



Healthy Workplaces Campaign 2018-19

Substitution of hazardous disinfectants in Viennese public services
by using the **WIDES** database (www.wides.at/en)

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Main Topics

- Vienna's Green Public Procurement Program "ÖkoKauf Wien" (Ecobuy Vienna)
- Why Green Public Procurement of disinfectants?
- Purpose and structure of the developed WIDES Database - www.wides.at/en
- Lessons learned - Experiences and results in Vienna



ÖkoKauf Wien (Ecobuy Vienna)

- Programme for Green Public Procurement



- In 1998 the Vienna City Administration decided to purchase ALL its goods and services according to **ecological considerations**.
For this purpose the programme „ÖkoKauf Wien“ was implemented.
(Vienna’s Budget: ~ € 5 billion per year)
- All Results, as **eco-criteria lists, position papers and Web tools** are published on the website:
<http://www.oekokauf.wien.at>
- By executive decree, these criteria lists are **binding for all departments** of the Vienna City Administration over the course of public **procurement and tendering**.

Disinfectants protect people's health against infections,



BUT their cell killing properties

- can stress waste water plants and harm the aquatic life in surface waters.

An investigation of Austrian rivers found surprisingly high concentrations of quaternary ammonium compounds (QAC) widely used as disinfectants. A QAC-derived risk to sensitive aquatic organisms could not be excluded.

- can lead to **HEALTH PROBLEMS.**

A French study found that 20% of all occupational dermatology consultations were initiated by patients exposed to disinfectants and detergents in the workplace.

Source:

<http://www.wien.gv.at/english/environment/protection/pdf/wides-folder.pdf>

Potential adverse impacts of disinfectants to human health



Depending on the (combination of) ingredients and the frequency of contact disinfectants may affect health by

