



Legal Compliance of Displays: Update of RoHS 2.0 and REACH SVHC

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SID Display Week 2013, Vancouver, Canada
Exhibitors' Forum, May 22nd, 2013, Booth No. 821



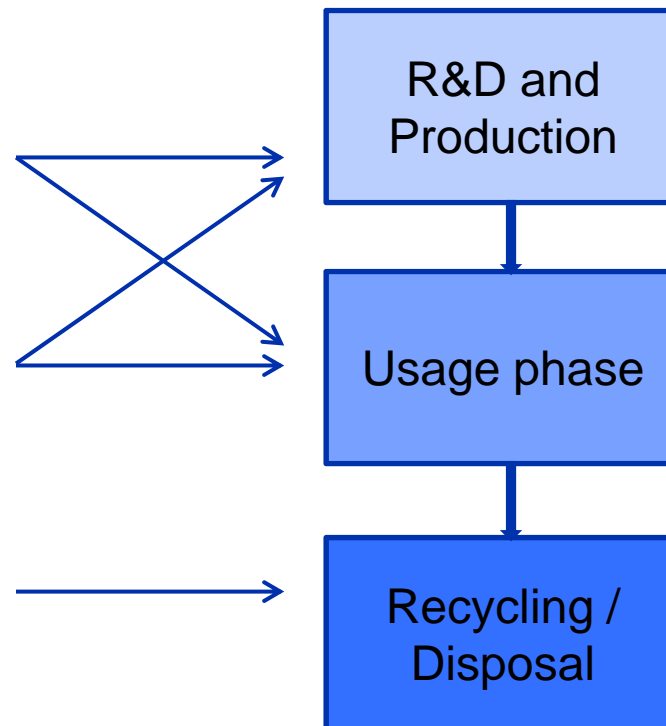
Contents

From 'Gradle to Grave' of Display Materials

- REACH / REACH SVHC

- RoHS & RoHS 2.0

- WEEE and its Recast *



* (not covered in this presentation)



Merck KGaA is not the same as Merck & Co.

Merck KGaA, Darmstadt, Germany, and the U.S. pharmaceutical company Merck & Co. have been two independent companies since 1917.

Common historical roots:

- 1891 Merck & Co. was founded in New York by Georg Merck, a member of the Merck family
- As a consequence of World War I, Merck & Co. was expropriated and became an independent company.

Today, Merck & Co. holds the rights to the name within North America. Merck operates here as **EMD** and holds the rights to the name Merck in the rest of the world.

www.emd-pm.com



Merck Products for Displays

- licristal[®]: Advanced liquid crystal materials for state-of-the-art displays
- livilux[®]: Materials for OLEDs (Organic Light-Emitting Diodes)
- licrivue[®]: Reactive mesogens for optical films
- lisicon[®]: Printable organic semiconductors
- isishape[®]: Structuring materials
- isiphor[®]: LED materials for backlighting
- Patinal[®]: Coatings for touch screens

See us at booth no. 821

Directive 2011/65/EU RoHS 2.0

- Restricted substances:
 - No additional hazardous substances at present
 - Some substances under consideration: Organobromine and organochlorine compounds,
 - Carbon nanotubes and Nanosilver, Arsenic and beryllium, PVC
 - phthalates like HBCDD, DEHP, BBP, DBP and other flame retardants
- Extended scope of electrical and electronic equipment
 - Large and small household appliances
 - IT and telecommunications equipment
 - Consumer equipment
 - Lighting equipment
 - Electrical and electronic tools
 - Toys, leisure and sports equipment
 - **Medical devices**
 - **Monitoring and control instruments**
 - Automatic dispensers
 - **other EEE not covered above**



Open Scope!

