Coventry City Council

Part B Application form

Application for a Part B Permit for Respraying of Road Vehicles covered by Process Guidance Note PG6/34b(06)

Local Authority Pollution Prevention and Control
Pollution Prevention and Control Act, 1999
Environmental Permitting (England and Wales) Regulations 2010

Introduction

When to use this form

Use this form if you are applying for a permit to a Local Authority to operate a vehicle refinishing installation as defined in Section 7 of Schedule 1 to the Environmental Permitting Regulations and covered by PG6/34(06).

The appropriate fee must be enclosed with the application to enable it to be processed further. When complete, send the form and the fee and any additional information to:

Environmental Protection, Coventry City Council
Room 314 Broadgate House, Broadgate
Coventry CV1 1NH

If you need help and advice

We have made the application form as straightforward as possible, but please get in touch with us at the local authority address given above if you need any advice on how to set out the information we need.

LAPPC application form: to be completed by the operator		
For Local Authority use		
Application reference	**Officer reference**	**Date received**

A1.1. Name of the premises
XL Accident Repair Centre

A1.2. Please give the address of the premises

304 Bedworth Road.,
Longford,
Coventry.

Postcode. CV6 6LA **Telephone** 024 7636 2181

A1.3. Do you have an existing permit for a road vehicle respraying installation?

No

A2.1. The Applicant - Please provide the full name of company or corporate body or the name of the sole trader or the names of the partners

XL Motors Limited

Trading/business name (if different)

XL Accident Repair Centre

Registered Office address
304 Bedworth Road.,
Longford,
Coventry.

Postcode. CV6 6LA **Telephone** 024 7636 2181

A2.2. Holding Companies

Is the operator a subsidiary of a holding company within the meaning of Section 1159 of the Companies Act 2006?

No

Yes? Name of ultimate holding company ..... N/A
Ultimate holding company registered office address

N/A

Postcode .....**Telephone**.....

A3 Who can we contact about your application?

It will help to have someone who we can contact directly with any questions about your application. The person you name should have the authority to act on behalf of the operator - This can be an agent or consultant.

Name Tony Keetley CMIOSH MRSPH (TK Management Services)

Position Environmental/H & S Consultant

Address: 1 Milton Crescent, Attenborough, Beeston. Nottinghamshire NG9 6BE

Telephone: 07831 330665
Fax number: 01159 222456
Email: tony.keetley@safety4bodyshops.com

B. About the installation

Please provide written information about the aspects of your installation listed below. We need this information to determine whether you will operate the installation in a way in which all the environmental requirements of the Environmental Permitting Regulations are met.

B1.1 Describe the proposed installation and activities and identify the foreseeable emissions to air from the process.

Doc Reference: **Doc - 01**

B1.2 Once all foreseeable emissions have been identified in the proposed installation activities, each emission should be characterised (including odour) and quantified.

Atmospheric emissions should be categorised under the following:

(i) point source (e.g. chimney/vent, identified by a number and detailed on a plan)
(ii) fugitive source (e.g. from stockpiles/storage areas).

If any monitoring has been undertaken please provide the details of emission concentrations and quantify in terms of mass emissions. If no monitoring has been undertaken please state this.

Doc Reference: **Doc - 02**

B1.3 For each emission identified from the installation's activities, describe the current and proposed technology and other techniques for preventing or, where that is not practicable reducing the emissions. If no techniques are currently used and the emission goes directly to the environment, without abatement or treatment, this should be stated

Doc Reference: **Doc - 03**

B1.4 Describe the proposed systems to be used in the event of unintentional releases and their consequences. This must identify, assess and minimise the environmental risks and hazards, provide a risk based assessment of any likely unintentional releases, including the use of historical evidence. If no assessments have been carried out please state.

Doc Reference: **Doc - 04**

B1.5 Describe the proposed measures for monitoring all identified emissions including any environmental monitoring, and the frequency, measurement methodology and evaluation procedure proposed. (e.g. particulate matter emissions, odour etc). Include the details of any monitoring which has been carried out which has not been requested in any other part of this application. If no monitoring is proposed for an emission please state the reason.

Doc Reference: **Doc - 05**

B1.6 Provide detailed procedures and policies of your proposed environmental management techniques, in relation to the installation activities described.

Doc Reference: **Doc - 05**

B1.7 Attach a plan of the premises showing the location of:

(a) the premises
(b) spray booths
(c) organic solvent-containing material storage
(d) organic solvent-containing waste storage.

Doc Reference: **Doc SL-1** (Schematic layout)

B1.8 Supply a description of the location and methods of storage of organic solvent- containing materials.

Doc Reference: **Doc - 05**

B1.9 Supply certification of spray booth performance

Doc Reference: **Docs 7 & 8**

B1.10a Are VOC emitting stacks[1] at least 3m above the roof ridge height of buildings within 15 m of the stack?

☐ No (If "no", complete B1.10b)

☑ Yes.

B1.10b Provide a written plan for the construction, operation and maintenance of stacks emitting VOCs.

Doc Reference: **N/A**

B1.11 Provide details how the mass of VOC emitted and of paint solids used will be determined and recorded

Doc Reference: N/A (**This information <u>not required</u> under the Compliant Coatings legislation)**

B1.12 Provide a written plan for the maintenance, inspection and replacement of extract air filters of the spray booth and abrasive blasting equipment plant.

Doc Reference: **Doc - 05**

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[1] **NB – All new VOC emitting stacks are required to vent VOC's at a height greater than 3m above the roof ridge height of buildings within 15 m of the stack**

B1.14 Provide a written plan for measuring particulate emissions from abrasive blasting equipment, using manual extractive testing methods.

Doc Reference: **N/A**

B1.15 Provide a written plan for control of VOC emissions from spray gun testing and sprayout following cleaning.

Doc Reference: **Spraygun Testing Procedure**

B1.16 Provide a written plan for the control of VOC emissions from spray gun and equipment cleaning.

Doc Reference: **Spraying Equipment Cleaning Procedure**

B1.17 Provide a written plan for the control of VOC emissions from solvent contaminated wipes and other wastes

Doc Reference: **Solvent-contaminated Wipes & Waste Procedure**

B1.18 State whether any structured environmental management system (such as ISO 14001, EMAS or BS8555) or a tailored system is being used or is planned, and if so what.

Doc Reference: **Doc - 05**

B1.19 Specify what training and instruction staff will be given to ensure that this permit (if granted) is complied with.

Doc Reference: **Doc - 05**

B2 Impact on the environment

B2.1 Provide an assessment of the potential significant local environmental effects of the foreseeable emissions (for example, is there a history of complaints, is the installation in an air quality management area?)

Doc Reference: **Doc - 06**

B2.2 Are there any sites of Special Scientific Interest (SSSIs) or European Sites, which are within 500 metres of the installation?

☑ **No**

☐ Yes. Please give the names of the sites

.....
N/A
.....

Doc Reference: .....

B2.3 Provide an assessment of whether the installation is likely to have a significant effect on such sites and, if it is, provide an assessment of the implications of the installation for that site, for the purpose of the Conservation (Natural Habitats etc) Regulations 1994.

Doc Reference: .....

B3 Environmental Statements

B3.1 Has an environmental impact assessment been carried out under The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, or for any other reason with respect to the installation?

☑ No

☐ Yes. Please supply a copy of the environmental impact assessment

Doc Reference: N/A

B4 Additional Information

Please supply any additional information, which you would like us to take account of in considering this application.

Doc Reference: None

C1. Fees and Charges

The enclosed charging scheme leaflet gives details of how to calculate the application fee. Your application cannot be processed unless the application fee is correct and enclosed.

C1.1. Please state the amount enclosed as an application fee for this installation.

£346.00

Cheques should be made payable to Coventry City Council.

We will confirm receipt of this fee when we write to you acknowledging your application.

C1.2. Please give any company purchase order number or other reference you wish to be used in relation to this fee.

C2. Annual charges

If we grant you a permit, you will be required to pay an annual subsistence charge. If you don't pay, your permit can be revoked and you will not be able to operate your installation.

C2.1. Please provide details of the address you wish invoices to be sent to and details of someone we may contact about fees and charges.

Rob Ally.
XL Motors Ltd.
04 Bedworth Road
Longford
Coventry

Postcode. CV6 6LA **Telephone** 024 7636 2181

C3. Commercial Confidentiality

C3.1. Is there any information in the application that you wish to justify being kept from the public register on the grounds of commercial or industrial confidentiality? **NO**

If **Yes**, please provide full justification, considering the definition of commercial confidentiality within the PPC regulations (See the general guidance manual).

C4. **Data Protection**

The information you give will be used by the Local Authority to process your application. It will be placed on the relevant public register and used to monitor compliance with the permit conditions. We may also use and or disclose any of the information you give us in order to:

- consult with the public, public bodies and other organisations,
- carry out statistical analysis, research and development on environmental issues,
- provide public register information to enquirers,
- make sure you keep to the conditions of your permit and deal with any matters relating to your permit
- investigate possible breaches of environmental law and take any resulting action,
- prevent breaches of environmental law,
- offer you documents or services relating to environmental matters,
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows)
- assess customer service satisfaction and improve our service.

We may pass on the information to agents/ representatives who we ask to do any of these things on our behalf.

It is an offence under regulation 38 of the EP Regulations, for the purpose of obtaining a permit (for yourself or anyone else) to:

- make a false statement which you know to be false or misleading in a material particular,
- recklessly make a statement which is false or misleading in a material particular.

If you make a false statement

- we may prosecute you, and
- if you are convicted, you are liable to a fine or imprisonment (or both).

C5 Declaration: previous offences (delete whichever is inapplicable)

I/We certify:

EITHER

No offences have been committed in the previous five years which are relevant to my/our competence to operate this installation in accordance with the EP Regulations.

Signature .....[redacted].....

Name: Rob Ally

Position: Managing Director

Date: 1st November 2011

6 Declaration

C6.1 Signature of current operator(s)*

I/We certify that the information in this application is correct. I/We apply for a permit in respect of the particulars described in this application (including supporting documentation) I/We have supplied.

Please note that each individual operator must sign the declaration themselves, even if an agent is acting on their behalf.

For the application from:

Premises name	XL Accident Repair Centre
Signature	[redacted]
Name	Rob Ally
Position	Managing Director
Date	01/11/2011

Signature .....

Name .....

Position.....

Date .....

** Where more than one person is defined as the operator, all should sign. Where a company or other body corporate – an authorised person should sign and provide evidence of authority from the board of the company or body corporate.*

B1.1 PROPOSED INSTALLATION & ACTIVITIES

The installation consists of a vehicle repair workshop complete with paint spraying facilities for the re-spraying of road vehicles. There are 2 fully-enclosed spray-booths, 1 Smart Repair spraybooth and an enclosed paint preparation & mixing room with separate spraygun cleaning area. The range of activities carried out as part of the re-spraying of road vehicles process includes the following;

1. STORAGE OF PAINT MATERIALS

All paint related materials are stored in the paint mixing room and are kept in sealed containers unless actually in use. Back-up stock of paint bases is kept within a metal cabinet in the parts store with some also being kept in the mixing room. There is a limited amount of paint materials kept on the workbench within the mixing room when actually in use. All containers that hold solvents or solvent-based paint materials are kept sealed until either being used or disposed of so as to reduce fugitive emissions of solvent vapours.

