



OECD SUBSTITUTION AND ALTERNATIVES ASSESSMENT TOOLBOX

Substitution Seminar – Oslo, Norway – 13 May, 2019

Eeva Leinala, Principal Administrator - OECD



OECD ENVIRONMENT, HEALTH AND SAFETY (EHS) PROGRAMME

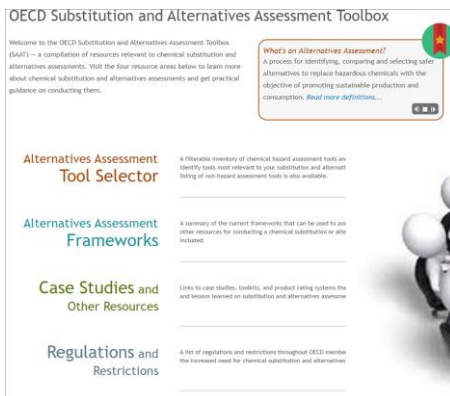
36 Member countries, many partner countries and other stakeholders work together to develop and co-ordinate activities on chemical safety and biosafety on an international basis. One of the core aspects of the work relates to the Mutual Acceptance of Data.

The main objectives of the Programme are to:

- Assist OECD Member countries' efforts to protect human health and the environment through improving chemical safety and biosafety
- Make chemical control policies more transparent and efficient and save resources for government and industry; and
- Prevent unnecessary distortions in the trade of chemicals, chemical products and products of modern biotechnology.



<http://www.oecd.org/chemicalsafety/>



Adhoc Group on Substitution of Harmful Chemicals

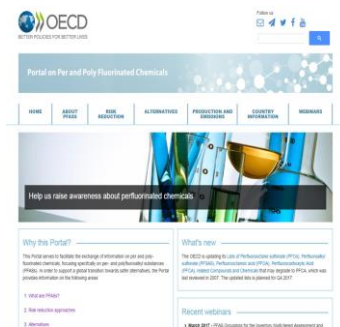


Issue Team on Sustainable Chemistry

RISK REDUCTION Programme



OECD/UNEP Global PFC Group



Expert Group on Risk Management Including Socioeconomic Analysis





OECD Ad-Hoc Group on Substitution of Harmful Chemicals



- Established in 2012
- Goal: Furthering tools and approaches to support decision-making for the substitution of hazardous chemicals
- Member countries, industry, NGOs, experts
- Recent Outputs:
 - Development of a toolbox to support substitution of hazardous chemicals (launched in January 2015 and ongoing improvement)
 - Synthesis report from OECD Workshop on Approaches to Support Substitution and Alternatives Assessment (2019)
 - approaches used to support alternative assessments and substitution; the strengths of the approaches and challenges to design and implementation, the link between innovation and progress in substitution and alternatives assessment; and initiatives to facilitate data sharing and other collaborative efforts
 - A Cross Country Analysis of Approaches to Support Alternatives Assessment and Substitution of Chemicals of Concern (2019)
 - describes and gives a list of approaches developed across countries and by different stakeholders to support alternatives assessment and substitution of chemicals of concern.



A forum for information sharing and collaboration

Sharing of experience on policy and regulatory approaches to support substitution

- Increase awareness of approaches
 - Identify common challenges and goals
 - Examine processes used & information considered for decision-making
 - Build networks
 - Identify potential activities for collaboration at OECD
-
- Face-to-face meetings on specific topic areas, either at the OECD or in a member country ~ every 12-18 months
 - Other activities if/as identified



What could help advance Substitution and Alternative Assessment

- Gather existing tools, frameworks and resources existing to support AA in a one place repository;
- Collect case studies from actual substitution.



