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Report

drawn up on behalf of the Committee on the
Environment, Public Health and Consumer Protection

on the proposal from the Commission of the
European Communities to the Council (COM(83)189 final -
Doc. 1-261/83) for a directive on procedures for
harmonizing the programmes for the reduction and
eventual elimination of pollution caused by waste
from the titanium dioxide industry

Rapporteur: Mr A. GHERGO

PE 88.190/fin.

Or. Fr.

By letter of 20 April 1983, the President of the Council of the European Communities requested the European Parliament, pursuant to Articles 100 and 235 of the Treaty, on the proposal for a Council directive on procedures for harmonizing the programmes for the reduction and eventual elimination of pollution caused by waste from the titanium dioxide industry (COM(83) 189 final).

On 16 May 1983, the President of the European Parliament referred this proposal to the Committee on the Environment, Public Health and Consumer Protection as the committee responsible.

At its meeting of 22 June 1983, the Committee on the Environment, Public Health and Consumer Protection appointed Mr GHERGO rapporteur.

The committee considered the Commission proposal and the draft report at its meetings of 29 September 1983, 3 February 1984 and 22 March 1984.

At the last meeting, the committee decided by 10 votes to 2 and 1 abstention to recommend to Parliament that it approve the Commission proposal with the following amendments.

It also decided to reserve the right to propose to Parliament the application of Rule 36(2) of the Rules of Procedure.

The committee adopted the motion for a resolution as a whole by 11 votes to 1, with 1 abstention.

The following took part in the vote: Mr COLLINS, chairman; Mr RYAN and Mrs WEBER, vice-chairmen; Mr GHERGO, rapporteur; Mr BOMBARD, Mr CERAVOLO (deputizing for Mr SPINELLI), Mr K. FUCHS (deputizing for Mr ALBER), Mrs LENTZ-CORNETTE, Mr NIELSEN (deputizing for Mrs SCRIVENER), Mrs SCHLEICHER, Mrs SEIBEL-EMMERLING, Mr SHERLOCK and Mr VERROKEN (deputizing for Mr DEL DUCA).

The report was tabled on 29 March 1984.

The deadline for tabling amendments to this report will be indicated in the draft agenda for the part-session at which it will be debated.

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The Committee on the Environment, Public Health and Consumer Protection hereby submits to the European Parliament the following amendments to the Commission's proposal and motion for a resolution together with explanatory statement:

Proposal from the Commission for a Council directive on procedures for harmonizing the programmes for the reduction and eventual elimination of pollution caused by waste from the titanium dioxide industry

Amendments tabled by the
Committee on the Environment,
Public Health and Consumer
Protection

Text proposed by the Commission of
the European Communities

Preamble and recitals
unchanged

Article 1 unchanged

Amendment No. 1

Article 2, from paragraph 1, to read as follows:

- strong acid wastes arising from the filtration phase following hydrolysis of the titanium sulphate solution or from a combination of these wastes with weak acid wastes and containing more than 0.5% free sulphuric acid and various metallic salts; and
- strong acid arising from the separation phase which follows on from the hydrolysis of the titanium oxide solutions and containing between 20% and 23% free sulphuric acid and various metallic salts; and
- weak acid wastes containing 0.5% or less free sulphuric acid, such as wash waters, cooling waters and condensates, but excluding diluted strong acid wastes;
- weak acid at a concentration of between 5% and 7%, arising from the washing phase which follows on from the separation stage and also the other wash waters, and in particular those associated with the gaseous discharges from the manufacturing processes, including both the sulphate and chloride processes;

- wastes arising from the treat-
ment of the abovementioned wastes
and containing various heavy
metals, including the non-
separated solid wastes;

after 'in the case of the chloride process':

- weak acid wastes containing 0.5% or
less free hydrochloric acid, such
as wash waters, cooling waters and
condensates, but excluding diluted
strong acid wastes;
- free hydrochloric acid.
- wastes arising from the treatment
of the abovementioned wastes and
containing various heavy metals,
including the non-separated solid
wastes.

