ENVIRONMENTAL PROTECTION AGENCY

BATNEEC GUIDANCE NOTE

Class 12.1

ORGANO-TIN COATING

(DRAFT 3)

1. INTRODUCTION

This Guidance Note is one of a series issued by the Environmental Protection Agency and designed to provide guidance to those applying for integrated pollution control licences under the EPA Act. It should also be read in conjunction with the Notes on Licence Applications, available under separate cover.

It should be noted at the outset, that noise is not included within the scope of this work and guidance on this parameter will be issued separately.

This Guidance Note is comprised of seven main sections. Following a general note on the interpretation of BATNEEC, a listing of the industrial sectors covered by the terms of this note are listed in Section 3. In Section 4, the technologies to control emissions are tabulated and in Section 5 the specific emission limit values (ELV's) are given. The note ends with comments on compliance monitoring requirements, and a list of relevant reference materials used in the drawing up of this Guidance Note. An Appendix (Appendix 1) gives the main sources of emissions, and the principle releases from such sources.

All applicants for Integrated Pollution Control licences should carefully examine the information laid down in this guidance note, and should use this information to assist in the making of a satisfactory application for an Integrated Pollution Control licence to the Agency.

The technologies and the associated emission limit values (ELV's) identified in this Guidance Note are regarded as representing BATNEEC, for new activities at the time of writing. BATNEEC is not a static quality and will change as technologies, environmental factors and costs alter with the passage of time. The Agency may amend or update the guidelines contained in this note should such amendments seem appropriate. The information contained in this Guidance Note is intended to be used only as a tool to assist in determining the BATNEEC for an operation in this sector and should not be taken to be a definitive authority on the BATNEEC for this sector**.** This Note should not be considered as a Legal Document**.**

2. INTERPRETATION OF BATNEEC

BATNEEC means '*the best available technology not entailing excessive costs'*. The technology in question should be **Best** at preventing pollution and **Available** in the sense that it is procurable by the industry concerned. **Technology** itself is taken as the techniques and the use of the techniques, including training and maintenance etc. **NEEC** addresses the balance between environmental benefit and financial expense.

The objective of the Best Available Technology Not Entailing Excessive Costs (BATNEEC) Guidelines is to provide a list of technologies which will be used by the EPA to determine BATNEEC for a scheduled activity. The BATNEEC identified in this Guidance Note is used as a basis for setting emission limit values. It is intended to update these guidelines as required in order to incorporate technological advances as they occur.

In the identification of BATNEEC, emphasis is placed on pollution prevention techniques, including cleaner technologies and waste minimisation, rather than end-of-pipe treatment.

Technologies identified in the BATNEEC guidelines are considered to be current best practice for the purposes of setting emission limit values. These technologies are representative of a wide range of currently employed technologies appropriate to particular circumstances. However, the guidance issued in this note in respect of the use of any technology, technique or standard does not preclude the use of any other similar technology, technique or standard which may achieve the same emission. The entire range would not necessarily be appropriate in specific cases. The specific choice depends on a wide range of circumstances but the crucial factor is that the selected regime achieves BATNEEC. In applying BATNEEC, Environmental Quality Objectives (EQOs) must be respected where set. Measures such as in-plant changes, raw material substitution, process recycling and improved material handling and storage practices, may also be employed to effect reductions in emissions. As well as providing for the installation of equipment and the operation of procedures for the reduction of possible emissions, BATNEEC will also necessitate the adoption of an on-going programme of environmental management and control, which will focus on continuing improvements aimed at prevention, elimination and/or progressive reduction of emissions.

As described in the EPA Act of 1992, BATNEEC will be used to prevent, eliminate or, where that is not practicable, limit, abate, or reduce an emission from an activity which is listed in the first schedule to the Act. The use of BATNEEC is construed in the Act to mean the provision and proper maintenance, operation, use and supervision of facilities which are the most suitable for the purposes.

In determining BATNEEC for an activity, regard shall be had to :

- the current state of technical knowledge;

- the requirements of environmental protection;

- the application of measures for these purposes, which do not entail excessive costs, having regard to the risk of significant environmental pollution which, in the opinion of the agency, exists.

For existing facilities, additional regard shall be had to :

- the nature, extent and effect of the emission concerned;

- the nature and age of the existing facilities connected with the activity and the period during which the facilities are likely to be used or to continue in operation, and

- the costs which would be incurred in improving or replacing these existing facilities in relation to the economic situation of activities of the class concerned.

The technologies and the associated emission limit values (ELVs) identified in this Guidance Note are regarded as representing BATNEEC for a *new* activity. However, it is also generally envisaged that *existing* facilities will progress towards attainment of similar emission limit values, but the specific ELV requirements and associated time frames will be identified on a case by case basis when the licence application is being processed. Furthermore, for *all* facilities, additional and more stringent requirements may be specified on a site-specific basis whenever environmental protection so requires. Hence the BATNEEC guidelines are not the sole basis on which licence emission limit values are to be set, since information from other sources will also be considered, including site-specific environmental and technical data, plant financial data and other relevant information.

