Intertek Polychemlab
Koolwaterstofstraat 1
6161 RA Geleen
The Netherlands

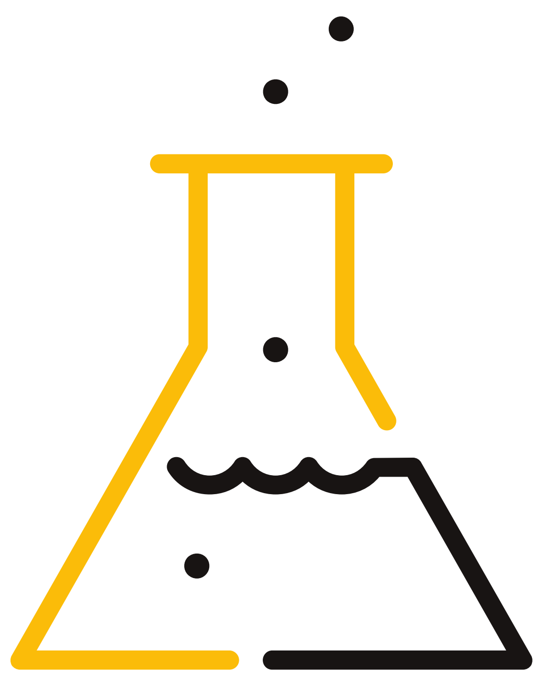
Telephone: +31 (0)88 126 8888

www.intertek.com

TEST REPORT – RE36136-2

TESTING 3 SAMPLES OF PP AND 3 SAMPLES OF RPP.
SAMPLE 2 INPUT 2020 PP SAMPLE AND SAMPLE 2 OUTPUT 2020 PP SAMPLE

Intertek MSG
Attn. James Lynch
Room D135 The Wilton Centre
TS10 4RF Redcar
United Kingdom



DATE
August 20th, 2021

RE36136-2

August 20th, 2021

Dear Mr. Lynch,

Hereby we present to you the results of the laboratory study, which was carried out by your request (Ref. SO36136).

The general conditions of delivery of Intertek Polychemlab B.V., located in Geleen, the Netherlands, are applicable. These conditions are an integral part of all research carried out and the services and consultations provided; where appropriate, expanded upon by agreements specific to the client.

Samples of unknown origin can only be checked for plausibility to a limited extent. Results of the examination of these samples only relate to the samples as received by Intertek.

Intertek is not responsible for the data supplied by the client. These data may affect the validity of the analysis results.

If information about the measurement uncertainty of a method is required, this can be provided on request.
We trust that this information will meet your approval.

Yours sincerely,

Intertek Polychemlab B.V.

Rens Pörteners
Application Specialist Food Contact

Frans Jongen
Application Specialist Technique

Drs. Gabriëlle van Benthem
Application Specialist Food Contact

RE36136-2
August 20th, 2021

1 INTRODUCTION

Intertek MSG requested Intertek Polychemlab B.V. to perform the following analysis on 3 PP samples (feedstock) and 3 rPP samples (final products) to determine the difference between the samples before and after recycling:

- GC/MS analysis for volatile organic compounds;
- Additive Screening;
- LC/MS for non-volatiles;
- Determination of Phthalates;
- Determination of Metals;
- FDA extraction testing (21 CFR 177.1520) – 3 samples – only on final products.

2 SAMPLES

2.1 Description of samples

The samples were described by the client as displayed in table 1. After arrival the samples were registered and coded with a unique Intertek LIMS number.

Table 1: Sample description

NO.	INTERTEK SAMPLE DESCRIPTION	CUSTOMER SAMPLE DESCRIPTION	DATE RECEIVED	INTERTEK LIMS NUMBER
1	Sample 1 input	Sample 1 input 2019 PP Sample	May 12th, 2021	23163596
2	Sample 1 output	Sample 1 output 2019 rPP Sample (30% with virgin PP)	May 12th, 2021	23163597
3	**Sample 2 input**	**Sample 2 Input 2020 PP Sample**	**May 12th, 2021**	**23163598**
4	**Sample 2 output**	**Sample 2 output 2020 rPP Sample**	**May 12th, 2021**	**23163599**
5	Sample 3 input	Sample 3 input 2021 PP ptt	July 13th, 2021	23183912
6	Sample 3 output	Sample 3: 22 hr refresh output material 20-21 trial	July 13th, 2021	23183913

Remark: This report holds the results of sample 3 and 4. The results of the other samples are reported respectively in RE36136-1 and RE36136-3.

3 METHOD(S) APPLIED

3.1 Screening of volatiles, non-volatiles, and additives

3.1.1 Screening of volatile organic compounds – TD GC-MS

The volatile compounds from the samples were analyzed by thermal desorption TD GC-MS. This analysis was performed on the sample after rinsing to pH neutral (only Input) and cryogenic grinding.

Concentrations were semi-quantitatively determined using an external standard of toluene as a reference compound. The details of the method applied can be found in table 2. For the analysis, a single run was performed.

