



CLIENT: Biogen

FAO: Ms Kate Lister

**QUOTATION: Odour abatement for AD
Plant, Separation Building**

EXEON[®]
CLEAN AIR FOR INDUSTRY



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Dear Kate,

We thank you for your recent enquiry and have pleasure in quoting herewith.

We trust our offer will be of interest and assistance, however should you require any additional information or you have any queries relating to the quotation, please do not hesitate to contact us.

Yours sincerely,

Best Regards,

Mark Tilbrook

Sales Director

Mobile Tel: 07848453184

Email: mark.tilbrook@exeon.co.uk

Quote Details

Quote Ref: Q 502445

Client: Biogen

FAO: Kate Lister

RE: Odour abatement for AD Plant, Separation Building

Site notes / Abatement Requirement

Exeon have been asked to provide an Odour Control System for the Separation Building in Biogen Westwood.

The site is expected to take predominantly Food Waste, which will require ventilation for adequate internal air quality and Odour control for the discharge. The requirement is to control odour levels on discharge.

This proposal is for a supply of extraction plant including, filter plant, extract fans, and control system.

System Input Data

Separation Building:

Dimension: 4,400 mm W x 8,000 mm L x 6,000 mm H

Volume: 211.20 m³

Air Changes: 10 ACH

Aiflow Requirement: 2,112 m³/hr

Thresholds:

