

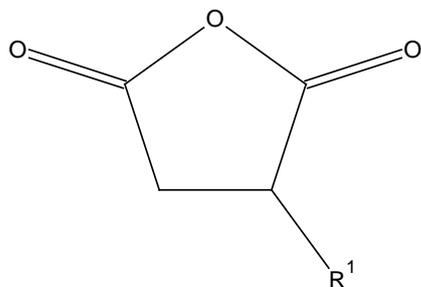
Assessment of regulatory needs

Authority: European Chemicals Agency (ECHA)

Date: 19 October 2021

Group Name: Succinic anhydrides

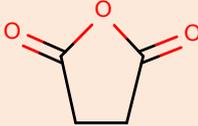
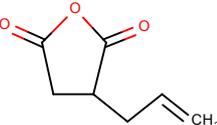
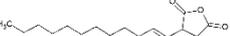
General structure:



Revision history

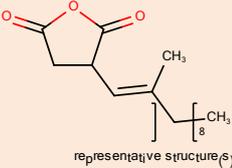
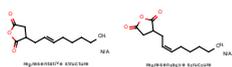
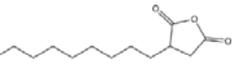
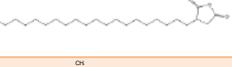
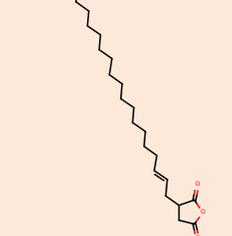
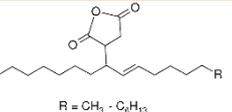
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Substances within this group:

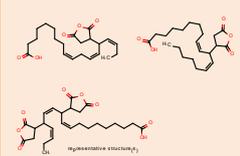
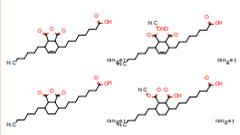
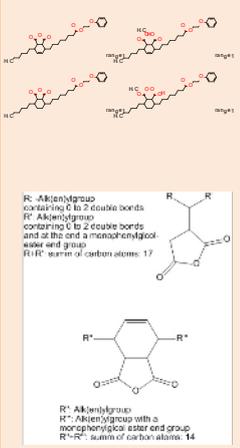
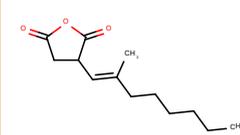
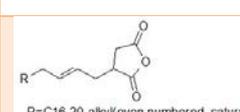
EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) ¹
203-570-0	108-30-5	succinic anhydride		Full, >1000
231-412-0	7539-12-0	3-allyl(dihydro)furan-2,5-dione		OSII or TII
243-296-9	19780-11-1	3-(2-dodeceny)succinic anhydride		Full, 100-1000
246-917-1	25377-73-5	dodecenylsuccinic anhydride		C&L notified

¹ Note that the total aggregated tonnage band may be available on ECHA's webpage at <https://echa.europa.eu/information-on-chemicals/registered-substances>

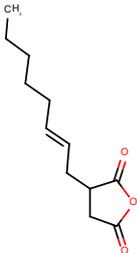
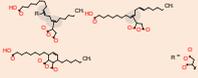
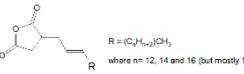
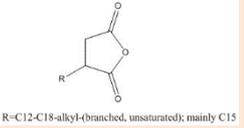
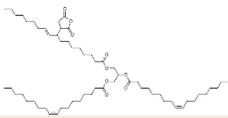
ASSESSMENT OF REGULATORY NEEDS

EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) ¹
247-781-6	26544-38-7	dihydro-3-(tetrapropenyl)furan-2,5-dione		Full, >1000
247-899-8*	26680-54-6	Dihydro-3-(octenyl)furan-2,5-dione		C&L notified
249-210-6	28777-98-2	Dihydro-3-(octadecenyl)furan-2,5-dione		C&L notified
249-317-8	28928-97-4	Dihydro-3-(nonenyl)furan-2,5-dione		Not registered
250-911-4	32072-96-1	Hexadecenylsuccinic anhydride		C&L notified
258-603-1	53520-67-5	3-icosenylsuccinic anhydride		Not registered
266-561-0*	67066-88-0	Dihydro-3-(2-octadecenyl)furan-2,5-dione		C&L notified
272-221-2	68784-12-3	2,5-Furandione, dihydro-, mono-C15-20-alkenyl derivs.		Full, >1000

