SHERWIN-WILLIAMS.

The Valspar (UK) Corporation, Limited
Packaging Coatings Group
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31 January 2021.

Natural Resources Wales
Regulatory and Community Division
Chester Road
Buckley, Flintshire
CH7 3AJ

Dear Julia,

See attached information as required by:- **Reference Permit EPR/BU7545IM:**

Annual submissions due 31st January 2021 (for year 2020)

1. Reporting of water usage
2. Reporting of energy usage for the year
3. Reporting of other performance indicators for the period (solvents)
4. VOC's annual reports – Q1 – Q4
5. Solvent Management Plan for 2020

General Comments

The specific water usage has increased by 11% in 2020 due to an increase of production for BREXIT stock build for the site.

The overall specific energy consumption has increased by 3% for 2020 due to an increase in production for BREXIT stock build.

The solvent emissions as a % of solvent input has increased due to the demand of the BREXT stock build. The emissions is within the permit level of 3%.

Yours sincerely

Candice Sankoomar

Candice Sankoomar
EHS Manager
Sherwin Williams
(The Valspar (UK) Corporation Ltd)

Permit Number: EPR/BU7545IM **Operator: The Valspar (UK) Corporation Ltd**

Installation: Deeside Packaging Coatings **Form number: Water Usage1 11/12/17**

Reporting of Water Usage for the year: 2020 (January to December)

Water Source	Usage m^3 / year	Specific Usage (m^3/ unit output)
Mains water	**17, 775 m^3**	**0.924 m^3/tonnes**
TOTAL WATER USAGE	**17, 775 m^3**	

Operator's comments:

There was an 11% increase specific usage from 2019 to 2020 due to the demand of producing BREXIT stock in 2020.

Production for 2020 – 19,247 tonnes

Signed.....Candice Sankoomar..... **Date**.....28/01/21.....

(Candice Sankoomar, EHS Manager)

Permit Number: EPR/BU7545IM **Operator;** The Valspar (UK) Corporation Ltd

Installation: Deeside Packaging Coatings **Form number:** Energy 1 11/12/17

Reporting of energy usage for the year: January 2020 to December 2020

ENERGY SOURCE	ENERGY USAGE QUANTITY	PRIMARY ENERGY (MWh)	Specific Usage (MW/unit output)
Electricity*	2,845.58 MWh	6829 MWh	0.354 MWH/tonne**
Natural Gas	3597.8 MWh	3597.8 MWh	0.187 MWH/tonne
Gas Oil	37.38 MWh	37.38 MWh	0.002 MWH/tonne
TOTAL	6,480.76 MWh		0.542 MWH/tonne

*** Conversion factor for delivered electricity to primary energy = 2.4**

Operator's comments:
The overall specific energy consumption has increased by 3% for 2020 due to increase of production for BREXIT stock build.

**Calculation of Specific usage is from the primary energy per total production for 2020.
Total production for 2020 is 19,247 tonnes.

Signed.....Candice Sankoomar..... **Date**.....28/01/21.....

(Candice Sankoomar, EHS Manager)

Permit Number: EPR/BU7545IM **Operator; The Valspar (UK) Corporation Ltd**

Installation: Deeside Packaging Coatings **Form number: Performance11/12/2017**

Reporting of other performance indicators for the period - January 2020 to December 2020.

Solvent usage (tonnes)	**6,098.96 tonnes**
Total solvent emissions as a % of solvent input	**0.129%**

Operator's comments:

Emissions calculated based on emissions points A5 and A37 and workplace monitoring data. The change of % of solvent emissions from 2019 to 2020 was as a result of the increase in BREXIT stock during 2020.

Signed..Candice Sankoomar..... **Date**.....28/01/21.....

