

Process Guidance Note 6/9 (04)

Secretary of State's Guidance for the Manufacture of Coating Powder



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Defra would like to acknowledge the work of the Environment Agency's Local Authority Unit in the drafting of this guidance note.



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1 Introduction

- 1.1 This note is issued by the Secretary of State, the Welsh Assembly Government (WAG) and the Scottish Executive ("the Government") to give guidance on the conditions appropriate for the control of emissions into the air from manufacture of coating powder processes/ installations.¹ It supersedes guidance note PG6/9(96) published in May 1996.
- 1.2 This is one of a series of notes giving guidance on Best Available Techniques (BAT) and Best Available Techniques Not Entailing Excessive Cost (BATNEEC)². The notes are all aimed at providing a strong framework for consistent and transparent regulation of installations.
- 1.3 This note is for use under both Local Air Pollution Control (LAPC) established by Part I of the Environmental Protection Act 1990, and Local Air Pollution Prevention and Control (LAPPC) established by the Pollution Prevention and Control Act 1999³. It constitutes statutory guidance to regulators under regulation 37 of The Pollution Prevention and Control (England and Wales) Regulations 2000, SI 1973⁴. To the extent it provides guidance on techniques, it also constitutes statutory guidance to regulators under section 7(11) of the 1990 Act, and in any event regulators are expected to have regard to it. The note will be treated as one of the material considerations when determining any appeals made against a decision under either the 1990 or 1999 Acts.
- 1.4 The note also (where appropriate) gives details of any mandatory requirements affecting air emissions which are in force at the time of publication, such as those contained in Directions from the Government.
- 1.5 All processes are subject to BAT/ BATNEEC. In general terms, what is BAT/ BATNEEC for one process in a sector is likely to be BAT/ BATNEEC for a comparable process; but in each case it is, in practice, for regulators (subject to appeal) to decide what is BAT/ BATNEEC for the individual process and the regulator should take into account variable factors (such as configuration, size and other individual characteristics of the process) and the locality (such as proximity of particularly sensitive receptors⁵). Ultimately, therefore, what constitutes BAT/ BATNEEC is site specific but this guidance note comprises guidance for the generality of processes in the sector and careful regard should be had to it, in order to maximise consistency of permits as appropriate.

Site specific BAT/ BATNEEC

Who is affected

- 1.6 This guidance is for:
 - regulators: who must have regard to the guidance when determining applications and reviewing extant authorisations and permits
 - operators: who are best advised also to have regard to it when making applications, and in the subsequent operation of their process
 - members of the public: who may be interested to know what the Government considers (in accordance with the legislation) amounts to appropriate conditions for controlling air emissions for the generality of processes in this particular industry sector

1. The term "process(es)" is used in the remainder of the note to mean both "processes" under the Environmental Protection Act 1990 and "installations" under the Pollution Prevention and Control Act 1999.
2. BATNEEC is the formulation used in the Environmental Protection Act 1990 and BAT is used in the Pollution Prevention and Control Act 1999. For the purpose of this guidance note, the two concepts are regarded as having essentially the same effect.
3. In accordance with Part 2 of Schedule 3 to the PPC Regulations, SI 2000/1973, manufacture of coating powder processes transfer from regulation under the 1990 Act to the 1999 Act from 1 April 2004. The relevant date in Scotland under Part 2 of schedule 3 to SSI 2000/323 is 31 December 2002.
4. In Scotland, section 24 of the Pollution Prevention and Control (Scotland) Regulations 2000.
5. Guidance on the relationship between BAT/BATNEEC and air quality objectives is contained in the General Guidance Manual on policy and procedures for A2 and B installations.

- 1.7 The guidance is based on the state of knowledge and understanding at the time of writing of:
- manufacture of coating powder processes
 - their potential impact on the environment and
 - what constitutes BAT/ BATNEEC for preventing and reducing air emissions
- 1.8 The note may be amended from time to time in order to keep abreast with developments in BAT/BATNEEC including improvements in techniques and new understanding of environmental impacts and risks. Such changes may be issued in a complete revision of this document, or in separate additional guidance notes which address specific issues. (It may not always be possible to issue amending guidance quickly enough to keep in absolute step with rapid changes, which is another circumstance where paragraph 1.5 above might apply.)
- 1.9 Steps will be taken to ensure that those who need to know about changes are informed. Operators (and their advisers) are, however, strongly advised to check with the regulator whether there have been any changes before relying on this note for the purposes of making an application under the 1990 or 1999 Acts or making any other decisions where BAT/ BATNEEC may be a consideration.

Consultation

- 1.10 This note has been produced in consultation with relevant trade bodies, representatives of regulators including members of the Industrial Pollution Liaison Committee, and other interested organisations.

Publication

- 1.11 This and the other published guidance in this series is available, free of charge, via Defra at www.defra.gov.uk. There are links to this site from the following web sites:
- Scottish Executive at www.scotland.gov.uk.
 - Environment Agency at www.environment-agency.gov.uk.
 - Scottish Environment Protection Agency at www.sepa.org.uk.