3. SECTOR COVERED BY THIS GUIDANCE NOTE

This Guidance Note covers SECTOR 12.1 of the activities specified in the First Schedule to the EPA Act 1992. These are:

12.1 Operations involving coating with organo-tin compounds.

4. CONTROL TECHNOLOGIES

4.1 INTRODUCTION

As explained in Section 2 this Guidance Note identifies BATNEEC but obviously does so in the absence of site-specific information. Accordingly it represents the requirements expected of any new activity covered by the Note, but does not exclude additional requirements which may form part of the granting of a licence for a specific site.

The approach to be used in selecting BATNEEC is based on the following hierarchy:

- Process design / redesign changes to **eliminate** emissions and wastes that might pose environmental problems.

- **Substitution** of materials /biocides etc. by environmentally less harmful ones (e.g. tin free self-polishing copolymer antifouling paints; use of controlled release organo-tin self-polishing copolymer paints etc.)

- Demonstration of waste **minimisation** by means of process control, inventory control and end-of-pipe technologies etc.

The existing or possible measures for reducing and controlling emissions are described in this section. These range from relatively simple containment measures to sophisticated recovery and "end-of-pipe" technologies and include:

(i) Load minimisation
(ii) Containment
(iii) Recovery/recycle
(iv) Emission reduction
(v) Waste treatment and disposal

The technical feasibility of the measures listed below has been demonstrated. Used singly or in combination, they represent BATNEEC solutions when implemented in the appropriate circumstances. The circumstances depend on scale, chemicals used, etc. A summary of the treatments for various emissions is given at the end of the section.

Note that where flammable/explosive vapours or dusts are handled, safety procedures (acceptable to HSA) should be adopted and nothing in this note should be construed as advice to the contrary.

4.2 TECHNOLOGIES FOR LOAD MINIMISATION

(No priority ranking is intended, and the appropriate selection in a particular case will depend on the specifics of the process concerned and on site constraints).

- Optimisation of water usage.
- Inventory control.
- Optimisation of coating and immediate process to ensure minimum wastage.
- Substitution e.g. cuprous oxide and biocide mixtures instead of TBT/TPT.
- Where coating is applied by spray (rather than brush/roller) an airless system to be used.
- High solids paints to be used to reduce VOC emissions.
- Vacuum blasting techniques preferred to dry or wet grit blasting.

4.3 CONTAINMENT OF EMISSIONS:

(No priority ranking is intended, and the appropriate selection in a particular case will depend on the specifics of the process concerned and on site constraints).

- Roofing and bunding of coating and immediate post-coating areas.
- Interceptor discharges to WWTP prior to water discharge.
- Bunding of tanks, cleaning and coating areas.
- Design of hardstanding, bunding and unloading areas to prevent surface and groundwater contamination from storage after coating etc.
- Overground pipelines and transfer lines.
- Site organisation to ensure segregation of potentially contaminated surface waters from uncontaminated areas and waters.
- Chemical off-loading to be carried out so as to avoid spillages etc. (e.g. bunding).
- Removal of anti-foulant coatings by non-shot blast is preferred.
- Where coating is undertaken on ships/boats in dry-dock, measures to prevent particulate matter being flushed out of the dock should be taken.
- Preventative measures to be taken to ensure particulate debris does not become wind-blown.
- Wind sheeting should be erected around open work areas where dry/wet shot blasting and paint spraying is carried out.

4.4 TECHNOLOGIES FOR RECOVERY AND RECYCLE:

(No priority ranking is intended, and the appropriate selection in a particular case will depend on the specifics of the process concerned and on site constraints).

- Recycle of collected drainage liquors from coating and post-coating stages.

4.5 TECHNOLOGIES FOR TREATING WATER EMISSIONS

(No priority ranking is intended, and the appropriate selection in a particular case will depend on the specifics of the process concerned and on site constraints). (Symbols refer to Table 4.1).

- Coagulation/flocculation/precipitation (F1).
- Sedimentation/filtration/floatation (F2).
- Activated carbon polishing (F3).
- Membrane technology (F4).
- UV-light polishing (F5).

4.6 TECHNOLOGIES FOR THE TREATMENT AND DISPOSAL OF WASTES:

(No priority ranking is intended, and the appropriate selection in a particular case will depend on the specifics of the process concerned and on site constraints).

4.6.1 Sludge Treatment

- Filtration.
- Centrifugation.

4.6.2 Disposal

- Engineered landfill.
- Solidification
- Incineration

Table 4.1 - Summary of Technologies for Treating Water Emissions (Symbols refer to section 4.5)

Emission Type	Technology
Organo Tin and Organics (e.g. TBT, TPT, etc.)	F1, F2, F3, F4, F5

5. EMISSIONS LIMIT VALUES

5.1 INTERPRETATION OF COMPLIANCE

5.1.1 Emissions to waters

The limit values for discharges to water are based on 24 hour flow proportional composite samples unless otherwise specified.

