



**Cyfoeth
Naturiol**
Cymru
**Natural
Resources**
Wales

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Knauf Insulation Limited

Queensferry Mineral Fibre Works
Chemistry Lane
Queensferry
Deeside
Flintshire
CH5 2DA

Permit number
EPR/BR9383ID

Queensferry Mineral Fibre Works

Permit number EPR/BR9383ID

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

The activities covered by this permit are the manufacture of mineral wool insulation materials for use in structural, fire protection, thermal and acoustic insulation applications as well as hydroponic growing media for the horticultural industry.

Raw materials used in the furnace are Coke, Basalt, Dolomite, Anorthosite and blast furnace slag together with steel slag. These materials are delivered to site by tipper lorries and stored in concrete bunkers. They are then loaded into raw material handling conveyers and weighing plant by loaders. Liquid oxygen is used to enrich the combustion air fed into the furnace (cupola) and generates temperatures greater than 2000⁰C to melt the stone and is stored in a pressure vessel, alongside the vaporiser, within a fenced enclosure.

The installation manufactures mineral wool (stonewool) from molten stone produced by melting blast furnace slag and natural stone together in a blast furnace with an emergency bypass stack. The stone, slag and coke are weighed out and fed into the furnace by overhead conveyors. They are then weighed and blended to specification and fed into the cupola. Heat for melting the stone is produced by burning coke in a hot blast furnace with oxygen enriched air. Prior to melting the carboniferous rocks are thermally calcinated and subsequent reactions between the resultant oxides and the basalt rock produce the required melt.

Molten stone flows from the cupola by means of water cooled troughs onto the forming spinner. This spinner has wheels which rotate at high speed. Stone melt is spun into stone wool fibre which is then projected by high pressure air towards a collection chamber where binder is applied. The furnace waste gases are filtered to remove dust, then passed through an oxidiser burner.

The fibre is then collected on a moving grate which is under suction to allow the fibre to be laid down under controlled conditions into a thin blanket. The blanket is folded back upon itself on the forming belt to give the required weight, density and thickness per square metre. Waste gases from this process are removed and passed through a wet scrubber.

The blanket passes into a heated oven for curing, allowing the stone wall to establish the required physical properties. After this, the product passes over a cooling zone that draws ambient air through the product to cool the stone wool. Oven waste gases are burnt in an oxidiser tube. The product is then trimmed to required size and passed into a packaging area where they are packaged and stored awaiting dispatch. Scrap product is recycled back in to the process using an integrated fibre recovery and recycling plant. Waste water is recycled in the binder application and is filtered to remove stone wool prior to reuse.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application BR9383 (EPR/BR9383ID/A001)	06/08/02	.
Permit Issued BR9383 (EPR/BR9383ID/A001)	25/06/04	
Application for Variation NP3835SW EPR/BR9383ID/V002	Received 07/12/04	
Variation issued NP3835SW (EPR/BR9383ID/V002)	22/02/05	
Application for Variation EPR/BR9383ID/V003	Received 11/09/08	
Variation issued EPR/BR9383ID/V003	12/02/09	
Application for Variation EPR/BR9383ID/V004	Received 15/11/10	
Additional Information	18/01/11	Received 07/02/11
Variation issued EPR/BR9383ID/V004	21/02/11	
Agency variation determined EPR/BR9383ID/V005	04/03/13	Environment Agency variation to implement the changes introduced by IED
Regulation 60(1) Notice of request for more information	27/02/14	
Regulation 60(1) response received	30/05/14	Implementation of BAT conclusions under IED
Natural Resources Wales Glass Sector Review 2014 Permit EPR/BR9383ID Variation issued EPR/BR9383ID/V006	31/07/15	Varied and consolidated permit issued in modern IED condition format.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/BR9383ID

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BR9383ID/V006 authorising,

Knauf Insulation Limited (“the operator”)

whose registered office is

**PO Box 10
Stafford Road
St Helens
Merseyside
WA10 3NS**

company registration number **01926842**

to operate a regulated facility at

**Queensferry Mineral Fibre Works
Chemistry Lane
Queensferry
Deeside
Flintshire
CH5 2DA**

to the extent authorised by and subject to the conditions of this permit.

