

## **Environment Agency**

### **Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)**

#### **Decision document recording our decision-making process following review of a permit**

The Permit number is:     EPR/BQ4335IC

The Operator is:            Knauf Insulation Ltd

The Installation is:         Ravenhead Insulation Works

This Variation number is:  EPR/BQ4335IC/V007

Consultation: No consultation is required for a standard variation.

#### **What this document is about**

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the Glass industry sector published on 8<sup>th</sup> March 2012 and other relevant BAT Conclusions published prior to this date. This is our decision document, which explains the reasoning for the consolidated variation notice that we are issuing.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions ('BAT Conclusions') for the manufacture of Glass as detailed in document reference 2012/134/EU. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have disappeared because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

## **How this document is structured**

1. Our proposed decision
2. How we reached our decision
3. The legal framework
4. Annex 1- Review of operating techniques within the Installation against BAT Conclusions
5. Key Issues
6. Annex 2 – Review and assessment of derogation request(s) made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value.
7. Annex 3 – Improvement Conditions
8. Annex 4: Advertising and Consultation on the draft decision

# 1 Our proposed decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

## 2 How we reached our decision

### 2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 19<sup>th</sup> December 2013 requiring the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice also required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 8/03/2016, which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 8/03/2016, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 60 Notice requested that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 60 Notice response from the Operator was received on 30<sup>th</sup> May 2014.

We considered that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the Operator. Suitable further information was provided by the Operator on 9<sup>th</sup> October 2014 and 9<sup>th</sup> January 2015.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

## 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we consider that the operator will be able to comply with the techniques and standards described in the BAT Conclusions other than for those techniques and requirements described in BAT Conclusion 1.1.4 (11). In relation to this/these BAT Conclusion(s), we do not fully agree with the operator in respect to their current stated capability as recorded in their Regulation 60 Notice response. We have therefore included Improvement Condition IC 19. in the Consolidated Variation Notice, which requires them to upgrade their operational techniques so that the requirements of the BAT Conclusion are delivered.

## 2.3 Requests for Further Information

In addition to the response(s) to our further information request(s), we received additional information during the determination from *Knauf on the 9<sup>th</sup> October 2014 and 9<sup>th</sup> January 2015*. We made a copy of this information available to the public in the same way as the response(s) to our information request

### 3 The legal framework

The Consolidated Variation Notice will be issued, under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- Subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

## Annex 1: decision checklist regarding relevant BAT Conclusions

BAT Conclusions for the Manufacturing of Glass, were published by the European Commission on 8th March 2012. There are 76 BAT Conclusions. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice.

*All BAT Conclusions arising are listed by number in order below.*

BAT Conclusion No	Summary of BAT Conclusion requirement	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement	Status NA/ C / FC / NC
<b>General BAT Conclusions for the manufacture of Glass</b>			
1	BAT is to implement and adhere to an environmental management system (EMS).	ISO 14001 certificate number BE008876/1	CC
2	BAT is to reduce the specific energy consumption by using one or a combination of techniques	The response addresses process optimisation, regular maintenance, optimising furnace design, combustion control techniques, increased cullet levels (reuse), waste heat recovery and pre-heating. Knauf have investigated energy recovery however contamination issues and optimising the Electrostatic Precipitator have resulted in the project being abandoned.	CC
3	BAT is to prevent, or where that is not practicable, to reduce diffuse dust emissions from the storage and handling of solid materials by using one or a combination techniques:	The response addresses storage of bulk materials, fine particulate material, dusty materials, and damping down techniques. It also details handling techniques including the use of enclosed conveyers, particulate abatement filters, moistening batches, negative pressure within furnace, decrepitation, and filter for small lot handling, enclosed screw feeds, and enclosed feed pockets.	CC

