

**ENVIRONMENT AND HERITAGE SERVICE**

**GUIDANCE FOR PROCESSES PRESCRIBED FOR  
AIR POLLUTION CONTROL  
BY THE CHIEF INDUSTRIAL POLLUTION INSPECTOR**

**CHIEF INSPECTOR'S GUIDANCE  
TO INSPECTORS  
(PART B PROCESSES)**

**ROADSTONE COATING PROCESSES**

**B PROCESS GUIDANCE NOTE - GNB 6/2 VERSION 4**

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## 1. INTRODUCTION

This Note is issued by the Chief Industrial Pollution Inspector as one of a series providing guidance for processes prescribed for Air Pollution Control (APC) by the Chief Inspector in Regulations made under the Industrial Pollution Control (Northern Ireland) Order 1997.

A further series of Notes is produced by the Department of the Environment (NI) for those processes prescribed for air pollution control and subject to regulation by the District Councils.

This Note provides a guide on standards and techniques to Inspectors in their assessment of an application for, or variation of, an APC authorisation under the Order.

This Note will also be of interest to operators of such processes, however it should be understood that whether an authorisation is granted, and on what conditions, will depend on the particular circumstances of each application. Parameters such as individual process characteristics and site location may influence the nature of the conditions that are included in an authorisation.

A key objective of the legislation is to ensure that, in carrying on a prescribed process, the best available techniques not entailing excessive cost (BATNEEC) will be used -

- (i) for preventing the release of prescribed substances into the air or, where that is not practicable by such means, for reducing the release of such substances to a minimum and for rendering harmless any such substances which are so released; and
- (ii) for rendering harmless any other substances which might cause harm if released into the air.

This Note comprises guidance in relation to new and existing processes and is based on an assessment of best available techniques as qualified by the requirement not to entail excessive cost. (The definition and meaning of BATNEEC is contained in the Industrial Pollution Control Part A and B processes “A Practical Guide”.)

The guidance contained in this Note is based on the current state of knowledge and understanding of these processes, their potential impact on the environment, and the available control techniques at the time of publication. The guidance will be updated regularly, (as a minimum the Note will be reviewed at not more than four yearly intervals from the date of publication), to reflect changes in knowledge and understanding. It will not always be possible to revise the Notes quickly enough to keep in absolute step with rapid changes. It is therefore recommended that operators and their advisors check with the Inspectorate as to whether there have been any changes before relying on this Note for the purpose of making an application or taking other significant action under the Order.

## 2. **PROCESS DEFINITION**

- 2.1 This Note applies to processes involving the heating, but not the distillation, of tar or bitumen in the production of coated road stone, as described in Schedule 1 - Section 6.3, Part B of the Industrial Pollution Control (Prescribed Processes & Substances) Regulation (Northern Ireland) 1998.
- 2.2 In the context of this Note “process” comprises the whole process including the treating, handling and storage of any materials used in the process as well as products and wastes produced by the process.

### 3. **GENERAL REQUIREMENTS**

3.1 New processes must comply with the standards contained in this Note immediately.

3.2 It should be the aim to bring existing processes up to current standards whenever the opportunity arises. Account should be taken of the plant's technical characteristics; its rate of utilisation and the length of its remaining life; the nature and amount of polluting emissions from it and the desirability of not entailing excessive costs for the plant concerned.

3.3 As part of the first application the authorisation of existing processes, those areas of the process that require upgrading to achieve the standards of this Note should be identified, and the possible techniques which are to be employed indicated. Under normal circumstances, a detailed programme for upgrading, including timetable, should be submitted with the application.

### 4. **RELEASES INTO AIR**

#### 4.1 **Reference Conditions**

All pollutants concentrations should be expressed at standard conditions of temperature 273K (0°C) and pressure 101.3 kPa (1 atmosphere), without correction for water vapour except where waste or recovered oil is used as fuel. In these circumstances all emissions of substances listed in Table 1 should also be corrected to dry gas conditions.

These units and reference conditions may not be suitable for continuous monitoring methods and may, by agreement with the Inspectorate, be converted for day to day control purposes, into values more suitable for the available instrumentation.

## 4.2 **Emission Targets**

4.2.1 A particulate concentration of  $100 \text{ mg/m}^3$  has been set taking account of the reference test method in par. 7.2.4 which is used to verify compliance.

4.2.2 Emissions from combustion processes should in normal operations be free from visible smoke and in any case should not exceed the equivalent of Ringelmann Shade 1 as described in British Standard BS 2742:1969.