(Candice Sankoomar, EHS Manager)

Permit Number: EPR/BU7545IM

Operator: The Valspar (UK) Corporation Ltd

Installation: Deeside Packaging Coatings

Form Number: Air1 / 11/12/17

Reporting of emissions to air for the period from 1/01/2020 to 31/03/2020

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
A1	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	0.12 g/hr	BSEN13649	5th February 2020 14:50-15:50	±20.0 %
A1	Total Class B VOCs as Carbon	2000 g/hr	1 hour	0.71 g/hr	BSEN13649		±20.0 %
A2	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.12 g/hr	BSEN13649	5th February 2020 12:42-13:42	-
A2	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.12g/hr	BSEN13649		±20.0 %
A2	Particulates	20 mg/m^3	1 hour	0.63 mg/m^3	EN13284-1		±20.0 %
A3	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.30 g/hr	BSEN13649	5th February 2020 13:10-14:10	±20.0 %
A3	Total Class B VOCs as Carbon	2000 g/hr	1 hour	45.8 g/hr	BSEN13649		±20.0 %
A6	Particulate	20mg/m^3	1 hour	0.43 mg/m^3	EN13284-1	4th February 2020 12:00-13:00	-
A38	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.08 g/hr	BSEN13649	5th February 2020 12:05-13:05	±20.0 %
A38	Total Class B VOCs as Carbon	2000 g/hr	1 hour	0.2 g/hr	BSEN13649		±20.0 %

* (**There is a measurement uncertainty of +/- 25%**)

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed Candice Sankoomar

(Candice Aliasgar Sankoomar, EHS Manager)

Date 28/01/21

Permit Number: EPR/BU7545IM

Operator: The Valspar (UK) Corporation Ltd

Installation: Deeside Packaging Coatings

Form Number: Air1 / 11/12/17

Reporting of emissions to air for the period from 1/04/2020 to 30/06/2020

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
A1	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	3.1 g/hr	BSEN13649	6th May 2020 10:20-11:20	±20.0 %
A1	Total Class B VOCs as Carbon	2000 g/hr	1 hour	35.3 g/hr	BSEN13649		±20.0 %
A2	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.11 g/hr	BSEN13649	6th May 2020 12:33-13:33	-
A2	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.11 g/hr	BSEN13649		±20.0 %
A2	Particulates	20 mg/m^3	1 hour	1.3 mg/m^3	EN13284-1		±20.0 %
A3	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.05 g/hr	BSEN13649	6th May 2020 12:32-13:32	±20.0 %
A3	Total Class B VOCs as Carbon	2000 g/hr	1 hour	14 g/hr	BSEN13649		±20.0 %
A6	Particulate	20mg/m^3	1 hour	0.88 mg/m^3	EN13284-1	5th May 2020 10:08 – 11:08	-
A38	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.08 g/hr	BSEN13649	6th May 2020 10:10 – 11:10	±20.0 %
A38	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.8 g/hr	BSEN13649		±20.0 %

* (There is a measurement uncertainty of +/- 25%)

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed ..... Candice Sankoomar .....

(Candice Aliasgar Sankoomar, EHS Manager)

Date..... 28/1/21 .....

Permit Number: EPR/BU7545IM

Operator: The Valspar (UK) Corporation Ltd

Installation: Deeside Packaging Coatings

Form Number: Air1 / 11/12/17

Reporting of emissions to air for the period from 1/07/2020 to 30/09/2020

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
A1	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	1.26 g/hr	BSEN13649	16th July 2020 11:46-12:46	±20.0 %
A1	Total Class B VOCs as Carbon	2000 g/hr	1 hour	44.8 g/hr	BSEN13649		±20.0 %
A2	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.23 g/hr	BSEN13649	16th July 2020 9:36-10:36	-
A2	Total Class B VOCs as Carbon	2000 g/hr	1 hour	0.07 g/hr	BSEN13649		±20.0 %
A2	Particulates	20 mg/m^3	1 hour	0.93 mg/m^3	EN13284-1		±20.0 %
A3	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.20 g/hr	BSEN13649	16th July 2020 9:32-10:32	±20.0 %
A3	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.2 g/hr	BSEN13649		±20.0 %
A6	Particulate	20mg/m^3	1 hour	0.28 mg/m^3	EN13284-1	15th July 2020 9:40-10:40	-
A38	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.09 g/hr	BSEN13649	16th July 2020 13:10 – 14:10	±20.0 %
A38	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.09 g/hr	BSEN13649		±20.0 %

* (**There is a measurement uncertainty of +/- 25%**)

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed Candice Sankoomar

(Candice Aliasgar Sankoomar, EHS Manager)

