EEE Substance Inventory

Identification and Prioritisation of Substances for Inclusion in the List of Restricted Substances (Annex II) under the RoHS 2 Directive

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Outline

- Goal and method
- Stakeholder process
- Actions taken since the last stakeholder consultation
- Results and discussion

- Discussion (15 mins)

Goal and method

- **Goal**: Identification and prioritisation of substances for a detailed assessment for the inclusion in Annex II under the RoHS Directive (list of restricted substances)
  - Inventory of substances with hazardous properties in EEE that are prioritized for a detailed assessment for a restriction under RoHS Annex II

- **Method**: Following Part I and II of the methodology manual to:
  - Create/update an inventory of substances in EEE from a range of sources (incl. REACH registered substances; IEC 62474 declarable substances DB; studies and reports) (Part I)
  - Research and list relevant attributes of each substance (status under RoHS, REACH, and other EU legislation; hazardous properties; volumes of use in EEE; etc.) (Part I)
  - Prioritise substances according to defined criteria (Part II)

Goal and method

Table 1-5: Overview of possible colour combinations for the highest overall priority categories

Criteria	Colour coded priority									
Human Health & Environment (REACH Annexes)										
High volume of use (nano)										
Resulting overall priority of substances / substance groups	I	II	III	IV	V	VI	VII	VIII	IX	X

Source: Adapted with revisions from AUBA (2013)

- Additional criterion: Substances that are listed on Annex XIV or XVII of REACH, or are proposed for inclusion, are also prioritised

Stakeholder process

- **3 stakeholder consultations** were held with relevance to the substance inventory*
  - 2018 Consultation 2: EEE substance inventory
  - 2019 Consultation 3: Pre-prioritised substance inventory
  - 2019 Consultation 4: Prioritised shortlist

- **Information was requested on**
  - Additional substances that are used in EEE but were not yet included in the inventory
  - Information on the usage of substances in the EU (presence in EEE, applications, volumes of use, use as nanomaterial) in general and in EEE; additive or reactive use, substitution
  - Evidence that would change the priority group for listed substances
  - Evidence that a substance has known impacts according to RoHS Article 6(1)(a-c)

- **Contributions were received** from 18 stakeholders in total (mostly associations, a few individual companies)*

