Part B Permit Application Supporting Document – Aston Martin Lagonda Ltd Gaydon

Doc Reference: AstonMartinGaydonPartBPermit-supporting-info2021.doc

1. Introduction

This document supports the application submitted by Aston Martin Lagonda Ltd (AML) for a new Local Authority Pollution Prevention and Control ('LAPPC') Part B permit at its car manufacturing facility in Gaydon within Warwickshire. The installation utilises existing paint repair booths to paint the vehicles and newly installed individual paint spraying booths, with the current paint shop (permit reference PERM/EPA 65) being decommissioned. However, the current paint shop would be decommissioned to a shut-down state whereby it could be re-instated for emergency paint spraying requirements until the end of the year, with a review to follow of the requirement to keep it in a reusable state if needed.

The paintshop is being decommissioned because we have had a significant organisational re-structure and reset business plan with strategy significantly reducing the number of vehicles to be painted at the Gaydon site so that only "difficult to paint" cars (e.g. those that require sparkle paint coating by skilled hand paint sprayers) are painted there with other vehicles being shipped to our St Athan manufacturing facility in South Wales for robotic painting. In turn, this means that the solvent usage and VOC emissions at Gaydon will also be significantly lower than in comparison to the current paint spraying operations process.

The build rate at Gaydon for difficult to paint vehicles will be approximately 22 per week (compared to 60 per week for current year).

We will be painting OEM body shells with refinished paints (that are currently used in AML manufacturer of body shells) in paint combi-booths. The process will be the cleaning of the body shell, etch, primer, base, and clear coat application including drying and stoving and any repairs required.

2. The Installation

C1 How will the installation operate?

The installation is used for the assembly of motor vehicles including the preparation and painting of motor vehicle bodies with a capacity of approximately 3000 bodies/year manufactured at Gaydon but painting would be 1000 special bodies per years. The following activities will be carried out on site as part of the AML paint spraying operations for the individual paint booths:

1. Raw Material Storage (Paints, Adhesives, Solvent)
2. Paint Mixing
3. Surface Preparation
4. Paint Application (Primer, Base Coat & Clear Coat)
5. Finishing

The process is a coating process involving the preparation and painting of motor vehicle bodies using 5 tonnes or more of organic solvents in any 12 month period, as prescribed in **Section 6.4 Part B (a)(iv)** of the Environmental Permitting Regulations. The detailed guidance for the process is contained in Process Guidance Note PG6/47(11) - "Paint Application in Vehicle Manufacturing". This Note applies as it is expected that the process will consume between 5 to 15 tonnes of organic solvent in a 12 month period.

1. **Raw Material Storage**

The major raw materials used within the installation include solvent thinners, solvent borne primer resin and hardener (2K Isocyanate), waterborne base coat, solvent borne clearcoat resin and hardener (2K Isocyanate), solvent and waterborne degreasers, and flushing solvent. All material is stored in designated areas, with ventilation provided as required, and handled in a safe manner. Foreseeable emissions to air include fugitive emissions of Volatile Organic Carbon (VOC) and odour during storage and release of hazardous substances to air from leaks and spillages.

2. **Paint Mixing**

Paint mixing, where required, is carried out within a designated area known as the Paint Mixing Room, with the paint being diluted with solvent thinners to the required specification and ventilation provided as required. The mixed paint is then automatically pumped to the application area and the final mix of resin and hardener takes place there, as per the normal application of twin-pack paint. Pre-mixed paint may also be used (basecoat) and automatically pumped to the application area. For rework, paint will be delivered manually to the rework booths in a safe controlled manner.

The spray guns will be cleaned in the enclosed Paint Mixing Room in an automatic, totally-enclosed, equipment cleaning machine using flushing solvent. The spray guns are manually cleaned in a stream of flushing solvent. This is pumped from a drum of solvent held under the machine. The solvent then drains back into the drum. When the flushing solvent in the drum becomes too contaminated with paint to be used further, the drum is sealed and a fresh solvent drum is put on the machine. The spent flushing solvent is collected into a tank and returned to an authorised disposal agent for recovery and reclamation. Equipment is cleaned in a ventilated sink. All solvent waste is automatically pumped from drain into a IBC (Intermediate Bulk Container) for removal from site by an authorised contractor.

Foreseeable emissions to air include fugitive emissions of VOC and odour during paint mixing or cleaning and release of hazardous substances to air from leaks and spillages.

