ allows integration of chemical substance information and supply chain management for more efficient regulatory compliance.

04

## LDAR21™ Leak Detection And Repair System

LDAR21™ is an exclusive and effective system to control, manage, and minimize fugitive VOCs and HAPs emissions from a number of equipments (e.g. valves, flanges, compressors, pumps) in chemical industries.

05

## Emission Calculation Program

- TANK2000™ : Estimation tool for storage tank emissions
- WWT2000™ : Estimation tool for wastewater treatment facility emissions
- FUGITIVE2000™ : Estimation tool for fugitive emissions
- CHEM2000™ : Search Program for physicochemical properties