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- 1.12 General guidance explaining LAPPC and setting out the policy and procedures, is contained in the "General Guidance Manual on Policy and Procedures for A2 and B Installations" available from www.defra.gov.uk/environment/ppc/index.htm, referred to in this document as the "General Guidance Manual." See Ref. (a). This is designed for operators and members of the public, as well as for local authority regulators. In Scotland there is the SEPA Practical Guide (see Ref. (b)) for Part B activities available from www.sepa.org.uk/ppc/guidance/practical_guide_part_b_activities.pdf

- 1.13 In addition to the General Guidance Manual referred to above, explanation or clarification of certain terms used in this guidance note may be found in a general guidance note issued under Part I of the Environmental Protection Act 1991: 'Interpretation of terms used in process guidance notes', known as General Guidance Note 4 - GG4 - published by HMSO in 1991. Where there is any conflict between GG4 and the guidance issued in this note or in the General Guidance Manual, the latter two documents should prevail, as should any subsequent guidance issued in relation to LAPPC.

2 Timetable for compliance and reviews

Existing processes or activities

2.1 The previous guidance advised that upgrading to that standard should usually have been completed by 1 October 1998. Requirements still outstanding from any existing upgrading programme should be completed.

Upgrading for this note

2.2 The new provisions of this note and the dates by which compliance with these provisions is expected are listed in the table below, together with the paragraph number where the provision is to be found. Compliance with the new provisions should normally be achieved by the dates shown. Authorisations/permits should be varied as necessary, having regard to the changes and the timetable.

Table 1: Compliance timetable

Provision	Relevant paragraph/ row in this note	Compliance date
5mg/m ³ emission limit for CMR	Table 2 Row 2	24 months from publication of this note
All new provisions	-	To be complied with as soon as practicable, which in most cases should be within 12 months of the publication of this note.

2.3 Replacement plant should normally be designed to meet the appropriate standards specified for new installations or activities.

Relaxation of conditions

2.4 Where provisions in the preceding guidance note have been deleted or relaxed, authorisations should be varied as necessary as soon as reasonably practicable. [Section 7](#) provides a summary of all changes.

New processes or activities

2.5 For new processes or activities, the authorisation/permit should have regard to the full standards of this guidance from the first day of operation.

Substantially changed processes or activities

2.6 For substantially changed processes or activities, the authorisation/permit should normally have regard to the full standards of this guidance with respect to the parts of the process that have been substantially changed and any part of the process affected by the change, from the first day of operation.

Permit reviews

Reviewing permits

- 2.7 Under LAPC the requirement is to review conditions in authorisations at least every four years. (Section 6(6) Environmental Protection Act 1990).
- 2.8 Under LAPPC the legislation requires permits to be reviewed periodically but does not specify a frequency. It is considered for this sector that a frequency of once every six years ought normally to be sufficient for the purposes of Regulation 15(1) Pollution Prevention and Control Regulations⁶ 2000.

More frequent review may be necessary in individual cases for the reasons given in Regulation 15(2). Further guidance on permit reviews is contained in chapter 26 of the General Guidance Manual. Regulators should use any opportunities to determine the variations to authorisations/permits necessitated by paragraph 2.2 above in conjunction with these reviews.

- 2.9 Under both LAPC and LAPPC, conditions should be reviewed where complaint is attributable to the operation of the process and is, in the opinion of the regulator, justified.

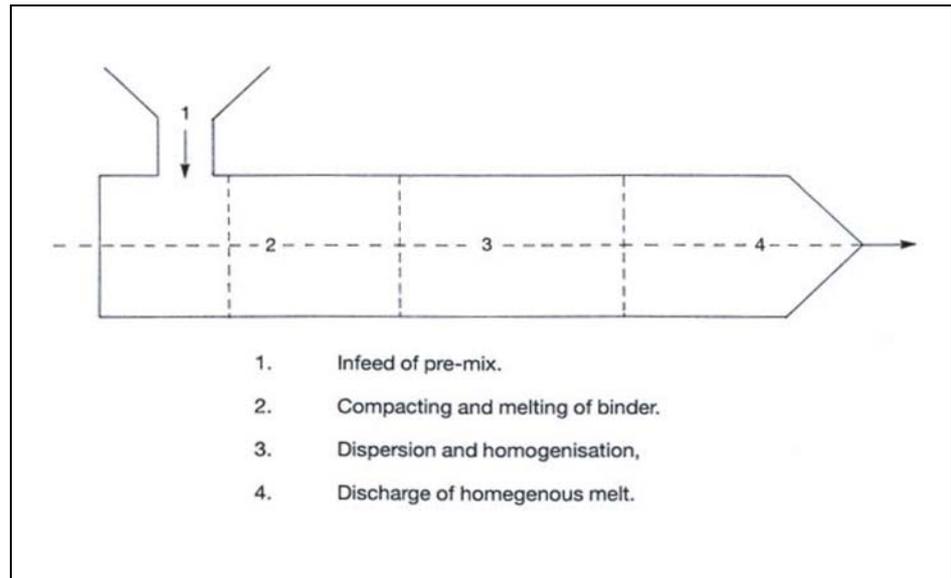
6. In Scotland, Regulation 11(1) of the Pollution Prevention and Control (Scotland) Regulations 2000 (SSI 2000/323). More frequent reviews may be necessary for the reasons given in Regulation 11(2).