'Solid wastes' means:

- in the case of the sulphate process:
 - . insoluble solid ore residues not
broken down by the sulphuric acid
during the manufacturing process;
 - . copperas, produced as crystalline
ferrous sulphate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) in
solid form;
 - . filtration salts and sludges
separated during treatment of
strong acid wastes;

- in the case of the chloride process:
 - . insoluble solid ore residues
not broken down by the chlorine
during the manufacturing process;
 - . metal chlorides and metal hydroxides
(filtration substances) produced in
solid form during the manufacture
of titanium tetrachloride;
 - . coke residues arising from the
manufacture of titanium tetra-
chloride;
 - . filtration salts and sludges
separated during treatment of
strong acid wastes.

Article 2, after 'for liquid wastes - in the case of the sulphate process:'

unchanged

Article 3(1) unchanged

Amendment No. 2

Article 3(2), first indent:

- by 1 January 1986 they prohibit the
disposal of solid wastes;
- by 1 July 1987 they prohibit dis-
charges of all forms of copperas
and of insoluble matter;

Amendment No. 3

Article 3(2), second indent:

- by 1 July 1986 they reduce dis-
charges of liquid wastes to the
- by 1 July 1988 they reduce dis-
charges of liquid wastes to the

reference value of 500 kg of
free acid per tonne of titanium
dioxide produced;

reference value of 1,000 kg of
free acid per tonne of titanium
dioxide produced;

Amendment No. 4

Article 3(2), third indent:

- by 1 July 1987 they further reduce
discharges of liquid wastes by 60%
of the abovementioned reference
value;

- by 1 July 1993 they further reduce
discharges of liquid wastes by 60%
of the abovementioned reference
value;

Article 3(3) unchanged

Amendment No. 5

Article 3(4)(a)

(a) In respect of the atmosphere,
Member States shall take the
measures necessary to ensure
that by 1 July 1988 SO_x dis-
charges are reduced to the
reference value of 20 kg per
tonne of titanium dioxide pro-
duced, as the annual average.

(a) In respect of the atmosphere,
Member States shall take the
measures necessary to ensure
that by 1 July 1988 SO_x dis-
charges are reduced to the
reference value of 30 kg per
tonne of titanium dioxide pro-
duced, as the annual average.

Article 3(4)(b) and (c) unchanged

Article 4(1) unchanged

Amendment No. 6

Article 4(2), first indent:

- in respect of estuary waters,
coastal waters and the open sea,
by 1 July 1986 discharges of liquid
wastes are reduced to the reference

- in respect of estuary waters,
coastal waters and the open sea,
by 1 July 1988 discharges of
liquid wastes are reduced to the

value of 200 kg of acid per
tonne of titanium dioxide
produced;

reference value of 200 kg of
acid per tonne of titanium
dioxide produced;

Amendment No. 7

Article 4(2), second indent:

- in respect of surface waters, by
1 July 1986 they prohibit discharges
of liquid wastes with a pH value
lower than 6.5.

- in respect of surface waters, by
1 July 1988 they prohibit dis-
charges of liquid wastes with a
pH value lower than 6.5.

Article 4(3) unchanged

Article 5 unchanged

Amendment No. 8

Article 6 to read as follows:

Member States shall take the measures
necessary to ensure that wastes sub-
ject to a prohibition on discharge
into water or the atmosphere are

- avoided or re-used where technic-
ally and economically feasible;
- re-used or eliminated without risk
to human health or damage to the
environment.

The same shall apply to wastes
arising from the re-use or treat-
ment of the above wastes.

1. Member States shall take the
measures necessary to ensure that:

- wastes subject to a discharge
prohibition are stored on land
with a view to re-use wherever
possible;
- products arising from the treat-
ment of copperas, strong acids,
weak acids and any other wastes
not subsequently re-used can be
stored on land without prejudice
to Directive 80/68/EEC.

2. The remaining quantities of the
discharges defined in Articles 3
and 4 may be disposed of without
pretreatment.

Article 7 unchanged

Article 8

Amendment No. 9

Article 8(1)

Member States shall take the
measures necessary to comply with
this Directive not later than
1 January 1985. They shall forth-
with inform the Commission thereof.