Name	Date
	31 July 2015

Eirian Macdonald

Authorised on behalf of Natural Resources Wales

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
- (b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

1.2.1 The operator shall:

- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
- (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
- (b) maintain records of raw materials and water used in the activities;
- (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
- (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by Natural Resources Wales.
- (b) If notified by Natural Resources Wales that the activities are giving rise to pollution, the operator shall submit to Natural Resources Wales for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.
- 2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.3 Waste shall only be accepted if:
- (a) it is of a type and quantity listed in schedule 2 table S2.2; and

- (b) it conforms to the description in the documentation supplied by the producer and holder.
- 2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
 - (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by Natural Resources Wales.
- 2.4.2 Except in the case of an improvement which consists only of a submission to Natural Resources Wales, the operator shall notify Natural Resources Wales within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 The Operator shall carry out monitoring of groundwater at least once every 5 years; and of soil at least once every 10 years; to the protocol agreed in writing with Natural Resources Wales under IC31.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:

- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution, submit to Natural Resources Wales for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

- 3.3.1 The operator shall, unless otherwise agreed in writing by Natural Resources Wales, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- (a) point source emissions specified in tables S3.1 and S3.2 ;and S3.3
- 3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by Natural Resources Wales.
- 3.3.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by Natural Resources Wales.
- 3.3.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that
- (a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

Carbon monoxide	10%
Sulphur dioxide	20%
Nitrogen dioxide	20%
Total dust	30%
 - (b) valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.3.5(a);
 - (c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are

- available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;
- (d) daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than five half-hourly average values in any day have been determined not to be valid;
 - (e) no more than ten daily average values per year shall be determined not to be valid.

3.4 Odour

- 3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.4.2 The operator shall:
 - (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to odour, submit to Natural Resources Wales for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
 - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

3.5 Noise and vibration

- 3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.
- 3.5.2 The operator shall:
 - (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to noise and vibration, submit to Natural Resources Wales for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
 - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

4 Information

4.1 Records

- 4.1.1 All records required to be made by this permit shall:
 - (a) be legible;

- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by Natural Resources Wales, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by Natural Resources Wales.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to Natural Resources Wales using the contact details supplied in writing by Natural Resources Wales.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) the performance parameters set out in schedule 4 table S4.2 using the forms specified in table S4.3 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by Natural Resources Wales, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.3 ; and
- (c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to Natural Resources Wales, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.3 Notifications

- 4.3.1 (a) In the event that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

- (i) inform Natural Resources Wales,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
- (b) in the event of a breach of any permit condition the operator must immediately—
- (i) inform Natural Resources Wales, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) in the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where Natural Resources Wales has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform Natural Resources Wales when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to Natural Resources Wales at least 14 days before the date the monitoring is to be undertaken.

4.3.4 Natural Resources Wales shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:
- (a) Natural Resources Wales shall be notified at least 14 days before making the change; and
 - (b) the notification shall contain a description of the proposed change in operation.
- 4.3.6 Natural Resources Wales shall be given at least 14 days notice before implementation of any part of the site closure plan.
- 4.3.7 Where the operator has entered into a climate change agreement with the Government, Natural Resources Wales shall be notified within one month of:
- (a) a decision by the Secretary of State not to re-certify the agreement;
 - (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
 - (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

- 4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.
- 4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “without delay”, in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities

Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity and waste types
Section 3.4 Part A(1)(a)	Melting mineral substances in plant with a melting capacity of more than 20 tonnes per day	From receipt of raw materials, storage and materials handling to processing of product and packaging.
	R5: Recycling/reclamation of other inorganic materials	Wastes as specified in Table S2.2
	R13: Storage of wastes pending any of the operations R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced.	

Directly Associated Activity

-	-	-
---	---	---

Table S1.2 Operating techniques

Description	Parts	Date Received
Application	The response to question B2.3 given in sections B2.3 of the application	31/07/02
Supplementary Information	Information provided in Section 2 of the supplementary information	09/03
Supplementary Information	Information provided throughout the document	11/03
Schedule 4 Notice Issued 17th March 2004	Responses to questions 7, 8, 9, 10, 11 and 12	14/04/04
Definition of "melt" submitted 25/08/04	All	25/08/04
Variation Application NP3835SW	Responses to question C2.1 to C12.	07/12/04
Variation Application EA/EPR/BR9383ID/V003	Responses to question C2	
Queensferry Site Groundwater Baseline Condition Report 29/09/04	All	Agreed 20/10/04
Queensferry Site Proposed Changes to Melting and Forming 29/09/04	All	Agreed 8/02/05
Queensferry Site Proposed Changes to Product Finishing Plant Report 29/09/04	All	Agreed 8/02/05
Proposed changes to Process Operation- Permit Number BR9383 4/05/07	All	Agreed 14/05/07
Variation Application EPR/BR9383ID/V003	Responses to question C2	11/09/08
Supplementary Information	All	27/11/08

