



OSPAR Decision 98/4

on Emission and Discharge Limit Values for the Manufacture of Vinyl Chloride Monomer (VCM) including the Manufacture of 1,2-dichloroethane (EDC)

(Consolidated text¹)

**OSPAR Decision 98/4 adopted by OSPAR 1998 (OSPAR 98/14/1, Annex 39)
Amended by OSPAR Decision 2006/1 (OSPAR 06/23/1, Annex 11)**

RECALLING Article 2(1) of the Convention for the Protection of the Marine Environment of the North-East Atlantic (“OSPAR Convention”);

RECALLING that the 1997/1998 Action Plan of the Oslo and Paris Commissions calls for the adoption of further measures, including the application of best available techniques (BAT) and best environmental practice (BEP), for the reduction or elimination of inputs to the maritime area from specific industrial sectors, and in considering these sectors, attention should be given in particular to activities which result in inputs of hazardous substances (especially organohalogen substances) and to the reduction of such inputs, with the aim of their elimination;

RECALLING that the Oslo and Paris Commissions published in 1996 a Description of BAT for the Vinyl Chloride Industry;

RECALLING PARCOM Recommendation 96/2 Concerning Best Available Techniques for the Manufacture Vinyl Chloride Monomer (VCM);

NOTING Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC Directive) and corresponding legislation of other Contracting Parties;

RECOGNISING that the vinyl chloride industry has the potential to release significant amounts of organohalogens to the environment;

RECOGNISING that the releases of chlorinated hydrocarbons arising in the manufacture of VCM can be minimised by applying BAT;

The Contracting Parties to the Convention for the Protection of the Marine Environment of the North-East Atlantic DECIDE:

¹ The consolidated text integrates the basic OSPAR measure with subsequent amendments adopted by OSPAR in a single, non-official document to facilitate documentation. Only the basic OSPAR measure and the subsequent measures adopted by OSPAR to amend the basic measure are official documents.

1. Definitions

For the purposes of this Decision:

“Chlorinated hydrocarbons”	means the sum of at least 1,2-dichloroethane (EDC), vinyl chloride monomer (VCM), chloroform, carbon tetrachloride, trichloroethane, methyl chloride and hexachlorobenzene.
“Existing plant”	means plant the operation of which was authorised before 9 February 1999.
“New plant”	means plant the operation of which was authorised on or after 9 February 1999.
“VCM-plant”	means plant manufacturing VCM and/or EDC from ethylene and chlorine and/or hydrochloric acid (HCl) as feedstock.
“Dioxins”	means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofuranes, reported as Toxic Equivalents (TEQ)
“Fugitive emissions”	means releases into air due to leakages

2. Scope

- 2.1 The purpose of this Decision is to prevent and eliminate pollution and to take the necessary measures to protect the maritime area against the adverse effects of human activities due to the manufacture of VCM including the manufacture of EDC.
- 2.2 This Decision lays down limit values for releases of certain hazardous substances into water and air from the manufacturing process of VCM including EDC from ethylene and chlorine and/or HCl as feedstock.
- 2.3 The discharge limit values in table 3.2 apply only to VCM-plants from which discharges may reach the maritime area of the OSPAR Convention by waterborne routes.
- 2.4 The emission limit values in table 3.1 apply to all VCM-plants of Contracting Parties.

3. Programmes and Measures

3.1 General provisions

- 3.1.1 The annual averages of emissions from VCM-plants to the air shall not exceed the emission limit values in table 3.1.
- 3.1.2 The annual averages of discharges from VCM-plants to the water environment shall not exceed the discharge limit values in table 3.2.
- 3.1.3 The dilution of treated or untreated waste air or waste water streams for the purpose of compliance with limit values as set out in §§ 3.2 and 3.3 shall not be permitted.

3.2 Emissions to air:

- 3.2.1 Potential point sources of gas emissions from the installation/equipment shall be collected as far as possible for treatment in an incinerator or in equipment with comparable performance.

Table 3.1: Emission Limit Values

Substance	Limit value ¹⁾
VCM	5 mg/Nm ³
EDC	5 mg/Nm ³
Dioxins	0,1 ng/Nm ³ (TEQ)
HCl	30 mg/Nm ³

¹⁾ Standardised at the following conditions: temperature 273 °K, pressure 101,3 kPa and 11% O₂ dry gas.