Date 28/01/21

Permit Number: EPR/BU7545IM

Operator: The Valspar (UK) Corporation Ltd

Installation: Deeside Packaging Coatings

Form Number: Air1 / 11/12/17

Reporting of emissions to air for the period from 1/10/2020 to 31/12/2020

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
A1	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.05 g/hr	BSEN13649	6th October 2020 10:15-11:55	±20.0 %
A1	Total Class B VOCs as Carbon	2000 g/hr	1 hour	0.11 g/hr	BSEN13649		±20.0 %
A2	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.11 g/hr	BSEN13649	6th October 2020 12:35 – 13:35	-
A2	Total Class B VOCs as Carbon	2000 g/hr	1 hour	0.2 g/hr	BSEN13649		±20.0 %
A2	Particulates	20 mg/m^3	1 hour	0.25 mg/m^3	EN13284-1		±20.0 %
A3	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.21 g/hr	BSEN13649	6th October 2020 13:40-14:40	±20.0 %
A3	Total Class B VOCs as Carbon	2000 g/hr	1 hour	141 g/hr	BSEN13649		±20.0 %
A6	Particulate	20mg/m^3	1 hour	0.16 mg/m^3	EN13284-1	7th Oct 2020 10:30-11:30	-
A38	Total Class A VOCs as individual VOCs	100 g/hr	1 hour	<0.12 g/hr	BSEN13649	7th Oct 2020 9:03-10:03	±20.0 %
A38	Total Class B VOCs as Carbon	2000 g/hr	1 hour	<0.12 g/hr	BSEN13649		±20.0 %

*** (There is a measurement uncertainty of +/- 25%)**

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed Candice Sankoomar

(Candice Aliasgar Sankoomar, EHS Manager)

Date 28/01/21

valspar

SOLVENT MANAGEMENT PLAN – 2020
DEESIDE PACKAGING COATINGS

Document REFERENCE: 34312R2

REPORT PREPARED BY: The VALSPAR CORPORATION (UK) LTD

DATE: 31st January 2021

REPORT ISSUE

Issue/revision	Issue 1	Revision 2	Revision 3
Remarks	-		
Date	31st January 2020		
Prepared by	Candice Sankoomar		
Signature			
Position	EHS Manager		
Verified by	Neil Booth		
Signature			
Position	Site Manager		

Parkway, Deeside Industrial Estate, Deeside, Flintshire, CH5 2NN
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TABLE OF CONTENTS

Contents

1.0 INTRODUCTION

1.1 Background

This annual solvent emissions report for 2020 has been written to address the relevant annual compliance requirements of Environmental Permit reference BU7545IM.

The calculation of solvent emissions has been undertaken in accordance with the methodology outlined in 'The BCF VOC Workbook', as requested by the Natural Resources Wales (NRW) in EPR Compliance Assessment Report reference BU7545IM/0221994. The relevant inputs and calculations are detailed within this report.

2.0 METHODOLOGY

2.1 Scope

As required by the Environmental Permit for the installation, the solvent emissions calculations only consider releases from the Coatings Plant. However, it should be noted that all materials manufactured in the Resin Plant are used in the Coatings Plant and therefore the Volatile Organic Compound (VOC) input to the process can be considered as all solvents used on site.

2.2 Assessment Criteria

There are two solvent emission limit Options outlined in the BCF VOC Workbook. These are summarised in Table 1.

Table 1 VOC Emission Limits for Coatings Manufacture

Solvent Consumption (tonnes per annum)		Option 1	Option 2	
		Total Emissions	Fugitive Emissions	Waste Gas Emissions
Band 0	< 100	Not in scope	Not in scope	
Band 1	100 - 1,000	< 5% of solvent inputs	< 5% of solvent inputs	< 150mg carbon/m^3
Band 2	> 1,000	< 3% of solvent inputs	< 3% of solvent inputs	< 150mg carbon/m^3

The Deeside Packaging Coatings facility consumes in excess of 1,000-tonnes of solvent per annum and is therefore classified as a Band 2 installation. Stack monitoring has shown carbon concentrations greater than 150mg/m^3 in the exhaust gases. As such, the emission limit provided in Option 1 has been selected for use in this assessment.

2.3 Emission Calculation

As stated in the BCF VOC Workbook:

Total emission = waste gases emissions + fugitive emissions
= final discharge from a stack + any other emissions to air, soil or water, excluding solvent in product
= Solvent emissions in waste gases (O1) + (uncaptured emissions (O4) + solvents lost in water (O2) + solvent contamination or residues in products (O3) + solvent released in other ways (O9)).

