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Application for a Variation to Environmental Permit

Permit No. EPR/BM3965IA

Prepared for: Airbus Operations Limited

CRA Europe
Unit 1, Calverton Business Park
Hoyle Road
Calverton
Nottingham, NG14 6QL
www.cra.co.uk

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Application for a Variation to Environmental Permit
Permit No. EPR/BM3965IA

Submitted to: Airbus Operations Limited
Chester Road
Broughton
Chester
CH4 0DR

This report was prepared by: Sharon Abram & David Gill
and
reviewed by: Bryan Hughes

Non-Technical Summary

The Airbus installation is currently permitted for '*Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts*', the '*Surface Treatment of Metals and Plastic Materials*', the '*Coating Activities, Printing and Textile Treatments*', and directly associated activities.

The Airbus Permit was varied in August 2010 (EPR/BM3965IA/V005) to enable the operator to convert the Stringer Manufacturing Centre (SMC) and Large Components Manufacturing (LCM) (panels and reinforcing) surface treatment processes from a chromic acid anodising solution to a mixed tartaric and sulphuric acid anodising solution, known as TSA. The change process is being implemented in stages, with chromate free operation being anticipated circa 2016.

This current Permit Variation Application is in respect of the penultimate stage of the 'Airbus chromate free' programme and relates to the proposed modification of the rinse tanks and chemical process tanks within the SMC and LCM surface treatment facilities. It is also proposed to modify the effluent treatment plant (ETP) associated with each facility.

The changes will increase the installation's aggregated treatment tank volume by more than the 30 m³ activity threshold specified in the Environmental Permitting (England and Wales) Regulations 2010 (as amended). Accordingly, this Permit Variation application considers that the proposed modifications represent a substantial change to the installation.

Emissions from the proposed installation have been assessed with respect to the environmental impact assessment included within the previous permit variation application (EPR/BM3965IA/V005). The current assessment indicates that emissions from the proposed installation will not cause harm to human health or ecosystems and will not exceed current permit consent conditions.

The proposed changes do not involve the use of any additional land and do not alter the current permitted boundary of the installation. Additionally, there will be no changes to the number or location of currently permitted release points to air, water and sewer.

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1.0 Introduction

Conestoga-Rovers & Associates (Europe) Ltd. (CRA) has been commissioned by Airbus Operations Limited (Airbus) to provide an application for a variation to its Environmental Permit reference number EPR/BM3965IA originally issued under the Pollution Prevention and Control (England and Wales) Regulations 2000, and now an Environmental Permit under the Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EPR). This report provides information to support the Airbus Permit Variation Application and should be read in conjunction with the Natural Resource Wales (NRW) Application Forms A, C2, C3 and F1.

The Airbus installation is currently permitted for '*Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts*' (Section 1.1 Part A(1)(a)), the '*Surface Treatment of Metals and Plastic Materials*' (Section 2.3 Part A(1)(a)), the '*Coating Activities, Printing and Textile Treatments*' (Section 6.4 Part B(a) and Part B9a) (iv)), and directly associated activities. This Permit Variation Application is in respect of the surface treatment of metals activity and relates to the proposed modification of the rinse tanks and chemical process tanks within the SMC (stringers) and LCM (panels and reinforcing) treatment facilities.

The Airbus Permit was varied in August 2010 (EPR/BM3965IA/V005) to enable the operator to convert the SMC and LCM surface treatment processes from a chromic acid anodising solution to a mixed tartaric and sulphuric acid anodising solution, known as TSA.

Extensive trials of the TSA anodising process had been conducted in order to secure Civil Aviation Authority approval for the use of the TSA process in aircraft manufacture. The trials demonstrated that the TSA process offers lower environmental impact, reduced energy consumption and reduced water consumption in relation to the chrome anodising process.

The varied permit issued in August 2010 acknowledged that, during the process of transition from chromic acid anodising to TSA anodising, there will be a period when both techniques will be effectively operational, leading to a temporary increase in chemical inventory and consequently an increased risk to the environment. This transition period is being undertaken in stages, with the completion date of the 'chromate free programme' anticipated circa 2016.

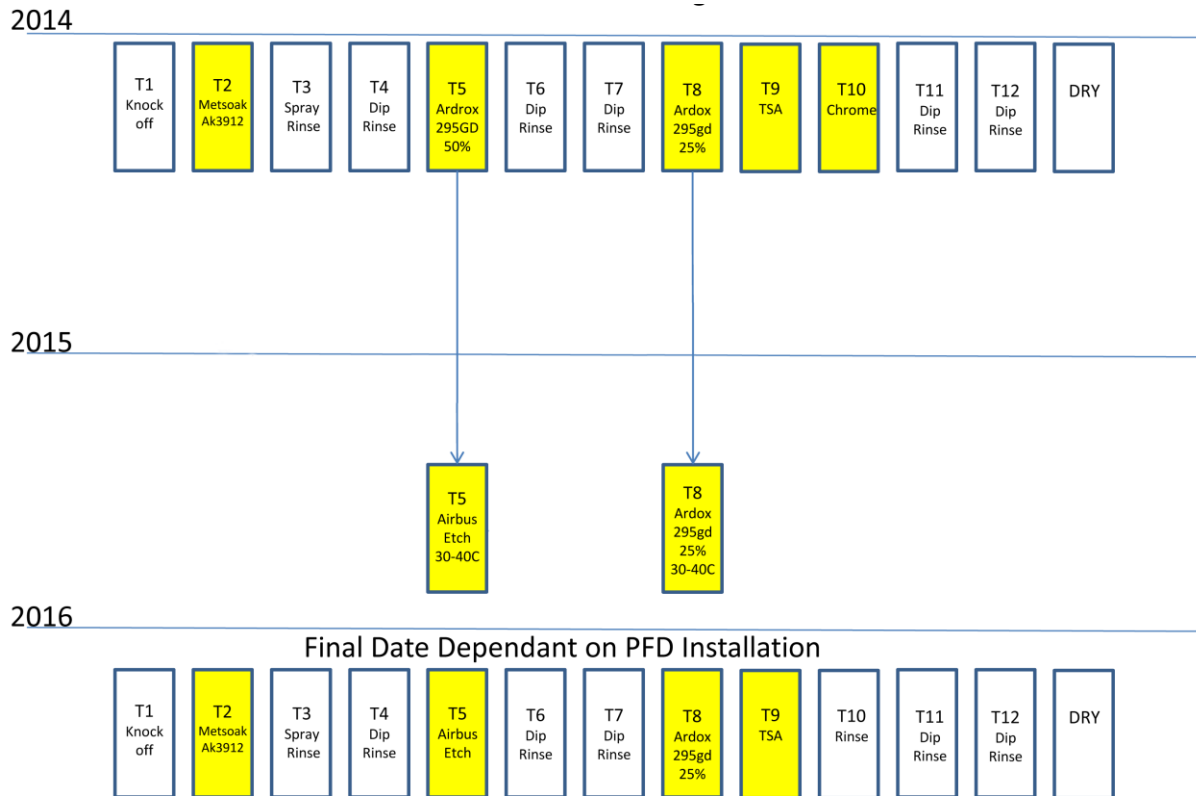


Figure 1: SMC Chemical Process Changes

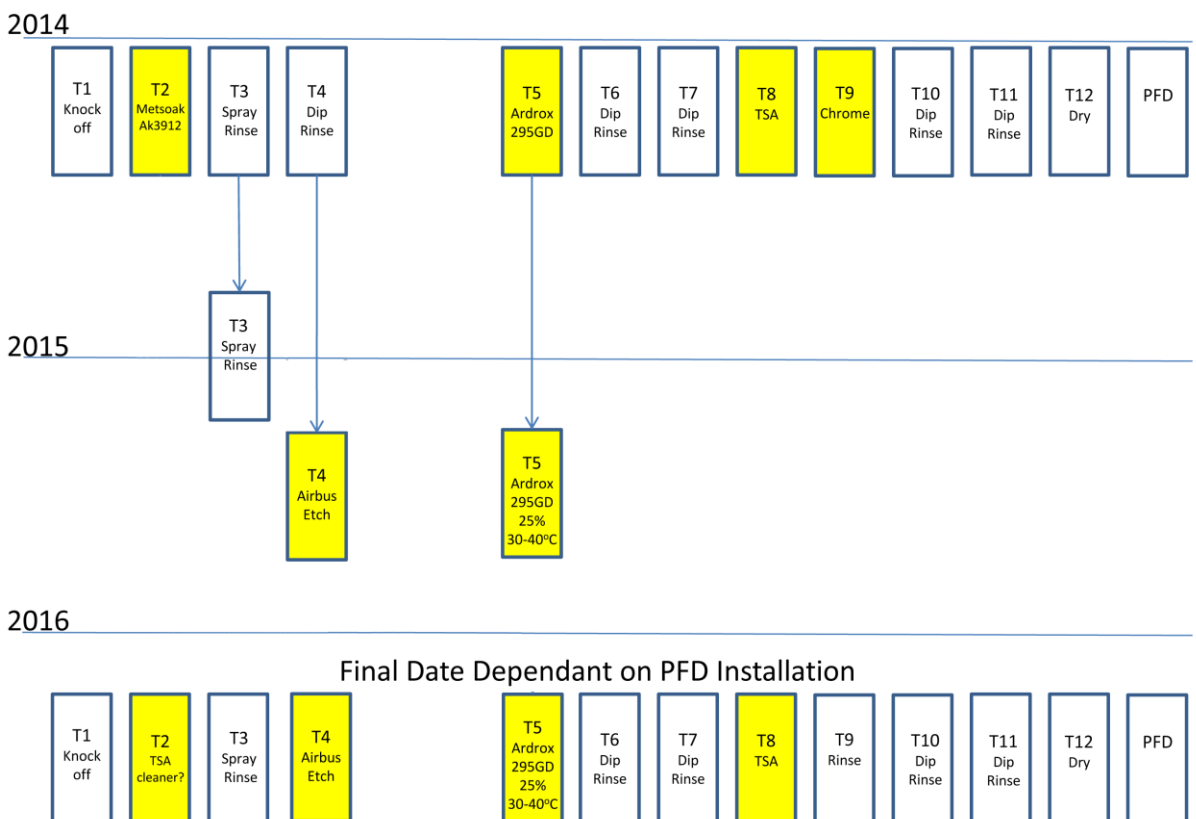


Figure 2: LCM Chemical Process Changes

This current Permit Variation Application is in respect of the proposed 2015 transition stage modifications to the SMC and LCM surface treatment processes as shown in Figure 1 and Figure 2. A subsequent Permit Variation Application will be prepared for the final chromate free installation. The 2015 transition stage changes will result in an increased surface treatment tank capacity on the LCM facility. The proposed increase in capacity will be in excess of the 30 m³ treatment threshold stipulated in the EPR.

With respect to the above, the term ‘surface treatment’ is defined in environmental permitting guidance¹ as:

“Only the vats specifically carrying out surface treatment count towards the 30 m³ threshold.”

In addition, Environment Agency Regulatory Guidance Note (RGN) 2 states:

“Note 2.3.1: “Surface treating ...using an electrolytic or chemical process” means treatment in which there is a chemical reaction at the surface and the surface is altered chemically. Thus anodising (in which the aluminium surface is oxidised electrolytically) is surface treatment in this context, whilst electrolytic alkaline cleaning of a steel surface is not.”

Accordingly, the existing ‘surface treatment’ capacities of the installation are:

- Stringer Manufacturing Centre (SMC): 336 m³ (i.e. SMC Tanks T5, T8, T9 and T10); and
- Large Components Manufacturing (LCM): 900 m³ (i.e. LCM Tanks T5, T8 and T9).

The proposed modifications to the installation will change the duty of one of the LCM rinse tanks (T4) to an etching activity thereby increasing the ‘surface treatment’ capacity of the installation to:

- SMC: 336 m³ (i.e. no change); and
- LCM: 1,200 m³.

As such, the surface treatment capacity of the proposed installation will remain above the Part A(1) activity threshold of 30 m³. It should be noted that the chrome anodising tanks (SMC: T10 and LCM: T9) will be decommissioned circa 2016; this future change will be the subject of a subsequent Permit Variation application.

¹ Additional guidance for: The Surface Treatment of Metals and Plastics by Electrolytic and Chemical Processes (EPR 2.07), NRW, Version 2.0, dated September 2014.

1.1 Summary of Existing Permitted Surface Treatment Activities

Airbus, Broughton, (the Site) produce wings for the Airbus range of commercial aircraft. Surface treatment activities currently undertaken at the installation comprise the anodising (formation of protective layer) of aluminium aircraft wings.

Airbus currently operates two separate surface treatment anodising facilities, for the processing of aluminium aircraft components, located in the LCM and SMC facilities. Whilst each facility is operated slightly differently, the current facilities both utilise a chromic acid anodising process. Also, both processes have dedicated effluent treatment plants (ETP) that treat the wastewater generated by the surface treatment activities.

It should be noted that the current Permit (EPR/BM3965IA/V005) references the Hawker Redux surface treatment activity, which has now been decommissioned (NRW has been notified). This current Permit Variation Application requests that reference to Hawker Redux is removed from the Permit.

The LCM and SMC plants are in the process of transitioning from chromic acid anodising to “TSA Anodising” (TSA). This process has been developed and extensively tested by Airbus for use on its own products and has been successfully implemented at four other Airbus sites in mainland Europe.

A series of other permitted processes are carried out at the installation, these include:

- Combustion of fuels for heat and electricity;
- Machining of aluminium;
- Forming of aluminium using heat and pressure;
- Painting, primer and top-coat; and
- Assembly of components.

In addition, a ‘Shot Peening’ process (i.e. ball bearings are fired at the metal to improve fatigue resistance) is technically linked to the Airbus installation but the subject of a separate permit and operated by another company at the facility.

These other processes and technically linked activities are not subject to this variation and hence are not discussed further in this Permit Variation Application.

1.1.1 Surface Treatment Overview

The surface treatment process is a multi-staged process involving cleaning and anodising of aluminium aircraft components, in accordance with Civil Aviation Authority and Airbus

specifications, following machining and de-burring. There are two treatment regimes, 'flash' anodising for flaw detection and 'full' anodising prior to painting.

The surface treatment processes are served by ETPs, which process liquid effluents taken from the LCM and SMC anodising plants and discharged to the municipal sewer.

The surface treatment process carried out at the installation comprises rinsing, pickling, etching and anodising of aircraft components in surface treatment process tanks.

The current permitted surface treatment processes, as described in the original permit application and subsequent variations, are discussed in more detail below.

Flash Anodising

Flash Anodising is a non-destructive testing method carried out on the aluminium components prior to 'Shot Peening'. The aluminium components are delivered to the surface treatment facility either directly from the machine shop, where they may be contaminated with aluminium waste and cutting oils. If brought-in as finished components, these may be contaminated with dust and/or metal preservatives. In either case these contaminants must be removed before anodising (Airbus specification ABP 8-1290).

A two-stage system is used. A spray 'knock off' provides mechanical cleaning, followed by full immersion in a second cleaning stage (hot aqueous cleaner based upon mild alkalis, phosphates, and surfactants) to provide a completely clean and oil free surface. Following the cleaning process the components are then rinsed in deionised water to remove any chemical residues.

Residual contamination due to surface oxidation, which is not removable by alkaline cleaning (Airbus specification ABP 8-1296), is removed by immersing the components into a dilute mixture of nitric and sulphuric acids at room temperature to remove the oxide film but not to remove significant amounts of aluminium. This process does not result in significant emissions of oxides of nitrogen or sulphate. Following the de-oxidising process the components are rinsed in deionised water to remove chemical residues.

The aluminium components can now be 'flash' anodised by immersing them in a chromate solution and applying an electric current (Airbus specification ABP 1-1023 method 4). This is an electrolytic process to produce oxygen and involves passing an electric current through the TSA, using the aluminium component as the anode. This oxygen reacts with the aluminium to produce aluminium oxide (alumina) and the chromate then reacts with the alumina to create pores in the surface coating.

For flash anodising the DC voltage of the electrical current being used is raised to 40 volts over 10 minutes and then held for 10 minutes before being switched off. The components are briefly rinsed with deionised water to remove the excess chromic acid and allowed to stand for 12 hours before inspection for metal flaws.

Upon completion of the Airbus 'chromate free programme' (i.e. the implementation of TSA anodising), flash anodising will no longer be carried out.

Full Anodising

Following inspection, the components are passed to the 'Shot Peening' facility (a technically linked activity carried out by a third party) where they are blasted with steel shot to modify the surface. This process results in some limited contamination to the component, caused by the iron in the steel, which must be removed. This involves immersion of the component into a sulphuric/nitric acid mix, which is the same chemical used in the de-oxidising process; the stringer treatment line however uses a slightly higher concentration.

After treatment the components are rinsed in deionised water, re-immersed in the de-oxidising process and then rinsed in deionised water again to remove any chemical residues. The components can now be 'fully' anodised by immersing them in a TSA solution and applying an electric current in accordance with an Airbus specification. Full anodising the DC voltage is raised to 14 volts over 5 minutes and held for 20 minutes, before being switched off.

Following the anodising process the components are rinsed in deionised water to remove any residual TSA before passing them to the drying stage prior to inspection and coating with paint.

The principal process emissions to atmosphere during full anodising are oxides of nitrogen and sulphuric and nitric acid mists, however monitoring has shown these to be insignificant or below limits of detection. These emissions are controlled using "scrubbers" and similar devices, which remove the majority of gaseous emissions.

1.1.2 Effluent Treatment

The ETP serving the LCM and SMC lines remove contaminants from the wastewater using "ion exchange" units prior to consented discharge to the municipal sewer. Both ETPs operate in a similar manner and are designed to receive process wastewater from the surface treatment facility and ancillary plant. The plants treat the effluent to produce either, deionised water that is suitable for recycling back to the surface treatment facility or effluent that is of a standard acceptable for discharging into the municipal sewer.

The ETP comprise the following elements:

- Rinse-water Recycling;
- Chromium Reduction;
- Hydroxide Precipitation; and
- Final Polishing Ion Exchange.

An emergency holding facility is also available, as a contingency, with the provision to gradually bleed the wastewater to the effluent treatment facility when needed.

1.2 Summary of Proposed Permit Variation

Under the Airbus 'chromate free programme', it is proposed to modify the chemical process tanks within the SMC and LCM surface treatment facilities. Associated modifications are also required within the effluent treatment process to accommodate the wastewater from the amended surface treatment operations.

The SMC surface treatment line comprises twelve tanks (Figure 1), with tanks 5 and 8 currently being used for the decontamination and de-oxidation of components. The LCM line comprises eleven tanks (Figure 2), with tanks 3 and 4 currently being used for rinsing and tank 5 being used for de-oxidation of components.

The scope of the permit variation comprises:

a) Modifications to the SMC surface treatment line:

- Tank 5 modifications – change from 'decontamination' to 'etching'
- Tank 8 modifications – change from deoxidisation to 'pickling'
- Effluent Treatment Modifications

b) Modifications to the LCM surface treatment line:

- Tank 3 modifications – upgrading of spray rinsing
- Tank 4 modifications – change from rinse to 'etching'
- Tank 5 modifications – change from deoxidisation to 'pickling'
- Effluent Treatment Modifications.

The pickling solution to be used on both lines (i.e. SMC Tank 8 and LCM Tank 5) is Ardrex 295GD, which will be heated and maintained at a temperature of 30-40°C.

The etching solution to be used on both lines (i.e. SMC Tank 5 and LCM Tank 4) is a proprietary 'Airbus Etching Solution'.

The proposed changes to the installation do not involve the use of any additional land and do not alter the current permitted boundary of the Installation. Additionally, there will be no changes to the number or location of permitted release points to air, water and sewer.

1.3 Technical Guidance

Reference is made to NRW guidance provided in *"Additional guidance for: The Surface Treatment of Metals and Plastics by Electrolytic and Chemical Processes (EPR 2.07)"*.

Reference is made to Regulatory Guidance Series: RGN 2 – *"Understanding the meaning of regulated facility"* and RGN 8 – *"Substantial changes in operation at installations"*.

Reference is also made to Horizontal Guidance Note H1 – *"Environmental risk assessment for permits: overview and annexes"*.

1.4 Substantial Change Assessment

Environment Agency Regulatory Guidance Note (RGN) 8 provides guidance on assessing changes in operation of a permitted installation that may have an effect on the environment, and defines a 'substantial change' as:

"3.5 A substantial change is a change in operation of installations or mining waste facilities, which in our [NRW / Environment Agency] opinion may have significant negative effects on human beings or the environment. Certain changes are automatically regarded as substantial, namely:

- (a) a change in operation of a Part A installation which in itself meets the thresholds, if any, set out in Part 2 of Schedule 1 EPR²; or*
- (b) a change in operation of an incineration or co-incineration plant for non-hazardous waste which would involve the incineration or co-incineration of hazardous waste."*

The Scottish Environment Protection Agency (SEPA) provides further clarification on paragraph 3.5(a) of RGN8 in guidance note PPC-TG-03, "Identifying Substantial Change", stating that:

² Schedule 5, Paragraph 5(5)(a) of EPR 2010

“A change should be categorised as substantial when the change would in itself constitute the carrying out of a listed activity in its own right. That is, if the increase in the capacity of the plant would by itself have exceeded the activity threshold. For example a slaughterhouse only requires a permit if it has a carcass production capacity greater than 50 tonnes per day. Therefore if an operator was increasing the capacity of their plant by more than 50 tonnes per day, say from 60 to 111 tonnes per day they would be carrying out a substantial change.”

RGN8 also provides practical tests to assess if a proposed change to a permitted Installation is substantial. An assessment of the proposed installation in accordance with the guidance is presented in Table 1.

Table 1: RGN 8 – Substantial Change Assessment

Section	RGN 8 Criteria	Response
A.1	Release of Polluting Substances	
A.1.1	<i>A proposed change should be assessed firstly in terms of the likely environmental impact of individual substances released to individual media</i>	An assessment of the anticipated environmental impact of the installation is provided in Section 4 of this application report.
A.2	Ambient Concentration of polluting substances as a result of releases	
A.2.3	<i>A change in concentration of a substance in the environment should normally be regarded as substantial if:</i> <i>i) it produces an increase in the PC of more than 20% of a short term EQS/EAL; or</i> <i>ii) the predicted Environmental Concentration (PEC) exceeds 70% of the long term EQS/EAL.</i>	As discussed in Section 4 of this application report, Airbus do not consider that the proposed modifications to the SMC and LCM surface treatment lines will alter composition or concentration of substances within vent stack emissions. The proposed variation does not add any additional point source emissions to atmosphere. The proposed variation will alter the composition of the wastewater discharged to sewer but current permit consent conditions will not be exceeded. However, the constituents of a proposed degreasing solution (Metsoak) to be used on the SMC and LCM lines are reported as being hazardous to aquatic life. As discussed in Section 4, whilst these chemicals do not have assigned EQS or EAL values, their presence in the effluent discharge cannot be considered as insignificant.

Section	RGN 8 Criteria	Response
A.2.4	<i>For releases to controlled waters, the assessment of an impact on an EQS/EAL should be undertaken at the boundary of the designated mixing zone.</i>	There are no direct releases to controlled water from the installation.
A.3	Releases of substances to groundwater	
A.3.1	<i>For releases to groundwater ...</i>	There are no releases to groundwater from the proposed installation.
A.4	Accumulation of substances in the environment	
A.4.1	<i>Some releases, for example of heavy metals or persistent organic compounds such as dioxins...</i>	The proposed plant does not introduce any new chemicals that have the potential to accumulate in the environment.
A.5	Release of substances where there is no reference standards	
A.5.1	<i>Where the unquantifiable risks to human health or the environment...</i>	All substances released from the proposed installation have established material safety data sheet (MSDS) data defining the exposure risks with respect to human health and ecosystems.
A.6	Energy Efficiency and Release of Greenhouse Gases	
A.6.2	<i>It is not possible to establish the absolute environmental impact per tonne of CO₂ since this is a global pollutant. Therefore a surrogate level at which the release should be deemed substantial is needed. 150,000 tonnes CO₂/year is suggested for this purpose.</i>	The total greenhouse gas emission arising from the proposed modification to the installation is estimated to be 265 tonnes CO ₂ /year.
A.7	Release of substances that deplete the ozone layer	
A.7.1	<i>Depletion of stratospheric ozone is caused by chemicals containing chlorine and bromine...</i>	The proposed modifications to the installation do not result in the release Class I or Class II ozone depleting substances.

