

## **MANAGING PRODUCTS THROUGH THEIR LIFECYCLES**

At NOVA Chemicals, we strive to continuously improve our product safety and risk management systems as part of our Responsible Care® commitment. Through our Product Stewardship program, we assess the health, safety, environmental and resource impacts of our products at all stages of their lifecycles and we take the steps necessary to protect stakeholders and the environment.

Product Stewardship at NOVA Chemicals is based on sound science and improving product lifecycle knowledge through internal research and collaboration with universities, external agencies and our industry associations. Knowledgeable and experienced employees work together to identify, review and respond to any product risk management issues arising during new product design, market development, raw material selection, manufacturing, product distribution, sales and customer use. We also work with external agencies through our industry associations to help address public health and environmental issues arising from the reuse, recovery and disposal of our products.

Our commitment to product safety and risk management includes ongoing work in the following areas:

### **Research**

- Undertaking product research, new product testing and assessment studies.
- Carrying out product risk reviews and participating with the industry in regulatory agency risk assessment processes.

### **Product Development**

- Improving our products, processes and services in concert with our customers' needs, including updating and distributing product information and safety data sheets.
- Complying with existing laws and regulations and monitoring emerging requirements.

### **Communication**

- Advising customers on product selection, performance, safe handling and end use.
- Addressing inquiries and resolving complaints.

### **Response**

- Responding to emergencies involving our products.

### **Advocacy**

- Working with industry associations to respond to the major issues confronting the chemicals and plastics industry.

## **PRIORITIZING OUR PRODUCTS' RISK**

Our products are evaluated for overall risk internally, with our trade associations, and by governments and other organized groups. Our prioritization process uses hazard and risk assessment methodology - considering hazard properties, along with exposure and use information.

## **Hazard Properties**

Hazard is an inherent property of a chemical/product that is independent of its use or application. Hazard information is typically physical, chemical, and toxicological properties. Significant hazard information is summarized on our publicly available Safety Data Sheets. Some of these include:

- Regulatory Status (OSHA/WHMIS 2015, DOT/TDG/IATA/IMDG)
- Carcinogen Classification (e.g. International Agency for Research on Cancer (IARC), US OSHA, US NTP)
- Persistence, Bioaccumulation and Toxic (PBT) Characteristics
- Developmental, Reproductive or Mutagenic Effects

## **Exposure/Use Information**

Exposure evaluation considers the magnitude, frequency, duration and route of potential or actual human and environmental exposure/use. It also considers the nature, size and constitution of the potentially exposed population. Included are:

- Commercial volumes shipped/sold
- Worker, downstream handlers/users and public exposure potentials
- Transport mode(s)
- Uses (including sensitive end uses such as food contact and medical applications)
- Customers (including robustness of their product stewardship programs)
- Releases to the environment
- Past incidents

## **Regulatory Programs and Testing Initiatives**

NOVA Chemicals also provides chemical and product information to many regulatory programs, such as:

- The *Canadian Environmental Protection Act* (CEPA) and the Canadian Chemicals Management Plan (CMP)
- US EPA's *Toxic Substances Control Act* (TSCA) Chemical Data Reporting (CDR) Rule
- The European Union's *Registration, Evaluation, Authorization and Restriction of Chemicals* (REACH) Regulation and Substance Information Exchange Forums (SIEFs)

We also participate in testing and/or risk evaluation work completed or underway by governments and industry associations:

- American Chemistry Council (ACC) Olefins Panel
- Various provincial regulatory agencies

## **Prioritization**

Prioritization of our chemicals and products is based principally upon:

- Hazard Evaluation (IARC carcinogen, PBT, or developmental/reproductive/mutagenic effects)
- Exposure /Use Evaluation (manufacturing operations, volumes, uses, customers, transport modes, public exposure, past incidents)
- New information is reviewed by the ACC Olefins Panel to determine if products need to be reprioritized (ethylene, 1,3-butadiene streams).