Mucous membrane-irritation

Toxic contact eczemas

Skin irritation

Allergic contact eczemas

Degreasing of skin

Acute or chronic Bronchitis

Corrosivity

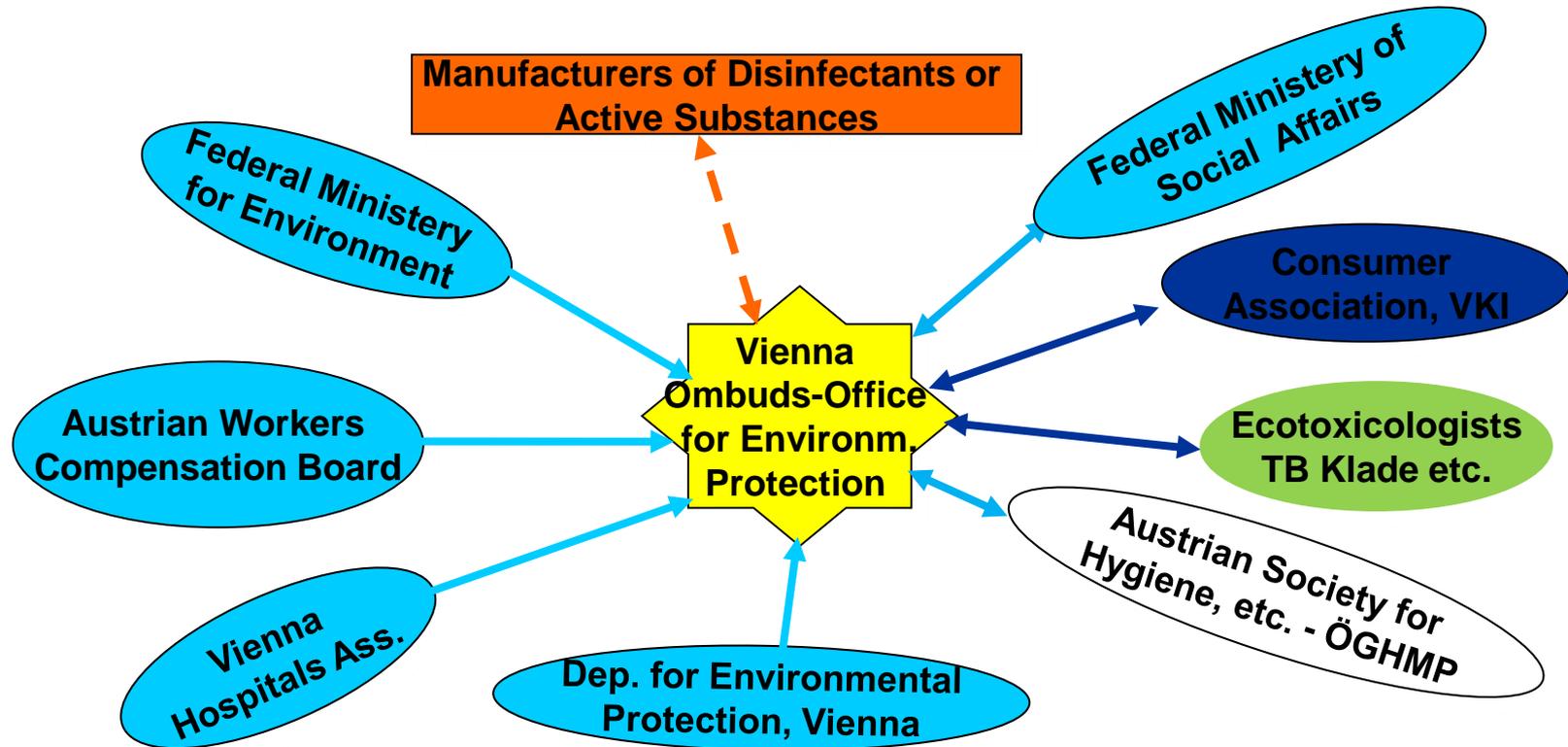
Eye conjunctivitis

Sensitisation

Allergic Asthma

(Organ Toxicity, Cancer?)

Participants of the „EcoBuy Vienna“ Working Group „Disinfection“



Also HCWH - Look up all Cooperation Partners at www.wides.at/en !

Our Theses, when we started



- **The use of disinfectants in hygiene risk areas is indispensable.**
- **Several disinfectants show relevant impacts on health and the environment.**
- **Disinfectants (with the same application field, efficacy and spectrum of activity) show relevant differences in their toxicological profiles that justify substitution measures.**
- **It is possible to identify those products with the lowest impact on health and environment, despite a lack of data, complex composition and diverse dilution rates.**
- **Disinfectants with the lowest impacts are affordable.**

The main **GOAL** of the working group “Disinfection” was



SUBSTITUTION of the most toxic products

Reduction of possible risks of disinfection measures for health and the environment to a minimum, by carefully selecting those disinfectants with the lowest hazard potential from the market supply.

BUT a lot of disinfectants are sold as concentrates. Depending on the specific application the dilution rate changes and also differs between the products.

That’s why the information in Safety Data Sheets do not provide enough basis to carry out comparisons of the diluted products “ready to use”.

This makes **substitution** of disinfectants **difficult**. That’s why we created a Database to compare products at the needed dilution rates.

The WIDES Database is industry-independent, user-friendly and without charge.



It includes

human- and ecotoxicological data on > 200 ingredients of disinfectants, as antimicrobial substances, surfactants, solvents, etc. including source references.

Data regarding the composition, INDEPENDENTLY CERTIFIED spectrum of activity, applications and material compatibility of > 200 disinfectants for surfaces, instruments, laundry, dishes, hands and skin. Mainly from manufacturers' data .

An evaluation scheme to compare human- and ecotoxicological properties of the ingredients of the most important disinfectants available on the Austrian market.