4	BAT is to prevent, or where that is not practicable, to reduce diffuse gaseous emissions from the storage and handling of volatile raw materials by using one or a combination of techniques:	The response addresses the use of low solar absorbency paint(N/A), storage temperature control(N/A), tank insulation for storing VOCs(N/A), inventory management(SAP System used), floating roof tanks(N/A), vapour return transfer systems(N/A), bladder roof tanks(N/A), pressure/vacuum valves to equalise pressure(N/A), application of absorption/adsorption/condensation to storing materials(small scrubber for Ammonia tank) and subsurface filling to reduce foaming(N/A).	CC
5	BAT is to reduce energy consumption and emissions to air by carrying out a constant monitoring of the operational parameters and a programmed maintenance of the melting furnace.	<p>The furnace is a combination furnace using electrodes and oxy-gas flames. The furnace operation is monitored at the control room. The operational parameters that are continually monitored are air flow, electrical current and raw material loading rate. Furnace temp and CEMS data for particulates, CO, NOx and SOx are constantly monitored via SCADA linked system. The operators adjust the furnace control parameters following the procedures for furnace control to ensure fibre quality.</p> <p>The Knauf internal furnace expert carries out regular reviews of the furnace operation and condition and prepares a report for the plant manager. Twice a year, the site's furnace and ducting are inspected as far as the electrostatic precipitator so as to track wear of refractory and equipment and the main objectives to scope, budget and schedule necessary repairs, and to look for opportunities of improvement in furnace operation and design. Process critical recommendations within the report are implemented as a priority by the Plant Manager. In addition shift and daily inspections by the furnace operators are carried out which results minor maintenance items such as, refractory block sealing, electrode and burner erosion, etc., being undertaken as required.</p>	CC

6	<p>BAT is to carry out a careful selection and control of all substances and raw materials entering the melting furnace in order to reduce or prevent emissions to air by using one or a combination of techniques.</p>	<p>Knauf St Helens has a cullet specification for the cullet bought in from external suppliers. The cullet suppliers provide a certificate of conformance to the Knauf specification. The specification has a limit for metals, due to the product there is no limit for chlorides or fluorides. Knauf St Helens aims to build long term arrangements with suppliers allowing for improvements in quality management by suppliers working in conjunction with Knauf to achieve the specification in cullet quality at the volumes and price required by Knauf St Helens. If a new supplier, or an issue with an existing supplier, is identified then Knauf St Helens will sample the cullet and undertake compositional analysis against the required specification. The site uses oxy/gas fuel.</p>	CC
7	<p>BAT is to carry out monitoring of emissions and/or other relevant process parameters on a regular basis.</p>	<p>Operational parameters are continually monitored for air flow and electrical current and raw material loading rate. Furnace temp and CEMS data for particulates, CO, NOx and SOx constantly monitored via SCADA linked system.</p> <p>This is in addition to half yearly MCERTS monitoring as required by the permit. For other release points included in the permit, half yearly or yearly monitoring is undertaken as required by the permit. For other release points, surrogate parameters such as water jet impinger flows, (which are alarmed at a pre-set flow limit), electrostatic precipitator fan speed/current, electrostatic precipitator unit voltages and pressure drop across filters, etc, are used to indicate the correct operation of the relevant abatement systems. Failure of such critical systems would alarm in the relevant control room</p> <p>Emissions are routinely tested using an MCERTs test team twice per year apart from metals which are tested annually.</p>	CC

8	BAT is to operate the waste gas treatment systems during normal operating conditions at optimal capacity and availability in order to prevent or reduce emissions	When the electrostatic precipitator requires maintenance, this is shut down and the furnace emissions are via the bypass stack. Site has a procedure for the shut down of the electrostatic precipitator for maintenance, which aims to minimise and limit the time taken for the maintenance. This occurs approx 3 times / year and the Agency are informed of this before the event. System monitors and alarms would alert the operators to significant variances of critical parameters, on abatement systems for the furnace (ESP), and the process would be operated at reduced capacity until the issue was addressed. For the wet ESP on the downstream process insufficient waste gas flow or temperature would result in a 60 minute critical alarm that if not addressed would shut the individual line. Meets BAT.	CC
9	BAT is to limit carbon monoxide (CO) emissions from the melting furnace, when applying primary techniques or chemical reduction by fuel, for the reduction of NOX emissions	Oxy gas fuel is used to limit NOx and CO emissions with low - NOx burners. The oxygen/air: fuel ratio and furnace temperature are monitored constantly and adjusted accordingly to ensure efficient combustion. Hydrocarbon fuel addition to the waste gas stream is not used. CO limit is not applicable as primary technique is employed (oxy gas fuel supply)	CC
10	BAT is to limit ammonia (NH <sub>3</sub> ) emissions, when applying selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) techniques for a high efficiency NOX emissions reduction	SCR / SNCR not used on site and therefore an Ammonia limit does not apply.	N/A