Table 2: Method applied for the volatile compounds analysis

GC	AGILENT 7890B
Detector:	Agilent 5977B Mass detector
Thermal desorption unit:	Unity xR
Software:	Mass hunter GC-MS acquisition B.07.04.2260
Column:	Restek 624 Sil-MS – 60m x 320 µm x 1.8 µm
Temperature program:	Initial 32°C, hold for 5 min, ramp 10°C/min until 280°C, hold for 10 min.
Detection:	3 min, 29 – 350 AMU
Desorption temperature:	110°C
Desorption time:	30 min

3.1.2 Screening of residual additives and non-volatiles – LC-MS

The analysis of non-volatile components from the sample was performed using LC-MS technique. An in-house method developed for the reference compounds, which are common to expect from the polymers such as polyolefins (mentioned below) were analyzed. The samples (~0.2g) were dissolved in 10 mL boiling toluene, quenched with 20 mL methanol, and concentrated 10 times prior to injection. For the analysis, a single run was performed.

Each reference standard mentioned below was used to quantify the corresponding components in the measurement solution if any detected. Please note that unknown substances cannot be identified with this technique, only mass/fragment ions information is provided. The details of the method applied can be found in table 3.

Remark: for sample 2 Input 2020 PP Sample, a washing step was performed before any extraction was performed.

Reference compounds*: Benzophenone, oleamide, erucamide, hexadecanoic acid, octadecanoic acid, Atmer 163, Irgacure 184, Irgafos 168, Irgafos 168 phosphate, Irganox 245, Irganox PS800, Irganox PS802, Irganox 1010, Irganox 1076, Irganox 1330 and Irganox 3114.*

Table 3: Method applied for the LC-MS screening

LC	**WATERS ACQUITY H CLASS**
Detector	Waters SQ Detector 2
Software	MassLynx V4.1
Column	Waters Acquity UPLC BEH Phenyl, 2.1 x 100mm, 1.7 µm
Column temperature	40°C
Injection	2 µl
Mobile phase A	0.1% formic acid in water
Mobile phase B	Methanol
Mobile phase C	Isopropanol
Gradient	From 20% A, 70% B and 10% C to 90% and 10% C B within 6 min, hold for 1 min.
Flow	0.4 ml/min
MS-screening	*m/z* 100-2000 ESI in positive, *m/z* 60-2000 ESI negative mode For some targeted components APCI was used

3.2 Phthalates screening

Approximately 0.5 gram was cryogenically grinded and extracted for 4 hours using methylene chloride. The extracts were evaporated to dryness and redissolved in methanol (1:1). For the analysis, a single run was performed. The following phthalates were quantified using external standards using LC-MS/MS:

- 2-Ethylhexyl methyl terephthalate (EHMTP);
- Bis(2-ethyl hexyl) phthalate (DEHP);
- Diisononyl phthalate (DINP);
- Butylbenzyl phthalate (BBP);
- Dibutyl phthalate (DBP);
- Diethyl phthalate (DEP);
- Diisobutyl phthalate (DIBP);
- Dimethyl phthalate (DMP);
- Di-n-hexylphthalate (DNHP);
- Dipentyl phthalate (DPP);
- Di-isohexyl phthalate (DIHxP);
- Di n octyl phthalate (DnOP);
- Dinonyl phthalate (DNP);
- Diisopentyl phthalate (DIPP);
- Diisodecyl phthalate (DIDP).

The apparatus and settings used are mentioned in table 4.

Table 4: LC-MS/MS setting s for phthalates analysis

UPLC	**SCIEX EXIONLCTM**
Detector	Sciex QTRAP 4500
Software	Analyst 1.7, MultiQuant 3.0.3
Analytical Column	Waters Acquity CSH C18 column 100*2.1 mm, 1.7 µm,
Guard column	Waters Isolator Column 2.1x50mm

3.3 Metal screening (ICP/MS, FIMS): screening multi-elements

3.3.1 Sample preparation

Samples were digested with concentrated oxidizing acid at elevated temperature and pressure with a microwave. After digestion, the solutions were transferred into a volumetric flask and analyzed with ICP-MS and FIMS. For the analysis, a single run was performed.

3.3.2 Hg-analyzer (FIMS)

Mercury was analysed using a “Perkin Elmer FIMS100; Flow Injection Mercury System”.

3.3.3 ICP-MS analysis

The apparatus and settings used for the ICP-MS analysis is mentioned in table 5, and the results of the performed suitability test is mentioned in table 6.

Table 5: Method applied for the ICP-MS analysis

APPARATUS	PERKIN ELMER NEXION 350D EQUIPPED WITH PREPFAST SAMPLE INTRODUCTION SYSTEM
Mode	Standard/KED
Plasma Flow (l/min)	18
Aux. Flow (l/min)	1.2
Neb. Flow (l/min)	0.97
RF Power (Watt)	1600

Table 6: ICP-MS System Suitability test

ANALYTE	UNIT	SPECIFICATION	DAILY
Be	Counts	> 2000	3496
In	Counts	> 40000	70820
U	Counts	> 30000	47474
CeO/Ce	%	≤ 2.5	1.36
Ce++/Ce	%	≤ 3.0	1.24
Background (220)	Counts	<1	2

3.3.4 ICP-OES analysis

The apparatus and setting used for the ICP-OES analysis is mentioned in table 7, and the results of the performed suitability test is mentioned in table 8.

