

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)**

**BLENDING, PACKING, LOADING
AND USE OF BULK CEMENT**

B PROCESS GUIDANCE NOTE - GNB 3/1 VERSION 1

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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 includes the blending of cement, putting cement into silos for bulk storage and removing cement from silos in which it has been stored in bulk and any process involving the use of cement in bulk, including the bagging of cement and cement mixtures, the batching of ready-mixed concrete and the manufacture of concrete or other cement products as described in Schedule 1 - Section 3.1, Part 6 of the Industrial Pollution Control Order (Prescribed Processes and Substances) Regulations (Northern Ireland) 1998 and is carried on at the same location as a process described in Schedule 1 - Section 3.4, Part B of same regulations.

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 plants concerned.
- 3.3 As part of the first application for 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 All releases, other than steam of water vapour, should be colourless, free from persistent mist or fume and free from droplets.
- 4.2 Emissions from combustion processes at concrete product manufacturing plants should be normal operation be free from smoke and in any case should not exceed Ringelmann Shade 1, as described in British Standard BS2741:1969.
- 4.3 All plant and all material storage areas should in normal operation be substantially free from visible emissions of dust.
- 4.4 The aim should be that all releases are free from offensive odour outside the process site boundary, as perceived by the Inspectorate.

5. **RELEASE ROUTES**

The principle release routes to air are as follows:-

<u>Pollutants</u>	<u>Source</u>
Particulate	Screening plant Material handling - wind shipping from conveyors, conveyor discharge to stockpile, double handling with mechanical plant. Material storage - wind shipping of stockpiles, bin discharge to lorries, silo vents. Surface dust - works vehicle disturbance, wind whipping.
Oxides of Sulphur	Combustion gases
Oxides of Nitrogen	Combustion gases
Oxides of Carbon	Combustion gases

6. **TECHNIQUES FOR RELEASE MINIMISATION**

6.1. **Introduction**

The techniques selected need to cover releases from raw materials reception/storage, internal transportation, 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 **Materials Handling**

6.2.1.1 A policy of dust containment and arrestment should be the preferred option for materials handling. However, it is recognised that in some cases, such as remote mineral conveyors, suppression techniques where properly designed, used and maintained, can be an effective alternative means of control.

6.2.1.2 Bulk cement and other cementitious materials should be stored in silos. Silos should be vented to suitable arrestment plant, (for example bag filters). Arrestment plant fitted to silos should be of sufficient size (and kept clean) to avoid over-pressurisation during delivery.

Visual assessment of emissions from arrestment plant to the silo should be undertaken periodically during all bulk deliveries, particularly during the first and last five minutes. The start and finish times of all deliveries should be recorded in a log book, retained by the operator for a minimum of 4 years and made available for examination by the Inspectorate. Storage silos should be equipped with audible or visual high-level alarms to warn of overfilling. The correct operation of such alarms should be checked regularly.

6.2.1.3 Seating of pressure relief valves on silos, should be checked at least once a week or before a delivery takes place, whichever is the longer interval. Immediately it appears that the valve may have become unseated, the delivery should cease and no further delivery should take place. The valve should be examined and resealed if

necessary. Tanker drivers should be informed of the correct procedure to be followed.

6.2.1.4 All filter bags should be inspected at the frequency specified below. If defects or significant blinding are detected, corrective action should be taken promptly and, normally, before another delivery occurs. Operators should record in the log book any cases where deliveries are made prior to corrective action being taken.

Filters fitted with reverse jets - *at least once a month*

Filters fitted with mechanical shakers - *at least once a week*

Filters requiring manual shaking - *at least once a day, except where there is no delivery on any given day, in which case inspection should be made before the next delivery*

Persistent mal-operation of the arrestment plant may result in a requirement for more regular checks and it may be necessary to investigate the proper operation of the plant. Conversely, it may be appropriate to reduce the above inspection frequencies for filters fitted with reverse jets or with mechanical shakers where operating experience has demonstrated satisfactory operation of the arrestment plant. Reduced inspection frequency may also be appropriate where pressure drop sensors are used to monitor any of the above-mentioned types of filters; such monitors should be inspected regularly to check their proper operation.

6.2.1.5 Care should be taken during delivery from tankers to avoid venting of air to silos at a rate which is likely to result in over-pressurisation of the silos. Particular problems may arise during the release of air from tankers at the end of deliveries and care should therefore also be taken to avoid over-pressurisation of silos when venting air from tankers at this stage. (It is envisaged that the only practicable means of venting at the end of deliveries will be through a silo). These can be alleviated by the use of tankers with sufficient valvework to allow a gradual release to occur and by carefully

controlled venting. In order that fugitive emissions are minimised during the charging of silos, care should be taken to ensure that the transfer lines are securely connected to the tanker discharge point and the silo delivery inlet point. Tanker drivers should be informed of the correct procedures to be followed.

- 6.2.1.6 Other materials which may generate airborne dust emissions, for example crushed rock or coarse aggregate, should be delivered, stored and handled so as to minimise dust emissions (for example, by dampening or covering).
- 6.2.1.7 The transfer of cement, other than delivery to site storage, should be by air slide, elevator, screw feeder, enclosed chain en-mass conveyor, gravity or pneumatic means.

Internal transport of other dusty materials should be carried out so as to prevent or minimise airborne dust emissions. Where conveyors are used, they should be of sufficient capacity to handle maximum loads and should be provided with protection against wind whipping, for example fitting side boards. For all new conveyors, discharges should be designed to minimise free fall at all times.