**OECD Substitution and Alternatives
Assessment Toolbox (SAAToolbox)**
www.oecdsaatoolbox.org



OECD Substitution and Alternatives Assessment Toolbox (SAAToolbox)

- Brings together practical resources on chemical substitution and alternatives assessments
- Development by a collaborative effort
 - Content development led by technical workgroup under the OECD's Ad Hoc Group on Substitution of Harmful Chemicals
 - Test versions demonstrated via several webinars; feedback incorporated
- Launched in January 2015 @ www.oecdsaatoolbox.org
- Updated on an ongoing basis

The screenshot shows the homepage of the OECD Substitution and Alternatives Assessment Toolbox (SAAToolbox). The header features the OECD logo and the tagline "BETTER POLICIES FOR BETTER LIVES". Navigation links include HOME, ABOUT, RESOURCES, and GLOSSARY. The main content area is titled "OECD Substitution and Alternatives Assessment Toolbox" and includes a welcome message. A "Learn about..." section highlights the current landscape of substitution and alternatives assessment practices, with a link to the "OECD Meta-Review of Current Practices". Below this, four resource areas are listed: "Alternatives Assessment Tool Selector", "Alternatives Assessment Frameworks", "Case Studies and Other Resources", and "Regulations and Restrictions". Each resource area has a brief description and a "Learn more" link.

OECD
BETTER POLICIES FOR BETTER LIVES

HOME ABOUT RESOURCES GLOSSARY

OECD Substitution and Alternatives Assessment Toolbox

Welcome to the OECD Substitution and Alternatives Assessment Toolbox (SAAT) – a compilation of resources relevant to chemical substitution and alternatives assessments. Visit the four resource areas below to learn more about chemical substitution and alternatives assessments and get practical guidance on conducting them.

Learn about...
the current landscape of substitution and alternatives assessment practices in the:
[OECD Meta-Review of Current Practices](#)

Alternatives Assessment Tool Selector
A filterable inventory of chemical hazard assessment tools and data sources to help you identify tools most relevant to your substitution and alternatives assessment goals. A listing of non-hazard assessment tools is also available.
[Learn more](#)

Alternatives Assessment Frameworks
A summary of the current frameworks that can be used to assess alternatives. Guides and other resources for conducting a chemical substitution or alternatives assessment are included.
[Learn more](#)

Case Studies and Other Resources
Links to case studies, toolkits, and product rating systems that provide examples, insights, and lessons learned on substitution and alternatives assessment approaches.
[Learn more](#)

Regulations and Restrictions
A list of regulations and restrictions throughout OECD member countries that are driving the increased need for chemical substitution and alternatives assessment approaches.
[Learn more](#)

OECD Substitution and Alternatives Assessment Toolbox

Welcome to the OECD Substitution and Alternatives Assessment Toolbox (SAAT) — a compilation of resources relevant to chemical substitution and alternatives assessments. Visit the four resource areas below to learn more about chemical substitution and alternatives assessments and get practical guidance on conducting them.

Learn about...

the current landscape of substitution and alternatives assessment practices in the:

 [OECD Meta-Review of Current Practices](#)



Alternatives Assessment Tool Selector

A filterable inventory of chemical hazard assessment tools and data sources to help you identify tools most relevant to your substitution and alternatives assessment goals. A listing of non-hazard assessment tools is also available.

[Learn more](#) 

Alternatives Assessment Frameworks

A summary of the current frameworks that can be used to assess alternatives. Guides and other resources for conducting a chemical substitution or alternatives assessment are included.

[Learn more](#) 


Case Studies and Other Resources

Links to case studies, toolkits, and product rating systems that provide examples, insights, and lessons learned on substitution and alternatives assessment approaches.

[Learn more](#) 

Regulations and Restrictions

A list of regulations and restrictions throughout OECD member countries that are driving the increased need for chemical substitution and alternatives assessment approaches.