ASSESSMENT OF REGULATORY NEEDS

EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) ¹
273-193-4	68953-24-2	Fatty acids, linseed-oil, maleated		Full, 1-10
288-306-2	85711-46-2	Fatty acids, C14-18 and C16-18-unsatd., maleated		Full, not (publicly) available
292-835-4	91001-64-8	Fatty acids, C14-18 and C16-18-unsatd., 2-phenoxyethyl esters, maleated		Full, not (publicly) available
295-556-6	92077-08-2	dihydro-3-(tripropenyl)furan-2,5-dione		Full, not (publicly) available
615-230-2	70983-53-8	2,5-Furandione, dihydro-, mono-C20-24-2-alkenyl derivs.		OSII or TII

ASSESSMENT OF REGULATORY NEEDS

EC/List number	CAS number	Substance name	Chemical structures	Registration type (full, OSII or TII, NONS), highest tonnage band among all the registrations (t/y) ¹
629-679-7	42482-06-4	2-Octen-1-ylsuccinic anhydride, mixture of cis and trans		Full, 100-1000
701-043-4	Not (publicly) available	Addition reaction products of conjugated sunflower-oil fatty acids and tall-oil fatty acids with maleic anhydride		Full, 100-1000
701-338-8	Not (publicly) available	Reaction products of furan-2,5-dione and octadec-1-ene		Full, 100-1000
800-310-3	78683-74-6	2,5-Furandione, dihydro-3-(pentapropenyl)-		OSII or TII
809-977-5	1309959-24-7	Fatty acids, sunflower-oil, conjugated, maleated		C&L notified
941-396-3	Not (publicly) available	High oleic sunflower oil, maleated		Full, not (publicly) available

* EC 247-899-8 adapted to List 629-679-6 and EC 266-561-0 to List 701-338-8.

This table contains also group members that are only notified under the CLP Regulation. However, the list is not necessarily exhaustive. Should further regulatory risk management action on one or more substances in the group be considered, ECHA may make an additional search for related C&L notified substances to be included in the group and develop an assessment of regulatory needs for them.

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DISCLAIMER

The author does not accept any liability with regard to the use that may be made of the information contained in this document. Usage of the information remains under the sole responsibility of the user. Statements made or information contained in the document are without prejudice to any further regulatory work that ECHA, the Member States or other regulatory agencies may initiate at a later stage. Assessment of regulatory needs and their conclusions are compiled on the basis of available information and may change in light of newly available information or further assessment.

Foreword

The purpose of the assessment of regulatory needs of a group of substances is to help authorities conclude on the most appropriate way to address the identified concerns for a group of substances or a single substance, i.e. the combination of the regulatory risk management instruments to be used and any intermediate steps, such as data generation, needed to initiate and introduce these regulatory measures.

An assessment of regulatory needs can conclude that regulatory risk management at EU level is required for a (group of) substance(s) (e.g. harmonised classification and labelling, Candidate List inclusion, restriction, other EU legislation) or that no regulatory action is required at EU level. While the assessment is done for a group of substances, the (no) need for regulatory action can be identified for the whole group, a subgroup or for single substance(s).

The assessment of regulatory needs is an important step under ECHA's Integrated Regulatory Strategy. However, it is not part of the formal processes defined in the legislation but aims to support them.