Section	RGN 8 Criteria	Response
A.8	Releases of substances causing formation of ozone at low level	
A.8.1	<i>Ground level ozone is formed as a result of the interaction between sunlight, hydrocarbons and nitrogen species... release rates likely to give rise to ground level ozone concentrations have been calculated for representative substances in each category...</i>	The proposed variation is not anticipated to alter the composition, on concentration of vent stack emissions. It is considered, therefore, that there will be no change to the ozone formation potential of the installation.
A.9	Effects of releases on visual amenity	
A.9.1	<i>... However, the visual effects of polluting emissions, such as the appearance of any dispersed plume, will be relevant.</i>	Vent gas emissions resulting from the proposed changes to the plant are at ambient temperature and do not give rise to a visible plume.
A.10	Odours	
A.10.1	<i>Consideration should be given to any proposed increase in the mass release of an odorous substance...</i>	The materials used on the existing and proposed surface treatment lines are not odorous. The current facility does not have a history of complaints relating to odour.
A.11	Increased likelihood or consequence of accidents	
A.11.4	<i>If a proposed change would give rise to new hazards with potentially severe consequences for human health or the environment ... the change should normally be considered substantial regardless of the risk involved.</i>	The proposed amendments to the surface treatment lines primarily relate to a change of duty of existing surface treatment tanks. The changes are not considered to give rise to new hazards that would normally be regarded as having severe consequences for human health or the environment.
A.12	Increases in production of waste	
A.12.1	<i>A proposal leading to a significant increase in the quantity of waste consigned for waste disposal when it was previously recovered would constitute a substantial change.</i>	The proposed changes to the SMC and LCM processes results in an increase of approximately 150 - 300 tonnes of waste etch solution and 1.5 tonne of ETP filter cake. The current permitted arrangements for the disposal of spent process solutions and filter cake waste will not be changed by the proposed modifications to the plants.

Section	RGN 8 Criteria	Response
A.13	Heat	
A.13.1	<i>Releases of heat should be considered in the same way as other pollutants, considering the effect of temperature on the environment.</i>	The proposed modifications to the surface treatment processes include the introduction of pickling activities, which will be operated at a temperature of 30 – 40°C. The rinse water arising from the pickling activities will be discharged to the municipal sewer via buffer tanks and ETPs at essentially ambient temperature.
A.14	Noise and Vibration	
A.14.1	<i>Whether or not any changes in noise and vibration emissions are considered substantial should be assessed on the basis of the degree of any offence to human senses or interference with amenity.</i>	The proposed plant will be located within a Site production building and the nature of the surface treatment activities is considered unlikely to give rise to noise nuisance. The proposed variation does not alter the existing fume scrubbers that serve the surface treatment lines.
A.15	Effects on sensitive receptors	
A.15.1	<i>Specific attention will be required to address particular sensitive environmental receptors. A change that is not substantial in one location might be in another if a sensitive receptor is affected.</i>	As discussed in Section 4 of this application report, it is considered that emissions resulting from the proposed changes to the installation will not cause harm to human health or ecosystems.
A.16	Environmental impact assessment (EIA)	
A.16.2	<i>It should be noted that wherever a Local Planning Authority (LPA) has required an Environmental Statement (ES) under these Regulations...</i>	The proposed installation does not fall under the Town and Country Planning (EIA) Regulation's criteria. Also, the LPA has not requested an ES.

The above assessment (Table 1) indicates that the proposed modifications to the SMC and LCM processes will not “have significant negative effects on human beings or the environment” (i.e. it is not anticipated that there will be a significant change in composition or a significant increase in the concentration of emissions).

However, the proposed increase in the aggregated volume of the treatment vats (i.e. approximately 420 m³) is in excess of the 30 m³ threshold given in Section 2.3, Part A(1)(a) of EPR. Accordingly, with respect to Schedule 5, Paragraph 5(5)(a) of EPR 2010, it can be

anticipated that NRW may be of the opinion that the proposed change to the installation constitutes a “substantial change”.

This Permit Variation Application therefore considers that the proposed modification to the installation does constitute a substantial change.

2.0 Proposed Changes to Existing Activities

2.1 Proposed Changes to Current Permit

The proposed changes (highlighted in bold text) to the Schedule 1 activities given in Table S1.1 of the current Permit (EPR/BM3965IA/V005) are listed in Table 2:

Table 2: Permitted Schedule 1 Activities

Table S1.1 activities			
Activity Reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of Specified Activity
A1	S1.1A (1) (a)	Dispersed combustion plant	From receipt of raw materials to exhaust of products of combustion and delivery of hot water or steam.
A2	S2.3 A (1) (a)	Chrome anodising and TSA anodising (including etch and pickling) on LCM and SMC facilities until conversion process is complete, then TSA anodising only. Chrome anodising on Hawker Redux facility.	From receipt of raw materials to despatch of anodised material for further processing, despatch of process effluents to effluent treatment plant and exhaust of extracted process air via scrubbers to air.
A3	S6.4 B (a)	Painting of wing structures.	From receipt of raw materials to despatch of finished product and exhaust of extracted process air to air.
A4	S6.4 B (a) (iv)	Pin cleaning.	From receipt of fasteners for cleaning to despatch for re-use and exhaust of extracted process air to air.

Note: Proposed amendments highlighted in Bold enlarged text

As previously notified to NRW, subsequent to Permit (EPR/BM3965IA/V005) issue the Hawker Redux surface treatment line and Pin Cleaning operation were decommissioned and this current Permit Variation Application requests their removal from the Table S1.1 activities listed in the Permit (see Table 2).

Table S1.1 of current Permit (EPR/BM3965IA/V005) also lists permitted Directly Associated Activities (Table 3). This current Permit Variation Application requests the removal of the following highlighted (in bold) activity:

Table 3: Permitted Directly Associated Activities

Table S1.1 Directly Associated Activities			
Activity Reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of Specified Activity
A5	Manufacture of wing structures	Manufacture of components and assembly of structures.	From receipt of raw materials to dispatch of finished product.
A6	Machining	Manufacture of components	From receipt of raw materials to despatch of material for further processing.
A7	Grit blasting	Surface treatment of components.	From receipt of raw materials to despatch of material for further processing.
A8	Autoclaves	Assembly of components.	From receipt of raw materials to despatch of material for further processing.
A9	Effluent treatment	Treatment of effluent from chrome anodising and TSA anodising.	From receipt of effluent to discharge of treated effluent, despatch of waste material and exhaust of extracted process air to air.

Note: Proposed amendments highlighted in Bold enlarged text

This current Permit Variation Application adds additional etch and pickling operations to both surface treatment lines (i.e. SMC and LCM). A process description is provided in Section 2.3 below.

As a consequence of the proposed amendments to the Permit Table S1.1 listed activities, the following changes are proposed to Permit Table S4.1 “Point source emissions to air” (Table 4 below) and Permit Table S4.3 “Point source emissions to sewer, effluent treatment plant or other transfers off-site” (Table 5 below).

Table 4: Permitted Point Source Emissions to Air

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
Chrome Anodising, TSA Anodising and Effluent Treatment Plant						
Large Component Manufacture (LCM)						
A79, A81, A83	n/a	Tanks 01, 02, 03, 04 , 05, 08 and 11 on the LCM Treatment Line	n/a	n/a	n/a	n/a
A90	n/a	LCM Effluent Treatment	n/a	n/a	n/a	n/a
A82	n/a	Tank 9	n/a	n/a	n/a	n/a
Hawker Redux						
A85	n/a	Hanger 89 Treatment Line	n/a	n/a	n/a	n/a
Stringer Manufacturing Centre (SMC)						
A84	n/a	Tanks 01, 02, 05, 08, 09, 10 and 13 on the SMC Treatment Line	n/a	n/a	n/a	n/a
A91	n/a	SMC Effluent Treatment	n/a	n/a	n/a	n/a
Paint Shops						
Dash 600						
A24, A26	VOCs	Oven, spray booth and paint mix	n/a	n/a	Quarterly	Mass balance
Site 5						
A27 – A34	VOCs	Prep booths, spray booths, detail booths, detail booth oven and paint mix	n/a	n/a	Quarterly	Mass balance
Interim Single Aisle						
A35 – A43 A35a – A42a	VOCs	Booths and paint mix	n/a	n/a	Quarterly	Mass balance
Binks						
A44	VOCs	Spray booths, paint mix and oven	n/a	n/a	Quarterly	Mass balance

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
Hanger 91						
A48 – A54	VOCs	Spray booths and paint mix	n/a	n/a	Quarterly	Mass balance
Stringer						
A55, A56	VOCs	Spray booth, paint mix and booth oven	n/a	n/a	Quarterly	Mass balance
West						
A58 – A60	VOCs	Paint shops and paint mix	n/a	n/a	Quarterly	Mass balance
Final Single Aisle						
A177 – A181	VOCs	Prep booth and paintshop	n/a	n/a	Quarterly	Mass balance
Grit Blast						
A86 – A89	n/a	Hanger 89 Grit Blast	n/a	n/a	n/a	n/a
Pin Cleaning						
A182	VOC	Pin Cleaning Machine	n/a	n/a	Quarterly	Mass balance
Combustion Plant						
A4 – A10, A12, A14	n/a	Process/Space Heaters	n/a	n/a	n/a	n/a
A22	n/a	Hanger 89 Boiler	n/a	n/a	n/a	n/a
A23	n/a	Hanger 91 Boiler	n/a	n/a	n/a	n/a
A61 – A72	n/a	A380 Autoclaves	n/a	n/a	n/a	n/a
A73 – A78	n/a	Hanger 89 Autoclaves	n/a	n/a	n/a	n/a
A112 – A115	n/a	Site 5 Burners	n/a	n/a	n/a	n/a
A119	n/a	Dash 600 Burner	n/a	n/a	n/a	n/a
A99 – A111, A120 – A173, A182	n/a	Combustion Plant < 0.5 MW Input	n/a	n/a	n/a	n/a
A175	n/a	Final Single Aisle Boiler	n/a	n/a	n/a	n/a

Note: Proposed amendments highlighted in Bold enlarged text

Table 5: Permitted Point Source Emissions to Sewer

Table S4.3 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 (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
TE1 (LCM Treatment Plant)	Total Chrome	Effluent Treatment Plant	100 µg/l	Note 1	Weekly	Note 1 Note 2
TE2 (Hawker Treatment Plant)	Total Chrome	Effluent Treatment Plant	500 µg/l	Note 1	Weekly	Note 1
TE3 (SMC Treatment Plant)	Total Chrome	Effluent Treatment Plant	500 µg/l	Note 1	Weekly	Note 1 Note 2

Note: Proposed amendments highlighted in Bold enlarged text

2.2 Location

The Site is located within the boundary of the Hawarden airfield to the north of the village of Broughton, Flintshire, Wales (SJ 35127 64568) (Figure 3).

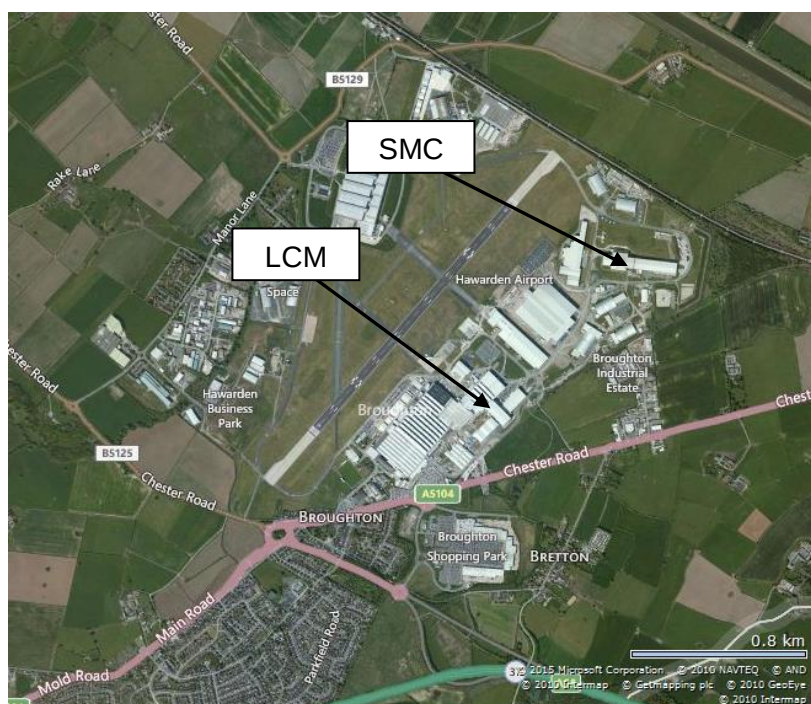


Figure 3: Site Location

Sandycroft town centre is located 1.5 km to the northwest, and the outskirts of Saltney are approximately 0.5 km east. The nearest residential dwellings are located adjacent to the south west side of the Site.

The nearest designated site of ecological importance is the River Dee located approximately 1 km to the north east. The river is designated as a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC). Approximately 1 km to the north east of the Site is the canalised section of the River Dee, which flows to the north west. Watercourses to the north west and south east of the Site flow towards the River Dee.

The SMC and LCM surface treatment lines are located in two separate facilities within the installation boundary as indicated on Figure 3.

The proposed changes do not involve the use of any additional land and do not alter the current permitted boundary of the installation.

2.3 Working Hours

The Installation operates 24 hours a day 7 days a week 52 weeks a year. The proposed permit variation will not change the current permitted operational and production hours.

2.4 Process Description

The surface treatment process involves the cleaning and anodising of aluminium aircraft components, in accordance with Civil Aviation Authority and Airbus specifications, following machining and de-burring. There are two treatment regimes: 'flash' anodising for flaw detection, and 'full' anodising prior to painting.

In order to comply with the REACH regulations, chromic acid use in the anodising process is being replaced with tartaric and sulphuric acid (TSA); a permit variation for use of TSA in the anodising process was obtained in 2010 (permit variation reference ERP/BM3965IA/V005). As a result of the introduction of TSA, modification are now required for the rinse tanks and chemical process tanks within the SMC (stringers) and LCM (panels and reinforcing) treatment facilities. Associated work is also required within the effluent treatment areas.

2.4.1 SMC Modifications

The modifications required for the SMC surface treatment line are:

- Tank 5: change from decontamination to etching; and
- Tank 8: change from deoxidisation to pickling.

The proposed SMC process changes are presented in Figure 4.

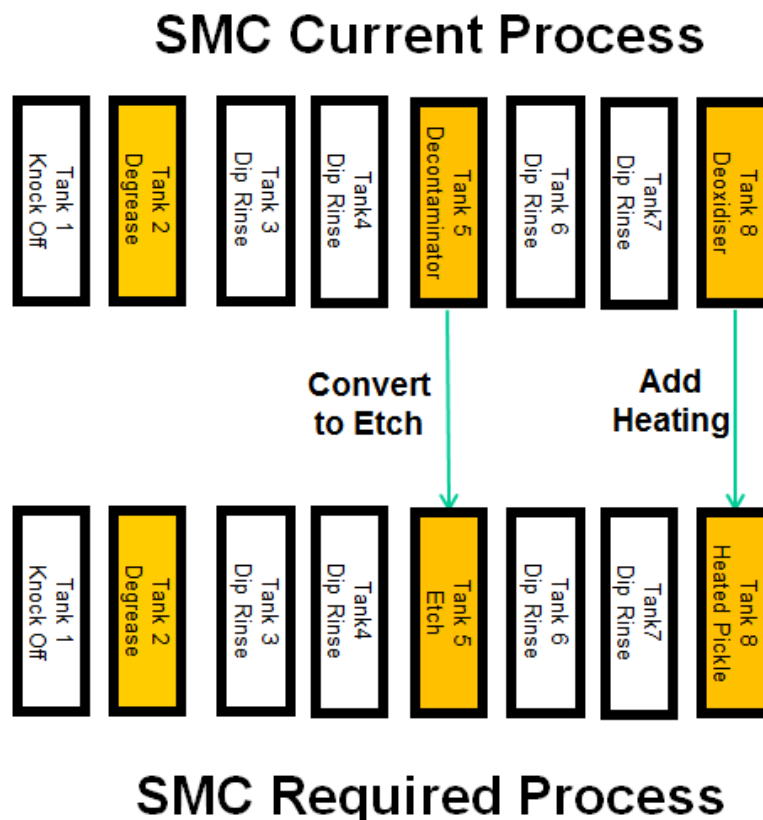


Figure 4: SMC Proposed Changes

Tank 5 Change of Duty (Etching)

Tank 5 has a working volume of 82.69 m³ and is currently used for decontamination. This involves spraying components with Ardox 295 GD (50% concentration), a degreaser solution, at ambient temperature to remove any surface contaminants. A change of use of Tank 5 to an etch duty is proposed. This will involve replacement of the tank contents with an 'Airbus Etching Solution', which will be heated and temperature controlled at 30 - 40°C. Information on the 'Airbus Etching Solution' is provided in Appendix A. The etching process will involve:

- The immersion of components into the etch solution to provide adequate decontamination.
- On removal from the tank, exit sprays will rinse the etched components with deionised (DI) water. Commencement of the sprays will be automatically triggered when the load is lifted from the tank. Feed for the sprays will be taken from the local DI water main which meets Airbus AIMS 09-00-003 'Grade A' quality.

Routine additions of etch solution will be made to the tank when required; this will be dependent on the analytical results of samples of the tank contents. The additions will be made using the existing chemical uplift system.

The tank currently has level controls. An additional level control will also be fitted which will disable the rinse sprays when the level of the tank content is between normal make up level and high level.

Tank 5 will be heated by the existing low temperature hot water (LTHW) circuit, which is supplied with heated water from the on-site boilers and supplemented by the on-site Combined Heat and Power (CHP) plant. The tank heating system will comprise a plate heat exchanger (316 Stainless Steel plates as recommended by the manufacturer).

The process tank will be temperature controlled ($\pm 0.5^{\circ}\text{C}$), with calibrated temperature probes fitted at the top of the tank. The bath temperature will be fed back to the SCADA system for display and logging.

Tank 8 Change of Duty (Pickling)

Tank 8 has a working volume of 82.69 m^3 and is currently used for deoxidisation (desmut), which involves immersing components in Ardox 295 GD solution (25% concentration) at ambient temperature. A change of the use of Tank 8 to a heated pickle tank is proposed. This will involve the heating and temperature control of the Ardox 295 GD solution to an operating temperature of $30 - 40^{\circ}\text{C}$. A material safety data sheet (MSDS) for the Ardox 295 GD solution is provided in Appendix A

The pickling process will involve:

- The immersion of components into the Ardox 295 GD solution (25% concentration) for typically 10 minutes to ensure adequate pickling.
- On removal from the tank, exit sprays will rinse the pickled components with deionised (DI) water. Commencement of the sprays will be automatically triggered as the load is lifted from the tank. Feed for the sprays will be taken from the local DI water main.

The tank will be topped up with Ardox 295 GD solution (100% concentrate) when required. This will be dependent on the analytical results of samples of the tank contents using the existing chemical uplift system.

The tank will be heated by the existing LTHW circuit, which is supplied with heated water from the on-site boilers and supplemented by the on-site Combined Heat and Power (CHP) plant. The tank heating system will comprise a plate heat exchanger (316 Stainless Steel plates as recommended by the manufacturer).

The process tank will be temperature controlled ($\pm 0.5^{\circ}\text{C}$), with calibrated temperature probes fitted at the top of the tank to measure the bath temperature. The bath temperature will be fed back to the SCADA system for display and logging.

The tank currently has level controls. An additional level control will also be fitted which will disable the rinse sprays when the level of the tank content is between normal make up level and high level.

SMC Ventilation System

Acidic fumes, mist and gaseous emissions from the acid etch tank (Tank 5) and the pickle tank (Tank 8) will be captured by the existing tank lip extraction systems, which direct the emissions to an existing scrubber system.

The treatment of exhaust gases in the scrubber system is already permitted and is considered to meet the requirements of BAT.

The additional loading on the scrubber system has been assessed by the installation contractor appointed by Airbus and deemed to have adequate capacity for the revised duty. Accordingly, Airbus considers that following commissioning of the proposed surface treatment line modifications there will be no increase in vent stack emissions.

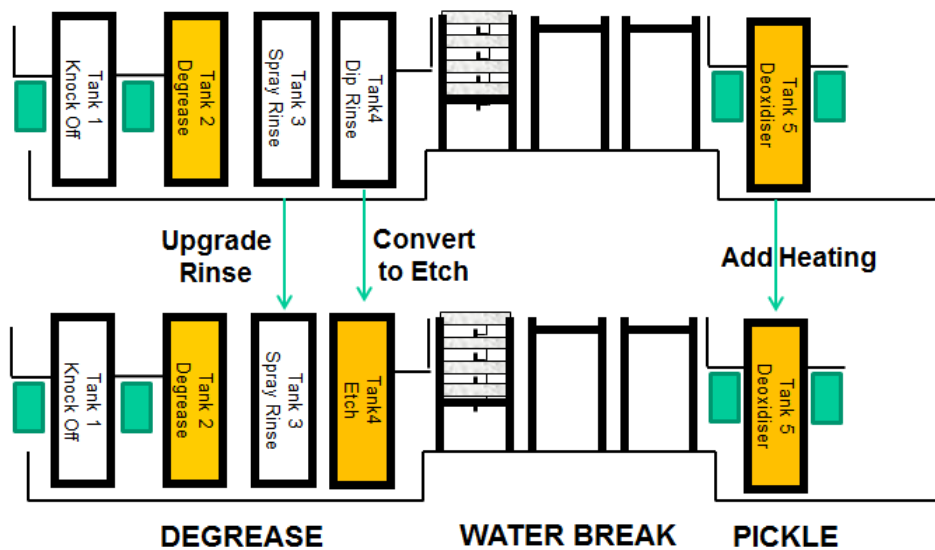
2.4.2 LCM Modifications

The modifications required for the LCM surface treatment line are:

- Tank 3: upgrading of spray rinsing;
- Tank 4: change from rinse to etching; and
- Tank 5: change from ambient pickling (deoxidisation) to heated pickling.

The proposed LCM process changes are presented in Figure 5.

LCM Existing Process



LCM Required Process

Figure 5: LCM Proposed Changes

Tank 3 Change of Duty (Rinse)

Tank 3 requires upgrading of the existing spray rinsing system. The upgrade will include the installation of three rinse storage tanks. The converted Tank 3 will receive up to:

- 1 load per hour from Tank 2 (degreaser (Metsoak AK3192)); and
- 1 load per hour from Tank 4 ('Airbus Etching Solution').

The rinsing operations will involve:

- A first stage rinse for at least 2 minutes;
- A second rinse for a further 3 minutes. The second rinse will be with water that meets Airbus AIMS 09-00-003 'Grade A' quality; and
- On removal of the rinsed component from the tank, exit sprays will operate to further rinse the component. The rinse sprays will be fed from the DI water main.

The design of the rinse system will minimise the cross contamination of the first rinse and second rinse. Separate pumps will be used for each rinse stage. Feed pipes from the pumps to each spray bank will run separately for each rinse stage. The two stage rinse system will be fitted with UV sterilisation (floating type inside rinse storage tanks).

The tank is currently bunded; the existing bunding arrangement will remain unchanged. The following modifications to the tank will be implemented:

- The tank will be fitted with level alarms.
- The tank floor will be modified to create a number of sloped sections to enable the drainage of the rinse liquid to the recirculation tanks. A drain connection will be provided on the tank bottom which will connect into the existing drain manifold pipework on the sump floor. Drainage of rinse water from the tanks will be directed to the on-site LCM ETP for treatment prior to consented discharge to sewer.
- A full size access door, to enable access to the tank for cleaning, will be fitted at each end of the tank, with access steps to each door. For safety purposes, controlled access to the tank will be provided by way of an automated interlock system.

Tank 4 Change of Duty (Etching)

Tank 4 has a capacity of 298.6 m³ and is currently in use as a rinse tank. The tank is to be converted to an alkaline etch tank in which components will be etched following degreasing and rinsing. The etching solution to be used in this tank is the 'Airbus Etching Solution'.

The etching process will involve:

- Immersion of the components into the etch solution to provide adequate decontamination.
- On extraction from the tank, exit sprays will then rinse the treated components with deionised (DI) water. Commencement of the sprays will be automatically triggered by the load being lifted from the tank. Feed water for the sprays will be taken from the local DI water main.

The tank will be fitted with automated lids with open and close limits, to minimise the release of fugitive emissions, and a high level alarm. An additional level control will be added between normal make up level and high level to automatically disable the sprays.

The tank will be heated by the existing LTHW circuit, which is supplied with heated water from the on-site boilers and supplemented by the on-site Combined Heat and Power (CHP) plant. The tank heating system will comprise a plate heat exchanger with 316 Stainless Steel plates. The tank will be temperature controlled ($\pm 0.5^{\circ}\text{C}$) and fitted with a temperature probe at the tank top to measure bath temperature; the temperature readings will be relayed to the master control room for display and logging.