Foreseeable potential emissions from the process:

Emissions to Air:	-	Potential of fugitive emissions of VOC's to air from spillages
Emissions to water:	-	Unlikely
Emissions to land:	-	None

2. SURFACE CLEANING & PREPARATION

a) Pre-cleaning:

Old paint substrates need to be cleaned before repairing or painting. This involves using a compliant Aqueous Pre-cleaner .that is applied to the surface to be repaired or painted via the use of hand-held wipers to remove dirt or other contaminants. All contaminated wiping materials are then placed in a lidded waste bin prior to removal from the site.

In some instances a solvent-based Degreaser/Silicone remover needs to be used to remove excessive amounts of silicone/wax or grease from the surface to be repaired and painted. The solvent-based degreasers are applied to a hand-held wiper from a solvent-dispenser so as to reduce the amount of solvent used. The degreaser is then applied to the surface with the hand-held wipers to remove any silicone/wax or grease. All contaminated wiping materials are placed in a lidded waste bin to reduce fugitive emissions of solvent vapour.

The Pre-cleaning process is carried out at various stages of the painting process.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	Fugitive emissions of VOC's from the use of solvent-based Degreaser/silicone remover Fugitive emissions of VOC's from contaminated waste wipers
Emissions to water:	-	None
Emissions to land:	-	None

b) Application of Body Fillers & knifing stoppers:

Uneven surfaces to be painted are filled with a resin-based 2-component body filler that is mixed by hand on either a wooden or metal pallet. When mixed the compound is applied to the uneven surface using a plastic spreader. When the filler is fully cured it is then sanded to the desired shape (see section c) Any waste from unused filler is placed into a lidded waste bin.

The process can take between 1 to 15 minutes depending on the size of the repair. This process can be repeated several times per day.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	Slight fugitive emissions of VOC's when mixing filler Slight fugitive emissions of VOC's from contaminated waste
Emissions to water:	-	None
Emissions to land:	-	None

c) Sanding of old paint substrates, body fillers & knifing stoppers :

Old paint substrates and body fillers etc are dry-sanded in order to prepare the repaired or replaced body vehicle panels for spraying of primers & topcoats. All dry sanding operations are carried out inside the building using pneumatic dual-action sanders & hand-held sanding blocks that are attached via plastic hoses to the dust extraction system. The dust is collected in to a sealed container & not emitted to air. The sanding process is carried out several times per day.

Foreseeable potential emissions from the process:

Emissions to Air:	-	No emissions to air
Emissions to water:	-	None
Emissions to land:	-	None

3. MIXING & PREPARATION OF PAINT MATERIALS:

All paint materials now used are classified as 'Compliant Coatings' as in accordance with the Paints Product Directive. All paint materials are mixed & prepared prior to the spraying process in the enclosed Paint mixing room.

The paint systems used are the Spies Hecker (SP) water-based base-coat + High-solids system and the Dupont water-based system. All paint systems are housed on paint mixing machines that automatically stirs the paint bases whilst still in their sealed containers thus, reducing fugitive emissions from the HS paint bases to a minimum.

All other containers holding solvent-based paint materials are kept tightly-lidded when not being used so as to prevent fugitive emissions. The paint containers used range in size from ½ to 5lt's.

The required quantity of paint material is poured into a metal container where the appropriate reducers or hardeners etc are added. The paint material is then poured in to a spray-gun paint cup in readiness for the spray application.

The mixing process can be carried out approximately 5 to 15 times per day. After mixing, paint stirring sticks used, are placed in the Spray Gun cleaning machine for cleaning.

Waste solvent /paints or are poured into a 25lt metal UN approved container fitted with a lidded funnel to reduce fugitive emissions of solvent vapour. The 25lt drum of solvent waste is kept the paint mixing room until full when it is then taken to the store at the rear of the building to be recycled on site in the solvent-recycler. Occasionally a build-up of solvent waste is removed from site under consignment by a licensed waste carrier for re-cycling.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	Fugitive emissions of VOC's from mixing, handling & spillages of materials or waste Very slight Fugitive emissions of VOC's when pouring waste in to waste container
Emissions to water:	-	None
Emissions to land:	-	None

4. APPLICATION OF PAINT COATINGS

a) Application of Primers:

Once all preparation work has been carried out and the area to be painted has been finally 'pre-cleaned', the next stage is to apply the primer, there are various types of primers used ie:

- an etch-primer / wash-primer is applied to any bare non-ferrous metals such as Aluminium to provide corrosion protection and to promote adhesion. (This is normally over-coated with either the Wet-on-wet primer system or a primer-surfacer, depending upon which system is required)

- a high solids solvent-borne isocyanate-activated Wet-on-wet primer system which is normally used for all new panels that have been supplied with an electrostatic-coated works primer. (The wet on wet system is then directly over-coated with the relevant top-coats, after a sufficient 'flash-off' period)

All primers are prepared and mixed in the paint mixing room and are applied inside one of the fully-enclosed spray-booths using High-volume low-pressure (HVLP) spray-guns. Aerosol etch-primers may be used for certain application.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	VOC's & isocyanates from booth emission-stacks during spraying process Particulate matter from booth emission-stacks
Emissions to water:	-	None
Emissions to land:	-	None

b) Application of Primer-filler/surfacer:

A solvent-borne isocyanate-activated Primer-filler/surfacer is applied to repaired areas that require a thicker paint film. This is prepared and mixed in the paint mixing room.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	VOC's & isocyanates from booth emission-stacks during spraying process Particulates from booth emission-stacks
Emissions to water:	-	None
Emissions to land:	-	None

All primers are applied inside one of the fully-enclosed spray-booths or in the Dalby Easysmart spraybooth using HVLP spray-guns that are designed to achieve a transfer efficiency of 65%.

c) Application of Top coats:
These include two-coat topcoats that involve the application of a water-based 'base coat' to provide the colour, followed by the application of a 'solvent-based Clearcoat to provide a gloss finish and; single-coat topcoats which provide both colour and gloss.

All top-coats to be applied to the vehicle are mixed and prepared in the paint mixing room. When the paint coating to be applied has been mixed and prepared, it is then put a sealed HVLP spray-gun which is then taken into one of the spray-booths.

The top coats are then applied to the prepared vehicle inside one of the 2 fully-enclosed spray booths or in the Dalby Easysmart spraybooth using HVLP spray-guns that are designed to achieve a transfer efficiency of 65%.

Foreseeable potential emissions from the process:

Emissions to Air:	-	VOC's & isocyanates from booth emission-stacks during spraying process Fugitive emissions of VOC's from mixing, handling & spillages Particulates from booth emission-stacks
Emissions to water:	-	None
Emissions to land:	-	None

Note! - All paint materials purchased are classified as 'Compliant Coatings' as in accordance with the Paints Product Directive. Our supplier is not permitted to sell non-compliant products for refinishing.

d) Potential emissions from Spray-booths:
When the spray-booths operate in the spray cycle, the paint dust created is extracted out of the booth via a 'high-density' filtration material that is designed to remove sufficient particulate matter as to comply with the maximum emission limit of 10 mg m^3

The spraying process time can vary between 5 and 45 minutes and on average the process can be repeated 1 – 7 times per working day within each spray booth.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	VOC's and isocyanates through booth emission-stacks Particulate matter through booth emission-stacks
Emissions to water:	-	None
Emissions to land:	-	None

Both fully-enclosed spray-booths are fitted with an automatic shutdown facility complete with an alarm in the event of positive pressure occurring in the booth during spraying operations. Procedures are in place to deal with this event in order to reduce the risk of emissions in to the open workshop. The Smart-repair booth operates under negative pressure by design.

e) Baking of paint-film as applied to vehicles:
Upon completion of the spraying process and all paint dust has been extracted, the vehicle then remains in the spray-booth where the paint coating is then baked at a high temperature in order to be fully cured.

When the paint film is fully cured the vehicle is removed from the spraybooth for refitting prior to its return to its owner.

Foreseeable potential emissions from the process:

Emissions to Air:	- -	VOC's and isocyanates through booth emission-stacks
Emissions to water:	-	None
Emissions to land:	-	None

continued

5. OTHER ACTIVITIES (That have the potential to create solvent emissions)

a) Cleaning of Spray guns:
After painting, the operator then returns the spray gun containing any unused paint material to the paint mixing room where the unused material is placed into a sealed container either for re-use or if no longer needed, placed in the waste drum for re-cycling.

The spray guns are cleaned in an automatic Spray-gun cleaning machine that is located in the paint mixing room. The machine is fully enclosed to prevent the escape of fugitive emissions. The Spray-gun cleaning machine is fitted with an extraction system that is vented to atmosphere. The cleaning agent used within the machine is a re-cycled cellulose-based gunwash.

Foreseeable potential emissions from the process:

Emissions to Air:	- - -	VOC release from cleaning machine extraction system Fugitive emissions of VOC from spillages
Emissions to water:	-	None
Emissions to land:	-	None

b) The application of seam sealers, adhesives, under-seals & cavity waxes & some aerosol primers:
These are normally applied either in the workshop or in the paint preparation area using brushes or specially adapted spraying equipment. These substances are normally only applied to small areas and the emissions are normally only fugitive. Any aerosols used are compliant and applied only in the spraybooths.

Foreseeable potential emissions from the process:

Emissions to Air:	-	Fugitive emissions of VOC's from use of substances & spillages
Emissions to water:	-	None
Emissions to land:	-	None

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SPRAY-GUN TESTING

PROCEDURE

TESTING SPRAY-GUNS & SPRAYING OUT TEST PANELS

The testing of spray-guns and spraying of solvent-based paint materials produce high levels of solvent vapour that could be released in to the atmosphere.

In order to reduce the emission of solvent vapours being emitted directly to the working environment & the atmosphere;

TESTING SPRAY-GUNS & SPRAYING TEST COLOUR PANELS

When testing spray-guns by spraying solvent or paint, the following procedures must be followed:

- The spraying of spraying any solvent-based materials must be carried out in only in a fully-enclosed spraybooth with the extraction turned on
- Before spraying, ensure that all spray booth doors are properly closed
- Ensure that the spraybooth extraction is turned on and operating in the spray-cycle
- Read the pressure gauge to check that the spraybooth is operating under negative pressure
- Ensure that air-fed masks are worn when spraying isocyanate-activated paint materials and that other PPE is worn as appropriate.
- Any contaminated wipers or empty containers used in the process MUST be placed in the waste bin provided
- Any major spills of paints or solvents during the process MUST be dealt with immediately ensuring that the 'Spillage Procedures' are followed.
- **Do not** spray cleaning solvent through or operate the trigger to clean in the spray-gun in open workshop - mixing room or cleaning area.
- **Never** place work colleagues at risk of exposure to solvents or isocyanates

Personal Protective/Respiratory Equipment that must be worn:

When carrying out the above activities, the following PPE must be worn as appropriate;

REPORTING DEFECTS

Any defects found in the Air-Fed Masks - Spraybooth or Extraction etc, must be reported immediately to the Body shop Manager or supervisor

THE ENVIRONMENTAL PROTECTION ACT 1990

SOLVENT CONTAMINATED WIPERS & WASTE

HANDLING PROCEDURE

Solvent-contaminated wastes can create solvent vapours that if not properly controlled can be emitted into the atmosphere and cause environmental damage.