Table S1.2 Operating techniques

Description	Parts	Date Received
Release Point "O" Queensferry Mineral Fibre Works	Explanation relating to the removal of emission point O	14/01/09
Variation Application EPR/BR9383ID/V004	All	15/11/10
Supplementary Information received by e-mail	All	07/11/11
Letter detailing operational change agreement - cessation of the requirement for boundary dust monitoring	All	28/08/13
Letter detailing operational change agreement - reduction in the operating temperature of the cupola abatement oxidiser.	All	03/10/13
Information received in support of Natural Resources Wales Glass Sector Permit Review 2014	All parts of operator response to Regulation 60 (1) notice	30/05/14
Letter detailing operational change agreement - reduction in the operating temperature of the oven abatement oxidiser	All	26/11/14

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IC31	The Operator shall submit the written protocol referenced in condition 3.1.3 for the monitoring of soil and groundwater for approval by Natural Resources Wales. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from Natural Resources Wales.	31/12/15
IC32	The Operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.	07/03/15
IC33	Bat AEL's only apply during normal operating conditions, therefore, the operator shall submit a written report defining the parameters of normal operating conditions for each plant item for which BAT AEL's apply for approval by Natural Resources Wales.	6 months from permit variation issue date
IC34	The operator shall submit proposals detailing improvements to the abatement equipment for the mainline cooling zone to Natural Resources Wales.	12 months from permit variation issue date
IC35	The improvements to the mainline cooling zone shall be implemented within 12 months following the written approval of the improvement proposals from Natural Resources Wales.	As agreed in writing with Natural resources Wales

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IC36	The operator shall confirm in writing to Natural Resources Wales whether the daily average limit for SO ₂ continuous monitoring or the mass emission per tonne of melted glass will be the most appropriate limit for the site. The decision shall be fully justified and agreed in writing by Natural Resources Wales.	15/01/16

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels

Raw materials and fuel description	Specification
-	-

Table S2.2 Permitted waste types and quantities for the installation

Waste code	Description
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 06	insulation materials and asbestos-containing construction materials
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03

Schedule 3(a) – Emissions and monitoring

Emissions until 7th March 2016

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A on Site Plan EP 2015	Cupola Stack After Oxidiser	Particulate matter	30 mg/Nm ³	Daily average	Continuous	EN 15267-1 EN 15267-2 BS EN 15267-3
		Oxides of nitrogen (expressed as NO ₂)	300 mg/Nm ³	Daily average	Continuous	BS EN 15267-3
		Oxides of sulphur (expressed as SO ₂)	1350 mg/Nm ³	Daily average	Continuous	BS EN 15267-3
		Sulphur dioxide	1.8 kg /tonne	Monthly average	Calculated from continuous monitoring data	Calculated
		Carbon monoxide	80 mg/Nm ³	Daily average	Continuous	BS EN 15267-3
		Chlorides (expressed as hydrogen chloride)	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 1911: 2010
		Fluorides (expressed as hydrogen fluoride)	5 mg/Nm ³	As per standard method	Annually in triplicate	BS ISO 15713: 2006
		Hydrogen sulphide	5 mg/Nm ³	As per standard method	Annually in triplicate	US EPA Method 11
		Metals (groups 1 & 2)	5 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 14385
		Metals (group 1)	1 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 14385
		Dioxins ng/Nm ³	No limit set	As per standard method	Annually	BS EN 1948-1: 2005
		Particulate	For calibration purposes- no limit	As per standard method	Annually	BS EN 13284-1:2002
		Oxides of Nitrogen	For calibration purposes- no limit	As per standard method	Annually	BS EN 14792: 2005
		Oxides of sulphur	For calibration purposes- no limit	As per standard method	Annually	BS EN 14791: 2005 TGN M21 calibration