The assessment of regulatory needs can be applied to any group of substances or single substance, i.e., any type of hazards or uses and regardless of the previous regulatory history or lack of such. It can be done based on a different level of information. A Member State or ECHA can carry out this case-by-case analysis. The starting point is available information in the REACH registrations and any other REACH and CLP information. However, a more extensive set of information can be available, e.g. assessment done under REACH/CLP or other EU legislation, or can be generated in some cases (e.g. further hazard information under dossier evaluation). Uncertainties associated to the level of information used should be reflected in the documentation. It will be revisited when necessary. For example, after further information is generated and the hazard has been clarified or when new insights on uses are available. It can be revisited by the same or another authority.

The responsibility for the content of this assessment rests with the authority that developed it. It is possible that other authorities do not have the same view and may develop further assessment of regulatory needs. The assessment of regulatory needs does not yet initiate any regulatory process but any authority can consequently do so and should indicate this by appropriate means, such as the Registry of Intentions.

For more information on Assessment of regulatory needs please consult ECHA website².

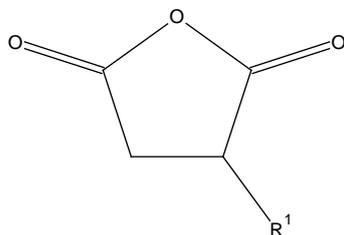
² <https://echa.europa.eu/understanding-assessment-regulatory-needs>

Glossary

ARN	Assessment of Regulatory Needs
CCH	Compliance Check
CLH	Harmonised classification and labelling
CMR	Carcinogenic, mutagenic and/or toxic to reproduction
DEv	Dossier evaluation
ED	Endocrine disruptor
NONS	Notified new substances
OEL	Occupational exposure limit
OSII or TII	On-site isolated intermediate or transported isolated intermediate
PBT/vPvB	Persistent, bioaccumulative and toxic/very persistent and very bioaccumulative
RMOA	Regulatory management options analysis
RRM	Regulatory risk management
SEv	Substance evaluation
STOT RE	Specific target organ toxicity, repeated exposure
SVHC	Substance of very high concern

1 Overview of the group

ECHA has grouped together structurally similar substances based on the presence of the succinic anhydride moiety shown in the figure below.



The group includes 24 substances consisting of 16 registered substances and 8 non-registered substances.

The registered substances include 13 full registrations and 3 intermediate registrations as transported isolated intermediate (TII) or on-site isolated intermediate (OSII).

The group can be described as succinic anhydrides with various alkyl chain lengths as result of the reaction of maleic anhydride with alkenes or fatty acids. The latter, also referred to as alkene-functionalised reactants, might be mono-, di- or tri-unsaturated. The degree of unsaturation of the starting material impacts on the degree of unsaturation and the degree of substitution of the resulting succinic anhydride.

Based on information reported in the REACH registration dossiers, the substances in the group are most commonly used as intermediate/monomer, lubricating agent, sizing agent, thickening agent and binder. They are mainly used in industrial and professional settings in lubricants, washing and cleaning products, polymer preparation, paints and inks. Most of the substances also have uses as intermediate. Six registered substances have consumer uses in lubricants, adhesives, paints and coatings, washing and cleaning products, personal care products.

Overall, there is potential for exposure and release in the environment, in particular from consumer and professional uses.

Most substances in the group are considered skin sensitisers, similarly to phthalic anhydrides and hydrogenated phthalic anhydrides of which regulatory needs have been assessed earlier.

Note on the scope of ECHA's assessment of regulatory needs

Regarding hazards, the focus of ECHA's assessment is on CMR (carcinogenic, mutagenic and/or toxic to reproduction), sensitiser, ED (endocrine disruptor), PBT/vPvB or equivalent (e.g. substances being persistent, mobile and toxic), aquatic toxicity hazard endpoints and therefore only those are reflected in the table in section 3. This does not mean that the substances do not have other known or potential hazards. In some specific cases, where ECHA identifies a need for regulatory risk management action at EU level for other hazards (e.g. neurotoxicity, STOT RE), such additional hazards may be addressed in the assessment. An overview of classification is presented in Annex 1.

