Best Available Techniques (BAT) Assessment BAE Systems (Operations) Limited, Samlesbury, Balderstone, Lancashire, BB27LF, UK (Permit Ref. BV0414IV)

On behalf of:
BAE Systems (Operations) Limited

Project Reference:
023-1932

Revision:
REV00

Date:
July-2023

Earth & Marine Environmental Consultants Ltd
7th Floor, West One, Forth Banks
Newcastle upon Tyne
NE1 3PA, UK

Tel: 0800 130 3408
enquiry@eame.co.uk
www.eame.co.uk

United Kingdom | Iraq | Kurdistan Region of Iraq | Guyana

BAT Assessment - Anodise Process Line

Project: 023-1932
Site: BAE Systems (Operations) Limited, Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Permit Ref. EPR/BV0414IV
Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297005/geho0209bpip-e-e.pdf
UK Government (2009). Guidance - EPR 2.07 Surface treatment of metals and plastics by electrolytic and chemical processes: additional guidance, March 2009

Section Ref.	Heading	Sub-Heading	BAT Requirement	Description and Assessment	BAT Assessment
1 Managing your activities	1.1 Energy efficiency		The following should be used where appropriate: 1. High efficiency dewatering techniques to minimise drying energy. 2. Minimisation of water use and closed circulating water systems. 3. Using spent cooling water (which is raised in temperature) for rinsing purposes. 4. Automated control for DC rectifiers. 5. Electrolytic processes that operate under thermally stable conditions without the need for heating or cooling. 6. Minimum use of fume extraction consistent with COSHH Regulations. 7. Inverter speed control or flow damper for fume extraction centrifugal fans.	Specific techniques applied include: - water use is minimised through the use of in-process monitoring (pH, temperature, conductivity sensors). - the LEV has been designed to operate at different extraction rates depending on whether the baths are lidded or unlidded (during loading), therefore reducing energy use. Lids controlled via PLC. - LEV extraction rates designed to meet CoSHH requirements first whilst also minimising energy use. - the energy performance of the system was considered during the design process of the line. - energy efficiency is a key metric of the business unit. - site is certified to ISO50001:2018 Energy management systems - Requirements with guidance for use.	Meets BAT
	1.2 Efficient use of raw materials		The following should be used where appropriate: 1. Ion exchange or other treatment unit to re-circulate rinse waters. 2. 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. 3. Spent pickle acid for pH control in the effluent treatment facility. 4. Proprietary plating electrolytes that have a low concentration of dissolved solids and operate with minimum energy requirements for heating or cooling. These should avoid cadmium where possible and should require relatively simple effluent treatment. 5. Minimise drag-out by maximising the drainage time of the work over the tank or in a separate drainage tank. 6. ECO-rinse tank(s) to reduce mass drag-out and subsequent rinse-water consumption. 7. Electrochemical metals recovery technology for unreturned drag-out. 8. Evaporation technology in conjunction with 3-5 stage cascade rinsing to allow closed loop operation. 9. Hydrogen peroxide in the pickling tanks to reduce NOx emission and acid consumption.	Specific techniques applied include: - cascade rinsing (where appropriate). - drag out reduction through active process control of the flight bar on removal from the process baths. - lidded process baths. - controlled top-off of process baths from adjacent Safetainers. - water use is minimised through the use of in-process monitoring (pH, temperature, conductivity sensors). - Use of water softeners and Reverse Osmosis (RO) recover and recycle rinse waters to the process. - the chemical consumption of the system was considered during the design process of the line.	Meets BAT
	1.2 Efficient use of raw materials		10. Low temperature processes consistent with good metal deposition rate. The use of lids on process tanks operating at 60°C and above, and hexagons or croffles should be considered for all manually operated tanks. 11. Recycle trade effluent to less critical rinsing stages. 12. Proprietary cleaners that allow a lower operating temperature. 13. 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.	Specific techniques applied include: - baths are lidded or unlidded (during loading), therefore reducing energy use and raw material (process chemical) evaporation.	Meets BAT
	1.3 Avoidance, recovery and disposal of wastes		1. Effluent treatment facilities should be designed to process spent process fluids and recover anode metals for reuse, e.g. cadmium, copper and nickel. 2. Spent alkaline cleaners and acid pickles should be used for pH control in the effluent treatment facility. 3. You should evaluate the use of phosphating sludge as a filler for agricultural and horticultural use. 4. Filter cake may have uses, and these should be investigated in preference to landfill disposal. 5. 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. 6. 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.	Specific techniques applied include: - ETP is used to treat and (where possible) recycle rinse waters. The ETP is not designed to treat spent process fluids. - the process line works using a feed and bleed process where the required chemical composition is monitored and adjusted, therefore, dropping whole process baths is an infrequent activity. Where this occurs external contractors are used to collect and treat the waste off-site.	Meets BAT
	1.3 Avoidance, recovery and disposal of wastes		7. Consider use of ion exchange or other treatment unit to re-circulate rinse waters. 8. 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. 9. Minimise drag-out by maximising the drainage time of the work over the tank or in a separate drainage tank. 10. Use electrochemical metals recovery technology for unreturned drag-out. 11. 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.	Specific techniques applied include: - RO is used to treat and recycle rinse waters. The current ETP and storage tanks allow recycle 65% of the waters (which are re-used within the process) with the remaining 35% subject to treatment and disposal to sewer (via point TE1). - drag out reduction through active process control of the flight bar on removal from the process baths.	Meets BAT