Solvent-contaminated wastes include;

- paper or cloth wipers used for pre-cleaning of panels or in the paint mixing room
- empty or discarded containers that have held solvents or solvent-based paint materials
- waste solvent-based paint/gunwash etc

Solvent-contaminated waste is classified as Hazardous.

WHEN HANDLING AND DISPOSING OF SOLVENT-CONTAMINATED WASTES

All staff must adhere to the following procedures;

- Suitable bin-liners should be used for bins holding contaminated waste
- Ensure all discarded solvent-contaminated wipers are placed in the correct waste bins
- Ensure that all empty containers that have held solvents or solvent-based paint materials, are placed in the correct waste bins
- Ensure that the lids are replaced on waste bins immediately after placing the contaminated waste in the bin
- Ensure that waste bins are emptied regularly & not allowed to overflow
- Ensure that all contaminated waste is disposed of in the waste skip provided
- **Do not** take any form of ignition ie; matches, lighters etc in areas where solvent vapour may be present

WASTE SOLVENT-BASED PAINT

- Ensure that all solvent-waste paint materials are kept in a separate container and not mixed with water-based waste.
- Ensure that the drums used for holding waste solvent/paint are fitted with a lidded funnel that is kept closed to reduce the emission of vapours


ENSURE THAT THE APPROPRIATE PROTECTIVE CLOTHING, HAND AND EYE PROTECTION IS WORN WHEN HANDLING SOLVENT-CONTAMINATED WASTES

THE ENVIRONMENTAL PROTECTION ACT 1990

SPRAYBOOTH START-UP & SHUTDOWN PROCEDURE

START – UP OF BOOTH FROM COLD

- Before starting up the spray booth, ensure that the extraction filters are fitted correctly & in good order
- Ensure that all spray booth doors are properly closed
- Start the booth in the spray cycle, run for 2 minutes and then check that the booth is operating under negative pressure (adjust damper if necessary)
- Only when the above is completed & correct; may paint spraying be commenced

IN THE EVENT OF AUTOMATIC SHUT-DOWN

- Inform Workshop Controller or Supervisor
- Restart the booth using the reset switch
- Complete the spraying of vehicle/ panels in the booth
- After baking cycle, shut down the booth and remove vehicle/panels

BEFORE RESTARTING THE BOOTH

- Check booth filters and change if blocked
- Ensure that all spray booth doors are properly closed
- Re-start the booth in the spray cycle, run for 2 minutes to check that the booth is operating under negative pressure (adjust damper if necessary)
- Continue spraying process

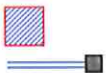
REPORTING DEFECTS

Any defect found in any spraying equipment should be reported immediately to the Management

EPA APPLICATION NOTES Document No: **- 02**

B1.2 FORESEABLE EMISSIONS - (Character & Quantification)

a) Atmospheric emissions:

Point / Source:	Type of emission:	Activity:	Location:	Identification on schematic layout
Fugitive emissions	VOC's (vapours & odours)	Paint storage & handling of paint materials (spillages)	Paint Mixing room	Mixing room (as out lined in red)
Fugitive emissions	VOC's (vapours & odours)	Mixing of paint materials	Paint mixing room	Mixing room (out-lined in red)
Fugitive emissions	VOC's (vapours & odours)	Degreasing of panels removal of silicone/wax	In spraybooths & Preparation area	area clearly indicated
Fugitive emissions	VOC's (vapours & odours)	Body filling & knifing stoppers	Panel repair area & Paint prep area	areas clearly indicated
Dust Extraction System	Fugitive emission of dust	Dry-sanding operations	Panel repair area & Paint prep area	
Spray-booth emission-stacks	VOC's & isocyanates (vapours & odours)	Application of Primers, Surfacers & Topcoats	Spray-booths/Ovens	
Spray-booth emission-stacks	Particulates (paint overspray dust)	Application of Primers, Surfacers & Topcoats	Spray-booths/Ovens	
Fugitive emissions	VOC's (vapours & odours)	Application of sealers, adhesives, under-seals, stone-chip coatings & cavity waxes	Panel repair & paint preparation area's	areas clearly indicated
Fugitive emissions	VOC's (vapours & odours)	Spray-gun Cleaning:	Spraygun-cleaning machine in Paint mixing room	
Fugitive emission of captured paint dust	Dried paint Dust (inert)	During removal of spraybooth extraction filters	Spray booths	clearly indicated

b) Emissions to water: NONE

c) Emissions to land: NONE

MASS EMISSIONS:
Based on information from suppliers & the use of new compliant coatings, the estimated amount of emissions to air of VOC's is anticipated to be between 1 – 2 tonnes per annum. This will be carefully monitored and all VOC information collated to provide accurate emission details.

B1.3 TECHNIQUES USED FOR PREVENTING/REDUCING TO A MINIMUM, RELEASES INTO THE AIR FROM IDENTIFIED EMISSIONS

Activity:	Release source:	Substance:	Techniques used for preventing or reducing emissions:
Storage & handling of paint related materials inc: Pre-cleaning - degreasing & body filling	Fugitive emissions from use of materials & Spillages	VOC's (organic solvents)	All full and partially full containers which hold or have held materials or wastes which contain organic solvents are kept tightly lidded when not in use Procedures to deal with spillages have been put in place
Paint mixing & Preparation prior to spraying	Paint mixing room	VOC's (organic solvents)	Use of low VOC Compliant coatings ie; Water-based & HS paint system (BAT) High standard housekeeping ensures minimum amount of material is used
Dry-sanding of paint substrates & fillers	Fugitive emissions	Dust from sanding	All dry sanding operations are carried out inside the building using pneumatic dual-action sanders & hand-held sanding blocks that are attached via plastic hoses to the dust extraction system. The dust is collected in to a sealed container & not emitted to air.
Storage of solvent-contaminated waste wipers, empty tins & paint related materials	Fugitive emissions	VOC's (organic solvents)	All solvent contaminated waste inc: soaked wipers, empty containers etc, are stored in a lidded waste bin prior to final removal from site. All solvent waste is poured via a lidded funnel into a UN approved 205lt container. When full the waste is removed from site by a licensed waste carrier for re-cycling.
Application of Primers, Surfacers & Topcoats	Spray-booth emission-stacks	VOC's & isocyanates Particulate matter	Use of best technology low VOC compliant coatings ie; water-based 2 coat base-coat system & High-Solids paint system High Volume Low Pressure spray guns with a transfer efficiency of 65% are used for the application of all coatings All spraying of paint materials is carried out in fully-enclosed spray booths or the smart-repair booth A filtration system is used to capture particulate matter. The filtration material used is designed to reduce the emission of particulates into the air to a minimum and below the emission limit of 10 mg m3.
Baking of coatings after painting	None	Oxides of Sulphur Nitrogen & Carbon	The 2 fully-enclosed spray booths are gas heated with direct-fired burners which eliminates the emission of nitrogen oxides into atmosphere. The smart-repair spray booth is unheated.
Spray-gun cleaning	Spray-gun cleaning machine extraction vent	VOC's (organic solvents)	Automatic fully-enclosed Spray-gun cleaning machine that is located adjacent to the paint mixing room + Procedures in place for cleaning & testing of spray-guns
Changing of spraybooth extraction filters	Spray booths	Dried paint dust	The extraction system is switched off during changing process. The filters are then dampened with clean water prior to removal to reduce the release of dust particles into the spray booth and workshop areas. The filters are then double-bagged whilst still in the spray booth and placed in the waste skip

DETAILS OF EQUIPMENT IN USE

SPRAY BOOTHS:
There are 3 Spray-booths installed. Detailed as follows:

No 1: Dalby 'Genesis Hi-air' Car Spraybooth: (combined spray booth / oven)

No 2: Dalby 'Genesis Hi-air' Car Spraybooth: (combined spray booth / oven)

- Both spraybooths are totally enclosed and designed to contain all emissions from spraying process. Both spraybooths operate under negative pressure during the spray cycle to prevent emissions of solvents, isocyanates & particulates into the surrounding work areas.

- Both spraybooths are fitted with automatic shutdown facilities complete with an alarm in the event of positive pressure occurring within the booths during spraying operations with magnehelic gauges fitted in order to continually monitor the internal pressure during the spray cycle.

- Both spraybooth extraction filtration systems are fitted with a high density filtration material designed to reduce emissions of particulate matter so far as is reasonably practicable and below 10mg m3

Note: These booths are gas heated with direct-fired burners which eliminating the emission of nitrogen oxides into atmosphere..

N0 3: Dalby 'Easysmart' panel Spraybooth
The Easysmart spraybooth operates through extraction only and has no forced-air entering the booth. This design means that the booth can only operate under negative pressure when the extraction is switched on. This booth is unheated so no nitrogen oxides are produced.

SPRAYGUN CLEANING EQUIPMENT

1 x Dresta 9000 Spray-gun cleaning machine:
All spray guns are cleaned in this fully-enclosed automatic spray gun cleaning machine. It is positioned in the gun cleaning area of the paint mixing room.

DUST EXTRACTION EQUIPMENT

1 x Rupes Dust Control System - Model HE703
A centralised dust-extraction / collection system has been installed and sited in the workshop. The system is fitted separate drop points for use with the pneumatic dual-action sanding equipment and hand-held blocks that are attached to the system via plastic hoses.

All dust collected is contained in a sealed bag - no dust is emitted to air.

SOLVENT RECYCLER

1 x AB TECH Solvent Recycler. Model AB10
Used solvents from the gun cleaning process and waste solvent-based paints are recycled on site in the Abtech solvent recycling machine located in a separate store outside the main building.

B1.4 PROPOSED SYSTEMS TO BE USED IN THE EVENT OF UNINTENTIONAL RELEASES / CONSEQUENCES

Potential unintentional releases:	Potential consequences:	Assessment of environmental hazards & risks:	System to be used in the event:
Failure of extraction system in spray booths due to poor maintenance of plant or: automatic shut-down of system due to blocked filters	Any paint overspray and solvent / isocyanate vapours left in the booth could be released into the open workshop if the doors are opened	Release of paint overspray and solvent / isocyanate vapours would present a minor risk to the environment, but due to regular maintenance, regular filter changes and employee training; the risk is assessed as low	Procedures to deal with automatic shut-down & start-up are being put in place. Staff to receive training in shut-down procedures.
Spillages of paints or solvents	Fugitive emissions of solvent vapours into the workshop.. Likely to create health & safety issue due to flammability and potential slip hazard but not major environmental impact	Not likely to create a major environmental hazard provided it is cleaned immediately and disposed of correctly Low risk	Procedures to deal with spillages are in place. Staff trained in procedure
Excess smoke from the direct-fired burners due to breakdown or lack of maintenance of plant	Excessive smoke release could present a health hazard that could affect the local community	This event could have a minor effect on the local community but due to regular maintenance of equipment, the risk is assessed as low.	Maintenance schedule in place for booths + procedure to deal with any abnormal conditions to be devised and staff trained in procedure

Having carried out the above risk assessments, it is extremely unlikely that there would be any unintentional releases that would have any impact on the local environment.