Fugitive emissions to air shall be minimised as far as possible.

3.3 Discharges to water (total of aqueous waste streams)

Table 3.2: Discharge Limit Values

Substance	Sampling Point	Limit values	
		concentration	releases in unit of weight per tonne
Chlorinated hydrocarbons	after stripper, before secondary treatment		0,7 g/tonne EDC purification capacity
Copper (total)	after final treatment		for plants with fixed bed reactors: 0,5 g/tonne of oxychlorination capacity for plants with fluidised bed reactors: 1,0 g/tonne of oxychlorination capacity
Dioxins	after final treatment		1 µg TEQ per tonne oxychlorination capacity
Chemical Oxygen Demand (COD)	after final treatment	250 mg/litre	

3.3.1 Adsorbable organic halogen compounds (AOX) or extractable organic halogen compounds (EOX) can be used as optional alternative parameters for chlorinated hydrocarbons, provided that a correlation, on a plant by plant basis, between AOX or EOX and chlorinated hydrocarbons has been established and will be reported in the reporting on implementation. On sites where no VCM is manufactured and EDC is not purified, the discharge limits for chlorinated hydrocarbons shall be defined in terms of EDC production capacity and not in terms of EDC purification capacity.

3.3.2 As copper discharges are related only to oxychlorination technology, their limits shall only be applied to discharges of the oxychlorination processes for VCM/EDC production.

3.3.3 On sites where no VCM is manufactured and oxychlorination processes are not used for VCM/EDC production, the discharge limits for dioxins shall be defined in terms of EDC production capacity. In this case, the limit value shall be 0,1 µg TEQ per tonne of EDC production capacity.

3.3.4 As an alternative to the discharge limit value of 250 mg/litre for COD, a 90% reduction of the load of COD may be applied.

3.3.5 As an alternative to COD as parameter, total organic carbon (TOC) may be used as a control parameter, provided a correlation factor between COD and TOC has been established.

3.4 Sampling

3.4.1 Samples shall be taken for analysis on the following bases:

- a. for emissions to the atmosphere, a sample, or a number of samples, representative of such emissions over a period of one hour;
- b. for discharges to water, a sample, or a number of samples, representative of such discharges over a period of one day. Analysis of chlorinated hydrocarbons (or AOX or EOX) shall be performed on the basis of spot samples over a period of one day.

3.4.2 The frequency of analysis shall be determined by the competent authorities taking into account the results obtained.

3.4.3 For dioxins, one analysis per year can be sufficient, provided that the sampling procedure ensures representative samples.

3.4.4 Water samples shall be homogenised, unfiltered and undecanted, where this is compatible with the analytical methodology specified in table 3.3.

3.5 Analyses

3.5.1 The analytical methods set out in table 3.3, or methods yielding equivalent results, shall be used:

Table 3.3: Analytical Methods

COD	to be analysed by using potassium dichromate oxidation (See ISO 6060, second edition)
TOC	to be analysed in accordance with EN 1484
AOX, EOX	to be analysed according to ISO 9562 and EN 1485
Cu (total)	to be analysed by using flame atomic absorption spectrometry (See ISO 8288: Water Quality – determination of cobalt, nickel, copper, zinc, cadmium and lead. - Flame atomic absorption spectrometric methods)
EDC	to be analysed by gas chromatography
VCM	to be analysed by gas chromatography
Dioxins	to be analysed according to EN 1948 parts 1-3
Chlorinated hydrocarbons	to be analysed by gas chromatography
Fugitive emissions	to be quantified by using appropriate methods (e.g. by using a trace gas technique)

4. Entry into force

4.1 This Decision enters into force on 9 February 1999 for new plants and on 1 January 2006 for existing plants. The programmes and measures of this Decision shall be applied to:

- a. new plants from 9 February 1999;
- b. existing plants from 1 January 2006.

4.2 In the case of technical modifications to an existing VCM-plant, the competent authorities shall decide whether the provisions for existing plants in this Decision still apply to the modified plant.