Tank 4 will be filled with etch solution directly from bulk tanker. To enable this, a bulk fill line will be installed from the bulk tanker connection point, located on the external wall of the building in which the LCM is located, to the top of Tank 4. A remote tank level reading and

tank high level alarm, comprising a red beacon and audible alarm, will be fitted in the bulk tank area. Additionally, a routine fill point from the chemical store area to the top of Tank 4 will be fitted, the pneumatic diaphragm pump for which will be interlocked to the tank high level alarm.

There will be a water make-up feed (auto top up) from the installation's DI system to the tank. The tank high level alarm will link into existing circuits for the DI make-up feed pumps, which on high level alarm will be automatically disabled, and will also link to the SMS text alarm.

Tank 5 Change of Duty (Pickling)

Tank 5 has a capacity of 288.6 m³ and will be used for the pickling of components using Ardrox 295 GD solution (25% concentration). An increase in temperature of the Ardrox 295 GD solution is required from ambient to a controlled temperature 30-40°C. Upgrading of Tank 5 will include a plate heat exchanger heating system connected to the LTHW circuit, which is fed from the on-site boilers and supplemented by the on-site Combined Heat and Power (CHP) plant, to enable heating.

Tank 5 will be temperature controlled ($\pm 0.5^{\circ}\text{C}$) and fitted with a temperature probe at the tank top to measure bath temperature; the temperature readings will be relayed to the master control room for display and logging.

LCM Ventilation System

The rinse tank (Tank 3) will be fitted with ventilation system for the capture of fumes, mist and gaseous emissions from the tank. Specifically:

- The tank will be fitted with lip extraction along the top edge of the tank and inlet grilles on the opposite side to create a cross draft over the tank; and
- The Tank 3 ventilation system will be connected into the existing Tank 2 system.

The etch tank (Tank 4) will be fitted with ventilation for the capture of acidic fumes, mist and gaseous emissions from the tank. Specifically:

- The tank will be fitted with lip extraction along the top edge of the tank and inlet grilles on the opposite side to create a cross draft over the tank;
- The Tank 4 ventilation will be connected into the existing Tank 5 system, which connects to the variable exhaust circuits and the existing scrubber system;
- The stainless steel ducting will slope to a low point with a drain connection for the collection of condensate; and
- Monitoring points will be provided to enable air flow and emissions monitoring.

The pickle tank (Tank 5) is fitted with lip extraction, which is connected into the existing permitted scrubber system and existing permitted exhaust circuits.

2.4.3 Effluent Treatment Plant Modifications

The installation has three ETPs, which are listed in Table S4.3 of the current Permit as:

- TE1 - LCM Treatment Plant
- TE2 - Hawker Treatment Plant (now decommissioned)
- TE3 - SMC Treatment Plant

These SMC and LCM ETPs process a mixture of rinse waters arising from the surface treatment activities. However, the addition of 'Airbus Etching Solution' into these wastewaters is anticipated to cause problems with respect to the existing chrome precipitation process. To address this issue it is proposed to modify the SMC and LCM rinse tank arrangements and install additional effluent treatment for each process. The proposed modifications are similar for both the SMC and LCM processes, the only difference being that LCM will operate on a spray rinse principle utilising a single tank while SMC will incorporate a twin rinse tank arrangement. The effluent treatment activities for these two treatment lines are discussed in turn below.

SMC Rinse Water Treatment

The SMC surface treatment line will operate a two stage dip rinse as described below and shown in Figure 6. The first stage will be a lower quality prewash in Tank 3 followed by a second high quality clean wash in Tank 4; the rinse water from the latter being recycled via an ion exchange plant.

a) Treatment of First Stage Rinse

The first stage effluent stream from rinse Tank 3 will be directed to the ETP at a flow rate of approximately 500 l/h. This allows for water usage of about 250 litres for each load that has been degreased and 250 litres for each load that has been etched.

The effluent will comprise a mix of:

- Organic materials from the degreasing solution and alkaline etching solution; and
- Dissolved aluminium and copper (the concentrations of these metal ions will vary depending on bath condition).

The proposed treatment of the effluent will comprise initial pH adjustment to slightly acidify it. Following this the effluent will undergo selective metal ion exchange to reduce concentrations of aluminium, copper and any other metals in the effluent. The ion exchange media will be periodically regenerated using sulphuric acid, and the regeneration wastewater will be processed in the existing ETP using hydroxide precipitation and settlement of precipitate.

Following selective metal ion exchange, the effluent will be pH adjusted back to a neutral prior to being discharged to the final outfall tank.

SMC Tank 3 & 4 Rinse and Effluent Outline

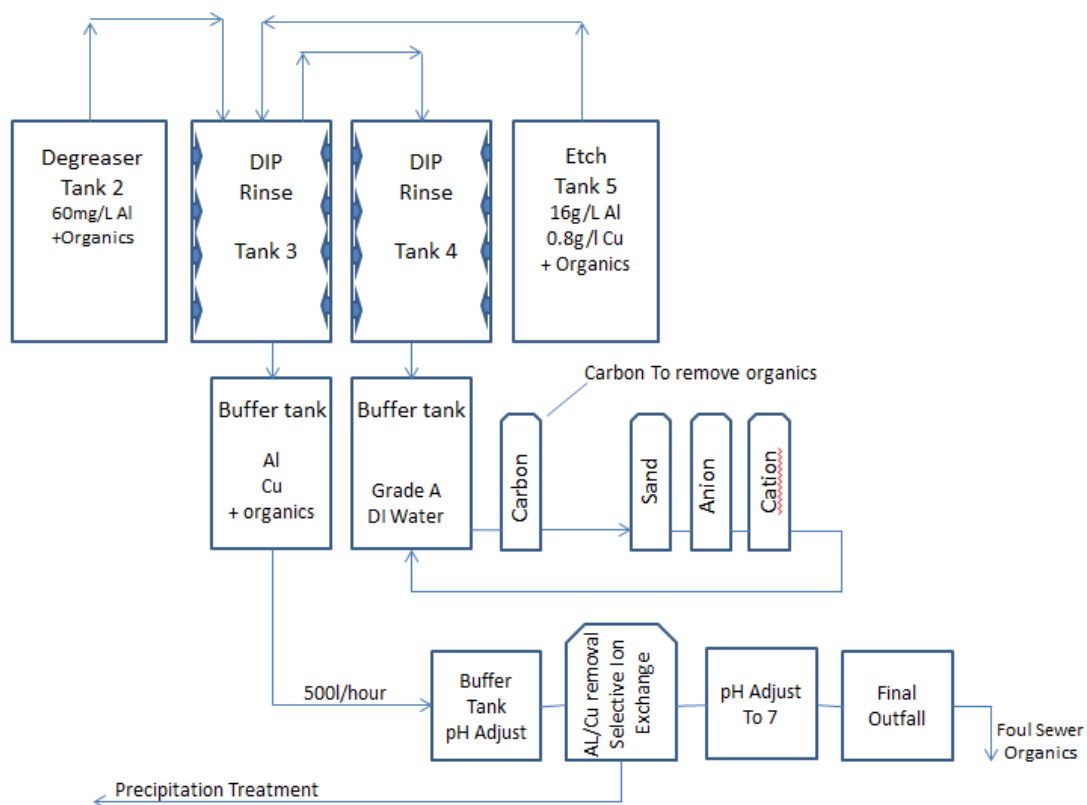


Figure 6: SMC Surface Treatment Line Effluent Treatment Plant

b) Treatment of Second Stage Rinse (Recycling)

The second stage stream from rinse tank 4 will be directed to the existing permitted deionised water plant for recycling, at a flow rate of up to 5,000 l/hr. Additional activated carbon filters will be used to remove traces of organic material originating from the degreaser and the alkaline etch. The water will be then feed to the existing ion exchange system, prior to being recycled to the process for reuse. It is anticipated that the activated carbon in these filters will be changed on a yearly basis.

LCM Treatment Line

The LCM surface treatment line will operate a single rinse system, as presented in Figure 7. This system will use the same set of spray rings to rinse the components twice, first with a lower quality prewash and then with a second high quality clean wash, which is recycled. It is appreciated that the nature of this design will result in greater amounts of cross contamination from the first rinse cycle to the second rinse cycle. Ideally, there would have been space for two separate rinse tanks within the existing surface treatment line. Due to space restrictions there is no opportunity for the installation of a second rinse enclosure or dip tank.

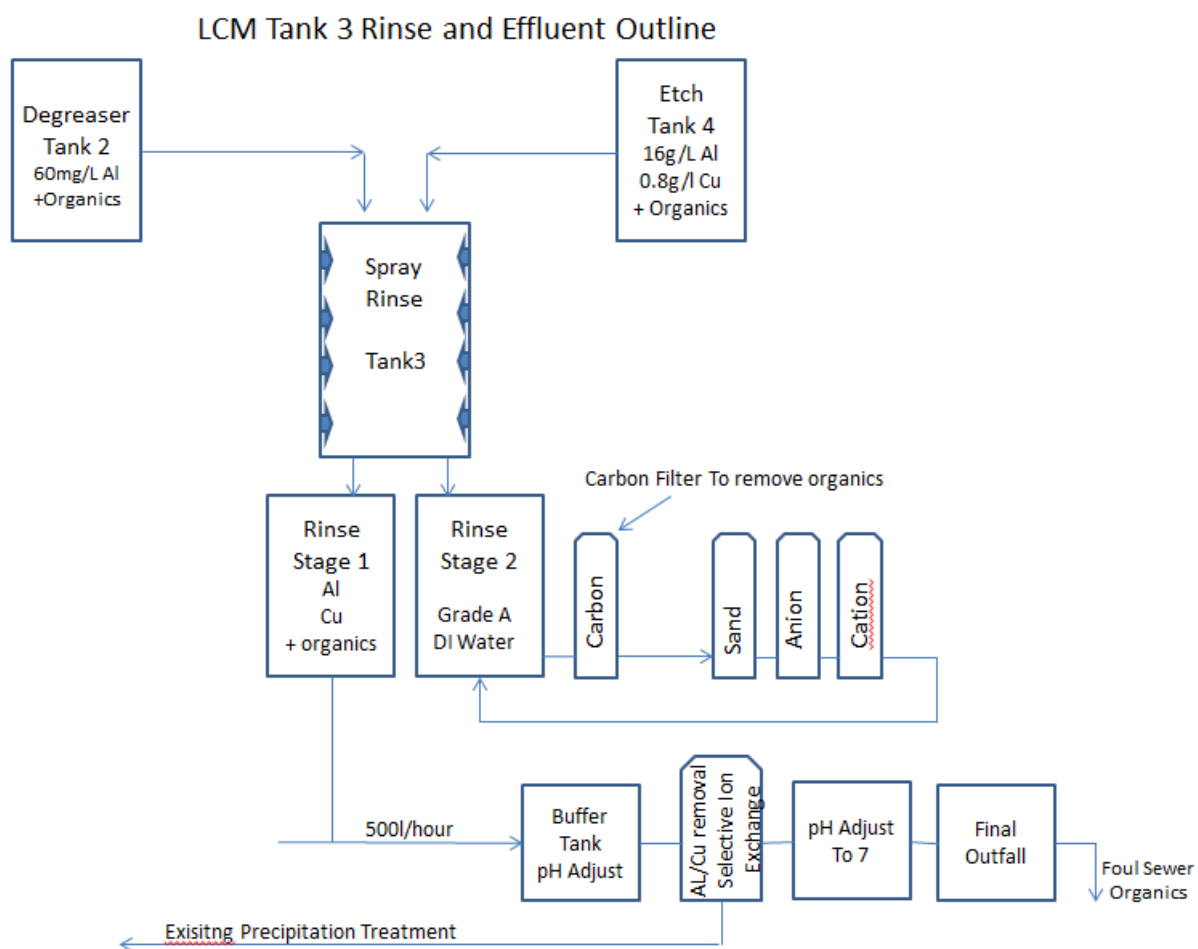


Figure 7: LCM Surface Treatment Line Effluent Treatment

a) Treatment of First Stage Rinse

The first stage wastewater from rinse Tank 3 will be directed to effluent treatment. The discharge rate of the effluent will be approximately 500 l/h based on a rate of water usage of

circa 250 litres for each load that has been degreased and 250 litres for each load that has been etched. The effluent composition will comprise a mix of:

- Organic materials from the degreasing solution and alkaline etching solution; and
- Dissolved aluminium and copper (the concentrations of these metal ions will vary depending on bath condition).

The treatment of the effluent will comprise initial pH adjustment with an acid reagent to slightly increase acidity. Effluents are continuously monitored and adjusted to ensure the correct pH. Following pH adjustment the effluent will undergo selective metal ion exchange to control levels of aluminium, copper and other metals in the effluent. The ion exchange media will be periodically regenerated using hydrochloric acid; the regeneration wastewater will be processed in the existing ETP using hydroxide precipitation followed by sludge settlement. After the selective metal ion exchange, the effluent will then be pH adjusted back to a neutral with sodium hydroxide prior to being directed to the existing permitted final outfall tank. The final pH adjustment stage will be continuously monitored and adjusted.

b) Treatment of Second Stage Rinse (Recycling)

The second stage effluent from rinse Tank 3 will be directed to the existing deionised water plant for recycling, at a flow rate of up to 5,000 l/h. The deionised water plant will be fitted with additional activated carbon filters to ensure removal of traces of organic material originating from the degreasing and the alkaline etch tanks.

The effluent will undergo ion exchange and prior to reuse. It is anticipated that the activated carbon used in the ion exchange system will be replaced on an annual basis.

Effluent Composition

The effluent from the rinse tanks on the SMC and LCM treatment lines will consist of alkaline etching solution and degreasing solution.

The main constituents of these solutions are listed in Table 6.

Table 6: Chemical Composition of Alkaline Etch and Degreasing Solutions

Name of Solution	Main Chemical Constituents	Concentration of Main Constituent	Environmental Hazard
Metsoak AK3912	Alcohol Ethoxylate	25%	Not hazardous to aquatic life
	Dipropylene Glycol Monomethyl Ether	1 – 5%	Not hazardous to aquatic life
	3-Butoxypropan-2-ol	1 – 5%	Not hazardous to aquatic life
	Sodium nitrate	0.1 – 1%	Aquatic Acute 1 - H400
	1,2,3-Propane Triol	0.1%	Not hazardous to aquatic life
	1,2-Benzisothiazol-3(2H)-One	0.1%	Aquatic Acute 1 - H400
	2,2'-Oxybisethanol	0.1%	Not hazardous to aquatic life
Etch	Caustic soda	45 g/l	Not hazardous to aquatic life
	Sodium Glucoheptonate	10 g/l	Not hazardous to aquatic life

Based on the above information, Airbus has calculated the maximum likely concentrations of these contaminants within the Site effluent discharge. The results of the calculations are presented in Table 7, and are based on Site knowledge of the drag-out volume between baths and the maximum throughput for each treatment line (i.e. loads per day).

Table 7: SMC and LCM Effluent Composition

Trade Effluent Composition	Surface Treatment Line	
	SMC Treatment Line (mg/l)	LCM Treatment Line (mg/l)
Metsoak (as a total)	250	50
Sodium Glucoheptonate	50	10
Sulphate	225	45
Disodium tetraborate decahydrate	2.5	0.5
1,2-Benzisothiazol-3(2H)-One	0.25	0.05
Aluminium	<1.0	<1.0
Copper	<1.0	<1.0
Chemical Oxygen Demand (COD (estimate))	<1,000	<1,000

The calculated values presented in Table 7 are based on the following assumptions and therefore represent a worst case emission scenario:

- No effect of dilution has been considered due to the use of the same outfall point, i.e. the calculations do not assume that both effluent streams (SMC and LCM) are discharging concurrently; and
- The calculations do not consider the effect of chemical recovery into the process baths, i.e. each tank has a system to rinse some of the process solution directly off the parts back into the process tank, thereby significantly reducing chemical drag out.

3.0 Comparison with Indicative BAT

An assessment of operating procedures and techniques for the proposed modifications to the process surface treatment tanks and ETPs has been undertaken with respect to the NRW guidance note EPR 2.071 on Best Available Techniques (BAT) for the surface treatment of metals.

The results of the assessment are presented in Table 8 below.

Table 8: BAT Assessment

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
1.1 Energy efficiency			
1	1	<i>High efficiency dewatering techniques to minimise drying energy.</i>	The proposed variation does not alter the current drying system arrangements, which are already permitted and are considered to meet the requirements of BAT.
2	2	<i>Minimisation of water use and closed circulating water systems.</i>	The LCM surface treatment line will operate a single rinse system that uses the same set of spray rings to rinse twice, first with a lower quality prewash and then with a second high quality clean wash, which is recycled. The SMC treatment line will operate a two stage dip rinse. The first stage will be a lower quality prewash in Tank 3, followed by a second high quality clean wash in Tank 4, which is recycled.
3	3	<i>Using spent cooling water (which is raised in temperature) for rinsing purposes.</i>	Not applicable. The proposed variation does not introduce tank cooling systems.
4	4	<i>Automated control for DC rectifiers.</i>	Not applicable. The proposed variation only adds non-electrolytic etch and pickling operations to the existing permitted surface treatment installation.
5	5	<i>Electrolytic processes that operate under thermally stable conditions without the need for heating or cooling.</i>	Not applicable. The proposed variation only adds non-electrolytic etch and pickling operations to the existing permitted surface treatment installation.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
6	6	<i>Minimum use of fume extraction consistent with COSHH Regulations.</i>	Tank 5, and 8 (SMC treatment line) will utilise the existing permitted tank lip extraction systems, which are considered to meet the requirements of BAT. Tanks 3, 4 and 5 (LCM treatment line) will be fitted with lip extraction. The lip extraction will be connected into the existing permitted scrubber system and existing permitted exhaust circuits, which are considered to meet the requirements of BAT.
7	7	<i>Inverter speed control or flow damper for fume extraction centrifugal fans.</i>	Not applicable, the proposed variation does not alter the existing extraction systems, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
1.2 Efficient use of raw materials and water			
8	1	<i>Effluent treatment facilities should be designed to process spent process fluids and recover anode metals for reuse ...</i>	Not applicable. The proposed variation only includes modifications to the existing permitted ETP systems to address the revised picking and etch processes to be implemented on the SMC and LCM treatment lines.
9	2	<i>Spent alkaline cleaners and acid pickles should be used for pH control in the effluent treatment facility.</i>	The proposed variation modifies the existing, permitted, ETP which was demonstrated to meet the requirements of BAT in previous permit variation application submissions. The proposed variation does not propose to alter the plant pH control systems.
10	3	<i>You should evaluate the use of phosphating sludge as a filter for agricultural and horticultural use.</i>	Not applicable. The proposed variation does not introduce phosphating processes.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
11	4	<i>Filter cake may have uses, and these should be investigated in preference to landfill disposal.</i>	Airbus has implemented a certified ISO14001 environmental management system under which waste management and disposal activities are periodically reviewed. As discussed in the previous Permit Variation Application, Airbus has not identified a viable alternative to landfill disposal of the ETP filter cake.
12	5	<i>Filter cake presses should be operated at not less than 7 bar and preferably 10-15 bar to reduce its mass, volume and water content.</i>	The proposed variation does not alter the current ETP filtration arrangements, which are already permitted and are considered to meet the requirements of BAT.
13	6	<i>Consider use of a low temperature biological cleaner system in place of the traditional alkaline soak cleaner for a long production life, low waste and low energy consumption.</i>	The components are treated in accordance with customer aviation specifications. Departure from specification is not practicable but discussions are frequently held with its customers with respect to process improvements and minimising the use of hazardous materials.
14	7	<i>Consider the use of ion exchange or other treatment unit to re-circulate rinse waters.</i>	Ion exchange is proposed for treating and recycling 'Grade A' DI water.
15	8	<i>Consider use of closed loop operation with three to four stage cascade rinsing, so that drag-out can be returned upstream to balance the evaporative loss and minimise waste.</i>	The proposed variation modifies, within the constraints of available space, the existing, permitted, process tank rinsing arrangements which were demonstrated to meet the requirements of BAT in previous permit variation application submissions.
16	9	<i>Minimise drag-out by maximising the drainage time of the work over the tank or in a separate drainage tank.</i>	The proposed variation incorporates exit sprays on the treatment tanks that will rinse the etched components with deionised (DI) water thereby minimising drag-out to subsequent stages of the treatment process. The drainage time of the work over the tank will be optimised to the rinse requirements.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
17	10	<i>Use electrolytic metals recovery technology for unreturned drag-out.</i>	As per the original permit application, metals recovery is not considered an economically viable option.
18	11	<i>Use electrodialysis technology for the re-oxidation of hexavalent chromium [chromate, or Cr(VI)] degraded to trivalent chromium [Cr(III)] in chromic acid anodising electrolytes.</i>	The proposed variation is a transition stage within the Airbus 'chromate free programme'. Upon completion of the programme chromic acid anodising will be replaced by TSA anodising.
2.2 Surface Preparation			
Mechanical			
19	1	<i>You should ensure that emissions from the local exhaust ventilation do not have an adverse environmental impact.</i>	Not applicable. The proposed variation does not include mechanical surface preparation activities.
Degreasing using organic solvents			
20	1	<i>You must comply with the requirements of the Solvent Emissions Directive, as implemented by the Solvent Emissions (England and Wales) Regulations 2004. Compliance with the SED goes beyond the technical measures described in this guidance.</i>	Not applicable. The proposed variation does not include solvent degreasing activities.
21	2	<i>The main control measures are ...</i>	

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
<i>Chemical cleaning using aqueous cleaners</i>			
22	1	<i>The key areas of control are:</i> - <i>energy consumption</i> - <i>fugitive emissions to air</i> - <i>rinse water efficiency</i> - <i>cleaning fluid lifetime</i> - <i>disposal of spent cleaners</i>	Not applicable. The proposed variation does not include chemical cleaning activities.
23	2	<i>Consider use of ion exchange or other treatment unit to re-circulate rinse waters.</i>	
24	3	<i>Closed loop operation with three to four stage cascade rinsing, so that drag-out can be returned upstream, is a particularly effective way to balance the loss of water by evaporation and minimise waste of costly process chemicals.</i>	
25	4	<i>Where appropriate, generate turbulence by means of an eductor to provide improved cleaning, and maintain particulates in suspension so that they can be removed continuously by external filtration.</i>	

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
26	5	Where appropriate, use membrane filtration to remove oil and grease, emulsions and dispersants	
27	6	Where possible, maintain adequate freeboard above the cleaner level (minimum of 150 mm) to minimise entrainment of liquid and subsequent emissions to air. Extraction lip ducts should be mounted at least 50mm above the top of the tank lip angle, and you should use the minimum air flow consistent with satisfactory extraction.	
28	7	Where appropriate, use “hexagons” or “croffles” to reduce evaporative loss and reduce energy consumption. Use automated lids on large cleaner tanks to reduce fume extraction energy costs as well as to reduce consumption for process heating.	
29	8	Consider the use of proprietary cleaners that allow a lower operating temperature.	