BAT Assessment - Anodise Process Line

Project: 023-1932
Site: BAE Systems (Operations) Limited, Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Permit Ref. EPR/BV0414IV
Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297005/geho0209bpip-e-e.pdf
UK Government (2009). Guidance - EPR 2.07 Surface treatment of metals and plastics by electrolytic and chemical processes: additional guidance, March 2009

Section Ref.	Heading	Sub-Heading	BAT Requirement	Description and Assessment	BAT Assessment
2 Operations	2.1 Material storage and handling		Prevention of fugitive emissions to air from material handling and storage Prevention of accidents during material handling and storage	Specific techniques applied include: - the majority of the chemicals supplied to the process line are dispensed via enclosed Safetainers. - the process line has been subject to a HAZID and there are CTF emergency preparedness plans. - all operators are suitable trained both in chemical handling and emergency response procedures. - site is ISO14001, ISO45001 certified.	Meets BAT
2 Operations	2.2 Surface preparation	Mechanical	1. You should ensure that emissions from the local exhaust ventilation do not have an adverse environmental impact.	No changes proposed as part of this application.	N/A
	2.2 Surface preparation	Degreasing using organic solvents	1. 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. 2. The main control measures are: • control of point source emissions to air (from the degreaser vents system) • control of fugitive emissions to air • recovery of solvent in spent solvent waste • disciplined use of properly positioned and closed lids, except when loading and unloading conventional degreasers • the use of top-loading multiple door facilities • the use of totally sealed end-loading degreasers with solvent vapour condensation and condensate recycle.	There is no solvent degreasing associated with the proposed permit variation (i.e. associated with the anodise line). The change to the 1-Shed vapour degreaser relates solely to a change in material from Trichloroethylene to Perchloroethylene. All equipment remains as previously stated and assessed.	Meets BAT
	2.2 Surface preparation	Chemical cleaning using aqueous cleaners	1. The key areas of control are energy consumption, fugitive emissions to air, rinse water efficiency, cleaning fluid lifetime and disposal of spent cleaners. 2. Consider use of ion exchange or other treatment unit to re-circulate rinse waters. 3. 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. 4. 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. 5. Where appropriate, use membrane filtration to remove oil and grease, emulsions and dispersants	The anodise process uses an initial alkaline clean using proprietary chemicals (Bonderite C-AK 4215 NC-LT and SURTEC 061 & SURTEC 089). Specific techniques applied include: - the process line works using a feed and bleed process where the required chemical composition is monitored and adjusted, therefore, dropping whole process baths is an infrequent activity. Where this occurs external contractors are used to collect and treat the waste off-site. - the process bath is lidded during operation to control emissions (workplace and environmental)	Meets BAT
	2.2 Surface preparation	Chemical cleaning using aqueous cleaners	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. 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. 8. Consider the use of proprietary cleaners that allow a lower operating temperature. 9. 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.	Specific techniques applied include: - an adequate freeboard (design basis of 175 mm) is maintained to prevent entrainment. This will vary slightly with cascade levels between some tanks and varying product volume. - the bath is fitted with automatic lids (during processing) - temperature of the bath is dictated by the process specification	Meets BAT
	2.2 Surface preparation	Pickling	1. The key areas of control are rinse water economy, prevention and control of point source and fugitive emissions to air, pickle efficiency, acid regeneration, acid recycling and the use of inhibitors which are readily biodegradable. 2. There should be two or three stage cascade pickling with continuous pickle acid feed and continuous discharge to the effluent treatment facility. 3. There should be a minimum of two stages of cascade rinsing with agitation. 4. Consider ion exchange or other treatment unit to re-circulate rinse waters. 5. Consider use of spent pickle acid for pH control in the effluent treatment facility.	The anodise process line includes three pickle stages (Station 9 Al pickle, Station 10 TFSA Ti etch/pickle and Station 11 Ti Pre-etch/Pickle). Specific techniques applied include: - the process line works using a feed and bleed process where the required chemical composition is monitored and adjusted, therefore, dropping whole process baths is an infrequent activity. Where this occurs external contractors are used to collect and treat the waste off-site. - the process bath is lidded during operation to control emissions (workplace and environmental)	Meets BAT