Table 7: Method applied for the ICP-OES analysis

APPARATUS	PERKIN-ELMER OPTIMA 8300DV SUPPLIED WITH FAST-LOOP SAMPLE INTRODUCTION SYSTEM
Plasma View	Axial
Plasma Flow (l/min)	10
Aux. Flow (l/min)	0.2
Neb. Flow (l/min)	0.70
RF Power (Watt)	1350

Table 8: ICP-OES System Suitability test

ANALYTE	UNIT	SPECIFICATION	DAILY
Manganese axial (SBR)	%	>100	433
Manganese radial (SBR)	%	>100	581
Rel. Stand. Deviation	%	≤ 3	0.51
Ratio axial $Mg_{280.271}$/ $Mg_{285.213}$	---		5.37
Ratio radial $Mg_{280.271}$ / $Mg_{285.213}$	---		7.60

The services described in this report are not covered by full validation for this specific sample matrix. Under no circumstances Intertek will be liable for any loss or damages, whether direct or indirect or any third-party claim, in relation to the applied method. If required, additional validation can be offered.

3.4 CFR 177.1520 (final products) samples

FDA extraction tests into Hexane and Xylene as specified in USA FDA 21 CFR § 177.1520; *Olefin polymers*. The tests are performed in duplicate.

3.4.1 n-Hexane extraction test according to 21 CFR section 177.1520

A sample is extracted at for 2 hours at reflux temperature. The filtrate is evaporated, and the total residue weighed as a measure of the solvent extractable fraction. *Portions of approximately 1 gram were extracted with 100 ml n-hexane.*

3.4.2 Xylene soluble fraction test according to 21 CFR section 177.1520

The sample is dissolved completely in xylene by heating and stirring in a bottle with little free space. The solution is allowed to cool without stirring, whereupon the insoluble portion precipitates and is filtered off; the total solids content of the filtrate is then determined as a measure for the soluble fraction. *Portions of approximately 1 gram portions were extracted with 100 ml of xylene.*

4 RESULTS AND DISCUSSION

4.1 TD GC-MS screening - volatiles

A numerous (non-)identified hydrocarbons and siloxanes have been detected. The results and chromatograms of the TD GC-MS analyses are presented in Appendix I; table 14 and figure 1 respectively.

Explanation of component identification using a commercial database:

- For the components with probability > 50%, the component name and the CAS number were provided;
- Probability takes into consideration the probable match and RI-index from the commercial database;
- If the probability is less (< 50%) the components were considered as unknowns without CAS numbers;
- If there is no match with the library the components were considered as unknowns. Unknowns can be further classified as likely to be, based on the main functional group or molecules present;
- If a spectrum does not match a component in the library but has a lot of similarity with a known component, the components were presented as unknowns with some info on the molecule;
- If a peak consists out of several components, the components were presented as Unknown + the number of components, e.g. Unknown 4x consists out of 4 unknown components;
- For unknowns, the three highest *m/z* masses were added to the component.

4.2 LC-MS screening – non-volatiles and additives

The results of the LC-MS screening to determine non-volatiles and additives are presented in table 9. Oleamide, Atmer 163, erucamide, hexadecanoic acid, octadecanoic acid, several Irgafos and Irganox substances have been identified.

Table 9: Results obtained from the LC-MS screening

RT (min)	COMPONENT	CAS	BLANK (MG/KG)	SAMPLE 2 INPUT 2020 PP SAMPLE (MG/KG)	SAMPLE 2 OUTPUT 2020 RPP SAMPLE (MG/KG)
0.86	Benzophenone	119-61-9	< 10	< 10	< 10
0.78	Irgacure 184	947-19-3	< 10	< 10	< 10
1.50	Oleamide	301-02-0	< 5	< 5	9
2.48	Atmer 163	-	< 5	< 5	< 5
4.67	Irganox PS800	53571-83-8	< 5	< 5	< 5
2.34	Erucamide	112-84-5	< 50	< 50	< 50
5.50	Irgafos 168	31570-04-4	< 5	29	28
6.08	Irganox PS802	693-36-7	< 5	< 5	< 5
4.91	Irganox 1076	2082-79-3	< 10	< 10	< 10

RT (min)	COMPONENT	CAS	BLANK (MG/KG)	SAMPLE 2 INPUT 2020 PP SAMPLE (MG/KG)	SAMPLE 2 OUTPUT 2020 RPP SAMPLE (MG/KG)
5.13	Irgafos 168 ox	95906-11-9	< 40	209	257
1.25	Irganox 245	36443-68-2	< 10	< 10	< 10
5.61	Irganox 1010	6683-19-8	< 10	61	124
4.53	Irganox 3114	27676-62-6	< 2	< 2	5
1.70	Hexadecanoic acid	57-10-3	< 50	577	395
2.16	Octadecanoic acid	57-11-4	< 50	358	321
5.21	Irganox 1330	1709-70-2	< 5	5	< 5

The results of the chromatogram screening are presented in the appendix II; table 15 - 16 and figure 2 - 3 respectively.

4.3 Phthalates screening

The results of the phthalates screening are mentioned in table 10.