[Learn more](#) 



Demonstration of Tool Features

<http://www.OECDSAAToolbox.org>



Future work of Adhoc Group

- Continuing update of SAAToolbox
- Collecting information on priorities for alternatives assessment and substitution across countries
 - Potential collaboration or re-use of information
- Development of a Guidance on Key Considerations for the Identification of Safer Alternatives.
 - The guidance will aim to provide key points to consider for the identification of safer chemicals, also reflecting on particular risk tradeoffs during the decision making process.
 - Principally focus on the identification of “safer” chemicals but would also touch upon life cycle aspects.



Further Information

- Website
 - <http://www.oecd.org/chemicalsafety>
 - <https://www.oecd.org/chemicalsafety/risk-management/>
- EHS Newsletters (sign up to receive automatically)
 - <http://www.oecd.org/chemicalsafety/environment-health-safety-news.htm>
- Email: eeva.leinala@oecd.org



BACK UP SCREEN SHOTS

OECD Substitution and Alternatives Assessment Tool Selector



The Tool Selector is designed to provide information on online resources and software that can be used in conducting chemical substitutions or alternatives assessments. The Tool Selector is divided into two categories: tools, which provide users with the ability to evaluate a chemical, material, process, product and/or technology for attribute analysis with an alternatives assessment, and data sources, which contain a repository of organized information but no mechanism for data manipulation for outside users.

For details on how the tools were identified and scored for the Tool Selector, please visit the [Tool Selector Methodology page](#).

The filters below may be used to identify tools and data sources of greatest relevance to your substitution or alternatives assessment goals – see the first tab for tools, and the second tab for data sources. You may also view more in-depth information on each tool and data source, or a side-by-side comparison of a set of tools or data sources, by selecting two or more items from the list below.

All tools and data sources included in the Tool Selector address chemical hazard assessment, and may address other comparative attributes. For information on tools with a primary focus on non-hazard comparative attributes such as cost/benefits and availability, life-cycle impacts, and materials management, please visit the [Inventory of Non-Hazard Assessment Tools](#).

Each tool and data source has its benefits and limitations. The user of this toolbox needs to understand the capabilities of the tools and data sources to make the most informed decisions about conducting alternatives assessments.

Select a Tool: ▼

Compare

☐
Compare


Column Model ([Summary](#) | [Tool Website](#))

The Column Model was developed by the Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance as a tool for industry for identifying alternative substances. The tool allows for the comparison on chemicals/substances or materials/mixtures based on six hazard endpoints. Endpoints are compared individually and collectively, and the user makes the final evaluation.

☐
Compare


Green Chemistry Assistant ([Summary](#) | [Tool Website](#))

The Green Chemistry Assistant allows users to manipulate and assess chemical reactions by determining atom economy, limiting reactant, theoretical yield, percent yield, and comparing chemical safety data. This tool is based on U.S. EPA's Green Chemistry Expert System SMART Module.

☐
Compare


GreenScreen® for Safer Chemicals ([Summary](#) | [Tool Website](#))

GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.

☐
Compare


GreenScreen® List Translator (GSLT) ([Summary](#) | [Tool Website](#))

GSLT was developed by Clean Production Action as a rapid screening assessment tool for chemical substances. The screening evaluation results in three outcomes: of high concern, possibly of high concern, and unknown. GSLT is meant to prioritize chemicals for a more comprehensive assessment using the full GreenScreen® method.

☐
Compare


Kemi PRIO ([Summary](#) | [Tool Website](#))

PRIO was developed by the Swedish Chemical Inspectorate (Kemi) to help eliminate high hazard chemicals from products to meet the Swedish government's goal of a "non-toxic environment" by 2020. PRIO contains a database of chemicals of high concern to human health and the environment, which are divided into "phase-out" or "priority risk reduction" chemicals. "Phase-out" chemicals should be avoided or substituted, and the tool provides a seven step process for identifying safer alternatives. For "priority risk reduction" chemicals, further assessments are recommended to ensure risk minimization.