BAT Assessment - Anodise Process Line

Project: 023-1932
Site: BAE Systems (Operations) Limited, Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Permit Ref. EPR/BV0414IV
Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297005/geho0209bpip-e-e.pdf
UK Government (2009). Guidance - EPR 2.07 Surface treatment of metals and plastics by electrolytic and chemical processes: additional guidance, March 2009

Section Ref.	Heading	Sub-Heading	BAT Requirement	Description and Assessment	BAT Assessment
2 Operations	2.3 Surface treatment	Electroplating	1. The main areas of control are rinse water economy – see Section 1, mass drag-out reduction, return of drag-out, recovery of higher value metals from drag-out which cannot be returned, energy consumption – see section 1 and prevention of fugitive emissions to air – see section 3. 2. You should give full consideration to using substances other than cadmium, chromium(VI) and other hazardous materials. Where alternatives are not available, you must provide proper controls. Where appropriate for the process you should: 3. Maximise stages of cascade rinsing, with agitation where appropriate. 4. Use ion exchange or other treatment units to re-circulate rinse waters. 5. Use proprietary plating electrolytes that have a low concentration of dissolved solids and operate with minimum energy requirements for heating or cooling. These should avoid cadmium where possible and should require relatively simple effluent treatment. 6. Replace EDTA by QUADROL in autocatalytic copper systems. 7. Minimise drag-out by maximising the drainage time of the work over the tank or in a separate drainage tank. 8. Use ECO-rinse tank(s) to reduce mass drag-out and subsequent rinse-water consumption.	-	N/A
2 Operations	2.3 Surface treatment	Electroplating	9. Use electrochemical metals recovery technology for unreturned drag-out. 10. Use evaporation technology in conjunction with 3-5 stage cascade rinsing to allow closed loop operation. 11. Generate turbulence by hydraulic power and eductors. 12. Use electrodialysis technology for the re-oxidation of chromium (VI) reduced to chromium (III) in chromic acid anodising electrolytes. 13. Use hydrogen peroxide in the pickling tanks to reduce NOx emission and acid consumption. 14. Employ low temperature processes consistent with good metal deposition rate. You should use lids on process tanks operating at 60°C and above, and you should consider hexagons or croffles for all manually operated tanks. 15. A minimum of 4 and preferably 5 stages of cascade rinsing after chromic/sulphuric acid etch, with techniques for minimising drag-out. Consider alternatives to chromic/sulphuric acid as an etchant. 16. Provide jig or barrel supports whilst draining for manually operated process tanks. 17. Use continuous filtration and removal of sludge from phosphating process tanks.	-	N/A
2 Operations	2.3 Surface treatment	Anodising	1. The main areas of control are: • rinse water economy – see Section 1 • mass drag-out reduction – see electroplating • energy consumption – see Section 1 • prevention of fugitive emissions to air – see Section 3 • removal of dissolved aluminium for the anodising electrolyte • chromium (VI) plating.	Specific techniques applied include: - cascade rinsing (where appropriate). - drag out reduction through active process control of the flight bar on removal from the process baths. - energy (refer to section above) - the existing process line uses Chromic acid. The replacement line uses Thin Film Sulphuric Acid Anodising (TFSAA). Only one bath (Bath 23) now uses a Cr (VI) based compound (Sodium dichromate) at very low levels. It is hoped, once approval is gained, that this can be removed from the process line.	Meets BAT
2 Operations	2.3 Surface treatment	Electropolishing	1. The main areas of control are: • rinse water economy – see Section 1 • mass drag-out reduction – see electroplating • energy consumption – see Section 1 • prevention of fugitive emissions – see Section 3 • prolongation of the descaling and electropolishing process fluids by basis metal removal • NOx control.	-	N/A
2 Operations	2.3 Surface treatment	Plating on Plastics	1. The main areas of control are: • rinse water economy – see Section 1 • mass drag-out reduction and return of drag-out – see electroplating • energy consumption – see Section 1 • prevention of fugitive emissions – see Section 3 • prolongation of the life of process fluids in the pre-treatment stage.	-	N/A