Member States shall take the
measures necessary to comply with
this Directive not later than
1 January 1986. They shall forth-
with inform the Commission thereof.

Article 8(2) unchanged

Article 9 unchanged

MOTION FOR A RESOLUTION

closing the procedure for consultation of the European Parliament on the proposal from the Commission of the European Communities for a Council directive on procedures for harmonizing the programmes for the reduction and eventual elimination of pollution caused by waste from the titanium dioxide industry

The European Parliament,

- having regard to the proposal from the Commission to the Council (COM(83) 189 final)¹,
 - having been consulted by the Council pursuant to Articles 100 and 235 of the Treaty (Doc. 1-261/83),
 - having regard to Council Directive 78/176/EEC of 20 February 1978 on waste from the titanium dioxide industry²,
 - having regard to the report of the Committee on the Environment, Public Health and Consumer Protection (Doc. 1-114/84),
 - having regard to the result of the vote on the Commission's proposal,
- A. whereas the discharge into Community waters of waste from the titanium dioxide industry, even when greatly diluted, is extremely dangerous,
- B. whereas, moreover, it is essential to harmonize as soon as possible at Community level the national programmes for the reduction of pollution, not least in order to avoid distortions of competition between producers of titanium dioxide in the Community,
- C. whereas an extension of the deadline from 1987 to 1993 would lead to distortions of competition favouring undertakings that have hitherto taken little or no action to comply with the basic Directive 78/176/EEC,

¹ OJ

² OJ L 54, 25.2.1978

- D. whereas some Member States have delayed proceedings by failing to meet their obligation to submit programmes fully or in time,
1. Deeply regrets the Commission's and the Member States' delay in complying with Directive 78/176/EEC of 20 February 1978, which has held up the implementation of important measures to reduce pollution by titanium dioxide;
 2. Considers that the proposal for a directive should lay down significantly shorter deadlines to reduce the pollution caused by the discharge of liquid, solid and gaseous waste from the titanium dioxide industry;
 3. Calls for a significant and rapid reduction in acid effluent together with, in particular, a reduction in the harmful metals contained;
 4. Calls, in view of the fact that Europe's forests are dying, for the introduction of state-of-the-art scrubbing techniques for the production of titanium dioxide as well, in order to reduce SO_x emissions into the atmosphere;
 5. Fully realizes that Community waters will be better protected by using less polluting production processes, employing the latest techniques for the treatment and elimination of waste, providing for its recycling and hence progressively reducing the amount discharged into Community waters;
 6. Calls on the Commission to draw up and submit to the Council within one year of the adoption of this directive standards for the construction of new plants for the production of titanium dioxide, laying down limits on the emission of waste at least as strict as those laid down by the directive itself;
 7. Approves the Commission's proposal for a Council directive on condition that it accepts the amendments tabled thereto;
 8. Instructs its President to forward to the Council and the Commission, as Parliament's opinion, the Commission's proposal as voted by Parliament and the corresponding resolution.

EXPLANATORY STATEMENT1. INTRODUCTION

In accordance with the principles set out in the Action Programme of the European Communities on the Environment of 20 December 1973 (OJ No. C 112), on 14 July 1975 the Commission submitted a proposal for a Council directive on waste from the titanium dioxide industry (COM (75) 339). This followed on a draft (ENV. 232/74) for the preparation of a document on aspects of a directive on the elimination of waste from the titanium dioxide industry.

At that time the titanium dioxide industry in the Community countries, with a total production capacity of 840,000 t/year, disposed of virtually all its waste by immersing it, untreated, in inland, coastal or estuary waters or in the open sea. This together with the rapid rate of expected development, necessitated the adoption of general rules at Community level which, through a gradual reduction in the waste produced by existing factories and appropriate restrictions on new installations, would virtually eliminate damage to the environment.

