

ENHANCING HAZARD COMMUNICATION – Use of AI in Chemical Compliance and Substance Regulations



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ABSTRACT

Businesses are under increased pressure to identify chemicals and products that could put companies at risk. Identifying these chemicals and products in a timely manner is important to be compliant with existing as well as emerging chemical and substance regulations. Many chemical regulations restrict entire classes of a substance, such as Perfluoroalkyl and Polyfluoroalkyl compounds. And adding to the complexity is the huge number of substances that are not identified by a CAS number. Responsibility falls on businesses to ensure SDS and labels accurately reflect a products hazard profile. Finding a solution that can identify restricted/hazardous substances in a businesses' portfolio can be difficult. In recent years, Artificial Intelligence has been gaining traction across sectors to improve efficiency. This poster will investigate strategies to identify substances that pose regulatory risk and present ideas to streamline workflow using AI tools. This will help to improve the accuracy of hazard labels and SDSs.

WAYS OF USING AI

SEARCH USING SPECIFIC PHRASES

What: Search engine designed to identify **specific search terms** in documents. Individual or multiple CAS numbers or Key words

Functionality: Ability to review large sets of data (SDSs, data information sheets, formulations).



SEARCH SPECIFIC REGULATIONS

What: Script designed to download latest version of specific regulatory lists and upload all regulated substances into a database.

Functionality: Ability to download regulatory lists and capture regulated substances. Identify what substances have been added or deleted. Compare client product formulations to regulated substance lists.

BUILDING BLOCKS FOR USING AI

Tools and Technologies

- Identify the specific AI tools, platforms, or technologies that will be used. This could include machine learning algorithms, natural language and processing

Documents Accessibility

- Use optical character recognition (OCR) technology to convert any non-searchable PDF files to readable formats and improve utilization of SDS PDFs, marketing materials, specification documents, etc., for specific data extraction

Identifying Compliance Criteria

- Define input search criteria using specific phrases/phrase sets, regulation citations, keywords, numeric values, etc., to recognize and extract text
- Use Application Programming Interfaces or APIs to access publicly available data

Run -Time Planning

- Time frame would be dependent on several factors
 - Search criteria
 - Number of documents
 - Number of regulatory lists

Analytics and Data Generation

- Export results to Excel format for analysis
- Track links to each identified result to review and monitor the performance and behavior of algorithms

Data Inventory

- Take stock of the data generated and identify any potential gaps
- Conduct a quality check on each result to verify and ensure accuracy

Additional Important Research/Tasks

- Substances listed as proprietary/trade secret may require additional information from the supplier to determine applicability
- Integrate updated regulatory content to AI tracking
- Generated required ingredient disclosure could be formatted for direct downstream reporting

CONCLUSION

Adhering to regulations is crucial for the continuous flow of products in the market and the responsible fulfillment of consumer needs. Utilizing AI tools could expedite the assessment of how regulations affect a business's products, enabling prompt anticipation and updates in hazard communication. A trained hazard communication specialist, with access to AI tools, has the potential to increase the accuracy of SDSs and labels while decreasing the time to identify necessary updates.

WHEN ARE AI TOOLS USEFUL?

- Numerous regulations to be reviewed in real-time or scheduled
- Large number of substances that need to be identified
- Data in multiple formats (Word, PDF, Excel)
- Substance lists are updated periodically
- Integration of various systems for data exchange
- Data is structured and unstructured



AI tools can speed up determining the applicability and impact of regulations on a businesses' products so that hazard communication updates can be anticipated and updates made in a timely manner.

Prop 65 – Businesses are required to provide “clear and reasonable” warnings.

SB-258 California Cleaning Product Right to Know Act – Provide consumers and workers with ingredient information.

USEPA TSCA Section 8(a)(7) – Reporting and recordkeeping for Per- and Polyfluoroalkyl Substances (PFAS).

USEPA Toxic Release Inventory (TRI) – Annual reporting of over 650 toxic chemicals.

ECHA Substances of Very High Concern (SVHC) – Obligations to supply SDS, communication, and reporting.

AVAILABLE APIs

EPA System of Registries Web Services

OECD eChemPortal

ECHA

PubChem

AI REGULATIONS

EU AI Act: The first regulation on AI in Europe. The AI Act classifies according to risk. Most of the obligations fall on providers of high-risk AI systems. Effective August 2, 2026 (with additional implementation dates)

US: No current federal legislation; state regulations on AI are evolving.

Global standards: The Organization for Economic Co-operation and Development (OECD) has been actively involved in developing AI policy guidelines and principles that aim to promote the responsible development and use of artificial intelligence technologies globally.

BENEFITS

Time savings/improve efficiency

Ability to implement change sooner

Mitigate risk

May increase market advantage

LIMITATIONS

Quality of data source

- Consistency of information provided across regulatory lists
- Limited information on SDSs

Specificity of search terms

Format of data source

Validity, reliability and currency of data source