5.2 RELEASES TO AIR

Site and plant to be operated such that odour nuisance beyond the boundary is prevented.
Otherwise, any licence conditions should be complied with.

5.3 Releases to Water

All releases to waters are subject to a licence from the Agency. However any discharge to sewer will require the consent of the local authority or sewerage undertaker. BATNEEC to minimise the release of substances will generally include minimisation at source and either specific treatment of contaminated waste streams to remove particular substances or co-treatment of combined effluent streams or both. The Emission Limit Values for effluent discharges to waters are set out in Table 5.1 overleaf.

Table 5.1 - Emission Limit Values for Discharges to Water*

(These values apply prior to any dilution with e.g. uncontaminated storm waters or cooling waters)

Constituent Group or Parameter	Limit Value	Notes
pH	6 - 9	3
BOD (mg/l)	25	3
Fish Tainting	No Tainting	2,3
EC List 1	As per 76/466/EC and amendments	3
Toxic units (mg/l)	10	1,3
Organo Tin (ng/l)	200	3
Copper (mg/l)	0.5	3
Mineral oil (mg/l)	20	3
Metals	As per Licence depending on metal present in paint	

* All values refer to daily averages, except where otherwise stated to the contrary, and except for pH which refers to continuous values.

Notes for Table 5.1:

1. The toxicity of the effluent shall be determined on an appropriate aquatic species. The number of Toxicity Units (TU) = 100/96 hr LC50 in percentage vol/vol. so that higher TU values reflect greater levels of toxicity.

2. No substances shall be discharged in a manner which, or at a concentration which, following initial dilution causes tainting of fish or shellfish, interferes with normal patterns of fish migration or which accumulates in sediments or biological tissues to the detriment of fish, wildlife or their predators.

3. Consent conditions for these parameters for discharge to municipal treatment plants can be established with the Licensing Authority, and different values may apply.

6. COMPLIANCE MONITORING

The methods proposed for monitoring the emissions from these sectors are set out below.

6.1 WASTE WATER DISCHARGES:

1. Establish existing conditions prior to start-up, of key emission constituents and salient flora and fauna.

2. Daily monitoring of flow and volume. Monitoring of other relevant parameters as deemed by the Agency taking account of the nature, magnitude and variability of the emission, and the reliability of the control technologies.

3. The potential for the treated effluent to have tainting and toxic effects should be assessed and if necessary measured by established laboratory techniques.

6.2 SOLID WASTE MONITORING:

1. The recording in a register of the types, quantities, date and manner of disposal of all wastes.

2. Leachate testing of sludges and other material as appropriate being sent for landfilling.

7. PRINCIPAL REFERENCES

7.1. **U.K. H.M.I.P.**

7.1.1. Chief Inspectors Guidance to Inspectors Process Guidance Note IPR 6/1 (The Application or Removal of Tributyltin or Triphenyltin Coatings - Draft April 1994).

APPENDIX 1

SOURCES AND EMISSIONS

1 INTRODUCTION:

In this section, the major sources of emissions to air and water are identified, as are the principal sources of waste from the sector. It should be borne in mind that the identified list of sources is not all encompassing, nor will every plant falling within an individual sector have every one of the emissions which are associated with the sector as a whole.

Emissions are considered under the following headings; fugitive unscheduled emissions and specific process emissions. Some of the latter are considered to have little potential environmental significance and these are designated as minor (m). (However, obviously there could be specific plants where this designation of minor may not be correct. Such emissions must then be examined on a one-off basis).

2 SOURCES OF EMISSION TO AIR FROM:

2.1 Fugitive and Unscheduled Emissions:

- VOC and Odour losses during preparation and coating operations.
- Stripping of VOC and odorous compounds from waste water treatment plants (WWTP) resulting in releases to air and/or odour problems.
- Particulates from open grit blasting.

2.2 Process Emissions

- Material handling and storage (m).
- Surface preparation and coating (m).

3. SOURCES OF EMISSIONS TO WATER FROM:

3.1 Spills and Diffuse Sources etc. (Symbols refer to Table A1)

- Storage tank leaks.
- Pipework leaks.
- Spillages.

3.2 Processes Emissions

- Contaminated stormwaters (E1).
- Bund drains (E1).
- Contaminated cleaning water (E1).

4. SOURCES OF WASTE FROM: (SYMBOLS REFER TO TABLE A2)

- Sludges from interceptors (W1).
- Sludges from WWTP (W1).
- Contaminated drums, equipment, packaging and protective clothing (W2).
- Spillage clean-up (W1).

Table A1- Summary of Sources and Emissions to Water
(Symbols refer to section 3 Appendix)

Source	Emission
E1	Organo-tin Organics

Table A2 - Summary of Other Releases
(Symbols refer to section 4 in Appendix)

Source	Emission
W1	Organo-tin, Oils, Paint solids
W2	Process Chemicals