

	Particulate and Solvent Release Guidance	
Site: ABL - 1 Touch Repair, Littlehampton	Project Ref: 1389	
By : P Goold	Booth Type : STL Cyclone	

At 1 Touch Repair Littlehampton there will be a Cyclone booth with vertical air flow and a Paint Mix Room. The airflow through the booth will be based on an average air velocity of 0.25m/s to 0.3 m/s. On this basis the air volume is calculated. The paint mix room will be used for storage and mixing of paints. As a result there will be no particulate release and the solvent release is only from surface evaporation during mixing.

It has been confirmed that the paints that will be used on site are 60% water and 40% solvent based. The particulate release calculation would be for both water and solvent based paints but the solvent release would only apply to 40% of the spraying that is solvent based.

It can be confirmed that 1 Touch Repair Littlehampton will not exceed a 1 tonne in 12 months threshold of VOC release. As a result it is under the activation level for the statutory guidance for re-spraying of road vehicles in the Department for Environment, Food & Rural Affairs Process Guidance Notes 6/34.

The Spray guns being used are the Devilbiss Sri PRO Series, Sri PRO Lite Gravity Spray Gun. The service manual confirms that it is "High efficiency complies with EPA by obtaining transfer efficiency above 65%" The Percentage transfer efficiency of the spraying of 65% is used in the calculation

For the site a maintenance agreement will be set up with STL. There will be two programmed services per year. At both filters are changed and at the main 12 monthly service there is an LEV check. Between services the site orders up replacement filters on a regular basis to maintain the particulate capture efficiency of the extract filters to the design 99% of the installed duplex filter

Air Extraction.

STL Spraybooths are designed and manufactured to comply with BS EN 13355, Coating plants, Combined booths, Safety requirements. The booth has a Duplex Filter with G2 Primary and G3 Secondary. This nominally removes 99% of all paint particulates. We understand the majority of paints that will be used are EPA compliant, primarily water based.

The extract ducts location and height with its efflux velocity will achieve effective odour dispersal at the boundary. The facility is immediately surrounded by industrial units and a Scout Ground to the North East. The nearest housing is 50m to the North East.

VOC Emissions

VOC Emissions are covered under statutory guidance for re-spraying of road vehicles in the Department for Environment, Food & Rural Affairs Process Guidance Notes 6/34. The activities for regulation by the Process Guidance Notes are as listed in table 3.1 for premises with solvent consumption used in coating activity of '1 tonne or more in any 12 month period'.

The VOC emissions is dependent on the Coatings and Process. By the use of compliant coatings and process omission control is demonstrated. Coatings compliance is achieved if the coating contains VOC's equal or less than the VOC detailed in Section 4 - Table 4.2 within the document. Compliant coatings are labelled with VOC content in grams per litre that corresponds to the permitted level for the category of the product in table 4.2 of the Process Guidance Notes 6/34.

The process control techniques are covered in Section 5 of the document. The summary in table 5.21 advises that for coating operations for VOC's the control technique is the use of a 'spray booth enclosure for capture and disposal'.

 SPRAYBOOTH TECHNOLOGY LIMITED	Particulate and Solvent Release Guidance	
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Particulate Release

The concentration of particulate matter has been calculated on the following basis

- 1 - Compliant coatings are in use
- 2 - Duplex ultra extract filter is fitted.
- 3 - A spraygun with a transfer efficiency of at least 65% is used (HVLP).

Particulate Release Calculation

Cyclone Booth

$$\text{Particulate Release} = [P] = \frac{M(S/100)(1-T/100)(1-A/100)}{V}$$

Where:

M =	666 mg/s	Mass delivery rate of paint from the spray gun.
S =	0.6	Percentage solids content of the paint (60%).
T =	0.35	Percentage transfer efficiency of the spraying (65%).
A =	0.01	Percentage arrestance of the Duplex Filter (99%).
V =	5917 m ³	Air volume flow rate of the above spraybooth in 10 mins
[P] =		Concentration of particles in the discharge from the spraybooth.

$$\text{Particulate in Discharge} = [P] = \frac{666 \text{ mg/s} \times 0.6 \times 0.35 \times 0.01}{5917 \text{ m}^3}$$

$$\text{Resultant} = 0.0002364 \text{ mg/m}^3$$

Paint Mix Room

No particulate release as no spraying taking place only the mixing of paints.

Solvent Release Calculation

Cyclone Booth

$$\text{Solvent Release} = \text{SR} = \frac{P \times S}{V}$$

Where:

SR =		Solvent Release.
P =	0.3 ltr	Paint Volume
S =	419000 mg/ltr	Percentage Solvent (419 g/ltr)
V =	5917 m ³	Air volume flow rate of the above Spraybooth in 10 mins

$$\text{Solvent in Discharge} = \text{SR} = \frac{0.3 \text{ ltr} \times 0.419}{5917 \text{ m}^3}$$

$$\text{Resultant} = 0.0000212 \text{ ltr/m}^3$$

$$21.2 \text{ mg/m}^3$$

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Paint Mix Room

Any solvent release will be from surface evaporation when the paint mixing is open to the air. This surface area is small and the evaporation will be negligible. As a result solvent release from Paint Mix Rooms are not normally considered. The paint mix room has a minimum air change rate of 20 air changes per hour to maintain a safe working environment.

Conclusion

With the small release levels, the height of emission ducts and the efflux velocity in excess of 15m/s that adds further dilution once the extract air has left the ducts there will be no noticeable particulate or solvent spread from the facility to neighbouring properties.