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
30	9	<i>Consider use of a low temperature biological cleaner system in place of the traditional alkaline soak cleaner for a long production life, low waste and low energy consumption.</i>	
Pickling			
31	1	<i>The key areas of control are:</i> <i>- rinse water economy</i> <i>- prevention and control of point source and fugitive emissions to air</i> <i>- pickle efficiency</i> <i>- acid regeneration</i> <i>- acid recycling</i> <i>- use of inhibitors which are readily biodegradable.</i>	The process tanks incorporate automatic top-up and temperature control for consistent surface treatment performance. The pickling tanks are fume extracted via extraction lip ducts and vented to atmosphere via the fume scrubber. The tanks are fitted with automated lids to minimise fugitive emissions, reduce extraction energy costs and for reducing consumption for process heating. The tank incorporates a pumped agitation system for improved pickling efficiency and temperature control.
32	2	<i>There should be two or three stage cascade pickling with continuous pickle acid feed and continuous discharge to the effluent treatment facility.</i>	The aviation specifications to which Airbus conforms do not require multi-stage pickling.
33	3	<i>There should be a minimum of two stages of cascade rinsing with agitation.</i>	The proposed variation does not alter the existing permitted pickling stage rinse tank arrangement, which is considered to meet the requirements of BAT.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
34	4	<i>Consider ion exchange or other treatment unit to re-circulate rinse waters.</i>	The proposed variation does not alter the existing permitted pickling stage rinse tank arrangement, which is considered to meet the requirements of BAT. The proposed etch tank rinse water treatment includes ion exchange.
35	5	<i>Consider use of spent pickle acid for pH control in the effluent treatment facility.</i>	The proposed variation does not alter the existing permitted pickling stage rinse tank arrangement, which is considered to meet the requirements of BAT.
2.3 Surface Treatment			
Electroplating			
36	1	<i>The main areas of control are: ...</i>	Not applicable. The installation does not carry out electroplating activities.
37	2	<i>You should give full consideration to ...</i>	
38	3	<i>Maximise stages of cascade rinsing ...</i>	
39	4	<i>Use ion exchange or other treatment units ...</i>	
40	5	<i>Use proprietary plating electrolytes ...</i>	
41	6	<i>Replace EDTA by QUADROL ...</i>	
42	7	<i>Minimise drag-out by maximising ...</i>	
43	8	<i>Use ECO-rinse tank(s) to reduce mass ...</i>	
44	9	<i>Use electrochemical metals recovery ...</i>	
45	10	<i>Use evaporation technology in conjunction ...</i>	
46	11	<i>Generate turbulence by hydraulic power ...</i>	
47	12	<i>Use electrodialysis technology for ...</i>	
48	13	<i>Use hydrogen peroxide in the pickling tanks ...</i>	

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
49	14	Employ low temperature processes ...	
50	15	A minimum of 4 and preferably 5 stages ...	
51	16	Provide jig or barrel supports whilst draining ...	
52	17	Use continuous filtration and removal of ...	
Anodising			
53	1	The main areas of control are: - rinse water economy - mass drag-out reduction – see electroplating - energy consumption - prevention of fugitive emissions to air - removal of dissolved aluminium for the anodising electrolyte - chromium (VI) plating.	The process tanks incorporate automatic top-up and temperature control for consistent surface treatment performance. The tanks are fume extracted via extraction lip ducts and vented to atmosphere via the fume scrubber. The tanks are fitted with an automated lid to minimise fugitive emissions and reduce extraction energy and heating costs. The tanks incorporate pumped agitation systems for improved etching efficiency and temperature control. Chromium is being replaced in the system via the Airbus ‘chromate free programme’.
Electropolishing			
54	1	The main areas of control are: ...	Not applicable. Electropolishing is not undertaken.
Plating on plastics			
55	1	The main areas of control are: ...	Not applicable. Plating on plastics is not undertaken.
Autocatalytic plating			
56	1	The main areas of control are: ...	Not applicable. Autocatalytic plating is not undertaken.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
Etching			
57	1	The main areas of control are: - rinse water economy - mass drag-out reduction - energy consumption - prevention of fugitive emissions - prolongation of process fluid life.	The process tanks incorporate automatic top-up and temperature control for consistent surface treatment performance. The tanks are fume extracted via extraction lip ducts and vented to atmosphere via the fume scrubber. The tanks are fitted with automated lids to minimise fugitive emissions and reduce extraction energy and heating costs. The tanks incorporate a pumped agitation system for improved etching efficiency and temperature control. The process tanks are provided with exit sprays to rinse the etch solution off the parts as they are removed from the tank to minimise drag out and prolong process fluid life. Ion exchange is used to re-circulate rinse waters and improve rinse water economy.
2.4 Rinsing			
58	1	The main areas of control are: - water economy - mass drag-out reduction You should use the following techniques where appropriate:	The process tanks are provided with exit sprays to rinse the etch solution off the parts as they are removed from the tank to minimise drag out and prolong process fluid life. Ion exchange is used to re-circulate rinse waters and improve rinse water economy.
59	2	Multistage cascade rinsing.	Multistage cascade rinsing is not deemed appropriate in terms of optimal process requirements and water minimisation.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
60	3	<i>Closed-loop or recirculation systems with rinse water treatment (ion exchange, reverse osmosis, electrodialysis, air swept evaporation or vacuum evaporation).</i>	Ion exchange is used to re-circulate rinse waters and improve rinse water economy.
61	4	<i>Conductivity probes.</i>	Conductivity probes are not proposed. First stage rinse water flow is optimised and fed to the ETP at a controlled rate. Second stage rinse water is recirculated via an ion exchange plant.
62	5	<i>Water meters on each line.</i>	Rinse water flow through the effluent treatment stages are continuously monitored and continuously adjusted. The final effluent discharge flow is monitored.
63	6	<i>Flow restrictors.</i>	Not considered necessary.
64	7	<i>Minimised drag-out by employing a drainage time over the process tanks of at least 20 seconds for rack work and 30 seconds for barrelled work.</i>	The process tanks are provided with exit sprays to rinse the etch solution off the parts as they are removed from the tank to minimise drag out and prolong process fluid life.
65	8	<i>Drag-in – drag-out tanks (ECO rinse system) to reduce mass drag-out and subsequent rinse water consumption.</i>	ECO-rinsing is a technique in which drag-out is recovered in a rinse tank in to which the work is dipped both before and after being processed. This technique is used on the SMC and LCM lines.
66	9	<i>Continuous filtration and removal of sludge from phosphating process tanks.</i>	Not applicable. The proposed variation does not include phosphating.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
67	10	Recycling of trade effluent to less critical rinsing stages.	Second stage rinse water is recirculated via an ion exchange plant.
2.5 Drying			
68	1	Centrifugal drying for small work.	Not applicable, the proposed variation does not alter the existing drying systems, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
69	2	Providing lids for hot water tank driers.	
70	3	Providing a continuous bleed-off ...	
3.1 Point source emissions to water			
71	1	You should normally use buffer storage tanks to contain process fluid dumps (e.g. spent alkaline cleaners, pickles, passivates), which are preferably treated in the effluent treatment facility rather than removed by a licensed waste disposal contractor. You will usually have a dedicated storage tank for alkaline, acidic, and Cr (VI) dumps. In such cases you should be able to release the spent materials to the effluent treatment facility at a slow, controlled rate.	The proposed variation does not alter the existing process wastewater treatment and disposal arrangements, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
72	2	<i>For larger surface treatment operations where there are several process lines, the effluent flow will vary in accord with the number of lines in operation. You should ensure that peak loads do not exceed the capacity of the effluent treatment facility.</i>	The proposed rinse water systems on the SMC and LCM lines will include buffer tanks to contain wastewater, which is released to the effluent treatment facility at a controlled rate to prevent the capacity of the plant being exceeded.
73	3	<i>Small effluent treatment facilities are preferably operated on a batch basis, only releasing trade effluent to the sewer after confirmation that it is within the Sewerage Undertaker's consent limits. Larger facilities may be operated on a continuous basis provided that adequate monitoring is in place.</i>	The proposed variation does not alter the monitoring and control arrangement for the Site effluent treatment facilities, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions. The proposed modifications to the SMC and LCM effluent treatment facility will not alter the existed monitoring/control arrangements.
74	4	<i>The effluent system should be designed so as to prevent process effluent by-passing the effluent treatment plant ETP.</i>	The ETPs do not have by-pass facilities.
75	5	<i>You should justify the choice and performance of the effluent treatment facility against the following objectives:</i> <i>- the removal of dissolved metals including basis metals, e.g. iron, aluminium, copper, and zinc, and plating metals e.g. chromium,</i>	The proposed modifications to the existing ETPs include removal of dissolved aluminium and copper. The modifications include control of the trade effluent pH within the Welsh Water consent limits.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
		<i>copper, nickel, lead, tin, silver, and zinc</i> <i>- the control of the trade effluent pH within the Sewerage Undertaker's consent limits</i> <i>- formal consent limits may also be set for suspended solids, oil and grease, sulphate, detergents, COD, and cyanide</i> <i>- your permit may also set limits on the discharge.</i>	The proposed modifications to the ETPs will ensure current consent to discharge limits are maintained.
Primary Treatment			
76	6	<i>Whether multistage cascade or rinse water re-circulation with ion-exchange (or other treatment unit) is used for water conservation, the primary stage of effluent treatment is the precipitation of the dissolved metals from the effluent. Any Cr (VI) present, must first be reduced to the trivalent state in a turbulent tank reactor. Any effluent stream containing cyanide requires a cyanide oxidation step, again in a turbulent tank reactor.</i>	The proposed modifications to the existing ETPs include, as a primary stage, the removal of dissolved aluminium and copper.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
77	7	<i>The next step is the separation of the precipitate in a void tank settler or a lamellar clarifier, often with chemical pre-treatment (e.g. polyelectrolytes, inorganic coagulants and bentonite) to enhance the removal of colloidal solids, and/or to reduce the settlement time. Settling equipment works best with a steady continuous flow.</i>	The wastewater from the proposed variation will be processed in the existing ETP using hydroxide precipitation and settlement of precipitate. The proposed variation does not alter the existing precipitation treatment, which is already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
78	8	<i>The sludge is then filtered in a high pressure batch filter press for further water removal...</i>	The proposed variation does not alter the existing ETP sludge filtration systems, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
79	9	<i>The clean water flow from the settler/clarifier is usually discharged directly to the foul sewer as trade effluent.</i>	The final effluents will be discharged to sewer as trade effluent in accordance with current Permit requirements.
Secondary Treatment			
80	10	<i>Filtration to remove fine suspended solids to achieve trade effluent consent limits for metals of 1-3mg/l is common.</i>	The proposed second stage rinse water treatment includes effluent filtration. Effluents entering sand filter will flow through the media where suspended solids will be extracted by attrition onto the mixed media. Clarified liquor will percolate through the media to an under-bed collection drain where the outlet will be directed into cation exchange vessel purification train. Transfer pumps will be rated at 500 litres per hour to facilitate operational parameters of the ion exchange vessel.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
81	11	<i>Trade effluent, whether filtered or not, may be recycled to the less critical rinsing steps and thus reduce input water usage by up to 30%.</i>	Purified water from the proposed second stage rinse water treatment will be recycled back to the surface treatment lines.
82	12	<i>Where multistage cascade rinsing is in place, the effluent flow may be very low. “End of pipe” treatment with such techniques as activated carbon, bone charcoal, selective cationic ion-exchange, membrane filtration technology, and reverse osmosis may be considered, thus enabling a further reduction in water usage.</i>	The proposed deionised water plant will be fitted with additional activated carbon filters to ensure removal of traces of organic material originating from the degreasing and the alkaline etch tanks.
3.2 Point source emissions to air			
83	1	<i>If you use local exhaust ventilation (LEV) to control harmful substances, you should use the minimum extraction rates that enable COSHH requirements to be met; and where possible extraction should not be used at all, as described above.</i>	The proposed process involves the use of acid mixtures that result in the evolution of nitrogen oxides and sulphur dioxide upon emersion of the work pieces. As it is not considered practicable to contain the fume and the use of bath additives such as hydrogen peroxide would compromise the aerospace/aviation treatment specification then it is proposed to extract the fume for treatment prior to discharge to atmosphere. The extraction system is optimised to minimise the emission.
84	2	<i>Process tank lip ducts should be located with at least a 50mm gap between the top of the tank and the bottom of the lip duct.</i>	The proposed variation reuses existing tanks which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.

Item No.	BAT No.	Description of Indicative BAT (EPR 2.07)	Description of Proposed Development Facilities
85	3	<i>Fume extraction through the upper sides of process tanks is not recommended.</i>	
86	4	<i>A mist eliminator should be installed in the suction side of the extraction fan, with mist-eliminator drainage and washings being discharged to the effluent treatment facility.</i>	The installation's fume extraction and scrubber systems are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
3.3 Fugitive emissions to air			
87	1	<i>Where there are opportunities for reductions, your permit may require you to submit a regularly updated inventory of fugitive emissions.</i>	The proposed variation does not alter the existing arrangements for minimising fugitive emissions, which are already permitted and demonstrated to meet the requirements of BAT in previous permit variation application submissions.
88	2	<i>A simple water scrubber should be fitted to the vent outlet of hydrochloric acid tonnage storage vessels (for use during filling operations).</i>	
89	3	<i>You should regularly clean flume extraction ducting and mist eliminators.</i>	

4.0 Environmental Assessment

4.1 Environmental Emissions

4.1.1 Atmospheric Emissions

As described in the previous permit variation application (EPR/BM3965IA/V005):

“The use of an automatic overhead crane system precludes the use of a hood to contain fugitive emissions. The chemical and heated tanks are provided with lids and exhaust system. The LCM treatment line utilises a two-sided exhaust system, the exhaust rate is variable depending on the process sequence, whilst the SMC treatment line use a fixed volume, single side exhaust.

The control systems regulate the temperature of those baths that are heated. The sudden release of gasses or vapours is not considered likely to occur and provisions have therefore not been made other than vents in exhaust stacks for emergency pressure relief.

The LCM treatment line is provided with two water scrubbing towers located on a steelwork support platform mounted external to the ancillary building, with an attached pH-controlled sodium hydroxide dosing system. These exhaust to emissions point ref. A79. Both scrubbers are currently attached to the deoxidising tank (Tank 05), however with the introduction of TSA, one will be rerouted to take air emissions from Tank 08 (TSA process) whilst the line from Tank 05 and the emissions point A79 will remain unchanged.

The existing Tank 05 (de-oxidiser) exhaust fan 1 currently operates at 24 m³/s only when the tank lids are open (approximately 2 minutes each hour). The new design will operate at 24 m³/s when tank lids are open and at 1.5 m³/s when the lids are closed. Maximum emissions occur when the lids are closed and the anodising process is operating (approximately 20 minutes each hour).

The existing Tank 05 (de-oxidiser) exhaust fan 2 currently operates at 24 m³/s when tank lids are open and at 1.5 m³/s when the lids are closed. The new design will serve Tank 08 (Anodising) and operates at 6 m³/s at all times. Maximum emissions occur when the lids are closed and the anodising process is operating (approximately 20 minutes each hour).

When the LCM Chrome anodising bath (Tank 09) is decommissioned, its extraction system comprising a wash box and vent to atmosphere (emissions point ref. A82) will remain in place. It will, however, only serve to extract the spray rinse stage which

is the final step of the conversion and therefore the emissions reference will become obsolete.

Air emissions from Tanks 01 (knock off) and 02 (degrease) are extracted together via the assistance of a fan and pass through a demister (Tank 01 only) prior to discharge to atmosphere at emissions point A81. Air emissions from Tank 11 (rinse) are also extracted via the assistance of a fan and pass through a demister prior to discharge to atmosphere to emissions point A83.

SMC treatment line uses a horizontal packed wet scrubber fitted with a blow down system, taking emissions from Tanks 01, 02, 05, 08, 10 and 13 with active local extraction via fans. The scrubber is designed to remove contaminated water from the system, which is then treated at the effluent treatment plant. Air is finally exhausted to atmosphere by means of a fan to emissions point ref. A84.

There is no change to air volume for the new process, however the pollutant input to the scrubber will change when the TSA process is operating. The Chromic Acid anodising process will be replaced and the Chrome emissions will change to Sulphuric and Tartaric Acid mists. Tank 09 (Anodising) exhaust will be pre-washed by a separate dedicated scrubber which will then discharge into the existing exhaust system and through the existing scrubber. Each scrubber is estimated to operate at 80% removal of mists and particulates whilst emissions of NO_x will not change from existing levels. Emissions of Chrome will be zero and emissions of Sulphuric and Tartaric Acid are based on estimated generation of aerosols from the process tank.

Minor amounts of gaseous emissions may be released from the deoxidising process, including oxides of nitrogen and sulphuric and nitric acid mists. Emissions of sulphuric and tartaric acid mist may arise from the TSA process. These emissions are (and will continue to be after TSA conversion) controlled using scrubbers which serve both process lines.”

The current permit variation application does not significantly change the existing surface treatment line extraction systems. As described in Section 2.3 above, the principal changes relate to changing the duty of the LCM rinse tanks to an etch process and the connection of the etch tank lip extraction into the existing ventilation system.

The etch chemical to be introduced on the SMC and LCM lines is a proprietary ‘Airbus Etching Solution’ which is primarily an aqueous solution of sodium hydroxide (45 g/l) and a sodium salt (10 g/l) (Appendix 1). As the existing tank ventilation system scrubbers use sodium hydroxide as the scrubbing medium then Airbus considers that there will be no additional atmospheric emission resulting from proposed introduction of the etch processes.

The proposed variation changes the duty of LCM Tank 5 and SMC Tank 6 from a deoxidiser duty using a 25% aqueous solution of Ardrex 295GD at ambient temperature to pickling duty using a 25% aqueous solution of Ardrex 295GD at a temperature of 30 – 40°C. The concentrated Ardrex 295GD solution contains less than 20% nitric acid and less than 10% sulphuric acid. Accordingly, Airbus considers that the proposed change of duty from deoxidation to pickling will not result in the release of harmful emissions, which was the conclusion stated in the previous permit application (EPR/BM3965IA/V005), i.e.

“3.8.3 Deoxidisation (LCM Tank 05 and SMC Tank 08): The extract air from the existing deoxidising stage contains very small quantities of NO_x due to the oxidation of the nitric acid. Although present, the levels are so low they have not historically been detected by the sites monitoring programme. Any NO_x that might be present is, however, removed from the air by scrubbing prior to discharge to atmosphere;”

The ventilation system contractor appointed by Airbus to design and install the proposed SMC and LCM surface treatment line modifications has confirmed that the existing scrubber systems have adequate capacity for the intended duty and that a change in emission concentration, as stipulated in the previous permit application, is not anticipated.

4.1.2 Wastewater Discharge

The Airbus installation is consented by Welsh Water to discharge trade effluent to the municipal sewer in accordance with the following limits (Table 9):

Table 9: Consent to Discharge Trade Effluent Limits

Parameter	Release Point TE1 (LCM)	Release Point TE3 (SMC)
Flowrate (m ³ /day)	84	72
pH	6 - 11	
Suspended Solids	200 mg/l	
COD	1,000 mg/l	
Oil / Grease	300 mg/l	
Copper	2 mg/l	
Zinc	2 mg/l	
Lead	2 mg/l	
Chromium	2 mg/l	
Nickel	2 mg/l	
Sulphate	2,500 mg/l	
Sulphide	2 mg/l	

All wastewater from the rinse operations on the SMC and LCM surface treatment lines is directed to the respective ETPs prior to discharge to sewer via the consented release points. After discharge to sewer, the effluent is treated by Welsh Water at the Chester Waste Water Treatment Works and subsequently discharged to the receiving water course, the River Dee.

There are no wastewater discharges from the installation directly to controlled waters. As stated in the previous permit variation application the SMC and LCM surface treatment plants are located within bunded spill containment which have sumps fitted with level sensors. Any spillage or overflows collecting in the bund sumps will be pumped direct to the ETP.

Airbus anticipate that the water flow following the proposed changes to the LCM and SMC surface treatment plants will increase by approximately 6 m³/day on each line. The contractor appointed by Airbus to design and install the proposed SMC and LCM ETP modifications has confirmed this increased water flow will not cause an exceedance of the currently consented discharge limits.

The previous permit variation application (EPR/BM3965IA/V005) assessed the environmental impact of the effluent discharge from the installation at the consented flow rates. The assessment concluded:

“Of the determinants tested in the effluent, only boron and sulphate exceed 1% of the EQS. Of these, boron has been screened out as insignificant, as there is no contribution from the process. For sulphate, this is not a testing requirement from the sewerage undertaker (Welsh Water) and Welsh Water has not reported any difficulties or issues with handling the effluent at the treatment works. Additionally, neither boron nor sulphate are measured in the receiving water (the River Dee).”

4.2 Environmental Setting

The installation is located within the confines of the Hawarden Airfield (Figure 8). Land uses in the wider area are industrial, retail, residential and agricultural. The nearest residential dwellings are located within 50 m of the Site boundary on the opposite side of Chester Road (A5104).

The permitted boundary of the installation is as given in the current permit, i.e. reference number EPR/BM3965IA/V005. In addition, atmospheric emission point and wastewater discharge locations are not changed by the proposed permit variation.

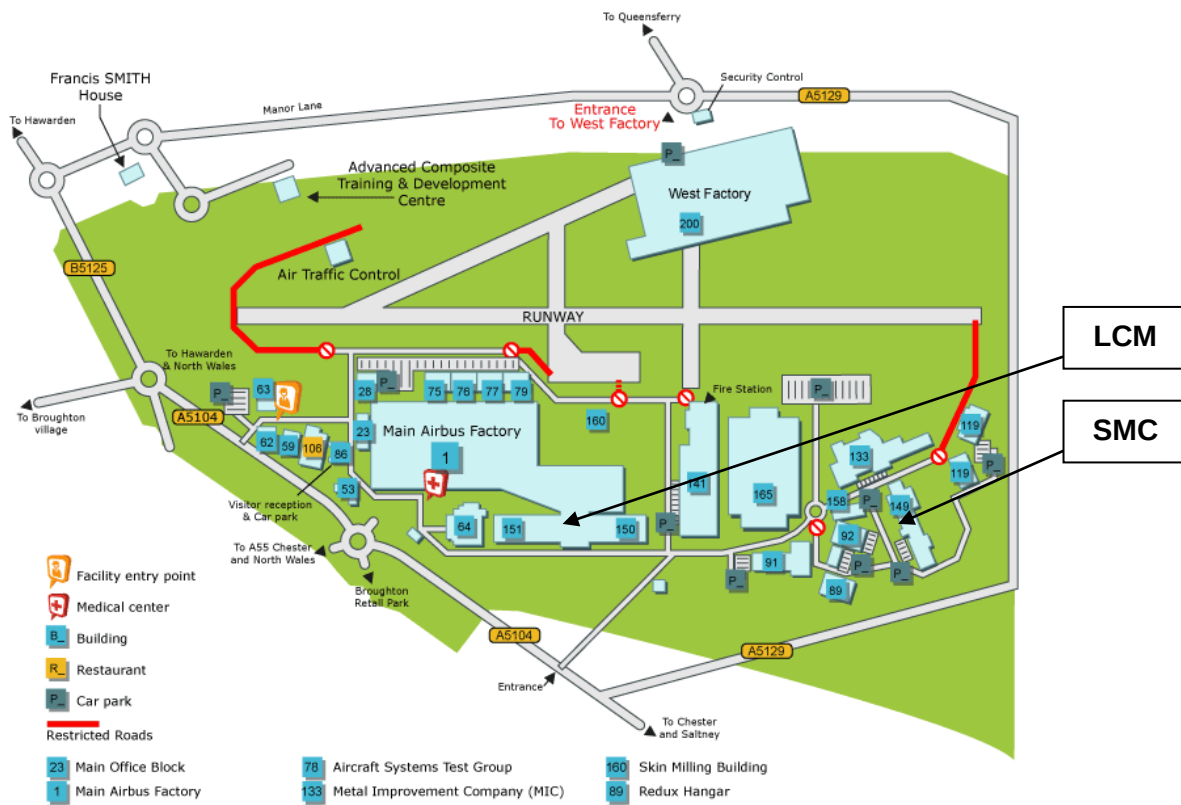


Figure 8: Airbus Site Plan

The Multi-Agency Geographic Information for the Countryside (MAGIC) service provides the following information on nature conservation areas within 10 km (Table 10):

The nearest Special Area of Conservation (SAC) is the River Dee and Lake Bala SAC, approximately 4 km north east of the Installation.

The nearest Site of Special Scientific Interest (SSSI) is the River Dee located approximately 1 km north east of the Installation.

The nearest RAMSAR site is located approximately 9 km to the north west of the Airbus Installation.

The previous permit variation application (Permit EPR/BM3965IA/V005) demonstrated that emissions from the surface treatment lines were insignificant and that air emissions did not impact upon human health or ecosystems in the vicinity of the Site.

Table 10: Ecological Receptors

Receptor Name	Designation			Approximate Distance from Site
	RAMSAR	SSSI	SAC	
Dee Estuary	x	x	x	9 km NW
River Dee (England)		x		6 km E
Inner Marsh Farm		x		8 km NNW
Buckley Clay Pits and Commons		x		5 km W
Chwarel Singret		x		8 km S
Connah's Quay Pond & Woodland		x		7 km NW
Llay Bog		x		9 km SW
Maes Y Grug		x		8 km NW
Marford Quarry		x		8 km S
Shotton Lagoons and Reed Beds		x		8 km NNW
Old Pulford Brook and Meadows		x		8 km SE
Coed Talon Marsh		x		9 km SW
River Dee including Lake Bala			x	4 km NE
Dee and Buckley Newt Sites			x	5 km NW

4.3 Point Source Emissions to Atmosphere

The installation is permitted for the emission to air of 'volatile organic compounds' (VOC).

The principal emissions to atmosphere from the Site surface treatment processes are oxides of nitrogen and, as mists, chromium and tartaric acid and sulphuric acid. The previous permit variation application (Permit EPR/BM3965IA/V005) demonstrated that emissions to atmosphere from the surface treatment lines were insignificant and consequently no emission limits values (ELV) for these substances are set within the current permit.