3 Process description

- 3.1 Coating powder manufacture processes are prescribed for:
- Local air pollution control, LAPC, under section 6.6 of Schedule 1 to the Environmental Protection (Prescribed Processes and Substances) Regulations 1991, SI 472 (as amended).
 - Local air pollution prevention and control, LAPPC, under section 6.5 Part B of Schedule 1 of the Pollution Prevention and Control (England and Wales) Regulations 2000 SI 1973⁷ as amended
- 3.2 This note refers to the manufacture of coating powder.
- 3.3 In the context of this note, "process" or activity comprises the whole process from receipt of raw materials via production of intermediates to dispatch of finished products, including the treating, handling and storage of all materials and wastes relating to the process.
- 3.4 Coating powders are made from solid resin, pigments, and additives which are compounded together to form a coating powder.
- 3.5 Within this note there are three categories of coating powder
- Thermoset coatings: typically particle sizes are in the range 30 - 50 micrometres
 - Thermoplastic toners: commonly most particle sizes are in the range 5 - 20 micrometres
 - Thermoplastic coatings: many particle sizes are around 100 micrometres
- 3.6 Some powders (especially some thermoplastic powders) have mostly large particles and have no potential to emit particulate matter to the air. Powders with more than 95% by weight above 75 microns may justify exemption from LAPC / LAPPC.
- Pre-mixing and dry blending**
- 3.7 The first stage is to weigh accurately and to mix the dry powders together.
- Compounding**
- 3.8 The second stage is described as compounding, which is commonly undertaken with an extruder.
- 3.9 The pre-mix (i.e. the pre-blended raw materials) is fed in. Once inside the extruder, the pre-mix is compacted and heated until it melts. Then shear forces break down the pigment aggregates and form a homogenous dispersion. Finally, this homogenous melt is discharged from the extruder.

7. In Scotland, Section 6.5 Part B of Schedule 1 of the Pollution Prevention and Control (Scotland) Regulations 2000 (SSI 2000/323)

