

Tools to find safer alternatives and identify regrettable substitutes

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Part 2

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Finding alternatives:



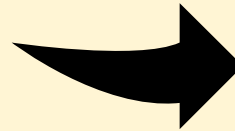
Function



Network

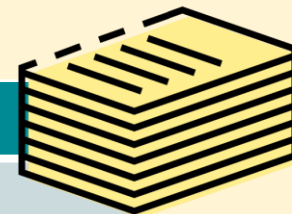


Databases



List with identified alternatives

Alternatives to Bisphenol A used as a dye developer in receipts



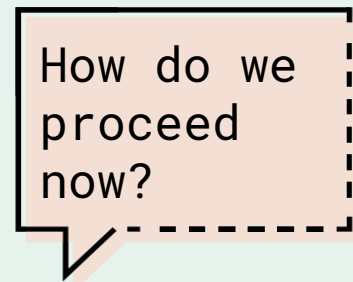
Alternative	CAS-number	Strategy	Source
Bisphenol S	80-09-1	New chemical	ECHA ¹ , US-EPA ² , RIVM ³
Urea-urethane compound	321860-75-7	New chemical	ECHA ¹ , US-EPA ² , RIVM ³
Vitamin C	50-81-7	New chemical	Chemsec Marketplace ⁴
Pergafast 201	232938-43-1	New chemical	ECHA ¹ , US-EPA ² , RIVM ³
TG-SA	41481-66-7	New chemical	ECHA ¹ , RIVM ³
BTUM	151882-81-4	New chemical	US-EPA ² , RIVM ³
Digital receipts	-	New system	-
BLUE 4EST™ multi-layer thermal paper	-	New technique/process	INERIS, compilation of BPA alternatives ⁵

Sources: ¹ https://echa.europa.eu/documents/10162/2564887/bpa_thermal_paper_report_2020_en.pdf/59eca269-c788-7942-5c17-3bd822d9cba0 ² <https://www.epa.gov/saferchoice/partnership-evaluate-alternatives-bisphenol-thermal-paper> ³ <https://www.rivm.nl/documenten/analysis-of-alternatives-for-bpa-in-thermal-paper-0> ⁴ <https://marketplace.chemsec.org/Alternative/Alpha-Free-163> ⁵ <https://substitution-bp.ineris.fr/en>

How to exclude alternatives using legislation and other tools



List of possible alternatives



Gather information about your alternatives

1. Are the alternatives included in any regulatory lists?



Candidate list, SVHC-substances, <https://echa.europa.eu/sv/candidate-list-table>
REACH, Annex 14, <https://echa.europa.eu/sv/authorisation-list>
REACH, Annex 17, <https://echa.europa.eu/sv/substances-restricted-under-reach>
POPs-regulation, <https://echa.europa.eu/sv/list-of-substances-subject-to-pops-regulation>

2. Are there any harmonized classifications for my alternatives, or is there any other useful information available?



C&L inventory
<https://echa.europa.eu/sv/information-on-chemicals/cl-inventory-database>
(Or do a search from ECHAs startpage: <https://echa.europa.eu/home>)
EUCLEF, <https://echa.europa.eu/legislation-finder>

Gather information about your alternatives

3. Tools to identify alternatives with unwanted properties



PRIO, a tool for substitution (<https://www.kemi.se/prioguiden/english/start>)

Two priority levels:

1. Phase-out substances → Substances with the most severe hazardous properties, SHOULD be prioritized for substitution.
2. Priority risk-reduction substances → Substances with less hazardous properties, CONSIDER substitution

ChemSec, SIN-list (<https://sinlist.chemsec.org/>)

List of >1000 substances identified as SVHC-substances based on the REACH criteria, contain both legislated and non-legislated substances.



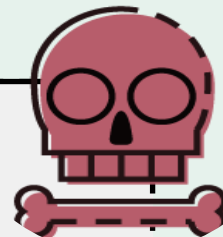
Endocrine Disruptor Lists (<https://edlists.org/>)



What alternatives can we exclude?

Our first screening shows that:

- 2 alternatives have similar endocrine disruptive properties as BPA
- 1 alternative is a **possible** carcinogen



	ECHA (Legislation)	PRIO	SIN-list	ED-list
Bisfenol S	Under assessment for Endocrine Disrupting properties	No	Endocrine Disruptive	List 2
Pergafast 201	Will be evaluated for Endocrine Disruptive properties	No	-	List 2
BTUM	H351, Suspected to be Carcinogenic	Priority risk-reduction substance	-	-

What alternatives do we have left ?

