Prepared in consideration with: Reference Document on Best Available Techniques for the Surface Treatment of Metals and Plastics dated August 2006 as accessed 16.11.2022

5.1.1 Environmental Management Systems

Smart Systems have in place a certified EMS through BSI, audited 6 monthly.

5.1.2 Installation design, construction and operation

Smart Systems operate their surface treatment operations in specially designed, purpose built facilities; inclusive of appropriate tanks and storage, and containment systems. These are subject to an establish internal and third party maintenance schedule.

5.1.3 Agitation of process solutions

Smart Systems are soon to operate 5 powder coating lines, each with pretreatment systems: the three high volume lines operate cascading treatments: thus ensuring movement of solution of the work face.

5.1.4 Utility inputs

Energy, and water consumption is measured and monitored in accordance with the certified EMS and EnMS on site. These are then compared as benchmarks with the larger international corporate group.

Heat Recovery is in active investigation for economic viability, and tank temperature management is improved via cascade systems requiring a lower quantity of solution to be heated.

5.1.5 Waste minimisation

Water input and waste discharge quantities are metered and reported monthly. Process flows are optimised to reduce waste. Combination of cascade rising and tested dip tanks reduce water discharge to waste.

Prepared in consideration with: EPR 2.07 How to comply with your environmental permit. Additional guidance for: The Surface Treatment of Metals and Plastics by Electrolytic and Chemical Processes; as accessed 16.11.2022

1. Managing Activities
	1. Energy Efficiency
		1. Dewatering completed by gravity drain and oven heat recovery
		2. Water reuse, filtration and recirculation in place across each plant
		3. N/A no cooling waters utilised in process
		4. Not in place
		5. Not utilised
		6. No recognised thermally stable electrolytic processes used
		7. Fume extraction via automated scrubber systems
		8. Speed control inverter status unknown, under investigation
	2. Efficient use of raw materials and water
		1. Ion exchange process in place at each plant
		2. Closed loop cascade in place for the 2 vertical coating lines
		3. Confirmed spend acids utilised in treatment of effluent
		4. Currently no proprietary electrolytic used
		5. Where practical, possible and needed drag-out is completed above tanks
		6. No dedicated ECO-rinse tanks declared
		7. No current electrochemical metals recovery
		8. Only natural evaporation utilised
		9. Hydrogen peroxide not currently used but under investigation with plant manufacturers
		10. No tanks maintained at 60C or above
		11. “Effluent” not reused in rinse stages, but cleaner waters reused upstream to less critical processes
		12. Proprietary cleaners being introduced in early 2023
		13. Proprietary cleaners being introduced in early 2023, investigations then to be completed to the possibility of replacing alkaline soaks
	3. Avoidance, recovery and disposal of wastes
		1. No such material or fluids in process
		2. Confirmed spent acid and alkaline utilised in pH balance of effluent plants
		3. No such sludges produced
		4. Regular investigation and testing completed to determine disposal opportunities
		5. Press operated at ~12 BAR when at full load
		6. Proprietary cleaners being introduced in early 2023, investigations then to be completed to the possibility of replacing alkaline soaks
		7. Ion exchange process in place at each plant
		8. Closed loop cascade in place for the 2 vertical coating lines
		9. Where practical, possible and needed drag-out is completed above tanks
		10. No electrochemical metal recovery in place
		11. No chrome related processes
2. Operations
	1. Material storage and handling

Facility maintain a series of secondary containment systems across each plant, formed of portable bunds. Each plant is built to retain any spillage or accidental releases, with a series of integrated pits and trenches.

Intake of handling of chemicals conducted by spill response trained individuals.