On the exposure side, ECHA is mainly using the information on uses reported in the registration dossiers (IUCLID) as a proxy for assessing the potential for exposure to humans and releases to the environment. The potential for release / exposure is generally considered high for "widespread" uses, i.e. professional and consumer uses and uses in articles. For these uses, normally happening at many places, the expected level of control is *à priori* considered limited. The chemical safety reports are not necessarily consulted and no quantitative exposure assessment is performed at this stage.

2 Justification for the no need for regulatory risk management action at EU level

Based on currently available information, there is no need for (further) EU regulatory risk management for any of the substances in the group.

All substances in the group (except for EC 231-412-0) have harmonised / self-classification as skin sensitisers. For industrial and professional uses, sufficient and consistent self-classification by registrants should require adequate risk management measures to be in place according to workplace legislation.

Adequate product labelling should in principle provide consumers with sufficient information to manage risks arising from the use of mixtures containing the substances of the group.

For the use of the substance EC 243-296-9 in cosmetics, sufficient and consistent self-classification by registrants would inform on the need or not for classification of the final product and safety assessment to be done according to Cosmetic product regulation (EC) No 1223/2009.

In relation to consumer uses in mixtures, exposure to consumers is considered unlikely for water-based mixtures as substances in the group hydrolyse quickly when in contact with water to corresponding acids not showing skin sensitising properties. No information is available on use of the substances in the group in non water-based mixtures and whether air humidity may be sufficient in this case, to hydrolyse these substances. As it is uncertain whether such use exist and whether there is any likelihood of exposure to humans or the environment from possible use of non water-based mixtures, no specific RRM is proposed for such use.

However, the concern related to skin sensitisers (potentially) present in consumer mixtures has already been identified in other groups of substances and was brought

for further discussion to Member States. Work is ongoing on this generic issue by both Member States and ECHA which may affect the regulatory actions on substances in this group.

Therefore, it is proposed that there is currently no need for EU-wide regulatory risk management.

Additional considerations on respiratory sensitisation

Succinic anhydride (EC 203-570-0) has already a harmonised classification as respiratory sensitiser and skin sensitiser and exposure is limited to industrial workers. This is also in line with the conclusions from SEV performed by Austria on this substance³.

Maleic anhydride, which has a harmonised classification as Resp. Sens. 1 and Skin Sens. 1A, is present as an impurity in several substances, sometimes in concentrations relevant for classification. Registrants are expected to apply the correct classification. Where this is not done, further regulatory action may be considered at a later stage.

Although other substances in the group may be considered as potential respiratory sensitisers based on their chemical structure (which is similar to phthalic anhydrides), it is not possible to verify this property via data generation. Furthermore, it has been clarified that the structural diversities of the substances in this group are higher than those of phthalic anhydrides and phthalic anhydride derivative groups. In the case of phthalic anhydrides and phthalic anhydride derivatives restriction under REACH was identified as suitable RRM to address risks. The proposal was based on (confirmed or potential) respiratory sensitising properties of the substances in the group and on the potential for regrettable substitution. Based on these considerations, no further EU regulatory risk management measures under REACH are proposed for succinic anhydrides. If respiratory sensitising properties would be confirmed for these substances, CLH and further measures to protect workers and consumers will be considered.

Based on ECHA's assessment of hazard information currently available for the substances EC 292-835-4 and List 701-043-4, they have low water solubility, higher octanol partitioning coefficient (i.e., $\log K_{ow} > 4$), are not readily biodegradable and have no data on chronic aquatic toxicity. On this basis, it is not possible to conclude on PBT/vPvB and aquatic toxicity. Due to these data gaps, compliance check is suggested for these two substances to clarify PBT/vPvB and aquatic toxicity hazards.