11	BAT is to reduce boron emissions from the melting furnace, when boron compounds are used in the batch formulation, by using one or a combination of techniques	The furnace emissions are abated using a dry electrostatic precipitator that will remove particulate phase boron. It is operated at optimum temperature for the electrostatic precipitator and removal of particulate. Boron testing will be added to the routine MCERTS testing programme from 2014 see improvement condition IC19 (9.19)	FC
12	BAT is to reduce water consumption by using one or a combination of techniques	<p>The overall approach to the use of cleaning water is to maximise the use of water of different condition in appropriate applications, (cascade system) until the condition of the water is such that it needs to be discharged and then fresh water added to the system at the top of the cascade system. In this way, wash water is reused in the Forming jet impingers and cyclones and oven impingers and cleaner process water is used in the cooling zone impingers and white wool impingers and cyclone. Through the design of purge and overflow arrangements between these basic systems, the reuse of water of an appropriate condition is maximised. The site also captures and recycles wash water from the wastewater collection system such that there is minimal discharge of wastewater to sewer. The proposed furnace rebuild in 2015 will reduce water use, with the aim being zero discharge to sewer by 2020. There are also arrangements for the collection and use of clean surface water to use as system top up water, with mains water only used when process requirements cannot be met from these sources.</p> <p>In addition to the above, there is also the use of a separate cooling water recirculation system from the cooling towers and wet electrostatic precipitator (EP) which are part of the cascade water reuse system, minimising the use of clean water.</p> <p>The site also has an inspection and maintenance programme to minimise leaks.</p>	CC

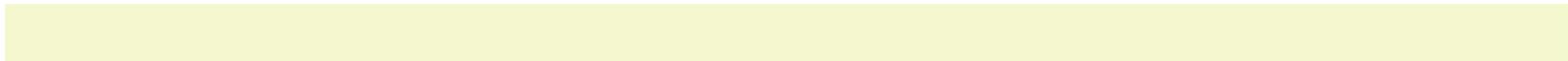
13	BAT is to reduce the emission load of pollutants in the waste water discharges by using one or a combination of waste water treatment systems	<p>There is no direct wastewater discharge to surface waters at Knauf St Helens. (Any waste water is discharged to sewer). The remaining process water, once it has been reused, as described in BAT12, will be treated by centrifuges and corrected for pH prior to discharge to the sewer. The sewer discharge then receives further treatment at the urban wastewater treatment works before ultimately being discharged to surface water. Clean site surface run off water, e.g. from clean areas and roofs is discharged to surface water.</p> <p>The internal wash water is due to be reviewed after the furnace is replaced in 2015. This review will look to reduce overall water usage and emissions to sewer. As part of the review it will also include an optional appraisal to reduce COD/BOD etc.</p>	CC
14	BAT is to reduce the production of solid waste to be disposed of by using one or a combination of techniques	<p>The formulation of the correct batch composition and management of the production process minimises waste during manufacturing and reduces the chance of an off specification batch. Where a batch is not to specification, following analysis, the batch recipe is corrected and reused. Where a batch cannot be reused in the manufacturing process on site it is reused with the wet fibre by a third party re-processor (external).</p> <p>All storage and handling of raw materials is via silos therefore, handling losses are minimised.</p> <p>Internal cullet is recycled and remelted in the furnace as is dust from the bag filters and dry electrostatic precipitators.</p> <p>Wet fibre is re-processed at a 3<sup>rd</sup> party site.</p>	CC