It should be noted that O3 is not applicable to coatings manufacturing processes as solvents in products are deliberately present.

The installation is shown to conform to the emission limit if:

(O1 + O2 + O4 +O9) ≤ 3 (Purchases of solvents (I1) + solvent recovered and reused in the installation (I2)) / 100

3.0 SOLVENT EMISSIONS CALCULATIONS

3.1 I1 - Purchase of Solvents

Solvent usage at the facility was obtained from delivery and usage records. The results are summarised in Table 2.

Table 2 Solvent Usage

	Usage (kg)
Diacetone aol AF Type	26182
n-Butanol	367322
n-Butanol	753
IPA	35042
isobutanol	3323
IMS99	10115
Monoethylene Glycol	42
Propylene glycol	200251
1° amyl aol	0
Tridecanol	29384
ISOAMYL ALCOHOL	10883
Glycol ether DE-LG	1760133
Butyl di glycol acetate	37012
Glycol ether EB	1011158
Butyl acetate	28570
Diethylene glycol butyl	40960
Dowanol PM	2608
Butyl cellosolve acetate type	12714
Glycol ether EP	90535
PM acdetate	7724
Methyl carbitol	400
Dibasic ester solvent	25149
MIBK	18425
cyclo Hexanone	18534
MEK	166570
Mineral spirits	7092
Solvent 60	7768
Xylene	111729
CDA 99%	17
Aromatic 100	715841
Aromatic 150	185755
Total	**4,931,990.69**

As shown in Table 2, **4,931,990.69** kg of solvent was used in 2020.

The majority of the resins used in the Coatings Plant are manufactured on site. However, other bought in resins containing solvents were used in 2020. Table 3 details calculated solvent based on suppliers SDS data.

Table 3 Solvent in bought in resins usage

Resin	Usage (kg)	% Solvent content	Calculated solvent usage (kg)
RB0008B	1495	2	29.9
AK1118A and AK118P	2398251	39.70	952105.65
SB0018B	261453	36.20	94645.99
SB0069B	3897	100	3897.00
SB0071B	52658	24.75	13032.90
SQ0567P	0	50	0
SQ0700E	187546	48.62	91184.87
SQ0839E	29091	41.50	12072.77
TOTAL	2,934,391		**1,166,969.06**

As such, **I1.2 (solvent in bought-in resins) = 1,166,969.06 kg.**

No other solvents in addition to those shown in Table 2 are used on site. As such, I1.3 (Solvent in other bought-in materials) = **0**kg. Based on the above values, **I1 =6,098,959.75 kg**.

3.2 I2 - Solvent Recovered and Reused in the Installation

There are no recovered solvents bought in to the facility. As such, I2.1 (bought-in recovered solvent) = **0**kg.

There are no solvents recovered on site. As such, I2.2 (on-site recovered solvent) = **0**kg. Based

on the above values, **I2 = 0kg.**

3.3 O1 - Solvent Emissions in Waste Gases:

The amount of solvent emissions in waste gases has been calculated for the relevant routes in the following Sections.

3.3.1 O1.1 - Powered Vents:

The emission points associated with the Coatings Plant:

3.3.1 Emission point A5 and A37 - Coatings plant vessels; and,
3.3.2 Coatings plant fugitive emissions local exhaust ventilation system (LEV).

Emissions from these points are calculated below.

Emission Points A5 and A37:

Quarterly monitoring of VOC emissions from A5 and A37 was undertaken for each quarter of 2020 to show compliance with the relevant condition included within the site's Environmental Permit. A summary of 2020 monitoring results is provided in Table 4.

Table 4 Monitoring Results - VOC Concentrations

Emission Point	Total VOC (kg/hr)				
	Q1	Q2	Q3	Q4	Mean
A5	0.107	0.0598	0.22	0.597	0.24145
A37	0.00092	0.017	0.00405	0.0659	0.02196

The calculation requires the monitored VOC concentration as carbon to be converted to mass of VOC. This requires speciation of the emission. However, this was not undertaken during 2014. As such, reference was made to the Speciation Monitoring included in the Environmental Permit Application for the site. This indicated the following species were present in the exhaust gases:

- n-Butanol
- 2-Butoxyethanol
- Phenol
- 2-(2-Butoxyethoxy) ethanol
- Formaldehyde
- Isobutanol
- Trimethylbenzenes
- Xylene
- Other hydrocarbons

The BCF VOC Workbook states that for the simplified approach it should be assumed that all of the emission consists of the species with the lowest proportion of carbon. As such, butanol was selected for the purpose of the assessment at it consists of 41% carbon.

