



Solar Screen International S.A.
Rue du Commerce 18
3895 FOETZ
Luxembourg

Your notice of
 07-05-2020

Your reference
 SSIBCC 2003643 REACH

Date
 18-06-2020

Analysis Report 20.02717.01

Required tests :

- | | |
|------------------|---|
| Centexbel | Determination of the elemental composition (screening) |
| Centexbel | Analysis of an extract with FTIR |
| Centexbel | Determination of the composition using XRF-screening |
| Centexbel | Determination of the limited FR products (REACH Annex XVII + SVHC) |
| Centexbel | LCMS screening (Reach SVHC) |
| Centexbel | Determination of the emission profile by thermal extraction. |

Identification number	Information given by the client	Date of receipt
T2009895	U19	07-05-2020

Stijn Steuperaert
Order responsible

This report may be reproduced, as long as it is presented in its entire form, without written permission of Centexbel.
 The results of the analysis cover the received samples. Centexbel is not responsible for the representativeness of the samples.
 In assessing compliance with the specifications, we did not take into account the uncertainty on the test results.



Reference: T2009895 - U19

Reach SVHC conclusion

The results for the analysis on specific elements and substances show that the sample does not contain any of the compounds mentioned on the Reach candidate list of 16-01-2020 (substances of very high concern), in concentrations > 0.1 mass%. Due to the presence of a significant amount of boron it can not be fully guaranteed that the boron containing substances of the list are below 0.1%.



Reference: T2009895 - U19

Determination of the elemental composition (screening)

Date of ending the test 04-06-2020
 Standard used Centexbel
 Sample preparation Mineralization using concentrated acids in a microwave.
 Determination ICP-OES quantitative measurement of specified elements with 1-point calibration

Results

Determination of B (boron)

Metals	Reporting limit mg/kg	Concentration mg/kg
B (boron)	20.0	854

The result of the Boron determination indicates compounds* of the REACH SVHC list (16-01-2020) may be present in the samples in concentrations >0.1 %

An analysis using an electron microscope showed that no glass fibre reinforcement is present. Glass fibres are a common source of Boron.

*boric acid, disodium tetraborate- anhydrous; tetraboron disodium heptaoxide- hydrate, diboron trioxide, sodiumperoxometaborate, sodiumperborate, disodium octaborate

Reference: T2009895 - U19

Analysis of an extract with FTIR

Date of ending the test	18-06-2020
Method used	Centexbel
Apparatus	Nicolet 6700
Method	Dissolved in a solvent and dried on KBr-discs

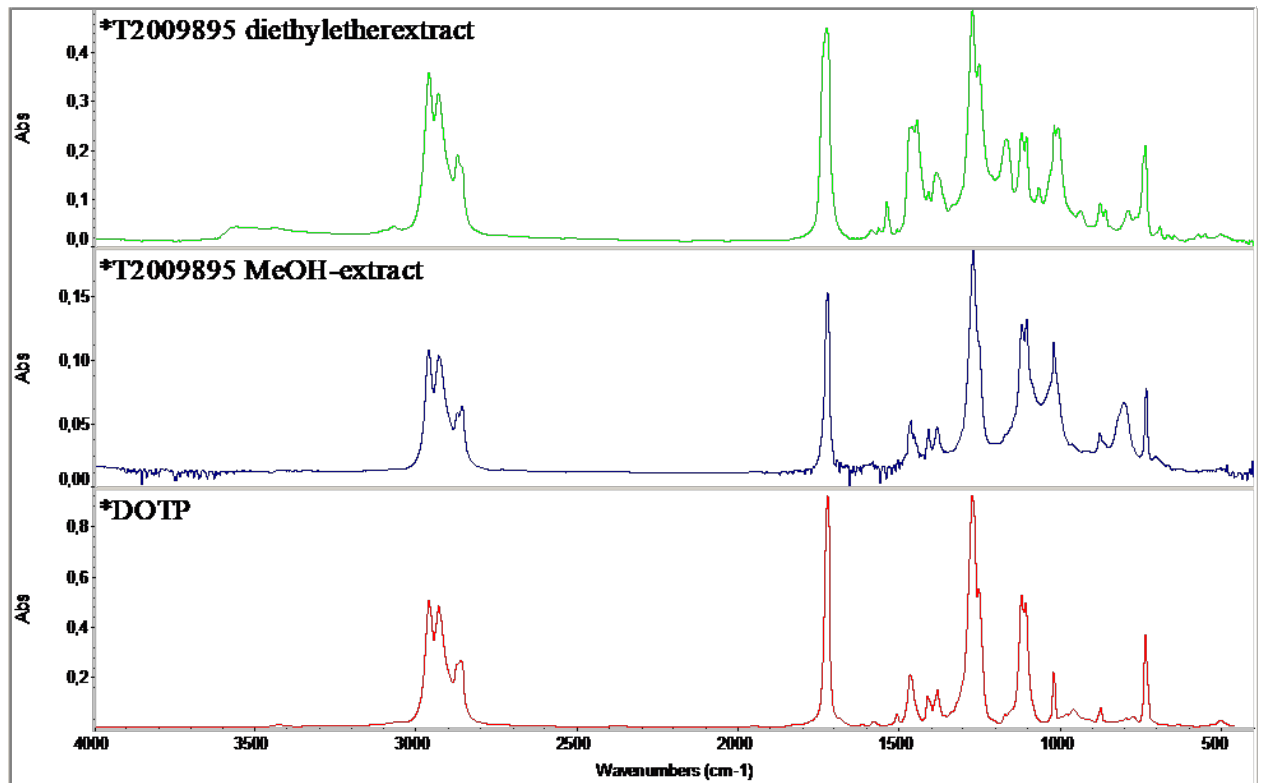
Question Identification of perborate or boric acid possible?