4.2.3 All releases, other than steam or water vapour, should be colourless, should be free from persistent fume or mist and free from droplets.

4.2.4 The concentration of bituminous fume in emissions to air should not give rise to blue smoke and the aim should be not to exceed  $25 \text{ mg/m}^3$ .

4.2.5 The aim should be that all releases will be free from offensive odour outside the process site boundary, as perceived by the Inspectorate.

4.2.6 Uncontained emissions, (for example from stockpiles), should be substantially free from visible emissions of dust.

### 4.2.7 **Waste or Recovered Oil Usage**

In all cases where waste or recovered oil is burned, in order to control emissions of sulphur dioxide and PCBs, the concentration of sulphur and PCBs in the fuel should not exceed 1% w/w and 10 ppm respectively.

Where the net rated thermal input of the appliance is 3 MW or more the releases to air from the combustion of waste or recovered oil should not exceed the emission

standards set out in Table 1. Where the net rated thermal input is below 3 MW, the lead concentration is the only standard that is applicable\*:

**TABLE 1**

<b><u>Pollutant</u></b>	<b><u>Concentration</u> (mg/m<sup>3</sup>)</b>
Cadmium	0.1
Nickel	1
Chromium ) Copper ) total emission Vanadium )	1.5
Lead*	5
Chloride (expressed as hydrogen chloride)	100
Fluoride (expressed as hydrogen fluoride)	5

## 5. **RELEASE ROUTES**

Principal release routes to air are shown in Table 2.

## 6. **TECHNIQUES FOR RELEASE MINIMISATION**

### 6.1 **Introduction**

The techniques selected need to include releases from raw materials reception/storage, internal transportation, and from processing.

The process should be designed and operated in such a way that the substances released have the minimum impact on the environment. As a general principle the Inspectorate should be looking for evidence of the prevention, minimisation and rendering harmless of all releases of prescribed substances, and the rendering harmless of all other releases in the application, and requiring this in the authorisation.

Releases from the process may require a combination of several abatement techniques and the careful control of the process route taken in order to deal with the releases. The applicant should review all the options that are available and demonstrate that the combination of primary process and selected abatement equipment represents BATNEEC.

## 6.2 **Techniques**

### 6.2.1 **Storage and Handling of Material.**

- 6.2.1.1 The preferred method of storage of working stocks of sand and dust is in covered storage.
- 6.2.1.2 It is acceptable to store material that has been screened to remove fines of 3 mm and under in the open.
- 6.2.1.3 Storage silos and hoppers for powders or filler dust should be enclosed and vented to air through a suitable arrestment plant.
- 6.2.1.4 Material feed hoppers should be covered with a canopy and the attendant conveyor(s) should be covered on top and two sides.
- 6.2.1.5 Steps should be taken to ensure that the storage of deferred set/coated chip material does not give rise to odour complaints off site. In this regard storage areas should be

located away from residential property and if necessary, as assessed by the Inspector, the coated material may also have to be cooled prior to storage.

6.2.1.6 For new processes, where the plant is at a quarry, it should be fed with material directly by conveyor from storage hoppers, bays or covered stores, except for imported material which may be introduced through re-feed hoppers, as described in par. 6.2.1.4.

## 6.2.2 **Particulate Matter**

6.2.2.1 The usual best available technology for removing suspended particulate matter from contained emissions are fabric filters. High efficiency wet collectors may also be acceptable in certain situations.

6.2.2.2 Coating plant should be designed and operated so that emission of dust during the discharge of surplus dried stone or filler is minimised. All hot storage bins should have level indication and any overflow chutes should have dust arrestment facilities fed into the main dust arrestment system.

6.2.2.3 The preferred removal of fine, dry waste collected by arrestment equipment should be by return into the product. Where the material is to be disposed of then the preferred removal system should be wet. Where a dry system is used the material should be discharged into closed vessels fitted with an effective dust collection system with consideration being given to its final mode of disposal.

## 6.2.3 **Bituminous Fume**

6.2.3.1 Fume emissions from hot liquids during tanker delivery may be minimised by pumping directly to the storage tanks with displaced air backvented to the delivery tanker.

6.2.3.2 Bitumen should be held at the recommended temperature to avoid excessive fume emission.

6.2.3.3 Techniques that may be used to control bituminous fume emissions include wet scrubbing, activated carbon, incineration or a combination.