RoHS applies to all components,
when not defined as exemption

Directive 2011/65/EU RoHS 2.0

■ Transition periods:

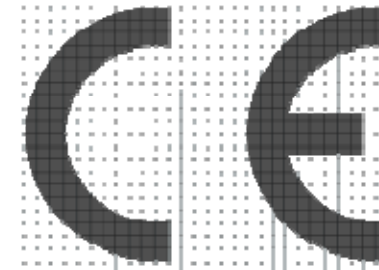
– Medical devices	3 years	July 22, 2014
– Monitoring and control instruments	3 years	July 22, 2014
– In-Vitro diagnostics devices	5 years	July 22, 2016
– Industrial monitoring control instruments	6 years	July 22, 2017
– Other EEE not covered above	8 years	July 22, 2019

■ Exemptions to RoHS 2.0:

- Security equipment for member states (arms, munitions)
- Equipment to be sent into space
- Large-scale stationary industrial tools (machinery, installed by professionals)
- Large-scale fixed installations (production lines, escalators, elevators)
- Photovoltaics
- Energy-saving light bulbs (temporarily)
- Specific applications (i.e. Mercury in CCFLs) with fixed expiry dates

Obligations for suppliers (manufacturers, importers, distributors)

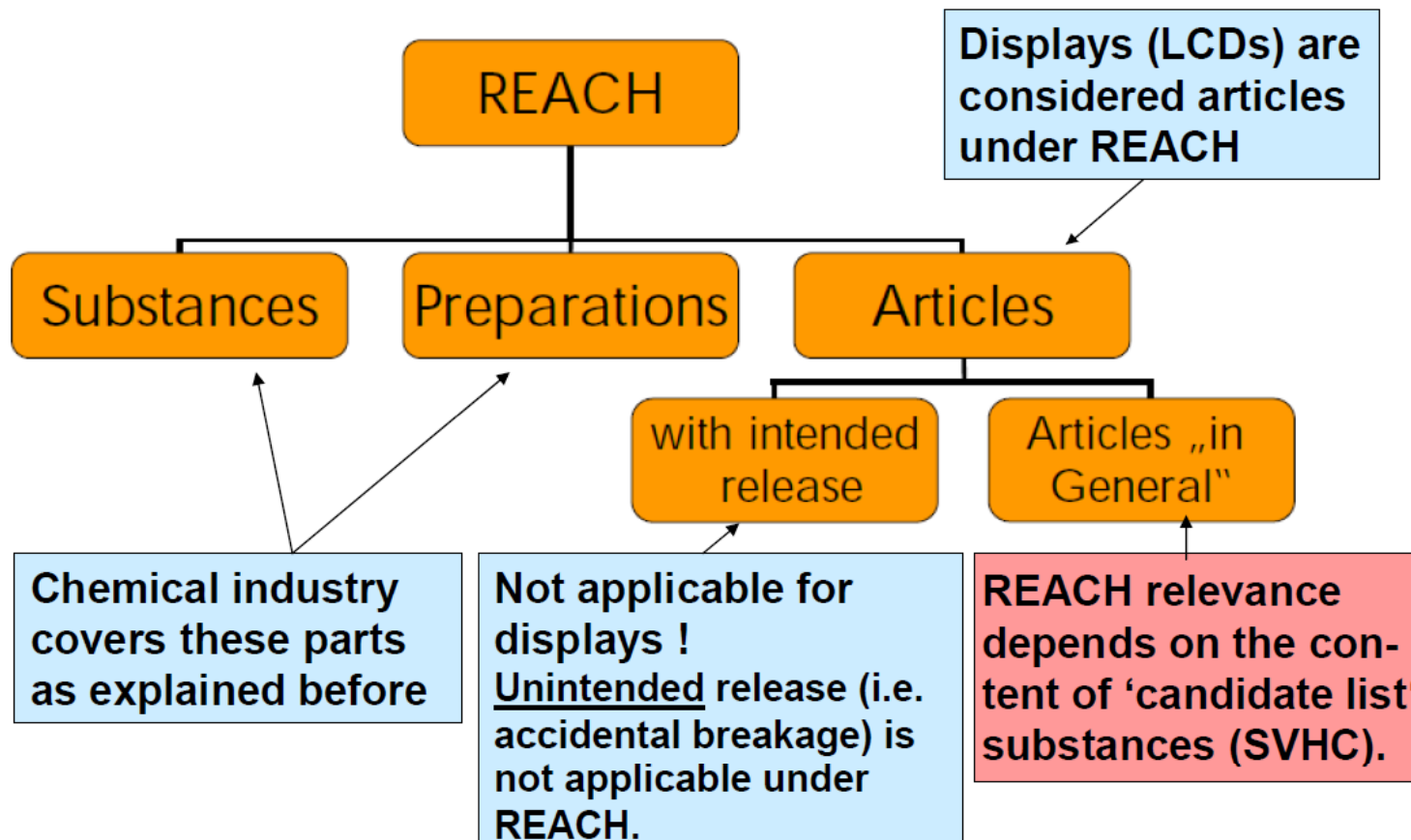
- Technical documentation and internal production control procedure
- EU declaration of conformity, obligatory from Jan.02, 2013
- CE labelling of the finished product, obligatory from Jan.02, 2013