* 1. Surface preparation
		1. No mechanical works
		2. No solvent works
		3. Alkaline and pickling processes used
			1. Control points maintained through EMS and operational processes
			2. Ion exchange process in place at each plant
			3. Closed loop cascade in place for the 2 vertical coating lines
			4. Agitation processes used to generate turbulence where appropriate
			5. Membrane filters confirmed installed
			6. Freeboard maintain
			7. No identified need for lids or similar, ~40C processes now in place in minimal tanks
			8. Proprietary cleaners being introduced in early 2023
			9. Proprietary cleaners being introduced in early 2023, investigations then to be completed to the possibility of replacing alkaline soaks
			10. Acid Pickle: Cascade in place on vertical coating lines
			11. Confirmed multi stage with agitation
			12. Ion exchange in place at each plant
			13. Spent pickle acids used in effluent pH balance
	2. Surface treatment – Dip treatment for etching
		1. See above
		2. Mass drag-out minimised through cascade and batching systems
		3. See above
		4. See below
		5. Fluid life prolonged through filtration and redosing where concentrations allow
	3. Rinsing
		+ 1. See above, noting rainwater harvesting in place
			2. See above
		1. Multi stage cascade rinse in place for vertical coating lines
		2. Rinse water recirculation with ion exchange in place
		3. Manual and automated conductivity probe systems in place
		4. Multi stage water meters install on incoming and output lines
		5. Flow restrictors in place on vertical coating lines
		6. Process for tank treatment established for over 20 sec drying time
		7. Drag out / drag in tanks in place
		8. Continuous filtration systems installed
		9. Rinse water reused upstream into increasingly “dirty” processes
	4. Drying
		1. N/A
		2. N/A
		3. N/A
1. Emissions and monitoring
	1. Point source emissions to water
		1. Buffer storage tanks of spent chemicals installed to allow trickle feed to effluent plant.
		2. Installed effluent plant capacity not exceeded by total incoming output from combined lines.
		3. Although trade effluent consent not yet issued by Wessex Water. Plant operated within consent of limits established in drafted versions.
		4. Effluent plant construction requires liquid be elevated by pipe work to enter the foul sewer, therefore stopping any bypass of the effluent treatment plant.
		5. Effluent plant installed have been specifically designed for the process of which they operated within: Plants two and three have been designed To achieve existing permit limits.
		6. N/A
		7. Settlement tanks using flocculants installed.
		8. Effluent sludge processed via filter press, resulting in a filter cake containing in excess of 40% solids, by utilising ~12BAR pressure at full load
		9. Clean water discharged from the plant to foul sewer via final buffer tank, with automated pH probe.
		10. N/A
		11. Reuse of rinse water in upstream process is confirmed.
		12. Membrane filtration in place are end of pipe.
	2. Point source emissions to air.
		1. LEV installed for the management of hydrogen emissions
		2. Minimum 50mm gap confirmed
		3. Fume extraction confirmed not through upper sides of process tanks
		4. Mist eliminators installed on horizontal coating lines
	3. Fugitive emissions to air
		1. N/A
		2. Water scrubber in place on Hydrochloric storage
		3. Contracted cleaning in place

Prepared in consideration with: L 208/38 dated 17.08.2018 accessed 05.12.2022

BAT 1:
A certified EMS to the requirements of ISO 14,001:2015 is held with BSI

BAT 2:

1. Waste accepted is arising only from the internal powder coating processes.
2. Not required – production processes within the powder coating operations require constant conditions under the Qualicoat (audited) procedures
3. Not required – process is contained plant, therefore retaining incoming waste
4. “quality” management system is established to ensure compliance with existing permit
5. Process is segregated from other site activities
6. Not required – fixed process generating wastes being treated
7. Not required – no solid wastes being treated

BAT 3:

1. Process generating waste known and documented
2. Automated monitoring of values for flow and pH, sample monitoring of temperature and conductivity. Concentrations tested quarterly by MCERTS third party lab. BOD and COD tested quarterly by MCERTS third party lab.
3. N/A

BAT 4:

1. Waste stored within purpose build facilities as part of the production plant
2. Daily mean treatment utilises ~12.5% of install capacity
3. Wastes transported by purposed designed pipework
4. n/a

BAT 5:

Handling near eliminated by piped infrastructure and automated filter presses. Only collection of solid filter cake requires handling by skip collection

BAT 6:

Multiple continuous monitoring points established throughout treatment, including final discharge. Calibrated and cross checked.

BAT 7:

Continuous monitoring of pH, Flow rate and volume. Quarterly monitoring of: Suspended solids. BOD, COD settled, silver, antimony, aluminium, arsenic, boron, beryllium, cadmium, chromium, cobalt, copper, iron, manganese, nickel, lead, selenium, thallium, vanadium, zinc. Oil.

BAT 8:
n/a

BAT9:

n/a

BAT 10:

No formal odour management, no reported or noticeable odours outside of buildings

BAT 11:

Monthly monitoring, with annual submission

BAT 12:

No formal odour management, no reported or noticeable odours outside of buildings

BAT 13:

No formal odour management, no reported or noticeable odours outside of buildings

BAT 14:

1. Contained treatment process through pipework and tanks
2. Purchasing policy to utilise best available within price bracket, full maintenance contract retained with plant manufacturer
3. No identified concerns
4. Plant contained within purpose built facility with integrated pit and trench containment
5. No duct emissions from process
6. full maintenance contract retained with plant manufacturer, internal PPM schedule managed by hub facilities team
7. Cleaning regime in place and managed
8. n/a

BAT 15:

n/a

BAT 16:

n/a

BAT 17:

No formal noise and vibration management, no reported or noticeable noise and vibration outside of buildings

BAT 18:

n/a

BAT 19:

Please refer to material and waste sections of treatment BAT

BAT 20:

Combination of Neutralisation, flocculation, filtration, and pressing. Discharge to foul sewer

BAT 21:

Access restricted site and process area, automation with alarms and recirculation systems. Spill and incident response trained staff in critical roles. Incident management and investigation through established Management System processes.

BAT 22:

Please refer to material and waste sections of treatment BAT

BAT 23:

ISO 50,001:2018 certified by BSI

BAT 24:

Chemical and material delivery via reusable bulk container. No treatment or awaiting treatment waste held in packaging