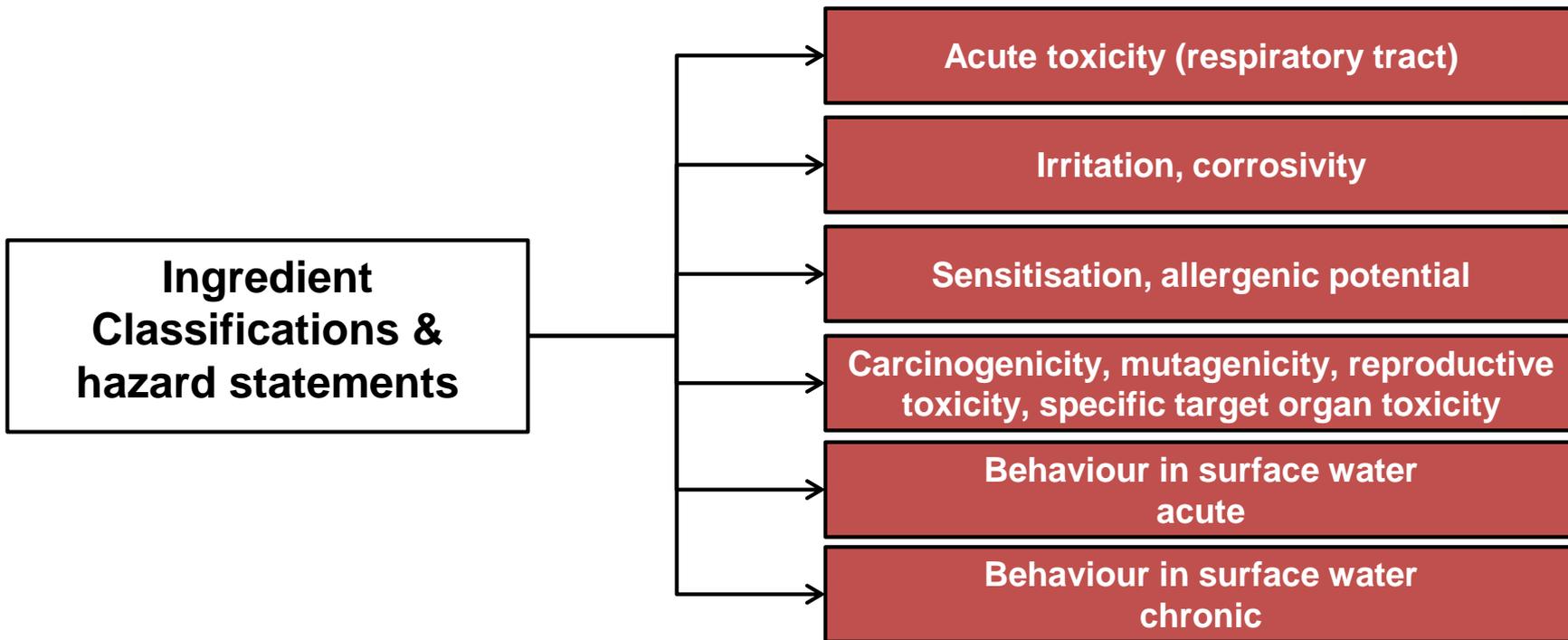
German and English Training Videos and Flyers
www.wides.at and www.wides.at/en



Assessment procedure

1. Categorising adverse impacts in respect to human health and the environment
2. Substance assessment
3. Product assessment on the basis of substance assessment (considering the respective concentration for application)

Categorization of adverse impacts



Rules for the assessment of ingredients



ASSESSMENT-NUMBER (HAZARD POTENTIAL)	ACUTE TOXICITY (RESPIRATORY TRACT)	IRRITATION AND CORROSIVITY	SENSI-TISATION, ALLER-GENIC POTENTIAL	CMR EFFECTS & CHRONICALLY TOXIC PROPERTIES	BEHAVIOUR IN SURFACE WATERS	
					ACUTE	CHRONIC
7 (very high ++)					H400 (M10000)	H410 (M1000)
6 (very high +)	H300,H310, H330			H340, H350 H360	H400 (M1000)	H410 (M100)
5 (very high)	H301, H311, H331 + H314 EUH032	H314 (1A)	H334	H372	H400 (M100)	H410 (M10)
4 (high)	H301, H311, H331, EUH029, EUH031, EUH070, H370	H314 (1B, 1C) H318, H281	H317	H341, H351, H361, H362	H400 (M10)	H410 (M1)
3 (moderate)	H302, H312, H332, H371	EUH071		H373	H400 (M1)	H411
2 (low)	H304, H336	H315, H319, H335, EUH066				H412, H413
1 (no)	Based on available data (e.g. animal studies) the hazard potential is negligible.					
?	A hazard cannot be excluded based on contradictory or insufficient data for an assessment.					

Assessment of active substances



Assessment of all ingredients, integrated in the WIDES Database:

www.wien.gv.at/wuawides/internet/Inhaltsstoffsuche/Bewertungen

Substance: Glutaraldehyde (CAS 111-30-8)

Intended use: antimicrobial agent

	Acute toxicity (respiratory tract)	Irritation and corrosivity	Sensitisation, allergenic potential	CMR effects & chronically toxic properties	Behaviour in surface water acute	chronic
Applied H-statement resp. data set	H331 + H314 (Skin Corr.1B)	H314 (Skin Corr. 1B)	H334	Based on available data (REACH dossier) hazard potential can be excluded	H400	H411
ANo (Hazard potential)	5 (very high)	4 (high)	5 (very high)	1 (no)	3 (moderate)	3 (moderate)

Decisions in Viennese Hospitals



1. Decision: Substitution of Aldehydes

Name ▲▼	Group of substances ▲▼	Acute toxicity (respiratory tract) ⓘ ▲▼	Irritation and corrosivity ⓘ ▲▼	Sensitisation, allergenic potential ⓘ ▲▼	Mutagenic, carcinogenic, toxic for reproduction, chronically toxic ⓘ ▲▼	Behaviour in surface waters ⓘ ▲▼	Behaviour in wastewater treatment plants ⓘ ▲▼
2-Ethylhexanal	Aldehyde	1	1	4	4	1	2
Citral	Aldehyde	1	2	4	1	1	2
Formaldehyd	Aldehyde	5	4	4	6	1	3
Glutaraldehyd	Aldehyde	5	4	5	1	3	3
Glyoxal	Aldehyde	3	2	4	4	1	2
Hexyl Cinnamal	Aldehyde	1	1	4	1 ?	4	?
Succinaldehyd	Aldehyde	4	2	?	?	?	?