**Analytical proof of the absence of RoHS substances
is not required !**

REACH

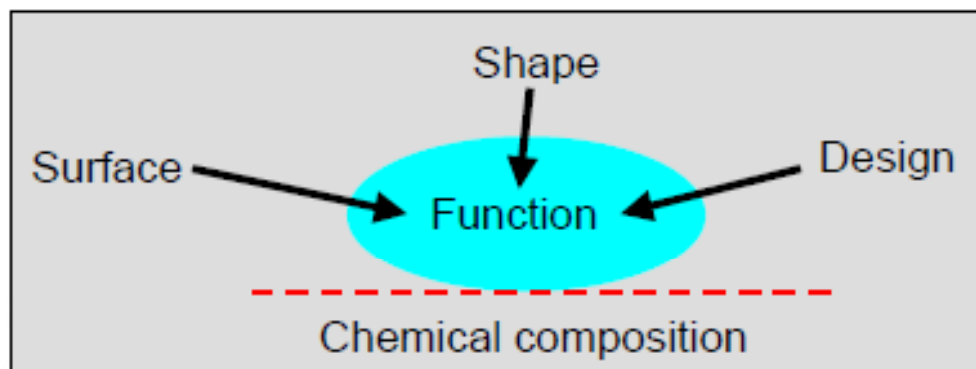
Registration, Evaluation, Authorisation and Restriction of Chemicals



The REACH Definition of an ‘Article’

Article:

means an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition.



Typical articles



REACH Candidate* List of SVHCs

(Substances of Very High Concern) Status: Dec. 19, 2012

- Articles are concerned under REACH if they contain any of the currently 138 **Substances of Very High Concern** from present **candidate list**.

Oct. 28, 2008	15 substances
Jan. 13, 2010	14 substances
Mar. 30, 2010	1 substance
Jun. 18, 2010	8 substances
Dec. 15, 2010	8 substances
Jun. 20, 2011	7 substances
Dec. 19, 2011	20 substances
Jun. 18, 2012	15 substances
Dec. 19, 2012	54 substances
Mar. 04, 2013	10 substances in consultation

Total: 138 substances

Outlook 2015: > 300 substances

- This list will increase depending on national authority or EU proposals.

Step by step ECHA proposes inclusion into REACH Annex XIV for authorization, currently containing 22 substances.

* means: 'candidates' for Annex XIV, then subjected to authorization by ECHA.

Recently added Candidates of SVHCs

Dec. 19, 2012

Substance name	EC-Number	CAS-Number
Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	214-604-9	1163-19-5
Pentacosafuorotridecanoic acid	276-745-2	72629-94-8
Tricosafuorododecanoic acid	206-203-2	307-55-1
Henicosafuoroundecanoic acid	218-165-4	2058-94-8
Heptacosafuorotetradecanoic acid	206-803-4	376-06-7
Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	204-650-8	123-77-3
Cyclohexane-1,2-dicarboxylic anhydride [1], cis-cyclohexane-1,2-dicarboxylic anhydride [2], trans-cyclohexane-1,2-dicarboxylic anhydride [3]	201-604-9, 236-086-3, 238-009-9	85-42-7, 13149-00-3, 14166-21-3
Hexahydromethylphthalic anhydride [1], Hexahydro-4-methylphthalic anhydride [2], Hexahydro-1-methylphthalic anhydride [3], Hexahydro-3-methylphthalic anhydride [4]	247-094-1, 243-072-0, 256-356-4, 260-566-1	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9
4-Nonylphenol, branched and linear	-	-
4-(1,1,3,3-Tetramethylbutyl)phenol, ethoxylated	-	-
Methoxyacetic acid	210-894-6	625-45-6
N,N-dimethylformamide	200-679-5	68-12-2
Dibutyltin dichloride (DBTC)	211-670-0	683-18-1
Lead monoxide (Lead oxide)	215-267-0	1317-36-8
Orange lead (Lead tetroxide)	215-235-6	1314-41-6
Lead bis(tetrafluoroborate)	237-486-0	13814-96-5
Trilead bis(carbonate)dihydroxide	215-290-6	1319-46-6
Lead titanium trioxide	235-038-9	12060-00-3
Lead titanium zirconium oxide	235-727-4	12626-81-2
Silicic acid, lead salt	234-363-3	11120-22-2
Silicic acid (H ₂ Si ₂ O ₅), barium salt (1:1), lead-doped	272-271-5	68784-75-8
1-bromopropane (n-propyl bromide)	203-445-0	106-94-5
Methyloxirane (Propylene oxide)	200-879-2	75-56-9
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	284-032-2	84777-06-0
Diisopentylphthalate (DIPP)	210-088-4	605-50-5
N-pentyl-isopentylphthalate	-	776297-69-9
1,2-diethoxyethane	211-076-1	629-14-1