5. Implementation reports

- 5.1 In respect of existing plants reports should be submitted to the appropriate OSPAR subsidiary body for the first time in the intersessional period 2008/2009 and every four years thereafter until this Decision is fully implemented unless otherwise specified by the Commission.
- 5.2 When reporting on implementation, the format as set out in the Appendix should be used to the extent possible.

Reporting format on the implementation and effectiveness of OSPAR measures relating to the vinyl chloride sector

Country: _____

I. Implementation

Measure	Reservation applies Yes ⁽¹⁾ /No	Is the measure applicable in your country? Yes/No ⁽²⁾	Is the measure fully implemented? Yes/No ⁽³⁾	Means of implementation ^{(4), (5)} 1. legislation 2. administrative action 3. negotiated agreement
PARCOM Decision 98/4 on Emission and Discharge Limit Values for the Manufacture of Vinyl Chloride Monomer (VCM) including the Manufacture of 1,2 dichloroethane (EDC)				
PARCOM Decision 98/5 on Emission and Discharge Limit Values for the Vinyl Chloride Sector, Applying to the Manufacture of Suspension-PVC (s-PVC) from Vinyl Chloride Monomer (VCM)				
OSPAR Recommendation 99/1 on the Best Available Techniques for the Manufacture of Emulsion PVC (e-PVC)				
OSPAR Recommendation 2000/3 on Emission and Discharge Limit Values for the Manufacture of Emulsion PVC (e-PVC) from Vinyl Chloride Monomer				

Note (1)

Please report on any progress towards lifting the reservation:

Note (2)

If the measure concerned is not applicable please state why (e.g. no relevant plant):

Note (3)

If the measure concerned is not fully implemented please state why and indicate when the measure is expected to be fully implemented:

Note (4)

Please specify the national measures taken to give effect to each of the measures:

Note (5)

Please specify any special difficulties encountered, such as practical or legal problems, in the implementation of each of the measures:

II. Effectiveness

Limit values for emissions and discharges

Please indicate the emissions and discharges of the substances and sum parameters listed in the tables for the following vinyl-chloride and PVC plants or installations. Where plants are operated in an integrated manner (an “installation”), plant-by-plant reporting is not required and reporting should cover the installation. Where an installation produced VCM and/or e-PVC and/or s-PVC, the reporting table should be combined ensuring that all parameters set out in the tables below were covered. Please give representative figure for each pollutant and- if possible- the observed range of figures from all plants.

Reporting on VCM and EDC parameters is on a voluntary basis.

Please also indicate - in brackets behind the figures – whether emission or discharge values are estimated (E), measured (M) or calculated (C). If data could not be made available, please indicate in the appropriate “remarks” section (e.g. if monitoring of substance in question is not specified in the permit for the plant or installation, and estimations or calculations are not available).

“Specific loads” are the amounts of emissions or discharges for each unit (usually tonne) of production that is produced in the year in question. “Total loads” are the amounts of emissions or discharges from the plant or installation in the year in question.

1. Vinyl Chloride Monomer (VCM) plants including manufacture of 1,2-dichloroethane (EDC) covered by OSPAR Decision 98/4

Please indicate number and capacity of VCM-plants/installations:

Total capacity (t VCM/year): _____

a. Emissions to air

Substances	Specific load ² In reporting year ^{3*} kg/tonne of VCM produced	Alternatively: Total load in reporting year kg/year (comparison with the base year) **	Alternatively: Concentration mg/m ³ ***
VCM			
EDC			
Dioxins	a)	a)	a)

* Please indicate under “remarks” how specific loads were calculated.

** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under “remarks” when installed production capacities have changed.

*** Please indicate the associated volumetric flow-rate and whether fugitive emissions are included.

a) mg (TEQ)/tonne of VCM produced **or** mg (TEQ)/year **or** ng (TEQ)/Nm³.

² Wherever possible this parameter should be reported

³ The year for which data are to be reported in 2008/2009 is 2007.

b. Discharges to water

Substances	Specific load ⁴ In reporting year ^{5*} (°)	Alternatively: Total load in reporting year ** kg/year (°)	Alternatively: Concentration mg/l *** (°)
Chlorinated hydrocarbons (g/tonne EDC purification capacity) ^{a)}			
Copper (total) (g/tonne of oxychlorination capacity) ^{b)}			
Dioxins (µg TEQ/tonne oxychlorination capacity) ^{b)}			

- * Please indicate under “remarks” how specific loads were calculated.
- ** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under “remarks” when installed production capacities have changed.
- *** Please indicate the associated volumetric flow-rate.