NH₃: 20 mg/m³

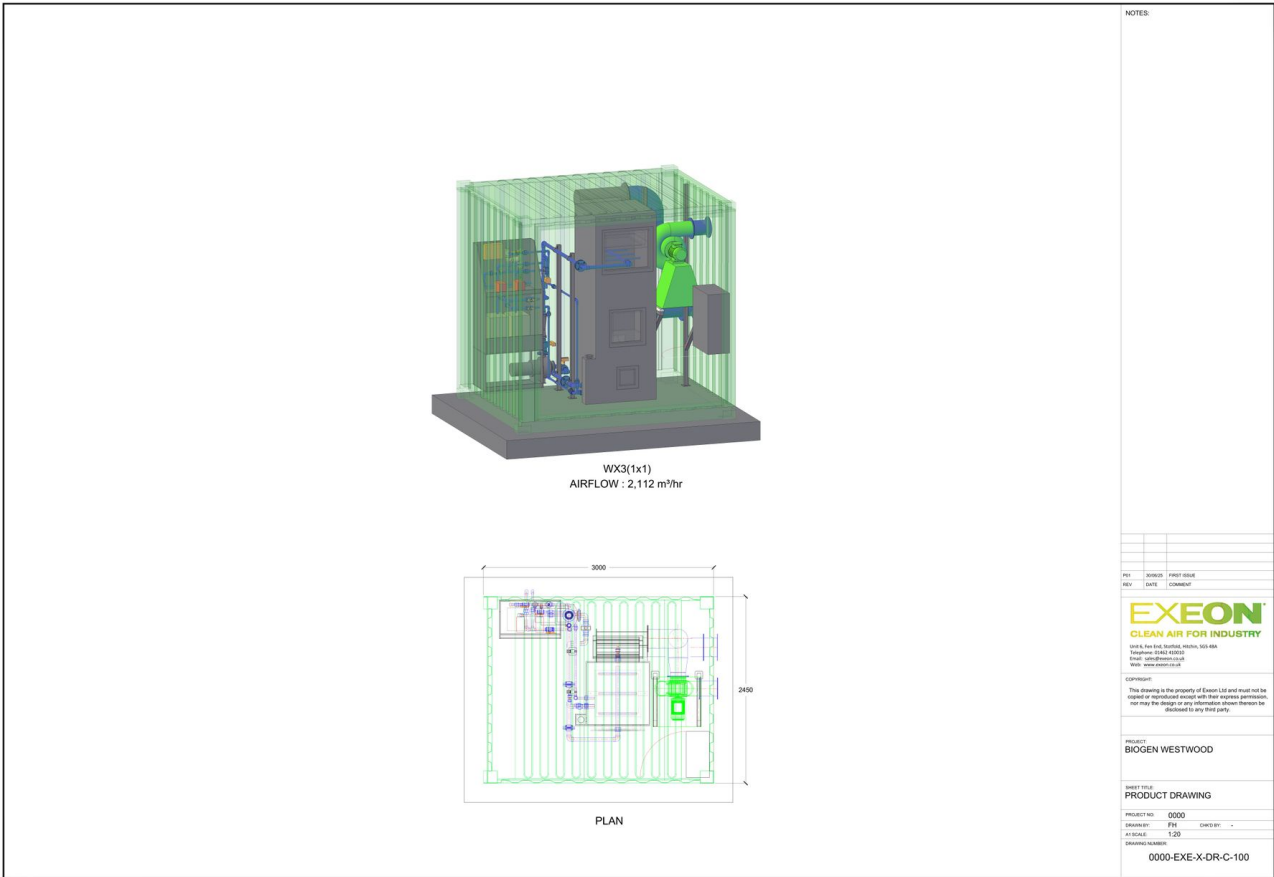
Abatement Selection Process

For the abatement of these odours, we suggest the installation of an WX3(1x1) NH₃ scrubber to control the relatively high NH₃ content. As for the second option, we recommend the installation of a C3 activated carbon system as an essential measure for additional abatement. This system will significantly enhance air quality by effectively adsorbing pollutants.

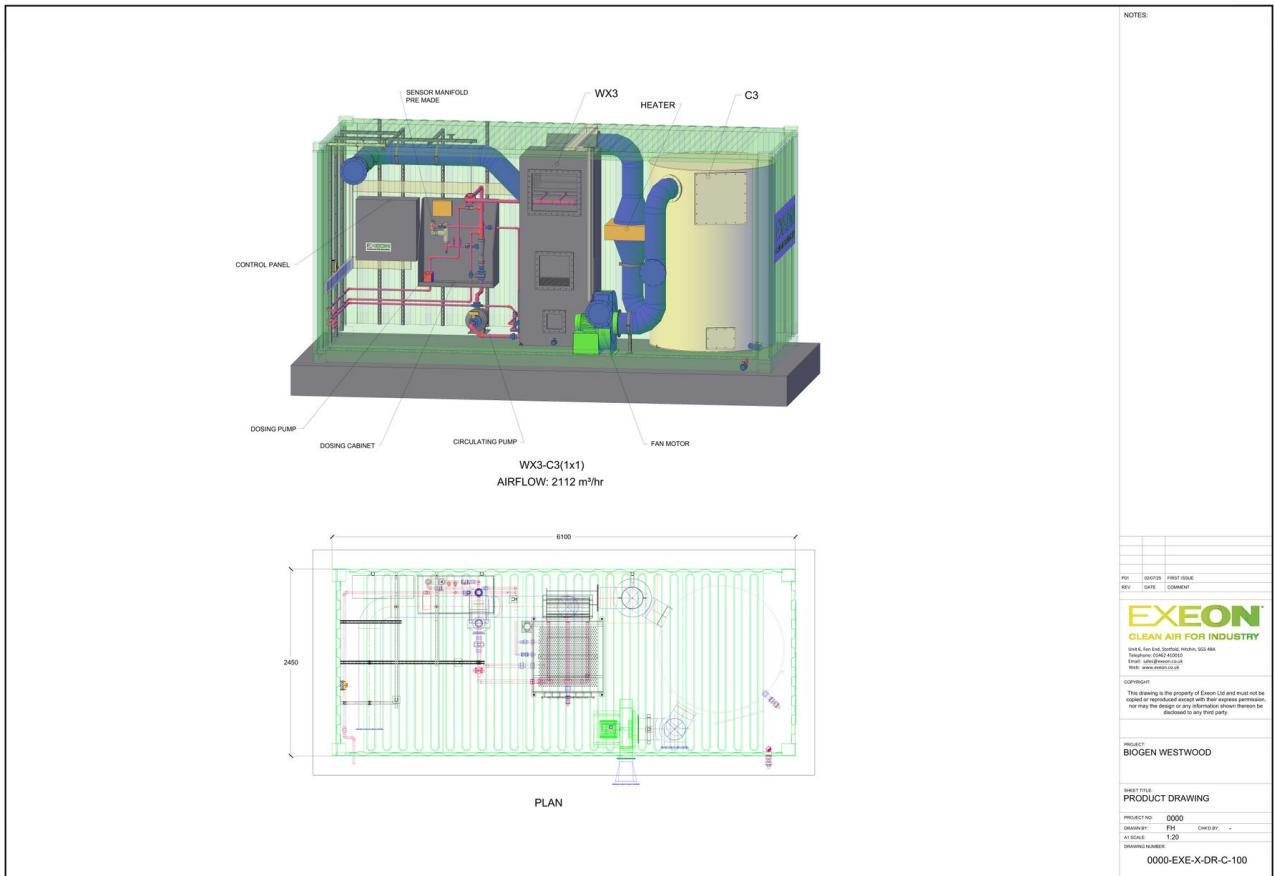
To enhance the system's efficiency and ensure the removal of particulates before they enter, we recommend considering the installation of a DF1(1x1) dust filter unit as an additional option. This installation would provide a significant improvement in filtration and overall air quality.