Select a Data Source: ▼

Compare



Compare



CAMEO Chemicals ([Summary](#) | [Tool Website](#))

CAMEO Chemicals is a database of hazardous chemicals that contain safety and exposure information for emergency responders and planners so they can use to get response recommendations and predict hazards, such as explosions, chemical fires and predicted results from chemical mixtures. It is part of the CAMEO software suite and is available in both online and desktop versions.



Compare



Chemical Entities of Biological Interest (ChEBI) ([Summary](#) | [Tool Website](#))

Chemical Entities of Biological Interest (ChEBI) is a database of molecular entities focused on 'small' chemical compounds with potential pharmacological properties. The database consists of records including products of nature or synthetic products used to intervene in the processes of living organisms.



Compare



Chemicalize ([Summary](#) | [Tool Website](#))

Chemicalize was developed by ChemAxon and contains structural and physiochemical data on chemicals, which includes molecular properties.



Compare



ChemicALL ([Summary](#) | [Tool Website](#))

ChemicALL is a database of hazardous chemicals used by members of the Swedish Chemicals Group in the electronics and textile industries. All chemicals contained in the database have been identified as hazardous per authoritative sources. ChemicALL also identifies human health and environmental impacts, as well as authoritative "chemicals of concern" lists that contain a specific chemical.



Compare



ChemSec Marketplace ([Summary](#) | [Tool Website](#))

ChemSec Marketplace is a business-to-business (B2B) website where buyers and sellers of safer alternatives to hazardous chemicals can interact. The Marketplace is designed with two goals in mind: to provide a unique marketing opportunity for producers of safer alternatives, and to become a one-stop shop for downstream user companies looking to substitute hazardous chemicals in their products.



Compare



ChemSec Textile Guide ([Summary](#) | [Tool Website](#))

ChemSec Textile Guide is a starting point for small and medium-sized textile companies to manage the chemicals present in their processes and products.

Selected Alternatives Assessment Tool Summary

An in-depth description of tool hazard endpoints, applicability, user expertise, and other tool-specific traits is provided for the selected tool below.

	GreenScreen® for Safer Chemicals
Summary	GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.
Tool Developer	Clean Production Action
Tool Capabilities	<ul style="list-style-type: none">• Identifies intrinsic characteristics such as known human health hazards associated with a chemical• Identifies completed alternatives assessments, case studies, and examples of successful substitutions• Compares alternatives based on one or more attributes• Ranks alternatives based on user-chosen attributes
Applicability	<p>For chemical/substance substitutions</p> <p>GreenScreen® can be used to compare organic, inorganic, and polymeric chemicals/substances and materials/mixtures. GreenScreen® is only intended for chemical hazard assessments.</p>
Hazard Endpoints	<p>Human Health Hazards</p> <ul style="list-style-type: none">• Human health group 1 (carcinogenicity, developmental toxicity, endocrine activity, mutagenicity and genotoxicity, reproductive toxicity)• Human health group 2 (acute mammalian toxicity, systemic toxicity and organ effects, eye irritation, neurotoxicity, respiratory sensitization, skin irritation, skin sensitization) <p>Environmental Hazards</p> <ul style="list-style-type: none">• Acute aquatic toxicity• Chronic aquatic toxicity <p>Environmental Fate</p> <ul style="list-style-type: none">• Bioaccumulation• Persistence

Filter Options (- Hide)

Applicability:

- ☐ Chemical substitution
- ☐ Material substitution
- ☐ Product substitution
- ☐ Process modification

Tool Capabilities: ?

- ☐ Identifies chemical characteristics
- ☐ Compares alternatives
- ☐ Prioritizes substances for assessment
- ☐ Identifies examples and/or case studies

Chemical Hazard Attributes:

- ☐ Human health
- ☐ Ecotoxicity
- ☐ Environmental fate
- ☐ Chemical/physical properties

Other Comparative Attributes:

- ☐ Cost/benefits and availability
- ☐ Exposure
- ☐ Life-cycle impacts
- ☐ Materials management
- ☐ Social impacts
- ☐ Technical feasibility

User Friendliness:

- ☐ Automated ?
- ☐ Available in multiple languages
- ☐ Guidance available ?
- ☐ Support/training available ?