Substance name	EC-Number	CAS-Number
Acetic acid, lead salt, basic	257-175-3	51404-69-4
Lead oxide sulfate	234-853-7	12036-76-9
[Phthalato(2-)]dioxotrilead	273-688-5	69011-06-9
Dioxobis(stearato)trilead	235-702-8	12578-12-0
Fatty acids, C16-18, lead salts	292-966-7	91031-62-8
Lead cyanimate	244-073-9	20837-86-9
Lead dinitrate	233-245-9	10099-74-8
Pentalead tetraoxide sulphate	235-067-7	12065-90-6
Pyrochlore, antimony lead yellow	232-382-1	8012-00-8
Sulfurous acid, lead salt, dibasic	263-467-1	62229-08-7
Tetraethyllead	201-075-4	78-00-2
Tetralead trioxide sulphate	235-380-9	12202-17-4
Trilead dioxide phosphonate	235-252-2	12141-20-7
Furan	203-727-3	110-00-9
Diethyl sulphate	200-589-6	64-67-5
Dimethyl sulphate	201-058-1	77-78-1
3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	421-150-7	143860-04-2
Dinoseb (6-sec-butyl-2,4-dinitrophenol)	201-861-7	88-85-7
4,4'-methylenedi- <i>o</i> -toluidine	212-658-8	838-88-0
4,4'-oxydianiline and its salts	202-977-0	101-80-4
4-aminoazobenzene	200-453-6	60-09-3
4-methyl- <i>m</i> -phenylenediamine (toluene-2,4-diamine)	202-453-1	95-80-7
6-methoxy- <i>m</i> -toluidine (p-cresidine)	204-419-1	120-71-8
Biphenyl-4-ylamine	202-177-1	92-67-1
<i>o</i> -Aminoazotoluene [(4- <i>o</i> -tolylazo- <i>o</i> -toluidine)]	202-591-2	97-56-3
<i>o</i> -Toluidine	202-429-0	95-53-4
<i>N</i> -methylacetamide	201-182-6	79-16-3

Obligations for Articles Containing SVHCs

▪ Obligation 1

Information to article recipients

- If a candidate list substance is **>0.1%w/w** of the article*
- then supplier must provide inform. to allow safe use of the article, at least disclose the name of that substance
- Consumers upon demand: < 45 days

▪ Obligation 2

Notification to ECHA

- If a candidate list substance is **>0.1%w/w** of the article* and
- if its quantities in the produced /imported article is **> 1 ton in total per year** per legal entity,
- then the producer/importer of such an article must notify the ECHA

- Display (article) suppliers **do not** need to provide analytical proof of SVHC absence.
- Statement letter to customer is sufficient.
- REACH enforcement bodies (different in EU member states) are obliged to proof presence of SVHCs in articles.
- Merck LC and OLED products fully comply with the standards of REACH SVHC.

Summary and Outlook

Regulations concerning display materials were extended recently and will be further modified in future.

- REACH SVHC
 - SVHC Candidate list has been extended to 138 substances.
 - At present, no critical candidates for display products (LC, OLED, RM, OSC etc.) from Merck.
 - Additional SVHC candidates will be announced in future, > 300 by 2015.
- RoHS 2.0
 - Due to the open application range all EEE are included, if not listed as exemption.
 - No additionally regulated substances, however some, e.g. phthalates, nanosilver, carbon nanotubes etc. are under discussion.

Thank you for your kind attention!

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