Comparative product assessment in the WIDES

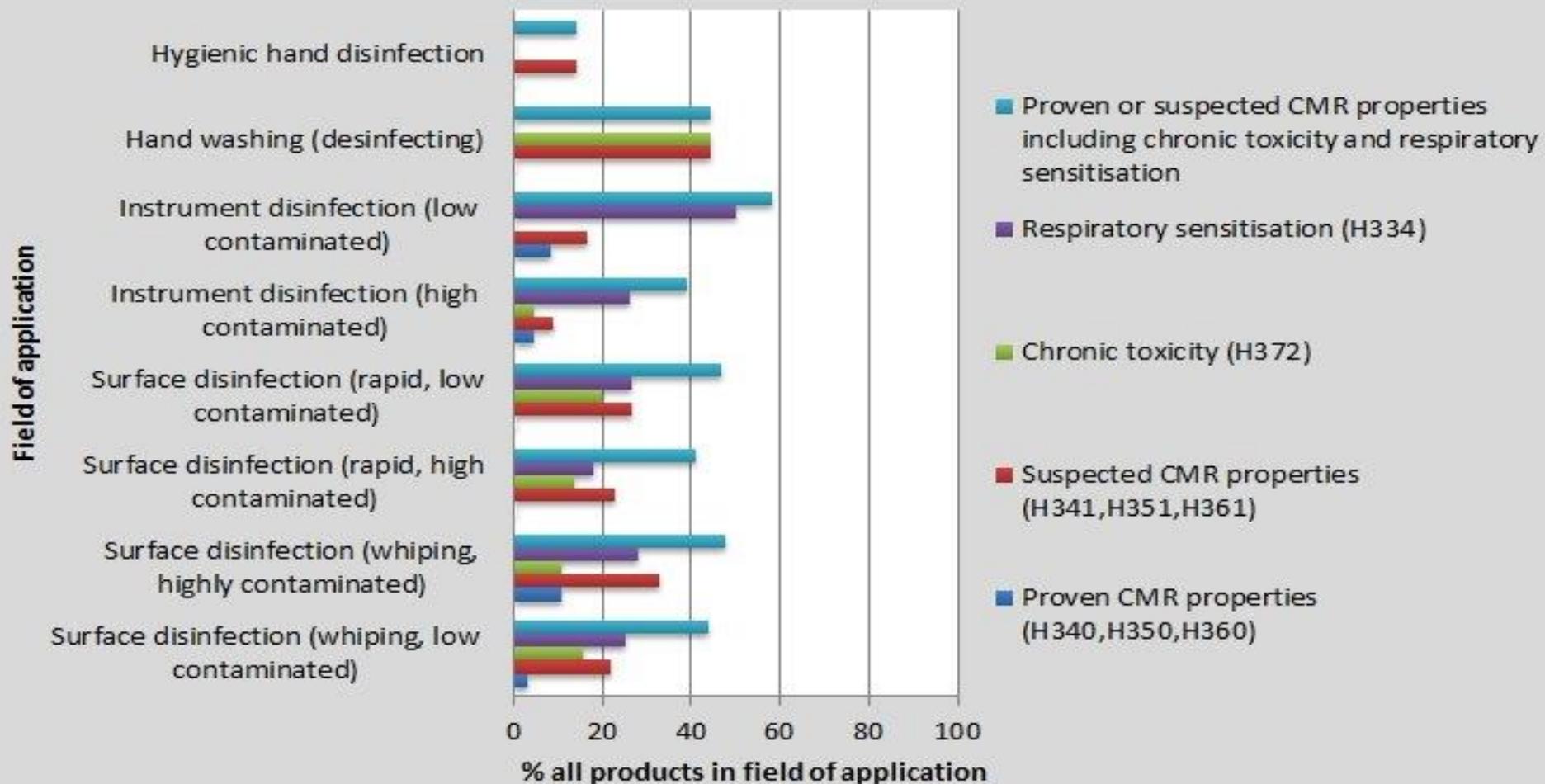
Compared disinfectants	Acute toxicity (respiratory tract)	Irritation, corrosivity	Sensitisation, allergenic potential	Carcinogenicity, mutagenicity, reproductive toxicity, specific target organ toxicity	Behaviour in surface water		Flammability (only for flammable products)
					acute	chronic	
A	Yellow	Orange	Red	Yellow	Orange	Yellow	Orange
B	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange
C	Red	Orange	Yellow	Red	Orange	Yellow	Red
D	Orange	Yellow	Yellow	Orange	Orange	Orange	White