*Available at: https://rohs.exemptions.oeko.info/index.php?id=288

Actions taken since the last stakeholder consultation

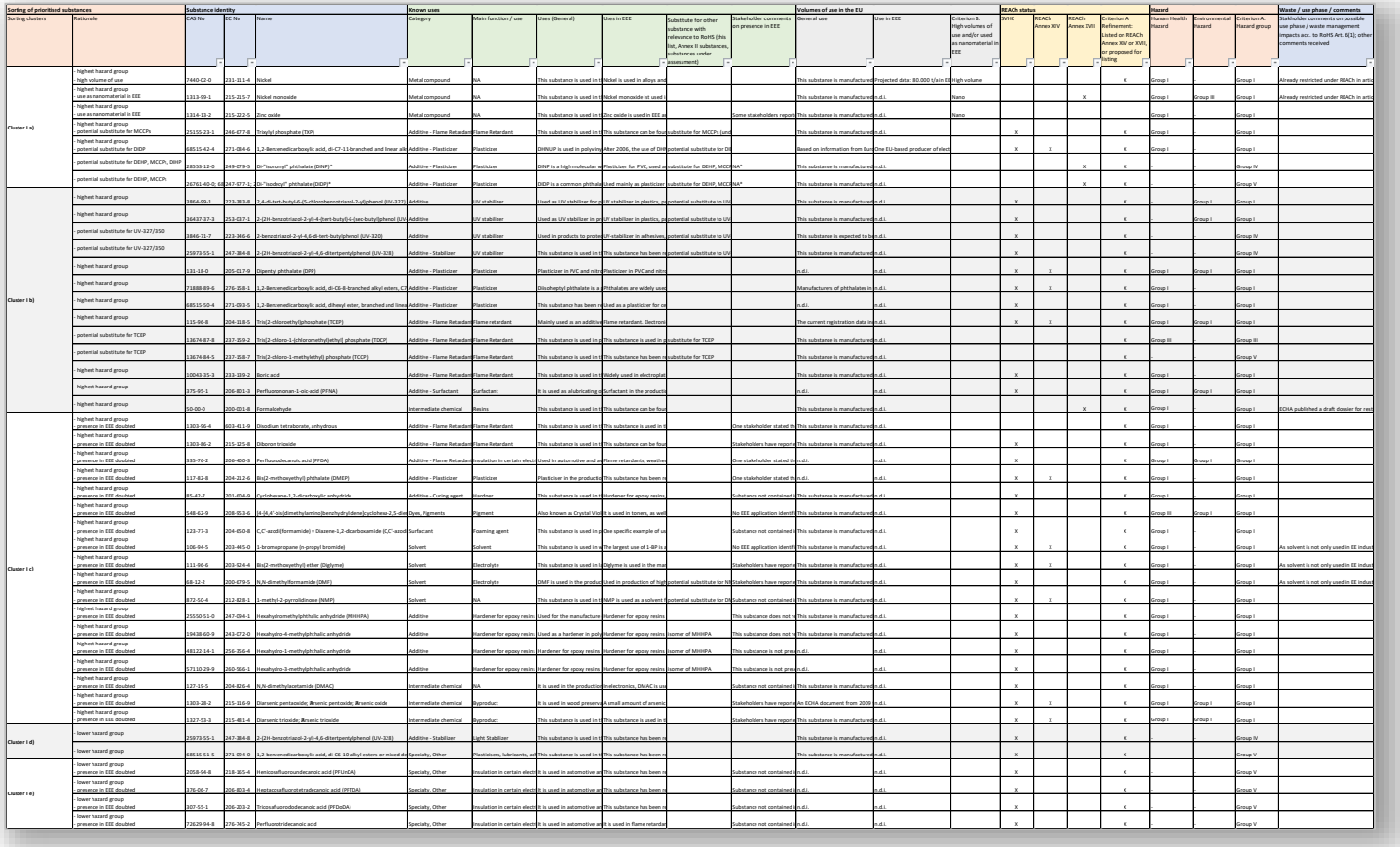
- Addition of 3 substances that were falsely eliminated from the list in a previous step:
  - Di-"isodecyl" phthalate (DIDP) (CAS Nr.: 26761-40-0)
  - Di-"isononyl" phthalate (DINP) (CAS Nr.: 28553-12-0)
  - Di-n-octyl phthalate (DnOP) (CAS Nr.: 117-84-0)

- Removal of 1 substance that was previously falsely indicated for use as nanomaterial in EEE:
  - reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)

- Sorting of the 44 substances with the highest priority into 5 clusters

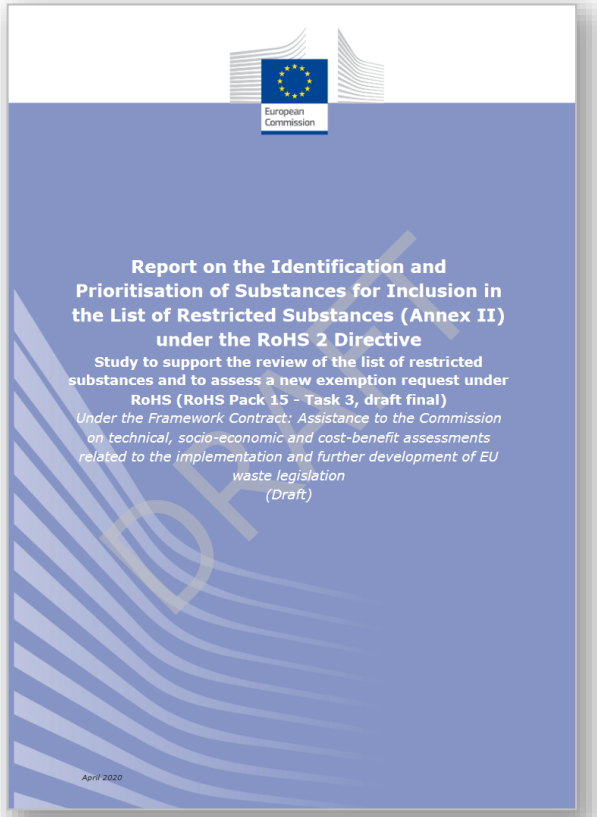
Results

- Prioritised substance inventory (spreadsheet, 2 tabs)