BAT Assessment - Anodise Process Line

Project: 023-1932
Site: BAE Systems (Operations) Limited, Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Permit Ref. EPR/BV0414IV
Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297005/geho0209bpip-e-e.pdf
UK Government (2009). Guidance - EPR 2.07 Surface treatment of metals and plastics by electrolytic and chemical processes: additional guidance, March 2009

Section Ref.	Heading	Sub-Heading	BAT Requirement	Description and Assessment	BAT Assessment
2 Operations	2.3 Surface treatment	Autocatalytic plating	1. The main areas of control are: • rinse water economy – see Section 1 • mass drag-out reduction – see electroplating • energy consumption – see Section 1 • prevention of fugitive emissions – see Section 3 • prolongation of process fluid life • avoidance of the use of cadmium salt as a brightener in autocatalytic nickel systems • disposal of spent process fluid • avoidance of the use of EDTA in autocatalytic copper systems.	-	N/A
2 Operations	2.3 Surface treatment	Dip Treatments	1. The main areas of control are: • rinse water economy – see Section 1 • mass drag-out reduction – see electroplating • energy consumption – see Section 1 • prevention of fugitive emissions – see Section 3 • prolongation of process fluid life	-	N/A
2 Operations	2.4 Rinsing		1. The main areas of control are water economy – see Section 1 and mass drag-out reduction – see electroplating. You should use the following techniques where appropriate: The main areas of control are: water economy – see Section 1 and mass drag-out reduction – see electroplating. 2. Multistage cascade rinsing. 3. Closed-loop or recirculation systems with rinse water treatment (ion exchange, reverse osmosis, electrodialysis, air swept evaporation or vacuum evaporation). 4. Conductivity probes. 5. Water meters on each line. 6. Flow restrictors. 7. 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. 8. Drag-in – drag-out tanks (ECO rinse system) to reduce mass drag-out and subsequent rinse water consumption. 9. Continuous filtration and removal of sludge from phosphating process tanks. 10. Recycling of trade effluent to less critical rinsing stages.	Specific techniques applied include: - water use is minimised through the use of in-process monitoring (pH, temperature, conductivity sensors). - drag out reduction through active process control of the flight bar on removal from the process baths. - water input is controlled via sensors linked to the flow control system. - cascade rinsing used (where possible).	Meets BAT
2 Operations	2.5 Drying		You should consider using the following techniques in order to save energy: 1. Centrifugal drying for small work. 2. Providing lids for hot water tank driers. 3. Providing a continuous bleed-off from hot-water driers as supply for the preceding cascade rinsing system, with equivalent water feed to hot water tank driers to make-up for evaporative loss and the bleed to the rinsing tanks.	Specific techniques applied include: - Temperature controlled (<90 °C) with three sensors per bath - Lidded drying ovens	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Handling	7. 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.	No changes proposed to the operation of the ETP (i.e. it currently meets BAT). Given the removal of Chromic acid from the new anodising process Chrome VI reduction will no longer be required within the ETP. Work pieces passing through Bath 23 (containing Sodium dichromate) are not subject to further rinsing - hence there will be no potential transfer of Cr (VI) into the wastewater system.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Handling	8. 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.	The extended storage arrangements for wastewater/chemicals and treated DI water are outlined within the main installation report.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Handling	9. 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.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Handling	10. The effluent system should be designed so as to prevent process effluent by-passing the effluent treatment plant.	By-pass of untreated rinse waters cannot occur.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Treatment Objectives	11. You should justify the choice and performance of the effluent treatment facility against the following objectives: • the removal of dissolved metals including basis metals, e.g. iron, aluminium, copper, and zinc, and plating metals e.g. chromium, copper, nickel, lead, tin, silver, and zinc • the control of the trade effluent pH within the Sewerage Undertaker's consent limits • formal consent limits may also be set for suspended solids, oil and grease, sulphate, detergents, COD, and cyanide • your permit may also set limits on the discharge.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT

