
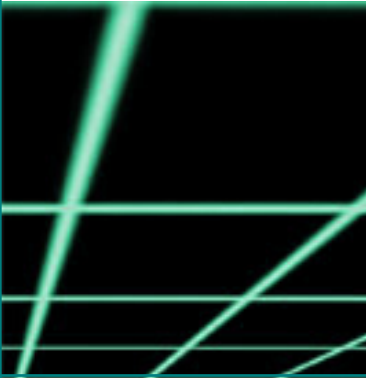


# Precautionary Matrix for Synthetic Nanomaterials

$$V = N \cdot (W \cdot E + S)$$

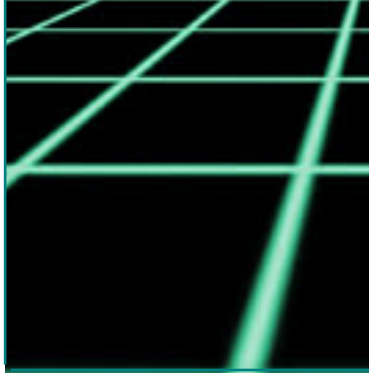


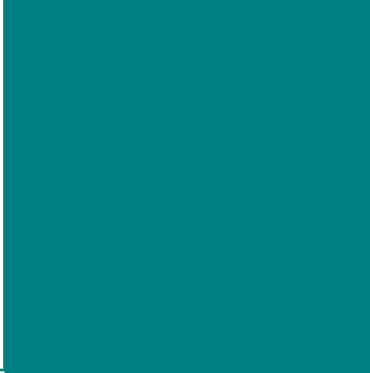


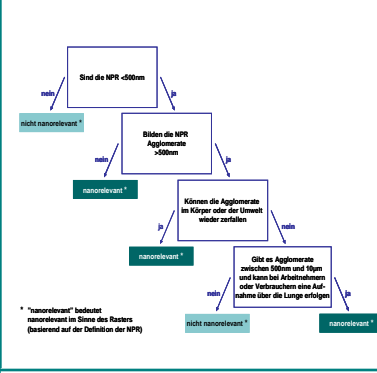
Vorsorgeraster für  
Synthetische Nanomaterialien


Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Bundesamt für Gesundheit BfG  
Bundesamt für Umwelt BAFU









Version 2.0



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Federal Office of Public Health FOPH  
Federal Office for the Environment FOEN

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<http://www.bag.admin.ch/themen/chemikalien/00228/00510/05626/index.html?lang=en>

A computerised version of the precautionary matrix exists which includes automatic evaluation of entries (www.nanotechnologie.admin.ch)

**General informations**

<b>Matrix completed by / responsible contact person</b>	
<b>Brief description of the considered nanospecific field</b> (type of NPR, which surrounding, in which application)	
<b>Brief description of the considered (process) step</b> (production, packaging, transport, further stages of processing, disposal, use...), brief description	
<b>Calculation of the precautionary need for employees</b>	<input type="radio"/> yes <input type="radio"/> no
<b>Calculation of the precautionary need for consumers</b>	<input type="radio"/> yes <input type="radio"/> no
<b>Is a product requiring nanospecific disposal involved?</b>	<input type="radio"/> yes <input type="radio"/> no Contact for information on disposal: see footer 27 in the guidelines
<b>Are coated / functionalised NPRs involved?</b>	<input type="radio"/> yes <input type="radio"/> no if yes, see statements in the guidelines, section 4.5

It is recommended that the relevant accompanying documents be studied before using the precautionary matrix  
(see www.nanotechnologie.admin.ch)

A: relevant for workers  
V: relevant for consumers  
U: relevant for the environment  
NPR: nanoparticles or nanorods