Figure 3.1: The Four Process Zones of an Extruder

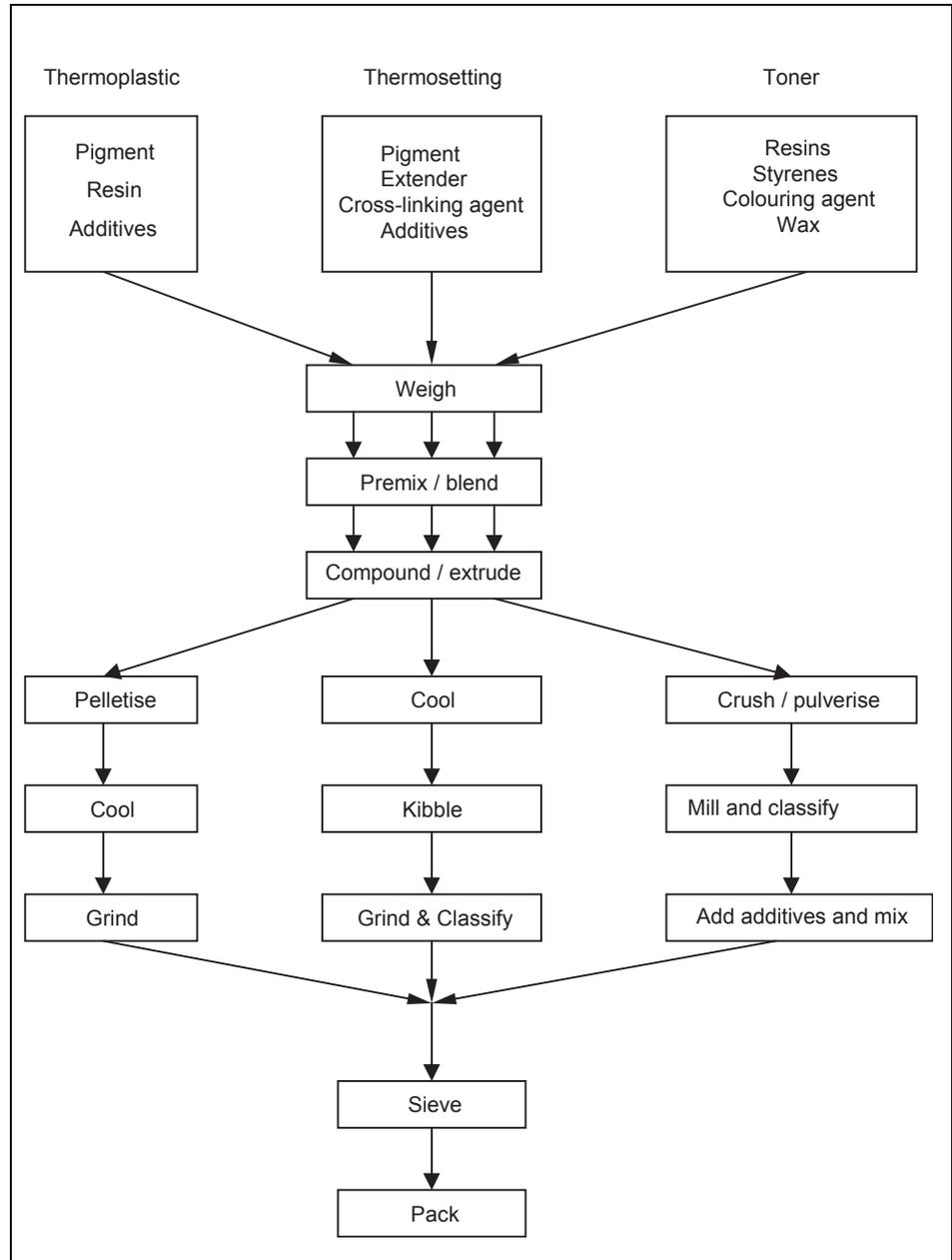


- 3.10 The next stage converts this hot melt into a cooled, hard and brittle strip by passing it through cooled rollers. Depending on the size of the extruder and its production rate, the extrudate may be further cooled on a cooling band. Toner powder is also pulverised down to between 50 to 250 micron called kneaded toner
- 3.11 The final operation in the cooling stage is to break the cold, brittle extrudate into small flakes around 5 to 15 millimetres (called kibble) using rotating hammers fitted at the end of the cooling stage.
- 3.12 The final stages of the manufacturing process are milling or grinding, and classification which convert the kibble or kneaded toner into a fine powder within a specified particle size range. The most widely used equipment for coatings is the micropulveriser. Toner processes use impact or jet milling. Some toner processes also mix additives to the finished product before sieving & packing.
- 3.13 Kibble or kneaded toner is transferred from a feed hopper into the mill by a screw feed. This screw further reduces the product size as it feeds the mill. The product is carried on an air-stream into the milling stage(s). Material enters a pulverising chamber where it is reduced to a fine powder by a rotating disc fitted with metal pins. Some toner powder processes use jet mills to achieve this fine powder. Jet mills feed the material into air streams which are either fired directly at ceramic collision plates, or multiple air streams are fired at each other. The milling or pulverising is caused by the product particles impacting with ceramic plates, each other or with the rotating pins depending upon the milling stage design.
- 3.14 The milled coating powder is transferred from the pulveriser / jet mill(s) on an air-stream. This air-stream is designed so that oversized particles drop down and are returned to the milling chamber. So, by a combination of rate of feed, speed of rotating pin disc and air velocity, it is possible to produce a powder with a controlled particle size distribution. In toner applications either cyclonic or mechanical wheel separation is used to separate the oversize particles for further milling. In most toner manufacturing plants between two to four classification stages are used to get the final particle distribution needed. Powder transport between each classification stage is done by vacuum transfer. The transport air is separated from the powder using either cyclonic or mechanical wheel separation. The extracted air is filtered to remove any unwanted fine powder.
- 3.15 The milled / classified powder is then transferred to a collection chamber. This may be a cyclone where the powder falls to the bottom, while the air is exhausted from the top, filtered and exhausted to the atmosphere. The other method of collection is where the powder/air mix is passed into a chamber fitted with bag filters. In toner

applications the powder is generally collected in a weighing vessel. This allows batch processing with other additives (such as silicates) required for the copy process. These additives are fed by separate screw feed system & the batches are mixed together mechanically then discharged to the packing stage.

3.16 Once the powder is in the required configuration it is generally sieved to remove any possible contaminants before being packed ready for sale or use.

Figure 3.2: Stages in the Manufacture of Powder Coatings



4 Potential releases

- 4.1 The key emissions from these processes that constitute pollution for the purposes of Part I of the Environmental Protection Act 1990 or the Pollution Prevention and Control Regulations 2000 and therefore warrant control are those consisting of particulate matter, which may include triglycidyl isocyanurate (TGIC) and lead chromate.
- 4.2 The following parts of the process may give rise to particulate matter:
- Raw material and pre-mix weighing, handling and additive handling and mixing
 - Grinding / milling and classification
 - Boxing, bagging and loading into bulk containers
 - Moving, cleaning and maintaining bag filters
 - Handling and storing waste powders

5 Emission limits, monitoring and other provisions

- 5.1 The emission limit values and provisions described in this section are achievable using the best available techniques described in [Section 6](#). Monitoring of emissions should be carried out according to the method specified in this section or by an equivalent method agreed by the regulator. (See Ref. [\(f\)](#) (M1) and Ref. [\(g\)](#) (M2))
- ▶ The reference conditions for limits in [Table 2](#) are:
 - 273K, 101.3kPa, without correction for water vapour.

Table 2: Emission limits, monitoring and other provisions

Row	Source	Substance	Emission limits / provisions	Type of monitoring	Monitoring frequency (subject to paragraph 5.10)
1	Contained sources that vent externally	Total particulate matter not containing CMR	Emission concentration limit 10 mg/m ³	Indicative monitoring, alarm and record See 5.6 plus Manual extractive test See 5.8	Continuous
2	Contained sources venting CMR*	Total particulate matter containing CMR	Emission concentration limit 5 mg/m ³		

* In this note CMR means substances or preparations carrying, or that need to carry the risk phrases R45, R46, R49, R60, or R61. The risk phrases are listed in full in [Section 8](#)

Monitoring, investigations and recording

- 5.2 The need for and scope of testing, and the frequency and time of sampling depend on local circumstances, operational practice and the scale of operation. As part of proper supervision the operator will monitor emissions, make tests and inspections of the process and keep records, in particular:
- ▶ The operator should keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments. The records should be:
 - kept on site
 - kept by the operator for at least two years; and
 - made available for the regulator to examine
 - ▶ Any historical records kept off-site should be made available for inspection within one working week of any request by the regulator and kept by the operator for at least two years.