The Coatings Plant operates 24-hours per day, 362-days per year. The annual mass emission from A5 and A37 was therefore calculated as follows:

0.26341/41*100 x 24 x 362 = **5581.72** kg VOC/year

Local Exhaust Ventilation System (Fugitive Emissions)

Annual workplace exposure monitoring of various VOCs is undertaken within the Coatings Plant. The results have been normalized to mg/m3 and are summarised in Table 5. These were utilised to represent solvent concentrations within the Coatings Plant in lieu of direct monitoring of the LEV system.

Table 5 Ambient VOC Concentrations

Species	Average molecular mass (g/mole)	Monitored Conc (ppm)	Monitored Conc (mg/m^3)
n-Butanol	74.12	0.06	0.94
2-Butoxyethanol	118.17	0.09	0.09666
Phenol	94.11	0.005	0.44
2-(2-Butoxyethoxy) ethanol	162.23	0.09	0.61
Formaldehyde	30.026	0.034	0.04974
Isobutanol	74.12	0.06	0.21
Trimethylbenzenes	120.195	0.02	0.84

Xylene	106.16	0.33	0.09426
Trimethylbenzenes	120.195	0.02	0.84
Total			**5.78066**

It should be noted that the workplace exposure monitoring recorded VOC concentrations whilst workers undertook specific activities with a high risk of solvent release. As such, the results are considered to provide a worst-case representation of VOC concentrations from fugitive emissions within the Coatings Plant.

The flow rate within the LEV system has been measured by an external consultant and when combined with the volume of the Coatings Plant the total volume discharged by the LEV system is as follows. 2020 data was used for this calculation:

10,571 x 3.1 = 32,770.1 m^3/hr.

This was converted into the airflow per year by multiplying by the number of operational hours:

32,770.1 x 24 x 362 = 284,706,628.8 m^3/year.

This was multiplied by the monitored VOC concentration to determine the annual mass release:

(284,706,629 x 5.78066) / 1,000,000 = 1645.79 kg VOC/year

Total Powered Vent Losses

Based on the above calculations, **O1.1 = 7227.51 kg**

3.3.2 O1.2 - Non-Powered Process Vessel Vents

Any releases through non-powered process vessel vents are collected by the LEV system as fugitive emissions to the building and have been accounted for in O1.1. As such, O1.2 (non-powered process vessel vents (e.g. breather vents) = 0kg.

3.3.3 O1.3 - General Extraction and Building Ventilation Systems

Ventilation is provided by the LEV system outlined in Section 3.3.1. As such, O1.3 (general extraction and building ventilation systems) = 0kg.

3.3.4 O1.4 - Bulk Storage Vessel Breather Vents

Tank solvent losses occur through either:

3.3.3 Vapour displacement on filling (F); or,
3.3.4 Vapour breathing losses (B) due to the volume changes as a result of the daily rise and fall in temperature.

F - Filling Losses

Filling losses have been calculated using the equation provided in the BCF VOC Workbook. The results are summarised in Table 6.

Table 6 Filling Losses

Release Point	Species	Annual Usage (kg)	Specific Gravity	Annual Usage (m^3)	Mol. Weight	Vapour Press @20C (kPa)	Filling Losses (kg per year)
Tank 1 & 2	Ethyl Diglycol TE0001A	1760133	0.989	1574.3	134.1	0.024	2.42
Tank 3	Solvesso 100/Naptha TR1002B	715841	0.878	847.3	127	0.194	8.49
Tank 4	Xylene TR0709B	111729	0.87	202.2	106	0.74	4.26
Tank 5	Epikote 828 RE0276B	266605	1.16	1280.2	374	0.00	0
Tank 6	Dowanol PM TE0036A	2608	0.921	5.5	90.1	1.33	0.14
Tank 7 & 13	MEK TK0012A	166570	0.806	243.5	72.1	9.459	70.16
Tank 8	Dowanol PMA TE0055A	7724	0.966	34.5	132.2	0.337	0.15
Tank 9	Normal Butanol TC0003A	367322	0.81	413.5	74.1	0.566	8.03
Tank 10	Butyl Glycol Ether TE0003A	1011158	0.902	796.5	118.2	0.118	6.62
Tank 18	Methacrylic Acid MQ0025A	93387	1.01	86.3	86.09	0.13	0.44
Tank 12	DMEA CM0564A	135920	1.01	110.5	86.09	0.13	0.52
Tank 14	Wash Solvent	1026616	0.82784	1200.9	83.983	3.585	157.71
Tank 16	Butyl DiGlycol TE0027A	40960	0.887	28.7	89.1	0.56	0.97
Tank 17	BCA - TE0047A	12714	0.972	48.5	160.21	0.03	0.03
ST 8	Ethyl Acrylate MQ0037A	327265	0.923	294.4	100	3.9	58.42
						TOTAL	**318**