BAT Assessment - Anodise Process Line

Project: 023-1932
Site: BAE Systems (Operations) Limited, Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Permit Ref. EPR/BV0414IV
Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297005/geho0209bpip-e-e.pdf
UK Government (2009). Guidance - EPR 2.07 Surface treatment of metals and plastics by electrolytic and chemical processes: additional guidance, March 2009

Section Ref.	Heading	Sub-Heading	BAT Requirement	Description and Assessment	BAT Assessment
3 Emissions and Monitoring	3.1 Point source emissions to water	Primary Treatment	12. 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. The dissolved metals in the combined effluent stream are then precipitated in a turbulent tank reactor by adjusting the pH within the range 6-10 depending on the metals present. Mixing in circular tank reactors is preferably promoted by slow speed propellor or turbine agitation and wall baffles. PID control rather than on-off control systems for dosing chemicals may improve pH stability.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Primary Treatment	13. 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. Pumping tanks should preferably be fitted with a level sensing device with a proportional output that is used to control the flow. The settled sludge containing 2-3% solids is periodically discharged to a secondary settlement tank where the solids level is allowed to attain a level of around 8%.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Primary Treatment	14. The sludge is then filtered in a high pressure batch filter press for further water removal. The discharged filter cake containing 20-30% solids is removed by a licensed waste disposal contractor to landfill. The filtrate is recycled to the precipitation reactor. Filter press pumps providing an operational pressure of 10-15 bar will increase the solids content of the filter cake to 35-40%.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Primary Treatment	15. The clean water flow from the settler/clarifier is usually discharged directly to the foul sewer as trade effluent.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Secondary/tertiary treatment	16. Filtration to remove fine suspended solids to achieve trade effluent consent limits for metals of 1-3mg/l is common.	No changes to the proposed ETP treatment operations or processes. The discharge remains consented by United Utilities.	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Secondary/tertiary treatment	17. 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%.	Recovered rinse waters are recycled (up to 65%).	Meets BAT
3 Emissions and Monitoring	3.1 Point source emissions to water	Secondary/tertiary treatment	18. 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.	Cascade recycling is used (where possible).	Meets BAT
3 Emissions and Monitoring	3.2 Point sources emissions to air		1. 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.	A full assessment of the process baths and operating temperatures etc. has been undertaken. LEVs are required for H&S reasons (i.e. cannot be avoided). The extraction rates have been balanced to ensure extraction rates minimise workplace risks while also minimising energy consumption.	Meets BAT
3 Emissions and Monitoring	3.2 Point sources emissions to air		2. 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.	The freeboard on the process tanks is greater than 50 mm.	Meets BAT
3 Emissions and Monitoring	3.2 Point sources emissions to air		3. Fume extraction through the upper sides of process tanks is not recommended.	The extraction points have been designed to operate in both the closed position (baths lidded) and the open position when loading of the flight bar via the transporter is taking place. The design prevents/minimises entrainment in the extracted air flow.	Meets BAT
3 Emissions and Monitoring	3.2 Point sources emissions to air		4. 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.	The scrubber is fitted with a Munters DV270 mist eliminator. The effluent is tankered away (as required).	Meets BAT
3 Emissions and Monitoring	3.3 Fugitive emissions to air		1. Where there are opportunities for reductions, your permit may require you to submit a regularly updated inventory of fugitive emissions.	All emissions (within the workplace) are subject to regular assessment and monitoring under Regulation 10 of The Control of Substances Hazardous to Health Regulations 2002. Where opportunities to reduce or further control emissions are identified they shall be implemented.	Meets BAT
3 Emissions and Monitoring	3.3 Fugitive emissions to air		2. A simple water scrubber should be fitted to the vent outlet of hydrochloric acid tonnage storage vessels (for use during filling operations).	-	N/A
3 Emissions and Monitoring	3.3 Fugitive emissions to air		3. You should regularly clean fume extraction ducting and mist eliminators.	All plant and equipment is subject to planned preventive maintenance (PPM) as per the stated manufacturers recommendations. The inspection will include all duct work and the fitted abatement systems.	Meets BAT