Results and interpretation

- Determination of a diethylether and MeOH-extract by IR reflection:

An extraction with diethylether and methanol was performed.

No perborate or boric acid is observed. The obtained spectra correspond to a plasticizer such as DOTP while also acrylates (glue) and silicones are present.



Reference: T2009895_01s - U19_Top & bottom

Determination of the composition using XRF-screening

Date of ending the test 02-06-2020
Method used Centexbel
Sample preparation Cutting, weighing + determination of thickness, presentation under vacuum
Determination X-rays fluorescence. Screening of the elements from sodium (11) up to uranium (92) using an EDX detector. Semi-quantitative measurements are performed using UniQuant.
Results
Reporting limit (mass %) 0.01
Matrix PVC

	design side	adhesive back side
Element	Mass %	Mass %
As	≤ 0.010	≤ 0.010
Co	≤ 0.010	≤ 0.010
Cr	≤ 0.010	≤ 0.010
Pb	≤ 0.010	≤ 0.010
Sn	0.019	0.020
Br	3.0	6.0
Zr	≤ 0.010	≤ 0.010
Al	≤ 0.010	1.9
Si	≤ 0.010	≤ 0.010
Cd	≤ 0.010	≤ 0.010

Px=phosphor; Sx=sulphur

Specific screening for elements indicating possible presence of Reach SVHC compounds (16-01-2020*

Presence of very significant amount of Br. A quantitative test is necessary to be sure bromine containing flame retardants on the * list are <0.1. The results for the other specific elements show that the sample does not contain the other (mainly inorganic) compounds* on the Reach candidate list (substances of very high concern), in concentrations >0.1 mass%.

* diarsenic tri- et pentoxide, arsenic acid, calcium arsenate, leadhydrogenarsenate, triethylarsenate, cobaltdiacetate, cobaltsulphate, cobaltdichloride, cobaltcarbonate, cobaltdinitrate, cadmium, cadmium oxide, cadmium chloride, cadmium sulphide, cadmium fluoride, cadmium sulphate, cadmium nitrate, cadmium hydroxide, cadmium carbonate, potassium chromate and dichromate, sodium chromate and dichromate, chromiumtrioxide, ammoniumdichromate, strontiumchromate, , chromic and dichromic acid, oligomers of chromic and dichromic acid, pentazincchromate octahydroxide, dichromium tris(chromate), potassium hydroxyoctaoxidizincatedichromate, lead, lead chromate and pigments based on lead chromate, Orange lead (lead tetroxide), Pyrochlore antimony lead yellow, Lead monoxide, Trilead bis(carbonate)dihydroxide, leaddinitrate

leadoxidesulfate, Lead titanium trioxide, Silicic acid, lead salt, Lead titanium zirconium oxide, Pentalead tetraoxide sulphate, Trilead dioxide phosphonate, Tetralead trioxide sulphate, Lead bis(tetrafluoroborate), Tetraethyllead, Leaddiazide - leadazide, leaddipicrate, leadstypnate, Lead



cyanamidate, [Phthalato(2-)]dioxotrilead , Dioxobis(stearato)trilead , Acetic acid lead salt(basic), C16-C18 fatty acid lead salts, Sulfurous acid lead salt (dibasic), Lead(II) bis(methanesulfonate), Lead di (acetate), HBCDD, DecaBDE, bistributyltinoxide, dibutyltin dichloride, aluminosilicate, silicic acid barium salt (lead doped), refractory ceramic fibres, zirconia aluminosilicate refractory ceramic fibres, trixylyl phosphate, 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE), 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (MOTE)