Initially, therefore, the rules provided for a gradual reduction over a ten-year period in the levels considered potentially harmful, a concept which involved respecting limits on the emission of waste. It was only subsequently, in the course of a lengthy and laborious process that this provision came to be concerned more generally with environmental protection, laying down objectives for the gradual reduction and eventual elimination of pollution caused by such waste. The abovementioned proposal led to Directive 78/176/EEC of 20 February 1978. In accordance with Article 9 (3) thereof the Commission submitted to the Council on 18 April 1983 (OJ No. C 138/5, 26.5.1983) the proposal for a Council directive on procedures for harmonizing the programmes for the reduction and eventual elimination of pollution caused by waste from the titanium dioxide industry.

The European Parliament is required to deliver an opinion on this proposal to enable the Council to take action, which it must do within six months of the publication of the opinion in the Official Journal.

2. PROPERTIES AND UTILIZATION OF TITANIUM DIOXIDE

2.1 - Pigmentary properties

Titanium dioxide has for a long time been considered as the most important known white pigment and is used as such in large quantities in an extremely wide range of fields such as paints, inks, plastics, rubber, paper, ceramics, synthetic fibres, etc.

The two commercial forms of the pigment are known as anatase and rutile and are distinguished by the fact that rutile has a more compact crystalline structure. It therefore has more centres of diffraction and hence possesses greater colouring power and higher resistance to chemical and photochemical agents. It has the highest known refractive index and it is this which explains the remarkable uses to which it can be put as a pigment. The superiority of the other variety, anatase, lies in the purity of its colour tone.

These two forms of titanium dioxide pigment broadly satisfy three fundamental requirements, - chemical inertness, covering power and depth of whiteness.

Consideration must also be given to other practical characteristics such as the ease with which it disperses in various excipients and high opacity to light.

It is possible using existing production techniques to obtain in the titanium dioxide pigments regular particles of optimum pre-established dimensions. The ideal conditions can thus be created for achieving maximum covering power, an extremely important requirement for a pigment which is used to cover surfaces after having been dispersed in a suitable medium. Titanium dioxide also has the lowest specific gravity of all white pigments, giving it a larger number of particles, per unit of volume, which operate as refractive centres.

2.2 - Uses

Given the basic characteristics outlined above, titanium dioxide is widely used in many fields. For the first years of this decade

its use in the various sectors in the European Community breaks down as follows :

- paints, varnishes, inks	63%
- plastics	18%
- paper and laminated plastics	10%
- other uses (rubber, ceramics, textiles, etc)	9%

This breakdown may vary slightly from one country to another, but by far the most important use is in paints and varnishes, which account for more than 60% of titanium dioxide, while the other sectors range from a few per cent to a maximum of 20%.

3. MANUFACTURE OF TITANIUM DIOXIDE AND RELATED EFFLUENTS

3.1 - General

The manufacture of titanium dioxide pigments entails the production of extremely pure titanium dioxide from ores in which it is mixed with other substances.

There are only two industrial-scale processes, both involving digestion of the basic ore followed by a series of operations designed to extract an intermediate compound which is then converted into titanium dioxide.

They are known as the 'sulphate' and 'chloride' processes.

3.1.1- Sulphate process

In this process the basic ore is digested with sulphuric acid to convert the oxides into sulphates. Titanium dioxide is obtained by calcination of the hydroxide precipitated selectively by means of hydrolysis from an intermediate product.

The raw materials usually used for this process in the countries of the European Community are :

- Norwegian ilmenite, TiO ₂ content around	45%
- Australian ilmenite, TiO ₂ content around	55%
- Canadian slag, TiO ₂ content around	72%
- South African slag, TiO ₂ content around	85%

There are large deposits of ilmenite, containing titanium dioxide in the form of ferrous titanate, and it is thus readily obtainable. Slag is obtained from ilmenite by means of a special reduction process in an electric kiln which enables a large part of the iron content of the ilmenite to be exploited as cast iron. Production of slag is increasing.

Using ilmenite, the sulphate process produces the following effluents :

- insoluble sludge from the digestion process consisting of solid residues from the ore undigested by the sulphuric acid ;
- crystalline ferrous sulphate, known as copperas ;
- liquid acid effluents containing free sulphuric acid and various metallic sulphates, known as 'strong' and 'weak' ;
- gaseous effluents containing sulphur oxides.