Fees to use tool:

No preference ▼

User Expertise:

Expertise needed to use tool:

No preference ▼

Expertise needed to interpret results:

No preference ▼

Filter

Filter Options (- Hide)


Human Health Effects:

- ☐ Acute mammalian effects
- ☐ Chronic mammalian effects
- ☐ Sensitization and irritation


Environmental Toxicity and Fate:

- ☐ Ecotoxicity
- ☐ Environmental fate

Type of Source:

- ☐ Single data source
- ☐ Compendium 

Physical and Chemical Properties:

- ☐ Chemical structure
- ☐ Vapor pressure
- ☐ Water solubility
- ☐ Log KOW
- ☐ Other 



Safety Information:

- ☐ Exposure limits
- ☐ First aid
- ☐ Personal protective equipment

Comparative Attributes:

- ☐ Cost/benefits and availability
- ☐ Exposure
- ☐ Life-cycle impacts
- ☐ Materials management
- ☐ Technical feasibility

User Friendliness:

- ☐ Available in multiple languages
- ☐ Guidance available 
- ☐ Support/training available 

Fees to use tool:

No preference ▼

Filter

Select a Tool: ▼

A color-coded summary score is shown below for each tool.

Scoring by specific filter categories is also available.

Tools match >80% 50-80% <50% of filter criteria[View Scores by Category](#)[Compare](#)

Sorted by: Most relevant, based on above filters

☐ Compare100%**Column Model** ([Summary](#) | [Tool Website](#))

The Column Model was developed by the Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance as a tool for industry for identifying alternative substances. The tool allows for the comparison on chemicals/substances or materials/mixtures based on six hazard endpoints. Endpoints are compared individually and collectively, and the user makes the final evaluation.

☐ Compare100%**GreenScreen® for Safer Chemicals** ([Summary](#) | [Tool Website](#))

GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.

☐ Compare100%**GreenScreen® List Translator (GSLT)** ([Summary](#) | [Tool Website](#))

GSLT was developed by Clean Production Action as a rapid screening assessment tool for chemical substances. The screening evaluation results in three outcomes: of high concern, possibly of high concern, and unknown. GSLT is meant to prioritize chemicals for a more comprehensive assessment using the full GreenScreen® method.

☐ Compare100%**UL The WerCS™** ([Summary](#) | [Tool Website](#))

UL The WerCS™ is a screening tool for product evaluation. The evaluation can be as complex as the user desires as the user selects the type and number of hazard endpoints/impacts to be evaluated: the user tailors the model. Multiple products can be compared graphically. The tool evaluates the products based on the presence of “chemicals of concern” in the product. The basis of chemicals of concern are “authoritative lists” or restricted substance lists developed by industry.

☐ Compare100%**Kemi PRIO** ([Summary](#) | [Tool Website](#))

PRIO was developed by the Swedish Chemical Inspectorate (Kemi) to help eliminate high hazard chemicals from products to meet the Swedish government's goal of a “non-toxic environment” by 2020. PRIO contains a database of chemicals of high concern to human health and the environment, which are divided into “phase-out” or “priority risk reduction” chemicals. “Phase-out” chemicals should be avoided or substituted, and the tool provides a seven step process for identifying safer alternatives. For “priority risk reduction” chemicals, further assessments are recommended to ensure risk

Comparison of Selected Alternatives Assessment Tools

Displayed below are the tools selected for comparison from the previous page. An in-depth description of tool hazard endpoints, applicability, user expertise, and other tool-specific traits is provided for each tool. For tools you no longer wish to compare on this page, please click to "X" button located by the tool's name.