Table 10: Results for the phthalate screening

COMPONENT	COMPONENT	SAMPLE 2 INPUT 2020 PP SAMPLE (MG/KG)	SAMPLE 2 OUTPUT 2020 RPP SAMPLE (MG/KG)
Bis(2-ethylhexyl) phthalate	DEHP	< 0.05	3.0
Diisononyl phthalate	DINP	< 0.10	2.7
Benzylbutylphtalat	BBP	< 0.10	< 0.1
Dibutylphthalate en Diisobutylphthalate	DBP en DIBP	0.64	1.2
Diethylphthalate	DEP	< 0.10	0.2
Dimethyl phthalate	DMP	< 0.05	< 0.05
Di-n-hexyl phthalate	DNHP	< 0.10	< 0.10
Dipentyl phthalate	DPP	< 0.05	< 0.05
Di-isohexyl phthalate (DIHxP)	DIHxP	< 0.10	< 0.10
Di n octyl phthalate	DnOP	< 0.10	< 0.10
Dinonyl phthalate (DNP)	DNP	< 0.05	< 0.05
Diisopentyl phthalate	DIPP	< 0.05	< 0.05
Diisodecyl phthalate (DIDP)	DIDP	< 0.50	< 0.50

RE36136-2

August 20th, 2021

4.3 Metal screening (ICP/MS, FIMS): screening multi-elements

The results of the elemental analysis by means of ICP-OES/ICP-MS and FIMS are mentioned in table 11 and are expressed as mg/kg material.

Table 11: Results elemental analysis

Element	Sample 2 Input 2020 PP Sample (mg/kg)	Sample 2 output 2020 rPP Sample (mg/kg)
Ag	0.03	< 0.02
Al	245	159
As	0.74	< 0.14
B	< 0.4	55.7
Ba	260	24.8
Be	< 0.03	< 0.03
Bi	< 0.4	< 0.4
Cd	< 0.02	0.09
Ce	0.09	0.44
Co	1.00	< 0.8
Cr	34.4	1.91
Cs	1.66	1.29
Cu	5.68	2.22
Fe	46000*	34.8
In	< 0.4	<0.4
Mn	150	0.87
Mo	0.65	0.07
Ni	12.1	1.26
Pb	0.81	0.70
Rb	< 0.4	< 0.4
Sb	< 0.36	< 0.36
Se	< 0.1	< 0.1
Si	265	< 0.8
Sn	< 0.7	< 0.7
Sr	4.80	1.50
Th	< 0.2	< 0.2
Ti	100	28.44
Tl	< 0.05	< 0.05
U	< 0.04	< 0.04
V	0.37	< 0.12
W	< 0.4	< 0.4
Zn	33.7	19.67
Zr	0.98	1.7

***Potential contamination from metal particle.**

4.4 CFR 177.1520 (final products) samples

4.4.1 Maximum extractable fraction in n-Hexane

The results of the maximum extractable fraction in n-hexane are mentioned in table 12 and are expressed as a percentage by weight of the polymer.

Start date test: May 20th, 2021.

Table 12: Results maximum extractable fraction in n-hexane

SAMPLE	MAXIMUM EXTRACTABLE FRACTION IN N-HEXANE AT REFLUX TEMPERATURE			
	REP 1 (%)	REP 2 (%)	MEAN (%)	SPECIFICATION § 177.1520 (%)
Sample 2 output 2020 rPP Sample	1.03	1.01	**1.0**	**6.4**

4.4.2 Maximum soluble fraction in xylene

The results of the maximum soluble fraction in xylene are mentioned in table 13 and are expressed as a percentage by weight of the polymer.

Start date test: May 20th, 2021.

Table 13: Results maximum soluble fraction in xylene

SAMPLE	MAXIMUM SOLUBLE FRACTION IN XYLENE AT 25°C			
	REP 1 (%)	REP 2 (%)	MEAN (%)	SPECIFICATION § 177.1520 (%)
Sample 2 output 2020 rPP Sample	9.28	9.14	**9.2**	**9.8**

RE36136-2

August 20th, 2021

APPENDIX I: RESULTS AND CHROMATOGRAMS OF TD GC-MS SCREENING

Table 14: Results of the TD GC-MS screening

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
8.61	Acetone	67-64-1	1.6	<0.1
8.94	Isopropyl Alcohol	67-63-0	0.2	<0.1
9.61	Pentane, 2-methyl-	107-83-5	0.2	0.1
9.73	2-Propanol, 2-methyl-	75-65-0	0.2	0.1
11.46	Propane, 2-ethoxy-2-methyl-	637-92-3	0.1	<0.1
11.51	Silanol, trimethyl-	1066-40-6	0.1	<0.1
11.61	Cyclopentane, methyl-	96-37-7	0.1	<0.1
11.71	2-Butanone	78-93-3	0.1	<0.1
13.09	Benzene	71-43-2	0.2	<0.1
13.78	1-Butanol	71-36-3	0.9	<0.1
14.37	Hexane, 2,4-dimethyl-	589-43-5	0.2	0.2
14.75	2-Butanone, 3,3-dimethyl-	75-97-8	0.2	<0.1
15.23	Heptane, 4-methyl-	589-53-7	0.3	0.2
15.9	Toluene	108-88-3	2.6	<0.1
16.44	Hexane, 2,3,5-trimethyl-	1069-53-0	0.6	0.4
16.55	Heptane, 2,4-dimethyl-	2213-23-2	4.5	3.4
16.91	Unknown Branched Alkene (m/z 83, 56, 55)		0.1	<0.1
16.95	Hexanal	66-25-1	<0.1	0.1
17.09	Unknown Branched Alkene (m/z 70, 43, 55)		1.4	1.1
17.37	Heptane, 2,3-dimethyl-	3074-71-3	0.4	0.3
17.46	Octane, 4-methyl-	2216-34-4	1.4	1.2
17.71	4,4-Dimethyl octane	15869-95-1	0.1	<0.1
18.22	Unknown Branched Alkane (m/z 43, 69, 83)		0.1	0.1
18.76	3-Heptanone	106-35-4	0.1	<0.1
19.4	α-Pinene	80-56-8	0.2	0.4
19.76	Unknown Branched Alkane (m/z 57, 43, 85)		1.0	0.5
19.87	Camphene	79-92-5	<0.1	0.1
19.98	3-Phenylpropionic acid, 4-cyanophenyl ester	no CAS	0.1	0.1