Using slag, the sulphate process produces the effluents referred to above, although no copperas is produced because of the high TiO_2 content and low iron content.

3.1.2 - Chloride process

In this process the basic ore is chlorinated to convert the oxides into chlorides. Titanium dioxide is then obtained by oxidizing the titanium tetrachloride previously separated from the other constituents.

The raw materials generally used for this process are as follows :

- natural rutile, TiO_2 content 96%
- synthetic rutile, TiO_2 content 93% + 95%

Unlike ilmenite, deposits of rutile are small and there is thus likely to be an increase in the production of the synthetic variety, which is obtained by enriching ilmenites. There is also a possibility that the chloride process may make direct use of ilmenites, although

this would exacerbate the problem of effluents which is considerably less serious in the case of the chloride process than the sulphate process.

The chloride process produces the following wastes :

- liquid acid wastes containing free hydrochloric acid and various metallic chlorides ;
- gaseous effluents containing chlorine.

3.2 - Disposal of wastes and effects on the environment

3.2.1- Disposal of wastes

There is ample up-to-date information available on the methods of waste disposal used by the various titanium dioxide plants in the different Community countries.

The situation is as follows :

- insoluble residues from the digestion process : these are mostly stored on land.
- Crystalline ferrous sulphate ('copperas'): not produced by establishments which use slag (50% of production by the sulphate process); in the case of establishments still using ilmenite, apart from small quantities which are recycled for water treatment, soil improvement, etc., the waste is dumped at sea in coastal or estuary waters or in the open sea or stored on land.
- Strong effluents : apart from small quantities which are re-concentrated and recycled or neutralized and stored on land as solid sludge, most of these wastes are dumped in the open sea, in coastal or estuary waters or in surface waters without any prior treatment - in only one case is the free acid neutralized before being dumped out at sea.
- Weak liquid effluents resulting from the sulphate and chloride processes: these are discharged with or without prior neutralization

and/or purification in surface waters or in coastal and estuary waters.

When the abovementioned three-year report was drawn up, most of the waste disposal methods could not be considered ecologically correct and in general resembled those which were felt to constitute a serious threat to the environment and which led to Directive 78/176/EEC.

3.2.2- Effects on the environment

The effects on the aquatic environment of the dumping of TiO_2 wastes as a whole - which vary according to their composition, the method of disposal used and the characteristics of the receiving medium - derive basically from the acidity and from the presence of ferrous sulphate and other metals. The following principal adverse effects are attributable to these two factors :

- disturbance of the pH of the receiving waters ;
- increase in the concentration of iron and other heavy metals ;
- reduced oxygenation as a result of the oxidization of the iron ;
- change in the colour and increase in the turbidity of the water leading to reduced photosynthesis ;
- reduction in the phyto- and zooplanktonic biomass ;
- in the case of dumping in deep water out at sea, formation of deposits of solid residues on the sea bed.

4. PROPOSAL FOR THE HARMONIZATION OF NATIONAL PROGRAMMES

4.1- Background

As pointed out in the introduction, this proposal fulfils one of the most important obligation placed on the Commission in the basic Directive 78/176/EEC.

This directive was notified to the Member States on 22 February 1978 and required them to meet a number of deadlines, including :

- Article 10 (2) - notification to the Commission of the establishments in respect of which no additional ecological measures were required (by 22 August 1978);
- Article 15 (1) and (2) - adjustment of national legislation to Directive 78/176/EEC (by 22 February 1979);
- Article 9 (3) - submission to the Commission of the national programmes for the reduction of pollution (by 1 July 1980) ;
- Article 9 (4) - introduction of an anti-pollution programme (1 January 1982) ;
- Article 14 - forwarding to the Commission of the report on anti-pollution measures (every three years).

The Commission was also required to meet similar deadlines, including :

- Article 7 (3) - submission to the Council of a proposal on the procedures for monitoring the environment (by 22 February 1979); Council Directive No. 82/883 - 3 December 1982;
- Article 9 (3) - submission to the Council of a proposal for the harmonization of the national anti-pollution programmes (within six months of receiving these programmes).