- 6.2.1.8 Truck mixers should be loaded in such a way as to minimise airborne dust emissions, for example by loading with wet pre-mixed materials. If they are loading with dry materials, local dust control measures should be provided. Appropriate dust control measures may include extract ventilation to arrestment plant, enclosure, water sprinklers and rubber sock type chute systems.
- 6.2.1.9 The packing of cement into bags should be carried out using purpose designed plant fitted with extraction for displaced air ducted to arrestment plant (for example bag filters).
- 6.2.1.10 All spillages which may give rise to dust emissions should be cleaned up promptly, normally be wet handling. Dry handling of dusty spillages should not be permitted other than in fully enclosed buildings. Major spillages should be dealt with using, for example, a vacuum cleaning system. It should not normally be necessary for a

vacuum cleaning system to be available on site at all times, provided that such equipment can be obtained in the event of a major spillage on the same day that it occurs and measures to minimise emissions, such as dampening, are taken immediately. Particular attention should be paid to preventing and cleaning up deposits of dust on external support structures and roofs in order to minimise wind entrainment of deposited dust.

6.2.1.11 In designing a new process, consideration should be given to a layout which minimises vehicle movement on site.

6.2.2 **General Operations**

6.2.2.1 Effective control of emissions requires the maintenance and proper use of equipment, as well as prudent supervision of process operations. Effective preventive maintenance should be employed on all plant and the equipment concerned with the control of emissions to the air. Essential spares and consumables should be held or be available at short notice to rectify breakdowns rapidly.

6.2.2.2 Any malfunction or breakdown leading to abnormal emissions should be dealt with promptly and process operations adjusted until normal operations can be restored. The Inspectorate should be informed without delay. All such malfunctions should be recorded in the log book.

6.2.2.3 Staff at all levels should receive the necessary formal training and instruction in their duties relating to control of the process and emissions to air. Particular emphasis should be given to training for start-up, shut down and abnormal conditions.

6.2.2.4 Roadways in normal use and any other area where there is regular movement of vehicles should be hard-surfaced, where appropriate, and kept clean, to prevent or minimise fugitive dust emissions. Where necessary wheel cleaning facilities should be provided and used by vehicles before leaving the site. Where the plant is co-located with a quarry which is not a prescribed process, the preceding requirements

may not be appropriate. Vehicle exhausts should not, wherever practicable, be directed below the horizontal.

6.2.2.5 A high standard of housekeeping should be maintained. In particular, this applies to areas where concrete casting products are being cured or stored and these areas should be kept clean to prevent fugitive dust emissions in dry and/or windy conditions.

6.2.3 **Dispersion from Chimneys and Vents**

6.2.3.1 The applicant will need to satisfy the Inspectorate that an appropriate assessment of vent and chimney heights has been made to provide adequate dispersion of odourous 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).

6.2.3.2 The Operator should have procedures in place to reduce load or shut-down plant in the event of inadequate dispersion conditions.

6.2.3.3 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.

6.2.3.4 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.

- 6.2.3.5 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 a dispersion of the residual pollutants except for a cone to meet the efflux velocity requirements of par. 6.2.3.3. The discharge should be vertically upwards.

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 of records for which regular formal returns to the Inspectorate are not normally required; and
- operational records made by the operator during the normal course of operating the process.

7.2 **Monitoring Requirements**

- 7.2.1 Regular visual assessments of emissions should be made on a random basis (normally daily) by the operator and remedial action initiated where any visible emissions are observed. Monitoring of wind speed and direction should not normally be required. Visual monitoring should take place during all deliveries of cement.
- 7.2.2 Monitoring emissions from silos because of the short duration of silo filling procedures, the collection of a sample sufficient for isokinetic monitoring of emissions from these sources is not likely to be possible. In the case of mal-operation, it should usually be sufficient for the cause of the problem to be rectified before further deliveries take place. However, in the event of persistent mal-operation, local enforcing authorities should consider whether it is appropriate to

require indicative monitoring of the arrestment plant performance be carried out. It should be noted that because of the short duration of silo filling procedures, the collection of a sample sufficient for isokinetic monitoring of emissions from these sources is not likely to be possible.

- 7.2.3 Monitoring emissions from other contained sources such as bagging plant. Other arrestment plant with an exhaust flow of over 50 m³/min. which discharges externally should be indicatively monitored, (for example using a particle impingement device or an opacity device). The indicative monitor should be fitted with a visual or audible alarm to activate on arrestment plant failure or malfunction. In the case of arrestment plant with an exhaust air flow of 50 m³/min. or less, the plant should be designed to prevent visible emission of dust.
- 7.2.4 Where there is evidence of off-site deposition of dust from the process, the Inspectorate should consider requiring the operator to undertake monitoring to identify the source and confirm the extent of the deposition. The monitoring should be by a method agreed with the Inspectorate.
- 7.2.5. The results of all monitoring and inspections should be recorded in the log book. 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 that this action is recorded in the log book.
- 7.2.6 The Inspectorate should be advised at least 7 days in advance of any periodic monitoring exercise to determine compliance with emission limits, as well as the provisional time and date of monitoring, pollutants to be tested and the methods to be used.
- 7.2.7 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.

7.2.8 **Environmental Monitoring**

The impact of the process on the environment will be affected by the size of the releases and the site's location. The need for environmental monitoring should be addressed in the application, where necessary, to demonstrate that the releases have been adequately rendered harmless by the application of BATNEEC.