Reference: T2009895 - U19

Determination of the limited FR products (REACH Annex XVII + SVHC)

Date of ending the test 09-06-2020
Standard used Centexbel
Deviation from the standard -
Extraction method Ultrasonic extraction with toluene/methanol
Separation and detection APPI-LC/MS/MS
Components PentaBDE (pentabromodiphenylether), OctaBDE (Octabromodiphenylether), PBB (polybrominated biphenyls), TRIS (Tris-(2,3-dibrompropyl)phosphate), TEPA (triaziridinylphosphine oxide), TCeP (Tris(2-chloroethylphosphate) , TXP (Trixylylphosphate), DecaBDE (Decabromodiphenylether), HBCDD (Hexabromocyclododecane)

Results

Determination limit 50 mg/kg

Compound	C (mg/kg)
PentaBDE	< 50.00
OctaBDE	< 50.00
PBB	< 50.00
TRIS	< 50.00
TEPA	< 50.00
HBCDD	< 50.00
TCEP	< 50.00
DecaBDE	< 50.00
TXP	< 50.00



Reference: T2009895 - U19

LCMS screening (Reach SVHC)

Date of ending the test	02-06-2020
Standard used	Centexbel
Extraction method	Methanol/DMSO ultrasonic extract
Analytical method	LC-MS

Results
Reporting limit See table

The method is used to screen for the presence of organic REACH SVHC compounds (16-01-2020)*.

The results for the specific substances show that the sample does not contain the (mainly organic) compounds* on the Reach candidate list (substances of very high concern), in concentrations >0.1 mass%.

* 4-nonylphenols (branched+linear) (NP), Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with $\geq 0.1\%$ w/w of 4-nonylphenol, branched and linear (4-NP), 4-nonylphenols (branched+linear) ethoxylated (NPEO), 4-(1,1,3,3-tetramethylbutyl)phenol (OP), 4-(1,1,3,3-tetramethylbutyl)phenol ethoxylated (OPEO), Heptylphenol (branched + linear) (HP), RP-HP (with $\geq 0.1\%$ w/w 4-heptylphenol, branched and linear), 4-tert-butylphenol (pTBP), Bisphenol A (BPA), p-(1,1,- dimethylpropyl)phenol (PTAP), Pentadecafluorooctanoic acid (PFOA), (C9-C14) perfluorocarboxylicacids (PFA's), Peffluorononanoic acid (+Na and NH4 salts) (PFNA), Peffluorodecanoic acid (+Na and NH4 salts) (PFDA), Perfluorohexane-1-sulfonic acid and its salts (PFHxS), 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acryl halides (HFPO-DA), Perfluorobutane sulfonic acid (PFBS) and its salts, Ammonium pentadecafluorooctanoate (APFO), Azodicarbonamide (ADCA), Imidazoline-2-thiol, C.I. Direct Red 28, C.I. Direct Black 38, 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320), 2,4 di-tert butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327), 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328), 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350), 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one (Irgacure 907), 2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone (Irgacure 369), Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride) (TMA)

Components	C (%)
NP	< 0.0010
NPEO	< 0.010
OP	< 0.010
OPEO	< 0.010
HP	< 0.0010
PTBP	< 0.010
BPA	< 0.010
PTAP	< 0.010
PFOA	< 0.010
PFA's	< 0.010
PFNA	< 0.010
PFDA	< 0.010
PFHxS	< 0.010
HFPO-DA	< 0.010
PFBS	< 0.010
APFO	< 0.010
ADCA	< 0.010
Imidazoline-2-thiol	< 0.010
C.I. Direct Red 28	< 0.010
C.I. Direct Black 38	< 0.010
UV 320	< 0.010
UV 327	< 0.010
UV 328	< 0.010
UV 350	< 0.010
Irgacure 907	< 0.010
Irgacure 369	< 0.010
TMA	< 0.010

Reference: T2009895 - U19

Determination of the emission profile by thermal extraction.