Limits of Our Assessment



1. Only ingredients with Hazard-Statements (R/H-Phrases) are assessed
2. No Life-Cycle-Assessment
3. Endocrine disruptors/**hormone active** effects are not assessed
4. Some **d**ata sets are incomplete (for instance about CMR-**e**ffects)
5. The bacterial resistances of biocides are not assessed
6. We don't summarize our assessment numbers to a single assessment number. The decision **on** which categories are the most important for a **specified** use must be taken by the user of the database/disinfectant.

Share of WIDES products with ingredients posing serious health hazards



Why a Working Group „Disinfection“?

→ To avoid the most hazardous substances

Ingredients of Several Disinfectants for Surface and Instrument Disinfection	Active Substance	Overall hazard classification	Thereof hazards with high concern
Polyhexamethylenbiguanid-Hydrochloride (CAS 27083-27-8 or 32289-58-0)	x	H302, H318, H351, H372, H317, H400 (M10), H410 (M10)	H351, H372, H317, H410 (M10)
Glyoxal (CAS 107-22-2)	x	H302, H315, H317, H319, H335, H341	H341, H317
N-(3-Aminopropyl)-N-dodecylpropane-1,3-diamine (CAS 2372-82-9)		H301, H314, H373, H400 (M10), H410	H301, H373, H410
Formaldehyde (CAS 50-00-0)	x	H301, H311, H331, H314, H317, H341, H350	H301, H311, H331, H317, H341, H350
Glutaraldehyde (CAS 111-30-8)	x	H301, H331, H314, H317, H318, H334, H400, H411	H301, H317, H334, H331
Di-decyl-methyl-polyoxyethyl-ammonium-quaternary-propionate (94667-33-1)	x	H302, H314, H400(M10), H410 (M10)	H410(M10)
Trisodium Nitrilotriacetate (CAS 5064-31-3)		H302, H319, H351	H351
Isothiazolinone (Kathon) (CAS 55965-84-9)	(x)	H301, H311, H314, H317, H331, H400, H410	H301, H311, H317, H331, H410
2-Biphenylol (CAS 90-43-7)	x	H315, H318, H335, H400, H410	H410
Glucoprotamin (CAS 164907-72-6)	x	H302, H330, H400, H410	H330, H410
Polyhexamethylenbiguanid (CAS 91403-50-8)	x	H315, H317, H319, H400, H410	H317, H410
Benzalkoniumchlorid (CAS 68424-85-1)	x	H302, H312, H314, H400 (M100)	H400 (M100)
lavandin oil (CAS 8022-15-9)		H315, H317, H412	H317
Methanol (CAS 67-56-1)		H301, H311, H331	H301, H311, H331
Limonene (5989-27-5)		H304, H315, H317, H400, H410	H317, H410

Why a Working Group „Disinfection“?

→ To use more active substances with low hazardous potential

Ingredients of Several Disinfectants for Surface and Instrument Disinfection	Active Substance	Overall hazard classification	Thereof hazards with high concern
Ethanol (CAS 64-17-5)	X	H319	-
Lactic acid (CAS 79-33-4)	X	H315, H318	-
Formic acid (CAS 64-18-6)	X	H302, H314, H318, H331	H331
Propan-1-ol (CAS 71-23-8)	X	H336, H318	-
Propan-2-ol (CAS 67-63-0)	X	H336, H319	-
Hydrogen peroxide (CAS 7722-84-1)	X	H302, H314, H332, H412	-
Citric acid (CAS 77-92-9)	X	H319	-
Magnesium monoperoxyphthalate hexahydrate (CAS 84665-66-7)	X	H314, H332	-
Pentapotassium bis(peroxymonosulphate) bis(sulphate) (CAS 70693-62-8)	X	H302, H314, H318, H412	-
Peracetic acid (CAS 79-21-0)	X	H302, H312, H314, H332, H400, H410 (M10)	(H410(M10))
6-(phthalimido)peroxyhexanoic acid (CAS 128275-31-0)	X	H318, H400	-