15	BAT is to reduce noise emissions by using one or a combination of techniques	Noise survey carried out for the original permit application, noise management plan as per IC2 (9.2) of permit version 4 2011. When new equipment is installed, if appropriate, a review of the noise impact is carried out. No noise complaints in 5 years Plant and equipment is enclosed where appropriate	CC
<b>BAT Conclusions for container glass manufacturing – not applicable (16-23)</b>			<b>N/A</b>
<b>BAT Conclusions for flat glass manufacturing – not applicable (24 – 31)</b>			<b>N/A</b>
<b>BAT Conclusions for continuous filament glass manufacturing – not applicable (32 – 37)</b>			<b>N/A</b>
<b>BAT Conclusions for domestic glass manufacturing – not applicable (38 – 47)</b>			<b>N/A</b>
<b>BAT Conclusions for special glass manufacturing – not applicable (48 – 55)</b>			<b>N/A</b>
<b>BAT Conclusions for mineral wool manufacturing</b>			
56	BAT is to reduce dust emissions from the waste gases of the melting furnace by applying an electrostatic precipitator or a bag filter system	Dry electrostatic precipitators are used on the outlet of the furnace Knauf emission limits will comply with the BAT-AEL	CC
57	BAT is to reduce NOX emissions from the melting furnace by using one or a combination of the following technique	Knauf permit emission limit complies with BAT-AEL	CC
58	When nitrates are used in the batch formulation for glass wool production, BAT is to reduce NOX emissions by using one or a combination of techniques:	The site does not add nitrates to the formulation and therefore the 700mg/m <sup>3</sup> Limit does not apply. The present limit 300mg/m <sup>3</sup> which is lower than the limit in BAT 58	NA

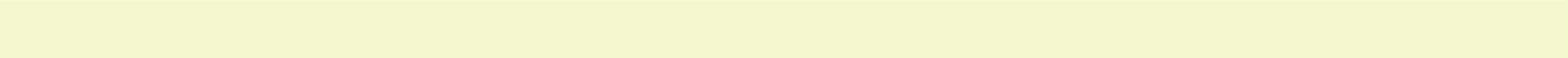
59	BAT is to reduce SOX emissions from the melting furnace by using one or a combination of techniques	<p>Oxy - gas (natural gas) and electricity are used as fuels which do not contain sulphur.</p> <p>The furnace emissions are treated using a dry electrostatic precipitator. The main source of sulphur is from the external cullet, Knuaf St Helens is increasing the use of external cullet with the associated environmental benefits. Although compositional analysis of raw materials is periodically undertaken, the use of lower metal / sulphur content raw materials is generally constrained by the availability of raw materials required for the batch formulation. The site work closely with cullet suppliers to secure a consistent source of plate and glass cullet which has impurity levels which can be accepted.</p> <p>The permit limit is 150mg/m<sup>3</sup> which meets the BAT-AEL.</p>	CC
60	BAT is to reduce HCl and HF emissions from the melting furnace by using one or a combination of techniques	<p>The permit emission level for HF is the same as the BAT-AEL and therefore there should be no problem complying with the limit. Knauf's monitoring result for HCl is less than 10mg/m<sup>3</sup> and the last time the results exceeded this was over 7 years ago.</p>	FC
61	BAT is to reduce H <sub>2</sub> S emissions from the melting furnace by applying a waste gas incineration system to oxidise hydrogen sulphide to SO <sub>2</sub>	H <sub>2</sub> S limit is for stone wool furnaces and does not apply to this site	NA

62	BAT is to reduce metal emissions from the melting furnace by using one or a combination of the following technique:	<p>Knauf St Helens has a specification for external cullet that includes metal content as one of the parameters. The external suppliers, who Knauf St Helens aims to develop a long term supply contract with, provide regular compliance reports for the quality and consistency of the cullet.</p> <p>Electrostatic precipitators are employed to reduce the dust and hence particulate phase metals from the furnace exhaust gases.</p> <p>Knauf St Helens have monitored for a range of metals including those listed, the latest MCERTS emissions tests show that these emissions are compliant with the BAT AEL value. Further testing will be undertaken to confirm compliance by 2016.</p>	FC
63	BAT is to reduce emissions from downstream processes by using one or a combination of techniques	<p>The emissions captured from the downstream processes are abated using a minimum of multiple impact jets and cyclones and wet electrostatic precipitators. The white wool line uses a combination of impact jets, drop out boxes and cyclones The process water from the impact jets is recycled.</p> <p>Ammonia - Information supplied 14/10/2014 details emission point A3 result under BAT-AEL. Other emission point limits in the permit are current to BAT-AEL limits.</p> <p>Knauf have combined forming and curing ovens therefore the 30mg/m<sup>3</sup> limit applies rather than the 10mg/m<sup>3</sup> curing oven limit. Information supplied 9/10/14 - latest result exceeded BAT-AEL however this is the first exceedance since Feb 2007 and is unlikely to happen again (resulted from unburned gas in fiberising process). This process has since been modified to prevent likelihood of this occurring again</p>	CC
<b>BAT Conclusions for high temperature insulation wool (HTIW) manufacturing – not applicable (64 – 70)</b>			<b>N/A</b>
<b>BAT Conclusions for Frits manufacturing – not applicable (71 – 76)</b>			<b>N/A</b>