³ <https://echa.europa.eu/documents/10162/62ebdbe4-b7ca-e5be-ca29-5652268bc6db>

3 Conclusions and actions

The conclusions and actions proposed in the table below are based on the REACH and CLP information available at the time of the assessment by ECHA. The main source of information is the registration dossiers. Relevant public assessments may also be considered. When new information (e.g. on hazards through evaluation processes, or on uses) will become available, the document will be updated and conclusions and actions revisited

EC/List number, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Last foreseen action	Action
243-296-9, 3-(2-dodecenyl) succinic anhydride 247-781-6, dihydro-3-(tetrapropenyl) furan-2,5-dione 266-561-0, Dihydro-3-(2-octadecenyl) furan-2,5-dione 273-193-4, Fatty acids, linseed-oil, maleated 288-306-2, Fatty acids, C14-18 and C16-18-unsatd., maleated 292-835-4, Fatty acids, C14-18 and C16-18-unsatd.,	Known or potential hazard for skin sensitisation for respiratory sensitisation (except for EC 231-412-0)	Known or potential hazard for aquatic toxicity	Industrial, widespread professional and consumer uses giving rise to the potential for exposure or release. The main uses are in lubricants, washing and cleaning products, paints, coatings and inks and as intermediates.	Currently no need for EU RRM Justification: Harmonised/self-classification followed by implementation of necessary RRMs should be sufficient to ensure safe use at the workplace. The concern related to the presence of skin sensitisers in consumer mixtures is under investigation.	CCH for EC 292-835-4 List 701-043-4

ASSESSMENT OF REGULATORY NEEDS

EC/List number, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Last foreseen action	Action
<p>2-phenoxyethyl esters, maleated</p> <p>629-679-7, 2-Octen-1-ylsuccinic anhydride, mixture of cis and trans</p> <p>701-043-4, Addition reaction products of conjugated sunflower-oil fatty acids and tall-oil fatty acids with maleic anhydride</p> <p>701-338-8, Reaction products of furan-2,5-dione and octadec-1-ene</p> <p>941-396-3, High oleic sunflower oil, maleated</p>					
<p>272-221-2, 2,5-Furandione, dihydro-, mono-C15-20-alkenyl derivs.</p>		<p>No hazard or unlikely hazard</p>			<p>No action</p>

ASSESSMENT OF REGULATORY NEEDS

EC/List number, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Last foreseen action	Action
295-556-6, dihydro-3-(tripropenyl) furan-2,5-dione					
203-570-0, succinic anhydride			Mainly used in industrial settings with limited potential for exposure and release		
231-412-0, 3-allyl(dihydro)furan-2,5-dione			Intermediates (EC/Lists 231-412-0, 615-230-2, 800-310-3)	<p>Currently no need for EU RRM</p> <p><u>Justification:</u> Substances for which there is only registration as intermediates or only C&L notification. Low potential for exposure to both human health and environment is expected. Actions will be re-considered when the assessment will be revisited if the registration status and/or uses change.</p>	
246-917-1, dodecenylsuccinic anhydride			No registration for all the others		
249-210-6, Dihydro-3-(nonenyl)furan-2,5-dione					
249-317-8, Dihydro-3-(nonenyl)furan-2,5-dione					
250-911-4, Hexadecenylsuccinic anhydride					
258-603-1, 3-icosenylsuccinic anhydride					

ASSESSMENT OF REGULATORY NEEDS

EC/List number, substance name	Human Health Hazard	Environmental Hazard	Relevant use(s) & exposure potential	Last foreseen action	Action
<p>615-230-2, 2,5-Furandione, dihydro-, mono-C20-24-2-alkenyl derivs.</p> <p>800-310-3, 2,5-Furandione, dihydro-3-(pentapropenyl)-</p> <p>809-977-5, Fatty acids, sunflower-oil, conjugated, maleated</p>					

