

Document MOU PP04 - Atmospheric emissions: details, volume, controls & monitoring.

Revision 2 – Addition of proposed controls for monitoring particulate emissions from the process

Revision 1 – following visit from MCC representative regards environmental monitoring section

Site Plan with points of emission and controls.

As per plan shown in MOU PP02 and photos in MOU PP03, the points of emission are listed below;



1 – Item identifies the Graco spray pumps that are attached to the 1000L IBC. Generally this is a closed system with no escape of VOC to atmosphere.

However the paint shop will process small volumes of 2 pack epoxy zinc phosphate which would be mixed in 20L pales next to the pump. Over 95% of paint applied will be single pack primer within the closed system.

Occasionally there is use of thinner solution for rollers to hand apply / touch up, but these are restricted to 5L containers, with lids kept on when not in use. Thinners is provided in 25L containers, and again tops are kept on when not in use to prevent further fugitive emissions.

2 – Waste IBC for waste paint and used thinners. This is kept closed and sealed with the plastic lid when not in use, so no VOC emission. Once full, removed from site using our licenced Haz waste carrier (Safety Kleen Ltd)

3 – General paint shop lay down area. Structural steel sections are laid out for paint spraying throughout the workshop. VOC evaporates from paint as part of air curing for single pack paints. Current Jotun product is approx. 56% volume solids.

The paint shop generally operates on a 12 hour working day – 06.00 to 18:00 dependant on the work required / sections requiring coating. Sections are currently supplied to the site either in a pre-blasted state, or with a 50 micron coat of holding blast/ primer.

Paint is applied throughout the working day as completed sections become available, and loaded outside to storage racking to await loading out for delivery to site. Occasionally we process sections requiring Galvanising, and these would not be processed through the paint shop.

The two pack product has a reduced solvent content at approx. 74% volume solids, but use of cleaning solvents and waste paint would increase as the mixed product cures mainly via chemical reaction, so if left can cure in the paint lines.

During the spraying activity there is a localised strong solvent odour, and as such spraying operatives wear suitable RPE, as well as disposable coveralls, gloves and safety glasses as per the requirements of the COSHH assessment.

The paint shop is restricted to authorised staff only, and all painting staff are also subject to Occupational Health surveillance.

Prices have been received for an improvement capital investment scheme for a paint shop extraction system, but nothing is in place at present.

4 – There are three points of fugitive emissions through natural ventilation via the workshop doors. Using the single pack primer there is very little release of odour from the building, and this is checked periodically.

The doors are also potential outputs for particulate emissions from the spraying process. At present this is presumed to be very low, as any particulates collect on the paint shop floor as overspray. This is currently regularly cleaned up to prevent dust build-up (which creates a potential hazard for static discharge

There have been no known complaints from other business neighbours on the trading estate, or residential neighbours adjacent to the site, and this is no odour noted at the site boundaries.

5 – A recent improvement is the installation of a self-contained solvent parts washer, which is regularly serviced and maintained by Safety Kleen UK. The washer recycles the solvent thinner solution within the washer apparatus, with a small extraction system to vent solvent away from the operator when in use. Vent is a simple hose apparatus to the external rear of the building (see phot in MOU PP03). One 25L container of thinners is reused every 3 months, when the old solution is removed and new thinners replaced.

When the washer is in use, the extraction hose would act as a small point source, although the emission to atmosphere would still be fugitive. The actual emissions has not been measured on this piece of equipment to date.

Therefore the emissions from points 1-5 go directly to the environment, without abatement or treatment.

Environmental monitoring.

Monitoring of VOC emissions is currently being conducted through monitoring of volume VOC supplied to the site (monthly delivery summary from our suppliers), and with volume deducted for waste products removed from the site (via waste returns from our licenced waste contractor).

For means of compliance to the Environmental Permitting (England & Wales) Regulations 2010 and The Solvent Emissions (England and Wales) Regulations 2004 there is a requirement for any operations that produce over 5000 Kg per annum to have a valid emissions permit.