	Column Model 	GreenScreen® for Safer Chemicals 	Keml PRIO 
Summary	The Column Model was developed by the Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance as a tool for industry for identifying alternative substances. The tool allows for the comparison on chemicals/substances or materials/mixtures based on six hazard endpoints. Endpoints are compared individually and collectively, and the user makes the final evaluation.	GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.	PRIO was developed by the Swedish Chemical Inspectorate (KemI) to help eliminate high hazard chemicals from products to meet the Swedish government's goal of a "non-toxic environment" by 2020. PRIO contains a database of chemicals of high concern to human health and the environment, which are divided into "phase-out" or "priority risk reduction" chemicals. "Phase-out" chemicals should be avoided or substituted, and the tool provides a seven step process for identifying safer alternatives. For "priority risk reduction" chemicals, further assessments are recommended to ensure risk minimization.
Tool Developer	Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance	Clean Production Action	Swedish Chemical Inspectorate (KemI)
Designed for	German companies, although it has been adapted for the Globally Harmonized System (GHS)	Businesses, governments, and individuals concerned about chemical risks	Swedish businesses and chemical suppliers to Sweden
Tool Capabilities	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritizes substances for alternatives assessment based on attributes of interest Compares alternatives based on one or 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Identifies completed alternatives assessments, case studies, and examples of successful substitutions 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritizes substances for alternatives assessment based on attributes of interest Compares alternatives based on one or

Selected Alternatives Assessment Tool Summary

An in-depth description of tool hazard endpoints, applicability, user expertise, and other tool-specific traits is provided for the selected tool below.

	GreenScreen® for Safer Chemicals
Summary	GreenScreen® was developed by Clean Production Action to support the transition to safer chemicals and to support more informed decision-making on the use of chemicals in products and processes. GreenScreen® provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based upon 18 hazard endpoints.
Tool Developer	Clean Production Action
Tool Capabilities	<ul style="list-style-type: none">• Identifies intrinsic characteristics such as known human health hazards associated with a chemical• Identifies completed alternatives assessments, case studies, and examples of successful substitutions• Compares alternatives based on one or more attributes• Ranks alternatives based on user-chosen attributes
Applicability	<p>For chemical/substance substitutions</p> <p>GreenScreen® can be used to compare organic, inorganic, and polymeric chemicals/substances and materials/mixtures. GreenScreen® is only intended for chemical hazard assessments.</p>
Hazard Endpoints	<p>Human Health Hazards</p> <ul style="list-style-type: none">• Human health group 1 (carcinogenicity, developmental toxicity, endocrine activity, mutagenicity and genotoxicity, reproductive toxicity)• Human health group 2 (acute mammalian toxicity, systemic toxicity and organ effects, eye irritation, neurotoxicity, respiratory sensitization, skin irritation, skin sensitization) <p>Environmental Hazards</p> <ul style="list-style-type: none">• Acute aquatic toxicity• Chronic aquatic toxicity <p>Environmental Fate</p> <ul style="list-style-type: none">• Bioaccumulation• Persistence

Case Studies and Other Resources

Case Studies

Toolkits




Product Rating Systems

Case studies are descriptions of alternatives assessments that have been conducted by manufacturers, academic institutions, NGOs or government bodies. The search feature below may be used to identify case studies of greatest relevance to your substitution or alternatives assessment goals. You may also view more in-depth information on each case study by clicking the "View Full Summary" button. For details on how case studies were selected and summarized, please visit the [Case Studies Methodology page](#).

Additional compilations of completed alternatives assessments include (but are not limited to) the following resources:

- The [SUBSPORT web portal](#), a compilation of case studies to support companies in fulfilling substitution requirements within EU legislation.
- The Interstate Chemical Clearinghouse (IC2) [Alternatives Assessment Library](#).
- ECHA's repositories of 'analysis of alternatives' performed in the context of [REACH applications for authorisation](#), and in the context of [REACH restriction proposals](#).