Sorting of prioritised substances		Substance identity			Known uses					Stakeholder comments on presence in EEE	Volumes of use in the EU			REACh status				Hazard			Waste / use phase / comments
Sorting clusters	Rationale	CAS No	EC No	Name	Category	Main function / use	Uses (General)	Uses in EEE	Substitute for other substance with relevance to RoHS [this list, Annex II substances, substances under assessment]		General use	Use in EEE	Criterion B: High volumes of use and/or used as nanomaterial in EEE	SVHC	REACh Annex XIV	REACh Annex XVII	Criterion A Refinement: Listed on REACh Annex XIV or XVII, or proposed for listing	Human Health Hazard	Environmental Hazard	Criterion A: Hazard group	Stakholder comments on possible use phase / waste management impacts acc. to RoHS Art. 6(1); other comments received
Cluster I a)	- highest hazard group high volume of use	7440-02-0	231-111-4	Nickel	Metal compound	NA	This substance is used in t	Nickel is used in alloys and			This substance is manufactured	Projected data: 80.000 t/a in EU	High volume				X	Group I		Group I	Already restricted under REACh in artic
	- highest hazard group use as nanomaterial in EEE	1313-99-1	215-215-7	Nickel monoxide	Metal compound	NA	This substance is used in t	Nickel monoxide ist used i			This substance is manufactured	n.d.i.	Nano			X		Group I	Group III	Group I	Already restricted under REACh in artic
	- highest hazard group use as nanomaterial in EEE	1314-13-2	215-222-5	Zinc oxide	Metal compound	NA	This substance is used in t	Zinc oxide is used in EEE as		Some stakeholders report	This substance is manufactured	n.d.i.	Nano					Group I		Group I	
	- highest hazard group potential substitute for MCCPs	25155-23-1	246-677-8	Trixylyl phosphate (TXP)	Additive - Flame Retardant	Flame Retardant	This substance is used in t	This substance can be four	substitute for MCCPs (und		This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group potential substitute for DIDP	68515-42-4	271-084-6	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alk	Additive - Plasticizer	Plasticizer	DINUP is used in polyvinyl	After 2006, the use of DIN	potential substitute for DI		Based on information from Eurc	One EU-based producer of elec		X	X		X	Group I		Group I	
	- potential substitute for DIDP, MCCPs, DINP	28553-12-0	249-079-5	Di-"isononyl" phthalate (DINP)*	Additive - Plasticizer	Plasticizer	DINP is a high molecular w	Plasticizer for PVC, used as	substitute for DEHP, MCCP/NA*		This substance is manufactured	n.d.i.				X	X			Group IV	
	- potential substitute for DEHP, MCCPs	26761-40-0, 68	247-977-1,	Di-"isodecyl" phthalate (DIDP)*	Additive - Plasticizer	Plasticizer	DIDP is a common phthalat	Used mainly as plasticizer	substitute for DEHP, MCCP/NA*		This substance is manufactured	n.d.i.				X	X			Group V	
Cluster I b)	- highest hazard group	3864-99-1	223-383-8	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	Additive	UV stabilizer	Used as UV stabilizer for pl	UV stabilizer in plastics, pa	potential substitute to UV		This substance is manufactured	n.d.i.		X			X		Group I	Group I	
	- highest hazard group	36437-37-3	253-037-1	2-(2H-benzotriazol-2-yl)-4,6-ditert-butylphenol (UV	Additive	UV stabilizer	Used as UV stabilizer in pl	UV stabilizer in plastics, pa	potential substitute to UV		This substance is manufactured	n.d.i.		X			X		Group I	Group I	
	- potential substitute for UV-327/350	3846-71-7	223-346-6	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	Additive	UV stabilizer	Used in products to protec	UV-stabilizer in adhesives,	potential substitute to UV		This substance is expected to be	n.d.i.		X			X			Group IV	
	- potential substitute for UV-327/350	25973-55-1	247-384-8	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	Additive - Stabilizer	UV stabilizer	This substance is used in t	This substance has been re	potential substitute to UV		This substance is manufactured	n.d.i.		X			X			Group IV	
	- highest hazard group	131-18-0	205-017-9	Dipentyl phthalate (DPP)	Additive - Plasticizer	Plasticizer	Plasticizer in PVC and nitro	Plasticizer in PVC and nitro			n.d.i.	n.d.i.		X	X		X	Group I	Group I	Group I	