Date of ending the test	02-06-2020
Method used	Centexbel
Sample preparation	One or more 1 cm diameter samples are heated in a glass tube at a fixed temperature under an inert gas flow. The gas flow is lead over a tenax filled tube where volatile organic compounds (VOC's) are trapped. The tenax tube with the VOC's is thermally desorbed. Released VOC's are cryo trapped and injected into a GCMS.
Temperatuur	120°C
Time	30'
Analytical method	Gas chromatography with Agilent MSD detector

Results

As conditions 120°C and 30' were used. These relate to the conditions used eg in VDA 278 to evaluate fogging behaviour of plasticisers. For the more volatile VOC's semi-quantitative results (µg/g) can be obtained while for the heavier VOC's and SVOC's it is a screening method for their presence. If present in higher concentrations only part of the products have already evaporated (results as ng/min.g).

Specific screening for substances indicating possible presence of Reach SVHC compounds (16-01-2020)*

The results for the specific substances show that the sample does not contain the compounds* on the Reach candidate list (substances of very high concern), in concentrations >0.1 %. Presence of very low amounts of dibutylphthalate and nonylphenols.

* Anthracene, anthracene oils, anthracene pastes, benzo(a) pyrene, benzo(a)anthracene, fluoranthene, benzo(k)fluoranthene, phenanthrene, pyrene, chrysene, benzo(ghi)perylene, pitch coal tar (high temp), dibutylphthalate (DBP), diisobutylphthalate (DiBP), Bis(2-methoxyethyl) phthalate (DMEP), benzylbutylphthalate (BBP), bis-(2-ethylhexyl)phthalate (DEHP), 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DHIP), 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP), 1,2-benzenedicarboxylic acid, C6-C8-C10-alkylesters with ≥ 0.3% of dihexyl phthalate (Di(C6-C10)alkylphthalate esters, diisopentylphthalate (DIPP), N-pentyl-isopentylphthalate, dipentylphthalate (DPP), dipentylphthalate (branched, linear), dihexylphthalate (DHP), dicyclohexyl phthalate (DCHP), dihexylphthalate (branched, linear), diisohexyl phthalate, Cyclohexane-1,2-dicarboxylic anhydrides (Hexahydrophthalic anhydrides - HHPA), Hexahydromethylphthalic anhydrides (MHHPA), 3-benzylidene camphor;3-BC, 2,2-bis(4'-hydroxyphenyl)-4-methylpentane, 2,4-dinitrotoluene, 2,4-diaminotoluene, 4,4'- Diaminodiphenylmethane (MDA), Formaldehyde- oligomeric reaction products with aniline, o-Anisidine, o-Toluidine, 4,4' -methylenedi-o-toluidine, 2,2'-dichloro-4,4'-methylenedianiline, diamonidiphenylether and its salts, p-aminoazobenzene, p-cresidine, o-aminoazotoluene, biphenyl-4-ylamine, 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine hexabromocyclododecane (HBCDD), trischloroethylphosphate, trixylylphosphate, Dechlorane Plus, C10-C13 chloroalkanes, Phenolphthalein, musk xylene,formamide, acrylamide, N-methylacetamide, N,N-dimethylacetamide, N,N' -dimethylformamide, 1-methyl-2-pyrrolidone, trichloroethylene, 1,2,3-trichloropropane, 1,2-dichloroethane, 1-bromopropane, 1,2-Diethoxyethane, EGDME, TEGDME, bis(2-methoxyethyl) ether, Furan, propylene oxide, 2-methoxyethanol, 2-ethoxyethanol, 2-ethoxyethylacetate, 2-methoxyethyl acetate, 4-(1,1,3,3-tetramethylbutyl)phenol, 4-Nonylphenol (branched+linear), Dinoseb, TGIC, β -TGIC, Michler's ketone, Michler's base, C.I. Basic Violet 3, C.I. Solvent Blue 4, C.I. Basic Blue 26, 4,4'-bis(dimethylamino)-4''-(methylamino) trityl alcohol, methoxyacetic acid, dimethylsulphate, diethylsulphate, 1,3-propanesultone, nitrobenzene, karanal, octamethylcyclotetrasiloxane(D4), decamethylcyclopentasiloxane(D5),

dodecamethylcyclohexasiloxane(D6), terphenyl; hydrogenated, ethylenediamine(EDA), Bistributyltinoxide is detected along with the inorganic compounds using XRF