Search by one or more fields:

CAS Number	<input type="text" value="e.g., 7550-45-0"/>	Chemical	<input type="text" value="e.g., lead; mercury"/>
Author	<input type="text" value="e.g., U.S. EPA; BizNGO"/>	Industry Sector 	<input type="text" value="e.g., electronics"/>
Technical Function 	<input type="text" value="e.g., solvent; catalyst"/>	Attributes	<input type="text" value="All attributes assessed"/>
Framework 	<input type="text" value="All frameworks"/>		

Search

Number of case studies shown: 33 of 33 ([Show All](#))

Alteration of Manufacturing Processes to Reduce Exposure to Titanium Tetrachloride

 No date  Titanium tetrachloride (7550-45-0) and more...  Hybrid car batteries

[View Full Summary](#)

American Industrial Hygiene Association

Phthalate-free Plasticizers in PVC

📅 2014 🏭 Diisononyl phthalate (DINP) (68515-48-0; 28553-12-0) and more...
🏠 Polyvinyl chloride (PVC) building materials

[View Full Summary](#)

Healthy Building Network

Phthalates are the most commonly used plasticizers in PVC. Since they are not tightly bound to the PVC molecules, they migrate from PVC products, resulting in the potential for human exposure. In addition to being endocrine disruptors, some phthalates are carcinogens and/or reproductive or...

✓ Chemical Hazard ✓ Exposure ✓ Technical Feasibility ✓ Cost/Benefits & Availability ✓ Lifecycle Impacts

Phthalates and Their Alternatives: Health and Environmental Concerns

📅 2011 🏭 Di-(2-ethylhexyl) phthalate (DEHP) (117-81-7) and more...
🏠 Medical devices, food wrap, and more...

[View Full Summary](#)

Lowell Center for Sustainable Production

Phthalates are used in a wide variety of consumer products, particularly those that are made up of PVC. The addition of phthalates to PVC makes this brittle plastic more flexible and durable. However, phthalates are not chemically bound to PVC, leading them to leach out of products over time and...

✓ Chemical Hazard ✓ Exposure

The Use of Di-2ethylhexyl-Phthalate in PVC Medical Devices: Exposure, Toxicity and Alternatives

📅 1999 🏭 Di-(2-ethylhexyl) phthalate (DEHP) (117-81-7) and more... 🏠 Medical devices

[View Full Summary](#)

Lowell Center for Sustainable Production

DEHP is widely used as a plasticizer to make polyvinyl chloride (PVC or vinyl) medical products soft and flexible. PVC is used in a range of medical devices from intravenous (IV) fluid containers and blood bags to medical tubing. This report examines the published literature on health risks to DEHP...

✓ Chemical Hazard ✓ Exposure ✓ Technical Feasibility ✓ Cost/Benefits & Availability ✓ Lifecycle Impacts

Five Chemicals Alternatives Assessment Study

📅 2006 🏭 Lead (Pb) & lead compounds (7439-92-1) and more...
🏠 Wheel weights, fishing sinkers, and more...

[View Full Summary](#)

TURI (Toxics Use Reduction Institute)

This report provides information for 16 different use categories for five chemicals (lead, formaldehyde, perchloroethylene, hexavalent chromium, and DEHP), their uses in manufacturing, consumer products, and possible substitutes for their uses. The report identifies several alternatives for each...

✓ Chemical Hazard ✓ Technical Feasibility ✓ Cost/Benefits & Availability ✓ Lifecycle Impacts

Phthalate-free Plasticizers in PVC

🔗 Link to Case Study: <http://healthybuilding.net/uploads/files/phthalate-free-plasticizers-in-pvc.pdf>