This permit variation application does not propose any changes to the permitted release points to atmosphere. Emissions to air from the SMC and LCM surface treatment processes comprise emissions extracted via the lip extraction systems from treatment tanks which are treated in the permitted scrubber systems (on the LCM treatment line extracted air emissions are treated in two water scrubbing towers, and on the SMC treatment line in a horizontal packed bed wet scrubber) prior to discharge to atmosphere.

As stated in the previous permit variation application, the main chemical constituents of the emissions to atmosphere are sulphuric acid and tartaric acid, with the elimination of the chromic acid mist upon completion of the Airbus 'chromate free programme'. Small amounts of NO_x and sulphates are anticipated from the pickling process. There are no VOC emissions from the surface treatment lines.

The environmental assessment presented in the previous permit variation application (Permit EPR/BM3965IA/V005) considered the impact of sulphuric acid emissions. Emissions of oxides of nitrogen (NO_x) from the surface treatment lines were considered as insignificant and screened out from further assessment. Accordingly, the assessment was based upon the following point source emissions (Table 11):

Table 11: Point Source Emissions to Air

<i>Emissions point reference and location</i>	<i>Parameter</i>	<i>Amount</i>	<i>Unit</i>	<i>Source</i>
A79 – LCM	Sulphates	5	mg/m ³	Tank 05
A79 – LCM	Sulphuric Acid	0.15	mg/m ³	Tank 08
	Tartaric Acid	0.25	mg/m ³	
A81	N/A	N/A	N/A	Tank 01 & 02
A83	N/A	N/A	N/A	Tank 11
A90 – LCM	N/A	N/A	N/A	Effluent treatment
A84 – Stringer	Sulphuric Acid	0.01	mg/m ³	Treatment line
	Tartaric Acid	0.02	mg/m ³	
A91 – Stringer	N/A	N/A	N/A	Effluent treatment

The assessment was undertaken in accordance with the Environment Agency's H1 assessment methodology and the following assumptions:

- pollutant concentrations in the stack emissions have been given an extra 100% 'contingency';
- since there are no EALs for sulphates, all emissions of sulphates have been assumed to undergo 100% conversion to sulphuric acid in the atmosphere;
- a 'weighted' flow rate has been used for the LCM air scrubber unit emissions, taking into account the maximum possible flow rate of 24 m³/s and the maximum concentration of sulphates within the emitted gas;
- assuming that background concentrations of sulphuric acid are calculable, based on a direct conversion from background concentrations of SO₂; and
- the maximum concentration has been determined for each source and combined together, assuming that the locations of these maxima coincide.

The estimated Process Contributions (PC) of sulphuric acid, as presented in the previous permit variation application, are given in Table 12. For the LCM scrubber unit, where the air flow rate of the extraction system is variable, a weighted average was calculated based on 2 minutes each hour at 24 m³/s and 58 minutes at 1.5 m³/s.

Table 12: H1 Assessment – Air Emissions

Source	Long term, annual average			Short term, hourly average		
	dispersion factor, $\mu\text{g}/\text{m}^3/\text{g}/\text{s}$	emission rate, g/s	PC, $\mu\text{g}/\text{m}^3$	dispersion factor, $\mu\text{g}/\text{m}^3/\text{g}/\text{s}$	emission rate, g/s	PC, $\mu\text{g}/\text{m}^3$
LCM scrubber	90	0.01	1.03	2240	0.01	25.73
LCM scrubber 2	90	0.0009	0.08	2240	0.0009	2.02
SMC scrubber	113.2	0.00015	0.02	2904	0.00015	0.44
Total			1.13			28.18
% of EAL			11.3			9.4

In the previous permit variation application, the background concentration of sulphuric acid was estimated to be $5.8 \mu\text{g}/\text{m}^3$, based on a SO_2 background concentration of $3.8 \mu\text{g}/\text{m}^3$ (obtained from the National Air Quality Information Archive). In accordance with the H1 methodology, this gave an estimated long term Predicted Environmental Concentration (PEC) of approximately $6.95 \mu\text{g}/\text{m}^3$.

This determination of background sulphuric acid was considered to be highly conservative as it was based on direct conversion of sulphur dioxide to sulphuric acid. Pure sulphuric acid is typically not found in ambient air due to its affinity to water; it is a component of acid rain.

As shown in Table 12, the short term PC was predicted in the previous permit variation application to be less than 10% of the relevant short term EAL ($300 \mu\text{g}/\text{m}^3$) and was therefore screened out as insignificant based on the criteria outlined in H1. The long term PC was predicted as greater than 1% of the relevant long term EAL ($10 \mu\text{g}/\text{m}^3$) and therefore could not be considered as insignificant. The long term PEC was, however, marginally within 70% of the long term EAL and due to the highly conservative nature of the assessment, including the assumptions described above, the long term impacts were considered to be negligible.

Accordingly, the assessment presented in the previous permit variation application concluded that atmospheric emissions from the installation would not impact upon human health or ecosystems in the vicinity of the Site. Airbus consider that the proposed changes to the installation, as described in this current permit variation application, will not alter vent stack emissions and will not therefore change the conclusions of the previous assessment.

4.4 Point Source Emissions to Sewer

Emissions to sewer comprise wastewaters generated by the rinse processes associated with the SMC and LCM surface treatment lines. Prior to discharge the wastewaters are treated in dedicated ETPs to achieve permit and Welsh Water (Dwr Cymru Cyfyngedig) consent

conditions. There are no point source emissions from the installation directly to controlled water.

This Permit Variation Application does not propose any changes to the consented release points to sewer. Whilst there will be some changes to the composition of the effluent releases from the SMC and LCM surface treatment processes as a result of the proposed changes, the effluent will be suitably treated in the ETPs to ensure compliance with the existing consent to discharge to sewer.

The environmental assessment presented in the previous permit variation application (Permit EPR/BM3965IA/V005) was based upon effluent sampling and analysis undertaken by Airbus. The assessment of the potential impact of the discharge was made using the “chemical specific” methodology as given in guidance note H1. The flow to sewer was based on the maximum quantity of trade effluent discharged under the Welsh Water trade effluent consent, which is 72 cubic metres per day. The results of the assessment demonstrated that of all the determinants tested for, only boron and sulphate were found to be greater than 1% of the EQS. All other determinants were assessed as insignificant.

As discussed in Section 2.3 above, the proposed changes to the surface treatment lines will include the use of Metsoak AK3192 (degreaser) and ‘Airbus Etching Solution’.

The use of Metsoak AK3192 will result in the discharge to sewer of ‘disodium tetraborate decahydrate’ and ‘1,2-benzisothiazol-3(2H)-one’, whilst the use of the ‘Airbus Etching Solution’ will result in the release to sewer of sodium glucoheptonate. Other than these additional substances, the composition of the effluents discharged to sewer from SMC and LCM will remain as currently permit and as assessed in the previous permit variation application.

Whilst these additional substances arising from the use of Metsoak and the ‘Airbus Etching Solution’ do not have assigned Environmental Quality Standards (EQS) or Environmental Action Levels (EAL), established for protection of ecosystems, ecological toxicity data is available from the respective Material Safety Data Sheets (MSDS) (Appendix A).

A comparison of the predicted concentration of these additional substances (as presented in Table 7, Section 2.3) against the respective MSDS ecological toxicity data is presented in Table 13.

Table 13: Wastewater Toxicity Assessment

Substance	Maximum Effluent Discharge Concentration (Table 7, Section 2.3)	MSDS Data Ecological Toxicity	
disodium tetraborate decahydrate	2.5 mg/l	Toxicity to fish	178 mg/l
		Toxicity to daphnia and other aquatic invertebrates	1,085 mg/l
		Toxicity to algae	158 mg/l
1,2-benzisothiazol-3(2H)-one	0.25 mg/l	Toxicity to fish	0.8 mg/l
		Toxicity to daphnia and other aquatic invertebrates	4.4 mg/l
sodium glucoheptonate	50 mg/l	Non-Toxic	

The assessment presented in Table 13 indicates that whilst the proposed wastewater discharge to sewer cannot be considered as having an insignificant impact (particularly in the case of 1,2-benzisothiazol-3(2H)-one), it is unlikely to cause harm to the receiving environment.

With respect to the metals content of the effluent discharge to sewer, Airbus considers that aluminium and copper will typically be at a concentration of less than 1 mg/l (as presented in Table 7, Section 2.3). The contractor appoint by Airbus to design and install the proposed modifications to the SMC and LCM ETPs predicts the maximum concentration of these metals in the final effluent will be:

- Copper : 0.1 mg/l
- Aluminium : 1.4 mg/l

These predicted concentrations are within Welsh Water current consent limits as presented in Table 9 above.

4.5 Point Source Emissions to Water

There will be no point source emissions direct to water as a result of the proposed changes to the SMC and LCM surface treatment lines (i.e. all effluent is discharged via the on-site ETPs to sewer).

4.6 Point Source Emissions to Land

There will be no wastewater discharge or waste deposition to land or groundwater as a result of the proposed changes to the SMC and LCM surface treatment lines.

4.7 Fugitive Emissions to Atmosphere

There will be no significant fugitive emissions as a result of the changes of the SMC and LCM treatment lines, which will be situated within the existing permitted buildings on Site.

The existing installation does not have a history of complaints from nearby residents and business, and it is considered unlikely that the changes will give rise to nuisance at the Site boundary.

4.8 Noise and Vibration

The proposed changes to the SMC and LCM surface treatment lines relate to the change in the use of a number of existing permitted tanks (with the exception of LCM Tank 3 which will comprise two new rinse tanks). The treatment lines and respective ETPs are located within existing process buildings and it is considered highly unlikely that the proposed changes will give rise to noise or vibration nuisance at the Site boundary. The existing installation does not have a history of complaints from nearby residents and business.

4.9 Fugitive Emissions to Water

The proposed changes to the surface treatment lines and associated ETPs, including raw material and waste storage areas, are located within existing permitted process buildings, the floorings of which are hard-surfaced. The bunding arrangements for the surface treatment line process tanks are permitted and demonstrated to meet the BAT requirements in previous Permit Variation applications. The existing plant fume scrubbers, which are also permitted, are located external to the production buildings on concrete hard-surfacing.

Airbus maintains spill containment procedures and operating personnel are provided with training in their implementation. In addition, regular inspections of yard area surfacing and bunding are undertaken in accordance with environmental management system and maintenance procedures.

Fugitive emissions to surface and ground water as a result of the changes are considered unlikely.

4.10 Accidents and Emergencies

The existing Installation is operated in accordance with the Broughton Site Environmental Incident Management Procedure that is maintained under the company ISO14001 certified environmental management system. The management system procedure details the action required in the event of an environmental incident at the installation. The procedure is regularly revised and reviewed to incorporate any additional accident or emergency scenarios arising from new plant and equipment that may be installed. Appropriate training is provided to employees and contractor staff to ensure that response to an incident is prompt and efficient.

5.0 Monitoring

5.1 Point Source Emissions to Atmosphere

Airbus consider that the composition of the atmospheric releases from the SMC and LCM surface treatment processes will not significantly alter as a result of the proposed changes. The emissions will be suitably treated in the existing on-site scrubber systems to ensure compliance with the existing Permit conditions. Accordingly, it is not proposed to alter the monitoring arrangements stipulate in the current Permit.

5.2 Point Source Emissions to Sewer

Whilst there will be some changes to the composition of the effluent releases from the SMC and LCM surface treatment processes as a result of the proposed changes, the effluent releases will be suitably treated in the ETPs to ensure compliance with the existing consent to discharge to sewer. Accordingly, it is not proposed to alter the monitoring arrangements stipulated in the current Permit.

5.3 Point Source Emissions to Water

The proposed changes are considered unlikely to result in direct discharges to surface water and groundwater.

6.0 Resource Efficiency

6.1 Energy Efficiency

Airbus has an EU ETS emissions trading permit and is a participant to a Climate Change Agreement, (CAA), since 2002. The agreement has a number of variable targets based on production output. Energy management techniques have been implemented to monitor, record and track energy consumption of the various activities undertaken at the Installation.

To achieve the reductions required under the CCA an energy policy has been prepared that is managed under the Airbus certified environmental management system. In addition, energy information, including monitoring data, is provided to NRW in accordance with the Installation's current Environmental Permit. The proposed changes will be incorporated into the existing energy efficiency management procedures.

The Installation has an on-site Combined Heat and Power (CHP) plant which provides power to the newer buildings at the Installation. The CHP and the existing boilers will be used to provide the additional energy requirements for the proposed changes to the surface treatment lines, i.e. additional pumps and control circuits.

On the basis that the SMC and LCM surface treatment lines will be operational 24 hours a day, 7 days a week, 52 weeks a year, the additional electricity requirements for the additional pumps and motors is estimated to be 0.66 MWh (Table 14).

Table 14: Additional Electricity Requirements

<i>Process</i>	<i>Tank</i>	<i>Pump Rating (KW)</i>	<i>Normal Running (hours/week)</i>	<i>Energy Consumption (KWh/week)</i>	<i>Energy Consumption (KWh/year)</i>	<i>Primary Energy¹ (KWh/year)</i>
SMC	T8	3	168	504	26,208	62,900
SMC	T5	3	168	504	26,208	62,900
LCM	T5	7.5	168	1,260	65,520	157,300
LCM	T4	7.5	168	1,260	65,520	157,300
LCM	Egger	55	168	9,240	480,480	1,153,200
Total:				12,768	663,936	1,593,600

Note 1: a correction factor of 2.4 has been used to convert delivered energy to primary energy

Compared to the data provided in the previous permit variation application (EPR/BM3965IA/V005) this increased electricity consumption equates to a 1% increase in carbon dioxide (CO₂) emissions (Table 15).

Table 15: Additional CO₂ emissions

Table 20: Additional CO ₂ emissions					
Energy Source	Emission Factor	Primary Energy conversion factor	CO ₂ emission factor	Annual Energy consumption	Annual CO ₂ emission
	kg CO ₂ /kWh		kg CO ₂ /kWh	kWh	tonnes
Previous Permit Variation Application (EPR/BM3965IA/V005)					
Site Consumption					
Grid	0.166	2.6	0.4316	57,289,874	24,726
CHP	0.190	1.818	0.3454	293,588	101
Total:					24,827
Proposed Modification to the Surface Treatment Lines					
Grid ¹	0.166 ²	2.4 ²	0.3984	663,936	265
% Increase:					1%

Note 1: assumes electricity is drawn from the grid; power may be supplied from the CHP plant

Note 2: values taken from H1 Software Tool, Version 2.7.2, dated October 2013

6.2 Raw Materials Consumption

In accordance with current Permit conditions, Airbus maintains an inventory of raw materials used at the Installation and undertakes periodic waste minimisation and water efficiency assessments. The proposed changes to the SMC and LCM surface treatment lines relate to the introduction of etch and pickling activities.

Table 16: 'Airbus Etching Solution' Consumption

Process	Chemical	First Fill	Half Fill after 12 month	Refill after further 6 month	Weekly addition
		kg	kg	kg	kg
LCM	28% sodium hydroxide	28,200	14,100	28,200	3000
	Sodium glucoheptonate	3,000	1,500	3,000	-
	Socomul TA surfactant	600	300	600	-
SMC	28% sodium hydroxide	8,000	3,950	8,000	1000
	Sodium glucoheptonate	850	425	850	-
	Socomul TA surfactant	170	85	170	-

The latter activity (i.e. pickling) continues to use the reagent Ardrex 295GD, but at an elevated temperature of 30 – 40°C. The former activity (i.e. etch) introduces the use of a proprietary 'Airbus Etching Solution', comprising:

- Sodium Hydroxide;
- Socomul TA surfactant; and

- Sodium Glucoheptonate.

The anticipate usage of the 'Airbus Etching Solution' is provided in Table 16:

6.3 Water Minimisation

It is anticipated that there will be an increase in water consumption as a result of the proposed changes. The following increases in water consumption are estimated:

- SMC – 2,190 m³ per year (based on 6 m³ per day for 365 days per year operation)
- LCM – 2,190 m³ per year (based on 6 m³ per day for 365 days per year operation)

The combined water consumption of 4,380 m³/y represents a 25% increase compared to the value of 17,500 m³/y reported in the previous permit variation application for LCM and SMC surface treatment plants.

As discussed in Section 2.3.3 above, to minimise water consumption the proposed plant has been designed to incorporate an ion exchange system to allow wastewater to be recycled to the process for reuse.

In addition, Airbus regularly reviews their water usage using data obtained from water meters on Site with comparisons made annually with UK national figures. Extensive control measures have been put in place to restrict water usage, as outlined in the previous permit variation application.

6.4 Waste Minimisation

The proposed changes to the SMC surface treatment line do not increase the production of waste and do not introduce any additional process waste streams. The principal change to the plant is the replacement of the existing decontamination process with an etching activity. As with the current process it is anticipated that half the tank volume of the etch solution will be replaced in the first year of operation and in the second year the full tank volume will be replaced, the cycle repeating thereafter.

The proposed changes to the LCM surface treatment line will result in an increase in waste, specifically as a result of the change of use of Tank 4 from a rinse to an etch tank. As with the SMC surface treatment line, it is anticipated that half the tank volume of the etch solution will be replaced in the first year, and in the second year the full tank volume will be replaced. This will result in the generation of 150 tonnes additional waste (waste etch solution) in the first year, and 300 tonnes of waste etch solution in the second year.

With regard to the SMC and LCM ETPs, it is anticipated that there will be an increase in filter cake production due to operation of the proposed etching and pickling processes on the SMC and LCM surface treatment lines. As described and justified in the previous permit variation application, this filter cake is sent off-site as a non-hazardous waste for landfill disposal.

The following increases in filter cake production are estimated:

- SMC – 0.35 tonnes annually (based on 1 kg per day); and
- LCM – 1.10 tonnes annually (based on 3 kg per day).

The combined increase of 1.45 t/y represents a 25% increase compared to the value of 6 t/y reported in the previous permit variation application for the ETP filter cake disposal.

The aforementioned waste quantities are based on a worst case scenario for normal operation of the treatment lines; it is however possible that the life of the etch solution in these tanks could be extended as a result of the efficient processing of components. Airbus will therefore undertake a waste review after year 1 and year 2 of production to establish an accurate figure for waste produced from the SMC and LCM treatment processes and associated effluent treatment activities.

With regard to waste disposal, an assessment of waste disposal options was provided in the original PPC Permit Application. Wastes arising at the Installation will be handled, managed and disposed of in accordance with current Permit conditions and the existing arrangements for the surface treatment and effluent treatment activities.

7.0 Management System

Airbus has an Environmental Management System (EMS) which is certified to ISO14001:2004. The management system has been ISO14001 certified since April 2004 and is regularly audited by a suitably accredited third party company. Access to the EMS and associated documents is via the Publication Management System (PMS) on the Airbus intranet.

The management system is fully compliant with the requirements as detailed in Environment Agency guidance document *How to Comply with your Environmental Permit* (document 433_11 (Version 6 - June 2013)).

7.1 Policy

The facility has developed an Environmental Policy, which can be found within Airbus management system document CPL 21. This document is available on the company's intranet.

The policy has been developed by Airbus top management and is signed by the UK's Managing Director. The Environmental Policy clearly defines Airbus's commitment to ensure that the impact of the Site activities upon the Environment is kept to a minimum. The Policy is reviewed annually at the Management Review meeting. The policy addresses specific Site Environmental issues by providing a framework for setting and reviewing environmental Objectives and Targets.

7.2 Organisation

Airbus has established and maintains documented procedures for identifying and recording environmental aspects for all its activities, products and services. Where significant, the environmental aspects have been considered in the development, implementation and maintenance of the EMS. These are also considered when introducing new or modified activities, products and services. Airbus has also established documented procedures for the setting and managing of environmental Objectives and Targets that are based on:

- The Environmental Policy;
- Legal and other requirements;
- Significant environmental aspects;
- Technology options;
- Finances; and
- Operational and Business requirements.

Company directors have overall responsibility for the provision and maintenance of an effective EMS Policy and improvement programme and will ensure that the requirements of the EMS are addressed in all management and business decisions.

Airbus has established documented procedures for structure and responsibility within the organisation. The UK's Managing Director is ultimately responsible for the environmental performance of Airbus.

Airbus has established procedures for conducting periodic internal audits to determine whether the EMS conforms to planned arrangements, and to determine whether it has been appropriately implemented and maintained in accordance with its Environmental Policy.

7.3 Operations and Maintenance

Operational Control

Airbus implements a range of operational controls to minimise the impact on the environment. The environmental impact of the facility's activities are minimised by:

- the choice and control of material inputs;
- minimising the energy usage;
- maintaining the Site in accordance a planned preventative maintenance programme; and
- managing the installation in conjunction with the operators of the other Site permitted installations (e.g. the CHP plant).

Operational controls implemented at Airbus are maintained within ISO 14001 management system. These documents and other operational control procedures have been established to ensure that Airbus activities and operations are undertaken to ensure environmental performance is achieved in line with the Environmental Policy.

Operational control documentation will be updated to include the operational requirements for the proposed changes to the LCM and SMC treatment lines, including the associated ETPs.

Preventative Maintenance

Airbus has a preventative maintenance programme to ensure the continued integrity of pollution prevention and abatement systems. Planned Preventative Maintenance (PPM) is managed through an asset management software package (Concept Evolution) which is used to create and issue PPM schedules and records for all planned and unplanned

maintenance activities for all Facilities & Infrastructure equipment listed in an asset database. The system generates PPM instructions to the maintenance personnel; these instructions are based on PPM requirements covering maintenance actions & checks, frequency, duration, skills, tools & spares required. This information is derived from various sources including maintenance manuals, manufacturer's handbooks, statutory requirements, environment, health & safety requirements, and Site processes & procedures.

The control, responsibilities and activities involved in utilising the PPM system are defined in controlled documents '*Concept Driven Asset Identification and Maintenance Issuing Procedure*' (FAS010) and '*Concept Asset Management Procedure*' (FAS011).

The PPM system and associated procedures will be updated to include the requirements for the proposed changes to the LCM and SMC treatment lines, including the associated ETPs.

7.4 Competence and Training

Airbus has established documented procedures for ensuring that the training needs of all employees, including those whose activities may affect the environment, are identified and that the necessary knowledge and skills are provided through appropriate education, training and experience.

An induction programme provides all new recruits and, if appropriate, contractors with environmental awareness training. Additional, on-the-job training and more specialist formal training, is provided as determined by the employees manager.

Environmental training is carried out in accordance with the Site's ISO 14001 environmental management system, document references A2595.1 and A2302, available from the Site's intranet.

7.5 Accidents, Incidents and Non-Conformance

Airbus has established and maintains documented procedures for the response to accidents and emergency situations that may arise. These include a procedure to prevent and mitigate environmental risks that may be associated with such situations. The procedures also include individual responsibilities and authority for each emergency situation.

The *Broughton Site Environmental Incident Management* document (document reference CPR7020.0) details the procedures to be taken in the event of an environmental incident and specifically the measures to be taken for making safe an area where an environmental incident has occurred to ensure the Site is secure; assessing the extent of damage; effective communication; and for full and permanent recovery of damaged premises, if appropriate.

Airbus also maintains systems to ensure non-conformances are investigated and that actions are taken to correct and prevent the causes. Systems are in place for investigating and managing all environmental corrective and preventative actions.

Appendices

Appendix A

Material Safety Data Sheets

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 5.0 Revision Date 05.10.2012

Print Date 11.03.2015

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifiers**

Product name : 1,2-Benzisothiazol-3(2H)-one

Product Number : 561487
Brand : Aldrich
Index-No. : 613-088-00-6
CAS-No. : 2634-33-5**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheetCompany : Sigma-Aldrich Company Ltd.
The Old Brickyard
NEW ROAD, GILLINGHAM
Dorset
SP8 4XT
UNITED KINGDOMTelephone : +44 (0)1747 833000
Fax : +44 (0)1747 833313
E-mail address : eurtechserv@sial.com**1.4 Emergency telephone number**Emergency Phone # : +44 (0)1747 833100

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]**Acute toxicity, Oral (Category 4)
Skin irritation (Category 2)
Serious eye damage (Category 1)
Skin sensitization (Category 1)
Acute aquatic toxicity (Category 1)**Classification according to EU Directives 67/548/EEC or 1999/45/EC**

Very toxic to aquatic organisms. May cause sensitization by skin contact. Irritating to skin. Risk of serious damage to eyes. Harmful if swallowed.

2.2 Label elements**Labelling according Regulation (EC) No 1272/2008 [CLP]**

Pictogram



Signal word : Danger

Hazard statement(s)

H302 : Harmful if swallowed.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H400 : Very toxic to aquatic life.

Precautionary statement(s)
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Statements none

According to European Directive 67/548/EEC as amended.