Any malfunction or breakdown that could lead to abnormal emissions which could affect the local community would be dealt with promptly by senior management and the process operation adjusted or shut down until normal operations can be restored. If it is likely that there could be an effect on the local community we would contact your department by the fastest possible means.

B1.5 Proposed Measures for Monitoring Identified Emissions
Measures for monitoring the identified potential emissions is to include the appointment of a responsible person to carry out visual and olfactory checks for particulate matter, smoke and odours at the boundary of the site during the spraying process. The results of the checks to be recorded on a log sheet and be available for inspection. Adequate cover will be provided in the event of the appointed person responsible for carrying these checks being unavailable.

B1.6 Proposed Environmental Management Techniques & Procedures
Our Company Environmental Policy (copy attached) is intended to form the basis of an Environmental Management System which is currently being designed to cover all aspects of the Respraying of Road Vehicles Process.

The EMS will include sections for;
- Management Responsibilities
- VOC usage
- Maintenance of equipment
- Suppliers of spare parts
- Record Keeping
- Staff Training
- Procedures to deal with environmental issues

See Document SL-1 (Schematic layout of Paint & Bodyshop)

B1.8 Brief Description Of The Location & Methods Of Storage Of Organic Solvent-Containing Materials
All solvent-based materials relating to the Respraying Process are stored in metal cabinets in parts store or in the paint mixing room until required for use. The 25lt containers of new cleaning solvents (Gunwash) are stored in the paint mixing room. All materials are kept tightly lidded when not in use.

Waste solvent & paints are kept in 25lt metal drum with lidded funnel which is stored in the paint mixing room as indicated on the document SL-1

B1.12 Spraybooth Extraction Filters;
Extraction filters require no maintenance other that to ensure they are in good condition & fitted correctly. They are visually checked by the paint staff prior to painting. Inspections of the spraybooths which include the filters are to be carried out basis on a regular basis with the results recorded. The dates of the filter changes are recorded.

The extraction filters are currently changed at least every 6 weeks. The 2 main spraybooths are also fitted with automatic systems that shut the booths down should positive pressure occur within the booth due to the filters become clogged.

B1.18 - See B1-6 above

B1.19 Training of Staff in EPA Awareness:
All paint and bodyshop staff shall be provided with adequate information and training in relation to the operating the process and controlling emissions to air. Particular emphasis shall be given to Start-up, shut down and abnormal conditions.

The information & training will include the following
- Spraybooth Start-up & shut down procedure
- Spray Gun Testing Procedure
- Equipment Cleaning Procedure
- Spillage procedure
- Housekeeping procedure
- Handling Waste Paint & Solvents
- Record-keeping

B2 IMPACT ON THE ENVIRONMENT

B2.1 Details of proposed release of substances into the air and assessment of the environmental consequences:

Emissions of volatile organic compounds and odours to air come from either the spraybooth emission stacks or the paint mixing room / Spray-gun cleaning machine. The use of low VOC compliant coatings ie; Water-based & High solids paint systems reduces the impact on the environment.

Emissions of particulate matter from the application of paint coatings in the spray booths will be kept below the limit of 10 mg m3 due to the design of the spraybooth extraction systems in conjunction with use of the high density filtration material fitted in the extraction system. The use of High-Volume Low-Pressure spray guns reduce the amount of particulates (overspray)

These measures in conjunction with the preventative maintenance programme in place should reduce the risk of emissions having any major impact on the environment.

The site is also located in an industrial area and is reasonable distance away from housing & other local amenities. To the best of our knowledge, there have been no complaints in relation to emissions or odours since re-locating to this site.

Conclusion:

It is assessed that due to the controls in place as detailed above and the management techniques in place, the environmental consequences of the emissions of VOC's and particulates to air from the process will be minimal.

DOC – N° 17

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Email: enquiries@dalby.co.uk

E.U. MACHINERY DIRECTIVE - DECLARATION OF CONFORMITY / LOCAL EXHAUST VENTILATION (LEV) / AIR CIRCULATION MACHINERY/PLANT - CERTIFICATE OF CONFORMITY AND EQUIPMENT HANDOVER

CONFORMITIES:

1 **E.U. MACHINERY DIRECTIVE** (As Subsequently Amended).

HARMONISED STANDARDS APPLIED (viz product standard where applicable):

2 **HEALTH AND SAFETY AT WORK ACT: 1974.**

3 **ENVIRONMENTAL PROTECTION ACT: 1990 (EPA), AND THE FOLLOWING RELEVANT AND/OR APPROPRIATE CLAUSES FROM PROCESS GUIDANCE NOTES:**

PG6/20 Guidance - paint application in vehicle manufacturing.	PG6/41 Guidance - coating and re-coating of rail vehicles.
PG6/23 Guidance - coating of metal and plastic.	PG6/40 Guidance - coating and re-coating of aircraft and aircraft components.
PG6/34b Guidance - re-spraying of road vehicles	Other: ————————

4 **COSHH REGULATIONS** (With regards to Local Exhaust Ventilation and Air Circulation Machinery).

5 **GAS SAFETY (Installation and Use) REGULATIONS: 1998.**

6 **THE ELECTRICITY AT WORK REGULATIONS: 1989** (With regards to the requirements for Hazardous Environments).

7 **BS 7671: 2008 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS** (IEE Regulations 17th Edition).

GUIDANCE:

8 **HEALTH AND SAFETY EXECUTIVE GUIDANCE NOTE HSG 54, Maintenance, Examination and Testing of Local Exhaust Ventilation (LEV).**

EUROPEAN MACHINERY DIRECTIVE - DECLARATION OF CONFORMITY FOR DESIGN

We hereby certify that the product/equipment summarised on Page 1 of 2 of this certificate complies with all the relevant Essential Health and Safety Requirements of the EC Machinery Directive 89/392/EEC as amended, and the National Laws and Regulations adopting this directive.

LOCAL EXHAUST VENTILATION (LEV) - CERTIFICATE OF CONFORMITY ON COMMISSIONING

The product/equipment uses Local Exhaust Ventilation (LEV) and Air Circulation machinery/plant and as such complies with the relevant regulations from COSHH Regulations. Harmful emissions are controlled and comply with the Environmental Protection Act: 1990, and the above Process and Technical Guidance Notes as relevant.

This is to certify that on commissioning by the Dalby Approved Engineer, the product/equipment was adjusted to give a **neutral** or **negative** air pressure to prevent any risk of contaminated substances escaping from the area.

It is emphasized that it is the responsibility of the equipment owner/occupier/operator to check the area pressurization on a daily basis or before use and to make the necessary adjustments to the equipment. Also, to ensure that operatives working inside the area wear the appropriate personal protective equipment and respiratory protective equipment, and comply with the Operating Instructions and Maintenance Manual published by Dalby.

MAINTENANCE

For the product/equipment to retain and maintain its performance within the specified design parameters, it must be maintained on 'hours run' basis and in accordance with the Maintenance Manual, by qualified and competent engineering personnel. Failure to comply with this fundamental maintenance requirement may compromise International and/or National statutory legislation.

Note 1: This initial Local Exhaust Ventilation (LEV) Certificate of Conformity is only valid if the extract and input filter media is purchased from Dalby or from an approved supplier.

Note 2: In accordance with Regulation 9 of the Control of Substances Hazardous to Health Regulations, all Local Exhaust Ventilation (LEV) equipment shall receive Maintenance, Examination and Testing every 14 months, and another certificate issued to this effect by a qualified and competent engineer.

PRODUCT/EQUIPMENT DETAILS: EASY SMART BOOTH

The Dalby Operating Instructions and Maintenance Manual details the relevant training required to operate the plant/equipment. It is recommended that the owner/occupier/operator read this manual fully before operating the plant/equipment.

MANUFACTURER:

Engineering Manager / ~~Service Manager~~:

Signature: [redacted]

Print Name: A.J. ROLLINGS

Date: 06\10\11

Being the competent person appointed by the Manufacturer

Contract No: SB 5035

Commissioning / Handover Date: 11\08\10

OWNER/OCCUPIER:

Operators Trained:

Print Name: .....

Signature: .....

Print Name: .....

Signature: .....

Print Name: .....

Signature: .....

Print Name: .....

Signature: .....

Print Name: .....

Signature: .....

I acknowledge that I have received a copy of the Operating / Maintenance Manual and the equipment operators have been suitably trained.

Signature: .....

Print Name: .....

Position: .....

Date: .....

ADDRESS:

XL MOTOR ACCIDENT REPAIR CENTRE

394 BELGRAVE ROAD

LONGFORD

COVENTRY CV6 6LA

Doc. No 8

HARRY DALBY ENGINEERING LTD

ENVIRONMENTAL PROTECTION ACT 1990

SECRETARY OF STATE'S PROCESS GUIDANCE NOTES:

PG6/20 – PAINT APPLICATION IN VEHICLE MANUFACTURING
PG6/23 – COATING OF METAL AND PLASTIC
PG6/34 – RESPRAYING OF ROAD VEHICLES
PG6/40 – COATING AND RECOATING OF AIRCRAFT AND AIRCRAFT COMPONENTS
PG6/41 – COATING AND RECOATING OF RAIL VEHICLES

TECHNICAL DATA AND INFORMATION BOOKLET

Issue No: 8 Issue Date: 5 Nov 09
Manager Responsible:
Engineering Manager

LLOYD'S REGISTER QUALITY ASSURANCE ISO9001
UKAS QUALITY MANAGEMENT 001
Approval Certificate No: 912451

CONTENTS

INTRODUCTION

Harry Dalby Engineering Limited is registered to BS EN ISO 9001:2000 and the scope of this registration is as follows:

'The design, manufacture, installation and maintenance of surface finishing plant and associated equipment'.

Therefore, in accordance with the European Union (EC) Machinery Directive 89/392/EEC and all subsequent amendments, **Harry Dalby Engineering Limited** is classified as a manufacturer.

This booklet lists the important points to be addressed in the requirements of the Secretary of State's Process Guidance Notes, as far as spray booth/ovens, re-finishing equipment and the up-grading of existing plants.

The initial testing programme carried out by Harry Dalby Engineering Limited was based on the dry filter bed found largely in vehicle finishing plant. The need to satisfy the industrial market led to additional testing of the open fronted dry filter chest design, and the waterwash chest design.

The test programme carried out on the open fronted dry filter chest was based around the research programme carried out on the vehicle refinish booths, and utilised the same testing technology.

The testing programme carried out on the waterwash chest was included in the prototype development of the unit.

This creates a situation whereby all of the products supplied by Harry Dalby Engineering Limited, are suitably tested and larger or complex system supplied shall be guaranteed by amalgamation/extrapolation of the recorded data

In light of the extensive test and research programme conducted by Harry Dalby Engineering Limited, conformity of all new spray booth/oven installations is guaranteed.