#### 6.2.4 **Dispersion**

6.2.4.1 The applicants will need to satisfy the Inspectorate that an appropriate assessment of vent and chimney heights has been made to provide adequate dispersion of odorous or prescribed substances, and other substances that might cause harm, which cannot be prevented and may be released. Some guidance is given in Technical Guidance Note D1 (ISBN 0-11-752794-7). Under normal circumstances, the minimum chimney height should be 3m above the roof ridge heights of any adjacent buildings, structures or rock faces and should not be less than 20m above ground level.

6.2.4.2 It may be necessary for dispersion modelling to be carried out which takes into account local meteorological data, local structures and topography, as well as other local releases, (for example, the use of recovered oil, sites with any large volume emission, significant non-combustion sources or multiple release points and sites where there are sensitive receptors nearby).

6.2.4.3 Applicants should provide clear information on the parameters used and the assumptions made in their assessments especially when using dispersion models. The assessment of background concentrations of pollutants will be particularly relevant. Statutory air quality standards and other recognised criteria should be taken into account.

6.2.4.4 Process upsets or equipment failure giving rise to abnormally high release levels over short periods should be assessed. Even if a very low probability of occurrence

can be demonstrated by the applicant, a value for the chimney or vent height should nevertheless be set to avoid any serious damage to health in such circumstances.

- 6.2.4.5 The Operator should have procedures in place to reduce load or shut-down plant in the event of inadequate dispersion conditions.
- 6.2.4.6 Chimneys or process vents should be designed to provide efflux velocities that meet the requirements for stack aerodynamic downwash as described in Technical Guidance Note D1. Care should be taken to avoid generating positive pressure zones within the chimney unless the chimney wall is impervious or lined. Where a wet method of arrestment is used, the linear velocity within the arrestment equipment should not exceed 9 m/sec, to avoid entrainment of droplets.
- 6.2.4.7 Chimney flues, process vents and all ductwork should be leakproof. Chimney flues and ductwork leading to the chimney should be adequately insulated to minimise the cooling of waste gases and prevent liquid condensation on internal surfaces. Chimney flues and ductwork should be regularly cleaned to prevent accumulation of material.
- 6.2.4.8 Chimney or process vents should not be fitted with any restriction at the final opening, (for example, a plate, cap or cowl) where it is necessary to achieve dispersion of the residual pollutants except for a cone to meet the efflux velocity requirements of par 6.2.4.6. The discharge should be vertically upwards.
- 6.2.5 **General Operations**
- 6.2.5.1 Effective control of emissions requires the maintenance and proper use of equipment, and the proper supervision of process operations. Effective maintenance, including cleaning of filters and ducts, should be employed on all plant and equipment concerned with the control of emissions to the air. Essential spares and consumables should be held or be readily available.

- 6.2.5.2 Staff at all levels should receive adequate training and instruction in their duties relating to the proper control of the process and emissions to air. Particular emphasis should be given to training for start-up, shut-down and abnormal conditions.
  
- 6.2.5.3 A high standard of housekeeping should be maintained.

## 7. COMPLIANCE MONITORING PROGRAMME

### 7.1 General

Conditions in the authorisation should require the results of all monitoring to be recorded. It should further distinguish between:

- compliance records;
- measurement or records for which regular formal returns to the Inspectorate are nor normally required; and
- operational records made by the operator during the normal course of operating the process.
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### 7.2 Monitoring Requirements

7.2.1 Monitoring of the final release of pollutants from all contained releases should be made for particulate emissions and bituminous fume.

7.2.2 For new plants, upgrades to existing plant or where there is a justifiable complaint situation, the emissions from any arrestment plant handling dry material with a nominal capacity in excess of 100 m<sup>3</sup>/min, (other than that serving storage silos), should be continuously indicatively monitored and continuously recorded for particulate emissions, bearing in mind the limitations and accuracy of continuous monitors. Audible and visible alarms which activate at a reference level agreed with the Inspectorate should be fitted. Emission events which result in the alarms being activated should be recorded. Arrestment plant handling below 100 m<sup>3</sup>/min should be designed and maintained to minimise visible particulate emissions.

When continuous monitoring is not appropriate, non-continuous monitoring should be undertaken. The averaging period for all continuous monitors should be calculated by taking into account only the hours that the process is operating. Where fabric filters are to be used an indication of pressure drop across the filter may be

useful. Continuous emission charts and records should be retained by the operator for a minimum of 4 years and available for examination by the Inspectorate.