Chemical discharge guidelines have been based on a maximum discharge threshold of 20 mg/m³.

Option 1 Product Drawing: WX3(1x1)



Option 2 Product Drawing: WX3(1x1) - C3



System Key Features: WX3(1x1)

Features	Comment / Benefit
Modular Configuration	Capacity can be expanded
16 mm Pall Rings	Enables high efficiency within compact system
Automated Chemical Dosing Control	Ensures efficient and adequate chemical use for variation in contaminant concentrations
Spray Nozzles	Creating even distribution of chemical over media bed to ensure adequate contact time
Sump Level Controller	Ensuring automated control of purge
Containerised	Maximum pre-assembly, minimal site disruption and scalable through stacking
Accessible	Open sided for ease of access and optimum visibility of operation
Alarm System	Alerting operator to low chemical level etc
Irrigation Pump System	For optimal recirculation of sump liquor and contact time
Speed Control	Can be increased or decreased depending on demand
GRP Lined Floor	Protection from knocks, chemical spills etc.
PVC Piping	Durable and corrosion resistant
Demister	Preventing carry over of chemical in airstream

System Key Features: C3

Feature	Comment / Benefit
Capacity	Full
Speed Control	Inverters allowed for, for full speed control.
In-line Attenuation	Integrated outlet attenuation.

Price Proposal:

Option 1: Chemical Scrubber System Cost: £100,006.00

This includes cost for a supply of WX3(1x1) scrubber, extract fan, and control system.

Option 2: Activated Carbon and Chemical Scrubber System Cost: £121,430.00

This includes cost for a supply of WX3(1x1) scrubber and a C3, extract fan, and control system.

Extra Optional Cost for: Dust Filter £21,122.000

Specifications

WX3(1x1) NH3 Scrubber

Container: Containerised steel construction.

Duty: Suitable for an airflow of up to 2,112 m³/hr.

Dimensions: 2,900 mm H x 2,450 mm W x 3,000 mm L.

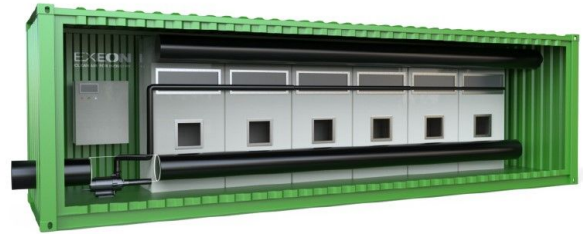
Construction: Recycled polypropylene bed and substructure with 3.0 mm perforated polypropylene sheet. Stainless steel prefilter framework with fully sealed individual prefilter housings

Connection: PVC Piping

Pre-filters: High capacity M5

Accessories: Complete with dosing controller, dosing pumps, level sensors, motorized valves, ball valves, non-return valves, recirculation pump, flow meter, pH probe, conductivity probe, pressure sensor, demister and spray nozzle.

Colour: RAL6029 Green.