The control of solvent and odour emissions from these spraybooths is by the use of compliant paint materials and application equipment referred to in the Process and Technical Guidance Notes. In consideration of the likely maximum productivity of these spraybooths and application of the BATNECC criteria, there is no current economic technology for solvent gas or odour arrestment from spraybooth plants of this type.

SECTION 1

DALBY AUTOMOTIVE SPRAY BOOTHS
STACK HEIGHT CALCULATIONS FOR V.O.C. EMISSIONS

The following stack height information for standard Dalby spray booths has been calculated using H.M.I.P. Technical Guidance Notes - D1. All references given refer to this paper.

The pollutant information is assimilated from information obtained from I.C.I. Autocolour for their range of 2 pack urethane automotive finishes and from Kemira for similar isocyanate cured industrial coatings. The solvent concentrations are general across the range of colours and use 'worst case scenarios'. As solvent blends are specific to this generic coating type across the industry it is also possible to use the following information for other coating manufacturers.

1. **Identification of Main Pollutants**

Solvent/Pollutant Type	Exposure Limit	Solvent/Pollutant Level
N butyl acetate	950 (S.T.E.L.)	25-50%
Xylene	650 (S.T.E.L.)	10-25%
C_9 Aromatic	240 (S.T.E.L.)	2.5-10%
Methoxyl propyl acetate	1620 (S.T.E.L.)	2.5-10%

Ref 4.0 - Calculating the Pollution Index P_I

Pollution Index - $P_I = \frac{D}{(G_d - B_c)} \times 1000$ where

D - Discharge rate of pollutant in g/s
G_d - Guideline concentration for pollutant in mg/m^3
B_c - Background pollutant level-assumed to be zero

Solvent/Pollutant Type	Exposure Limit	Guideline Concentration
N butyl acetate	950 (S.T.E.L.)	23.75
Xylene	650 (S.T.E.L.)	16.25
C_9 Aromatic	240 (S.T.E.L.)	6.0
Methoxyl propyl acetate	1620 (S.T.E.L.)	40.5

Note
Guideline concentrations are assumed to be one fortieth of the S.T.E.L.

Assuming a worst case scenario of:

1. 0.5 lts/min paint usage.
2. All of the solvent as C_9 Aromatic.
3. Maximum permitted V.O.C. level of 590g/l is used - discharge rate of 4.9g per second.

The 'Pollution Index' for the solvent discharge would be ((4.9) / (6.0-0)) x 1000 = **816m^3/s.**

Ref 5.0 Calculating the Discharge Stack Height

1. Calculating U_b - The 'Uncorrected Stack Height due to buoyancy.

Heat Release - **Q** = $\frac{V(1-(283/T_d))}{2.9}$ where T_d - Temp of discharge gases °K - 298 - 25°C
V - Discharge volume m^3/s.

Dalby standard spray booths vary in exhaust rate between 3.0 and 9.4m^3/s, therefore values of Q range between 0.04 and 0.13MW.

Using Figure 2 (Graph) the following values for U_b are obtained.

Booth	Q	P	U_b Stack Height
Dalby Easybooth	0.04MW	8.2×10^2	2.02m
Dalby 'X'	0.04MW	8.2×10^2	
Dalby Genesis 'X'	0.04MW	8.2×10^2	
Dalby Genesis 'X' Ext Hgt	0.05MW	8.2×10^2	
Dalby Genesis CV'X'	0.08MW	8.2×10^2	
Dalby 'Q'	0.08MW	8.2×10^2	
Dalby Genesis 'Q'	0.08MW	8.2×10^2	
Dalby '10K'	0.08MW	8.2×10^2	
Dalby Genesis Hi-Air	0.10MW	8.2×10^2	
Dalby '12K'	0.10MW	8.2×10^2	
Dalby '17K'	0.13MW	8.2×10^2	3.0m

Within the range of Dalby booths there is therefore little appreciable difference in U_b stack height.

2. Calculating U_m - The 'Uncorrected Stack Height due to momentum.

Momentum - **M** = $(283/T_d).V.w.$ where W - discharge velocity in m/s - 15m/s

A discharge velocity of between 10 & 15m/s is required depending on the heat release and discharge momentum from the stack. Harry Dalby Eng. Ltd. work on the standard of 15m/s for all of their stacks.

From figure 4 values of U_m can be obtained.

Booth	V	W	M	U_m
Dalby Easybooth	2.77m^3/s	15m/s	40	below table values
Dalby 'X'	3.0m^3/s	15m/s	44	
Dalby Genesis 'X'	3.0m^3/s	15m/s	44	
Dalby Genesis 'X' Ext Hgt	4.0m^3/s	15m/s	58	
Dalby Genesis CV'X'	5.0m^3/s	15m/s	72	
Dalby 'Q'	5.0m^3/s	15m/s	72	
Dalby Genesis 'Q'	5.5m^3/s	15m/s	79	
Dalby '10K'	5.0m^3/s	15m/s	72	
Dalby Genesis Hi-Air	7.0m^3/s	15m/s	100	
Dalby '12K'	6.9m^3/s	15m/s	99	
Dalby '17K'	9.4m^3/s	15m/s	135	

Fig 5.4 - Calculation of Final Discharge Stack Height (C), Corrected for Nearby Buildings

As $U_b > U_m$ then **equation 18** can be used to obtain a simplified value for C.

C = **H + 0.6 U** where H - building height

Therefore for Dalby Vehicle Spraybooths the 'final discharge stack height' should be between 1.6m and 2.85m above the highest point of any building within a distance of 5 times Um (according to Technical Guidance Note Dispersion – D1).

Note however, the Process Guidance Notes give additional information for the final discharge height. This is summarised below:

PG6/20	As Technical Guidance Note Dispersion – D1
PG6/23	As Technical Guidance Note Dispersion – D1
PG6/34a	As Technical Guidance Note Dispersion – D1, but not less than 3m above the roof ridge height of any building within 15m of the base of the chimney.
PG6/34b	As Technical Guidance Note Dispersion – D1, but not less than 3m above the roof ridge height of any building within 15m of the base of the chimney.
PG6/40	As Technical Guidance Note Dispersion – D1
PG6/41	As Technical Guidance Note Dispersion – D1

The above calculations give the stack height calculations for common booth specifications. In special circumstances the Technical Guidance Note D1 calculation is used to obtain the chimney height, which is then corrected by any additional data given in the Process Guidance Notes.

SECTION 2

ENVIRONMENTAL PROTECTION ACT 1990
PAINT PARTICULATE EMISSION RATES FROM DALBY SPRAY BOOTH EQUIPMENT
RESEARCH PROGRAMME AND COMPILATION OF TEST DATA

INTRODUCTION

Following the introduction of the Environmental Protection Act 1990 and the consequent requirements for controls on Paint Particulate Emissions from Spray Booth plants, Harry Dalby Engineering Ltd initiated a research and development programme. This programme's aim was to establish emission rates and to be able to give test data support to guarantees of conformity with all Spray Booth plant offered by the company.

OBJECTIVES

The objective of the programme was to develop a filtered extraction system for the company's range of Spray Booth/Oven plants which would achieve known rates of emissions together with the development of a filter bed design giving easy and economic maintenance. The whole programme was based on development work in connection with a dry filter media system, and was later applied to the design of the waterwash extraction chests.
Note: The results of the test data are based on using Dalby Filter Media of a known quality when fitted to our Local Exhaust Ventilation (LEV) plant/machinery, filter media supplied from sources other than Dalby may not meet the required particulate arrestment standard.

THE TEST APPARATUS

It was found that there was no well-established test apparatus or procedures available for the testing of fine particles, sticky paint particulate emissions. The BS 3405 test method suggested in the Process Guidance Notes is simply impractical with this type of emission due to the very small quantities of air sampled, the minute weight of material collected and the tendency of material to adhere to the pitot tube etc. Opto-electronic aerosol monitors were considered but their sensitivity to particle size, complex parameters of settings together with uncertainties over calibrations and readouts render their performance inconclusive for this test.

It was decided to develop an apparatus for emission testing based on the abstraction of relatively large quantities of contaminated air and collecting a significant quantity of emission particles by absolute filtration to enable easy weighing. By measuring relatively large quantities of air the proportion of material arrested in sampling tubes becomes much less significant and more easily assessed. The Dalby apparatus takes measurement quantities of approximately 1 cubic metre. The apparatus has proved to be very consistent in use and is easily operated.

THE TEST PROGRAMME

The initial dry filter bed testing programme was carried out from October 1991 to May 1992. The test programme comprised running a series of tests on standard Dalby Spray Booth/Oven models. A further programme of testing was undertaken on varying types of filter bed/extract air ratios to establish predictable performance for different kinds of filter bed against different airflow rates against different paint particulate materials.

Further tests were carried out in April 1997, comprised running a series of tests on standard Dalby open fronted dry filter booths.

The prototype waterwash extraction chest was tested in Aug 1998 during the design development of a new range. The testing procedure used in the earlier particulate test was repeated.

PAINT MATERIAL AND SPRAY GUN EQUIPMENT USED FOR TESTS

Our test programme showed that the type of spray gun profoundly affected the efficiency of any filter bed used, the viscosity of the paint material and the rate of application. Additionally, the transfer efficiency of the work being carried out was important i.e. when painting a flat panel where maximum transfer efficiency of the paint spray process was being achieved, the amount of over-spray material and therefore particulate emission was reduced. Our testing showed that with high-pressure spray guns of the Devilbiss JG type using two-pack Isocyanates based paint material produced the finest particle size of all the processes tested.

It was therefore decided to base our testing programmes using this type of spray gun and ICI 2K auto colour paint material with the colour of black and generally releasing the paint spray gun into the free area of the extraction system without any transfer efficiency at all. The spray gun was set to deliver the maximum possible amount of paint using an air pressure of approximately 55 psi. This basic parameter of equipment and material coupled with totally free release provided the worst scenario for testing filter efficiencies.

THE EFFECT OF AIR FLOW RATE ON PARTICULATE EMISSION

Different specifications of Spray Booth provide different airflow rates according to specification and engineering cost compromise. Our test programme shows that air flow rate has a profound effect on emission rate for a given paint release rate as the particulate is diluted with increasing air capacity. The lowest paint discharge rate to booth air flow rate is experienced on the Dalby 8K and 'X' model Spray Booth/Ovens where the air flow rate is approximately 6,000 cubic feet per minute or 10,000 cubic metres per hour. As the booth's air movement capacity increases so a predictable reduction in emissions take place.

The test result data detailed below is a representative sample of the range of booths supplied by this company, and establishes a relationship between airflow quantity and extraction filter area/type required to provide satisfactory particulate emissions. This enables the company to provide guarantees on the booths specified below, as well as booths not specifically mentioned: 'X', 'Q', & '15K' booths, and many other configurations of bespoke spraybooth installations conforming to the airflow and filter area/type relationship.

The prototype testing of the water wash chests used an air quantity of 4,500 cubic metres per hour and as a result the particulate measured in the discharge air was significantly higher. However the quantity of air flow used in this prototype booth is lower than normal equipment supplied and thus the true particulate emission rate would subject to further dilution by an increased air flow rate.

The average paint release rate of the spray gun equalled 150 grams per minute.