	- highest hazard group	71888-89-6	276-158-1	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-	Additive - Plasticizer	Plasticizer	Dihexyhptyl phthalate is a	Phthalates are widely used			Manufacturers of phthalates in	n.d.i.		X	X		X	Group I		Group I	
	- highest hazard group	68515-50-4	271-093-5	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linea	Additive - Plasticizer	Plasticizer	This substance has been re	Used as a plasticizer for ce			n.d.i.	n.d.i.		X			X	Group I		Group I	
	- highest hazard group	115-96-8	204-118-5	Tris(2-chloroethyl)phosphate (TCEP)	Additive - Flame Retardant	Flame retardant	Mainly used as an additive	Flame retardant. Electroni			The current registration data in	n.d.i.		X	X		X	Group I	Group I	Group I	
	- potential substitute for TCEP	13674-87-8	237-159-2	Tris(2-chloro-1-(chloromethyl)ethyl) phosphate (TDCP)	Additive - Flame Retardant	Flame Retardant	This substance is used in t	This substance is used in pu	substitute for TCEP		This substance is manufactured	n.d.i.					X	Group III		Group III	
	- potential substitute for TCEP	13674-84-5	237-158-7	Tris(2-chloro-1-methylethyl) phosphate (TCCP)	Additive - Flame Retardant	Flame Retardant	This substance is used in t	This substance has been re	substitute for TCEP		This substance is manufactured	n.d.i.					X			Group V	
	- highest hazard group	10043-35-3	233-139-2	Boric acid	Additive - Flame Retardant	Flame Retardant	This substance is used in t	Widely used in electroplat			This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group	375-95-1	206-801-3	Perfluorononan-1-oic-acid (PFNA)	Additive - Surfactant	Surfactant	It is used as a lubricating a	Surfactant in the products			n.d.i.	n.d.i.		X			X	Group I	Group I	Group I	
	- highest hazard group	50-00-0	200-001-8	Formaldehyde	Intermediate chemical	Resins	This substance is used in t	This substance can be four			This substance is manufactured	n.d.i.				X	X	Group I		Group I	ECHA published a draft dossier for revi
Cluster I c)	- highest hazard group presence in EEE doubted	1303-96-4	603-411-0	Disodium tetraborate, anhydrous	Additive - Flame Retardant	Flame Retardant	This substance is used in t	This substance is used in E		One stakeholder stated th	This substance is manufactured	n.d.i.					X	Group I		Group I	
	- highest hazard group presence in EEE doubted	1303-86-2	215-125-8	Diboron trioxide	Additive - Flame Retardant	Flame Retardant	This substance is used in t	This substance can be four		Stakeholders have reporte	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	335-76-2	206-400-3	Perfluorodecanoic acid (PFDA)	Additive - Flame Retardant	Insulation in certain electr	Used in automotive and ae	Flame retardants, weather		One stakeholder stated th	n.d.i.	n.d.i.		X			X	Group I	Group I	Group I	
	- highest hazard group presence in EEE doubted	117-82-8	204-212-6	Bis(2-methoxyethyl) phthalate (DMEP)	Additive - Plasticizer	Plasticizer	Plasticiser in the products	This substance has been re		One stakeholder stated th	n.d.i.	n.d.i.		X	X		X	Group I		Group I	
	- highest hazard group presence in EEE doubted	85-42-7	201-604-9	Cyclohexane-1,2-dicarboxylic anhydride	Additive - Curing agent	Hardner	This substance is used in t	Hardener for epoxy resins,		Substance not contained i	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	548-62-9	208-953-6	4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien	Dyes, Pigments	Pigment	Also known as Crystal Viol	It is used in toners, as wel		No EEE application identifi	This substance is manufactured	n.d.i.		X			X	Group III	Group I	Group I	
	- highest hazard group presence in EEE doubted	123-77-3	204-650-8	4,C'-azodi(formamide) = Diazene-1,2-dicarboxamide (C,C'-azodi	Surfactant	Foaming agent	This substance is used in p	One specific example of su		Substance not contained i	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	106-94-5	203-445-0	1-bromopropane (n-propyl bromide)	Solvent	Solvent	This substance is used in p	The largest use of 1-BP is		No EEE application identifi	This substance is manufactured	n.d.i.		X	X		X	Group I		Group I	As solvent is not only used in EE indus
	- highest hazard group presence in EEE doubted	111-96-6	203-924-4	Bis(2-methoxyethyl) ether (Diglyme)	Solvent	Electrolyte	This substance is used in t	Diglyme is used in the mak		Stakeholders have reporte	This substance is manufactured	n.d.i.		X	X		X	Group I		Group I	As solvent is not only used in EE indus