Annex 1: Overview of classifications

Data extracted on 18.05.2022

EC/ List No	CAS No	Substance name	Harmonised classification	Classification in registrations	Classification in C&L notifications
203-570-0	108-30-5	succinic anhydride	Acute Tox. 4 H302 Skin Corr. 1 H314 Eye Damage 1 H318 Resp. Sens. 1 H334 Skin Sens. 1 H317	Acute Tox. 4 H302 Skin Corr. 1 H314 Eye Damage 1 H318 Resp. Sens. 1 H334 Skin Sens. 1 H317	Eye Irrit. 2 H319 STOT Single Exp. 3 H335 STOT Single Exp. 3 H335 Eye Irrit. 2 H319 Eye Irrit. 2 H319 Eye Irrit. 2 H319 Skin Corr. 1B H314 STOT Single Exp. 3 H335
231-412-0	7539-12-0	3-allyl(dihydro)furan-2,5-dione		Eye Damage 1 H318 Skin Irrit. 2 H315 Acute Tox. 3 H311 Acute Tox. 4 H302	Eye Irrit. 2 H319 Skin Corr. 1B H314
243-296-9	19780-11-1	3-(2-dodeceny)succinic anhydride		Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1A H317	Skin Sens. 1 H317 STOT Single Exp. 3 H335 Acute Tox. 4 H332 Aquatic Chronic 4 H413 STOT Single Exp. 3 H335 STOT Single Exp. 3 H335
246-917-1	25377-73-5	dodeceny)succinic anhydride			Eye Damage 1 H318 Resp. Sens. 1 H334 Skin Sens. 1 H317 Eye Irrit. 2 H319 Skin Irrit. 2 H315 STOT Single Exp. 3 H335 Aquatic Chronic 2 H411 Aquatic Chronic 3 H412

ASSESSMENT OF REGULATORY NEEDS

EC/ List No	CAS No	Substance name	Harmonised classification	Classification in registrations	Classification in C&L notifications
					Aquatic Chronic 4 H413 Acute Tox. 4 H332
247-781-6	26544-38-7	dihydro-3-(tetrapropenyl)furan-2,5-dione		Eye Irrit. 2 H319 Skin Sens. 1A H317 Aquatic Chronic 4 H413	Acute Tox. 4 H302Skin Irrit. 2 H315Acute Tox. 4 H332Skin Sens. 1A H317STOT Single Exp. 3 H335 Skin Sens. 1 H317Resp. Sens. 1 H334Aquatic Chronic 2 H411 STOT Single Exp. 3 H335 Eye Damage 1 H318
247-899-8	26680-54-6	Dihydro-3-(octenyl)furan-2,5-dione			Eye Irrit. 2 H319 Skin Sens. 1A H317, specific concentration: >.1 Skin Irrit. 2 H315 Aquatic Chronic 4 H413 Acute Tox. 4 H302 Acute Tox. 4 H312
249-210-6	28777-98-2	Dihydro-3-(octadecenyl)furan-2,5-dione			Eye Damage 1 H318 Eye Irrit. 2 H319 STOT Single Exp. 3 H335 Skin Sens. 1 H317 Skin Irrit. 2 H315 Aquatic Chronic 4 H413
250-911-4	32072-96-1	Hexadecenylsuccinic anhydride			Skin Irrit. 2 H315 Eye Damage 1 H318 Aquatic Chronic 4 H413 Eye Irrit. 2 H319

ASSESSMENT OF REGULATORY NEEDS

EC/ List No	CAS No	Substance name	Harmonised classification	Classification in registrations	Classification in C&L notifications
					STOT Single Exp. 3 H335 Skin Sens. 1 H317
266-561-0	67066-88-0	Dihydro-3-(2-octadecenyl)furan-2,5-dione			Skin Sens. 1B H317 Skin Irrit. 2 H315
272-221-2	68784-12-3	2,5-Furandione, dihydro-, mono-C15-20-alkenyl derivs.		Skin Sens. 1B H317	Skin Sens. 1 H317 Aquatic Chronic 3 H412
273-193-4	68953-24-2	Fatty acids, linseed-oil, maleated		Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1 H317 Aquatic Acute 1 H400	
288-306-2	85711-46-2	Fatty acids, C14-18 and C16-18-unsatd., maleated		Skin Irrit. 2 H315 Eye Irrit. 2B H319 Skin Sens. 1B H317	Eye Irrit. 2 H319 Skin Sens. 1 H317
292-835-4	91001-64-8	Fatty acids, C14-18 and C16-18-unsatd., 2-phenoxyethyl esters, maleated		Eye Irrit. 2 H319 Skin Sens. 1 H317	
295-556-6	92077-08-2	dihydro-3-(tripropenyl)furan-2,5-dione		Acute Tox. 4 H302 Skin Irrit. 2 H315 Eye Damage 1 H318 Skin Sens. 1A H317 STOT Rep. Exp. 2 H373	