Hazard symbol(s)



R-phrases(s)

R22 Harmful if swallowed.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R43 May cause sensitization by skin contact.
R50 Very toxic to aquatic organisms.

S-phrases(s)

S24 Avoid contact with skin.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39 Wear suitable gloves and eye/face protection.
S61 Avoid release to the environment. Refer to special instructions/ Safety data sheets.

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : C_7H_5NOS
Molecular Weight : 151.19 g/mol

Component		Concentration
1,2-Benzisothiazolin-3-one		
CAS-No.	2634-33-5	-
EC-No.	220-120-9	
Index-No.	613-088-00-6	

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

- 4.3 Indication of any immediate medical attention and special treatment needed**
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides, nitrogen oxides (NO_x), Sulphur oxides

5.3 Advice for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information

no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end uses

no data available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of

contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---|---|
| a) Appearance | Form: crystalline
Colour: light yellow |
| b) Odour | no data available |
| c) Odour Threshold | no data available |
| d) pH | no data available |
| e) Melting point/freezing point | Melting point/range: 154 - 158 °C - lit. |
| f) Initial boiling point and boiling range | no data available |
| g) Flash point | no data available |
| h) Evaporation rate | no data available |
| i) Flammability (solid, gas) | no data available |
| j) Upper/lower flammability or explosive limits | no data available |
| k) Vapour pressure | no data available |
| l) Vapour density | no data available |
| m) Relative density | no data available |
| n) Water solubility | no data available |
| o) Partition coefficient: n-octanol/water | no data available |
| p) Autoignition temperature | no data available |
| q) Decomposition temperature | no data available |
| r) Viscosity | no data available |
| s) Explosive properties | no data available |
| t) Oxidizing properties | no data available |

9.2 Other safety information

no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

no data available

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - rat - 1,020 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitization

May cause allergic skin reaction.

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure

no data available

Specific target organ toxicity - repeated exposure

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation

May be harmful if inhaled. Causes respiratory tract irritation.

Ingestion

Harmful if swallowed.

Skin

May be harmful if absorbed through skin. Causes skin irritation.

Eyes

Causes eye burns.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information

RTECS: DE4620000

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) - 0.8 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 4.4 mg/l - 48 h

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN number

ADR/RID: 3077

IMDG: 3077

IATA: 3077

14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,2-Benzisothiazolin-3-one)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,2-Benzisothiazolin-3-one)

IATA: Environmentally hazardous substance, solid, n.o.s. (1,2-Benzisothiazolin-3-one)

14.3 Transport hazard class(es)

ADR/RID: 9

IMDG: 9

IATA: 9

14.4 Packaging group

ADR/RID: III

IMDG: III

IATA: III

14.5 Environmental hazards

ADR/RID: yes

IMDG Marine pollutant: yes

IATA: yes

14.6 Special precautions for user

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
no data available

15.2 Chemical Safety Assessment
no data available

16. OTHER INFORMATION

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

SAFETY DATA SHEET

1 Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product Name: **Caustic Soda 32% w/w**
Datasheet Number: Caustic Soda 32% 1. 0. 0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Various Uses

1.3 Details of the supplier of the safety data sheet

Name of Supplier: Almetron Ltd
Address of Supplier: Unit 24
Abenbury Way
Wrexham Industrial Estate LL13 9UZ
UK
Telephone: +44 (0) 1978 660297
Fax: +44 (0) 1978 661104
Responsible Person: Ian Rogers
Email: info@almetron.co.uk

1.4 Emergency telephone number

+44 (0) 1978 660297 Out of hours: +44(0)7860 593251

2 Hazards identification

2.1 Classification of the substance or mixture

- Skin Corr. 1A

2.2 Label elements



- Signal Word: Danger
- Symbols: C

Hazard phrases

- Causes severe skin burns and eye damage.

Precautionary Phrases

- Keep out of reach of children.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Remove/Take off immediately all contaminated clothing.
- Wear protective gloves/protective clothing/eye protection/face protection.

Risk Phrases

- Causes severe burns (R35)

Safety Phrases

- Keep out of reach of children (S2)

2 Hazards identification (....)

- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice (S26)
- Take off immediately all contaminated clothing (S27)
- Wear suitable gloves and eye/face protection (S37/39)

2.3 Other hazards

- Contains alkali

3 Composition/information on ingredients

3.1 Mixtures

Chemical Name	Concentration	CAS Number	EC Number	R/H Phrases*	Symbols
Sodium Hydroxide	30-40%	1310-73-2	215-185-5	H314, R35	GHS05, C

*See Section 16

4 First aid measures

4.1 Description of first aid measures

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- If substance has got into eyes, immediately wash out with plenty of water for at least 15 minutes
- If swallowed, rinse mouth with water (only if the person is conscious) (S64)
- Give plenty of water to drink
- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible) (S45)

4.2 Most important symptoms and effects, both acute and delayed

- Causes severe burns (R35)

4.3 Indication of immediate medical attention and special treatment needed

5 Fire-fighting measures

5.1 Extinguishing media

- In case of fire use extinguishing media appropriate to surrounding conditions

5.2 Special hazards arising from the substance or mixture

- Contact with light alloys releases Hydrogen.

5.3 Advice for firefighters

- Wear protective clothing as per section 8
- Wear Breathing Apparatus

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Wash area thoroughly after dealing with spillage

6.2 Environmental Precautions

- Do not allow to enter public sewers and watercourses

6.3 Methods and material for containment and cleaning up

- Contain leaking liquid in earth or sand and remove to safe place when solid
- Absorb spillage in suitable inert material

6 Accidental release measures (....)

- Place in appropriate container

6.4 Reference to other sections

- See Section 13

7 Handling and storage

7.1 Precautions for safe handling

- Avoid contact with acid

7.2 Conditions for safe storage, including any incompatibilities

- Store in secure compound that will contain accidental spillages.
- Keep away from acid (S14)

7.3 Specific end use(s)

8 Exposure controls/personal protection

8.1 Control parameters

- OES / LTEL 2 mg/m³

8.2 Exposure controls

Occupational exposure controls

- Ensure working area is well ventilated.
- Wear PVC gloves
- Wear rubber gloves
- Wear goggles giving complete eye protection
- Wear suitable protective clothing (S36)
- In poorly ventilated areas or confined spaces, use an airline respirator or self-contained breathing apparatus



Gloves



Goggles



Suit



Boots

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Appearance: Liquid, water white
- pH 13
- Boiling point 110 °C
- Miscible in water.
- Specific gravity 1.35 g/cm³

9.2 Other information

10 Stability and reactivity

10.1 Reactivity

10.2 Chemical stability

- Stable under normal conditions.

10 Stability and reactivity (....)

- 10 .3 Possibility of hazardous reactions
- 10 .4 Conditions to avoid
 - Avoid contact with acid
- 10 .5 Incompatible materials
 - Incompatible with acid
- 10 .6 Hazardous Decomposition Products

11 Toxicological information

- 11 .1 Information on toxicological effects
 - No experimental data available
- Carcinogenicity
 - No evidence of carcinogenic effects
- Teratogenicity
 - No evidence of reproductive effects
- Mutagenicity
 - No evidence of mutagenic effects

12 Ecological information

- 12 .1 Toxicity
 - Strong concentrations will cause fatalitites in aquatic life.
- 12 .2 Persistence and degradability
- 12 .3 Bioaccumulation Potential
 - Bioaccumulation is insignificant
- 12 .4 Mobility in soil
- 12 .5 Results of PBT and vPvB assessment
- 12 .6 Other Adverse Effects

13 Disposal considerations

- 13 .1 Waste treatment methods
 - Disposal should be in accordance with local, state or national legislation
 - Contact an authorised waste disposal contractor.
 - Do not discharge into drains or the environment, dispose to an authorised waste collection point

14 Transport information



Corrosive

14.1 UN Number

1824

14.2 UN Proper Shipping Name

Sodium Hydroxide Solution

14.3 Transport hazard class(es)

8

14.4 Packing group

II

14.5 Environmental hazards

14.6 Special precautions for user

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

Other information

Emergency Action Code

Proper Shipping Name:

EAC:

Road/Rail (ADR/RID)

Proper Shipping Name:

Sodium Hydroxide Solution

ADR UN No.:

1824

ADR Hazard Class:

8

ADR Item No.:

ADR/RID No.:

Tremcard:

Sea (IMDG)

Proper Shipping Name:

Sodium Hydroxide Solution

IMDG UN No.:

1824

IMDG Hazard Class.:

8

IMDG Page No.:

IMDG Pack Group.:

II

IMDG EmS:

IMDG MFAG:

Air (ICAO/IATA)

Proper Shipping Name:

Sodium Hydroxide Solution

ICAO Un No.:

1824

ICAO Hazard Class.:

8

ICAO Packing Group.:

II

DOT / CFR (US Department of Transportation)

DOT Proper Shipping Name:

Hazardous Material:

Hazard Class:

Identification Number:

Product RQ (lbs):

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- This Safety Data Sheet is provided in compliance with The Dangerous Substances Directive (67/548/EEC)

15 Regulatory information (....)

15 .2 Chemical Safety Assessment

16 Other information

Text of R and S phrase codes used in this safety data sheet:- H314: Causes severe skin burns and eye damage.; R35: Causes severe burns.

The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage, and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication, however no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.

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1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Ardrox 295 GD

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Sub- : Pickling agent for metal surfaces
stance/Mixture

Recommended restrictions : None known.
on use

1.3 Details of the supplier of the safety data sheet

Company : Chemetall Ltd
Denbigh Road
Bletchley Milton Keynes MK1 1PB
Telephone : 01908 649333
Telefax : 01908 373939

Contact person product safety
Telephone : +49(0)6971652832
E-mail address : msds.de@chemetall.com

1.4 Emergency telephone number

Emergency telephone : 01908 649333
number

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin corrosion, Category 1A H314: Causes severe skin burns and eye damage.
Specific target organ toxicity - single ex- H335: May cause respiratory irritation.
posure, Category 3

Classification (67/548/EEC, 1999/45/EC)

Corrosive R35: Causes severe burns.
Irritant R37: Irritating to respiratory system.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

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Hazard pictograms

:



Signal word

: Danger

Hazard statements

: H314
H335

Causes severe skin burns and eye damage.
May cause respiratory irritation.

Precautionary statements

: **Prevention:**

P260

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P262

Do not get in eyes, on skin, or on clothing.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Disposal:

P501

Dispose of contents/ container to an approved waste disposal plant.

Hazardous components which must be listed on the label:

- 10028-22-5 Diiron tris(sulphate)
- 7664-93-9 Sulphuric acid

Labelling according to EC Directives (1999/45/EC)

Hazard pictograms

:



Corrosive

R-phrase(s)

: R35
R37

Causes severe burns.
Irritating to respiratory system.

S-phrase(s)

: S23
S24/25
S26

Do not breathe gas/fumes/vapour/spray.
Avoid contact with skin and eyes.
In case of contact with eyes, rinse immedi-

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		ately with plenty of water and seek medical advice.
	S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	S60	This material and its container must be disposed of as hazardous waste.

Hazardous components which must be listed on the label:

- 7697-37-2 Nitric Acid
- 7664-93-9 Sulphuric acid

2.3 Other hazards

The information required is contained in this Material Safety Data Sheet.

3. Composition/information on ingredients

3.1 Substances

Identification: Ardrox 295 GD

3.2 Mixtures

Chemical nature : Aqueous solution

Hazardous components

Chemical Name	CAS-No. EC-No. Registration number	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
Diiron tris(sulphate)	10028-22-5 233-072-9 01-2119513202-59	Xn; R22 Xi; R36/37	Acute Tox. 4; H302 Eye Irrit. 2; H319 STOT SE 3; H335	>= 20 - < 25
Nitric Acid	7697-37-2 231-714-2 01-2119487297-23	O; R 8 C; R35 Nota B	Ox. Liq. 3; H272 Skin Corr. 1A; H314	>= 10 - < 20
Sulphuric acid	7664-93-9 231-639-5	C; R35	Skin Corr. 1A; H314	>= 5 - < 10

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		Nota B		
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For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.
For the full text of the Notas mentioned in this Section, see Section 16.

4. First aid measures

4.1 Description of first aid measures

- General advice : First-aid crew: Ensure self-protection.
Move out of dangerous area.
Take off contaminated clothing and shoes immediately.
- If inhaled : Move to fresh air.
If symptoms persist, call a physician.
- In case of skin contact : Wash off with soap and plenty of water.
Call a physician immediately.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids.
Call a physician immediately.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do NOT induce vomiting.
Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

- Symptoms : Respiratory disorder
Pain
Blistering
- Risks : corrosive effects

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.
For specialist advice physicians should contact the Poisons
Information Service.

5. Fire-fighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Carbon dioxide (CO₂)
Dry powder
Alcohol-resistant foam
Water spray

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Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : May form toxic gases on heating or in case of fire.
Sulphur oxides
nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.
Further information : Use water spray to cool unopened containers.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Ensure adequate ventilation.
Wear personal protective equipment.

6.2 Environmental precautions

Environmental precautions : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.
Inform the relevant authorities if it enters sewers, aquatic environment or soil.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Ensure adequate ventilation.
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

See chapter 8 and 13

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Provide sufficient air exchange and/or exhaust in work rooms.
Have eye wash bottle or eye rinse ready at the work place.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

7.2 Conditions for safe storage, including any incompatibilities

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Requirements for storage areas and containers : Keep containers tightly closed in a cool, well-ventilated place. Keep away from heat.

Storage temperature : > 20 °C

7.3 Specific end uses

Specific use(s) : Pickling agent for metal surfaces

8. Exposure controls/personal protection

8.1 Control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Diiron tris(sulphate)	10028-22-5	TWA	1 mg/m3 Iron	2005-04-06	GB EH40
Further information	:	Iron			
		STEL	2 mg/m3 Iron	2005-04-06	GB EH40
Further information	:	Iron			
Nitric Acid	7697-37-2	STEL	1 ppm 2.6 mg/m3	2006-02-09	2006/15/EC
Further information	:	Indicative			
		STEL	1 ppm 2.6 mg/m3	2007-08-01	GB EH40

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection : In case of insufficient ventilation wear suitable respiratory equipment.
Recommended Filter type:
B-P2

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- Hand protection : Neoprene gloves
butyl-rubber
Protective gloves complying with EN 374.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Eye protection : Eye protection (EN 166)
Tightly fitting safety goggles
Have eye wash bottle or eye rinse ready at the work place.
- Skin and body protection : Chemical resistant protective clothing according to DIN EN 13034 (Type 6)
- Hygiene measures : Take off contaminated clothing and shoes immediately.
Keep away from food, drink and animal feedingstuffs.
Wash hands before breaks and immediately after handling the product.
Avoid contact with skin and eyes.
Do not breathe vapour.
Do not breathe spray.

Environmental exposure controls

- General advice : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.
Inform the relevant authorities if it enters sewers, aquatic environment or soil.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Appearance : liquid
- Colour : dark brown
- Odour : none
- Flash point : not applicable
- pH : < 1
(undiluted)
- Melting point/range : -10 °C

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Boiling point/boiling range : 105 °C

Density : 1.40 g/cm³
at 20 °C

Water solubility : completely miscible

9.2 Other information

Explosivity : no explosion risk

10. Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Gives off hydrogen by reaction with metals.

10.4 Conditions to avoid

Conditions to avoid : Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid : When diluting, always add the acid to the water, never the other way round.
Incompatible with bases.

10.6 Hazardous decomposition products

Risk of decomposition. : No decomposition if stored and applied as directed.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity : Acute toxicity estimate: 2,332 mg/kg
Method: Calculation method

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Acute oral toxicity
Sulphuric acid : LD50: 2,140 mg/kg
Species: rat

Skin corrosion/irritation

Skin irritation : Causes severe burns.

Serious eye damage/eye irritation

Eye irritation : Causes serious eye damage.

Respiratory or skin sensitization

Sensitisation : no data available

Toxicology Assessment

Acute effects : May cause respiratory irritation.

Further information : If swallowed, severe burns in the oral cavity and throat as well as danger of perforation of the digestive tract and stomach.

12. Ecological information

12.1 Toxicity

Toxicity to fish
Sulphuric acid : LC50: 42 mg/l
Exposure time: 96 h
Species: Gambusia affinis (Mosquito fish)

LC50: 82 mg/l
Exposure time: 24 h
Species: Danio rerio (zebra fish)

12.2 Persistence and degradability

Biodegradability : no data available

12.3 Bioaccumulative potential

Bioaccumulation : no data available

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12.4 Mobility in soil

Distribution among environmental compartments : no data available

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

Additional ecological information : slightly water endangering
Do not flush into surface water or sanitary sewer system.
Do not allow material to contaminate ground water system.

13. Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.
Contaminated packaging : Dispose of as unused product.
Waste Code : Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

14. Transport information

ADR

UN number : 3264
UN proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., Sulphuric Acid, Nitric Acid
Transport hazard class(es) : 8
Packing group : II
Classification Code : C1
Hazard identification No : 80
Packing instruction (LQ) : LQ22
Labels : 8
Tunnel restriction code : (E)
Environmentally hazardous : no

IATA

UN number : 3264
Description of the goods : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., Sulfuric Acid, Nitric Acid
Class : 8
Packing group : II
Labels : 8

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Packing instruction (cargo aircraft) : 855

IATA_C

Environmentally hazardous : no

Packing instruction (passenger aircraft) : 851

IATA_P

Environmentally hazardous : no

IMDG

UN number : 3264

Description of the goods : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., Sulfuric Acid, Nitric Acid

Class : 8

Packing group : II

Labels : 8

EmS Number 1 : F-A

EmS Number 2 : S-B

Marine pollutant : no

RID

UN number : 3264

Description of the goods : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., Sulphuric Acid , Nitric Acid

Transport hazard class(es) : 8

Packing group : II

Classification Code : C1

Hazard identification No : 80

Labels : 8

Packing instruction (LQ) : LQ22

Environmentally hazardous : no

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Water contaminating class (Germany) : WGK 1 slightly water endangering
VWWWS A4

Other regulations : The product is classified and labelled in accordance with EC directives or respective national laws.
Regional or national implementations of GHS may not implement all hazard classes and categories.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment is not required for this substance.

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16. Other information

Full text of R-phrases referred to under sections 2 and 3

R 8	Contact with combustible material may cause fire.
R22	Harmful if swallowed.
R35	Causes severe burns.
R36/37	Irritating to eyes and respiratory system.
R37	Irritating to respiratory system.

Full text of H-Statements referred to under sections 2 and 3.

H272	May intensify fire; oxidiser.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Full text of Notas referred to under section 3

Nota B	Some substances (acids, bases, etc.) are placed on the market in aqueous solutions at various concentrations and, therefore, these solutions require different labelling since the hazards vary at different concentrations. In Annex I entries with Note B have a general designation of the following type: nitric acid%. In this case the manufacturer or any other person who markets such a substance in aqueous solution must state the percentage concentration of the solution on the label. Example: nitric acid 45 %. Unless otherwise stated, it is assumed that the percentage concentration is calculated on a weight/weight basis. The use of additional data (e.g. specific gravity, degrees Baumé) or descriptive phrases (e.g. fuming or glacial) is permissible.
--------	---

Further information

The information provided is based on our current knowledge and experience and apply to the product as delivered. Regarding the product properties, these are not guaranteed. The delivery of this safety datasheet does not free the recipient of the product from his own responsibility to follow the relevant rules and regulations concerning this product.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 5.2 Revision Date 13.06.2014

Print Date 11.03.2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifiers**

Product name : Sodium tetraborate decahydrate

Product Number : B9876
Brand : Sigma-Aldrich
Index-No. : 005-011-01-1
REACH No. : 01-2119490790-32-XXXX
CAS-No. : 1303-96-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Company Ltd.
The Old Brickyard
NEW ROAD, GILLINGHAM
Dorset
SP8 4XT
UNITED KINGDOM

Telephone : +44 (0)1747 833000
Fax : +44 (0)1747 833313
E-mail address : eurtechserv@sial.com

1.4 Emergency telephone number

Emergency Phone # : +44 (0)1747 833100

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

Reproductive toxicity (Category 1B), H360FD

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

R60, R61

For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements**Labelling according Regulation (EC) No 1272/2008**

Pictogram



Signal word : Danger

Hazard statement(s)
H360FD

May damage fertility. May damage the unborn child.

Precautionary statement(s)
P201
P308 + P313

Obtain special instructions before use.
IF exposed or concerned: Get medical advice/ attention.

Restricted to professional users.

- 4.3 Indication of any immediate medical attention and special treatment needed**
no data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture

Borane/boron oxides, Sodium oxides

5.3 Advice for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information

The product itself does not burn.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Disodium tetraborate decahydrate	1303-96-4	TWA	5 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
	Remarks	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- | | |
|--|------------------------------------|
| a) Appearance | Form: crystalline
Colour: white |
| b) Odour | no data available |
| c) Odour Threshold | no data available |
| d) pH | 9.2 at 10 g/l |
| e) Melting point/freezing point | 62 °C |
| f) Initial boiling point and boiling range | no data available |

g)	Flash point	no data available
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	no data available
l)	Vapour density	no data available
m)	Relative density	1.73 g/cm ³ at 25 °C
n)	Water solubility	38.1 g/l at 20 °C - completely soluble
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information

no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Strong oxidizing agents, Strong reducing agents

10.6 Hazardous decomposition products

Other decomposition products - no data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - rat - 4,500 - 5,000 mg/kg

LD50 Dermal - rabbit - 10,000 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitisation

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

fetotoxicity

Presumed human reproductive toxicant

Presumed human reproductive toxicant

Specific target organ toxicity - single exposure

no data available

Specific target organ toxicity - repeated exposure

no data available

Aspiration hazard

no data available

Additional Information

RTECS: VZ2275000

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Studies with the chemically related boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations. The doses administered were many times in excess of those to which humans would normally be exposed. Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiological study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

SECTION 12: Ecological information**12.1 Toxicity**

Toxicity to fish LC50 - *Carassius auratus* (goldfish) - 178 mg/l - 72 h

Toxicity to daphnia and other aquatic invertebrates EC50 - *Daphnia magna* (Water flea) - 1,085 - 1,402 mg/l - 48 h

Toxicity to algae IC50 - *Desmodesmus subspicatus* (green algae) - 158 mg/l - 96 h

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

ADR/RID: -

IMDG: -

IATA: -

14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

14.3 Transport hazard class(es)

ADR/RID: -

IMDG: -

IATA: -

14.4 Packaging group

ADR/RID: -

IMDG: -

IATA: -

14.5 Environmental hazards

ADR/RID: no

IMDG Marine pollutant: no

IATA: no

14.6 Special precautions for user

no data available

SECTION 15: Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Authorisations and/or restrictions on use

Disodium tetraborate decahydrate CAS-No.: 1303-96-4

Candidate List of Substances of Very High Concern for Authorisation

Toxic for reproduction (article 57c)

ED/30/2010

Disodium tetraborate decahydrate CAS-No.: 1303-96-4

Candidate List of Substances of Very High Concern for Authorisation

Toxic for reproduction (article 57c)

ED/30/2010

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H360FD May damage fertility. May damage the unborn child.

Repr. Reproductive toxicity

Full text of R-phrases referred to under sections 2 and 3

T Toxic

R60 May impair fertility.

R61 May cause harm to the unborn child.

Repr.Cat.2 Toxic to Reproduction Category 2

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

SAFETY DATA SHEET

This Safety Data Sheet is provided in compliance with the EC Directive 1907/2006-453/2010

SECTION 1 Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Product Name: Sodium Glucohetonate 450

1.2 Relevant identified uses of the substance or mixture and uses advised against

- Use of the substance/mixture: metal surface treatment

1.3 Details of the supplier of the safety data sheet

- Name of Supplier: Almetron Ltd
- Address of Supplier: Unit 24 Abenbury Way, Wrexham Ind Est, Wrexham LL13 9UZ, UK
- Telephone: +44 (0) 1978 660297
- Fax: +44 (0) 1978 661104
- Email: safety@almetron.com
- Responsible Person: Mr I Rogers

1.4 Emergency telephone number

- Emergency Telephone: +44 (0)1978 660297 Out of Hours +44 (0)7860 593251
-

SECTION 2 Hazards identification

2.1 Classification of the substance or mixture

- CHIP: Not Classified
- CLP: The product is not classified as hazardous according to directive 1999/45/EEC

2.2 Label elements

- Signal Word: Not hazardous according to current CHIP Regulations
- Hazard phrases
Irritating to eyes and skin
- Precautionary Phrases
IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

2.3 Other hazards

SECTION 3 Composition/information on ingredients

3.1 Substances

- Sodium Glucoheptonate
CAS Number: 31138-65-5
Concentration: <=50%
Categories:
EC Number: 250-480-2
R/H Phrases:
REACH Registration Number: Not applicable
Symbols:

SECTION 4 First aid measures

4.1 Description of first aid measures

- Contact with eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Contact with skin
Mildly irritating to skin
Wash affected area with plenty of water
- Ingestion
IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
Get medical advice/attention.
- Inhalation
Remove patient to fresh air
Seek medical advice if necessary

4.2 Most important symptoms and effects, both acute and delayed

- No information available

4.3 Indication of any immediate medical attention and special treatment needed

- Treat symptomatically
-

SECTION 5 Fire-fighting measures

5.1 Extinguishing media

- In case of fire use foam, carbon dioxide or dry agent
- Do not use water jets

5.2 Special hazards arising from the substance or mixture

- No hazard expected under normal conditions of use

5.3 Advice for firefighters

- Wear Breathing Apparatus
 - Wear protective clothing as per section 8
-

SECTION 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Ensure adequate ventilation

6.2 Environmental Precautions

- Do not discharge into drains or the environment, dispose to an authorised waste collection point

6.3 Methods and material for containment and cleaning up

- Absorb spillage in earth or sand
- Absorb spillage in inert material and shovel up

6.4 Reference to other sections

- See Section 8
 - See Section 13
-

SECTION 7 Handling and storage

7.1 Precautions for safe handling

- Ensure eye bath is nearby.
-

SECTION 7 Handling and storage (....)