3. **Surface Preparation**

The car body transfers into the paintshop from Body In White (BIW) where it is prepared for paint application which consists of a number of stages. Body panels are scuffed through a sanding operation to ensure a perfect surface for paint application, which is carried out in specialised enclosures fitted with filtration equipment. Critical areas are masked to protect them during spraying operations. Slave tooling is fitted for any additional parts which also need painting e.g. wingmirrors. Sealing is carried out to prevent water ingress, protect cut edges from the atmosphere or for soundproofing purposes. Following that the surfaces are cleaned and degreased to ensure the vehicle body is free from all contaminants. Cleaning is undertaken both manually using Tak-cloths and a solvent cleaner as well as compressed air. A final inspection is then undertaken and any defects identified within the body panels are repaired. This can include applying etch primer in order to prevent corrosion or coating composite panels.

Foreseeable emissions to air include particulate matter (dust) emissions from the sanding operations and fugitive emissions of VOC and odour during cleaning/degreasing operations.

4. **Paint Application**

The coating application is carried out in three stages.

Stage one of the spraying process is the solvent based primer application within a manual combi spray booth. Primer provides a smooth even surface to aid the adhesion of the basecoat. The primer is manually mixed with hardener within the paint mix room and delivered to the spray booth via PPS pots to attach to a HVLP spray gun. Two coats of primer are applied using HVLP spray guns. After spraying, the primer is allowed to flash off and then cured within the combi booth, (60 - 70C for approx. 40mins). Once the car body has been oven cured it enters the flatting stage which is a series of sanding operations within a ventilated area.

Stage two of the spraying process is the waterborne basecoat application within a manual combi spray booth. The basecoat is manually mixed within the paint mix room and delivered to the spray

booth via PPS pots to attach to a HVLP spray gun. Several coats of waterborne basecoat are applied using HVLP spray guns until the desired colour effect and quality is achieved. After spraying, the basecoat is allowed to flash off using a heated process (circa 40C for 15 mins).

Stage three of the spraying process is the solvent based clear coat application within a manual combi spray booth. The clear coat is manually mixed with hardener within the paint mix room and delivered to the spray booth via PPS pots to attach to a HVLP spray gun. Two coats of clear coat are applied using HVLP spray guns. After spraying, the clear coat is allowed to flash off. After flash off, the clear coat is cured (70-90C for approx. 60mins within the combi booth). Once the car body has been oven cured it enters the finishing stage described below.

Spray Booth Operation

All incoming air is passed through fabric panel air filters that are fitted into the booth ceilings. This ensures that no dust enters the spray booths. All outgoing (exhaust) air is extracted below the floor of the booth through a dry filtration system to ensure all paint residue from overspray is captured and to maintain downdraught of particulates within the spraybooth. All paint residue captured within the dry filters is removed from site by an authorised contractor.

Foreseeable emissions to air include point and fugitive emissions of VOC, particulate matter (dust) and odour during paint application and fugitive particulate matter (dust) emissions from the sanding operations.

5. Finishing

After curing the car body is polished and inspected for defects. Should any defects be found these are rectified by various methods depending on their severity. All repairs are carried out inside specially designed booths/enclosures. On completion the car bodies are transferred to the trim area of the plant for final assembly.

If rework is required once the vehicle has been assembled this is carried out in OWR where there are purpose built preparation booths where all pre-painting preparation will take place and 2 combined spray-booth ovens.

Foreseeable emissions to air include fugitive emissions of VOC and odour during finishing/rework activities and fugitive particulate matter (dust) emissions from the sanding operations.

Table 1 below outlines the main paint spaying operations by zone and the associated process.

Table 1. Paint spraying operations and process

Paint spraying operations		
No.	**ZONE**	**PROCESS**
1	New paint combi booth 1 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
2	New paint combi booth 2 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
3	New paint combi booth 3 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
4	New paint combi booth 4 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
5	Existing paint combi booth 5 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
6	Existing paint combi booth 6 (BIW)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
7	New paint work Exhaust Air Work Decks (BIW)	Primer Sanding, Clear Coat Sanding and Polish Particulate
8	New paint mix room (BIW)	Solvent + WB Solvent
9	New paint combi booth 1 (major rectification)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
10	Existing paint combi booth 2 (major rectification)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
11	Existing paint combi booth 3 (major rectification)	2K Primer Paint, WB Base Coat, 2K clear coat and Solvent
12	Major rectification Exhaust Air Work Decks	Primer Sanding, Clear Coat Sanding and Polish Particulate

3 Emissions Monitoring

C2 Emissions, techniques and monitoring

What pollutants (including odour) and how much are expected to be emitted into the atmosphere? Please say which stage of the process each emission will come from and also whether from a particular chimney, vent or other source (fugitive). Please include emissions during starting and shutting down the plant, and from possible breakdowns or accidents identified by a risk assessment. (Using process flow diagrams may help to simplify this).