ASSESSMENT OF REGULATORY NEEDS

EC/ List No	CAS No	Substance name	Harmonised classification	Classification in registrations	Classification in C&L notifications
615-230-2	70983-53-8	2,5-Furandione, dihydro-, mono-C20-24-2-alkenyl derivs.		Eye Damage 1 H318 Skin Sens. 1 H317 Skin Corr. 1 H314	
629-679-7	42482-06-4	2-Octen-1-ylsuccinic anhydride, mixture of cis and trans		Acute Tox. 4 H302 Acute Tox. 4 H312 Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1A H317, specific concentration: >.1	
701-043-4		Addition reaction products of conjugated sunflower-oil fatty acids and tall-oil fatty acids with maleic anhydride		Skin Irrit. 2 H315 Skin Sens. 1 H317	
701-338-8		Reaction products of furan-2,5-dione and octadec-1-ene		Skin Irrit. 2 H315 Skin Sens. 1A H317 Aquatic Chronic 3 H412	
800-310-3	78683-74-6	2,5-Furandione, dihydro-3-(pentapropenyl)-		Eye Damage 1 H318 Skin Irrit. 2 H315 Skin Sens. 1A H317	
809-977-5	1309959-24-7	Fatty acids, sunflower-oil, conjugated, maleated			Skin Irrit. 2 H315 Skin Sens. 1B H317 Eye Irrit. 2 H319
941-396-3		High oleic sunflower oil, maleated		Skin Sens. 1B H317	

Annex 2: Overview of uses based on information available in registration dossiers

Data extracted on 18 May 2021

Main types of applications structured by product or article types	EC/List	243-296-9	247-781-6	273-193-4	288-306-2	292-835-4	629-679-7	701-043-4	701-338-8	941-396-3	272-221-2	295-556-6	231-412-0	615-230-2	800-310-3	203-570-0
PC 9a: Coatings and paints, thinners, paint removes			F		C	F, I, P		F, I, P, C								I
PC 24: Lubricants, greases, release products	I, P		I		C		I		F, I, P, C							
PC 1: Adhesives, sealants			I, P		C		I									I
PC 9c: Finger paint					C											
PC 9b: Fillers, putties, plasters, modelling clay					C											I
PC 18: Ink and toners					C	F, I, P		F, I, P								
PC 35: Washing and cleaning products			I							F, I	F, I	F, I, P, C				
PC 39: Cosmetics, personal care products	F, C															
PC 26: Paper and board treatment products										F, I	F, I, P, A					

ASSESSMENT OF REGULATORY NEEDS

Main types of applications structured by product or article types	EC/List	243-296-9	247-781-6	273-193-4	288-306-2	292-835-4	629-679-7	701-043-4	701-338-8	941-396-3	272-221-2	295-556-6	231-412-0	615-230-2	800-310-3	203-570-0
PC 16: Heat transfer fluids			F, I, P, C													
PC 17: Hydraulic fluids			I, P, C													
PC 32: Polymer preparations and compounds			F, I		C		I									I
PC 23: Leather treatment products					C											
PC 14: Metal surface treatment products					C		I									
PC 15: Non-metal-surface treatment prod			F		C											
PC 20: pH-regulators, flocculants, precipitants, neutralisation agents			F, I, P			F		F								
PC 21: Laboratory chemicals					F, I, P				F	F, I	F, I					I, P
PC 19: Intermediate		I	F, I	I	I		I		I			F	I		I	I
PC 29: Pharmaceuticals																I

F: formulation, I: industrial use, P: professional use, C: consumer use, A: article service life; P, C and A are highlighted in red to indicate widespread use with potential fo

Annex 3: Overview of completed or ongoing regulatory risk management activities

Data extracted on 20 May 2021

EC/List number	RMOA	Authorisation		Restriction	CLH	Actions not under REACH/ CLP
		Candidate list	Annex XIV	Annex XVII	Annex VI (CLP)	
203-570-0					YES	

There are no relevant completed or ongoing regulatory risk management activities for any of the substances.