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon Monoxide	For calibration purposes- no limit	As per standard method	Annually	BS EN 15058: 2006
B on Site Plan EP 2015	Emergency Stack from cupola	No parameters set	No limits set	-	-	-
C on Site Plan EP 2015	Mainline Forming Stack	Particulate Matter	50 mg/Nm ³	As per standard method	6 monthly in triplicate	BS EN 13284-1: 2002
		Volatile Organic Compounds as C	50 mg/Nm ³	As per standard method	6 monthly in triplicate	BS EN 12619: 2013
		Ammonia	50 mg/Nm ³	As per standard method	6 monthly in triplicate	BS EN 14791
		Formaldehyde	10 mg/Nm ³	As per standard method	6 monthly in triplicate	US EPA Method 316
		Phenol	10 mg/Nm ³	As per standard method	6 monthly in triplicate	BS EN 13649
		Amines	20 mg/Nm ³	As per standard method	6 monthly in triplicate	BS EN 13649
D on Site Plan EP 2015	Binder Fume Plant Extraction	Particulate Matter	No limit set	As per standard method	Annually in triplicate	BS EN 13284-1:2002
		Volatile Organic Compounds as C	No limit set	As per standard method	Annually in triplicate	BS EN 12619: 2013
		Ammonia	No limit set	As per standard method	Annually in triplicate	BS EN 14791
		Formaldehyde	No limit set	As per standard method	Annually in triplicate	US EPA Method 316
		Phenol	No limit set	As per standard method	Annually in triplicate	BS EN 13649
		Amines	No limit set	As per standard method	Annually in triplicate	BS EN 13649
F on Site Plan EP 2015	Main line curing oven	Particulate Matter	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13284-1: 2002
		Volatile Organic Compounds as C	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 12619: 2013
		Ammonia	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 14791

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Formaldehyde	5 mg/Nm ³	As per standard method	Annually in triplicate	US EPA Method 316
		Phenol	5 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13649
		Amines	5 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13649
		Nitrous oxides	No limit set	As per standard method	Annually in triplicate	TGN M22
		Nitrogen Dioxide	No limit set	As per standard method	Annually in triplicate	BS EN 14792
G on Site Plan EP 2015	Main line Cooling Zone Stack	Particulate Matter	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13284-1: 2002
		Volatile Organic Compounds as C	15 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 12619: 2013
		Ammonia	10 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 14791
		Formaldehyde	5 mg/Nm ³	As per standard method	Annually in triplicate	US EPA Method 316
		Phenol	5 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13649
		Amines	5 mg/Nm ³	As per standard method	Annually in triplicate	BS EN 13649
H on Site Plan EP 2015	Tenkay Filter	No parameters set	No limits set	-	-	-
M on Site Plan EP 2015	Edge Trim return and recycle extracted air	No parameters set	No limits set	-	-	-
P1 to P7 on Site Plan EP 2015	Filtered release points on bulk silos	No parameters set	No limits set	-	-	-
Q on Site Plan EP 2015n	Emergency Diesel Powered Generator	No parameters set	No limits set	-	-	-
R on Site Plan EP 2015	Kerosene Burner	No parameters set	No limits set	-	-	-
T on Site Plan EP 2015	Domestic boiler	No parameters set	No limits set	-	-	-
V on Site Plan EP 2015	Factory Roof Vents	No parameters set	No limits set	-	-	-
X on Site Plan EP 2015	Firewater Pump	No parameters set	No limits set	-	-	-

Notes to Table S3.1

- Group 1 metals (and their compounds): arsenic, cobalt nickel, selenium, chromium VI
- Group 2 metals (and their compounds): antimony, lead, chromium III, copper, manganese, vanadium, tin
- When continuous monitoring is carried out (except carbon monoxide) not more than one half hour period during any 24 hour period commencing at midnight shall exceed the limit by more than 50%
- To obtain a valid daily average value no more than five half hourly average values in any day shall be discarded due to malfunction or maintenance of the continuous measurement system. No more than ten daily average values per year shall be discarded due to malfunction and maintenance of the continuous measurement system.
- CEMs which meet the MCERTS requirements will also meet the requirements of BS EN 15267-3

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
L1 on Site Plan EP 2015	pH	Surface drainage	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall and only when the outlet is open to discharge to controlled water.
	COD	from raw materials handling area in south of site via interceptor	No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L2 on Site Plan EP 2015	pH	Surface drainage	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall and only when the outlet is open to discharge to controlled water.
	COD	from raw materials handling area in south of site via interceptor	No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L3 on Site Plan EP 2015	pH	Roof drainage	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall and only when the outlet is open to discharge to controlled water.
	COD	from main ADA building	No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L4 on Site Plan EP 2015	pH	Roof and surface drainage	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD	from western end of site via trapped gullies	No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
L5 on Site Plan EP 2015	pH	Roof and surface drainage from mid section of site via gullies and interceptors	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L6 on Site Plan EP 2015	pH	Yard area on southern side of site	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
S1 on Site Plan EP 2015	Phenol	Effluent Recirculating system and base exchange unit	No limit set	-	During each batch or effluent being discharged to sewer	As per response to improvement programme item 1
	Total phenolic					
	Formaldehyde					
	Fluoride					
	Ammonia					
	pH					
	COD					
	Suspended Solids					
	Oil and Grease					
	Flow					