The overall status of compliance with the BAT conclusion is indicated in the table as:



NA Not Applicable  
CC Currently Compliant  
FC Compliant in the future (within 4 years of publication of BAT conclusions)  
NC Not Compliant



## Key Issues

- Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.
- The Emission and Monitoring table (table S3.1 in Schedule 3) has been changed to show the new emission limits transposed from the IED BAT conclusions document which will apply from 8/03/2016.
- The e-mail on 9<sup>th</sup> January 2015 from the operator highlighted that IC17 (9.17) & IC18 (9.18) had not been completed but were now no longer necessary as the operator has been unable to secure sufficient quantities of cullet to undertake the trials. They have requested that the improvement conditions are to be closed as they are no longer relevant. As a result the emission limit will be reduced and an SO<sub>2</sub> daily average of 150mg/m<sup>3</sup> will be introduced into the permit.
- BAT is to limit the carbon monoxide emissions from the melting furnace when applying primary techniques (low NOx burners etc) for the reduction of NOx emissions. A periodic monitoring limit has been set in this permit for CO as the NOx emission limit in the permit is substantially lower than the BAT-AEL.
- The requirement to undertake both periodic monitoring and continuous monitoring for the same parameters (as check monitoring) will be replaced with a continuous monitoring requirement. This is possible because modern certification standards for CEMs include measurement calibration and thus do not need to repeat periodic measurements for calibration purposes. The following notes will be added to the test method:-
  - Continuous Emission Monitoring systems shall be quality assured using the following general principles in BS EN 14181: functional tests with traceable gases or surrogates, and verification with parallel tests using a standard reference method.
- Noise conditions 6.6.1, 6.6.2 (in the original permit) relate to reviewing the noise management plan and detailed noise restrictions on delivery times and use of blowers. Such specifications will not be detailed within the revised noise condition but remain required as “appropriate measures” which is specified within the noise condition.
- We have included a new reporting form (Energy1) to enable the reporting of energy, as this industry is considered energy intensive.

This will monitor energy performance and demonstrate compliance with the narrative BAT 1.1.2 (2) Energy Efficiency.

- BAT Conclusion 13 - Reporting forms Air1 were part of the original permit however the form Sewer 1 has also been added to the reporting requirements as glass is a high water intensive industry and the reporting form is required to demonstrate compliance with the narrative BAT on Water waste treatments
- The BREF includes BAT-AELs for a range of metals (ref BAT 53 and 54) however Knauf have provided recent analysis to show that their emissions are lower than these limits, the BAT-AELs have been included in the Emission and Monitoring requirements and a 12 monthly monitoring frequency has been set.
- The by-pass Conditions 2.3.3, 2.3.4, 2.3.5, 2.3.8 from the original permit relate to operating the Dry and Wet Electrostatic Precipitator on by-pass operation have been transposed into the permit as conditions 2.3.4, 2.3.5, and 2.3.6. A summary of the conditions are below:-

2.3.4 During a period of “abnormal operation” relating to the wet electrostatic precipitator no product shall be cured in the ovens where by-pass operation exceeds 168 hours (7 consecutive days), or whereby the cumulative duration of “abnormal operation” exceeds 480 hours (20 days) over a calendar year period.

2.3.5 During a period of “abnormal operation” relating to the dry electrostatic precipitator no product shall be cured in the ovens where by-pass operation exceeds 168 hours (7 consecutive days), or whereby the cumulative duration of “abnormal operation” exceeds 192 hours (8 days) over a calendar year period.