- Ensure adequate ventilation
- Wear suitable protective clothing, including eye/face protection and gloves (PVC are recommended)

7.2 Conditions for safe storage, including any incompatibilities

- Keep only in the original container
- Store in a well-ventilated place.
- Incompatible with metals.

7.3 Specific end use(s)

- Metal surface treatment
-

SECTION 8 Exposure controls/personal protection

8.1 Control parameters

- There are no recommended or established controls for this product

8.2 Exposure controls

- Ensure working area is well ventilated.
- Eye protection:
Ensure eye bath is nearby.
Wear goggles giving complete eye protection
- Skin protection:
Wear suitable protective clothing, including eye/face protection and gloves (butyl rubber are recommended)
The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant gloves will break down after repeated chemical exposures). Most gloves provide only short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/ manufacturer and with a full assessment of the working conditions.
- Respiratory protection:
In poorly ventilated areas or confined spaces, use an airline respirator or self-contained breathing apparatus



SECTION 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Appearance: Liquid, pale yellow
- Odour: mild
- Flash point - not applicable

9.2 Other information

- No information available
-

SECTION 10 Stability and reactivity

10.1 Reactivity

- Considered stable under normal conditions
-

SECTION 10 Stability and reactivity (....)

10.2 Chemical stability

- Considered stable under normal conditions

10.3 Possibility of hazardous reactions

- Reacts with aluminium and zinc

10.4 Conditions to avoid

- No special requirements

10.5 Incompatible materials

- metals and Oxidising agents

10.6 Hazardous Decomposition Products

- No hazardous decomposition products known
-

SECTION 11 Toxicological information

11.1 Information on toxicological effects

- Non-toxic
-

SECTION 12 Ecological information

12.1 Toxicity

- On available data, substance is not harmful to aquatic life

12.2 Persistence and degradability

- Biodegradable

12.3 Bioaccumulation Potential

- Product is not expected to bioaccumulate

12.4 Mobility in soil

- Completely soluble in water

12.5 Results of PBT and vPvB assessment

- Not a PBT according to REACH Annex XIII

12.6 Other Adverse Effects

- On available data, substance is not harmful to the environment
-

SECTION 13 Disposal considerations

13.1 Waste treatment methods

- Refer to manufacturer/supplier for information on recovery/recycling
-

SECTION 14 Transport information

Not classified as hazardous for transport

14.1 UN Number

- UN No.: Not applicable

14.2 UN Proper Shipping Name

- Proper Shipping Name: Not applicable

14.3 Transport hazard class(es)

- Hazard Class: Not applicable

14.4 Packing group

- Packing Group: Not applicable
-

SECTION 14 Transport information (....)

14.5 Environmental hazards

- Not Classified

14.6 Special precautions for user

- Not Classified

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

- Not Classified
 - Proper Shipping Name:
 - ICAO UN No.:
 - ICAO Hazard Class:
 - ICAO Packing Group:
-

SECTION 15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- Not hazardous according to current The Dangerous Substances Directive (67/548/EEC)

15.2 Chemical Safety Assessment

- A REACH chemical safety assessment has not been carried out
-

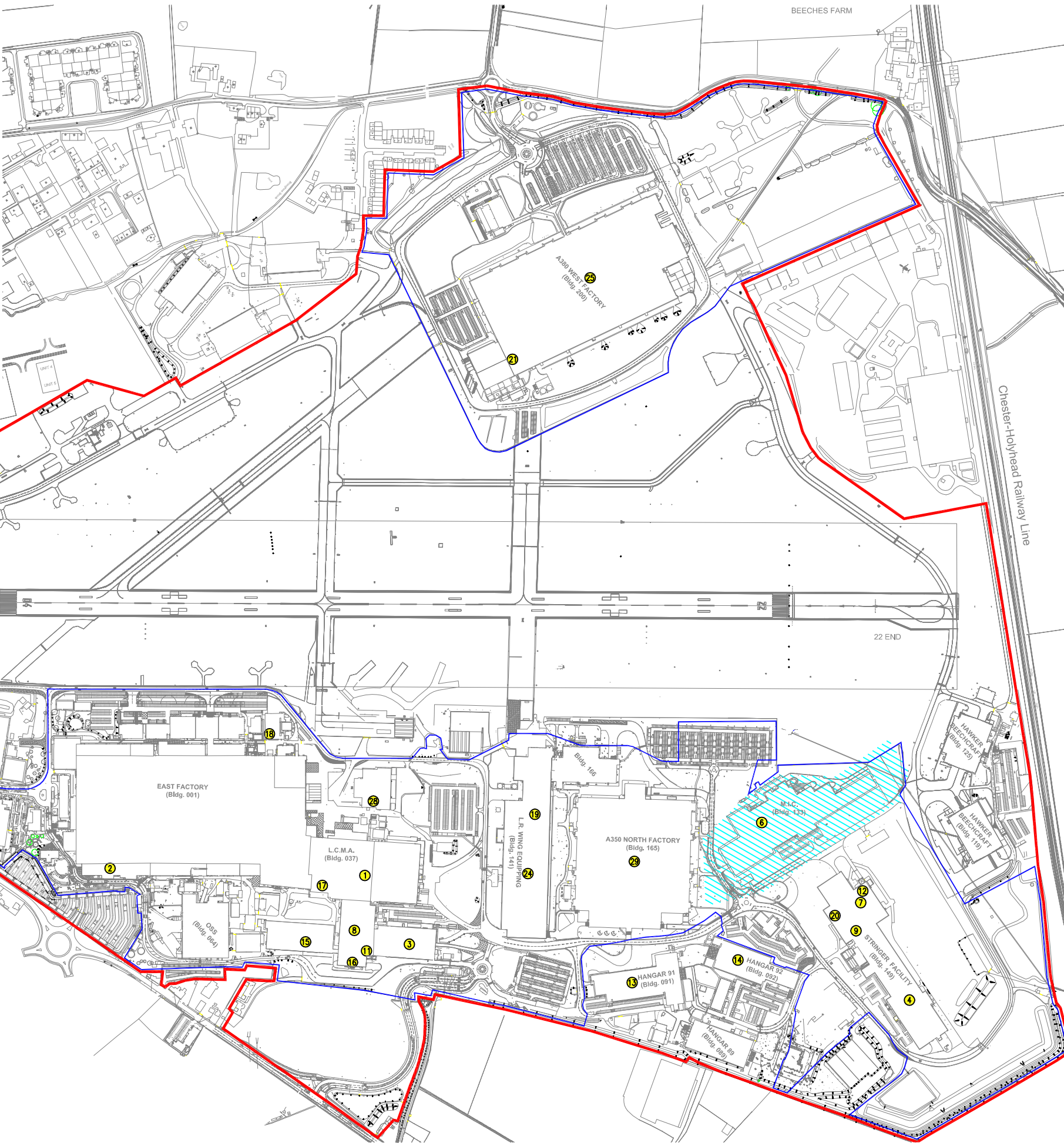
SECTION 16 Other information

The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage, and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication, however no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.

Appendix B

Site Plans

NUMBER	ACTIVITY	LOCATION
1	MACHINING	LCM (BUILDING 037)
2	MACHINING	SMC (BUILDING 015) CELL 1
3	MACHINING	A380 SKIN MILL (BUILDING 150)
4	MACHINING	SMC STRINGER FACILITY (BUILDING 149)
6	SHOT PEENING	MIC (BUILDING 133)
7	SHOT PEENING	SMC STRINGER FACILITY (BUILDING 149)
8	SURFACE TREATMENT	LCM TREATMENTS (BUILDING 134)
9	SURFACE TREATMENT	STRINGER FACILITY (BUILDING 149)
11	EFFLUENT TREATMENT	LCM TREATMENTS (BUILDING 134)
12	EFFLUENT TREATMENT	SMC STRINGER FACILITY (BUILDING 149)
13	SINGLE AISLE	WING ASSEMBLY (BUILDING 91)
14	SINGLE AISLE	WING ASSEMBLY (BUILDING 92)
15	CREEP FORMING	A380 CREEP FORM (BUILDING 151)
16	PAINTING	LCM TREATMENTS (BUILDING 134)
17	PAINTING	BINKS BOOTH LCM (BUILDING 037)
18	PAINTING	SA PAINT SHOP (BUILDING 128)
19	PAINTING	WING EQUIPPING CENTRE (BUILDING 141)
20	PAINTING	SMC STRINGER FACILITY (BUILDING 149)
21	PAINTING	A380 PAINT SHOP (BUILDING 202)
24	EQUIPPING	WING EQUIPPING CENTRE (BUILDING 141)
25	WING BOX ASSEMBLY AND EQUIPPING	A380 WING MANUFACTURING (BUILDING 200)
28	PAINTING	SA PAINT SHOP (BUILDING 160)
29	WING BOX ASSEMBLY AND EQUIPPING	A350 NORTH FACTORY (BUILDING 165)



NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS
2. DO NOT SCALE
3. IF IN DOUBT, PLEASE ASK

ALL REFERENCE NUMBERS QUOTED CAN
BE SEEN IN SITE BUILDING STANDARD
DOCUMENTS

FILE PATH TO DOCUMENTS -

P:\power 8\Brofac\AUTOCAD\CURRENT
DRAWINGS\IPPC

- KEY
- SHOT PEENING PROCESS AREA
OPERATED BY MIC
 - SITE ACTIVITIES (SEE SITE ACTIVITIES TABLE)
 - SITE BOUNDARY
 - INSTALLATION BOUNDARIES

G	5,10,13,14,26&27 REMOVED	20.03.15	CTB
F	LOCATION 29 ADDED	29.04.13	M.D.
E	DRAWING UPDATE	16.10.12	M.D.
D	DRAWING UPDATE	24.11.06	A.R
C	DRAWING UPDATE	12.9.03	A.R
B	STRINGER CHP RELOCATION	28.6.02	CS
A	NEW DRAWING	7.5.02	JC
ISSUE	DESCRIPTION	DATE	DRAWN

Airbus in the UK
DRAWING OFFICE – FACILITIES MANAGEMENT & REAL ESTATE
BROUGHTON
CHESTER
CH4 0DR
Telephone: +44(0)1244 520444

TITLE
**SITE AND INSTALLATION
DEFINITION, LOCATION OF
MAIN PLANT**

DRAWN	DATE	SCALE
A.R.	07.05.02	1:4000
DRAWING No.	ISSUE	
PPC 01	G	

Appendix C

Climate Change Levy Agreement

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

THIS AGREEMENT is made the 30th day of May 2014

BETWEEN:

- (1) the Environment Agency ("the Administrator"); and
- (2) the operator set out in Schedule 2 ("the Operator")

RECITALS

- (A) Section 30 of and Schedule 6 to the Finance Act 2000 ("the Act") make provision for a tax known as the climate change levy ("the Levy"). The Levy is charged on the supply of taxable commodities as defined in paragraph 3 of Schedule 6 to the Finance Act 2000.
- (B) Paragraphs 42(1)(ba) and 42(1)(c) of Schedule 6 to the Act provide that the amount payable by way of the Levy shall be discounted from the full rate where the supply is a reduced-rate supply. A reduced-rate supply is a taxable supply supplied to a facility specified in a certificate given by the Administrator to the Commissioners for Her Majesty's Revenue and Customs as a facility which is covered by a climate change agreement for a period specified in the certificate in accordance with paragraphs 42 to 52F of Schedule 6 to the Act.
- (C) A climate change agreement is defined in paragraph 46 of Schedule 6 to the Act. It may consist of a combination of agreements that falls within paragraph 48. A combination of agreements falls within paragraph 48 if a number of conditions are satisfied. The first condition is that the combination of agreements is a combination of an umbrella agreement and an agreement that, in relation to the umbrella agreement, is an underlying agreement.
- (D) This agreement is an underlying agreement in relation to an umbrella agreement, entered into for the purposes of the reduced rate of Levy. It is not intended to give rise to contractual obligations between the parties.
- (E) The facility or facilities set out in Schedule 4 to this agreement are a facility or facilities to which an agreement applies.
- (F) The Operator is a representative of each facility to which this agreement applies, as defined in paragraph 47(2) of Schedule 6.

AGREED TERMS

IT IS AGREED as follows:

1. INTERPRETATION

1.1 In this Agreement, unless the context otherwise requires:

"account" means the account in the Register of a sector association or an operator;

"agreement" means an umbrella agreement or an underlying agreement;

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

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“base year” in respect of a target unit which does not include a greenfield facility means a 12 month period agreed between an operator and the administrator, ending prior to the date of an underlying agreement, for which data is supplied by an operator to the administrator prior to the operator entering into the underlying agreement;

“base year” in respect of a target unit which does include a greenfield facility means the 12 month period starting on the date of an underlying agreement”;

“buy-out fee” means the fee calculated in accordance with Rule 7;

“certification period” means, any of the following periods:

- (a) 1st April 2013 to 30th June 2015;
- (b) 1st July 2015 to 30th June 2017;
- (c) 1st July 2017 to 30th June 2019;
- (d) 1st July 2019 to 30th June 2021; or
- (e) 1st July 2021 to 31st March 2023;

“charges” means charges due to the Administrator under the charging scheme;

“charging scheme” means the Climate Change Agreements Charges Scheme 2012 made by the Administrator or any replacement or revision of that charging scheme;

“emissions” means the total emissions in tCO₂ equivalent for a target period;

“EU ETS Directive” means Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emissions allowance trading within the Community and amending Council Directive 96/61/EC, as amended from time to time;¹

“facility” means a facility within the meaning of paragraph 50(2) to (6) of Schedule 6 to the Act;

“facility number” means the unique identification number of a facility set out in schedule 6 of this Agreement;

“greenfield facility” means a facility which started to carry out the process by virtue of which it is a facility within the meaning of paragraph 50 of Schedule 6 during the 12 month period ending on the date the operator applies for the facility to be covered by an agreement”

“Novem ratio target” has the meaning set out in the technical annex;

¹ *OJ No L 275, 25.10.03, p 32. The Directive was amended by European Parliament and Council Directives 2004/101/EC (OJ No. L 338, 13.11.2004, p 18), 2008/101/EC (OJ No L 8, 13.1.2009, p 3) and 2009/29/EC (OJ No L 140, 5.6.2009, p 63), and by Regulation (EC) No 219/2009 of the European Parliament and of the Council (OJ No L 87, 31.3.2009, p 109).

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

“operator” means, as the context requires, either:

- a) the party to this Agreement other than the Administrator; or
- b) a party to an underlying agreement other than the Administrator;

“personal information” means:

- a) the address of the registered office of the sector association or operator;
- b) the name, address and email address of:
 - i) in the case of a sector association, a person who can be contacted in respect of the sector association;
 - ii) in the case of an Operator, the responsible person; and
- c) the name, address and email address of a person who can be contacted in respect of the facility or each facility covered by an agreement;

“the Register” means the electronic system established and operated by the Administrator for the administration of agreements;

“the Regulations” means the Climate Change Agreements (Administration) Regulations 2012 S.I. 2012/1976;

“responsible person” means an individual who is legally authorised by the Operator to enter as the Operator’s agent into an underlying agreement, to agree any amendments to an underlying agreement, and to accept service of notices on behalf of the Operator;

“Rule or Rules” means the Rules for the Operation of Climate Change Agreements or any of them set out in Schedule 1 to this Agreement as varied from time to time;

“Schedule 6” means Schedule 6 to the Finance Act 2000;

“sector” means the sector consisting of facilities which are covered by the same umbrella agreement;

“sector association” means the sector association set out in Schedule 3;

“sector commitment” means the commitment set out in Schedule 5 of the umbrella agreement, as varied from time to time;

“surplus” means the amount by which the emissions have fallen below the target for any target period;

“target” means the percentage improvement in energy efficiency or carbon efficiency from the base year applicable to the target unit, set out in Schedule 6 to this Agreement, as varied from time to time;

“target period” means any of the following periods:

- a) 1st January 2013 to 31st December 2014;

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

- b) 1st January 2015 to 31st December 2016;
- c) 1st January 2017 to 31st December 2018; or
- d) 1st January 2019 to 31st December 2020;

“target unit” means the facility or group of facilities to which this Agreement applies;

“tCO₂ equivalent” means tonnes of carbon dioxide equivalent;

“technical annex” means the technical annex dated 6 March 2013 and published by the Administrator or the Secretary of State, available via the Administrator’s website;

“throughput” means the measure of production, or factor related to production, used to determine the relationship between the amount of energy used by the target unit and the levels of activity of the target unit, as set out in Schedule 6 of this agreement;

“the Tribunal” means the First-tier Tribunal established under the Tribunal Courts and Enforcement Act 2007²;

“umbrella agreement” means an agreement that is an umbrella agreement for the purposes of paragraph 48 of Schedule 6 to the Act;

“underlying agreement” means, as the context requires, either:

- a) this Agreement; or
- b) an agreement that is an underlying agreement for the purposes of paragraph 48 of Schedule 6 to the Act.

- 1.2 Other words and expressions used in this Agreement have the same meaning as they bear in Schedule 6 to the Finance Act 2000 or the Regulations.

2. FACILITIES TO WHICH THIS AGREEMENT APPLIES

- 2.1 This Agreement applies to the facility or facilities set out in Schedule 5 to this Agreement which carry out some or all of the activities set out in Schedule 4 to this Agreement.

3. TARGET

- 3.1 The target is set out in Schedule 6 to this Agreement, as varied from time to time.

² Appeals are assigned to the General Regulatory Chamber of the First-tier Tribunal by virtue of article 3(a) of the First-tier Tribunal and Upper Tribunal (Chambers) Order 2010 (S.I. 2010/2655). The Tribunal Procedure (First-tier Tribunal) (General Regulatory Chamber) Rules 2009 (S.I. 2009/1976) sets out procedural rules relating to such appeals.

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

- 3.2 Whether the target has been met must be determined in accordance with Rule 6.
- 3.3 The Secretary of State may carry out a review of the sector commitment during 2016 for the target periods 1st January 2017 to 31st December 2018 and 1st January 2019 to 31st December 2020. The target may be varied to take account of the review in accordance with the procedure set out in Rule 12.
- 3.4 The target may also be varied in accordance with Rules 6, 9, 10 and 11.

4. THE RULES

- 4.1 Schedule 1 to this Agreement which sets out the Rules for the operation of Climate Change Agreements has effect.
- 4.2 The Operator agrees to comply with the Rules.

5. DURATION AND TERMINATION OF THIS AGREEMENT

- 5.1 Subject to clause 5.2 below, this Agreement comes into force on 1 April 2013 or the date on which it is made, if later, and ends on 31 March 2023.
- 5.2 This Agreement may be terminated before 31 March 2023:
 - 5.2.1 at any time by a notice served by the Operator giving at least 20 working days notice served on the Administrator; or
 - 5.2.2 in accordance with the Regulations.

6. VARIATION OF AGREEMENT

- 6.1 Subject to clauses, 6.2 and 6.3 below, this Agreement may be varied at any time if agreed between the Administrator and the Operator.
- 6.2 The facilities to which this Agreement applies may be varied in accordance with Rules 9 and 10.
- 6.3 This Agreement may be varied by the Administrator at any time to take account of changes to the terms specified in the Regulations.

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7. AUTHORITY

- 7.1 The Operator warrants that it has the power to enter into this Agreement and is authorised and has obtained all necessary approvals to enter into this Agreement on behalf of the included facilities and the responsible person warrants that he or she is authorised to sign this Agreement on behalf of the operator.

Signed on behalf of
the Environment Agency



CCA Manager

Signed by the responsible person on behalf
of the Operator

.....

Mark Ashley
Energy Manager
mark.ashley@airbus.com

SCHEDULE 1

RULES FOR THE OPERATION OF CLIMATE CHANGE AGREEMENTS

1. OBLIGATIONS OF A SECTOR ASSOCIATION AND OF AN OPERATOR

1.1 An Operator and a Sector Association must:

- 1.1.1 supply such information to the Administrator as the Administrator may request in connection with an agreement, by the date specified in the request;
- 1.1.2 notify the Administrator of any changes to its personal information within 20 working days of the change;
- 1.1.3 co-operate with any person appointed by the Administrator to undertake an independent audit of information provided to the Administrator; and
- 1.1.4 comply with the provisions of the charging scheme. If a charge remains unpaid after the date on which it is due, it may be recovered by the Administrator as a civil debt.

2. OBLIGATIONS OF A SECTOR ASSOCIATION

- 2.1 Following the setting of the sector commitment by the Secretary of State, or following a variation of the sector commitment under Rule 12.1, a Sector Association must distribute the sector commitment between each target unit under the umbrella agreement.

3. OBLIGATIONS OF AN OPERATOR

3.1 An Operator must:

- 3.1.1 notify the Administrator and the Sector Association within 20 working days of the date when the Operator has reason to believe that a facility covered by an underlying agreement may not be eligible for inclusion in the underlying agreement;
- 3.1.2 notify the Administrator within 20 working days of becoming aware of any structural change or other change set out in the technical annex which may give rise to a variation to the target in accordance with Rule 11;
- 3.1.3 notify the Administrator within 20 working days of discovering any error in the data provided to the Administrator for the base year;
- 3.1.4 provide to the Administrator on or before 1st May following the end of a target period such information as has been requested by the Administrator in order to determine whether progress towards meeting the target is, or is likely to be, taken to be satisfactory;

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- 3.1.5 provide any other information requested at any time by the Administrator by the date specified in the request to enable the Administrator to determine that:
 - (a) the target has been met; or
 - (b) the Operator is complying with the terms of the underlying agreement;
- 3.1.6 notify the Administrator within 5 working days of the Operator or a facility in a target unit becoming a firm in difficulty, within the meaning of the European Commission Guidelines on State Aid for Rescuing and Restructuring Firms in Difficulty (2004/C 244/02);
- 3.1.7 provide the responsible person with full authority to carry out his or her functions, including authorisation to accept on behalf of the Operator the service of any notice; and
- 3.1.8 provide a current UK postal address and an operational email address of the responsible person for service of any notice.
- 3.2 If the Administrator enters into an underlying agreement before a target has been agreed, conditional upon the Operator providing sufficient information within a specified period in order to set the target for the target unit, the Operator must supply any data requested by the Administrator within the period specified by the Administrator on energy use and throughput of the target unit.

4. OPERATION OF THE REGISTER

- 4.1 Subject to Rules 4.2 and 4.3, to the extent possible, a Sector Association and an Operator must communicate with the Administrator using the Register.
- 4.2 Until a Sector Association and an Operator have been notified by the Administrator that the Operator is able to operate an account on its own behalf, an Operator must provide all information to the Sector Association to comply with the obligations of an Operator under an underlying agreement. The Sector Association must then operate the register on behalf of the Operator to provide the information to the Administrator.
- 4.3 After receiving notification from the Administrator that an Operator is able to operate an account on its own behalf, an Operator must notify the Administrator if it wishes to access its account directly to comply with its obligations under an underlying agreement. If an Operator makes such notification, the Operator must then operate the Register on its own behalf in order to comply with its obligations under an underlying agreement. If an Operator does not make such notification, the Operator must continue to provide all information to the Sector Association to comply with the obligations of an Operator under an underlying agreement and the Sector Association must continue to operate the register on behalf of the Operator to provide information to the Administrator.