Annex 4: Non exhaustive list of substances in the C&L inventory that may fall into the group definition

Further C&L notified substances related to this group are included in the table below. The additional substances have not been thoroughly checked and the list is just an indication.

EC number	CAS number	Substance name
219-880-4	2561-85-5	3-dodecyldihydrofuran-2,5-dione
223-870-5	4100-80-5	methy succinic anhydride
224-101-6	4200-91-3	3-hexadecyldihydrofuran-2,5-dione
224-102-1	4200-92-4	dihydro-3-octylfuran-2,5-dione
224-877-6	4534-73-0	tetrahydro[3,3'-bifuran]-2,2',5,5'-tetraone
231-828-2	7757-96-2	dihydro-3-(1-octenyl)furan-2,5-dione
241-371-0	17347-61-4	dihydro-3,3-dimethylfuran-2,5-dione
242-350-9	18470-76-3	3-decyldihydrofuran-2,5-dione
246-994-1	25447-83-0	3-(decenyl)dihydrofuran-2,5-dione
251-682-3	33806-58-5	dihydro-3-(tetradecenyl)furan-2,5-dione
256-300-9	47165-57-1	dihydro-3-tetradecylfuran-2,5-dione
256-316-6	47458-32-2	dihydro-3-octadecylfuran-2,5-dione
256-641-3	50598-33-9	3-ethyl-dihydro-3-methylfuran-2,5-dione
257-266-8	51546-74-8	dihydro-3-(isododecenyl)furan-2,5-dione
259-153-9	54405-64-0	dihydro-3-(2-tetradecenyl)furan-2,5-dione
261-356-2	58598-42-8	3-docosenylsuccinic anhydride
268-897-3	68153-83-3	Linseed oil, maleated
272-000-0	68648-66-8	Soybean oil, maleated
285-091-7	85029-65-8	Octadecadienoic acid, compound with succinic anhydride (1:1)
288-313-0	85711-53-1	Fatty acids, dehydrated castor-oil, maleated
601-608-4	119415-04-2	1-Propene, homopolymer, maleated
606-205-7	19024-74-9	2-(1-Octadecenyl)succinic anhydride
614-118-0	67762-77-0	2,-5-furandione, dihydro-, monopolyisobutylene derivs.
614-119-6	67762-79-2	2,5-FURANDIONE, DIHYDRO-, MONOPOLYBUTENYL DERIVS.
635-288-2	72242-65-0	2-(4,4-Dimethyl-2-methylenepentyl)succinic anhydride
636-033-8	76386-10-2	2-(1-Tetradecenyl)succinic anhydride
636-285-9	6709-29-1	Spiro[9H-fluorene-9,3'(2'H)-furan]-2',5'(4'H)-dione
661-624-2	101278-21-1	2,3-DIPHENYLSUCCINIC ANHYDRIDE
672-646-7	18908-20-8	(2-Methyl-2-propenyl)succinic Anhydride
678-007-9	7538-42-3	2-Buten-1-ylsuccinic Anhydride

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678-026-2	17309-39-6	meso-Butane-1,2,3,4-tetracarboxylic Dianhydride
678-184-2	2035-76-9	Butylsuccinic Anhydride
678-320-0	142826-45-7	(2,7-Octadien-1-yl)succinic Anhydride
679-924-7	10500-34-2	2-Hexen-1-ylsuccinic Anhydride (mixture of isomers)
808-202-8	1131-15-3	Phenylsuccinic Anhydride
822-927-7	14035-83-7	3-(2-methylpropyl)oxolane-2,5-dione
849-922-2	6051-25-8	2-oxaspiro[4.5]decane-1,3-dione
864-742-4	34299-44-0	5-oxaspiro[2.4]heptane-4,6-dione