	- highest hazard group presence in EEE doubted	68-12-2	200-679-5	N,N-dimethylformamide (DMF)	Solvent	Electrolyte	DMF is used in the product	Used in production of high	potential substitute for NM	Stakeholders have reporte	This substance is manufactured	n.d.i.		X			X	Group I		Group I	As solvent is not only used in EE indus
	- highest hazard group presence in EEE doubted	872-50-4	212-828-1	1-methyl-2-pyrrolidinone (NMP)	Solvent	NA	This substance is used in t	NMP is used as a solvent	potential substitute for DE	Substance not contained i	This substance is manufactured	n.d.i.		X	X		X	Group I		Group I	
	- highest hazard group presence in EEE doubted	25550-51-0	247-094-1	Hexahydromethylphthalic anhydride (MHHPA)	Additive	Hardener for epoxy resins	Used for the manufacture	Hardener for epoxy resins		This substance does not co	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	19438-60-9	243-072-0	Hexahydro-4-methylphthalic anhydride	Additive	Hardener for epoxy resins	Used as a hardener in poly	Hardener for epoxy resins	isomer of MHHPA	This substance does not co	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	48122-14-1	256-356-4	Hexahydro-1-methylphthalic anhydride	Additive	Hardener for epoxy resins	Hardener for epoxy resins	Hardener for epoxy resins	isomer of MHHPA	This substance is not prese	n.d.i.	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	57110-29-9	260-566-1	Hexahydro-3-methylphthalic anhydride	Additive	Hardener for epoxy resins	Hardener for epoxy resins	Hardener for epoxy resins	isomer of MHHPA	This substance is not prese	n.d.i.	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	127-19-5	204-826-4	N,N-dimethylacetamide (DMAC)	Intermediate chemical	NA	It is used in the production	In electronics, DMAC is use		Substance not contained i	This substance is manufactured	n.d.i.		X			X	Group I		Group I	
	- highest hazard group presence in EEE doubted	1303-28-2	215-116-9	Diarsenic pentaoxide; diarsenic pentoxide; diarsenic oxide	Intermediate chemical	Byproduct	It is used in wood preserva	A small amount of arsenic		Stakeholders have reporte	An ECHA document from 2009	n.d.i.		X	X		X	Group I	Group I	Group I	
	- highest hazard group presence in EEE doubted	1327-53-3	215-481-4	Diarsenic trioxide; diarsenic trioxide	Intermediate chemical	Byproduct	This substance is used in t	This substance is used in G		Stakeholders have reporte	This substance is manufactured	n.d.i.		X	X		X	Group I	Group I	Group I	
Cluster I d)	- lower hazard group	25973-55-1	247-384-8	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	Additive - Stabilizer	Light Stabilizer	This substance is used in t	This substance has been re			This substance is manufactured	n.d.i.		X			X			Group IV	
	- lower hazard group	68515-51-5	271-094-0	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters or mixed di	Specialty, Other	Plasticisers, lubricants, ad	This substance is used in t	This substance has been re			This substance is manufactured	n.d.i.		X			X			Group V	
Cluster I e)	- lower hazard group presence in EEE doubted	2058-94-8	218-165-4	Henicosafluoroundecanoic acid (PFUnDA)	Specialty, Other	Insulation in certain electr	It is used in automotive ar	This substance has been re		Substance not contained i	n.d.i.	n.d.i.		X			X			Group V	
	- lower hazard group presence in EEE doubted	376-06-7	206-803-4	Heptacosafluorotetradecanoic acid (PFTDA)	Specialty, Other	Insulation in certain electr	It is used in automotive ar	This substance has been re		Substance not contained i	n.d.i.	n.d.i.		X			X			Group V	
	- lower hazard group presence in EEE doubted	307-55-1	206-203-2	Tricosafluorododecanoic acid (PFDoDA)	Specialty, Other	Insulation in certain electr	It is used in automotive ar	This substance has been re		Substance not contained i	n.d.i.	n.d.i.		X			X			Group V	
	- lower hazard group presence in EEE doubted	72629-94-8	276-745-2	Perfluorotridecanoic acid	Specialty, Other	Insulation in certain electr	It is used in automotive ar	It is used in flame retarda		Substance not contained i	n.d.i.	n.d.i.		X			X			Group V	