SUMMARY OF TEST RESULT DATA

Dalby 8K Standard Spray Booth/Oven

Measured airflow of Spray Booth equalled 9,500 cubic metres per hour.
Average emission rate over 4 separate tests equalled 8.37 milligrams per cubic metre of air.
Total particulate emission 79,515mg/h.

Dalby 10K Spray Booth/Oven

Measured airflow of booth 18,700 cubic metres per hour.
Average emission rate of 4 tests - 5.6 milligrams per cubic metre of air.
Total particulate emission 104,720mg/h.

Dalby 12K Spray Booth/Oven

Measured airflow rate 20,400 cubic metres of air per hour.
Average emission rate over 8 tests - 4.3 milligrams per cubic metre of air.
Total particulate emission 87,720mg/h.

Dalby Commercial Vehicle Spray Booth/Ovens

From the period January 1992 to April 1996 test programmes have been performed on a range of Dalby Large Plants using dry filter extract systems. Designed with similar parameters of paint release rates/proportionate airflow rate/proportionate filter areas, all of which produced results lower than 5 milligrams per cubic metre of air.

Dalby 2.33m Open Fronted Dry Filter Booth

Measured airflow of dry filter booth equalled 12,300 cubic metres per hour. Average emission rate over 4 separate tests equalled 6.3 milligrams per cubic metre of air.
Total particulate emission 77,490mg/h.

Dalby Prototype Waterwash Extract Chest

Measured airflow of dry filter booth equalled 4,500 cubic metres per hour. Final emission rate on completion of development work equalled 15.2 milligrams per cubic metre of air.
The quantity of air flow used in this prototype booth is lower than normal equipment supplied and thus the true particulate emission rate would subject to further dilution by an increased air flow rate.

Additional Testing carried out

Apart from the specific Dalby models tested above, a further programme of testing was carried out to evaluate the possibility of predicting Dalby Filter Bed arrestance performance to investigate standard design parameters for special booths, large multi extract system Spray Booth/Ovens and production dry back Spray Booth equipment. This additional programme proved that it was possible using standard Dalby combinations of filter material against specific filter bed areas against specific air rates to predict with very good accuracy the performance of a special filter bed.

ADDITIONAL TEST DATA AVAILABILITY

The Dalby research and development programme including the development of suitable test apparatus has been costly and commercial confidentiality requirements prevent the release of more specific data regarding filter bed areas and types. However, further information will be made available to bona fide third parties who will not benefit commercially by such information.

VALIDITY OF TEST DATA

Harry Dalby Engineering Ltd submit the foregoing test data as ample evidence to support the guarantees of conformity for paint particulate emission rates of its Spray Booth/Oven equipment offered for general sale. Additionally, the data obtained and submitted enables the Company to guarantee any modified existing equipment or individually designed special purpose plant.

OUR CONCLUSIONS

Plants using Dalby developed filter beds can be made to conform with the emission limits defined in the Process Guidance Notes using the worst scenario of paint material/spray gun/air pressure. Our research shows that with the low VOC content paint materials being introduced in the future, coupled with the use of high volume low pressure spray guns, the particle size greatly increases and the consequent filtration efficiency is much improved. This also applies to the use of airless spray guns and air assisted airless guns used in the application of heavier paint materials.

Based on testing carried out by Harry Dalby Engineering, the average particulate recorded using these worst case conditions and the standard design filter bed is 87,360mg/h. Applying this to the 10mg/m^3 emission limit currently in force, an airflow of approximately 8,750m^3/h is necessary to produce the dilution rate required.

Based on this data, Harry Dalby Engineering guarantees the emission level to below 10mg/m^3 on all of its standard range of equipment.

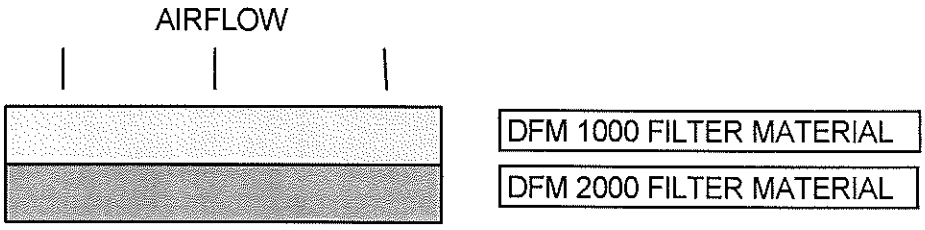
SECTION 3

SPRAY BOOTH FILTRATION DETAILS

THE DRY FILTRATION SYSTEM

The dry filtration system used to clean the air being extracted from Dalby Spray Equipment uses a dual stage process comprising two filter materials as shown below:

The Dalby Two-Stage Extract Filtration System



DFM 1000 AND DFM 2000 SPECIFICATIONS

All the results shown on the following 2 pages are attained from tests that are carried out according to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 52-68, which has also been adopted as Eurovent 4/5 and DIN 24185.

A standard test dust sample is used for the analysis of the filters, this dust is passed through the filter at a velocity of 1.5m/s and is detected by a photometer, which measures the filters dust holding capacity.

The dust particle size and composition is shown below:

COMPOSITION:	Air Cleaner Fine Particles	72%
	Soot	23%
	Cotton Linters	5%

PARTICLE SIZE	NUMBER OF PARTICLES
0.5 um	39%
5-10 um	18%
10-20 um	16%
20-40 um	18%
40-80 um	9%

DFM 1000 FILTER MATERIAL

FILTER APPLICATIONS

Collections of paint over-spray from the spray booth exhaust.

AIR FILTER MEDIA

The media is manufactured from continuous monofilament glass fibre bonded with a thermo-setting agent. The pattern and layout of the fibres is designed to give least air resistance and maximum dust holding capacity.

GENERAL SPECIFICATION

1. Bonded fibres give immediate lofting to the specified thickness when unrolled.

2. Strong and resilient maintaining a good operational performance at velocities of up to 3m/s (600ft/min).

3. High dust holding capacity due to fibre structure.

4. Fire resistance to meet BS2963 "Flame not propagated" requirements.

5. The material is non-hygroscopic.

6. Heat Resistance of up to 100^0C.

DFM 1000 DUST HOLDING CAPACITY

The following results are for a material thickness of 100mm as used on a standard Dalby Spray Booth.

SPECIFICATION	**DFM 1000**
Average Dust Arrestance	92%
Clean Pressure Drop at a Velocity of 1.5m/s	1.0mm wg

The recommended paint holding capacity for a 4" paint arrestor is 5-10 kilos per square metre.

DFM 2000 FILTER MATERIAL

FILTER APPLICATIONS

To remove finer paint particles and dust from the spray booth emissions.

AIR FILTER MEDIA

The DFM 2000 air filter materials is of the non-woven type processed to a regular labyrinth structure and comprising synthetic fibres bonded together by means of special solvents.

GENERAL SPECIFICATION

1. The labyrinth structure ensures good air distribution.
2. The fibres are resistant to moisture, fungi, bacteria and frost.
3. Synthetic fibres absorb very little moisture so that the material is stable even when subject to conditions of high humidity.
4. Operating temperature of up to 100^{0}C.

DFM 2000 DUST HOLDING CAPACITY

The following results are for material thickness of 50mm as used on a standard Dalby spray booth.

SPECIFICATION	**DFM 2000**
Average Dust Arrestance	83%
Clean Pressure Drop at a Velocity of 1.5m/s	3.3mm wg

SECTION 4

DALBY MK II PARTICULATE EMISSION TESTING APPARATUS PRINCIPLES OF OPERATION AND TESTING PROTOCOL

INTRODUCTION

This testing apparatus was developed specifically for measuring paint particulate emissions in exhaust stacks from paint spraybooths when assessing emission levels for conformity to the Environmental Protection Act 1990 and the appropriate PG Guidance Notes. Important priorities in the design of the equipment were accurate and consistent test results, lightweight and easily portable to facilitate easy on-site operation and simple and straightforward operation to allow its use by average technical personnel.

THE BS 3405 STANDARD TEST METHOD FOR MEASUREMENT OF PARTICULATE EMISSION

This is the method suggested in the various EPA Guidance Notes for establishing paint particulate emissions from spraybooths. The BS 3405 standard method was however developed for testing grit and dust emissions in solid fuel fired boiler flues where the particulate is dry and also has a significant particle weight. Early investigation of this standard method together with available proprietary equipment for carrying out this procedure showed important shortcomings when applied to testing for paint particulate material in spraybooth exhaust systems. It became obvious that most paint particulates, particularly from high pressure spray gun application using low viscosity mixes, produced a particulate mist so fine that it had a tendency to behave like gas rather than heavy particles possessing distinct inertia in an air flow stream. Additionally, paint particulate is sticky and tends to adhere in significant quantities to the small diameter pitot sampling tubes used in the BS 3405 method.

THE DALBY APPARATUS

The principal design features of this equipment are:

a) The ability to extract a large volume sample in a short time through a large diameter sample tube. This eliminates the difficulty of having to maintain a paint spraying operation for a prolonged period for testing purposes. Together with the advantage that the large airflow through a large sample tube reduces the percentage of sample particulate sticking to the pipework.

b) The apparatus is self-contained, portable and hand held giving very simple operation on site.

The Dalby test method is believed to give particulate testing to an accuracy of ± 25%.