A2002717 T2009895

**Solar Screen International S.A., Foetz
U19**

Group	MReach	Requested	CAS	tR min	Apparatus Gerstel	
					ng/min.g	µg/g (30', 120°C)
X263		Dibutylphthalate (DBP)	84-74-2	37,26	345,4	10,4
X287		Diisobutylphthalate (DiBP)	84-69-5	35,58	-	-
X314		Benzylbutylphthalate (BBP)	85-68-7	46,71	-	-
X288		Bis-(2-ethylhexyl)phthalate (DEHP)	117-81-7	54,50	13,7	<5
X361		Di-n-heptyl phthalate	3648-21-3	54,29	-	-
X334		C6-C8 phthalates, C7 rich (DHIP)	71888-89-6	48,90	-	-
X335		C7-C11 phthalates (DHNUP)	68515-42-4	60,40	-	-
X349		Bis(2-methoxyethyl)phthalate (DMEP)	117-82-8	37,66	-	-
X389		Diisopentylphthalate (DIPP)	605-50-5	39,47	-	-
X390		Dipentylphthalate (DPP)	131-18-0	41,24	-	-
X391		N-pentylisopentylphthalate	776297-69-9	40,32	-	-
X371		Dipentylphthalate isomers	84777-06-0	37,97	-	-
X408		Diethylphthalate (DHP)	84-75-3	45,60	-	-
X557		Diisohexyl phthalate	71850-09-4	44,45	-	-
X409		Diethylphthalates, branched+linear	68515-50-4	43,87	-	-
X417		Di(C6-C10)alkyl phthalate >0,3%DHP	68515-51-5	45,72	-	-
X418		Di(C6/C8/C10)alkyl phthalate >0,3%DHP	68648-93-1	45,75	-	-
X526		Dicyclohexylphthalate	84-61-7	53,60	-	-
X369		Hexahydrophthalic anhydrides	85-42-7	23,68	-	-
X392		Hexahydromethylphthalic anhydrides	25550-51-0	25,30	-	-
X286		Phenanthrene	85-01-8	34,30	-	-
X315		Anthracene	120-12-7	34,53	-	-
X353		Fluoranthene	206-44-0	39,73	-	-
X285		Pyrene	129-00-0	40,90	-	-
X354		Chrysene	218-01-9	51,81	-	-
X355		Benz(a)anthracene	56-55-3	51,44	-	-
X356		Benzo[a]pyrene	50-32-8	61,19	-	-
X531		Benzo[k]fluoranthene	207-08-9	59,35	-	-
X532		Benzo[ghi]perylene	191-24-2	72,86	-	-
X336		Pitch, coal tar, high temp	65996-93-2	40,40	-	-
X313		Short chain chlorinated paraffins	85535-84-8	31,15	-	-
X528		Terphenyl, hydrogenated (cluster)	61788-32-7	38,47	-	-
X278		TCEP (tri(2-chloroethyl)phosphate)	115-96-8	33,07	-	-
X410		Trixylylphosphate	25155-23-1	57,05	-	-
X319		Hexabromocyclododecane	3194-55-6	59,00	-	-
X419		Dechlorane plus	13560-89-9	53,50	-	-
X529		1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one	15087-24-8	37,11	-	-
X347		4-(1,1,3,3-Tetramethylbutyl)phenol	140-66-9	30,76	-	-
X367		4-Nonylphenol (cluster)	104-40-5	33,27	494,3	14,8
X330		Formamide	75-12-7	6,21	-	-
X221		Dimethylformamide (DMF)	68-12-2	8,07	-	-
H110		N-methyl-2-pyrrolidone	872-50-4	15,72	-	-
I121		Acrylamide	79-06-1	10,32	-	-
X380		N-methylacetamide	79-16-3	9,14	-	-
X233		N,N-Dimethylacetamide	127-19-5	10,69	-	-
X527		Ethylenediamine	107-15-3	5,63	-	-