RE36136-2

August 20th, 2021

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
20.19	Decane	124-18-5	<0.1	0.5
20.28	Unknown Branched Alkane (m/z 57, 56, 41)		0.6	0.4
20.39	Unknown Branched Alkane (m/z 71, 57, 43)		1.0	0.5
20.46	Unknown Branched Alkane (m/z 71, 57, 43)		1.1	0.8
20.56	Unknown Branched Alkane (m/z 57, 43, 85)		0.2	0.2
20.62	Unknown Branched Alkane (m/z 71, 57, 43)		0.4	0.3
20.73	Unknown Branched Alkene (m/z 56, 70, 85)		0.2	0.1
20.86	Benzaldehyde	100-52-7	0.1	0.3
21.05	7-Oxabicyclo[2.2.1]heptane, 1-methyl-4-(1-methylethyl)-	470-67-7	0.2	0.2
21.23	Unknown Branched Alkane (m/z 71, 57, 43)		1.8	2.9
21.27	Unknown Branched Alkane (m/z 71, 57, 85)		15.7	12.2
21.38	Unknown Branched Alkane (m/z 71, 57, 85)		4.9	3.3
21.53	1-Hexanol, 2-ethyl-	104-76-7	7.7	0.5
21.76	Unknown Branched Alkene (m/z 69, 70, 71)		1.6	0.8
21.83	Unknown Branched Alkene (m/z 69, 70, 83)		0.9	0.6
22	Unknown Branched Alkane (m/z 71, 57, 85)		1.0	1.0
22.03	Undecane	1120-21-4	8.1	6.1
22.13	Unknown Branched Alkane (m/z 71, 57, 43)		2.6	2.2
22.25	Unknown Branched Alkane (m/z 71, 43, 57)		1.4	2.1
22.26	Unknown Branched Alkane (m/z 71, 57, 43)		0.7	1.3
22.59	Unknown Ester (m/z 111, 43, 84)		0.1	0.1
22.63	Unknown Branched Alkene (m/z 73, 58, 43)		0.2	0.2
22.72	Linalool	78-70-6	0.2	0.2
22.84	Nonanal	124-19-6	0.2	0.9
22.91	Unknown Branched Alkane (m/z 57, 112, 84)		0.1	0.4
22.98	Unknown Branched Alkane (m/z 71, 43, 85)		0.1	0.4
23.01	trans-Decalin, 2-methyl-	-	0.1	0.1
23.05	Unknown Branched Alkane (m/z 71, 43, 57)		0.1	0.2
23.18	Unknown Branched Alkane (m/z 57, 71, 85)		0.1	0.4
23.24	Unknown Branched Alkane (m/z 57, 71, 85)		0.1	0.1
23.33	Unknown decahydronaphthalene (m/z 152, 95, 69)		0.2	<0.1

RE36136-2
August 20th, 2021

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
23.42	Unknown Cyclohexanone (m/z 105, 152, 95)		0.1	<0.1
23.58	Fenchol	1632-73-1	0.2	0.2
23.62	Dodecane	112-40-3	0.4	0.8
23.7	Unknown Branched Alkane (m/z 57, 71, 85)		0.1	0.1
23.72	Unknown Branched Alkane (m/z 57, 71, 85)		0.4	0.4
23.84	Unknown Branched Alkane (m/z 57, 71, 43)		0.3	0.2
23.91	Unknown Branched Alkane (m/z 57, 71, 43)		0.2	0.1
23.93	Unknown Ester (m/z 125, 57, 56)		0.1	<0.1
24.22	Unknown Branched Alkane (m/z 71, 57, 43)		0.2	0.1
24.35	Unknown Branched Alkane (m/z 71, 57, 43)		0.5	0.5
24.39	Unknown Cyclohexanol (m/z 57, 71, 95)		0.6	0.3
24.47	Unknown Branched Alkane (m/z 71, 57, 85)		0.4	0.9
24.64	α-Terpineol	98-55-5	1.0	1.4
24.75	Unknown Branched Alkane (m/z 57, 71, 56)		0.1	<0.1
24.89	Unknown Branched Alkane (m/z 71, 57, 85)		14.1	14.7
25.02	Unknown Branched Alkane (m/z 71, 57, 85)		2.0	2.3
25.11	Unknown Branched Alkane (m/z 71, 57, 85)		1.2	1.2
25.23	Unknown Branched Alkane (m/z 71, 57, 85)		1.3	1.6
25.38	Unknown Branched Alkene (m/z 69, 83, 111)		1.2	1.3
25.5	Unknown Branched Alkene (m/z 69, 83, 111)		1.1	1.1
25.55	Unknown Branched Alkane (m/z 71, 57, 85)		8.2	9.0
25.63	Unknown Branched Alkene (m/z 69, 85, 57)		1.2	1.4
25.69	Unknown Branched Alkane (m/z 71, 57, 85)		1.9	2.3
25.81	Unknown Branched Alkane (m/z 71, 57, 85)		2.0	2.2
25.83	Unknown Branched Alkane (m/z 71, 57, 85)		0.7	1.1
25.94	Unknown Branched Alkane (m/z 57, 71, 85)		1.0	1.5
26.02	Unknown Cyclohexanol (m/z 82, 67, 57)		0.1	1.3
26.03	Unknown Cyclohexanol (m/z 82, 67, 123)		0.1	1.1
26.21	Unknown Cyclohexane (m/z 82, 83, 57)		0.4	0.2
26.29	Unknown Branched Alkane (m/z 71, 57, 85)		0.7	0.1
26.31	Unknown Branched Alkane (m/z 71, 57, 85)		0.1	0.2
26.4	4,7-Methano-1H-indenol, hexahydro-	37275-49-3	0.2	0.1