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5. CERTIFICATION OF A FACILITY

- 5.1 The Administrator must certify that a facility is covered by an agreement from the signing of an underlying agreement to the end of the certification period in which the underlying agreement is signed.
- 5.2 The Administrator must certify that a facility is covered by an agreement for any certification period other than the certification period in which the underlying agreement is signed, where it appears to the Administrator that progress made in the immediately preceding certification period, whether under the underlying agreement or under any previous underlying agreement, towards meeting targets set for the target unit is, or is likely to be, satisfactory.
- 5.3 For the purposes of this Rule, progress made in the immediately preceding certification period towards meeting targets set for the target unit is, or is likely to be satisfactory only where condition 1 and condition 2 are satisfied.
- 5.4 Condition 1 is that:
 - 5.4.1 the target set for the target unit for the relevant target period is met, in accordance with Rule 6; or
 - 5.4.2 if the target set for the target unit has not been met, the target unit has paid the buy-out fee in accordance with Rule 7.
- 5.5 Condition 2 is that obligations imposed under or by virtue of regulations made for the purpose of implementing the EU ETS Directive have been complied with in respect of each facility comprising the target unit.
- 5.6 If:
 - 5.6.1 a target unit has failed to meet its target in accordance with Rule 6 and the Operator has failed to pay the buy-out fee in accordance with Rule 7;
 - 5.6.2 obligations imposed under or by virtue of regulations made for the purpose of implementing the EU ETS Directive have not been complied with in respect of any facility in a target unit; or
 - 5.6.3 the underlying agreement or umbrella agreement is terminated in accordance with Regulation 17(1)(2), or (3) or Regulation 18,the Administrator must not certify that the facility or facilities comprising the target unit are covered by an agreement or, where a certificate has been issued, the Administrator must vary the certificate in accordance with paragraph 45 of Schedule 6.
- 5.7 If:
 - 5.7.1 a facility is not or ceases to be eligible for inclusion in an agreement; or
 - 5.7.2 a facility is excluded from an underlying agreement under Rule 10;

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the Administrator must not certify that the facility is covered by an agreement or, where a certificate has been issued, the Administrator must vary the certificate in accordance with paragraph 45 of Schedule 6.

- 5.8 If the information supplied to the Administrator is insufficient to determine whether:

5.8.1 the target for the target period has been met; or

5.8.2 obligations imposed under or by virtue of regulations made for the purpose of implementing the EU ETS Directive have been complied with in respect of each facility comprising the target unit;

the Administrator may refuse to certify that the facility or facilities are covered by an agreement or, where a certificate has been issued, the Administrator may vary that certificate in accordance with paragraph 45 of Schedule 6.

- 5.9 Subject to Rule 5.10, if the Administrator does not certify a facility or varies a certificate that has been issued, the Administrator must serve a decision notice on the Sector Association and the Operator of the facility setting out the reasons for the decision, unless a notice of termination has already been served.

- 5.10 The Administrator is not required to serve a decision notice where a facility has been certified under this Rule and it is subsequently discovered that the target unit for the relevant target period had not been met because of an error in the information originally supplied to the Administrator provided that:

5.10.1 the Sector Association and the Operator have satisfied the Administrator that the error was unintentional; and

5.10.2 the Operator has paid any buy-out fee in accordance with Rule 7.

6. MEETING THE TARGET

- 6.1 A target unit meets its target for the purpose of Rule 5 if it meets or exceeds the percentage improvement in energy efficiency or carbon efficiency from the base year set out in Schedule 6 to the underlying agreement.

- 6.2 The Administrator must determine whether the target has been met in accordance with the principles, methodologies and procedures set out in the technical annex.

- 6.3 An Operator must notify the Administrator on or before 31st January in the year following the end of a target period of any circumstances which may give rise to an adjustment to the target for the previous target period, as set out in the technical annex.

- 6.4 If an Operator makes a notification under Rule 6.3, the Administrator may adjust the previous target in accordance with the principles, methodologies and calculations set out in the technical annex and must serve a notice on the Operator, setting out:

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6.4.1 whether or not it had decided to vary the target; and

6.4.2 any revised target (as varied) for the target unit.

7. BUY-OUT MECHANISM

7.1 If the administrator finds that the target unit has failed to meet its targets:

7.1.1 at any time in the period beginning with 1st May in the year following the end of a target period and ending immediately before the first day of the next certification period; or

7.1.2 at any other time,

the obligation to make progress towards meeting targets may instead be satisfied by the payment to the administrator of a fee in accordance with Rule 7.2.

7.2 If Rule 7.1 applies, the administrator must serve a notice on the Operator containing the following information:

7.2.1 that the target unit has failed to meet its target;

7.2.2 the fee to be paid, calculated in accordance with Rule 7.3 or Rule 7.4;

7.2.3 the date by which the fee must be paid, determined in accordance with Rule 7.5 or Rule 7.6;

7.2.4 to whom the fee must be paid;

7.2.5 how the fee is to be paid; and

7.2.6 that failure to pay the fee in accordance with the notice will result in the issue of a variation certificate in accordance with paragraph 45 of Schedule 6.

7.3 If Rule 7.1.1 applies, the amount of the fee is:

$$£12 \times (W - S)$$

where W in units of tCO_2 equivalent represents the amount by which the emissions for the target period exceed the target and S in units of tCO_2 equivalent represents any surplus.

7.4 If Rule 7.1.2 applies, the amount of the fee is:

$$£12 \times W$$

where W in units of tCO_2 equivalent represents the amount by which the emissions for the target period exceed the target.

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- 7.5 If Rule 7.1.1 applies, the fee must be paid on or before 1st July in the year in which the target unit is found to have failed to meet its targets.
- 7.6 If Rule 7.1.2 applies, the fee must be paid within 30 working days beginning with the date of the notice.
- 7.7 Payment of the fee is deemed to have been made when the person to whom the fee must be paid as specified in the notice receives full cleared funds.
- 7.8 For the purposes of calculating the buy-out fee under this Rule and for calculating the amount of any surplus, the Administrator must calculate the difference between the target for the target period and the actual performance achieved during the target period, where the target and the actual performance achieved are expressed in the same units, and convert any difference between the two into a quantity of carbon dioxide equivalent, expressed in units of tCO₂ equivalent, using the principles, methodologies and calculations set out in the technical annex.

8. SURPLUS

- 8.1 If a facility is excluded from a target unit, the Operator must determine how any surplus should be distributed between the facilities that have been excluded from the target unit and the facilities remaining in the target unit and must notify the Administrator of the redistribution within 20 working days of the facility being excluded from the target unit.
- 8.2 If an Operator fails to notify the Administrator of the redistribution in accordance with Rule 8.1 any surplus remains with the facilities remaining in the target unit.
- 8.3 If facilities join a target unit, any surplus attributable to those joining facilities may be used by the target unit as a whole.

9. VARIATION BY INCLUSION OF ADDITIONAL FACILITIES

- 9.1 A facility which is not already included in another umbrella agreement is eligible at any time to be considered for inclusion in an umbrella agreement where:
 - 9.1.1 it is a facility within the meaning of paragraph 50 of Schedule 6; and
 - 9.1.2 it is a facility undertaking the activities set out in Schedule 3 to an umbrella agreement.
- 9.2 A facility which is not already included in another underlying agreement is eligible at any time to be considered for inclusion in an underlying agreement where:
 - 9.2.1 it is a facility within the meaning of paragraph 50 of Schedule 6;
 - 9.2.2 it is a facility undertaking the activities set out in Schedule 3 to an umbrella agreement; and

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- 9.2.3 it has the same operator as the operator of the underlying agreement under which it will be included, as set out in the technical annex.
- 9.3 A facility which is already included in another underlying agreement is eligible to be considered for inclusion in a different underlying agreement on or before 30 September 2013 where:
 - 9.3.1 it is a facility within the meaning of paragraph 50 of Schedule 6;
 - 9.3.2 it is a facility undertaking the activities set out in Schedule 3 to an umbrella agreement; and
 - 9.3.3 it has the same operator as the operator of the underlying agreement under which it will be included, as set out in the technical annex.
- 9.4 A facility which is already included in another underlying agreement is eligible to be considered for inclusion in a different underlying agreement on or after 1 October 2013 where:
 - 9.4.1 it is a facility within the meaning of paragraph 50 of Schedule 6;
 - 9.4.2 it is a facility undertaking the activities set out in Schedule 3 to an umbrella agreement;
 - 9.4.3 it has the same operator as the operator of the underlying agreement under which it will be included, as set out in the technical annex; and
 - 9.4.4 there has been a change of operator of the facility.
- 9.5 An additional facility cannot be added to an umbrella agreement or an underlying agreement:
 - 9.5.1 during the final target period under the umbrella agreement or the underlying agreement; or
 - 9.5.2 during the last two months of a target period.
- 9.6 The administrator may vary the target of a target unit to take account of the inclusion of additional facilities following the principles, methodologies and calculations set out in the technical annex.
- 9.7 If a Sector Association wishes to add an additional facility to an umbrella agreement or an Operator wishes to add an additional facility to an underlying agreement the Sector Association or the Operator must notify the Administrator not less than two months before the commencement of the next target period setting out:
 - 9.7.1 the name of the Operator of the facility;
 - 9.7.2 the address of the facility;
 - 9.7.3 a description of the facility;

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- 9.7.4 such information as will enable the Administrator to reach a decision on establishing eligibility of the facility, as requested by the Administrator; and
- 9.7.5 such information as will enable the Administrator to determine the revised target for the target unit, as requested by the Administrator.
- 9.8 If the Administrator receives a notification under Rule 9.4, the Administrator must serve a notice on the Operator, copied to the Sector Association:
 - 9.8.1 consenting to include the additional facility in an umbrella agreement or an underlying agreement and setting out whether or not it has decided to vary the target, and if so, the revised target (as varied) for the target unit;
 - 9.8.2 refusing consent to include the facility in an umbrella agreement or an underlying agreement, giving reasons for the decision; or
 - 9.8.3 requesting such further information as is required in order to establish eligibility of the facility or reach a decision on the target for the facility.

10. VARIATION BY EXCLUSION OF FACILITIES

- 10.1 If a Sector Association or an Operator wishes to exclude a facility, or part of it, from an umbrella agreement or an underlying agreement, it must notify the Administrator of the proposed exclusion, setting out:
 - 10.1.1 the name of the Operator of the facility;
 - 10.1.2 the facility number, or a description of the part that is to be excluded; and
 - 10.1.3 the reason for the exclusion.
- 10.2 If:
 - 10.2.1 a Sector Association or an Operator has notified the Administrator that it wishes to exclude a facility under Rule 10.1; or
 - 10.2.2 the Administrator has terminated an agreement so far as it relates to an individual facility under Regulation 17(4),

the Administrator may vary the target to take account of the exclusion or termination following the principles, methodologies and calculations set out in the technical annex, and may request such information from the Sector Association or the Operator as it requires in order to determine the revised target.
- 10.3 If the Administrator decides to vary or not to vary the target under Rule 10.2, it must serve a notice on the Operator, copied to the Sector Association, setting out whether or not it has decided to vary the target, and if so the revised target (as varied) for the target unit.

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11. VARIATION OF TARGETS IN OTHER CIRCUMSTANCES

11.1 The Administrator may vary the target to take account of:

11.1.1 any structural changes or other changes to the target unit which the Operator must notify to the Administrator under Rule 3.1.2;

11.1.2 any errors in the data provided to the Administrator for the base year; or

11.1.3 in respect of a target unit which has a Novem ratio target, the removal of a product produced in the target period which was produced in the base year.

following the principles, methodologies and calculations set out in the technical annex.

11.2 The Administrator may request any information of a Sector Association or an Operator as it requires in order to determine the revised target under Rule 11.1.

11.3 If the Administrator decides to vary or not to vary a target under Rule 11.1, it must serve a notice on the Operator, copied to the Sector Association, setting out:

11.3.1 whether or not it has decided to vary the target; and

11.3.2 any revised target (as varied) for the target unit.

12. VARIATION OF SECTOR COMMITMENT FOLLOWING A REVIEW

12.1 The sector commitment may be reviewed by the Secretary of State during 2016 for the target periods from 1 January 2017 to 31 December 2018 and from 1 January 2019 to 31 December 2020.

12.2 If the Sector Association and the Secretary of State agree on a variation to the sector commitment following a review, the Secretary of State may issue a direction to the Administrator that the sector commitment must be varied and then the Administrator must serve a variation notice on the Sector Association.

12.3 The variation notice must state:

12.3.1 the agreed variation; and

12.3.2 the date from which the agreed variation will take effect.

12.4 The Sector Association must, within 20 working days of receipt of a variation notice, serve notice on the Administrator setting out the proposed distribution of the revised sector commitment between each target unit under the umbrella agreement.

12.5 The Administrator must:

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- 12.5.1 agree to the proposed distribution and vary the targets of each target unit accordingly;
 - 12.5.2 request further information in relation to the proposed distribution; or
 - 12.5.3 refuse the proposed distribution and propose an alternative distribution, giving reasons for the decision.
- 12.6 If the Sector Association and the Secretary of State fail to agree on a variation of the sector commitment, either party may refer any dispute as to matters of fact to an adjudicator for adjudication, in accordance with the procedure set out in guidance published by the Secretary of State.
- 12.7 The adjudicator must, on the basis of representations provided to the adjudicator and any additional information considered necessary by the adjudicator, make a finding on the disputed questions of fact and notify the parties of that finding.
- 12.8 The adjudicator's finding on a disputed question of fact shall be binding on the parties but it shall be for the Secretary of State and the Sector Association to agree, in the light of that finding, what variations to the sector commitment are required.
- 12.9 If the Secretary of State and the Sector Association fail to agree on the variation to the sector commitment, the Administrator may terminate the agreement in accordance with Regulation 18.

13. RIGHT OF APPEAL

13.1 If the Administrator:

- 13.1.1 decides not to certify a facility or to vary a certificate which has been issued;
 - 13.1.2 serves a notice imposing a buy-out fee under Rule 7 upon determining that a target unit has failed to meet its target; or
 - 13.1.3 decides to vary or not to vary the target for a target unit,
- the Operator may appeal to the Tribunal against the decision.
- 13.2 In respect of an Operator which enters into an agreement after 1 April 2013, the Operator may appeal to the Tribunal against the target that has been set for the target unit by the Administrator.
- 13.3 For the purposes of Rule 13.2, the date on which notice of the decision is deemed to have been sent to the Operator is the later of the date the agreement is entered into or the date the Administrator sends notice to the Operator of the target for the target unit.
- 13.4 The grounds on which an Operator may appeal under Rule 13.1 and 13.2 are:

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13.4.1 that the decision was based on an error of fact;

13.4.2 that the decision was wrong in law;

13.4.3 that the decision was unreasonable;

13.4.4 any other reason.

13.5 The bringing of an appeal suspends the effect of the decision pending final determination by the Tribunal of the appeal or its withdrawal.

13.6 On determining an appeal under these Rules the Tribunal must either:

13.6.1 affirm the decision;

13.6.2 quash the decision; or

13.6.3 vary the decision.

14. RECORDS AND INFORMATION

14.1 A Sector Association and an Operator must retain records of all information required to be supplied to the Administrator under these Rules.

14.2 In particular, an Operator must retain:

14.2.1 sufficient records to allow the Administrator to verify whether a target unit has met its target, including sufficient records to allow the accurate verification of throughput and annual consumption of energy of a target unit; and

14.2.2 records of energy saving actions and measures implemented during each target period.

14.3 A Sector Association and an Operator must make all records which it is required to retain under these Rules available for inspection by the Administrator or a person appointed by the Administrator and must provide copies of such records in response to a request by the date specified in the request.

14.4 All records required to be retained under these Rules must be retained throughout the duration of an agreement and for a period of four years following the termination of an agreement.

15. PUBLICATION AND DISCLOSURE OF INFORMATION

15.1 The Administrator must publish such information as required under the Regulations.

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15.2 In respect of the disclosure of information other than disclosure of information required to be published under the Regulations, information supplied by a Sector Association or an Operator to the Administrator or the Secretary of State, to any agent of the Administrator or the Secretary of State, or to any person appointed by the Administrator or Secretary of State to carry out an independent audit, may be disclosed without the consent of the Sector Association or Operator, where such disclosure is:

15.2.1 by the Administrator to the Secretary of State, for any purpose connected with the functions of the Secretary of State;

15.2.2 by the Secretary of State to the Administrator, for any purpose connected with the functions of the Administrator;

15.2.3 to a relevant authority, for any purpose connected with the functions of the relevant authority;

15.2.4 to any person appointed by the Administrator or the Secretary of State to carry out an independent audit;

15.2.5 to an adjudicator appointed under these Rules;

15.2.6 to any person appointed by the Administrator or the Secretary of State to act as agent, consultant, adviser or contractor to the Administrator or the Secretary of State, in connection with the functions of the Administrator or the Secretary of State;

15.2.7 necessary for the purpose of or in connection with any legal proceedings, including the obtaining of legal advice;

15.2.8 required to comply with any Act of Parliament or subordinate legislation made under an Act of Parliament, including requests made under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004; or

15.2.9 required to meet any obligation to the European Union.

15.3 A relevant authority referred to in this Rule means:

15.3.1 either House of Parliament including any committee of either or both Houses;

15.3.2 any Government department;

15.3.3 the European Commission;

15.3.4 the Committee on Climate Change;

15.3.5 the Commissioners of Her Majesty's Revenue and Customs;

15.3.6 a person or body prescribed by or appointed under Part I of the Environmental Protection Act 1990 or regulations made under section 2

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of the Pollution Prevention and Control Act 1999 or any corresponding legislation for Northern Ireland;

15.3.7 any regulator appointed under section 54 of the Competition Act 1998; or

15.3.8 any other public body, regulatory agency or government advisory body, where in the absolute discretion of the Administrator or the Secretary of State, as appropriate, the Administrator or Secretary of State considers that it would be obliged to disclose such information in response to a request for information under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004, if such a request were made.

16. COLLECTION OF CHARGES

16.1 A Sector Association may request the consent of the Administrator to collect charges due from Operators to the Administrator in respect of facilities under the charging scheme.

16.2 If a Sector Association wishes to collect charges due from an Operator to the Administrator under the charging scheme, the Sector Association may serve a notice in writing on the Administrator by the last working day in February in the calendar year in which the charges fall due.

16.3 A notice served under Rule 16.2 must specify the facilities in respect of which the Sector Association intends to collect charges, being not fewer than 50% of the facilities covered by an umbrella agreement.

16.4 Following receipt of the notice, the Administrator must:

16.4.1 consent to the Sector Association collecting charges; or

16.4.2 refuse consent to the Sector Association collecting charges, giving reasons for the decision.

16.5 If the Administrator consents to the Sector Association collecting charges the Sector Association must:

16.5.1 itemise charges separately in any invoices that it issues in respect of charges;

16.5.2 collect and remit all charges collected to the Administrator without deduction or set off by the last working day in September in each year;

16.5.3 prepare an annual report to the Administrator by the last working day in October in the year in which it has collected charges setting out which Operators it has collected charges from and which Operators have failed to pay charges due to the Sector Association.

16.6 A Sector Association must not actively pursue any outstanding charges after the last working day in September in any year in which they fall due. If a Sector

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Association receives charges after this date the Sector Association must accept the payment and remit this to the Environment Agency along with information identifying the Operator making the payment.

- 16.7 If a Sector Association fails to comply with any of its obligations under this Rule the Administrator may serve a notice on the Sector Association that consent to the Sector Association continuing to collect charges is withdrawn at the expiry of 20 working days from the date of the notice.

17. SERVICE OF NOTICES

- 17.1 Any notice served under these Rules must be in writing and may be served by sending it by post or electronically.

- 17.2 The address for the service of all notices on the Administrator is:

Postal: Environment Agency
Lutra House
Dodd Way, Off Seedlee Road
Walton Summit, Bamber Bridge,
Preston, Lancs
PR5 8BCX

Electronic: CCA-operations@environment-agency.gov.uk

- 17.3 The address for the service of all notices on the Sector Association is the address of the person set out in Schedule 2 to the umbrella agreement.

- 17.4 The address for the service of all notices on the Operator is the address of the responsible person.

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SCHEDULE 2

THE OPERATOR

Airbus UK Broughton

Whose address for service of all notices under this Agreement is

By post:

Chester Rd

Broughton

Chester

Flintshire

CH4 0DR

Wales

Administrative contact

MS. Amy Francis

Electronically:

a.francis@coefficientcompany.com

SCHEDULE 3

THE SECTOR ASSOCIATION

ADS Group Ltd

Whose address for service of all notices under this Agreement is

By post:

Salamanca Square

9 Albert Embankment

London

SE1 7SP

England

Sector Contact

MR. Kevin Morris

Electronically:

Kevin.Morris@adsgroup.org.uk

THE UMBRELLA AGREEMENT

The Agreement dated 01 Apr 2013 made between the Administrator and the Sector Association.

SCHEDULE 4

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

ACTIVITIES UNDERTAKEN BY A FACILITY FALLING WITHIN THE SECTOR

A facility belongs to the aerospace sector if it is a facility which undertakes one or more of the following activities: (i) casting of ferrous or non-ferrous metals in a foundry; (ii) melting ferrous or non-ferrous metals; (iii) hot-rolling of ferrous metals and their alloys; (iv) operating hammers in a forge; (v) surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating; (vi) surface treatment of metals and plastic materials using an electrolytic or chemical process; (vii) burning of any fuel in an appliance with a rated thermal input of 50 megawatts or more; (viii) manufacture or repair involving the use of beryllium or selenium or an alloy containing one or both of those metals; (ix) producing explosives; (x) activities involving carbonisation; or (xi) producing synthetic rubbers where the activity is in connection with the aerospace or defence industries.

UNDERLYING CLIMATE CHANGE AGREEMENT FOR THE AEROSPACE SECTOR

Agreement Dated: 30th day of May 2014

Agreement Identifier: ADS/T00013 v2

TU Identifier: ADS/T00013

SCHEDULE 5

FACILITIES TO WHICH THIS AGREEMENT APPLIES

Facility Identifier	Site Name & Address	EU ETS Identification / NAP number
ADS/F00026	Broughton Chester Rd, Broughton, Chester, Flintshire, CH4 0DR, Wales	GB-EA-ETCO2-0676

SCHEDULE 6

TARGET UNIT TARGET

The throughput of the target unit shall be given in the following units:

tonne

The throughput of the target unit in the agreed base year was (number of units):

6,295

The primary energy consumption of the target unit shall be given in the following units:

kWh

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The primary energy consumption of the target unit in the agreed base year was (number of units):

141,648,084

The targets are Relative in Energy:

TU Identifier	Target period	Target in kWh/tonne (percentage reduction from base year)
ADS/T00013	1 January 2013 to 31 December 2014	21,129.079 (6.100%)
	1 January 2015 to 31 December 2016	20,671.619 (8.133%)
	1 January 2017 to 31 December 2018	20,213.935 (10.167%)
	1 January 2019 to 31 December 2020	19,756.476 (12.200%)

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SCHEDULE 7

VALUE OF FINANCIAL PENALTY

49,972 GBP

See CCA operations manual.

30 May 2014
CCA Register Ref: ADS/T00013-GEN-2

Airbus UK Broughton
TU Identifier: ADS/T00013

Chester Rd
Broughton
Chester
Flintshire
CH4 0DR
Wales
mark.ashley@airbus.com

**CLIMATE CHANGE AGREEMENTS SCHEME
UNDERLYING AGREEMENT ACTIVATED**

Dear Mark Ashley

We are writing to inform Airbus UK Broughton ("you") that your underlying agreement ("the agreement") for the Climate Change Agreement scheme ("the scheme") has been activated. This will now allow your target unit and the facilities listed within your agreement to qualify for the Climate Change Levy discount under Part IV of Schedule 6 to the Finance Act 2000 (as amended). The details below confirm the target unit and agreement to which this letter relates.

Target Unit:	ADS/T00013 – Airbus UK Broughton Chester Rd Broughton Chester Flintshire CH4 0DR Wales
Agreement Identifier:	ADS/T00013 v2

We will notify HMRC that this agreement has been activated for your target unit and the facilities named within it. You will be required to contact your energy supplier and notify them of this agreement to obtain your discount from the Climate Change Levy.

If you require further clarification and your agreement is managed on your behalf by the sector association, please contact them directly. Where you manage your own agreement, please contact a member of the CCA operations team at cca-help@environment-agency.gov.uk. Further guidance on the Climate Change Agreement scheme can be found on our website. <http://www.environment-agency.gov.uk/CCA>.

Yours faithfully



CCA Team

c.c. Recipients:

Kevin Morris - Kevin.Morris@adsgroup.org.uk

Mark Ashley - mark.ashley@airbus.com

Amy Francis - a.francis@coefficientcompany.com

Paul MacDonald - paul.macdonald@goodrich-uk.com