A2002717 T2009895

Solar Screen International S.A., Foetz
U19

Group	MReach2 Requested	CAS	tR min	Apparatus Gerstel	
				ng/min.g	µg/g (30', 120°C)
X387	o-Toluidine	95-53-4	17,24	-	-
X381	p-Cresidine	120-71-8	22,82	-	-
X382	4-Aminoazobenzene	60-09-3	39,49	-	-
X383	4,4'-Methylenedi-o-toluidine	838-88-0	44,72	-	-
X384	2,4-Diaminotoluene	95-80-7	25,24	-	-
X385	o-Aminoazotoluene	97-56-3	44,28	-	-
X386	Biphenyl-4-ylamine	92-67-1	33,37	-	-
X343	o-Anisidine	90-04-0	20,10	-	-
X317	2,4-Dinitrotoluene	121-14-2	28,43	-	-
X318	5-Tert-butyl-2,4,6trinitro-m-xylene (musk xylene)	81-15-2	35,65	-	-
X311	4,4'-Diaminodiphenylmethane	101-77-9	40,22	-	-
X344	2,2'-Dichloro-4,4'-methylenedianiline	101-14-4	51,05	-	-
X342	Formaldehyde/aniline oligomeric react prods	25214-70-4	39,65	-	-
X388	4,4'-Oxydianiline and its salts	101-80-4	39,88	-	-
X393	Zoldine MS+ (3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine)	143860-04-2	7,05	-	-
X556	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	44,70	-	-
X370	Dinoseb	88-85-7	34,70	-	-
X372	Methoxyacetic acid	625-45-6	9,22	-	-
X345	1,2-Dichloroethane	107-06-2	5,48	-	-
A143	Trichloroethylene	79-01-6	6,73	-	-
A144	1,2,3-Trichloropropane	96-18-4	12,39	-	-
X374	1-Bromopropane	106-94-5	5,23	-	-
X376	1,2-Diethoxyethane	629-14-1	9,31	-	-
X394	Propylenoxide	75-58-9	6,05	-	-
X331	2-Methoxyethanol	109-86-4	5,30	-	-
X332	2-Ethoxyethanol	110-80-5	6,91	-	-
I107	2-Ethoxyethylacetate	111-15-9	12,17	-	-
X558	2-Methoxyethyl acetate	110-49-6	10,12	-	-
X348	Bis(2-methoxyethyl)ether	111-96-6	13,60	-	-
X360	1,2-Bis(2-methoxyethoxy)ethane	112-49-2	21,55	-	-
X362	1,2-Dimethoxyethane	110-71-4	5,75	-	-
X377	Furan	110-00-9	3,85	-	-
X378	Diethyl Sulphate	64-67-5	14,85	-	-
X379	Dimethyl Sulphate	77-78-1	10,36	-	-
X346	Phenolphtalein	77-09-8	45,35	-	-
X366	TGIC	2451-62-9	46,30	-	-
X364	Michlers' ketone	90-94-8	60,59	-	-
X365	Michlers' base	101-61-1	46,98	-	-
X363	β-TGIC	59653-74-6	45,20	-	-
X415	1,3-Propanesultone	1120-71-4	18,50	-	-
X416	Karanal	117933-89-8	34,33	-	-
X530	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	48,03	-	-
X340	Nitrobenzene	98-95-3	17,47	-	-
D209	Octamethylcyclotetrasiloxane	556-67-2	16,03	68,3	<5
I110	Decamethylcyclopentasiloxane	541-02-6	20,71	-	-
H119	Dodecamethylcyclohexasiloxane	540-97-6	25,22	<10	<5



Reference: T2009895 - U19

Determination of the emission profile by thermal extraction.

Date of ending the test	02-06-2020
Method used	Centexbel
Sample preparation	One or more 1 cm diameter samples are heated in a glass tube at a fixed temperature under an inert gas flow. The gas flow is lead over a tenax filled tube where volatile organic compounds (VOC's) are trapped. The tenax tube with the VOC's is thermally desorbed. Released VOC's are cryo trapped and injected into a GCMS.
Analytical method	Gas chromatography with Agilent MSD detector
Results	
Determination limit	0.1 mg/kg (when no overlapping peaks are present lower determination limits can easily be reached)
Identification	For dimethyl fumarate specific ion with mass 113 is used. For positive identification masses 85 and 59 are used.

As conditions 120°C and 30' were used. These relate to the conditions used eg in VDA 278 to evaluate fogging behaviour of plasticisers. For the more volatile VOC's semi-quantitative results (µg/g) can be obtained while for the heavier VOC's and SVOC's it is a screening method for their presence. If present in higher concentrations only part of the products have already evaporated (results as ng/min.g).

	Amount emitted (µg/g)
DMFu	< 0.10