The limit of 5000Kg is identified as classifying the facility as a part B facility - *Other coating activities, including metal, plastic, textile (except rotary screen printing on textile), fabric, film and paper coating.*

Historical data for the organisation and previous BS 8555 accreditation audits state that emissions prior to 2021 were under this limit.

A combination of an increase in production turnover and required painting capacity, a change in key personnel (resignation of the previous General Manager) and the COVID 19 Pandemic has meant a delay in assessing current emissions, but the appointment of a dedicate SHEQ Manager by the business identified a need for a permit for the site.

The current and anticipated solvent emissions can be demonstrated that there will an exceedance of the 5T limit for 2022, thus requiring an emission permit for a Part B installation. It is noted that VOC emissions are not expected to pass the threshold of 15T, which would require further limits.

Therefore VOC emissions will be monitored under the Solvent Reduction Scheme, with an annual submission to the Local Authority, (Monmouthshire County Council) demonstrating via a Solvent Management Plan that total VOC emissions are under 15T / annum AND within a 60% ratio of solvent to solids.

Particulate emissions

It has been advised that consideration is also required for the particulate emissions from the painting process.

The long term improvement plan for the facility is the installation is to install a bespoke extraction system containing spray booths with fitted louvres to capture particulates. Once installed, the extraction outlets will be subject to annual monitoring and inspection.

Until the extraction solution can be finalised and installed, as this will involve a significant amount of capital expenditure in the region of £50K, we propose the following controls for the particulate emissions:

- We will conduct air monitoring of particulates to determine the levels being emitted from the spray guns within the workshop. This will determine the levels in comparison the 50mg/Nm³ limit as per the DEFRA Process Guidance Note 6/23(11), and also how far the particulates (overspray) travels.
- Currently particulates are actually currently contained within the paint shop during the spraying activity and drop to ground. The dust is then regularly collected and disposed of as inert waste via a licenced waste contractor, as highlighted as a current control in our Fire and DSEAR Risk assessments conducted for the site.

Occupational Health

An Occupational Hygiene survey has been conducted on the paint shop activities by an external consultant (Huw Wilkins Associates Ltd).

Results of the testing concluded that exposures to Ethylbenzene was well below the Workplace Exposure Limit (8 Hrs TWA), but samples of Xylene did exceed the exposure limit, so use of RPE and appropriate PPE would be required (see table 1 below)

HUW WILKINS ASSOCIATES LIMITED

Table 1

Morgan's of Usk Limited, Woodside Works, Woodside Trading Estate, Llanbadoc, Usk
Location: Paint Spraying Building
Personal and static organic conc. and mixed exposures assessments
Samples collected: 12th January 2021

Sample Ref.	Operator/ sample type	Operation/ Location	Sample period	Sample time Minutes	Xylene (mg.m ⁻³)	Ethylbenzene (mg.m ⁻³)	2-Butanone Oxime (mg.m ⁻³)	Mixed Exposure
M USK-001	M Giles	Spraying and hand painting using a roller of metal components predominantly steel girders and trestles in an open plan area using Pint OD primer paint	08.45 – 15.51	426	382.01	81.61	0.53	1.92
M USK-002	Static	Background in middle of the area where the majority of the painting tasks was carried out	08.48 – 15.52	424	274.12	59.09	0.18	1.38
Workplace Exposure Limit (8 hr TWA):					220	441	--	--
Workplace Exposure Limit (15 min TWA):					441	552	--	--
Mixed exposure derived limit:								1

The detection limits for this method is 1.0 µg for xylene, ethylbenzene and 2-butanone oxime respectively.

Emission levels at source have been noted to exceed Occupational Health limits as set in EH40, but this well managed with the use of RPE by the painting operatives, and restrictive access during painting activities are ongoing.

Odour Management

At present, it can be reported that there is no noticeable odour outside of the paint shop either during or after spraying has taken place. However, at present there is not a fixed regime or any historic records for odour testing, as it has not been deemed necessary.

It is also noted that there have never been any complaint regards paint / VOC solvent odour from any properties or other businesses adjacent to our site.

It was agreed with MCC that as a condition of the granted permit, MOU will implement a system of regular documented checks to ensure no external odours can be detected.