Vitamin C
CAS-nr: 50-81-7

Urea-urethane compound
CAS-nr: 321860-75-7

TG-SA
CAS-nr: 41481-66-7



Exampels of models to continue with

Level 1 The Column model



Data needs :
Hazard classification
Information in safety data
sheets/ information
available at ECHA

<https://www.dguv.de/ifa%3bpraxishilfen/hazardous-substances/ghs-spaltenmodell-zur-substitutionspruefung/index.jsp>

Level 2 P20Asys



Data needs:
Hazard classifications
Toxicological
information

<https://p2oasys.turi.org>

Level 3 GreenScreen

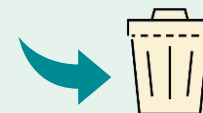
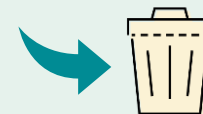


Data needs:
Hazard classifications
Toxicological information
Literature studies

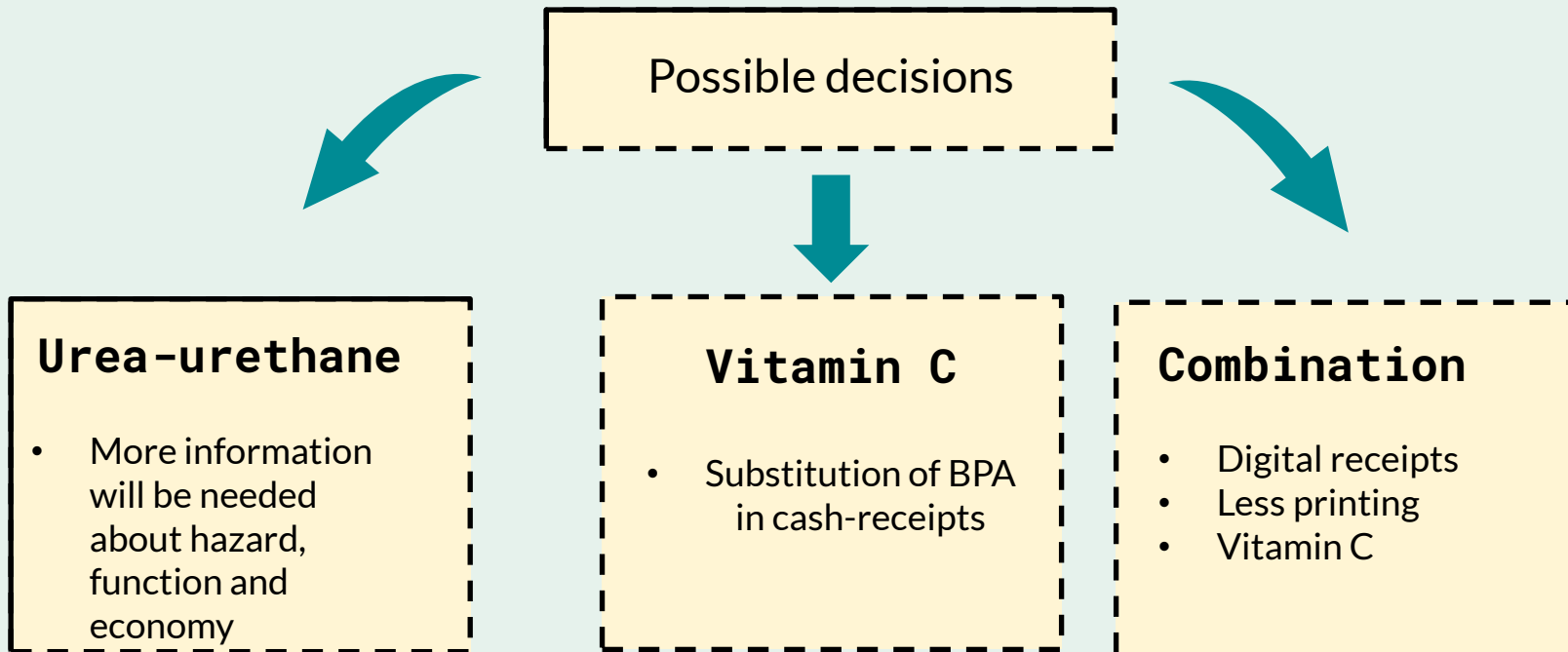
<https://www.greenscreenchemicals.org/learn>

Time to make a decision!

Alternative	Health hazards (Column model)	Environmental hazards (Column model)	Economy	Function
Vitamin C	Negligible	Negligible	10 – 20% more expensive than BPA	Yellow receipts POS
Urea-urethane compound	<i>Acute:</i> Lack of data <i>Chronic:</i> Lack of data	Negligible	Limited information	Limited information
TG-SA	<i>Acute:</i> High (H317) <i>Chronic:</i> Lack of data	High (H411)	Limited information	Limited information
New system: Digital receipts	negligible	Negligible	Long term saving	Delay in time
New technique/process: BLUE 4EST™ multi-layer thermal paper	Not evaluated	Not evaluated	Need to contact the supplier	Yes, according to supplier



Time to make a decision!



A man with glasses and a white shirt is smiling in a laboratory. In the background, there are various pieces of equipment and signs, including "Merck", "EPOXY", and "WELD".

Goda exempel

Just dare to get started

” You don't need to be an expert to get started, but you need to get started to become an expert”

Kristoffer Karström, Environmental Officer
G A Lindberg

<https://www.ri.se/en/centre-chemical-substitution/about-chemical-substitution/just-dare-get-started>

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Thank you!