C3 Activated Carbon System

Duty: Activated carbon bed type filter system providing a minimum of 3.0 second³ contact time against an airflow of 2,112 m³/hr, situated on top of heavy-duty steel plenum support

Carbon Type: High grade 60 CTC 4 mm pellets

Volume: 0.88 m³

Construction: Welded 4.0 mm polypropylene construction

Inlet / Outlet Connections: 150 mm flanged spigots

Filter Access: Via filter access panel in the top of filter housing for ease of filter change.



Stainless Centrifugal Fan

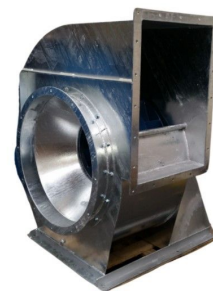
Type: Centrifugal extract fan with motor out of airstream, direct drive

Material: 2.0mmth stainless steel fan with 2.0mmth mild steel painted support parts

Duty: 1,500 Pa @ 2,112 m³/hr.

Estimated Power: 2.2 kW max

Motor: 3-phase, 2-pole



Standard Controls

Panel: IP54 rated, internally mounted near plant area to receive 3-phase incoming.

Indications: Normal and alarm indication of operation with appropriate signal lights, normally taken as outputs from the inverters

Differential Pressure: Switch to indicate blocked filter with signal light.

Switches: On/Off and isolator control and provision for remote start/stop

Gauges: Magnehelic pressure gauge for dust filter loading.

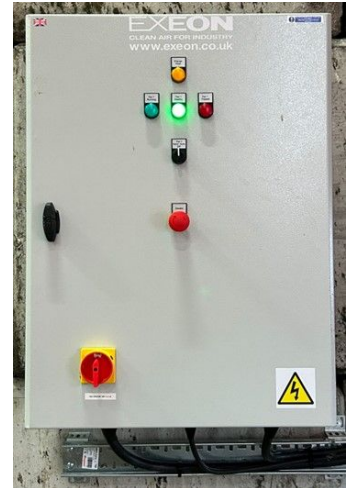
Control Method: Manual electromechanical control with no requirement for PLC

Accessories: Integral inverter for speed control

(For SCADA integration, volt free contact terminals can be provided to show fan healthy, run, and tripped status as well as filter blocked alarm).

Colour: RAL 7035

Corrosion Level Coating: C3



TERMS AND CONDITIONS

Clarifications

1. All prices exclude VAT.
2. Quotation valid for 14 days.
3. All work carried out by EXEON is subject to these T&Cs unless exception is given in writing prior to work commencing.
4. All items excluded unless specifically mentioned in scope of works
5. EXEON may update the T&Cs at any time. Changes will only come into effect once a subsequent quote has been ordered.
6. EXEON will have Public and Employer's Liability Insurance to the value of £5million whilst work is being carried out.

Invoicing and Payment

- 40% Upfront Payment
 - 10% on Completion of Design
 - 25% on Delivery
 - 15% on Commission
 - 10% on Completion
1. All invoices should be paid on 14 day terms.
 2. Invoices that are not paid on time will be subject to a £40 administration charge and daily interest at 8.25% APR.
 3. We have assumed for continuous working, any delays outside what is considered reasonable will be chargeable at £50 per hour.
 4. Any works cancelled with less than 24 hours' notice will incur stand-down charges.

Ordering

1. Before any work can commence, a written instruction must be issued by the client. This may take the form of a purchase order.
2. Any work outside the scope of the original quote, must also be requested in writing.
3. Lead time is dependent on site diary at the time of ordering, but expected lead times from approval of design are as follows: Scrubbers- 10-14 weeks.

Specific exclusions

1. No site or commissioning works have been included
2. Impact from excess humidity has not been appreciated within our proposal and should any unknown production or safety processes affect humidity levels it could affect filter life.
3. We have assumed that all electrical supply works would be by others.
4. Price submitted is subject to review & agreement of contract terms.
5. Control box protection is allowed for as standard IP54. Other protection available upon request.
6. No fan acoustic treatment allowed for.
7. 1 year warranty will start from the date of first use of the equipment, if no later than 6 months from date of delivery.
8. No ductwork allowed
9. Our standard Terms and Conditions of Sale also apply, available on request