Schedule 3(b) – Emissions and monitoring

Emissions from 8th March 2016

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A on Site Plan EP 2015	Cupola Stack After Oxidiser	Particulate matter	20 mg/Nm ³	Daily average	Continuous	EN 15267-1 EN 15267-2 BS EN 15267-3 ^{Note4} ^{Note5}
		Oxides of nitrogen (expressed as NO ₂)	300 mg/Nm ³	Daily average	Continuous	BS EN 15267-3 ^{Note4} ^{Note5}
		Oxides of sulphur (expressed as SO ₂)	1350 mg/Nm ³	Daily average	Continuous	BS EN 15267-3 ^{Note4} ^{Note5}
		Sulphur dioxide	1350 mg/Nm ³ ^{Note3, Note6}	Daily average	Calculated from continuous monitoring data	TGN M21 – Instrumental Sampling or TGN M22 if FTIR sampling technique ^{Note4} ^{Note5}
		Carbon monoxide	80 mg/Nm ³	Daily average	Continuous	BS EN 15267-3 ^{Note5}
		Chlorides (expressed as hydrogen chloride)	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 1911: 2010
		Fluorides (expressed as hydrogen fluoride)	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS ISO 15713: 2006 in conjunction with MID ISO 15713
		Hydrogen sulphide	2 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	US EPA Method 11

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Group 1 Metals ^{Note1}	1 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 14385:2005 in conjunction with MID 14385 For Chromium _{VI} use US EPA Method 0061 in conjunction with BS EN ISO 23210
		Group 2 Metals ^{Note2}	2 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 14385:2005 in conjunction with MID 14385 For Chromium _{VI} use US EPA Method 0061 in conjunction with BS EN ISO 23210
B on Site Plan EP 2015	Emergency Stack from cupola	No parameters set	No limits set	-	-	-
C on Site Plan EP 2015	Mainline Forming Stack	Particulate Matter	50 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS E13284-1: 2002 in conjunction with MID 13284-1
		Volatile Organic Compounds as C	30 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 12619: 2013
		Ammonia	50 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 14791:2005
		Formaldehyde	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	US EPA Method 316, BS EN 13649

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Phenol	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 13649:2002
		Amines	3 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 13649:2002
D on Site Plan EP 2015	Binder Fume Plant Extraction	Particulate Matter	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13284-1:2002 in conjunction with MID 13241-1
		Volatile Organic Compounds as C	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 12619:2013
		Ammonia	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 14791:2005
		Formaldehyde	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	US EPA Method 316
		Phenol	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13649:2002

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Amines	No limit set	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13649:2002
F on Site Plan EP 2015	Main line curing oven	Particulate Matter	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 13284-1: 2002 in conjunction with MID 13284-1
		Volatile Organic Compounds as C	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 12619: 2013
		Ammonia	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 14791:2002
		Formaldehyde	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	US EPA Method 316
		Phenol	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 13649:2002
		Amines	2 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 13649:2002

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Nitrogen Dioxide	200mg/ Nm ³	Average value of three spot samples of at least 30 minutes each	6 monthly	BS EN 14792: 2005 in conjunction with MID 14792
G on Site Plan EP 2015	Main line Cooling Zone Stack	Particulate Matter	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13284-1: 2002 in conjunction with MID 13284-1
		Volatile Organic Compounds as C	15 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 12619: 2013
		Ammonia	10 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 14791:2005
		Formaldehyde	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	US EPA Method 316
		Phenol	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13649:2002
		Amines	5 mg/Nm ³	Average value of three spot samples of at least 30 minutes each	Annually	BS EN 13649:2002
H on Site Plan EP 2015	Tenkay Filter	No parameters set	No limits set	-	-	-

Table S3.1 Point source emissions to air – emission limits and monitoring requirements from 08/03/16