- Report (draft version*)



*Available at: https://rohs.exemptions.oeko.info/index.php?id=341

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Results: Prioritised substance inventory (spreadsheet)

Tab 1: Prioritised substances

- 44 substances/substance groups of the highest priority (group I)
- Including detailed information on each substance
- Sorted into 5 clusters

Tab 2: Non-prioritised substances

- 799 substances/substance groups of lower priority (groups II – X)
- Including basic information on each substance
- Only sorted according to group#

Results: Prioritised substances – Included information on each substance

Known uses					
Category	Main function / use	Uses (General)	Uses in EEE	Substitute for other substance with relevance to RoHS (this list, Annex II substances, substances under assessment)	Stakeholder comments on presence in EEE

Volumes of use in the EU		
General use	Use in EEE	Criterion B: High volumes of use and/or used as nanomaterial in EEE

REACh status			
SVHC	REACh Annex XIV	REACh Annex XVII	Criterion A Refinement: Listed on REACh Annex XIV or XVII, or proposed for listing

Hazard		
Human Health Hazard	Environmental Hazard	Criterion A: Hazard group

Waste / use phase / comments
Stakholder comments on possible use phase / waste management impacts acc. to RoHS Art. 6(1); other comments received

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Results: Prioritised substances – Criteria for sorting into 5 clusters

- Hazard group
- High volume of use and/or use as nanomaterial
- Indication that substance is a potential substitute for substances that are listed on RoHS Annex II or are under assessment for possible inclusion on RoHS Annex II
- Indication that substance is a potential substitute for another substance on the list (to facilitate parallel assessments);
- Indication that substance may possibly not be present in EEE
  - E.g. IEC 62474 Declarable Substances DB; stakeholder comments
  - Information was noted in the list but not considered sufficient to remove substances from the list as it could not be ensured that statements were representative for all EEE sectors / manufacturers

Results: Prioritised substances – Cluster I a)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
7440-02-0	231-111-4	Nickel	- highest hazard group - high volume of use
1313-99-1	215-215-7	Nickel monoxide	- highest hazard group - use as nanomaterial in EEE
1314-13-2	215-222-5	Zinc oxide	- highest hazard group - use as nanomaterial in EEE
25155-23-1	246-677-8	Trixylyl phosphate (TXP)	- highest hazard group - potential substitute for MCCPs
68515-42-4	271-084-6	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	- highest hazard group - potential substitute for DIDP
28553-12-0	249-079-5	Di-"isononyl" phthalate (DINP)*	- potential substitute for DEHP, MCCPs, DIHP
26761-40-0; 68515-49-1	247-977-1; 271-091-4	Di-"isodecyl" phthalate (DIDP)*	- potential substitute for DEHP, MCCPs

Known uses

Volumes of use

REACh status

Hazard

Waste / use phase / comments

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Results: Prioritised substances – Cluster I b)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
3864-99-1	223-383-8	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	- highest hazard group
36437-37-3	253-037-1	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-	- highest hazard group
3846-71-7	223-346-6	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	- potential substitute for UV-327/350
25973-55-1	247-384-8	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	- potential substitute for UV-327/350
131-18-0	205-017-9	Dipentyl phthalate (DPP)	- highest hazard group
71888-89-6	276-158-1	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7	- highest hazard group
68515-50-4	271-093-5	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linea	- highest hazard group
115-96-8	204-118-5	Tris(2-chloroethyl)phosphate (TCEP)	- highest hazard group
13674-87-8	237-159-2	Tris[2-chloro-1-(chloromethyl)ethyl] phosphate (TDCP)	- potential substitute for TCEP
13674-84-5	237-158-7	Tris(2-chloro-1-methylethyl) phosphate (TCCP)	- potential substitute for TCEP
10043-35-3	233-139-2	Boric acid	- highest hazard group
375-95-1	206-801-3	Perfluorononan-1-oic-acid (PFNA)	- highest hazard group
50-00-0	200-001-8	Formaldehyde	- highest hazard group