PRINCIPLE OF OPERATION

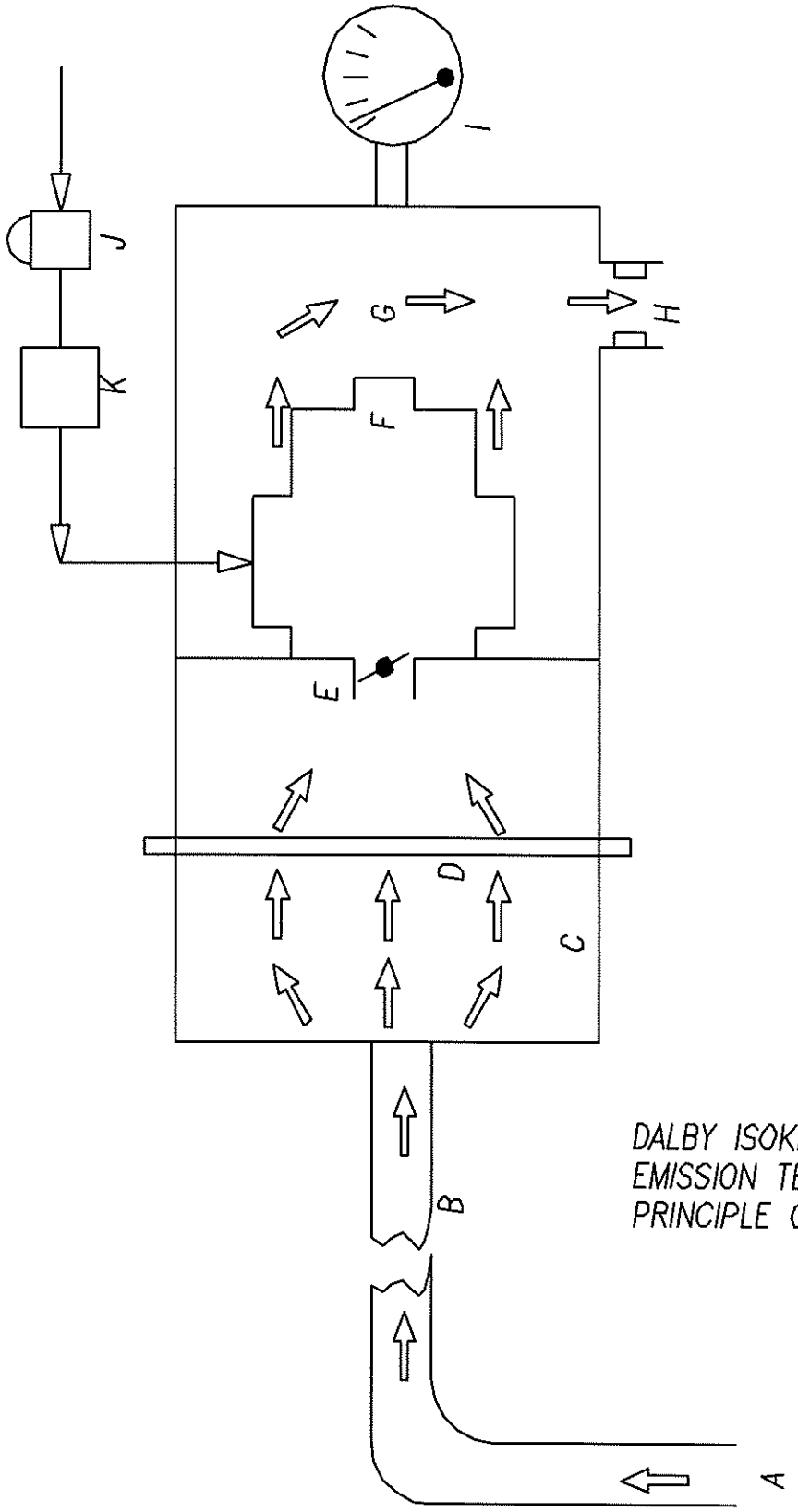
The diagram on the next page shows the general arrangement of the apparatus. The sample tube entry at 'A' is arranged in the ducted air stream to be tested for particulate emission with the axis along 'A' in line with the axis of air flow in the duct. The sample being drawn off is conducted through the connecting tube 'B' the length of which is arranged to be long enough to cover the size of the duct where sampling is to take place. The sample tube is of lightweight plastic material giving easy cleaning and straightforward and low cost replacement for additions and special applications. The air sample containing the particulate enters into a diffusion chamber 'C' where it is presented to an absolute filter 'D'. This filter is of such a density as to eliminate any paint particulate matter passing through. It also has enough absorbency to provide normal test duration without overloading or variation in air flow resistance. The sample air having passed through the filter is collected and enters the motor driven vacuum pump through a variable throttle at 'E'. The power vacuum pump 'F' passes air into the pressure chamber at 'G'. This air is then discharged to atmosphere through the exhaust port 'H' which is fitted with a flow restricting nozzle. The pressure in the pressure chamber is monitored by an accurate pressure gauge at 'I'. The electrical control circuit to the vacuum pump includes a push button starter 'J' and an accurate, adjustable automatic timer 'K'.

The fan used to remove the sampled air from the exhaust duct operates at a higher pressure than the exhaust duct. This renders the velocity/pressure present in the exhaust duct insignificant and allows the sampling unit to extract the air quantity it requires. The benefit of this system of air extraction is that a complex velocity survey is not required in order to produce isokinetic sampling. It also aids where the airflow is of a turbulent nature because the sampled air quantity is removed regardless of velocity.

CALIBRATION OF AIR FLOW

The testing apparatus is calibrated for airflow by attaching a large bag of reasonable airproof construction to the exhaust outlet 'H'. This bag is of proven volume and calibration is achieved by timing the inflation of this bag, with subsequent adjustments to the exhaust restriction nozzle and pressure gauge readings to give the ideal operating range for any particular test. Once the apparatus is calibrated it is a straightforward process of timing the air extraction process.

NOTE: The Dalby 'Isokinetic Particulate Emission Testing Apparatus - Principle Of Operation' is shown is shown on the following page.



DALBY ISOKINETIC PARTICULATE EMISSION TESTING APPARATUS PRINCIPLE OF OPERATION

PROTOCOL OF TESTING

(i) Establish Sampling Point

A suitable sampling point must be found in the booth extract duct system from which representative samples of emitted air are taken. Ideally the duct air velocity at the point where sampling is to be carried out should be uniform across the whole area of the duct up to 100mm away from the duct wall at any point to a variation of not more than ± 10%. (See **Diagram 3**.) The sampling point will be generally in a reasonably straight section of duct away from sharp bends, fans, dampers or other variations in cross section.
The sampling point aperture requires to be 150mm side x 50mm deep arranged across the duct as shown in **Diagram 4**, this opening will require to be closed with a suitable gasket plate after the completion of sampling.

(ii) Booth Preparation and Operation

Before testing is carried out the spraybooth must be run and checked for proper operation in terms of correct filter maintenance, airflow rates and booth pressure balancing etc. The booth operating temperature in the spray mode must also be checked.

(iii) Paint Spraying Preparation and Duration of Test

The paint spray gun operation for the purpose of testing should simulate, as far as possible, the work being carried out in the spraybooth under normal conditions. The spray gun should be set up for normal pressures and nozzle settings. Paint materials should be mixed to the conventional viscosity for the process being used. The best test simulation is to contrive a horizontal flat panel in the centre of the booth where the spray gun may be worked continuously for the duration of the test with conventional transfer efficiency normally obtained. When spraying very small components it may be argued that the transfer efficiency rate is much reduced but continuous spray gun operation does not occur when painting such small items. With the test panel being contrived as close as possible to the centre of the booth the best representations of paint overspray discharge in to the booth body will be experienced. When the spray gun is being used with a conventional siphon or gravity cup, the duration of the spray gun operation before the paint runs out should be ascertained. This will have an important bearing on the duration of the emission testing, that is, if the spray gun will run continuously for 3 minutes before the paint is exhausted, the emission test cannot exceed 3 minutes in time.

On larger facilities where 2 or more extraction systems are used, an identical test must be carried out on each extract system and the results averaged to give an overall result for the plant.

It is also important with larger facilities that where more than one spray gun may be in use at one time, testing should be carried out with this number of spray guns in simultaneous operation and the ultimate certification should state the maximum number of guns usable at one time.

(iv) Filter Preparation

The instructions supplied with the apparatus should be carefully followed in handling the filters for sample analysis, particularly in keeping the weighing registration filter sample with the actual sample filter. After each test the two filters should be placed in the polythene envelope that is clearly identified with the parameters of the test run, that is, exhaust nozzle used, pressure gauge reading, time and volume of the sample.

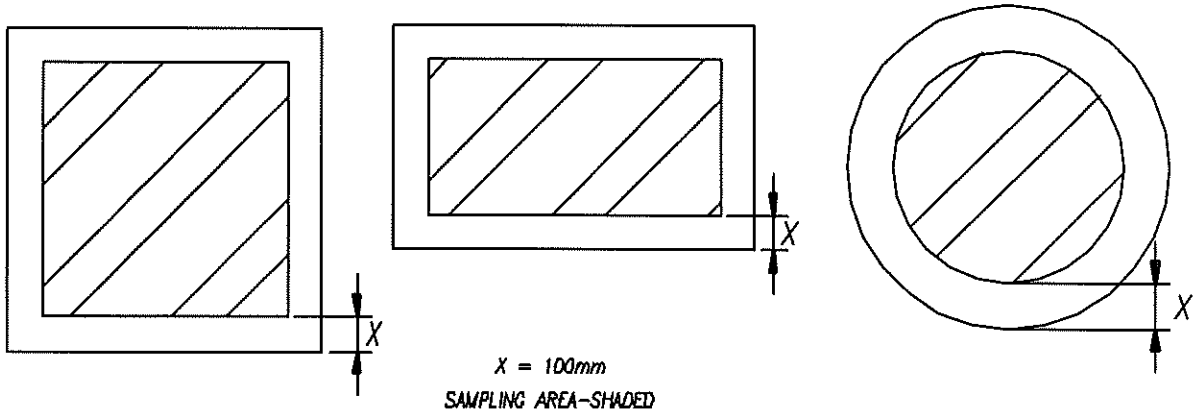
(vii) Sampling

The spraybooth should be set in the spraying mode with the paint gun operator ready to commence spraying by a pre-arranged signal with the emission tester. The spray gun should be in operation shortly before the starting of the timed run of the testing apparatus. During the course of the test the emission test apparatus should be held at 90° to the duct with the probe tube in line with the line of airflow. During the duration of the sampling period, the testing apparatus should be moved so that the intake sampling tube 'a' is moved progressively across the central area of the ducts as illustrated in **Diagram 5**. This will provide the best representation of a true sample. Immediately after the test is carried out the sample tube 'b' should be cleaned with solvent to remove any paint material collecting on the outside of the tube.

(viii) Weighing

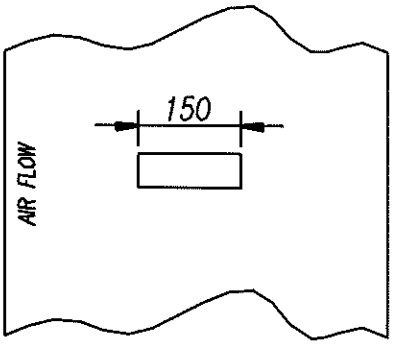
The electronic balance supplied with the apparatus for weighing samples which resolves to 1 milligram should be set in accordance with the instructions and zeroed. The sample papers and their associated reference papers should be processed and weighed strictly in accordance with the testing apparatus instructions. The resultant weight recorded should be corrected by the actual volume of the sample against the time scale. These filters should subsequently be filed for future reference against any particular plant. Where test results show marginal conformity, it is desirable to find weight increase of the sampling tube as instructed. (This has not been found significant in general testing.)

NOTE: Diagram 3, Diagram 4 and Diagram 5 are shown on the following page.