**Please note:**  
The precautionary matrix does not produce a definitive evaluation in terms of a risk assessment!

	Parameter classes	Parameter	Identifier	A	V	U	Appraisal	Basis for appraisal, applied measurement method
<b>Nano-relevance</b>	<b>Nano-relevance according to the precautionary matrix (i.e. contains NPR)</b>		N					
		Order of size of the primary particles (NPR) in the materials (free, bound, aggregated or agglomerated)	N1				<input type="radio"/> 1nm - 100nm, or <input type="radio"/> 100nm - 500nm <input type="radio"/> over 500nm	
		Do the NPRs form agglomerates >500nm	N1a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/> yes (proceed to N2)  <input type="radio"/> no (or not known) -> review of nano-relevance concluded	
		<b>Only if N1a = yes:</b> In the body does deagglomeration of agglomerates (or aggregates) to primary NPRs or agglomerates <500nm occur	N2 <sub>A,V</sub>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="radio"/> yes <input type="radio"/> no (proceed to N2a)	
		<b>Only if N1a = yes:</b> Under the respective environmental conditions does deagglomeration of agglomerates (or aggregates) to primary NPRs or agglomerates <500nm occur?	N2 <sub>U</sub>			<input checked="" type="checkbox"/>	<input type="radio"/> yes <input type="radio"/> no	
		<b>Only if N2A,V = no:</b> If agglomerates between 500nm and 10µm are present, can employees or consumers take them in through their lungs?	N2a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="radio"/> yes <input type="radio"/> no	

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	Parameter classes	Parameter	Identifier	A	V	U	Appraisal	Basis for appraisal, applied measurement method
<b>Specific framework conditions</b>	<b>Specific framework conditions on the information status</b>		S					
		Is the origin of the (nanoscale) starting materials known?	S1	x	x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		Is sufficient information available to complete the precautionary matrix for nanoscale starting materials?	S2	x	x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		Are the subsequent users of the considered NPRs known?	S3	x	x	x	<input type="radio"/> yes <input type="radio"/> partly <input type="radio"/> no	
		How accurately is the material system known, or can disturbing factors (e.g. impurities) be estimated?	S4	x	x	x	<input type="radio"/> accurately <input type="radio"/> not accurately <input type="radio"/> unknown	
<b>Potential effect</b>	<b>Potential effect</b>		W					
		Redox activity and/or catalytic activity of the NPRs present in the nanomaterial	W1	x	x	x	<input type="radio"/> low <input type="radio"/> medium <input type="radio"/> high	
		Stability (half-life) of the NPRs present in the nanomaterial in the body	W2 <sub>A,V</sub>	x	x		<input type="radio"/> hours <input type="radio"/> days-weeks <input type="radio"/> months	
		Stability (half-life) of the NPRs present in the nanomaterial under environmental conditions	W2 <sub>U</sub>			x	<input type="radio"/> hours <input type="radio"/> days-weeks <input type="radio"/> months	

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Parameter classes	Parameter	Identifier	A	V	U	Appraisal	Basis for appraisal, applied measurement method
Potential exposure of humans / potential input into the environment	<b>Physical surroundings</b>	E1					
	Air	E1.1	x	x	x	O yes O no	
	Aerosols <10 µm	E1.2	x	x	x	O yes O no	
	Aerosols >10 µm	E1.3	x	x	x	O yes O no	
	Liquid media	E1.4	x	x	x	O yes O no	
	Solid matrix, not stable under conditions of use	E1.5	x	x	x	O yes O no	
	Solid matrix, stable under conditions of use, NPR mobile	E1.6	x	x	x	O yes O no	
	Solid matrix, stable under conditions of use, NPR not mobile	E1.7	x	x	x	O yes O no	
	<b>Maximum possible exposure of humans</b>	E2					
	Amount of NPR which a worker handles per day	E2.1	x			O up to 1.2mg O 1.2mg - 12mg O over 120mg	
	Amount of NPR with which a worker comes into contact in the "worst case"	E2.2	x			O up to 12mg O 12mg - 120mg O over 120mg	
	Frequency with which a worker handles the NPR(s)	E2.3	x			O monthly O weekly O daily	
	Amount of NPR which a consumer handles daily through the utility product	E2.4			x	O up to 1.2mg O 1.2mg - 12mg O over 12mg	
	Frequency with which a consumer uses the utility product	E2.5			x	O monthly O weekly O daily	
<b>Maximum possible input into the environment</b>	E3						
Amount of NPR disposed of as waste (in wastewater, exhaust gases, solid waste) per year which is not subject to specific waste	E3.1				x	O up to 5kg O 5kg - 500kg O over 500kg	
Amount of NPR in utility products per year	E3.2				x	O up to 5kg O 5kg - 500kg O over 500kg	