Information required by the regulator

- 5.3 The regulator needs to be informed of monitoring to be carried out and the results; the results should include process conditions at the time of monitoring.
- ▶ The operator should provide a list of key arrestment plant and should have a written procedure for dealing with its failure, in order to minimise any adverse effects.
 - ▶ The operator should notify the regulator at least 7 days before any periodic monitoring exercise to determine compliance with emission limit values. The operator should state the provisional time and date of monitoring, pollutants to be tested and the methods to be used.
 - ▶ The results of non-continuous emission testing should be forwarded to the regulator within 8 weeks of the completion of the sampling.
 - ▶ Adverse results from any monitoring activity (both continuous and non-continuous) should be investigated by the operator as soon as the monitoring data has been obtained/received. The operator should:
 - identify the cause and take corrective action

- record as much detail as possible regarding the cause and extent of the problem, and the action taken by the operator to rectify the situation
- re-test to demonstrate compliance as soon as possible; and
- notify the regulator

Visible emissions

- 5.4 Visible emissions should be limited and monitored as follows. Abnormal emissions require action as described in paragraph 5.5
- ▶ All releases to air, other than condensed water vapour, should be free from persistent visible emissions.
 - ▶ All releases to air, other than condensed water vapour, should be free from persistent visible emissions.
 - ▶ All emissions to air should be free from droplets.

Abnormal events

- 5.5 The regulator needs to be notified about certain events, whether or not there is related monitoring showing an adverse result, and the operator should respond to problems which may have an adverse effect on emissions to air.
- ▶ In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions the operator should:
 - investigate and undertake remedial action immediately
 - adjust the process or activity to minimise those emissions; and
 - promptly record the events and actions taken
 - ▶ The regulator should be informed without delay:
 - if there is an emission that is likely to have an effect on the local community; or
 - in the event of the failure of key arrestment plant, for example, bag filtration plant or scrubber units

Continuous monitoring

- 5.6 Continuous indicative monitoring can be used as a management tool. In conjunction with continuous recording it identifies any trends in emissions; for example, that emissions are gradually increasing, which may indicate a need for maintenance. It can also be used with or without continuous recording to trigger an alarm when there is a sudden increase in emissions; for example, if arrestment plant fails. For a given concentration of particulate the output level varies with the instrument. It should be noted that not all monitors provide a linear response to an increase in particulate matter. The monitor should be set up to provide a baseline output when the plant is known to be operating under the best possible conditions; i.e. such that emissions are fully compliant with the requirements. The instrument manufacturer should be able to set an output level which corresponds to around 75% of the emission limit, to trigger the alarms. Thus the alarms are activated in response to this significant increase in particulate loading above the baseline, so that warning of the changed state is given before an unacceptable emission occurs.
- 5.7 All new continuous monitoring equipment should be designed for less than 5% downtime over any 3-month period. Where continuous monitoring is required, it should be carried out as follows:
- ▶ All continuous monitoring readings should be on display to appropriately trained operating staff.
 - ▶ Instruments should be fitted with audible and visual alarms, situated appropriately to warn the operator of arrestment plant failure or malfunction.
 - ▶ The activation of alarms should be automatically recorded.
 - ▶ All continuous monitors should be operated, maintained and calibrated (or referenced) in accordance with the manufacturers' instructions, which should be made available for inspection by the regulator. The relevant maintenance and calibration (or referencing) should be recorded.
 - ▶ Purchasers of new or replacement monitoring equipment should specify the requirement for less than 5% downtime over any 3-month period, on ordering.

Calibration and compliance monitoring

- 5.8 Calibration of quantitative instruments and compliance monitoring should meet the following provisions as appropriate:
- ▶ No result should exceed the emission concentration limits specified, except where either:
 - (a) data is obtained over at least 5 sampling hours in increments of 15 minutes or less; or
 - (b) at least 20 results are obtained where sampling time increments of more than 15 minute are involved; AND in the case of (a) or (b)
 - (c) no daily mean of all 15-minute mean emission concentrations should exceed the specified emission concentration limits during normal operation (excluding start-up and shut-down); and
 - (d) no 15-minute mean emission concentration should exceed twice the specified emission concentration limits during normal operation (excluding start-up and shut-down).
 - ▶ Non-continuous emissions monitoring of particulate matter should be carried out according to the main procedural requirements of BS ISO 9096: 2003, with averages taken over operating periods, excluding start-up and shutdown.
- 5.9 Exhaust flow rates should be consistent with efficient capture of emissions, good operating practice and meeting the requirements of the legislation relating to the workplace environment.

Varying monitoring frequency

- ▶ The introduction of dilution air to achieve emission concentration limits should not be permitted.
- 5.10 Where non-continuous quantitative monitoring is required, the frequency may be varied. Where there is consistent compliance with emission limits, Regulators may consider reducing the frequency. When determining "consistent compliance" factors to consider include:
- (a) the variability of monitoring results, for example, results which range from 3 - 9 mg/m³, against an emission limit of 10 mg/m³ might not qualify for a reduction in monitoring.
 - (b) the margin between the results and the emission limit, for example, results which range from 9 - 10 mg/m³ when the limit is 10 mg/m³ might not qualify for a reduction in monitoring.

Consistent compliance should be demonstrated using the results from at least;

- ▶ three or more monitoring exercises within two years or;
- ▶ two or more monitoring exercises in one year supported by continuous monitoring.

Any significant process changes which might have affected the monitored emission should be taken into account. The nature of the material being monitored should also be taken into account.

- 5.11 The frequency of testing should be increased, for example, as part of the commissioning of new or substantially changed processes, or where emission levels are near to or approach the emission concentration limits.
- 5.12 Care is needed in the design and location of sampling systems in order to obtain representative samples. For example, BS ISO 9096:2003 calls for sampling within a straight section of flue. The design for new sampling points is usually about 7 to 10 diameters in length.
- ▶ The operator should ensure that adequate facilities for sampling are provided on vents or ducts.
 - ▶ Sampling points on new plant should be designed to comply with the British or equivalent standards.