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
26.58	Tetradecane	629-59-4	2.0	2.0
26.68	a-Terpinyl acetate	80-26-2	<0.1	0.5
26.92	Unknown Branched Alkane (m/z 57, 71, 85)		0.3	0.6
26.96	Unknown Branched Alkane (m/z 85, 57, 71)		<0.1	0.1
27.08	Unknown Cycloalkane (m/z 97, 96, 55)		<0.1	0.8
27.11	Unknown Branched Alkane (m/z 57, 85, 71)		<0.1	0.3
27.38	Unknown Branched Alkane (m/z 71, 57, 43)		0.1	0.2
27.44	Unknown Branched Alkane (m/z 71, 57, 85)		1.1	1.1
27.46	Unknown Branched Alkane (m/z 71, 57, 85)		0.4	0.4
27.51	Unknown Branched Alkane (m/z 57, 85, 71)		0.2	0.4
27.58	Unknown Branched Alkane (m/z 57, 71, 85)		0.2	0.2
27.81	Unknown Ester (m/z 57, 85, 71)		0.1	0.2
27.83	Unknown Branched Alkane (m/z 71, 57, 85)		0.3	0.4
27.93	Unknown Branched Alkane (m/z 71, 85, 57)		14.8	18.7
28.05	Unknown Branched Alkane (m/z 71, 57, 85)		2.1	3.8
28.13	Unknown Branched Alkane (m/z 58, 71, 85)		0.9	3.6
28.25	Unknown Cycloalkane (m/z 58, 83, 55)		0.7	0.2
28.27	Unknown Branched Alkane (m/z 58, 83, 69)		0.3	0.1
28.38	Unknown Ester (m/z 71, 57, 69)		1.4	3.6
28.49	Unknown Branched Alkane (m/z 71, 85, 57)		9.8	12.7
28.61	Unknown Branched Alkane (m/z 71, 57, 85)		2.4	3.3
28.73	Unknown Branched Alkane (m/z 71, 57, 85)		2.4	3.8
28.86	Unknown Branched Alkane (m/z 71, 57, 85)		1.5	2.2
28.88	Unknown Branched Alkane (m/z 71, 57, 85)		0.8	1.0
29	Unknown Branched Alkane (m/z 71, 57, 85)		0.9	1.2
29.07	Unknown Branched Alkane (m/z 71, 57, 85)		0.1	0.2
29.16	Unknown Acid (m/z 191, 57, 206)		0.3	2.6
29.19	Hexadecane	544-76-3	1.8	1.9
29.48	Unknown (m/z 99, 83, 98)		<0.1	0.1
29.54	Unknown Cycloalkane (m/z 97, 55, 83)		0.1	0.3
29.7	Unknown Branched Alkane (m/z 71, 57, 85)		0.2	0.4
29.75	Unknown Branched Alkane (m/z 57, 71, 105)		0.4	1.9

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
29.76	Unknown Branched Alkane (m/z 57, 71, 85)		0.3	0.5
29.96	Benzene, (1-pentylhexyl)-	4537-14-8	0.1	1.2
30.01	Benzene, (1-butylheptyl)-	4537-15-9	0.1	1.0
30.07	Octane, 1,1'-oxybis-	629-82-3	0.5	0.5
30.18	Benzene, (1-propyloctyl)-	4536-86-1	0.4	0.5
30.27	Unknown Branched Alkane (m/z 57, 71, 85)		0.5	0.4
30.39	Unknown Branched Alkane (m/z 57, 71, 85)		0.9	2.8
30.61	Unknown Branched Alkane (m/z 71, 85, 57)		14.8	17.3
30.71	Unknown Branched Alkane (m/z 71, 85, 57)		2.1	2.7
30.78	Unknown Ester (m/z 71, 57, 85)		0.9	0.6
31.07	Unknown Alkene (m/z 69, 57, 111)		0.7	0.9
31.14	Unknown Branched Alkane (m/z 71, 85, 57)		7.1	9.0
31.18	Unknown Branched Alkane (m/z 71, 57, 85)		1.1	1.3
31.25	Unknown Branched Alkane (m/z 71, 57, 85)		2.0	2.3
31.34	Benzophenone	119-61-9	0.4	2.9
31.41	Unknown Ester (m/z 71, 57, 69)		0.8	1.0
31.51	Unknown Branched Alkane (m/z 71, 57, 85)		0.3	0.3
31.54	Unknown Ether (m/z 69, 71, 111)		0.3	0.4
31.57	Amberonne (isomer 2)	no cas	0.5	1.0
31.67	Unknown Branched Alkane (m/z 57, 71, 85)		1.3	1.4
31.83	Unknown Ether (m/z 71, 57, 69)		0.5	0.8
31.97	Unknown Branched Alkane (m/z 71, 57, 85)		0.3	0.6
32.12	Amberonne (isomer 3)	no cas	0.1	0.3
32.35	Isopropyl myristate	110-27-0	0.1	4.0
32.43	Octanal, 2-(phenylmethylene)-	101-86-0	0.1	1.5
32.5	Unknown Branched Alkane (m/z 91, 71, 57)		0.2	0.5
32.63	Benzene, (1-butylnonyl)-	4534-50-3	0.1	0.1
32.74	Cyclohexyl salicylate	no cas	<0.1	0.7
32.99	Unknown Branched Alkane (m/z 71, 57, 85)		0.3	0.5
33.1	Unknown Branched Alkane (m/z 57, 71, 85)		0.2	0.4
33.14	2-Ethylhexyl salicylate	118-60-5	0.2	1.1
33.19	3,5-di-tert-Butyl-4-hydroxybenzaldehyde	1620-98-0	0.1	0.4