Known uses

Volumes of use

REACh status

Hazard

Waste / use phase / comments

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Results: Prioritised substances – Cluster I c) (1/2)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
1303-96-4	603-411-9	Disodium tetraborate, anhydrous	- highest hazard group - presence in EEE uncertain
1303-86-2	215-125-8	Diboron trioxide	- highest hazard group - presence in EEE uncertain
335-76-2	206-400-3	Perfluorodecanoic acid (PFDA)	- highest hazard group - presence in EEE uncertain
117-82-8	204-212-6	Bis(2-methoxyethyl) phthalate (DMEP)	- highest hazard group - presence in EEE uncertain
85-42-7	201-604-9	Cyclohexane-1,2-dicarboxylic anhydride	- highest hazard group - presence in EEE uncertain
548-62-9	208-953-6	[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dier	- highest hazard group - presence in EEE uncertain
123-77-3	204-650-8	C,C'-azodi(formamide) = Diazene-1,2-dicarboxamide (C,C'-azodi	- highest hazard group - presence in EEE uncertain
106-94-5	203-445-0	1-bromopropane (n-propyl bromide)	- highest hazard group - presence in EEE uncertain
111-96-6	203-924-4	Bis(2-methoxyethyl) ether (Diglyme)	- highest hazard group - presence in EEE uncertain

Known uses

Volumes of use

REACh status

Hazard

Waste / use phase / comments

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Results: Prioritised substances – Cluster I c) (2/2)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
68-12-2	200-679-5	N,N-dimethylformamide (DMF)	- highest hazard group - presence in EEE uncertain
872-50-4	212-828-1	1-methyl-2-pyrrolidinone (NMP)	- highest hazard group - presence in EEE uncertain
25550-51-0	247-094-1	Hexahydromethylphthalic anhydride (MHHPA)	- highest hazard group - presence in EEE uncertain
19438-60-9	243-072-0	Hexahydro-4-methylphthalic anhydride	- highest hazard group - presence in EEE uncertain
48122-14-1	256-356-4	Hexahydro-1-methylphthalic anhydride	- highest hazard group - presence in EEE uncertain
57110-29-9	260-566-1	Hexahydro-3-methylphthalic anhydride	- highest hazard group - presence in EEE uncertain
127-19-5	204-826-4	N,N-dimethylacetamide (DMAC)	- highest hazard group - presence in EEE uncertain
1303-28-2	215-116-9	Diarsenic pentaoxide; Arsenic pentoxide; Arsenic oxide	- highest hazard group - presence in EEE uncertain
1327-53-3	215-481-4	Diarsenic trioxide; Arsenic trioxide	- highest hazard group - presence in EEE uncertain

Known uses

Volumes of use

REACh status

Hazard

Waste / use phase / comments

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Results: Prioritised substances – Cluster I d) and e)

Cluster d)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
25973-55-1	247-384-8	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	- lower hazard group
68515-51-5	271-094-0	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters or mixed de	- lower hazard group

Known uses

Volumes of use

REACh status

Hazard

Waste / use phase / comments

Cluster e)

Substance identity			Sorting of prioritised substances
CAS No	EC No	Name	Sorting rationale
2058-94-8	218-165-4	Henicosafluoroundecanoic acid (PFUnDA)	- lower hazard group - presence in EEE uncertain
376-06-7	206-803-4	Heptacosafluorotetradecanoic acid (PFTDA)	- lower hazard group - presence in EEE uncertain
307-55-1	206-203-2	Tricosafluorododecanoic acid (PFDoDA)	- lower hazard group - presence in EEE uncertain
72629-94-8	276-745-2	Perfluorotridecanoic acid	- lower hazard group - presence in EEE uncertain