No monitoring has been undertaken for the new paint spraying process. Data in Table 1 below is based on estimations and knowledge of how the process will work. Monitoring will be able to be undertaken during Q3 2021 and onwards. A separate solvent reduction action plan and solvent management plan will be developed providing more information.

Table 2. information on emissions, techniques and monitoring

Process	Emissions and quantities	Point source or fugitive)	Operational controls using BAT	Monitoring undertaken/ proposed
Start-up procedure	Particulate matter VOCs Odour	Point source	Booth automatically purges and runs to a negative pressure before releasing for production and continually monitors pressure. Running hours displayed on HMI	N/A booth will not operate outside of compliant parameters
Paint application	Particulate matter VOCs Odour	Point source	Specialised enclosure with filtration equipment. Booth automatically purges and runs to a negative pressure before releasing for production and continually monitors pressure. Running hours displayed on HMI. Designed to meet current uk environmental Protection Act	Annual emissions exhaust stack test
Plant stack	VOCs Oxides of nitrogen Carbon monoxide Odour	Point source	Paint booths meet specific requirements.	Weekly stack monitoring for odour, noise and smoke.
Storage and handling of solvents and materials containing organic solvents	VOC Odour	Fugitive	Use of enclosed storage and mixing Controlled handling procedures.	Annual emissions exhaust stack test. Monthly mass balance calculations
Paint mixing/cleaning	VOC odour	Fugitive	Enclosed gun wash equipment	As per mix room
Surface preparation/finishing/rework activities	Particulate matter	Fugitive	Exhaust equipment fitted with filters	Annual emissions exhaust stack test
Shut-down procedure	Particulate matter VOCs Odour	Point source	Booth shuts down process is automated and will not run outside of compliant parameters	Annual emissions exhaust stack test. Monthly

An annual manual extractive test will be completed for VOCs, oxides of nitrogen, carbon monoxide and exit velocity of all combi booth exhaust stacks. The remaining exhaust stacks will have an annual manual extractive test for VOCs where relevant, particulate matter and exit velocity. All exhaust stacks will be visibly checked for potential odour or particulate emission issues on a weekly basis. The mass emission of VOC will be calculated on a monthly basis.

Information on locations of paint operations are identified on the attached drawing (AMLPaint-emission-points2021.pptx).

4 Environmental Management and Impacts

C3 Environmental Management?
What environmental management procedures and policy will you deploy?

AML will operate the installation in accordance with an environmental management system (EMS) which is certified to ISO14001: 2015. As such AML has a number of environmental procedures to which it conforms:

Training and awareness: Effective control of emissions to air requires the proper management, supervision and training for process operations; the proper use of equipment, effective preventative maintenance on all related plant and equipment; and ensuring related spares and consumables are adequately available so plant breakdowns can be rectified rapidly.

Competency: AML will ensure staff and contractors are competent and provide training and instruction in their duties relating to the control of emissions to air. The training will focus on the awareness of responsibilities under the permit, steps to minimise emissions during start-up and shut-down and actions to take when there are abnormal or emergency conditions that could, if not controlled, result in emissions to air. Training requirements will be documented and maintained, and records of training undertaken will be retained.

Maintenance: Effective preventative maintenance shall be employed on all plant and equipment concerned with the control of emissions to air. A written maintenance programme for air pollution control equipment will be documented and records of maintenance undertaken will be retained.

Evaluation of compliance: AML has an annual external evaluation of compliance audit on its high risk compliance obligations including environmental permits, consents and licences. The evaluation of compliance will check status and progress of actions for solvent management plans and solvent reduction action plans, for example.

Internal audits: AML has internal audits for its high risk compliance obligations including environmental permits, consents and licences. Internal audits will check status and progress of actions for solvent management plans and solvent reduction action plans, for example.

Incident reporting procedure: AML has a robust reporting process through its AIRS (Aston Martin Incident Reporting System) to identify any issues and follow-up with root cause analysis, interim corrective actions and longer-term corrective actions.