As shown in Table 6, F =**318** kg.

It should be noted that the vapour pressures have been used at 20°C as a worst-case, as described in the BCF VOC Workbook.

B - Breathing Losses

As stated in the BCF VOC Workbook, the calculation of breathing losses is complex and laborious. As such, they can be approximated by adopting the value determined for F. Evaluation of data shows these to be similar in magnitude and if the worst case is used for filling losses (as utilised in this

assessment), this compensates for any reduction in breathing losses.

As such, B = 318 kg.

Total Bulk Storage Losses

Based on the above calculations, **O1.4 = 636 kg.**

3.3.5 O1.5 - Abatement Plant Discharges

The Coatings Plant does not include any solvent abatement equipment. As such, O1.5 (abatement plant discharges) = 0kg.

3.4 O2 - Solvents Lost in Water

The Coatings Plant does not have any associated effluent releases. As such, O2 (solvents lost in water) = 0kg.

3.5 O4 - Uncaptured Emissions

3.5.1 O4.1 - Natural Ventilation of Buildings

Ventilation is provided by the LEV system outlined in Section 3.3.1. As such, O4.1 (natural ventilation of buildings) = 0kg.

3.5.2 O4. 2 - Outside Emptied Drum Storage

All solvents are delivered directly to the tank farm. Resins are delivered in sealed IBCs and returned to the supplier in a closed state. Given the very high solids content of the resin used on site it is considered the amount of residual VOCs in the IBCs is likely to be negligible. Therefore, O4.2 (outside emptied drum storage) = 0kg.

3.5.3 O4.3 - Outside Container Crushing Plant

The facility does not include a container crushing plant. As such, O4.3 (outside container crushing plant) = 0kg.

3.6 O9 - Solvent Released in Other Ways

It is confirmed that there were no exceptional solvent releases in 2020. As such, O9 (solvent released in other ways) = 0kg.

4.0 SUMMARY REPORT

A summary of solvent emissions is provided in Table 7.

Table 7 Summary Report

I/O Code	Activity	Solvent Input (tonnes)	VOC Emission (tonnes)	VOC Emission (% input)
I1.1	Bought-in 'new' solvents	4931.99	-	-
I1.2	Solvent in bought-in resins	1166.969	-	-
I1.3	Solvent in other bought in materials	0.00	-	-
I2.1	Bought-in recovered solvent	0.00	-	-
I2.2	On-site recovered solvent	0.00	-	-
Total Inputs		**6098.959**		
O1.1	Powered vents	-	7.226	0.1184
O1.2	Non-powered process vessel vents	-	0.00	0.00
O1.3	General extraction and building ventilation systems	-	0.00	0.00
O1.4	Bulk storage vessel breather vents	-	0.636	0.0104
O1.5	Abatement plant discharges	-	0.00	0.00
O2.1	Solvents in final discharges to sewers and drains	-	0.00	0.00
O4.1	Natural ventilation of buildings	-	0.00	0.00
O4.2	Outside open emptied drum storage	-	0.00	0.00
O4.3	Outside container crushing plant	-	0.00	0.00
O9.1	Releases in other ways	-	0.00	0.00
Total Emissions			**7.862**	**0.1288**

As shown in Table 7:

O1 + O2 + O4 +O9 = **7.862** t

And:

3 x (I1 + I2) / 100 = **182.97t**

As such, solvent emissions are less than 3% of the input and the facility is compliant with the relevant emission limit and there is no requirement to formally plan further solvent emission reductions.