Basic Information

Author	Healthy Building Network
Year Published	2014
Chemical(s) of Focus	Diisononyl phthalate (DINP) (68515-48-0; 28553-12-0)
Alternatives Considered	Diisononyl cyclohexane-1,2-dicarboxylate (DINCH) (166412-78-8; 474919-59-0); Dibenzate blends (27138-31-4; 120-55-8; and/or 120-56-9); Di-(2-ethylhexyl) terephthalate (DEHT) (6422-86-2); Vegetable oil based blend (8013-07-8; 68082-35-9 & Antioxidant); Acetylated monoglycerides of fully hydrogenated castor oil (COMGHA) (736150-63-3); Isosorbide diesters (1215036-04-6)
Sectors	Polyvinyl chloride (PVC) building materials
Technical Function	Plasticizer

Methodology

Framework	Unknown
Attributes Considered	Chemical Hazard, Exposure, Technical Feasibility, Cost/Benefits & Availability, Lifecycle Impacts
Chemical Hazard Endpoints	<u>Human Health</u> : Carcinogenicity; Mutagenicity; Reproductive toxicity; Developmental toxicity; Endocrine activity; Acute toxicity; Systemic organ toxicity; Neurotoxicity; Skin sensitization; Respiratory sensitization; Skin irritation; Eye irritation <u>Environmental</u> : Aquatic toxicity; Chronic aquatic toxicity; Persistence; Bioaccumulation <u>Other Hazards</u> : Reactivity; Flammability
Tools Used to Assess Chemical Hazard	GreenScreen®
Other Tools Used	Cannot be determined

Goal, Summary, Findings, and Impact

Purpose/Goal	To: (1) take a detailed look at the six plasticizer alternatives now in use in PVC building products; (2) compare what is known and unknown about these substances' human health and environmental impacts; and (3) compare them to known effects of a standard phthalate used in PVC building products, DINP.
Report Summary	Phthalates are the most commonly used plasticizers in PVC. Since they are not tightly bound to the PVC molecules, they migrate from PVC products, resulting in the potential for human exposure. In addition to being endocrine disruptors, some phthalates are carcinogens and/or reproductive or developmental toxicants, necessitating that other plasticizers be considered. This assessment examines six alternatives to the commonly used phthalate, DINP, in PVC building materials. It compares the manufacturing, human, and eco- toxicity of these phthalate-free plasticizer chemicals before making a recommendation for the best alternative.
Key Findings/Impact	Many of the plasticizer alternatives considered in this assessment are an improvement to phthalate plasticizers. Overall, COMGHA and Isosorbide esters appear to be the best alternatives with few data gaps and low toxicity during manufacture and in use. Potential toxicity and data gaps surrounding DINCH, Dibenzates, and DEHT make them less desirable alternatives, while Ecolibrium, which has potential as a promising alternative, is locked behind industry secrecy and therefore cannot be fully assessed for toxicity. While the replacement of toxic phthalate plasticizers is a necessary step for PVC, this should not distract from the intractable environmental health issues

OECD Substitution and Alternatives Assessment Toolbox

Welcome to the OECD Substitution and Alternatives Assessment Toolbox (SAAT) — a compilation of resources relevant to chemical substitution and alternatives assessments. Visit the four resource areas below to learn more about chemical substitution and alternatives assessments and get practical guidance on conducting them.

Learn about...

the current landscape of substitution and alternatives assessment practices in the:

 [OECD Meta-Review of Current Practices](#)



Alternatives Assessment Tool Selector

A filterable inventory of chemical hazard assessment tools and data sources to help you identify tools most relevant to your substitution and alternatives assessment goals. A listing of non-hazard assessment tools is also available.

[Learn more](#) 

Alternatives Assessment Frameworks

A summary of the current frameworks that can be used to assess alternatives. Guides and other resources for conducting a chemical substitution or alternatives assessment are included.

[Learn more](#) 

Case Studies and Other Resources

Links to case studies, toolkits, and product rating systems that provide examples, insights, and lessons learned on substitution and alternatives assessment approaches.

[Learn more](#) 

Regulations and Restrictions

A list of regulations and restrictions throughout OECD member countries that are driving the increased need for chemical substitution and alternatives assessment approaches.

[Learn more](#) 