2.3.6 During a period of planned maintenance of wet or dry electrostatic precipitator the operator shall notify the Environment Agency in writing at least 48hrs in advance of by-pass operation, or in the case of an emergency immediately.

As part of this permit review Improvement condition IC20 has been included in the permit to assess the environmental impact of the emissions when the Electrostatic Precipitators are on by-pass.

- BAT Conclusion 11- In order to comply with this BAT Conclusion an improvement condition (IC19) has been added to measure the concentration of both gaseous and solid forms of Boron in the flue gases with a view to determining effective removal techniques for these species. Performance 1 has also been modified to report/record Boron emissions each year.
- The limit of specified activity “Manufactured products shall not have a binder content of greater than 7% by weight” in table S1.1 has been

removed for consistency between glass sector permits; its relevance following binder resin changes(R232 to R225) and as emissions are already addressed in the monitoring part of the permit.

- Waste codes have been added to the permit to reflect the use of recycled glass cullet which has been used in their process since the original permit BQ4335IC was issued
- Several waste codes have been added to schedule 2 table 2.2 in order to allow glass cullet to be accepted on site. However it is anticipated that the glass will pass the “end of waste” test or Quality Protocol before it is processed through the furnace.

The main reason for utilising glass cullett in the formulation is as a replacement for virgin raw materials and it is not used as a fuel, or for waste disposal, or energy generation and therefore under the definition below it cannot be considered as a Co-Incineration plant and therefore the Waste Incineration Directive does not apply for this activity.

#### Co-Incineration Plant

Industrial emissions Directive EPR Guidance on Part A installations defines a "waste co-incineration plant" as any stationary or mobile technical unit whose main purpose is the generation of energy or production of material products and which uses waste as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated.

**Annex 2: Assessment, determination and decision where an application(s) for Derogation from BAT Conclusions with associated emission levels (AEL) has been requested.**

The IED enables a competent authority to allow derogations from BAT AEL's stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

*By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:*

*(a) the geographical location or the local environmental conditions of the installation concerned; or*

*(b) the technical characteristics of the installation concerned.*

The Operator did not request derogation from compliance with any AEL included within the BAT Conclusions as part of their Regulation 60 Notice response.

### Annex 3: Improvement Conditions

Based in the information in the Operators Regulation 60 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These additional improvement conditions are set out below - a justification for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

Reference	Improvement measure	Completion date
IC 19	<p>The operator shall submit a report on the techniques Knauf propose to use to reduce Boron emissions from the furnace. As a minimum these should include:-</p> <ul style="list-style-type: none"> <li>• Operation of a filter system at a suitable temperature to enhance the separation of boron compounds in the solid state</li> <li>• Use of dry or semi-dry scrubbing</li> <li>• Use of wet scrubbing</li> </ul> <p><b>The report shall identify any improvements together with a proposed timetable for their implementation.</b></p>	27 <sup>th</sup> February 2016
IC20	<p>The operator shall provide a written report to the Environment Agency (for approval in writing) evaluating the impact of emissions during periods of abnormal operations (i.e. when either wet OR dry Electrostatic Precipitator (ESP) plant is non-operational). <i>Consideration should be given for the durations specified within conditions 2.3.4, 2.3.5 and 2.3.6 of this permit.</i></p> <ul style="list-style-type: none"> <li>• Where the impact is considered negligible to that of 'normal operations' the report should include a full justification for such conclusion.</li> <li>• Where the impact is not considered negligible to that of 'normal operations' then the operator must carry out an impact assessment (emissions to air) <i>or emissions modelling</i> to evaluate the impacts from such operations.</li> </ul> <p>Where improvements or modifications are identified, the Operator shall propose timescales for their implementation.</p> <p>The Environment Agency may vary conditions 2.3.4, 2.3.5, 2.3.6 or any other relevant conditions in response to this improvement condition.</p>	8 <sup>th</sup> March 2016

#### **Annex 4: Advertising and Consultation on the draft decision**

The permit and decision document will be published on the Agency website for 28 days after they have been issued.