- 7.2.3 The sampling positions for all monitoring instruments should be agreed with the Inspectorate. Care is needed in the design and location of sampling systems to obtain representative samples.
- 7.2.4 The reference method for testing and reporting particulate emissions is BS 3405: 1983. An alternative method of testing is acceptable by agreement with the Inspectorate, provided that it can be shown that results comparable with this method are obtained. The onus is on the operator, that the appropriate equipment, laboratory facilities, expertise and quality control procedures are provided to ensure accurate results.
- 7.2.5 The methods used to measure bituminous fume, or other pollutants when using recovered oil, should be agreed with the Inspectorate. A representative sample of the recovered oil should be taken in conjunction with an emissions test and the fuel analysis compared with the fuel specification.
- 7.2.6 The frequency of periodic particulate emission testing should be at least once per year. If waste or recovered oil is burned then the frequency of periodic particulate emission testing should be at least once every six months, unless the particulate emission is continuously monitored, in which case periodic testing once per year is sufficient. If a justifiable complaint situation arises, the frequency may need to be increased. The Inspectorate should be advised at least 7 days in advance of any periodic monitoring exercise to determine compliance with emission standards as well as the provisional time and date of monitoring, pollutants to be tested and the methods to be used. The Inspectorate reserves the right to observe or audit any periodic compliance testing.
- 7.2.7 Where waste or recovered oil is burned in a roadstone coating plant, an analysis should be available for every delivery of waste or recovered oil, which should

provide details of the concentration of cadmium, nickel, chromium, copper, vanadium, lead, chlorides, fluorides, sulphur and PCBs. (The use of a quarterly composite sample for analysing and reporting copper and/or fluoride concentrations may be acceptable). Such analyses should be held by the Operator for a period of not less than a year and be available for inspection by the Chief Inspector upon request. In the event of a change of supplier, the Inspectorate should be notified in writing forthwith.

7.2.8 Whenever waste or recovered oil is burned in roadstone coating plants, (and where the net rated thermal input is 3MW or more), it will also be necessary to undertake at least one emission test per year for:

Cadmium;

Nickel;

Chromium;

Copper;

Vanadium;

Lead;

Chlorides and Fluorides.

An independent sample should also be taken of the waste or recovered oil being burned at the time of the test for subsequent analysis of the following:

Cadmium;

Nickel;

Chromium;

Copper;

Vanadium;

Lead;

Chlorides and Fluorides;

Sulphur; and

PCBs.

7.2.9 The periodic testing should be carried out at “worst case” representative conditions, (for example, the particulate emissions test should be carried out at a high load

condition with a product with high fines content such as asphalt and tests for the other pollutants should be carried out when using the maximum concentration of recovered oil).

- 7.2.10 Visual assessments of emissions should be made frequently, and at least once a day. Remedial action should be taken immediately in the case of abnormal emissions. Visual assessments and any action taken should be recorded in a log book retained by the operator for a minimum of 4 years and available for examination by the Inspectorate.
- 7.2.11 The results of all non-continuous monitoring and inspections should be recorded in the log book, retained by the operator for a minimum of 4 years and made available for examination by the Inspectorate. Adverse results should be investigated immediately and in all cases should be recorded in the log book. The operator should ensure that the cause has been identified and corrective action taken, and this action recorded in a log book.
- 7.2.12 The results of all non-continuous emission testing should be forwarded to the Inspectorate within 8 weeks of the completion of the sampling. A summary of results of all continuous monitoring should be retained for at least 4 years. The summary and inspection records may be kept on electronic recording devices.

### 7.3 **Environmental Monitoring**

Depending on the local circumstances the Inspectorate may require the owner of a works to monitor the effects of their operation on the surrounding neighbourhood by means of atmospheric sampling or other measurements. Such monitoring would be of a scope and frequency sufficient only to establish the level of any local environmental impact.

**TABLE 2**

**TABLE OF PRINCIPAL RELEASE ROUTES TO AIR**

<u>POLLUTANTS</u>	<u>SOURCE</u>
Particulate	Material storage - stockpiles - silo vents Material handling - conveyors/elevators - screens - mechanical plant - bin discharge to lorries - drying operations - combustion
Bituminous fume	Storage tanks Coating box extract Drum mix plants Storage of coated material
Hydrocarbons	Combustion of fuel
Sulphur Dioxide	Combustion of fuel
Oxides of Nitrogen	Combustion of fuel
Metals ) Chlorides ) Fluorides )	Combustion of waste/recovered oil