6 Control techniques

Summary of best available techniques

- 6.1 The following table provides a summary of the best available techniques that can be used to control the process in order to meet the emission limits and provisions in [Section 5](#). Provided that it is demonstrated to the satisfaction of the regulator that an equivalent level of control will be achieved, then other techniques may be used.

Table 3: Summary of control techniques

Release source	Substance	Control techniques
Raw material weighing and handling	Particulate matter	Contain and arrest
Production handling	Particulate matter	Contain and arrest
External process vents	Particulate matter	Arrest and monitor
Moving bag filters to cleaning station	Particulate matter	Contain
Dry cleaning of bag filters	Particulate matter	Contain and arrest

Techniques to control emissions from contained sources

Particulate matter

- 6.2 Emissions of particulate matter should be arrested if necessary to meet the emission limit.

Techniques to control fugitive emissions

- 6.3 Closed containers prevent wind whipping of dusty, dry waste materials
- ▶ Dusty wastes should be stored in closed containers and handled in a manner that avoids emissions
 - ▶ All spillages should be cleared as soon as possible; solids by vacuum cleaning, wet methods, or other appropriate techniques. Dry sweeping of dusty spillages should not be permitted, nor should dust be blown with compressed air.
 - ▶ A high standard of housekeeping should be maintained.

Air quality

Ambient air quality management

- 6.4 In areas where air quality standards or objectives are being breached or are in serious risk of breach and it is clear from the detailed review and assessment work under Local Air Quality Management that the Part B process itself is a significant contributor to the problem, it may be necessary to impose tighter emission limits. If the air quality standard that is in danger of being exceeded is not an EC Directive requirement, then industry is not expected to go beyond BAT to meet it. Decisions should be taken in the context of a local authority's Local Air Quality Management action plan. For example, where a Part B process is only responsible to a very small extent for an air quality problem, the authority should not unduly penalise the operator of the process by requiring disproportionate emissions reductions. More guidance on this is provided in paragraph 360 of the Air Quality Strategy which gives the following advice:

“The approach from local authorities to tackling air quality should be an integrated one, involving all strands of local authority activity which impact on air quality and underpinned by a series of principles in which local authorities should aim to secure improvements in the most cost-effective manner, with regard to local environmental needs while avoiding unnecessary regulation. Their approach should seek an appropriate balance between controls on emissions from domestic, industrial and transport sources and draw on a combination and interaction of public, private and voluntary effort.”

6.5 A stack height is unlikely to be needed for emissions consisting of air and particulate only.

Dispersion and dilution

6.6 Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are harmless. This is the basis upon which stack heights are calculated using HMIP Technical Guidance Note D1 (D1) Ref (e). The stack height so obtained is adjusted to take into account local meteorological data, local topography, nearby emissions and the influence of plant structure. It is necessary that the assessment also take into account the relevant air quality standards that apply for the emitted pollutants.

The calculation procedure of D1 is usually used to calculate the required stack height but alternative dispersion models may be used in agreement with the regulator. D1 relies upon the unimpeded vertical emission of the pollutant. A cap or other restriction over the stack impedes the vertical emission and hinders dispersion. For this reason where dispersion is required such flow impeder should not be used. A cone may sometimes be useful to increase the exit velocity and achieve greater dispersion.

Revised stack height calculations should not be required unless it is considered necessary because of a breach or serious risk of breach of an EC Directive limit value and because it is clear from the detailed review and assessment work that the Part B process itself is a significant contributor to the problem.

An operator may choose to meet tighter emission limits in order to reduce the required stack height.

Management

Management techniques

6.7 Important elements for effective control of emissions include:

- proper management, supervision and training for process operations;
- proper use of equipment;
- effective preventative maintenance on all plant and equipment concerned with the control of emissions to the air; and
- it is good practice to ensure that spares and consumables are available at short notice in order to rectify breakdowns rapidly. This is important with respect to arrestment plant and other necessary environmental controls. It is useful to have an audited list of essential items.

▶ Spares and consumables - in particular, those subject to continual wear - should be held on site, or should be available at short notice from guaranteed local suppliers, so that plant breakdowns can be rectified rapidly.

Appropriate management systems

6.8 Effective management is central to environmental performance; It is an important component of BAT and of achieving compliance with permit conditions. It requires a commitment to establishing objectives, setting targets, measuring progress and revising the objectives according to results. This includes managing risks under normal operating conditions and in accidents and emergencies. It is therefore desirable that processes put in place some form of structured environmental management approach, whether by adopting published standards (ISO 14001 or the EU Eco Management and Audit Scheme [EMAS]) or by setting up an environmental management system (EMS) tailored to the nature and size of the particular process. Operators may also find that an EMS will help identify business savings.

Regulators should use their discretion, in consultation with individual operators, in agreeing the appropriate level of environmental management. Simple systems which ensure that LAPC considerations are taken account of in the day-to-day running of a process may well suffice, especially for small and medium-sized enterprises. While authorities may wish to encourage wider adoption of EMS, it is

outside the legal scope of an LAPC authorisation/LA-PPC permit to require an EMS for purposes other than LAPC/LA-PPC compliance. For further information/advice on EMS refer to EMS Additional Information in [Section 8](#).

Training

- 6.9 Staff at all levels need the necessary training and instruction in their duties relating to control of the process and emissions to air. In order to minimise risk of emissions, particular emphasis should be given to control procedures during start-up, shut down and abnormal conditions.

Training may often sensibly be addressed in the EMS referred to above.