There have in general been substantial delays on the part of both the Member States and the Commission in meeting these deadlines, thereby jeopardizing the timely and effective implementation of the Directive. For example, Directive 82/883/EEC on the procedures for monitoring the environments affected by the wastes, . was adopted on 3 December 1982, around two years after the expected date. There was a similar prolonged delay in the submission by the Commission to the Council of the proposal for the harmonization of the national

anti-pollution programmes which is the subject of this report. In accordance with Directive 78/176/EEC, this proposal should have been submitted within six months of receiving the national programmes, which would have meant by 1 January 1981, if all the Member States had forwarded their programmes to the Commission by the prescribed date of 1 July 1980.

However, these programmes were received intermittently between 3 July 1980 and 15 October 1981. Furthermore, not least because of the absence of specific guidelines on the form to be taken by these national reports, the information forwarded by the Member States was disparate and therefore not comparable and moreover incomplete, so that supplementary data was required.

Given its inability to meet its obligations within the deadlines set out in the basic Directive, on 13 July 1982 the Commission submitted to the Council a proposal seeking to extend the deadlines stipulated in Article 9. This proposal gave rise to Directive 83/29/EEC of 24 January 1983, which fixed 15 March 1983 as the deadline by which the Commission should submit to the Council the proposal for harmonization.

4.2 - Comments on the proposal for harmonization

The purpose of this directive is to prevent, reduce and eventually eliminate pollution caused by waste from the titanium dioxide industry. In addition to this objective, which concerns environmental protection, there is a second, equally important aim concerning the operation of the Common Market and, more specifically, the elimination of the existing inequality in the conditions of competition.

One of the principal difficulties encountered by the Commission in harmonizing the programmes has been not so much to reconcile various programmes to be implemented in the future, as to find an approximation between practical anti-pollution measures which have already been implemented and other proposed measures. This reveals without any shadow of doubt the long-standing existence of distortions of competition.

In laying down the measures to be taken to eliminate pollution, the proposal does not analyse the merits of the technologies to be applied and leaves the individual Member States to select an appropriate method in accordance with the facilities offered by the various production plants.

The proposal also indicates the dates by which the individual measures are to be implemented. While certain dates accord with the date laid down in the basic Directive for the achievement of the ultimate objective, i.e. 1 July 1987, others have been extended to a greater or lesser degree up to a maximum of seven years (1 July 1993 with a possible extension of one year).

This clearly renders the contents of the basic Directive totally meaningless, since it enables the existing distortions of competition to be maintained for a further ten years. There is no justification whatever for this, particularly in view of the fact that the present proposal does not contain more restrictive provisions than those set out in the basic Directive, which stipulated unequivocally the deadline of 1 July 1987 and required the Member States to implement a programme for reducing pollution from 1 January 1982.

As regards the various measures designed to reduce the pollutant effects of the waste, the individual articles provide for :

- prohibition on the dumping in the sea of ferrous sulphate ('copperas') and insoluble matter (for the sake of completeness, this ban should be extended to include surface waters);
- discharges of liquid wastes in the sea to be limited to 1,000 kg of free sulphuric acid per tonne of TiO_2 produced, to be reduced subsequently by a further 60% ;
- discharges of liquid wastes from the chloride process to be limited to 200 kg of acid per tonne of TiO_2 produced ;
- restrictions on the pH value and/or the temperature for discharges of liquid wastes in coastal, estuary and surface waters (for the sake of consistency these limits, which apply to wastes from the sulphate process, should be extended to include those from the chloride process);

- discharges into the atmosphere to be restricted to 30 kg of SO_x per tonne of TiO₂ produced by the sulphate process and to 6 g of chlorine per tonne of TiO₂ produced by the chloride process.

It is reasonable to assume that suitable technologies already exist for the implementation of these provisions and that real reductions in pollution could therefore be achieved in a shorter time or at least nearer the deadlines set out in the basic Directive. The use of existing techniques does not of course exclude the future application of more effective methods.

In addition to speeding up the timetable for the practical implementation of these provisions and for compliance with the proposed limits, for the sake of consistency it would also be logical to bring forward the date envisaged for the incorporation of the new Community rules into national legislation.