The European REACH and Biocidal Product Regulation are closing Data gaps



- Since 2006 we have a NEW Principle in the European Union:

NO DATA - NO MARKET

- All chemicals on the market - if produced or only imported - have to be registered by the companies and sometimes authorised (> 1 ton/year)
- All Active Substances have to be notified, (Data dossiers 40.000 Pages)
- All Biocidal Products have to be authorised **by** competent authorities
- All data are assessed and the **a**ssessment reports are published by ECHA (European Chemical Agency)
- LOOK AT: <http://echa.europa.eu/de/>
- **C**urrent Score: Only few substances/chemicals are restricted or prohibited
- **B**UT everyone can use the data from ECHA and support or develop „Substitution tools and **p**rocesses“



Since 2010 we consult hospitals, kindergardens, schools, official swimming pools and further Viennese institutions by selecting safe disinfectants - using the WIDES Database

www.wides.at

Examples for substitutions

In Viennese schools antimicrobial soaps were replaced with ordinary soap.

In our official swimming pools the use of a disinfectant with an ingredient with CMR properties could not be substituted. But the concentration could be reduced by 50%. After some time, the manufacturer changed the formulation and could phase out Trisodiumnitritriacetate.

The department for Health Service (MA15) changed the guidance for the selection of effective disinfectants. The use of „aldehydes“, which had been recommended since 1995, was explicitly not recommended any more since 2014. The assessment in the WIDES Database played a key role for this decision.

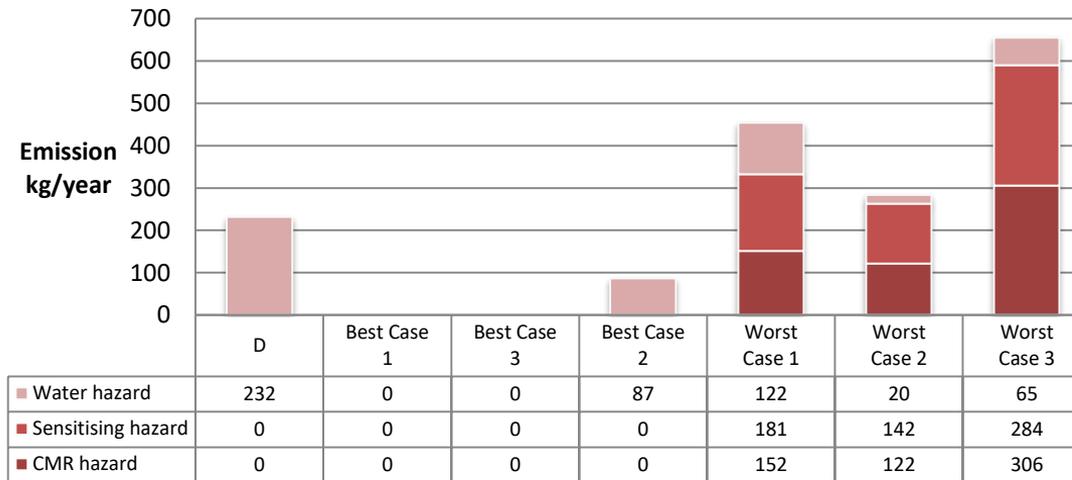
1995: www.wien.gv.at/gesundheit/strukturen/hygiene/pdf/hygienearchiv-nr09.pdf