- ▶ Training of all staff with responsibility for operating the process should include:
 - awareness of their responsibilities under the permit; in particular, how to deal with conditions likely to give rise to dust emissions, such as the event of spillage, and emptying and cleaning of arrestment plant
 - minimising emissions on start up and shut down
 - action to minimise emissions during abnormal conditions
- ▶ The operator should maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an impact on the environment. These documents should be made available to the regulator on request.

Maintenance

- 6.10 Effective preventative maintenance should be employed on all aspects of the process including all plant, buildings and the equipment concerned with the control of emissions to air. In particular:
- ▶ A written maintenance programme should be provided to the regulator with respect to pollution control equipment; and
 - ▶ A record of such maintenance should be made available for inspection.

7 Summary of changes

Reasons for the main changes are summarised below.

Table 4: Summary of changes

Section and paragraph	Change	Reason	Comment
Emission limits, monitoring and other provisions			
	For CMR an emission limit of 5mg/m ³ (from 10)	To better regulate the more dangerous compounds	
	Triviality threshold changed from 40 to 76micrometres	To avoid confusion with thermoset powders at 30-50microns	No effect on thermoplastic coatings triviality exemption expected

8 Definitions and further information

This guidance	Process Guidance Note 6/9(04)
Previous guidance	Process Guidance Note 6/9(96)
LAPC	explained in the Introduction of this guidance
LAPPC	explained in the Introduction of this guidance
Permit	the written permission to operate an installation prescribed for LAPPC – (the replacement for authorisation under LAPC)
Authorisation	the written authority to operate a process prescribed for LAPC - (will be replaced by permit under LAPPC)
Local enforcing authority	is replaced by the word 'regulator' in LAPPC
Regulator	replaces the phrase 'local enforcing authority' from LAPC
Existing process	should be taken to have the following meaning (which is based on paragraph 14 of Schedule 3 to SI 1991 /472): <ul style="list-style-type: none">• a process which was being carried on at some time in the 12 months immediately preceding the first day of the month following publication of this guidance note• a process which is to be carried on at a works, plant or factory or by means of mobile plant which was under construction or in the course of manufacture or in the course of commission on the first day of the month following publication of this guidance note, or the construction or supply of which was the subject of a contract entered into before that date
New process	not an existing process.
Authorised person	under section 108 of the Environment Act 1995, "authorised person" has replaced the term "inspector"
Installation	should be interpreted in accordance with the guidance contained in the the General Guidance Manual on Policy and Procedures for A2 and B Installations. www.defra.gov.uk/environment/ppc/manual/index.htm
Process	the term "process has been used in this guidance note to refer to both "processes" under the Environmental Protection Act 1990 and "installations" under the Pollution Prevention and Control Act 1999
CMR	in this note, should be taken to mean <ul style="list-style-type: none">· Substances or preparations which carry or need to carry the risk phrases R45, R46, R49, R60 or R61
Risk Phrase	should mean the same as in Directive 67/548/EEC (Ref. (h))
R45	- may cause cancer
R46	- may cause heritable genetic damage
R49	- may cause cancer by inhalation
R60	- may impair fertility
R61	- may cause harm to the unborn child

Health and safety

Operators of processes and installations must protect people at work as well as the environment:

- requirements of a permit or authorisation should not put at risk the health, safety or welfare of people at work
- equally, the permit or authorisation must not contain conditions whose only purpose is to secure the health of people at work. That is the job of the health and safety enforcing authorities

Where emission limits quoted in this guidance conflict with health and safety limits, the tighter limit should prevail because:

- emission limits under the Environment Protection Act 1990 or Pollution Prevention and Control Act 1999 relate to the concentration of pollutant released into the air from prescribed activities
- exposure limits under health and safety legislation relate to the concentration of pollutant in the air breathed by workers
- these limits may differ since they are set according to different criteria. It will normally be quite appropriate to have different standards for the same pollutant, but in some cases they may be in conflict (for example, where air discharged from a process is breathed by workers). In such cases, the tighter limit should be applied to prevent a relaxation of control

EMS additional information

Further information/advice on EMS may be found from the following:

- Envirowise at www.envirowise.gov.uk and www.energy-efficiency.gov.uk and Environment and Energy Helpline freephone 0800 585794
- ISO 14001 www.bsi.org.uk or telephone BSI information centre (020 8966 7022)
- EU Eco Management and Audit Scheme (EMAS) www.emas.co.uk or telephone the Institute of Environmental Management and Assessment (01522 540069)

Regulators and process operators may also like to be aware of:

BS 8555: a new standard to help SMEs implement an EMS, by offering a five-phase approach, is contained in BS 8555 which was published in 2003 following on from work undertaken by the Acorn Trust. The Institute of Environmental Management and Assessment, which has taken over the Trust's activities, is developing a scheme of accredited recognition for companies achieving different phases of BS 8555. BS 8555 can be used to achieve ISO 14001 and registration to the higher standard, EMAS.

Some of the **High Street banks**, such as NatWest and the Coop, now offer preferential loan rates to organisations that can demonstrate they are committed to improving their environmental performance. The NatWest also produce a self help guide for SMEs, 'The Better Business Pack', focusing on waste, utilities, transport and supply chain issues. It gives tools, guidance and examples. Contact: WWF-UK on 01483 426444.