- a) To be sampled after stripper, before secondary treatment. Chlorinated hydrocarbons may alternatively be calculated from AOX or EOX if a correlation, on a plant-by-plant basis, has been established. The application of those alternatives should be described in the implementation report.
- b) To be sampled after final treatment.
- c) In brackets: (Number of samples).

c. Remarks: (i.e. explanation if change in production capacity in the country appeared, method to calculate specific loads)

⁴ Wherever possible this parameter should be reported
⁵ The year for which data are to be reported in 2008/2009 is 2007.

2. Suspension-PVC (s-PVC) covered by OSPAR Decision 98/5

Please indicate number and capacity of plants: _____

Total capacity (tonnes s-PVC/year): _____

a. Emissions to air

Substances	Specific load ⁶ In reporting year ^{7*} g/tonne of s-PVC produced	Alternatively: Total load in reporting year kg/year (comparison with the base year) **	Alternatively: Concentration mg/m ³ ***
VCM (point sources)			
VCM (fugitives)			

* Please indicate under "remarks" how specific loads were calculated.

** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under "remarks" when installed production capacities have changed.

*** Please indicate the associated volumetric flow-rate.

b. Discharges to water

Substances	Specific load ⁸ In reporting year ^{9*} g/tonne of s-PVC produced	Alternatively: Total load in reporting year kg/year (comparison with the base year) **	Alternatively: Concentration mg/l ***
VCM ^{a), b)}			

* Please indicate under "remarks" how specific loads were calculated.

** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under "remarks" when installed production capacities have changed.

*** Please indicate the associated volumetric flow-rate.

a) Please state correlation when VCM data are based on AOX or EOX measurements.

b) After effluent stripper, before secondary treatment.

c. **Remarks:** (i.e. explanation if change in production capacity in the country appeared, method to calculate specific loads)

⁶ Wherever possible this parameter should be reported

⁷ The year for which data are to be reported in 2008/2009 is 2007.

⁸ Wherever possible this parameter should be reported

⁹ The year for which data are to be reported in 2008/2009 is 2007.

3. Emulsion-PVC Plants (e-PVC) covered by the OSPAR Recommendations 99/1 and 2000/3

Please indicate number and capacity of plants: _____

Total capacity (tonnes e-PVC/year): _____

a. Emissions to air:

Substances	Specific load ^{10 a)} In reporting year ^{11*} g/tonne of e-PVC produced	Alternatively: Total load in reporting year ^{a)} kg/year (comparison with the base year) **	Alternatively: Concentration ^{a)} mg/m ³ ***
VCM (point sources)			
VCM (arising from PVC waste – all environmental routes)			

* Please indicate under “remarks” how specific loads were calculated.

** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under “remarks” when installed production capacities have changed.

*** Please indicate the associated volumetric flow-rate and whether fugitive emissions are included.

a) In brackets: (Number of samples)

b. Discharges to water

Substances	Specific load ¹² In reporting year ^{13*} g/tonne of PVC produced	Alternatively: Total load in reporting year kg/year (comparison with the base year) **	Alternatively: Concentration mg/l ***
VCM (producing only e-PVC) ^{a), b)}			
VCM (producing e-PVC and s-PVC at the same site) ^{a), b)}			

* Please indicate under “remarks” how specific loads were calculated.

** If reporting total loads, please add a baseline load for (2001) and please indicate associated actual production of VCM and report under “remarks” when installed production capacities have changed.

*** Please indicate the associated volumetric flow-rate.

a) Please state correlation when VCM data are based on AOX or EOX measurements.

b) After effluent stripper, before secondary treatment.

¹⁰ Wherever possible this parameter should be reported

¹¹ The year for which data are to be reported in 2008/2009 is 2007.

¹² Wherever possible this parameter should be reported

¹³ The year for which data are to be reported in 2008/2009 is 2007.

c. Remarks: (i.e. explanation if change in production capacity in the country appeared, method to calculate specific loads)