2014: www.wien.gv.at/gesundheit/strukturen/hygiene/pdf/hygiene-nr9.pdf

Product benchmarking example - result



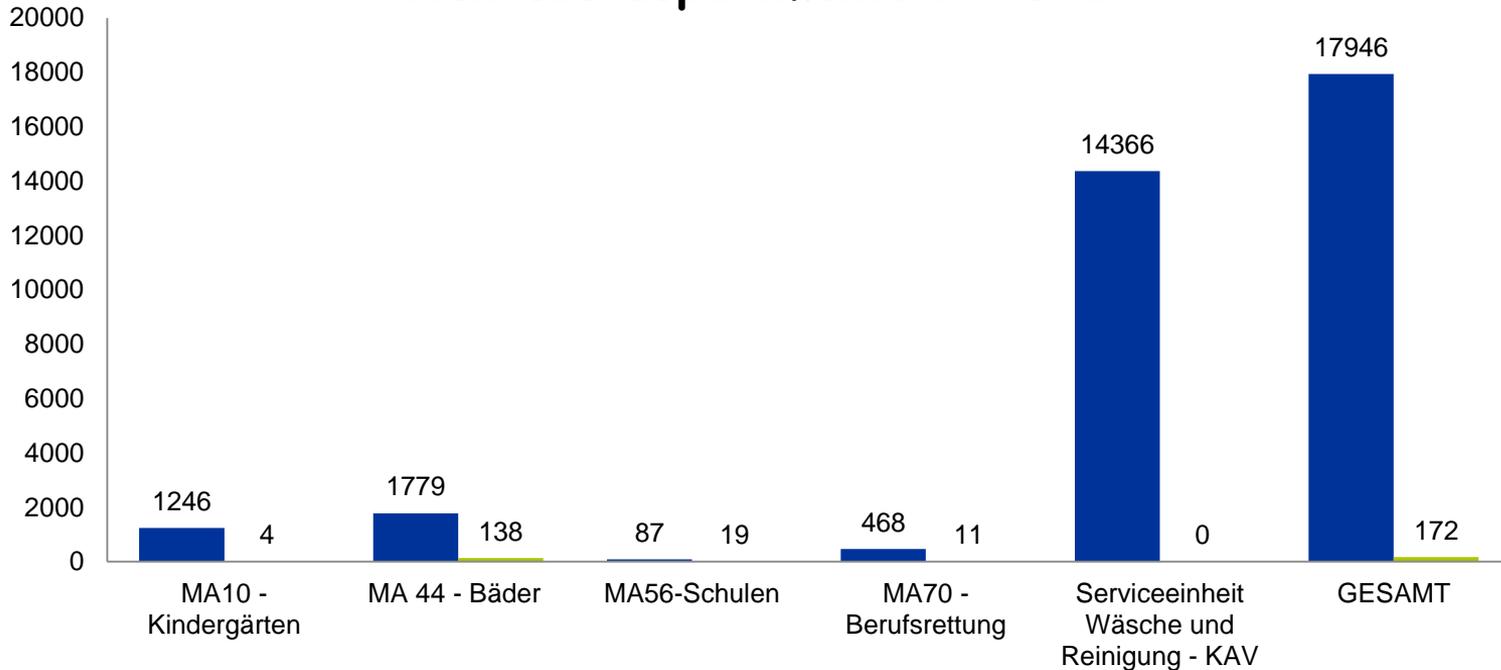
Product Benchmarking



Provisional conclusion: The use of product D generates an emission of 232 kg substances of very high concern per year. There are products available for the same application and with the same efficacy which emit 0 kg substances of very high concern.

A substitution should be taken into consideration but does not appear to be urgent (distance to worst case products is substantial).

MONITORING the **disinfectants used** in Viennese departments in 2015



Blue: Additional emissions in kg/year, if the worst products from the market would be used.
Green: Potential for substitution in kg/year, if the best products from the market would be used.

List of Recommended Disinfectants of the Vienna Hospital Association using (also) the WIDES Database