RE36136-2
August 20th, 2021

RT (MIN)	COMPONENT	CAS	CONCENTRATION IN MATERIAL (MG/KG)	
			INPUT	OUTPUT
33.41	Benzene, 1,1'-[1,2-ethanediylbis(oxy)]bis-	104-66-5	0.2	0.2
33.6	Unknown Branched Alkane (m/z 71, 85, 57)		8.4	11.1
33.69	Unknown Branched Alkane (m/z 71, 57, 85)		2.5	2.8
33.75	Unknown Branched Alkane (m/z 71, 57, 85)		0.4	0.8
33.99	Cyclopenta[g]-2-benzopyran, 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethyl-	1222-05-5	0.2	0.7
34.17	Unknown Branched Alkane (m/z 71, 57, 69)		0.1	0.1
34.22	Unknown Branched Alkane (m/z 71, 57, 85)		0.4	0.6
34.26	Unknown Branched Alkane (m/z 71, 85, 57)		3.6	5.1
34.38	Unknown Branched Alkane (m/z 71, 57, 85)		1.3	1.7
34.54	Unknown Branched Alkane (m/z 71, 85, 57)		0.1	0.1
34.72	Eicosane	112-95-8	0.4	0.6
34.89	Unknown Branched Alkane (m/z 71, 85, 57)		0.1	0.1
34.93	Homosalate	118-56-9	<0.1	0.3
35.03	Unknown Branched Alkane (m/z 71, 85, 57)		0.2	0.2
35.21	Unknown Aromate (m/z 178, 194, 179)		0.2	0.4
35.39	Unknown Branched Alkane (m/z 99, 57, 112)		0.2	<0.1
35.62	Isopropyl palmitate	142-91-6	<0.1	0.9
35.79	Unknown Branched Alkane (m/z 71, 57, 85)		0.1	0.1
36	Unknown Phthalic acid (m/z 149, 73, 57)		<0.1	0.2
36.94	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione	82304-66-3	0.4	3.0
37.67	Unknown Branched Alkane (m/z 71, 85, 57)		3.1	4.3
37.82	Unknown Branched Alkane (m/z 71, 85, 57)		0.4	0.5
38.02	Diphenyl sulfone	127-63-9	0.4	0.1
38.42	Unknown Branched Alkane (m/z 71, 85, 57)		0.1	0.2
38.62	Unknown Branched Alkane (m/z 71, 85, 57)		1.1	1.7
38.8	Unknown Branched Alkane (m/z 71, 85, 57)		0.2	0.3
39.01	Unknown Branched Alkane (m/z 57, 71, 85)		0.1	0.1
39.21	Unknown Fatty Acid Ester (m/z 71, 57, 85)		<0.1	0.1