NOVA Chemicals prioritizes its chemicals and products for hazards, exposures and risks. Testing and risk evaluation work completed or underway by governments or other organized groups is factored into our prioritization process. Public concerns and product issues are also factored into the prioritization process.

## **CHARACTERIZING PRODUCT RISK**

Our commercial products are evaluated using a risk analysis process that involves the following steps:

Step 1: Determine product review timing and secure resources.

Step 2: Identify internal and external experts in the areas of research, product regulations, toxicology, health, environment, safety, manufacturing, storage & handling, markets, customers and other stakeholders.

Step 3: Review relevant product information for chemical, physical, and toxicological properties. Summarize and update lifecycle considerations for regulatory compliance; operations, handling, storage & distribution controls; suppliers, customers, targeted markets and end use; and public health, security or environmental concerns and issues.

Step 4: Conduct more detailed investigation to assess major risk-based considerations. Note sources of supporting data and identify areas to focus attention on for additional risk reduction actions.

Step 5: Evaluate all information in a peer-review process.

Step 6: Share information with the applicable business; where risk management actions are recommended, align resources and plan improvements.

Step 7: Summarize and document information on a Product Risk Profile (also called Product Stewardship Summary by other stakeholders).

Step 8: Schedule the next review to focus on evaluation of actions taken and any relevant changes planned or completed since the prior risk review.

Some examples of risk management actions taken include: improving products by reducing hazardous components and substituting lower hazard raw materials; creating and updating product information; improving training materials and information exchange systems; improving product safe handling and delivery systems; improving equipment; and resolving identified customer issues and public concerns with special projects.

## **COMMUNICATIONS: SHARING TO IMPROVE**

NOVA Chemicals is cognizant of public concerns regarding our chemicals and products. We are committed to responding to product safety and risk management questions raised by our many stakeholders, including employees, neighbors, customers, regulators and other interested members of the public.

Within the communities where our facilities are located, NOVA Chemicals seeks to transparently share information on our operations, products and risk control processes including safe operating practices, incident investigation and emergency planning & response. We encourage two-way dialogue with our neighbors through site open houses and local advisory groups to ensure that we are addressing the concerns the community regards as most pressing. We further seek positive community engagement through community volunteer work and donations.

Our employees meet regularly with customers, carriers, and suppliers to identify opportunities for improving the safe handling and use of our products and the materials required to make them. NOVA Chemicals' employees respond to questions in person or by telephone, written letters and e-mail. We are committed to improving the ongoing exchange of information about our company and products, and use a variety of tools such as our Corporate Website to share information.

There are more complex public issues that require co-operation and joint action by industry, communities, governments and special interest groups. As a member of chemical industry trade associations, we sponsor independent, third-party research on emerging health and environmental issues at prominent research centers and universities. For example, NOVA Chemicals participated in hazard evaluations of major products as part of the U.S. EPA's High Production Volume (HPV) Chemical Challenge program, the American Chemistry Council's (ACC) Long-Range Research Initiative, and the European Union risk assessments for chemical substances. NOVA Chemicals also plays a leading role in the industry's efforts to encourage sustainable plastic resource recovery and reuse through programs funded by plastic trade associations.

## QUESTIONS & FEEDBACK

We hope this summary has helped to increase your awareness of NOVA Chemicals' product risk review and communications practices. If you have questions, feedback or would like additional information, please contact us during business hours or visit our website at [www.novachemicals.com](http://www.novachemicals.com).

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Or visit the websites of the following associations to which we belong:

American Chemistry Council (ACC) @ <https://www.americanchemistry.com>

Canadian Plastics Industry Association (CPIA) @ <http://www.cpia.ca>

Chemistry Industry Association of Canada (CIAC) @ <http://www.canadianchemistry.ca>

Plastics Division of the American Chemistry Council (ACC) @ <https://plastics.americanchemistry.com/>

PLASTICS Industry Association @ <http://www.plasticsindustry.org/>

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