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
M on Site Plan EP 2015	Edge Trim return and recycle extracted air	No parameters set	No limits set	-	-	-
P1 to P7 on Site Plan EP 2015	Filtered release points on bulk silos	No parameters set	No limits set	-	-	-
Q on Site Plan EP 2015	Emergency Diesel Powered Generator	No parameters set	No limits set	-	-	-
R on Site Plan EP 2015	Kerosene Burner	No parameters set	No limits set	-	-	-
T on Site Plan EP 2015	Domestic boiler	No parameters set	No limits set	-	-	-
V on Site Plan EP 2015	Factory Roof Vents	No parameters set	No limits set	-	-	-

Notes to Table S3.1

- Note 1: Group 1 metals (and their compounds): Arsenic, Cobalt, Nickel, Cadmium, Selenium, Chromium_{VI}
- Note 2: Group 2 metals (and their compounds): Arsenic, Cobalt, Nickel, Cadmium, Selenium, Chromium_{VI}, Antimony, Lead, Chromium_{III}, Copper, Manganese, Vanadium, Tin
- Note 3: Concentrations in mg/Nm³ shall be converted to kg/tonne of melted glass using the calculation procedure described in the “Conversion from concentrations to specific mass emissions” set out in Table 2 (pages 8 & 9) of the BAT Conclusions document for the manufacture of glass.
- Note 4: When continuous monitoring is carried out (except carbon monoxide) not more than one half hour period during any 24 hour period commencing at midnight shall exceed the limit by more than 50%
- Note 5: CEMs which meet the MCERTS requirements will also meet the requirements of BS EN 14181
- Note 6: Subject to Improvement condition 36

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
L3 on Site Plan EP 2015	pH	Roof drainage from main ADA building	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall and only when the outlet is open to discharge to controlled water.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L4 on Site Plan EP 2015	pH	Roof and surface drainage from western end of site via trapped gullies	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		None visible			
L5 on Site Plan EP 2015	pH	Roof and surface drainage from mid-section of site via gullies and interceptors	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		No visible			
L6 on Site Plan EP 2015	pH	Yard area on southern side of site	No limit set		Every 6 months	Sampling to be carried out during a period of rainfall.
	COD		No limit set			
	Total Suspended Solids		No limit set			
	Oil and grease		No visible			

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
S1 on Site Plan EP 2015	None Set	Effluent Recirculating system and base exchange unit	No limit set	-	-	-

Schedule 4 - Reporting

Table S4.1 Reporting of monitoring data

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air	A, C, D, F, G,	<u>Every 12 Months</u>	1 January
Parameters as required by condition 3.3.1	<u>C</u>	<u>Every 6 Months</u>	
	A	Every 3 Months	
Emissions to water	L3, L4, L5, L6	Every 6 Months	1 January
Parameters as required by condition 3.3.1			

Table S4.2 Performance parameters

Parameter	Frequency of assessment	Units
Emergency stack operating times	Annually	Total hours operating with by-pass stack open
Total Energy Used	Annually	MWh
Water usage	Annually	Tonnes

Table S4.3 Reporting forms

Media/parameter	Reporting format	Date of form
Air	Form air 1a to air1f or other form as agreed in writing by Natural Resources Wales	31/07/15
Water	Form water 1 or other form as agreed in writing by Natural Resources Wales	31/07/15
Sewer	Form sewer 1 or other form as agreed in writing by Natural Resources Wales	31/07/15
Performance indicators	Form performance 1 or other form as agreed in writing by Natural Resources Wales	31/07/15

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any activity that gives rise to an incident or accident which significantly affects or may significantly affect the environment	
To be notified Immediately	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a permit condition	
To be notified immediately	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) In the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment:

To be notified immediately

Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

“*Annex I*” means Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*Annex II*” means Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*Authorised officer*” means any person authorised by Natural Resources Wales under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“*Accident*” means an accident that may result in pollution.

“*Application*” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“*Building*” means a construction that has the objective of providing sheltering cover and minimising emissions of noise, particulate matter, odour and litter.

“*D*” means a disposal operation provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*Emissions to land*” includes emissions to groundwater.

“*EP Regulations*” means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“*Emissions of substances not controlled by emission limits*” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“*Groundwater*” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“*Groundwater protection zones 1 and 2*” have the meaning given in the document titled “Groundwater Protection: Policy and Practice” published by the Environment Agency in 2006.

“*Industrial Emissions Directive*” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

“*MCERTS*” means the Environment Agency’s Monitoring Certification Scheme.

“*R*” means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*Waste code*” means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

Parliament and of the Council on waste

“*Year*” means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- (a) in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- (b) in relation to emissions from other sources (none melting, downstream processes), the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa with no correction for oxygen.