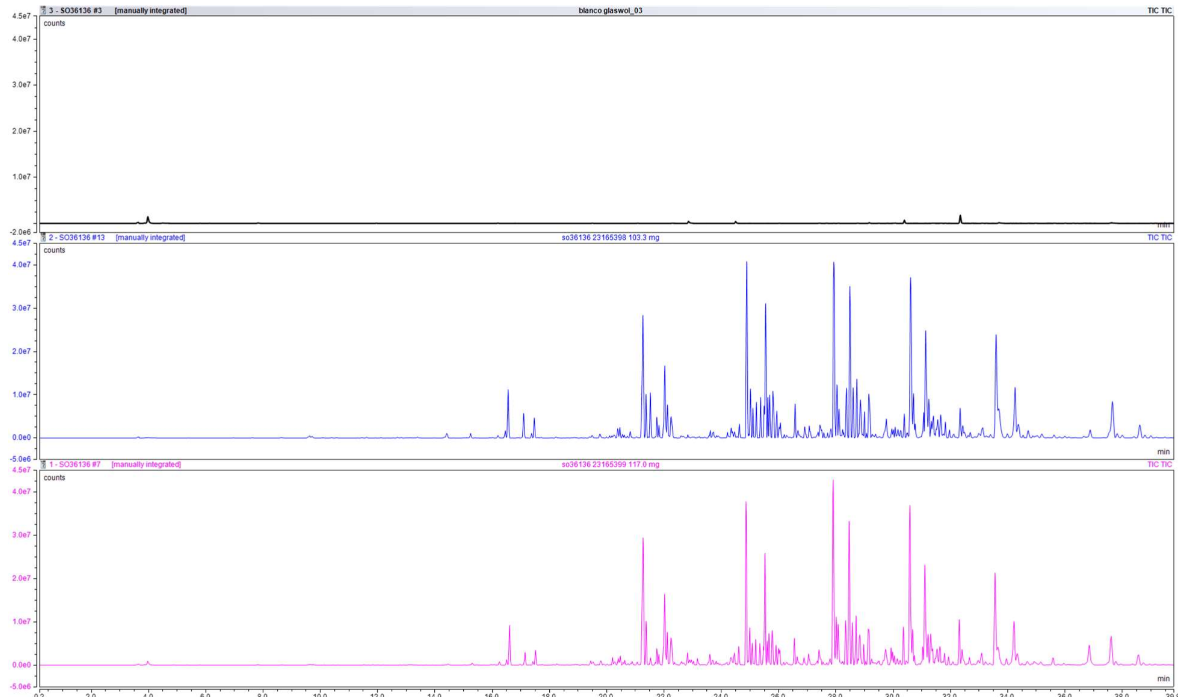


Figure *1*: Screening of volatile components from the samples: Sample 2 input 2020 PP Sample and Sample 2 output 2020 rPP Sample. Top trace is the blank chromatogram, the blue trace is the chromatograms of the input and the pink trace is the chromatogram of the output.

APPENDIX II: RESULTS AND CHROMATOGRAMS OF LC-MS SCREENING

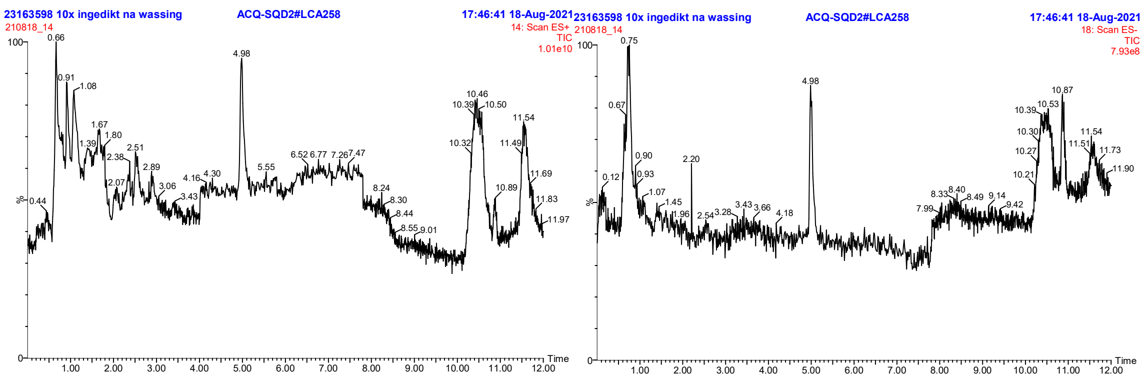


Figure 2: Chromatogram of Sample 2 input 2020 PP Sample, left ESI+ , right ESI-

Table 15: Screening of unknowns, Sample 2 input 2020 PP Sample

RT	M/Z	COMPONENT	ESI MODE
0.66	159/ 227	unknown	Positive
0.91	433/ 416	unknown	Positive
1.08	280/ 311	unknown	Positive
1.39	275	unknown	Positive
1.67	503	unknown	Positive
1.80	503	unknown	Positive
2.07	437/ 481/ 525	? glycol like	Positive
2.38	495/ 539/ 636	? glycol like	Positive
2.51	339	unknown	Positive
2.89	490/ 550	unknown	Positive
0.75	249/ 317	unknown	Negative

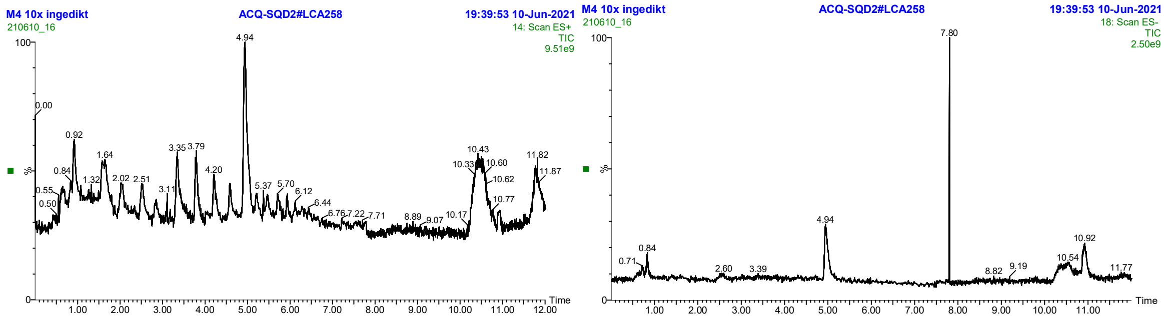


Figure 3: Chromatogram of sample Sample 2 Output 2020 PP Sample left ESI+ , right ESI-

Table 16: Screening of unknowns, Sample 2 Output 2020 PP Sample

RT	M/Z	COMPONENT	ESI MODE
0.92	433	unknown	Positive
1.64	259/202/503	unknown	Positive
2.86	537	unknown	Positive
3.35	611	unknown	Positive
3.80	686	unknown	Positive
4.20	759	unknown	Positive
4.58	833	unknown	Positive
5.21	982	unknown	Positive
5.47	1056	unknown	Positive
5.71	647/1132	unknown	Positive
5.94	1204	unknown	Positive