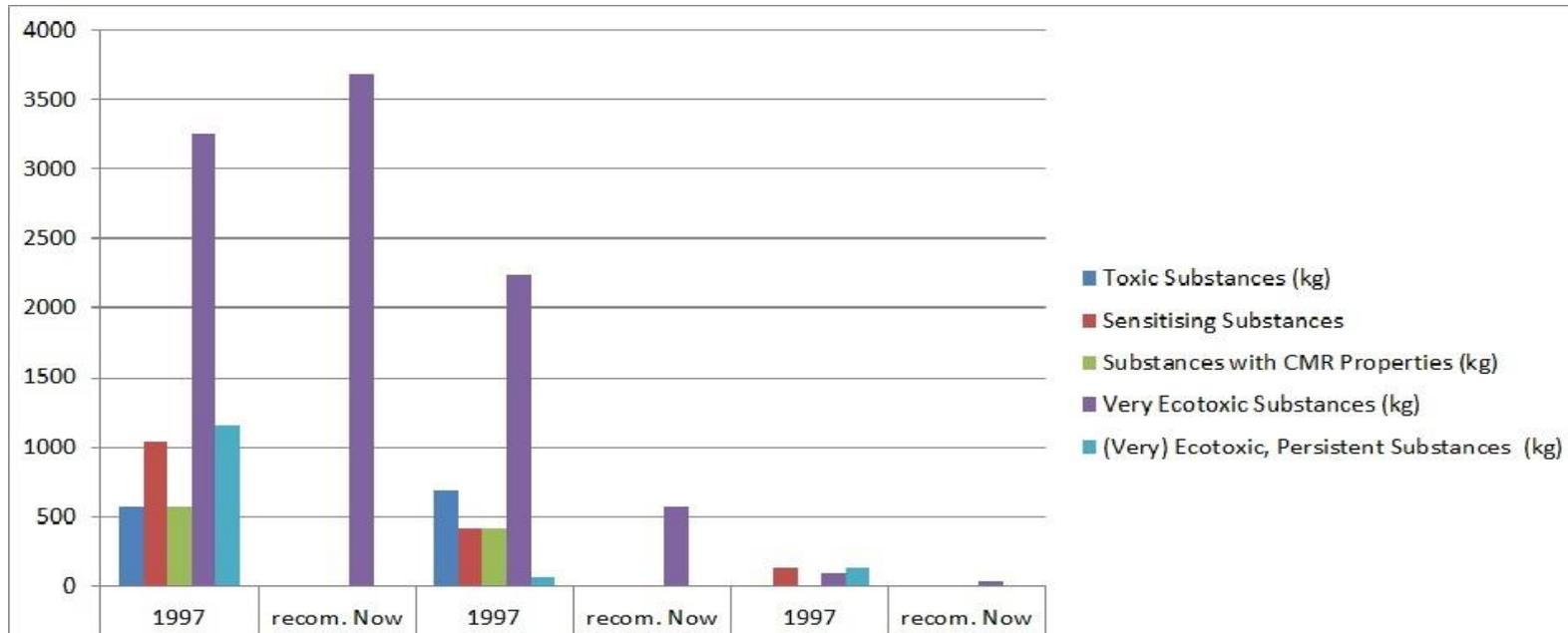


Persons responsible for hygiene measures in the Viennese Hospitals Association created a performance specification for a number of applications of disinfectants. These specifications - including criteria such as quantity, packaging size, spectrum of activity, and absence of aldehydes - were made part of a public tender.

The proposals received were ranked both by price and by considering the ecological and health-related impacts according to the WIDES assessment. Low price products with a good ecological and health ranking were identified and a list of recommended, low-price disinfectants was created.

The Viennese Hospitals Association now takes this list into consideration.
(Actually about 90% of the used disinfectants)

Achieved Reduction of Hazardous Chemicals by using the WIDES Database



Analysis showed that all chemicals with allergenic, toxic, teratogenic, (potentially) carcinogenic and very ecotoxic chemicals with long lasting effects to aquatic life could be phased out of routine disinfection of surfaces, instruments and hands by using the disinfectants, that are on top of the recommendation list.

Who uses the WIDES database?



Its use is binding

for the Vienna Hospital Association
for Kindergardens, Schools and Baths of the City of Vienna

Its use is recommended by

- the Austrian Action Plan für Sustainable Procurement
- the global NGO „Health Care without Harm“
- the Austrian Labour Inspectorate

(Austrian Decree about Hand Disinfectants for Pregnant Employees)

Publications by WHO and ILO, EU-Commission, ICLEI and now: EU-OSHA

Using the WIDES database to protect pregnant employees



- The Austrian Labour Inspectorate made a DECREE about hand disinfectants that may be used by pregnant employees.
- The WIDES is used to select products that fulfill the criteria.
[Händedesinfektion und Beschäftigungsverbot § 4 Abs. 2 Z 4 MSchG](#)
- The decree resulted in a strong increase of the use of perfume-free products with low hazardous potential.

Citation from the Draft Commission report on the sustainable use of biocides (CA-May15-doc.7.4a)



”On the long term it might be suitable to expand the features of R4BP (Register for Biocidal Products) in view of providing a tool for the overview and selection of biocidal products that have a lower impact on the environment and human health ¹⁶. The first step would however be to define what data and selection criteria can be used for this purpose.

16: ”This is similar to the WIDES database in Vienna (Austria) which is developed to help professional users making a choice of the most suitable disinfection product based on different criteria.”

Former source:

www.biozid.info/uploads/media/EU-Commission_Draft_COM_report_Sustainable_use_of_biocides.pdf

CONCLUSIONS



The WIDES Database provides ALL users of disinfectants with useful information, even at global scale.

(BECAUSE the listed active ingredients cover a significant proportion of those used worldwide, and typical formulations of disinfectants are similar worldwide.)

English training videos facilitate use!!! (Look at: www.wides.at/en)

ALL disinfectant manufacturers wishing to have their products included in the WIDES Database are welcome, if they meet some basic criteria, specified on the website.

„The dose makes the poison.“ That´s why it´s useful not only to phase out the most hazardous chemicals, but to also consider the concentration of all relevant chemicals to select the safest products.

QUESTION TO YOU:

DO YOU SEE SYNERGIES WITH YOUR WORK?



Thank You!



German Website www.wides.at
English Website www.wides.at/en

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