Interpretation of results

- Substances of the highest priority are **not automatically included in Annex II** of the RoHS Directive
- Substances of the highest priority are **prioritised for a detailed assessment** according to Part III of the methodology, which takes into account additional information (including exposure assessment, alternative substances/technologies, socio-economic impacts of inclusion in Annex II under RoHS, etc.), resulting in a recommendation for or against inclusion of assessed substances in Annex II under RoHS
- The European Commission **may decide to include substances of highest priority in a detailed assessment** in the future

Discussion points (1/3)

- **Data availability**: Data on volumes of use (quantity) of substances present in EEE in the EU are practically not available
  - Registration dossiers under REACH account for substance volumes manufactured or imported into the EU as such, but not in articles – EEE are largely imported into the EU
  - Industry and associations commonly have quantitative data for their own production/ sector, but not on quantities in EEE in the EU in total
  - Some stakeholder statements regarding the presence of substances in EEE were contradictory (used in EEE / not used in EEE)
- Therefore, **quantity data was not sufficiently available to generate a magnitude ranking** → data gap

Discussion points (2/3)

- **Question**: Why is nickel in the highest priority group?

- **Answer**: Nickel fulfils several of the criteria that indicate the highest priority:
  - Highest hazard group due to harmonized classification (acc. CLP Annex VI) as:
    - Carcinogen category 2 (Carc 2)
    - Specific target organ toxicity after repeated exosure category 1 (STOT RE 1)
    - Skin sensitisation category 1 (Skin Sens. 1)
  - High volume of use: 80.000 t/a in EU-28 in 2020 [1] for nickel and its compounds
  - Listed on REACH Annex XVII

[1] Data from the Urban Mine Platform: http://www.urbanmineplatform.eu/

Discussion points (3/3)

- **Question**: Why is specific substance XY ranked as it is?

- **Answer**: The priority of substances included in the process were determined following the methodology manual (please see for details of the methodology). Final results (spreadsheet) will include all properties of prioritised substances that determined their priority and cluster (clusters I a – e).

Additional discussion points?

Backup slides

Table 1-2: Human Health Hazard Groups

Human Health Hazard – Group I
Carcinogenic (CLP Category 1A or 1B)* (WF 1000)
Germ cell mutagenic (CLP Category 1A or 1B)* (WF 1000)
Toxic for reproduction (CLP Category 1A, 1B, or 2)* (WF 500)
Specific target organ toxicity after repeated exposure (CLP STOT RE Category 1)* (WF 500)
Specific target organ toxicity after single exposure (CLP STOT SE Category 1) (WF 1000)
Endocrine disruptive
Respiratory sensitisation (CLP Category 1) WF 500 (where included in the candidate list)
Acute toxic (CLP Category 1 and 2) WF ≥1000
Aspiration toxicity (CLP Category 1) (WF 1000)
Human Health Hazard – Group II
Skin sensitisation (CLP Category 1) (WF 500)
Respiratory sensitisation (CLP Category 1) WF 500 (other)
Respiratory sensitisation (CLP Category 2)
Human Health Hazard – Group III
Specific target organ toxicity at single exposure (CLP STOT-SE Category 2 and 3) (WF ≤100)
Acute toxic (CLP Category 3 and 4) (WF ≤100)
Carcinogenic (CLP Category 2) (WF 100)
Reprotoxic (CLP Category 2; Lact.) (WF ≤100)
Mutagenic (CLP Category 2) (WF 100)
Skin corrosion/irritation (CLP Category 1A, 1B, 1C, 2) (WF ≤100)
Serious eye damage/eye irritation (CLP Category 1, 2) (WF ≤100)

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Backup slides

Table 1-3: Environmental Hazard Groups

Environmental Hazard Group I
PBT (persistent, bioaccumulative, toxic) according SVHC criteria REACH
vPvB (very persistent and very bioaccumulative) according SVHC criteria REACH
Endocrine Disruptive
Hazardous to the aquatic environment (CLP Chronic Category 1, 2) (WF 1000)
Hazardous to the aquatic environment (CLP Acute Category 1) (WF 1000)
Hazardous to the ozone layer (CLP Category 1) (WF 1000)
Environmental Hazard Group II
PB (persistent and bio-accumulative)*,**
Environmental Hazard Group III
Hazardous to the aquatic environment (CLP Chronic category 3, 4)
Persistent (REACH criterion)* or Bioaccumulative (REACH criterion)**