References

- (a) Secretary of State's Guidance (England and Wales): General Guidance Manual on Policy and Procedures for A2 and B Installations , March 2003 - available from the Defra web-site and, in hard copy, from the Defra Publications line 08459 556000 www.defra.gov.uk/environment/ppc/index.htm
- (b) Scottish Executive Guidance: The Practical Guide for Part B Activities Issue 1 - available from the SEPA web-site. http://www.sepa.org.uk/pdf/ppc/guidance/practical_guide_part_b_activities.pdf
- (c) DOE/WO Additional Guidance AQ17(94), issued to local authorities by the Air and Environment Quality Division of DEFRA and by the Welsh Office, provides further advice on the assessment of odour. The Scottish equivalent of AQ17(94) is SN 11(94).
- (d) Current air quality objectives are specified in:
 - The Air Quality (England) Regulations 2000 SI 928
 - The Air Quality (England) (Amendment) Regulations 2002 SI 3043
 - The Air Quality (Wales) Regulations 2000 SI 1940 (W.138)
 - The Air Quality (Wales) (Amendment) Regulations 2002 SI 3182 (W.298)
 - The Air Quality (Scotland) Regulations 2000 SSI 97
 - The Air Quality (Scotland) Amendment Regulations 2002 SSI 297
- (e) HMIP Technical Guidance Note D1: "Guidelines on Discharge Stack Heights for Polluting Emissions", published by The Stationery Office, ISBN 0-11-752794-7.
- (f) M1 Sampling requirements for monitoring stack emissions to air from industrial installations, Environment Agency July 2002 ([EA website](#))
- (g) M2 Monitoring of stack emissions to air. Environment Agency May 2003 ([EA website](#))
- (h) The Chemical (Hazard Information and Packaging of Supply) Regulations 2002 SI 3247

Web addresses

The final consultation drafts and final published versions of all guidance notes in this series can be found on www.defra.gov.uk/environment/index.htm.

Welsh Assembly Government web-site www.wales.gov.uk.

Local Authority Unit of the Environment Agency for England and Wales. www.environment-agency.gov.uk/business/lapc.

Scottish Environment Protection Agency (SEPA) www.sepa.org.uk.

Energy saving and environmental management measures can increase industry profits. Envirowise (formerly ETBPP) show how at www.envirowise.gov.uk (or freephone 0800 585794).

Appendix 1: Extract from LAPC regulations

Definition of Manufacture of Dyestuffs, Printing ink and Coating Materials in Schedule 1 of the Environmental Protection (Prescribed Process and Substances) (England and Wales) Regulations 1991 SI 472 as amended⁸

(The processes for local air pollution control are listed under "Part B". The "Part A" processes are for national regulatory control.)

SCHEDULE 1 - Description of processes

Section 6.6 The manufacture of dyestuffs, printing ink and coating materials

PART A

Any process for the manufacture of dyestuffs if the process involves the use of hexachlorobenzene.]

PART B

Any process . . . -

(a) for the manufacture or formulation of printing ink or any other coating material containing, or involving the use of, an organic solvent, where the carrying on of the process by the person concerned at the location in question is likely to involve the use of 100 tonnes or more of organic solvents in any 12 month period;

(b) for the manufacture of any powder for [use as a coating material] where there is the capacity to produce 200 tonnes or more of such powder in any 12 month period.

In this Section, "coating material" has the same meaning as in Section 6.5[, and the amount of organic solvents used in a process shall be calculated as-

(a) the total input of organic solvents into the process, including both solvents contained in coating materials and solvents used for cleaning or other purposes; less

(b) any organic solvents (not contained in coating materials) that are removed from the process for re-use or for recovery for re-use.]

8. * Every effort has been taken to ensure that this Appendix is correct at the date of publication, but readers should note that the Regulations are likely to be subject to periodic amendment, and this Appendix should not therefore be relied upon as representing the up to date position after the publication date

Appendix 2: Extract from LAPPC regulations

Definition of Manufacture of Dyestuffs, Printingink and Coating Materials in Schedule 1 of the Pollution Prevention and Control (England and Wales) Regulations 2000 SI 1973 as amended⁹

(The processes for local air pollution prevention and control are listed under "Part B". The "Part A1" processes are for national regulatory control. The "Part A2" processes are subject to local authority integrated pollution prevention and control.)

SCHEDULE 1 - ACTIVITIES, INSTALLATIONS AND MOBILE PLANT - PART 1: ACTIVITIES

Section 6.5 The Manufacture of Dyestuffs, Printing Ink and Coating Materials

Part A(1)

Nil.

Part A(2)

Nil.

Part B

(a) Unless falling within Part A(1) or A(2) of any Section in this Schedule-

- (i) manufacturing or formulating printing ink or any other coating material containing, or involving the use of, an organic solvent, where the carrying out of the activity is likely to involve the use of 100 tonnes or more of organic solvents in any period of 12 months
- (ii) manufacturing any powder for use as a coating material where there is the capacity to produce 200 tonnes or more of such powder in any period of 12 months

Interpretation of Part B

1 In this Part, "coating material" has the same meaning as in Section 6.4.

2 The amount of organic solvents used in an activity shall be calculated as-

- (i) the total input of organic solvents into the process, including both solvents contained in coating materials and solvents for cleaning or other purposes; less
- (ii) any organic solvents, not contained in coating materials, that are removed from the process for re-use or for recovery for re-use.

9. * Every effort has been taken to ensure that this Appendix is correct at the date of publication, but readers should note that the Regulations are likely to be subject to periodic amendment, and this Appendix should not therefore be relied upon as representing the up to date position after the publication date