X = 100mm
SAMPLING AREA-SHADED
DIAGRAM 3

DIAGRAM 4



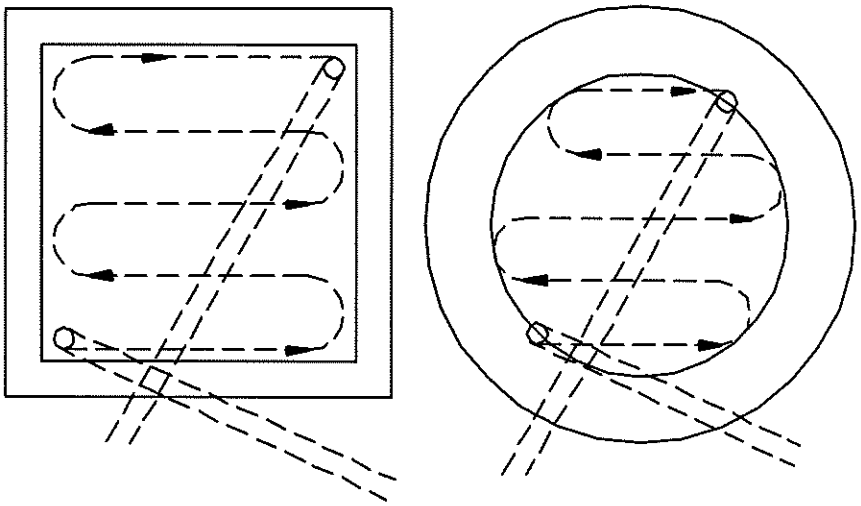


DIAGRAM 5

SECTION 5

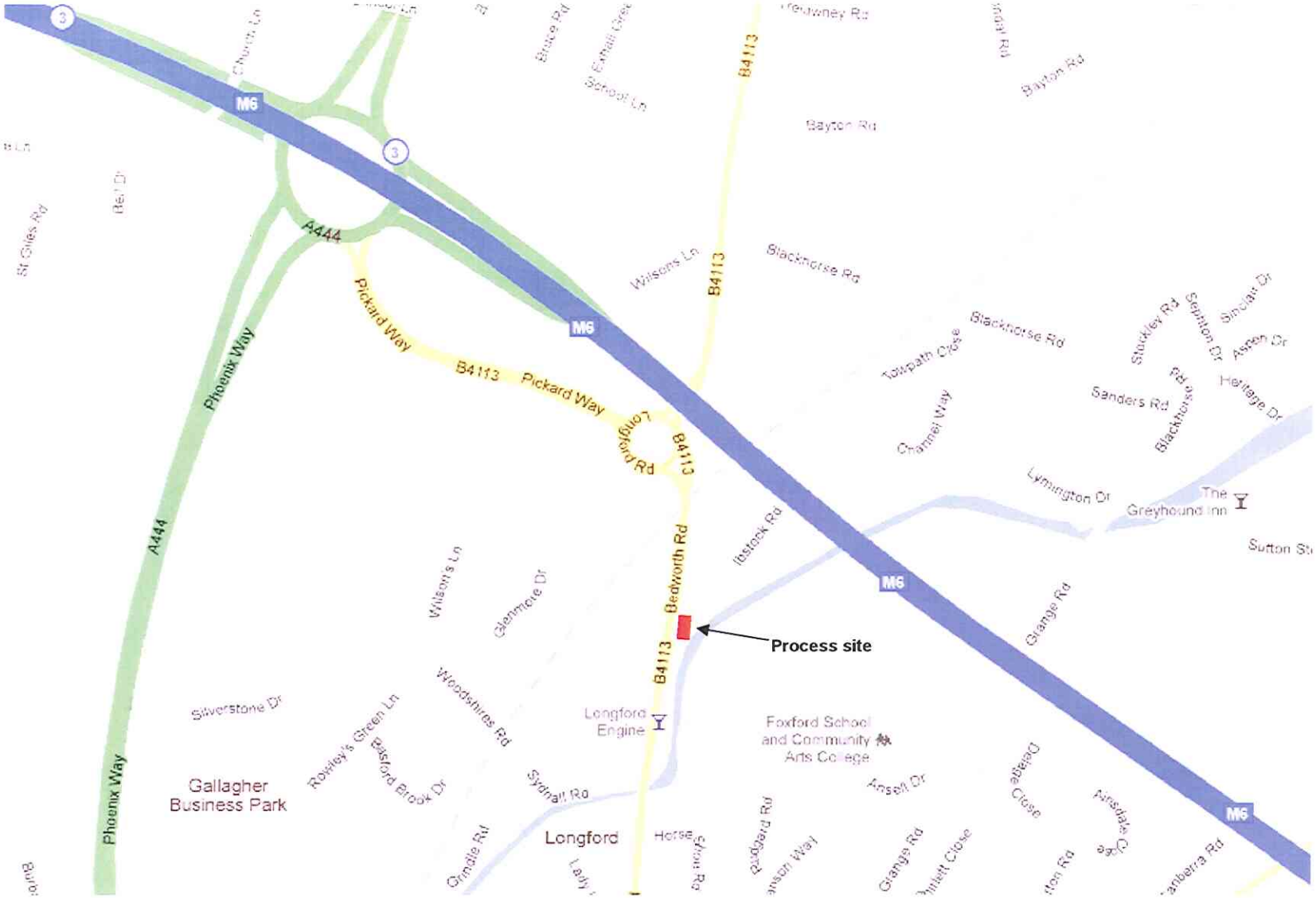
PAINT MIXING ROOMS AND GUN CLEANING MACHINES

All spray gun equipment should be cleaned using a fully - enclosed, automatic gun wash machine or any other type of equipment which can achieve comparable or lower levels of emissions. The gun wash machine should be complete with a suitable level of ventilation. This is to prevent the fugitive emission of solvent vapour when the machine is opened for the introduction and removal of equipment. This also applies to the changing of cleaning solvent. The amount of exhaust ventilation available on the gun wash will also be of concern under the health and safety legislation.

When testing the sprayguns, following cleaning, all testing should be conducted into the equipment cleaning machine with the extraction running. If this is not possible then any spray-gun testing or spray-out should be done in a separate spray-out unit or chamber which is fitted with its own independent extraction. Further to this it must also be fitted with a receptacle to collect the solvent which is put through the gun. The receptacle should be fitted with a lid to prevent fugitive emission of solvent vapour and evaporation when not in use.

The above information relates generally to the information given in the Process Guidance Notes.

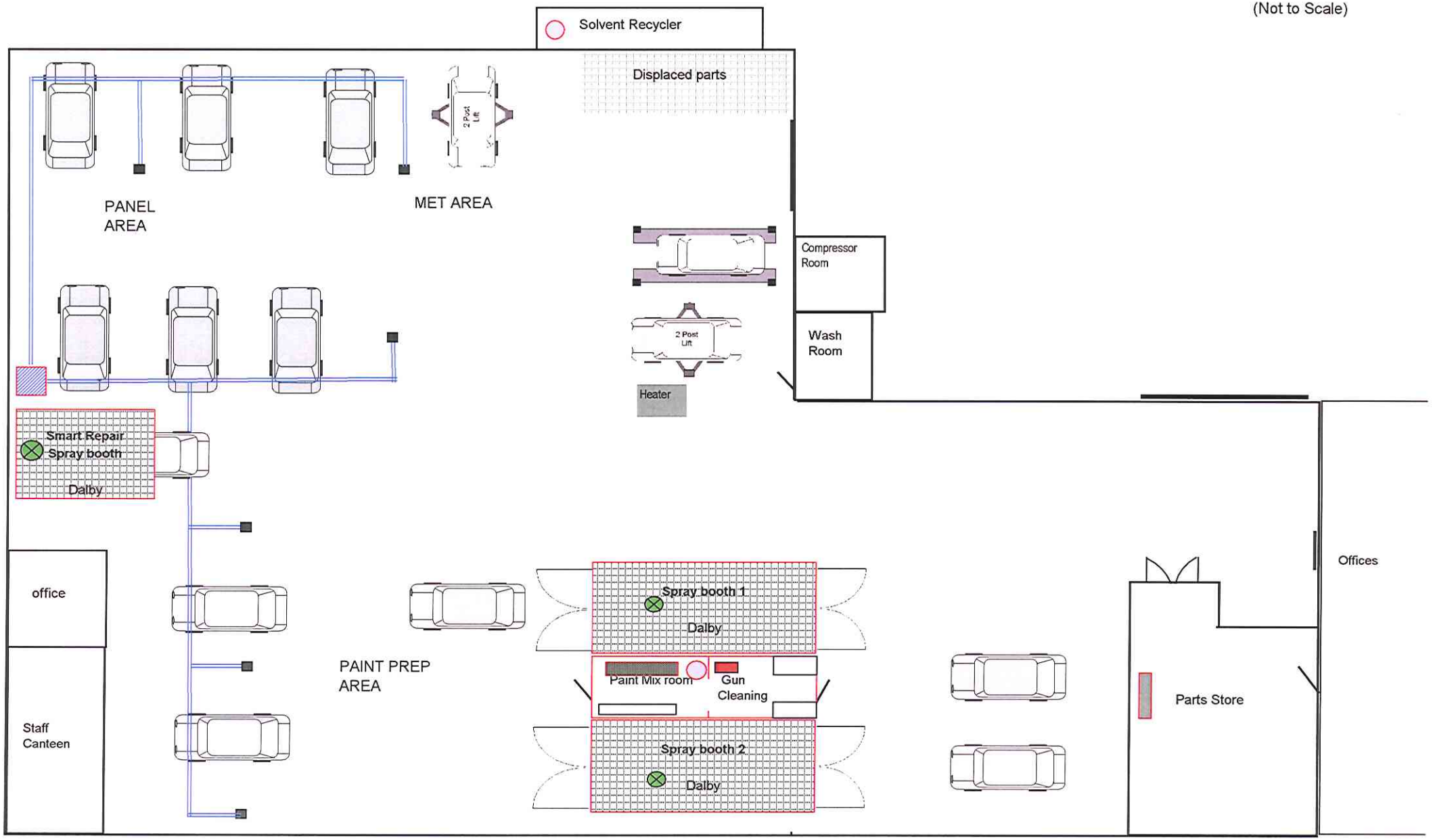
MAP 1 XL Motors ARC



DOCUMENT No: **SL - 1**

XL Motors ARC WORKSHOP

SCHEMATIC LAYOUT
(Not to Scale)



Spraybooth Emission stacks

Spraybooth burner emission vent

Spraygun Cleaning Machine

Dust Extraction System

Solvent Storage Area

Waste solvent storage

THE ENVIRONMENTAL PROTECTION ACT 1990

SPRAYING EQUIPMENT CLEANING PROCEDURE

CLEANING SPRAY GUNS & EQUIPMENT

When cleaning spray-guns after spraying solvent or isocyanate-based paints, operatives must ensure that;

- Spray-guns are cleaned only in the enclosed automatic gun-wash machine provided
- The extraction hose/vent is fitted correctly & in good condition with no splits or leaks etc
- Spray-guns are not 'sprayed-through' with cleaning solvent in open work rooms or areas
- Ensure absorbent material is readily available to soak up any spillages
- Ensure that all wipers contaminated with solvents are placed in a suitable waste bin that is kept lidded to prevent fugitive emissions of solvent vapours
- A high standard of housekeeping should be maintained at all times
- **Do not** spray cleaning solvent through or operate the trigger to clean in the spray-gun in open workshop - mixing room or cleaning area.
- **Never** place work colleagues at risk of exposure to solvents or isocyanates
- **Do not** allow any solvents to enter drains

DISPOSING OF WASTE PAINT & SOLVENTS

Ensure that all waste paint and solvent is collected in a receptacle that is kept lidded or fitted with a lidded funnel.

STATIC ELECTRICITY

Care should be taken to prevent static discharges that can ignite solvent vapour. Measures such as earth straps and the wearing of antistatic work clothing and footwear can help to reduce the risk of static discharges.

Personal Protective/Respiratory Equipment that must be worn:

When carrying out the above activities, the following PPE must be worn as appropriate;


REPORTING DEFECTS

Any defects found in Gun-wash cleaning equipment must be reported immediately to the Body shop Manager or supervisor